

# A CONSENSUS APPROACH TO THE MEASUREMENT OF ORGANISATIONAL CLIMATE

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## ABSTRACT

The assumption that organisational climate refers to individuals' perceptions of organisational attributes has led to the common practice of *aggregating* measures of individuals' perceptions, and subsequently considering these averages to be indicators of the degree to which climate is experienced by *all* organisation members, hence *organisational* climate. The question arises, however, whether an organisation should be described in terms of an aggregated climate if no real, statistically based, consensus of perceptions exists. Using cluster analysis, 390 employees were grouped into five significantly different clusters based on the consensus of perceptions across 10 climate dimensions. The results suggest that average measures are not accurate indicators of an organisation's climate.

## OPSOMMING

'n Konsensus benadering tot die meting van organisasieklimaat: Die aanname dat organisasieklimaat na individue se persepsies van organisasie-attribute verwys het tot die algemene praktyk van die berekening van die *gemiddeldes* van individue se persepsies gelei. Die gevolg is dat hierdie gemiddeldes as indikatore beskou word van die mate waarin klimaat deur *alle* organisasieledere ervaar word, dus *organisasieklimaat*. Die vraag ontstaan egter of 'n organisasie in terme van 'n gemiddelde klimaat beskryf kan word indien daar geen werklike, statisties gebaseerde, konsensus van persepsies bestaan nie. Met behulp van bondelontleding, is 390 werknemers in vyf betekenisvol verskillende bondels op grond van die konsensus van persepsies oor 10 klimaatdimensies saamgegroeper. Die resultate dui daarop dat gemiddelde metings nie akkurate indikatore van 'n organisasie se klimaat is nie.

Over the past 30 years, a great deal of research has been published concerning organisational climate. At least 11 reviews of the climate literature have appeared since the mid-1960's, illustrating the importance of the construct (Campbell, Dunnette, Lawler & Weick, 1970; Forehand & Gilmer, 1974; Glick, 1985; Hellriegel & Slocum, 1974; James & Jones, 1974; Joyce & Slocum, 1979; Litwin & Stringer, 1968; Naylor, Pritchard & Ilgen, 1980; Payne & Pugh, 1976; Taguiri, 1968; Woodman & King, 1978). It appears that knowledge of organisational climate is necessary to acquire an understanding of an individual's behaviour so that the individual can be managed effectively and efficiently.

However, the evolution of the climate construct has not been without controversy, particularly regarding its measurement. Although the measurement of atmospheric climate (weather conditions) is a relatively simple process due to the many objective measures available, the same cannot be said of the measurement of organisational climate, leading Woodman et al. to state that "until these issues of validity can be resolved, much speculation about organizational climate is likely to elude science and remain in the realm of organizational folklore" (p. 824).

The purpose of this article is consequently to present some research results regarding the measurement of climate using a consensus approach in an attempt to elevate the concept of organisational climate from the "realm of organizational folklore" and to firmly embed it in the field of science.

## THE CONTROVERSIAL NATURE OF ORGANISATIONAL CLIMATE

Initially, researchers approached organisational climate as an objective construct. It was believed that climate consisted of organisational attributes such as structure, context and processes, and that the degree to which these attributes were actually present in the organisation could be measured accurately and objectively. This approach assumes that the objectively measured attributes indirectly affect employees.

The objective approach, however, has been criticised as being so encompassing that it is rather a broad-spectrum approach to organisational attributes (James et al.). In addition, its validity has been questioned in that it ignores individual perceptions of organisational attributes. Researchers (such as LaFollette, 1975) who are in favour of the perceptual approach argue that individuals are greatly influenced by their perceptions, or by the psychological meaning they attach to organisational attributes. In other words, and using the analogy of weather as "climate", what is important is the individual's actual feeling (perception) of warmth, and not the exact temperature (objective measure) as measured on a thermometer.

Aggravating the controversy surrounding climate has been the common practice of *aggregating* measures of individuals' perceptions. This results in average scores which are considered to be indicators of the degree to which climate is experienced by everyone in the organisation, and obviously not accurate as far as the individual is concerned. James (1982) emphasises the need to demonstrate consensus among individuals' perceptions of climate *prior* to averaging climate scores. He shows that estimates of agreement based on group mean scores have been incorrectly interpreted as applying to perceptual agreement among individuals. According to Joyce and Slocum (1984), however, there is little agreement concerning whether individuals' perceptions may be *aggregated* to represent the climate of a group or larger unit of analysis.

The term *psychological climate* has evolved as a result of the abovementioned controversies. This refers to the perception of the environment at an individual level. Schneider and Reichers (1983) are of the opinion that the clarification of the distinction between *psychological* climates and *organisational* climates has gained general acceptance. Naylor, Pritchard and Ilgen (1980) also make this distinction and believe that climate can be conceived as having an organisational or individual element, but that the more important level is that of the individual.

Climate has usually been described as consisting of a set of factors or dimensions. Atmospheric climate, for instance, includes measures of temperature, windspeed and humidity. Similarly, researchers have attempted to obtain a definitive

set of dimensions for organisational and psychological climate. Although many such dimensions have been identified, they appear to vary greatly from researcher to researcher. However, Field and Abelson (1982), suggest the following four common dimensions, namely: (a) autonomy/control, (b) degree of structure, (c) rewards, and (d) consideration, warmth and support. These dimensions appear to be consistent across all organisations, but there may be other dimensions which are organisation specific.

A further issue heating up the controversy debate has been the confusion of *job satisfaction* with climate, and certain researchers (such as Johannesson, 1973) have believed that the assessing of climate may result in the replication of the *work attitude* literature. However, it does appear that some advance has been made in clarifying these two constructs: climate is seen as the *description* of work environments, while *job satisfaction* is seen as the *evaluation* of such environments (Naylor et al.)

### GROUP/SUBSYSTEM/COLLECTIVE CLIMATE

As mentioned above, one of the problems regarding organisational climate centres around the issue of aggregating individuals' perceptions with the aim of describing such average scores as representing the climate of a group or larger unit of analysis.

Field et al.'s review of the climate literature reveals that, while climates do exist at the individual or psychological level, they may also exist at group and/or organisational levels. In this regard, Woodman et al. (p. 18) state as follows:

*Climate is reality-based and thus is capable of being shared in the sense that observers or participants may agree upon the climate of an organization or group, although this consensus may be constrained by individual differences in perceptions.*

According to Gavin and Howe (1975:228), "psychological climate becomes organizational climate when there is significant consensus on climate perceptions among organization members." Similarly, it can be hypothesised that psychological climate becomes collective or group climate upon significant consensus of individuals' climate perceptions. The greater the consensus, the greater the predictive power of climate (Field et al.). Johannesson (1971) warns, however, that with perceptual measures of climate, in contrast to objective climate assessments, there are as many climates as there are people in the organisation.

The possibility of consensus occurring, however, raises the question of *how* it should be determined. Field et al. state that consensus occurs when the mean climate scores of individuals within the appropriate level of analysis vary minimally. The smaller the variation the stronger the argument that group climate has occurred. Jones and James (1979) explored the possibility of using aggregated psychological climate scores in respect of organisational subsystems of groups. Their sample consisted of 4 315 male, US Navy personnel operating on 20 ships in the Atlantic and Pacific Oceans during the latter half of 1973. Ships were organised into four or more departments, each responsible for a major set of duties. Departments were further subdivided into divisions. Jones et al.'s findings contradict the use of aggregated scores at department or ship levels of analysis. However, they found some justification for using aggregated scores at divisional (or subgroup) level. They conclude that the use of aggregated individual perceptions to describe subgroup (division) conditions is appropriate only for homogeneous subgroups.

Joyce and Slocum (1984) have conducted interesting research with regard to perceptual agreement or consensus. Using consensus of individuals' psychological climate scores as a basis, they attempted to establish multiple or group climates in an organisation. However, and in contrast to the research reported above, they termed these climates *collective climates* to make clear that these climates referred to aggregate climates con-

sisting not necessarily of individuals from the same *formal* organisational units, divisions, or work groups. Employing hierarchical and nonhierarchical methods of cluster analysis which clustered individuals on the basis of profile similarity on six climate dimensions, various collective climates were identified. By definition, therefore, internal consistency, or agreement in perceptions with aggregate climates was assured. Moreover, Joyce and Slocum found that membership in these collective climates is related to job performance and job satisfaction.

The purpose of the research to be described below was to investigate whether Joyce and Slocum's identification of collective climates by means of consensus of psychological climates could be supported.

## METHOD

### Measurement of psychological climates

A questionnaire consisting of 59 items with Likert-type scoring scales was completed by 390 respondents in a large organisation to measure their psychological climates in respect of eight initial dimensions (structure, responsibility and participation, recognition and reward, risk and challenge, human relationships (warmth and support), general communication, standards and identification). The questionnaire was developed previously by the organisation itself and was based on various national and international measures of climate.

The respondents represented 15 different sections in the organisation and included middle management, lower level supervisors and non-supervisory staff. The average age of the respondents was 37 years, and 66.4 percent were male. Average length of service was 7 years, and 64.2 percent possessed a qualification of Std. 10 or higher.

Since the questionnaire used was an unstandardised one, a principal components analysis (PCA) was done with the aim of identifying a minimal set of variables or factors that accounted for a major portion of the total variance of the original items (Weiss, 1976). The P4M programme of the BMDP computer programmes was used for this purpose. Initial factor extraction was done according to PCA, and rotated according to the varimax method. The Kaiser criterion, which specifies that all factors with eigen values of 1.00 or greater should be retained, was used. For purposes of discussion of the results of the PCA, the term *factor* rather than *component* is used, in keeping with the statistical software employed.

The PCA isolated 14 factors, all having eigen values greater than 1.00 and explaining 100 percent of the variance of the questionnaire items. Of the 14 factors isolated, 10 (comprising 41 items in total) were eventually used:

- *Interpersonal communication* (10 items): the clearness of upward and downward communication and the relationship between subordinate and supervisor
- *Warmth and support* (5 items): the feeling that good camaraderie and respect for each other prevails in the work group
- *Risk and challenge* (4 items): the feeling that risks and challenges exist in the work and that knowledge and abilities are utilised and developed
- *Promotion and remuneration* (5 items): the feeling that promotion depends on good performance and the fairness of the remuneration policy
- *Identification* (5 items): the feeling that an employee belongs to an organisation and is loyal towards the organisation
- *Standards* (3 items): the perceived importance of implicit goals and performance standards and the emphasis placed on doing a good job
- *Recognition and reward* (3 items): the feeling that recognition and rewards are given in return for good performance

- *Participation* (2 items): the feeling that the supervisor has confidence in the subordinate's ability to participate in decision-making
- *Training and development* (2 items): the feeling that training and development takes place and that it achieves results
- *Responsibility* (2 items): the feeling of being one's own boss and not having to have one's decisions double checked

Ten dimension scores for each respondent were subsequently calculated (by adding the scores of the relevant items in each dimension and dividing these totals by the number of items measuring each dimension), and these scores were then considered as the psychological climates of the respondents. The overall reliability (Cronbach Alpha) of the questionnaire is 0,946 while the internal consistencies of the ten dimensions vary from 0,363 to 0,908 (Table 1). The five dimensions containing three or less items have, as expected, the lowest coefficients (all less than 0,628) while the five dimensions containing more than three items all have coefficients higher than 0,705.

**TABLE 1**  
**RELIABILITY OF THE CLIMATE DIMENSIONS**

CLIMATE DIMENSION	CRONBACH ALPHA
Interpersonal communication	0,908
Warmth and support	0,855
Risk and challenge	0,802
Promotion and remuneration	0,746
Identification	0,705
Standards	0,545
Recognition and reward	0,628
Participation	0,363
Training and development	0,415
Responsibility	0,477
OVERALL RELIABILITY	0,946

**Identification of collective climates**

As suggested by Joyce and Slocum (1982), cluster analysis techniques were used to identify collective climates based on the consensus of respondents' psychological climate scores. This ensured that the mean collective climates were reliable by definition.

To begin with, a hierarchical method of cluster analysis was used to identify initial climates. According to Dixon (1985), hierarchical methods begin by finding the closest pair of cases according to a distance matrix (i.e. those two cases with the shortest distance between them) and combining them to form a cluster. The algorithm continues, joining pairs of cases, pairs of clusters or a case with a cluster, until all the cases are in one cluster. The centroid linkage algorithm method of the P2M programme of the BMDP computer programmes was employed to cluster respondents (or cases) with similar climate profiles or ranges of scores across climate dimensions together. This particular algorithm begins by computing the distance between each pair of cases in respect of the ten dimensions. For each case, the case number of the closest case and its distance are stored. After two cases are joined, a new pseudo-point or centroid is formed by averaging the coordinates of each variable or dimension. Distances are measured from this centroid to candidates for membership, namely another case or the centroid of another cluster. Thus, the number of cases (or pseudo-cases) is reduced by one at each step, until all the cases are in one cluster. The researcher must decide at which point to terminate clustering, or which levels in the hierarchy best represent the organisation's climates.

In this way, five initial clusters or collective climates, each consisting of a set of unique respondents, were identified. However, Joyce and Slocum (1982) warn that when individuals are allocated to climates using hierarchical methods, the

results at succeeding levels of clustering are generally dependent on previous steps in the process. Consequently, allocation decisions made early in the clustering affect subsequent clusters, and nonoptimum clusters are generated. Joyce and Slocum (1982) suggest that nonhierarchical clustering methods should then also be used to refine the initial climates and to obtain a better solution. For this purpose, the seed method of the PKM programme (called K-means clustering) of the BMDP computer programmes was employed. This particular method is useful when one knows approximately where each cluster centre or mean is located in respect of the various variables or dimensions of climate. The programme begins with the user-specified cluster centres and uses the Euclidean distance to measure the distance between each case and the specified centre of each cluster. At the completion of the run, each case belongs to the cluster whose centre is closest to the case. The initial user-specified centres are also slightly modified to represent the actual means of the iteratively reallocated cases (Dixon, 1985).

In this way, the means of the climate dimensions of each of the five initial climates identified by hierarchical cluster analysis were entered into the PKM programme as the *user-specified cluster centres*. Five final, and more optimal, collective climates were subsequently identified, each with its own set of ten aggregate dimension scores or means. Of these final clusters, cluster one consisted of 121 respondents, cluster two consisted of 33, cluster three of 68, cluster four of 107 and cluster five of 34. Twenty seven respondents could not be allocated to clusters because of missing data.

**DISCUSSION OF RESULTS**

The results of the cluster analyses clearly support Joyce and Slocum's research that collective climates can be identified on the basis of consensus of individuals' perceptions or psychological climates. In other words, it does appear that shared perceptions do occur in organisations and that a single organisation can have more than one "organisational" climate.

However, two questions need answering, namely:

- are these collective climates significantly different from one another to warrant further description and analysis?; and
- are these collective climates significantly different from the aggregate climate of the total group to warrant further description and analysis?

In order to answer the first question, the PKM programme also computed analyses of variance for each variable or climate dimension, comparing the between-cluster mean square to the within-cluster mean square. The *F*-ratios (Table 2) so obtained indicated that there were meaningful differences across the five collective climates in respect of their dimensions. Further description and analysis of these collective climates therefore appears warranted.

**TABLE 2**  
**F-RATIOS OF CLIMATE DIMENSIONS ACROSS THE FIVE CLUSTERS**

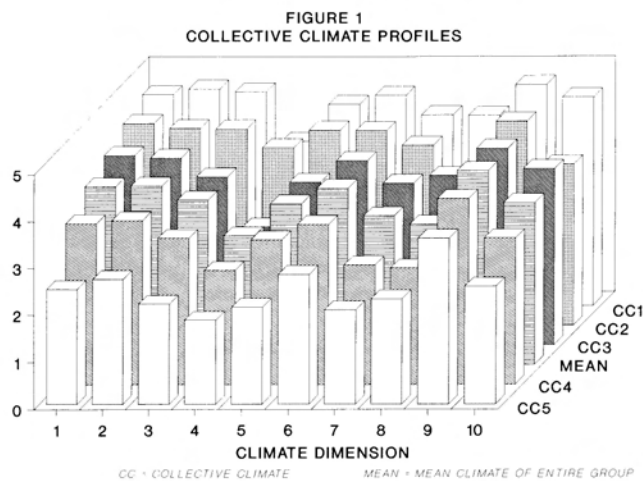
CLIMATE DIMENSION	F-RATIO*
Interpersonal communication	102,831
Warmth and support	58,629
Risk and challenge	65,717
Promotion and remuneration	83,004
Identification	86,949
Standards	49,549
Recognition and reward	99,891
Participation	66,696
Training and development	15,033
Responsibility	30,475

\*p-values: 0,000 for all dimensions

To answer the second question, the *t*-test was used to determine whether the climate dimensions of the various clusters differed significantly from the aggregate or mean climate dimensions of the total group. Of the 50 *t*-values obtained (5 clusters x 10 dimensions), 42 were significant at the 0.1 percent level, three were significant at the 1 percent level, one was significant at the 5 percent level, while only four were not significant at all. Since the cluster dimension scores were on the whole significantly different from the mean dimension scores of the total group, further description and analysis of these collective climates also appears warranted.

Figure 1 compares the dimension scores of the various collective climates identified by cluster analysis with one another and with the mean dimension scores of the total group.

**Figure 1: Collective climate profiles**



### CONCLUSION

An important conclusion arising from this research is that an organisation should not be described in terms of a unique, single and average climate if no real consensus of individual perceptions exists amongst employees. Average climate dimension scores of all the perceptions of employees in an organisation appear not to be accurate indicators of organisational climate.

When studying climate, it would therefore perhaps be prudent for researchers to consider whether there was consensus amongst employees' perceptions before any further analyses or descriptions were done. However, one must bear in mind that this approach to the measurement of organisational climate is still in its infancy and should not be considered as conclusive yet. For instance, Glick (1985, p. 603) criticises Joyce and Slocum's collective climates as follows:

*A conceptual problem is encountered, however, because individuals in some collectives may not be in the same job, work group, or department, or they may not interact with each other. Defining unit boundaries with the cluster analysis ignores the more accepted criterion of selecting unit boundaries that reflect hypothesised interdependence of elements within units. . . . The unit of theory for collective climate cannot be defined independently of the operational definition, and its substantive interpretation is questionable.*

Further research in this regard is therefore necessary, particularly regarding the importance and value of collective climates for the organisation.

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