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**Organizational Climate and Company Productivity:
The Role of Employee Affect and Employee Level**

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Abstract

Consistent with a growing number of models about affect and behaviour and with a recognition that perception alone provides no impetus for action, it was predicted that associations between company climate and productivity would be mediated by average level of job satisfaction. In a study of 42 manufacturing companies, subsequent productivity was significantly correlated in controlled analyses with eight aspects of organizational climate (e.g. skill development and concern for employee welfare) and also with average job satisfaction. The mediation hypothesis was supported in hierarchical multiple regressions for separate aspects of climate. In addition, an overall analysis showed that company productivity was more strongly correlated with those aspects of climate that had stronger satisfaction loadings. A second prediction, that managers' perceptions of climate would be more closely linked to company productivity than would those of non-managers, was not supported. However, managers' assessments of most aspects of their company's climate were significantly more positive than those of non-managers.

JEL Classifications: M11; M12; J5; J24

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Introduction

It has long been clear that behaviour is a function both of a person's characteristics and the nature of his or her environment. Important environmental features in work settings have sometimes been brought together under the general heading of "climate", usually measured through individuals' perceptions of their organization's policies and practices (e.g. Schneider, 1990; Ashkenasy *et al*, 2000). Associated research has investigated perceptions of "culture", sometimes taking measures of perceived culture through questionnaires similar to those applied in climate studies (e.g. Reichers and Schneider, 1990; Payne, 2000). As described by Denison (1996, p. 624), "culture" "refers to the deep structure of organizations", whereas "climate" mainly concerns "those aspects of the social environment that are consciously perceived by organizational members".

Measures of climate seek to represent employees' experiences of important organizational values and processes, and thus have often been thought of as possible predictors of organizational performance. Four kinds of performance may be suggested: economic (productivity, profitability, etc.), technological (development of new products, etc.), commercial (market share, a specific niche, etc.), and social (effects on customers, suppliers and the public at large) (Bartram *et al*, 2002). Most research in the area of this paper has examined economic aspects of organizational performance, and that approach will be taken here.

Wilderom *et al*, (2000) located and summarized 10 relevant studies. They reported that, although most of those had found some dimensions of organizational climate to be associated with performance, different climate aspects had emerged as important in different studies. In addition, causal interpretation of observed relationships has been made difficult by a frequent reliance on cross-sectional research designs, obtaining measures of performance for the period immediately before climate is assessed. It is instead desirable to examine climate at one point in time as a possible predictor of performance in a subsequent period.

Two studies that obtained objective organizational performance data later than the assessment of climate were by Denison (1990) and by Gordon and DiTomaso (1992). In the first case, a climate that encouraged employee involvement in company decision-making (through individual inputs and between-role collaboration) was found (across 34 firms in 25 different industries) to predict company financial success in subsequent years; however, quantitative support for the importance of three other climate dimensions was not obtained.

The study by Gordon and DiTomaso (1992) (across 11 insurance companies) examined aspects of adaptability (a combination of scales to tap action orientation and risk-taking), finding that this climate indicator was positively associated with subsequent financial growth. However, three other aspects of climate were unrelated to financial outcomes.

Research into organizations' climate and performance has thus yielded varying results. This diffuse pattern is likely to arise in part from different studies' use of different indicators of performance, from variations in the temporal sequence of measurement, and from the fact that different kinds of organizations were examined by different researchers. In addition, of particular importance are variations in the intervening processes which may translate an organization's climate into performance.

Kopelman, Brief, and Guzzo (1990) have presented a model to make more explicit those intervening processes. Organizational climate is viewed as influencing organizational productivity (the form of performance considered in the model) through "cognitive and affective states" and "salient organizational behaviours". The former states are primarily employees' work motivation and their feelings of job satisfaction. Those are considered to influence productivity through three kinds of behaviour: attachment behaviours (attending and staying in the organization), role-prescribed behaviours (tasks in one's organizational role), and citizenship behaviours (helpful contributions that are not mandatory).

This model has been developed by Sparrow (2001), who also includes features of person-organization fit and of employees' psychological contract. The psychological contract is viewed as incorporating "mental, emotional and attitudinal states" and "salient organizational behaviours", the two principal intervening processes considered by Kopelman and colleagues. The psychological states are seen as linking perceived climate and potential person-organisation fit with salient employee behaviours and then with performance at the organizational level. These states include perceived justice and organizational support, work motivation, and feelings of trust, commitment, job involvement and job satisfaction.

There is very little empirical research into the validity of these models. Given that an overall test is unlikely to be practicable in a single study, it is important to examine the possible mediating role of specific elements of the models. Affective variables such as work motivation, job satisfaction, job involvement, organizational commitment, and experienced support and justice tend to be positively intercorrelated (e.g. Meyer *et al*, 2002), and their mediating role in climate-performance associations may turn out to be similar. We will here focus on the affective state of overall job satisfaction, assumed by both Kopelman *et al* (1990) and Sparrow (2001) to be a central variable linking organizational climate with salient

behaviours and performance outcomes.

If job satisfaction is found to mediate climate-performance associations, the importance of climate for organizational performance may be partly explained in evaluative terms (in ways to be illustrated below), and the models summarized above will receive partial support. Furthermore, different findings between studies in the literature may turn out to be partly due to variations in the affective tone of the climate dimensions that happen to have been studied in each case.

The Role of Employee Affect

Employee affect can operate as a mediator between perceived climate and organizational performance only when two conditions are met. Perceptions of climate must statistically overlap with the affective reaction under examination; and that affective reaction must itself be associated with performance. What is known about those two possible relationships?

Affect and climate

Climate has always been viewed as a descriptive concept (referring to facts about the environment), in contrast to, for instance, the evaluative construct of job satisfaction. However, there has long been concern that this conceptual separation is not maintained in practice (e.g. Guion, 1973). Some descriptive items in climate questionnaires have an obviously value-laden content (e.g. “This company cares for its employees”), and many others have implications about personal benefit (e.g. “This company provides a lot of training”). Description and affect are thus likely to be combined in responses to at least some climate items.

Broader psychological research has pointed to the inseparability of descriptive and evaluative perceptions. For example, an extensive programme of investigations by Osgood *et al* (1957) revealed that the first factor in perceived meanings of any stimulus was evaluative (with smaller factors of potency and activity); evaluation (a general like or dislike, pro or con, approach or avoid response) is inherent in the perceived meaning of any construct. Although an object of perception may be described in factual terms, evaluative connotations cannot be avoided.

A similar conclusion is suggested by Gibson's (e.g. 1950) model of perception. This emphasises that perception operates in the service of action, for which we need to anticipate possible threats and opportunities. Gibson points out that we automatically notice significant "affordances" in the environment. These are properties of a situation that are potentially harmful or beneficial, indicating that certain important actions are either made possible or prevented by the environment. Affordances are inherent in the meaning that we attach to any perceived object, person or situation.

Assessments of personal meaningfulness are also found in studies of organizational climate. Payne (1976) showed that perceptions of an organization's emphasis on achievement, affiliation, autonomy and understanding were highly correlated with satisfaction with those aspects of climate. Furthermore, the magnitude of this perception-affect correlation was found to correlate .63 with each item's rated importance to the perceivers. "In other words, the more an area is valued, the higher the relationship between climate and satisfaction" (Payne *et al*, 1976, p. 53).

James and James's (1989) model argues that environmental perceptions and affects of these kinds are "components of reciprocally interacting, interdependent, non-recursive, fused processes" (p. 749; see also James, James and Ashe, 1990, p. 64). The position taken in this paper is that the concepts of climate and affect are conceptually distinct, but that perceptions of climate are usually tinged with some degree of affect. This emotional loading raises the possibility that perceived climate is reflected in performance because of associated job-related feelings; given that climate aspects vary in their affective loading, those aspects of climate with greater loadings may be more associated with organizational performance. Of course, that expectation does not rule out the operation of other mediators, such as organizational behaviours illustrated in the models outlined earlier.

Affect and performance

The second requirement for mediation of climate-performance links by employee affect is that the affect examined should itself be associated with performance. Evidence about affect-performance associations in organizations is growing, and the theoretical bases of possible mediation are becoming clearer.

For example, employees' job satisfaction has been found to be associated with each of the three "salient organizational behaviours" in the model of Kopelman *et al*. (1990) (see above). In respect of attachment behaviour, a significant negative correlation with staff

turnover is found (Griffeth *et al.*, 2000). In respect of role-prescribed behaviour, Judge, Thoresen, Bono, and Patton (2001) demonstrated that employees' overall job satisfaction is on average correlated .30 (after corrections for measurement unreliability) with their work performance. Staw, Sutton, and Pelled (1994) found that positive emotion at work predicts subsequent employee performance, controlling for prior performance, education level, age and gender. Negative affect in terms of job-related tension is associated with poorer work performance (Jamal, 1984).

For the third salient behaviour in the model by Kopelman and colleagues, measures of job satisfaction are significantly associated with discretionary behaviours classed as "organizational citizenship": helping, loyalty, compliance and so on (Podsakoff *et al.*, 2000). Similarly, school-teachers with greater overall satisfaction are significantly more likely to undertake unpaid overtime work than others (Gechman and Wiener, 1975).

At the organizational level, Ostroff (1992) reported significant associations between teachers' average job satisfaction and several standardized measures of school performance. Koys (2001) found that mean employee satisfaction was significantly correlated with subsequent company profitability, and this association was also observed in relation to company productivity by Harter, Schmidt, and Hayes (2002). (However, the temporal sequence of measurement is not clear in the latter report.)

What kinds of mechanism may underlie these empirical associations? In general terms, perception on its own generates no impulse for action; that comes from processes that are affective. Possible processes have been illustrated by George and Brief (1992). They discussed how positive mood at work can give rise to four kinds of "organizational spontaneity": activities that help others, protect the organization, develop oneself, and generate suggestions to improve functioning. They showed that variations in affect were linked to these forms of spontaneity in work settings.

The model developed by Staw *et al.* (1994) also illustrates possible mechanisms. They suggested that three kinds of process intervene between positive emotion and high performance at work. First are direct effects on task activity, persistence and functioning. Wright and Staw (1999) drew attention to two of those. In terms of expectancy theory, positive affect can increase both the expectancy that one's effort will lead to high performance and the belief that performance will lead to desirable outcomes. Another direct process is in terms of personal goals, causing those to be either set more highly or more readily accepted by people experiencing positive affect. The second intervening process in the model of Staw *et al.* (1994) is interpersonal: it is likely that positive affect and its

manifestations yield more favourable responses by other people and greater influence over them. Third, Staw and colleagues review evidence that employees with more positive emotion react more favourably to others, resulting in greater altruism and task co-operation.

Some of these processes have been explored in experimental research (e.g. Isen and Baron, 1991). Mood levels were induced through manipulation of gifts, compliments or pleasant surprises, and associated differences were observed in people's helpfulness, sociability, concern for positive outcomes in disputes, active problem-solving, mental flexibility, recall of positive material, and creative problem solving. (See also Isen, 1987.) Although this evidence comes from non-occupational settings, its experimental basis permits strong inferences about the causal importance of affect in shaping behaviour.

Several more general perspectives are based on the notion that feelings and action are closely interdependent. For example, "action theory" focuses on the ways in which people behave in order to achieve their goals, the latter reflecting both previous satisfaction and new objectives (e.g. Frese and Sabini, 1985). Locke's (1970) analysis of job satisfaction and job performance illustrates how positive feelings arising from previous behaviour are likely to lead to future actions that might sustain those feelings. Satisfaction (from the attainment of previous goals) and motivation (to achieve similar goals in the future) are considered to be inherently overlapping. Employees' satisfaction with their job is thus conceptually and empirically linked to more purposive affect-laden constructs that imply activity in the pursuit of goals or values.

This interdependence is particularly clear in forms of employee affect that incorporate raised levels of activation. For example, well-being may be viewed in terms of orthogonal axes of pleasure and psychological arousal (e.g. Warr, 1999), so that positive affect may be in terms of either active or passive feelings. Active feelings (enthusiasm, energy, excitement, etc.) are by their energized nature likely to promote action.

Although this paper is concerned with links between perceived organizational climate and performance, parallel arguments apply to the relationship between perceived job characteristics and the performance of individual employees. Models in that area have long asserted that job content has its influence on employee behaviour through variations in the "motivating potential" of perceived characteristics (e.g. Hackman and Oldham, 1976). A mediating process of that kind was illustrated by Parker, Baltes, Young, Huff, Altmann, Lacost, and Roberts (2003), who reported that variations in job satisfaction and similar affects accounted for the relationship between individuals' perceptions and performance.

Overlaps between affect and action have also been examined through the concept of

“attitude”. This is usually defined in terms of a bias predisposing a person towards evaluative responses that are either positive or negative (e.g. Eagly and Chaiken, 1993). Such evaluative tendencies are conventionally viewed as having three aspects: cognitive, affective and behavioural. Affects and actions thus operate together, reflecting multi-dimensional orientations to features of the environment. This theme is also central to several theories of motivation. For example, the theory of planned behaviour (Ajzen, 1991) seeks to predict people’s actions from a range of factors including their attitudes to an act. The theory (and several associated models) indicate that almost all behaviour arises in part from some form of affect.

A rather different reason to expect job satisfaction and related forms of affect to be associated with work performance arises from the correlation between job (and other forms of) satisfaction and a range of personality attributes. More satisfied employees possess some personality characteristics that are likely to be reflected in good work performance. For example, Judge and Bono (2001) reviewed previous studies indicating that traits such as self-esteem, self-efficacy, locus of control and emotional stability are significantly associated with both job satisfaction and job performance. More satisfied employees thus tend to differ from others in attributes that may themselves give rise to better performance.

In addition to those possible influences at the individual level, aspects of organizational climate may also contribute to performance through collective forms of affect. It is in the nature of many climate constructs that they reflect processes of co-operation or conflict. Such communal activities or interdependent motives may influence group and organizational performance at the supra-individual level, operating through social norms and mutual reinforcement. This process may be viewed through the concept of “group affective tone” (George and Brief, 1992) – consistent feelings experienced by members of a work team. This group characteristic is thought to influence members’ mental models, decision-making procedures and outcomes, collaborative behaviour, and withdrawal behaviours such as absenteeism and staff turnover (George, 1996).

For both individual and collective reasons, the association between organizational climate and organizational performance is thus expected to be mediated by affective reactions of employees. This prediction will be examined here, taking overall job satisfaction to illustrate the types of affect which may link climate with performance. It will be tested in two ways, first through hierarchical multiple regression analyses for individual aspects of climate, and second through an overall comparison between each aspect’s overlap with job satisfaction and its association with company productivity.

Differences in employee level

In addition to testing the prediction about affective mediation, the paper also has a methodological aim. It is possible that studies which measure climate merely through the perceptions of managers generate results that differ from those examining a wider sample of employees. In that case, misleading interpretations might be made, and combining the two kinds of investigation in an overall review would yield inappropriate conclusions.

The literature appears to have ignored this possibility. Climate has typically been viewed as characteristic of an entire organization or sub-organization, apparently requiring measurement through the perceptions of a broad range of employees. For instance, Wilderom *et al.* (2000, p. 207) argued that “it seems crucial that researchers investigate organizational members who are representative of all the ... levels of the organization”. With that in mind, early questionnaires (e.g. Payne and Pheysey, 1971) were explicitly designed for completion by employees of all kinds.

However, more recent investigators have often derived climate scores from managers alone. For instance, Gordon and DiTomaso (1992) studied company performance as a function of perceptions by the top four or five levels of management. They recognized that “management ... is clearly not a representative sample of the employees in the companies” (p. 788). However, it was argued that, because of managers’ greater influence over work processes, “culture measured at this level will be most predictive of future behaviour and performance of the firm” (p. 789). Top managers only were studied by Peters and Waterman (1982), and a similar restriction was applied by Gordon (1985), Kotter and Heskett (1992), Sheridan (1992), Denison (2001), Denison and Mishra (1995) and Weber (1996), in each case excluding climate perceptions by non-managerial employees.

There is evidence that managers’ perceptions of their organization’s climate tend to be more positive than perceptions by non-managers (Payne and Mansfield, 1973). However, we have located no empirical comparisons between the predictive strength of climate measures obtained from these two groups. Despite the apparent importance of assessing experience widely across the work-force, there are two arguments for the possibly greater predictive value of managerial perceptions. First, it might be the case that managers’ roles within a company provide them with more wide-ranging evidence on which to base their assessments of climate. Whereas most non-managers necessarily have a perspective restricted to their own area of work, senior staff are often able to make more wide-ranging judgments. Managers’ perceptions of the company’s climate may thus be based on more comprehensive

knowledge than are those of non-managerial employees. Second (as illustrated by the reasoning of Gordon and DiTomaso, above), managers have a principal impact on both climate and company performance, so that their perceptions may be more associated with outcome variables.

Comparisons between the two employee groups will be made here. The paper's second prediction is that associations between climate and company productivity will be stronger when climate is assessed by managers rather than by non-managers. If climate-productivity associations are moderated by employee status in this manner, this contingency will need to be considered in interpreting findings from the two kinds of study.

The Need for Longitudinal Analyses

It is important to examine relationships with organizational performance in the future, rather than (as is common in this field) obtaining cross-sectional data that link climate to performance in the recent past. In addition, although correlations between climate and subsequent levels of (for instance) company productivity or profitability provide important information, significant associations might arise because previous performance influenced later climate. It is thus desirable also to study performance prior to the measurement of climate, and to control for those earlier values in examining associations between climate and later performance. This across-time control has almost never been used in this area; it will be applied here.

Method

Sample and procedure

Information about climate, affect and performance was obtained from 42 manufacturing companies in the United Kingdom. In order to ensure that perceptions within an organization described the same work setting, the sample was made up of single-site companies. These were drawn mainly from the metal goods, mechanical engineering, plastics and rubber sectors, and ranged in size from 70 to 1,150 employees.

In 39 companies, all employees were asked to complete questionnaires about

company climate and their feelings about their job and organization. However, in the three companies employing more than 500 people a random sample of 500 was approached. Completed questionnaires were returned (by mail directly to the research team) by 4,503 employees, a response rate of 54%.

Measures applied

Organizational climate Respondents recorded perceptions of their company's climate through items to tap 17 dimensions identified as important from previous research and from discussions with managers. No available instruments covered the desired range of dimensions, and a new inventory was therefore constructed. Items were initially created for 19 possible dimensions, and preliminary analyses were based on responses from 5,415 employees in 54 organizations (including the 42 examined here).

Exploratory factor analyses on a randomly-selected 50% of this sample indicated the presence of 17 significant factors. Cross-loading items were next omitted in line with that initial structure. A subsequent confirmatory factor analysis of retained items, conducted on the remaining 50% of respondents, supported the pattern, demonstrating as significant the previously-identified 17 components. With a total of 83 items, most scales contained five items, and alpha coefficients of internal reliability ranged from .67 to .88 with a median value of .82. The inventory and its development are described more fully by Patterson, West, Lawthom, Maitlis, and Robinson (2003).

The 17 climate scales are shown in Tables 1 to 4. Sample items are "management involve people when decisions are made that affect them" (involvement scale), "supervisors here are friendly and easy to approach" (supervisory support scale), "people are strongly encouraged to develop their skills" (skill development scale), and "this company is always looking to achieve the highest standards of quality" (quality scale). Four response alternatives were provided (definitely false, mostly false, mostly true and definitely true), and items from different scales were intermingled in presentation of the questionnaire.

Overall job satisfaction The primary measure of employee affect was a 16-item scale of overall job satisfaction (Warr *et al*, 1979; Mullarkey *et al*, 1999). This covers principal job features (physical working conditions, opportunity to use your ability, etc.) and presents seven response options ranging from extremely dissatisfied to extremely satisfied; a mean score was computed. The alpha coefficient of internal reliability was .92.

Organizational commitment Job-related affect was also examined through a nine-item scale

of commitment to one's organization (Cook and Wall, 1980). Example items (with five disagree-agree response options) are "I feel myself to be part of this organization" and "In my work I like to feel I am making some effort, not just for myself but for the organization as well". Coefficient alpha was .85.

Organizational performance Models of climate-performance links include among their outcome indicators the productivity and profitability of companies investigated. In addition to their theoretical importance, those outcomes are clearly of major practical concern, and they were the aspects of performance examined. Both were measured through standard economic metrics, using data obtained from audited company accounts lodged in Companies House. Values were calculated for the three years preceding data-collection (to act as a control for associations with later values) and also for the subsequent year (providing the performance data to serve as dependent variables).

Productivity was indexed as the logarithm of the financial value of net sales per employee. This value (sometimes referred to as "labour productivity") was made relative to the sector in which a company was located by dividing it by the overall sector productivity value. The logarithmic value was used in order to prevent the results being distorted by any extreme scores. Profitability was measured as profits before tax, after control for company size (number of employees). In order to allow for changes due to movements in prices, this value controlled for the producer price index for the company's sector.

Other variables Respondents described their job content and status in six categories, three sub-categories (shop-floor, office, and other) of managers and of non-managers. In order to examine predicted differences between two employee levels, separate groups of managers and non-managers were created by merging the three sub-categories in each case. As desirable controls in statistical analyses, information was also gathered from each company about its number of employees and industry sector. The last variable was coded through dummy variables with reference categories of engineering, plastics and miscellaneous.

Results

For each of the 42 companies, mean values were computed for the 17 climate scales and for overall job satisfaction and organizational commitment. In order to check that between-person variation within companies was acceptably small for this aggregation process, the r_{wg}

index of agreement was applied (James *et al*, 1984). A high score indicates that judges make very similar ratings, justifying aggregation of their scores.

The mean r_{wg} level was found to be .78 (range = .67 to .86), with all but two values exceeding the conventional .70 threshold for aggregate indicators (George, 1990). High r_{wg} levels were also found for job satisfaction (.91) and organizational commitment (.84).

Consistent with previous studies, the two measures of job-related affect were highly intercorrelated. The r -value between mean overall job satisfaction and mean organizational commitment across the 42 companies was .88. (At the individual level $r = .72$, $N=3894$ employees). Given this substantial overlap, it is inappropriate to report complete results for the two variables. The paper thus concentrates on job satisfaction; findings for organizational commitment were almost identical.

In a similar manner, the indices of company productivity and profitability were highly intercorrelated (.83 for pre-study values and .84 for subsequent values). The paper will report productivity analyses; patterns for company profitability were very similar, although associations tended to be slightly less strong.

Company climate and subsequent productivity

The right-hand column of Table 1 shows that, for the full sample of respondents (managers and non-managers together), five aspects of organizational climate were significantly correlated with subsequent productivity: concern for employee welfare, skill development, reflexivity, innovation and flexibility, and performance feedback. Companies that were perceived by employees to place more emphasis in those domains were more productive than others in the following year.

It is important to examine those associations after statistical controls have been applied for prior company performance and for variations in size and industrial sector. Results from hierarchical multiple regression analyses with those controls are summarized in Table 2. At the first step of analysis, each climate scale served alone as the predictor, so that the values in column 2 (climate alone) are equivalent to correlations in the right-hand column of Table 1. Controls for previous productivity, company size and industry sector were entered at step 2, and beta weights after those controls are presented in column 3. (Columns 4 and 5 will be examined later.)

Of the five scales of climate that predicted subsequent productivity in bivariate terms (concern for employee welfare, skill development, reflexivity, innovation and flexibility, and

performance feedback), four remained significant predictors after statistical controls. However, reflexivity became non-significant at the second step; see column 3 of Table 2. It can be seen that company productivity was in addition predicted in those controlled analyses by supervisory support, effort, quality, and formalization. Eight aspects of organizational climate were thus predictive after statistical control, reflexivity was significant only in bivariate analysis, and the remaining eight scales were non-significant at all stages.

Employee affect and subsequent productivity

The bottom right-hand corner of Table 1 shows the associations of company mean job satisfaction and organizational commitment with subsequent productivity across the 42 companies. In the full-sample analyses (final column), overall job satisfaction and organizational commitment predicted company productivity in the subsequent year .44 and .36 respectively ($p < .01$ and $p < .05$).

It is important to examine these affect-performance associations with controls of the kind applied for the climate scales. Hierarchical multiple regressions revealed that the pattern remained unchanged. For all employees together (managers and non-managers), company mean overall job satisfaction and organizational commitment were significantly predictive of subsequent productivity after controls for previous productivity, company size and industrial sector ($\beta = 3.10$, $p < .01$, and $\beta = 2.51$, $p < .05$).

Prediction one: Overall job satisfaction as a mediator

It was predicted that employee affect, measured through average overall job satisfaction, would mediate observed associations between company climate and productivity. For all employees (managers and non-managers together), this possibility was first examined in step 3 of the hierarchical multiple regressions summarized in Table 2. Following Baron and Kenney (1986), the criteria for mediation by job satisfaction were taken to be (a) a substantial reduction of the β weight of an initially significant climate scale after inclusion of the potential mediator (job satisfaction), and (b) a significant β coefficient for that mediator in the final equation. The magnitude of a reduction that is deemed “substantial” appears to be unspecified in the literature, and we set a minimum requirement that the significant contribution of a climate scale should be rendered non-significant after entry of job satisfaction into the equation. In addition, following Huselid (1995) we also report the

average percentage reduction in beta weights after inclusion of the potential mediator.

It can be seen from Table 2 that inclusion at step 3 of company scores for average job satisfaction reduced to non-significance all the eight climate-productivity associations that were significant at step 2. (Compare columns 4 and 3.) Furthermore (see column 5), the beta weight for job satisfaction was significant at step 3 in six of these eight cases. (The exceptions were concern for employee welfare and skill development. As shown in brackets in column 1, those two climate features were highly correlated with overall job satisfaction, above the .70 level that is conventionally taken to indicate excessive multi-collinearity. Multiple regression analyses including both variables are therefore inappropriate in those two cases.) The average percentage decline in beta values between steps 2 and 3 for the six examined scales was 65. The pattern indicates mediation of the climate-productivity association by overall job satisfaction for these aspects of climate: supervisory support, effort, innovation and flexibility, quality, performance feedback, and formalization.

Given that both climate and job satisfaction were assessed by reports from the same individuals, it is possible that this mediation relationship is artificially inflated by common-method variance (e.g. Spector, 1994). For example, it has been argued that the personality trait of negative affectivity accounts for some of the variance shared by reports about many variables (e.g. Brief *et al*, 1988).

We were able to eliminate this possible method effect through examination of mean values derived from different sets of employees in each organization. For each company, respondents were divided randomly into two sub-groups. Additional multiple regression analyses were carried out, in which the mean climate scores inserted in step 1 and subsequently were from one sub-group of employees, and the mean job satisfaction values inserted in step 3 were from the other sub-group. This two-group analysis was carried out twice. In the first case, sub-group A's climate and sub-group B's job satisfaction were examined; the second analyses were of B's climate and A's job satisfaction scores.

It was found that this analytic separation of respondents had no effect on the observed pattern. The eight significant climate effects at step 2 in Table 2 were all rendered non-significant at step 3 by the inclusion of mean job satisfaction values from different employees in the same company. Furthermore, the beta coefficient for job satisfaction was always statistically significant in relevant cases at step 3 in the split-group analyses. The robustness of these findings across separate sub-groups within a company (excluding a possible impact of common-method variance), and complete confirmation of predictions about the pattern of beta weights, argue strongly for the mediation of climate-productivity links by employee job

satisfaction.

Prediction one was also examined in terms of all 17 climate dimensions simultaneously. The mediation hypothesis implies that climate scales will differentially predict subsequent productivity as a function of each scale's affect-loading. If employee affect mediates the impact of climate features on productivity, a stronger climate-productivity association should be found for those aspects of climate that have a stronger affective tone.

The affective tone of each climate dimension was indexed in terms of its correlation with overall job satisfaction (examining associations between those mean scores across the 42 companies). All correlation values are shown in brackets in the left-hand column of Table 2. Each scale's affective tone was then correlated with the strength of its controlled prediction, that is its beta weight in step 2 of the hierarchical regression analyses (column 3). A scale's affective loading and its controlled association with subsequent productivity were found to be intercorrelated .92 ($N = 17$ scales). In support of the paper's first prediction, the strongest climate predictors of later productivity were thus the ones that most reflected employees' overall job satisfaction; climate scales with lower correlations with overall job satisfaction were less associated with later productivity.

Prediction two: Differences in employee level

The paper's second concern is for possible biases when climate reports are examined merely from managers, a practice that is widespread in the literature. As well as containing full-sample information (discussed above), Table 1 also summarizes separate analyses for managers and non-managers. These show (in columns 2 and 3) that managers described their organization's climate significantly more positively than did other employees on 11 of the 17 scales. Despite that, there was considerable correlational agreement between average perceptions of the two sub-groups in each company. Column four of Table 1 shows that correlations between managers' and non-managers' perceptions on each climate dimension ($N = 42$ companies) ranged from .37 (for reflexivity) to .91 (for quality); the mean r -value was .68. When managers viewed their company's climate relatively more positively or negatively than managers in other companies, so did their non-manager colleagues.

On the basis of prediction two, we expected that climate-productivity links would be stronger for managers' than for non-managers' perceptions of climate. However, Table 1 shows that the mean difference between climate-productivity correlations for managers and non-managers (.04 across 17 climate scales) does not come close to statistical significance.

Are the eight scales that are significant in controlled analyses for all employees combined (Table 2) also significant in analyses of perceptions by managers and non-managers separately? Controlled analyses for the two sub-groups are shown in Tables 3 (managers only) and 4 (non-managers only). It can be seen from column 3 in the two tables that, after control for previous productivity, company size and industrial sector, four aspects of climate were statistically significant predictors for both managers and non-managers separately (supervisory support, concern for employee welfare, skill development, and innovation and flexibility); two were predictive for managers' perceptions only (effort and performance feedback; see Table 3); and three aspects of climate were associated with subsequent productivity when measured by non-managers' (but not managers') perceptions (outward focus, quality and formalization; see Table 4). There was thus no general trend towards a stronger association of company productivity with climate perceptions by managers rather than non-managers. Prediction two, expecting a stronger climate-productivity association for managers, was thus not supported.

Given that many researchers have examined merely the responses of managers, it is important also to compare managers' analyses with those for the full sample. Would restriction to a sample of managers yield conclusions that differ from an investigation of a work-force as a whole (including the managers themselves)?

In fact, patterns are extremely similar. The mean difference in correlations of climate with subsequent productivity (see Table 1) is 0.05, and six of the eight climate dimensions that are significant for the full sample after controls (column 3 of Table 2) are also predictive for managers after those controls in Table 3 (supervisory support, concern for employee welfare, skill development, effort, innovation and flexibility, and performance feedback).

What about the associations of average job-related affect with company productivity at the two employee levels? The two bottom rows of columns 5 and 6 in Table 1 indicate that the bivariate pattern was extremely similar (significant positive correlations) for both job satisfaction and organizational commitment in separate analyses for managers and for non-managers. This similarity reflects the high correlations between managers' and non-managers' values (.58 and .47; see the bottom of column 4 in Table 1); the companies differ in their levels of job-related affect in a similar rank-order for non-managers as for managers.

As in the full-sample analyses (above), controls were introduced into the sub-sample analyses through multiple regressions, holding constant previous productivity, company size and industrial sector. The mean values of both job satisfaction and organizational commitment for managers alone remained associated ($p < .01$) with future productivity (beta

= 2.92 and 3.15) after these controls, as did non-managers' mean job satisfaction (beta = 2.73). The controlled association with non-managers' organizational commitment had a p value of .06; beta = 1.95.

For the full-sample analyses, it was shown earlier that the inclusion in hierarchical multiple regressions of mean job satisfaction rendered non-significant those climate aspects that had themselves been significantly associated with productivity. Furthermore, the beta weight for job satisfaction was itself significant, indicating its mediation of climate-productivity associations. (See columns 3, 4, and 5 of Table 2.) Parallel analyses for managers only and non-managers only are shown in the equivalent columns of Tables 3 and 4.

Comparisons between columns 3 and 4 in these tables reveal that the average percentage decline in beta values between steps 2 and 3 for those aspects of climate that were significant at step 2 was 57 and 59 for managers and non-managers respectively. Furthermore, mean sub-group job satisfaction was itself widely significant at step 3. (See the right-hand column of Tables 3 and 4.) Job satisfaction thus mediates significant climate-productivity associations for sub-groups of managers and non-managers alone, as well as for all employees together (above).

As in the full-sample analysis, the affective loading (in terms of correlation with overall job satisfaction) of each climate dimension was examined as a possible correlate of controlled (step 2) climate-productivity associations. Job satisfaction loadings for each sub-sample are set out in the first column of Tables 3 and 4. Intercorrelations between scales' affective loading and their beta weights in step 2 (see column 3) were found to be .74 for managers alone and .88 for non-managers alone (N = 17 scales). In both employee sub-groups, company productivity was most predicted by climate scales that most reflected that sub-group's overall job satisfaction.

As for the full sample, split-group analyses (examining randomly-selected sub-groups' mean climate scores and the remaining respondents' mean job satisfaction scores) were carried out for the non-managers in each company. (Manager numbers were too small to permit a reliable split-group examination in that case.) For all aspects of climate, significant effects at step 2 were rendered non-significant at step 3 by the inclusion of job satisfaction scores from different employees in the same company (12 analyses, six for each pairing of sub-groups). In addition, the beta coefficient for job satisfaction was significant in six of the relevant cases, narrowly failing to reach significance in all other step-3 analyses.

The evidence thus indicates that significant associations between non-managers'

perception of company climate and subsequent company productivity are mediated by non-managers' mean job satisfaction. That is shown in both single-group analyses and in analyses that avoid possible bias from common responding by splitting randomly the overall sample. For managers alone, single-group analyses yield the same conclusion, but the small numbers of managers in each company did not permit split-group examinations. And for both sub-groups climate-productivity associations were stronger when a climate scale was more affectively loaded.

Discussion

This study differs from most others that examine organizational climate and performance in that it covers a wide range of climate components and records productivity in objective terms before and after the measurement of climate. Of 17 aspects of company climate examined, eight were found to predict productivity in the following year, controlling for previous productivity, company size and industrial sector: supervisory support, concern for employee welfare, skill development, effort, innovation and flexibility, quality, performance feedback, and formalization. The longitudinal and controlled nature of the analyses suggest that these associations may be viewed as causal; a company's subsequent productivity was influenced by the level of those eight aspects of its climate.

Climate and performance: Possible mechanisms

As summarized in the Introduction, processes through which an organization's climate might affect its performance have been brought together in overall frameworks by Kopelman *et al.* (1990) and Sparrow (2001). Consistent with those perspectives, the role of overall job satisfaction as a possible mediator of climate-productivity associations was examined here. Average job satisfaction in a company was found to predict later company productivity ($r = .44$; $p < .01$), and this significant association was retained after controls for previous productivity, company size and industrial sector.

Across the 17 aspects of climate that were examined, some were more strongly associated with subsequent productivity than were others. Following the rationale set out in the Introduction, the paper's first prediction implied that more strongly-predictive aspects of climate would be those that were more affectively loaded, here indexed in terms of

correlation with overall job satisfaction. That pattern was found in correlational analysis across all 17 scales ($r = .92$), and the significant climate effects were shown in separate hierarchical multiple regressions to be mediated by this type of job-related affect. Affective mediation of the climate-productivity link was also found in separate analyses of responses from managers and non-managers alone, and it was present when different sub-groups of employees provided data for the climate and the affect indicators. The results thus apply at different levels in an organization, and they cannot be attributed to issues of common-method variance.

It thus appears that those features of climate which predict later performance have their impact at least in part through associated levels of employee affect, here examined in terms of overall job satisfaction. As outlined in the Introduction, this influence is likely to be through variations in employees' affect generating variations in active work behaviour, enhanced commitment and mutual helpfulness, and responsiveness to group affective tone. The causal influence of affect is central to models of attitude and motivation (see above), and perception in the absence of affect provides no impetus for action.

The mediating role of employee feelings may be of widespread explanatory value in this area of study. Previous studies of climate and performance have disagreed about which particular aspects of climate are important or unimportant (Wilderom *et al.*, 2000). Furthermore, in the present investigation only eight of the 17 climate components predicted subsequent productivity, despite the fact that several others are often viewed as desirable for high performance (for instance, involvement and integration). Those climate components that less predicted productivity were the ones that were less heavily loaded with job-related affect.

If aspects of climate have their impact in part through the operation of associated affect, it may be that the components that are found to predict company performance in any study are those that are most affectively loaded by employees. That possible mediator deserves systematic attention in future investigations. It seems likely that between-study variations in the affective loading of investigated climate dimensions will partly explain inconsistent findings about which climate features are associated with organizational performance.

The form of affect examined here is central to the models of Kopelman *et al.* (1990) and Sparrow (2001). Indicators of affect are widely intercorrelated with each other (e.g. Meyer *et al.*, 2002; $r = .88$ in the present study for mean satisfaction and mean organizational commitment), and it might be expected that the mediating importance of job satisfaction will

be replicated for associated affective constructs. The present analytic approach now needs to be extended to other forms of job-related affect. For example, both Kopelman and colleagues and Sparrow draw attention to the likely mediating role of work motivation, and Sparrow also points to possible links through feelings of trust and job involvement. In addition, measures of positive mood (George and Brief, 1992) or activated well-being (Warr, 1999) could helpfully be examined as possible mediators.

As well as research into those possible mediating variables, it is now desirable to examine a range of other processes. For example, the present evidence for mediation by employee affect does not exclude a possible impact from some climate features in terms of increased operational efficiency. In addition, future research could helpfully complement the present focus on medium-sized manufacturing companies through parallel investigations in the service sector.

Differences in employee level

The paper also examined whether prediction of performance differed according to the source of climate perceptions: from managers alone or from other employees. This is an important question, since many investigations (see the Introduction) have been restricted to samples of managers, and their perceptions might be inconsistent with those of the wider work-force. It was predicted that managers' perceptions would be more closely associated with company productivity than would non-managers'. That prediction was not confirmed.

Results remained extremely similar when managers-only responses were compared with those of an entire sample (including the managers themselves). A linked finding was that mean climate perceptions by managers and non-managers were significantly intercorrelated, on average .68 across the 17 dimensions studied here. In companies where managers' views of climate features are higher or lower, so too are non-managers' views. It thus appears that studies based on climate information provided by managers alone are likely to obtain relative patterns very similar to those based on the perceptions of other employees, at least in manufacturing companies of the kind studied here.

While this is encouraging in terms of generalizability from manager-only data, it does not remove the need for broad surveys of all employees. For example, information from a wide sample of employees is needed in settings of organizational change. Baseline information gains in face validity and acceptability if it derives from a large number of employees, rather than from merely a sample of managers. In some cases, investigators wish

to learn how “strong” is an organization’s climate, in terms of the closeness of agreement between different employees or sub-groups. Other studies have a particular interest in possible differences between the sub-climates in different parts of an organization, and thus need to sample employees in several sections.

In respect of average levels of climate as reported by managers and non-managers, the observed pattern is consistent with findings by Payne and Mansfield (1973). Managers’ assessments were significantly more positive than non-managers’ in 11 of 17 cases, compared to 15 of 20 cases in that earlier study. Climate scales varied between the two studies, but the absence of employee-level differences in the present data for outward focus, efficiency and formalization appears to confirm earlier non-significant patterns for dimensions labelled by Payne and Mansfield as orientation to the wider community, administrative efficiency and rules orientation.

Correlated concepts and complex causation

The study has shown that there is substantial empirical overlap between some aspects of organizational climate and employee affect indexed as overall job satisfaction. It appears that sometimes when we measure a feature of organizational climate we also pick up associated job satisfaction or other evaluative responses.

In seeking to account for an outcome such as subsequent company productivity, we should not necessarily infer from significant climate-productivity correlations that climate is a direct cause of that outcome. Causal influence may be at least in part indirect, through correlated variables such as satisfaction. This possibility is in principle widely known, but is often forgotten.

Given the strong empirical overlap between climate and affect, two questions deserve consideration. First, are those constructs in fact different? In conceptual terms, they certainly are, being defined in very different ways. For instance, organizational climate concerns a described situation, whereas job satisfaction reflects feelings and evaluations. The concepts’ separation is also supported empirically, by the finding that not all the aspects of climate studied here are significantly associated with job satisfaction. However, given that (as illustrated earlier) descriptions often carry with them evaluations, and given that evaluations usually derive from perceptions, the two notions necessarily overlap despite being definitionally separate.

Second, how can we best learn about causal sources if a measure of climate is likely

also to reflect other variables? Two recommendations can be made. First, it is clear that we must investigate more than a single construct. Research into the perception of organizational characteristics should also examine affective and other variables. Second, it is important to better characterize each study variable on dimensions whose understanding may enhance conceptual clarity. Of particular importance in the area of this paper are variations in specificity-generality and descriptiveness-evaluativeness.

Four types of possible combination of those two features in studies of organizational characteristics may be illustrated as follows:

1. Descriptive and specific: examining the presence of a specific organizational practice,
2. Evaluative and specific: examining satisfaction with a specific organizational practice,
3. Descriptive and general: examining the presence of a broad set of procedures,
4. Evaluative and general: examining satisfaction with a broad set of procedures.

Types 1 and 2 include research into particular management or HRM practices; most research into climate is of type 3; and type 4 is illustrated by studies of wide-ranging or overall satisfaction.

We need to specify a study's aims and measures in those two-dimensional terms. In practice, researchers may slip between concepts, so that instruments, analyses and discussions sometimes mix several of the four types. Indeed, some "climate" measures appear to be more evaluative than descriptive. Each pole of the two dimensions has advantages and disadvantages. For instance, specific measures of single aspects of an organization (types 1 and 2, above) can encourage accurate reporting by research participants, but may exclude some key elements from the assessment. Similarly, descriptive indicators (types 1 and 3) are central to the assessment of job content or organizational climate, but attempts at the complete exclusion of evaluation may result in only partial coverage, because many features cannot be recorded without some evaluative tone.

In overview of this section, climate and satisfaction are distinct concepts, but evaluative judgements cannot always be excluded from the measurement of climate. We should study a range of variables rather than climate alone, and explicitly examine the descriptive-evaluative and specific-general loadings of each organizational feature investigated. Where appropriate, those loadings should be controlled by research design or statistical analysis.

Table 1

Climate and subsequent productivity: Managers' and non-managers' perceptions. ($N = 42$ companies)

Climate scale	Mean climate perception: Managers	Mean climate perception: Non-managers	r between manager and non-manager climate perception	r with subsequent productivity: Managers	r with subsequent productivity: Non-managers	r with subsequent productivity: All employees
Involvement	<u>2.55</u>	<u>2.26</u>	.69***	.21	.19	.24
Autonomy	<u>2.50</u>	<u>2.26</u>	.57***	.12	.12	.20
Supervisory support	<u>2.85</u>	<u>2.62</u>	.63***	.17	.23	.27
Integration	<u>2.68</u>	<u>2.42</u>	.68***	-.04	.22	.11
Concern for employee welfare	<u>2.91</u>	<u>2.53</u>	.81***	.47**	.45**	.49**
Skill development	<u>2.79</u>	<u>2.46</u>	.71***	.39**	.35*	.44**
Effort	<u>2.85</u>	<u>2.72</u>	.71***	.28	.22	.26
Reflexivity	2.69	2.57	.37*	.10	.29	.33*
Innovation and flexibility	<u>2.67</u>	<u>2.51</u>	.55***	.35*	.37*	.40**
Outward focus	3.19	3.12	.76***	.05	.33*	.15
Goal clarity	2.59	2.57	.58***	.25	.27	.27
Pressure to produce	2.90	2.89	.69***	-.01	-.04	-.03
Quality	3.27	3.24	.91***	.17	.16	.18
Performance feedback	<u>2.58</u>	<u>2.44</u>	.75***	.31*	.28	.33*
Efficiency	2.07	1.99	.78***	.28	.24	.27
Formalization	2.79	2.75	.67***	.14	.30	.30
Tradition	<u>2.19</u>	<u>2.48</u>	.72***	-.09	-.20	-.22
<u>Employee affect</u>						
Overall job satisfaction	<u>4.91</u>	<u>4.36</u>	.58***	.41**	.39**	.44**
Organizational commitment	<u>4.06</u>	<u>3.57</u>	.47**	.36*	.28	.36*

Underlined mean values in a pair (columns 2 and 3) are significantly different from each other, $p < .001$. Other differences between means are non-significant, except those for Reflexivity, where $p < .005$.

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 2

Future company productivity: all employees. Hierarchical multiple regressions on climate dimensions, control variables and overall job satisfaction. Step 1: climate alone. Step 2: add previous productivity, company size and industrial sector. Step 3: add overall job satisfaction. ($N = 42$ companies)

Climate scale (In brackets: r with job satisfaction)	Beta and significance level of climate at step 1 (climate alone)	Beta and significance level of climate at step 2 (without job satisfaction)	Beta and significance level of climate at step 3 (with job satisfaction)	Beta and significance level of job satisfaction at step 3
Involvement (.69***)	.24	.17	-.14	.45**
Autonomy (.36*)	.20	.21	.06	.33*
Supervisory support (.46**)	.27	.32*	.18	.27*
Integration (.54***)	.11	.14	-.09	.40**
Concern for employee welfare (.92***)	.49**	.41**	.54	-.13
Skill development (.74***)	.44*	.32*	.08	.30
Effort (.70***)	.26	.26*	.02	.34*
Reflexivity (.54***)	.33*	.22	-.01	.36*
Innovation and flexibility (.60***)	.40**	.31*	.10	.30*
Outward focus (.47**)	.15	.22	.02	.34*
Goal clarity (.62***)	.27	.22	.01	.35*
Pressure to produce (-.27)	-.03	-.08	.02	.36**
Quality (.47**)	.18	.28*	.12	.29*
Performance feedback (.57***)	.33*	.26*	.08	.31*
Efficiency (.39**)	.27	.14	.00	.35**
Formalization (.45**)	.30	.26*	.11	.31*
Tradition (-.63***)	-.22	-.19	.09	.41**

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 3

Future company productivity: managers only. Hierarchical multiple regressions on climate dimensions, control variables and overall job satisfaction. Step 1: climate alone. Step 2: add previous productivity, company size and industrial sector. Step 3: add overall job satisfaction. (N = 42 companies)

Climate scale (In brackets: manager_r with job satisfaction)	Beta and significance level of climate at step 1 (climate alone)	Beta and significance level of climate at step 2 (without job satisfaction)	Beta and significance level of climate at step 3 (with job satisfaction)	Beta and significance level of job satisfaction at step 3
Involvement (.51***)	.21	.19	.02	.32*
Autonomy (.39**)	.12	.19	.07	.31*
Supervisory support (.32*)	.17	.24*	.16	.29*
Integration (.50***)	-.04	.02	-.17	.41**
Concern for employee welfare (.81***)	.47**	.45**	.46*	-.01
Skill development (.44**)	.39**	.28*	.14	.26*
Effort (.68***)	.28	.27*	.10	.27*
Reflexivity (.41*)	.10	.07	-.05	.38**
Innovation and flexibility (.46**)	.35*	.27*	.14	.27*
Outward focus (.58***)	.05	.18	-.06	.37*
Goal clarity (.38*)	.25	.23	.12	.28*
Pressure to produce (.09)	-.01	.04	.02	.33**
Quality (.48***)	.17	.23	.09	.29*
Performance feedback (.36*)	.31*	.27*	.17	.27*
Efficiency (.12)	.28	.14	.10	.32**
Formalization (.48***)	.14	.12	-.07	.36**
Tradition (-.38*)	-.09	-.11	.02	.34**

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 4

Future company productivity: non-managers only. Hierarchical multiple regressions on climate dimensions, control variables and overall job satisfaction. Step 1: climate alone. Step 2: add previous productivity, company size and industrial sector. Step 3: add overall job satisfaction. (N = 42 companies)

Climate scale (In brackets: non-manager r with job satisfaction)	Beta and significance level of climate at step 1 (climate alone)	Beta and significance level of climate at step 2 (without job satisfaction)	Beta and significance level of climate at step 3 (with job satisfaction)	Beta and significance level of job satisfaction at step 3
Involvement (.69***)	.19	.14	-.14	.41**
Autonomy (.24)	.12	.14	.04	.30*
Supervisory support (.47**)	.23	.27*	.15	.25*
Integration (.61***)	.22	.13	-.10	.39*
Concern for employee welfare (.92***)	.45**	.36**	.08	.29
Skill development (.74***)	.35*	.25*	.03	.28
Effort (.66***)	.22	.21	.03	.29
Reflexivity (.61***)	.29	.16	-.07	.39*
Innovation and flexibility (.60***)	.37*	.29*	.12	.24
Outward focus (.55***)	.33*	.31*	.13	.26
Goal clarity (.68***)	.27	.22	.01	.30
Pressure to produce (-.37*)	-.04	-.13	.00	.31*
Quality (.43**)	.16	.25*	.13	.25*
Performance feedback (.54***)	.28	.21	.07	.27*
Efficiency (.47**)	.24	.13	-.01	.31*
Formalization (.48***)	.30	.25*	.13	.25*
Tradition (-.64***)	-.22	-.16	.07	.35*

* $p < .05$, ** $p < .01$, *** $p < .001$

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