
Individual Perceptions of Organizational Cultures: A Methodological Treatise on Levels of Analysis

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Abstract

Data from a survey study of organizational cultures in 20 organizational units in Denmark and the Netherlands were re-analyzed at the individual level, after elimination of between-unit variance. A factor analysis showed individuals' values to be composed of six dimensions, and individuals' perceptions of their organization's practices of another six dimensions, entirely different from the dimensions found earlier to apply at the organizational level. The scores on these new dimensions are related to various demographic characteristics of the respondents. This case is used for a methodological treatise stressing the need to choose the proper level of analysis for the problem at hand, a need which is too seldom recognized.

Studying Elephants or Studying Blind Men

The Indian fable of the six blind men studying an elephant is well known. They variously report the animal to be a snake, a stick, a disk, a column, a wall or a rope, depending on whether they get hold of the trunk, a tusk, an ear, a leg, a side or the tail. The fable is often used as a metaphor to illustrate the partial nature of human knowledge about social reality, and of the need for pooling subjective perceptions.

However, let us expand the metaphor. Suppose we live in the land of the blind, we are blind ourselves, and we are given the reports of N blind observers, divided into n groups, about as many elephants in the local zoos. How should we analyze this data bank?

The answer depends on where our interest lies. If we are interested in the perceptual skills of blind individuals, we would have to pool all N cases, and study them as one population, regardless of the group from which they originate. If we are interested in the group dynamics among blind observers, we would need to study what happened in each of the n groups, and group membership would become a key variable in the interpretation of the individuals' reports. If we are interested in elephants, we would probably pool all the available information about each of the n animals, and try to eliminate the bias of individual observers as much as possible.

If we use a multivariate statistical technique — say, factor analysis — to reveal the structure in the N individual reports, the results could still not

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be interpreted as a contribution to elephantology. Even though, as this paper will argue later on, such an overall analysis may be affected by the properties of the n elephants, it remains basically a study of the minds and skills of blind men, not a study of elephants, and it should not be interpreted as such.

Choosing the Appropriate Level of Analysis: A General Dilemma in the Social Sciences

Choosing the appropriate level of analysis for the problem at hand is a major problem in a lot of social science research; a problem which, amazingly, is far too seldom recognized (Rousseau 1985). For example, an authoritative and extensive textbook on behavioural research methodology like Kerlinger (1986) does not mention it at all (we will treat the terms 'behavioural' and 'social' as synonyms, although the first clearly has an individual-level flavour). In its most general form, the problem can be stated as follows: the subject of the social sciences is the behaviour of individuals and/or the properties of some kind of social system ultimately composed of individuals. The data collected derive from individuals (such as variables describing characteristics of individual behaviours, or answers by individuals to questions), or they are directly collected at one of the many levels of different social systems (such as accident rates by age category in a province, or the presence or absence of trial by jury in a country). The level-of-analysis problem in behavioural research occurs when conclusions applying to one level have to be drawn from data only available at another. If the fact that the two levels do not correspond is not recognized and accommodated by the researcher, a cross-level fallacy (Rousseau 1985) occurs.

This fallacy can logically go two ways: interpreting data from the social-system level as if they were data about individuals, and the reverse (in addition, a third kind of fallacy occurs when data from one level of social systems are interpreted as applying to another, such as when dominant values of top-management teams are supposed to be held by all members of organizations). The first kind is known as '*the ecological fallacy*' (the term 'ecological' indicating something operating at the system level). It means using information about elephants for drawing conclusions about blind men. The ecological fallacy was brought to the fore by Robinson (1950). His famous example is the relationship between skin colour and illiteracy in the United States. Using 1930 data, Robinson found that across nine geographic regions of the United States, the ecological correlation between percentage of Blacks in the population and percentage of illiterates was 0.95. Across (at that time) 48 states, it was 0.77. Across 97 million individuals, the individual-level correlation, 0.20, was significant, but weak. The ecological fallacy was committed when authors interpreted the strong ecological correlations (0.95 or 0.77, depending on the level of aggregation) as if they applied to individuals.

The second fallacy, interpreting data from the individual level as if they applied to social systems, has been much less often recognized, and is thus more frequently committed. It means interpreting information about blind men as if it represented information about elephants. A striking example is cited in Hofstede (1980: 30). In a survey study among over 1,000 students in six countries about how to succeed in organizations, the 12 questions in the questionnaire were grouped into a 'social' and a 'political' index based on the way they correlated across individuals within a U.S. sample. Subsequently, country 'social'- and 'political'-index values were calculated by averaging the country means for each country, on the corresponding questions. However, the researchers overlooked the fact that the answers to the questions composing either index were quite differently affected by the changes in national environment. When aggregated to the country level (by taking the means), some of the questions which had been positively correlated across individuals in the United States now became negatively correlated across countries (in one case, with -0.86). Yet, the mean scores for the two questions with this strongly negative ecological correlation were *added* in calculating the country index, thereby rendering this index meaningless. Country indexes should have been based on country-level correlations. Recalculating the data in this way produced three (rather than two) country-level indices, which made perfect theoretical sense. One of the three was strongly correlated with a country 'individualism' index from a different study by a different researcher on different samples (Hofstede 1980: 227).

There may well be a cultural reason for the fact that the ecological fallacy is usually recognized and avoided, but not the reverse situation. The social sciences are Western (Sinha 1983), and the dominant cultural pattern in Western countries is individualism. In particular, the United States and Great Britain foster extremely individualist values (Hofstede 1980: 222; Hoppe 1990). A possible consequence of this cultural pattern is that data collected at the ecological level are more likely to be regarded with suspicion than data collected from individuals. In a U.S. monograph series about quantitative research methods in the social sciences, Langbein and Lichtman (1978) illustrate with mathematical algorithms how the ecological fallacy can be avoided if only aggregate data are available, but they pay no attention at all to avoiding the reverse fallacy.

The individualist bias in the West leads to a primacy of psychology and social psychology over sociology, political science and anthropology, all of which operate at the ecological level; where economic theory uses notions from other social sciences, they are commonly derived from individualistic psychology. The ecological fallacy is a temptation for sociologists and political scientists who deal with aggregate data, and, in an individualistic environment, they will be quickly called to order if they commit the fallacy. The reverse ecological fallacy is a temptation for psychologists who may try to treat social systems as king-size individuals, but in an individualistic environment they will rarely be chided for doing

so, even if it is a fallacy. Psychologists and social psychologists in the United States tend to ignore sociological, cultural and historical conditions (Sampson 1977; Hogan and Emler 1978), but it is they who produce a major part of the published social-science research which is read by policy-makers, by colleagues and by students in other countries.

Choosing the appropriate level of analysis for the problem at hand in social-science research is more than a matter of avoiding fallacies. A skilful use of multilevel research allows one to disentangle processes at the individual- and the social-systems levels, thereby gaining insights which research at one level cannot produce, i.e. learning something about blind men *and* about elephants at the same time. A fine example of a multilevel interpretation of data is described in Lincoln and Zeitz (1980: 403). They surveyed over 500 employees of 20 different social-service agencies in a U.S. city, and found that the relationship between the professional qualification of the employees and their amount of supervisory duties was positive across individuals, but negative across agencies. Employees of higher professional levels tended to be given more supervisory duties within an agency, but agencies with a higher overall level of professionalism had a smaller proportion of supervisory personnel. This finding has obvious policy consequences which would have gone unnoticed without the multilevel analysis.

Multilevel research involves a disregard for the traditional boundaries between the various social-science disciplines: psychology, sociology, political science, anthropology and economics. It requires courage, because the reward and status structure in the academic world, especially in the United States, is still strongly linked to disciplinary parochialism (Gabrenya 1988). Manuscripts describing multilevel research are criticized by reviewers: 'this is sociology, not psychology' (Leung 1989: 711); or 'this is sociology, not anthropology' (Hofstede 1991: 246). At the same time, new sub-disciplines are born, spanning two or more of the original disciplines. Cross-cultural psychology is a case in point: it involves the simultaneous use of psychological, sociological and anthropological frameworks. Mono-disciplinary habits die hard, and lack of sensitivity for the social systems and the cultural levels have retarded the development in this area.

Some years ago, a dispute in U.S. organizational research placed 'situational' effects in opposition to 'dispositional' ones (Staw et al. 1986; Schneider 1987; Davis-Blake and Pfeffer 1989); the basic issue being whether job attitudes and behaviour depend on the individual dispositions of organization members, or on aspects of the job situation. Thus formulated, the problem is an all-or-nothing dilemma which corresponds to the aphorism attributed to Martin Luther *Jeder Konsequenz führt zum Teufel* (every argument, applied consistently, leads to the devil). Of course, attitudes and behaviour in organizations depend on *both* individual dispositions and on the situation. If multilevel research is well designed, it is possible to separate the effects of these components, as we hope to demonstrate in the present article.

A Method for Disentangling Individual- and Social-Systems-Level Effects

Leung and Bond (1989), writing in the *Journal of Cross-Cultural Psychology*, have described a general approach to the treatment of multi-level data. Such data generally consist of variables of the following nature:

- They are collected from, or about, N individuals (like our blind men)
- who belong to n different social systems or cultures (like our blind research teams. Sometimes, these social systems or cultures can be further subdivided, for example blind men can be distinguished from blind women).
- In addition, there can be other, external, information about the n social systems or cultures as a whole (such as about the elephants they studied).

Research on such data consists of detecting relationships between the variables, using some kind of multivariate statistical technique such as correlation analysis, factor analysis, cluster analysis, multidimensional scaling or smallest space analysis. Within these various techniques, Leung and Bond distinguish:

1. A *pancultural* analysis, pooling the data from all N individuals together, regardless of the culture they belong to;
2. A *within-culture* analysis, limited to the individuals within each of the n cultures;
3. An *ecological* analysis, performed on aggregate measures of the variables for each of the n cultures (usually the means, but sometimes also the standard deviations taken from the individuals constituting each unit), as well as on the external variables which exist only at the culture level;
4. An *individual* analysis, performed on the pooled data for the N individuals after elimination of the culture-level effects. This can be done by deducting from each individual score the unit's mean score on the question, so that the new unit mean becomes 0 and the ecological variance is eliminated. It can also be done by full standardization of the individual scores, which results in standard scores with a mean (for each question, across the individuals within each culture) of 0 and a standard deviation of 1. In both cases, the individual analysis considers precisely that part of the variance in the data which had been eliminated in the ecological analysis. It is a way of pooling the within-culture analyses across all n cultures or units.

From these four ways of treating the data, (3) and (4) are entirely separate and non-overlapping. The correlation coefficients between the same two variables at the ecological and at the individual level may differ and may even carry opposite signs, as was illustrated in the example from Lincoln and Zeitz cited above. Of course, the correlation coefficients at the two levels may also be similar. Leung and Bond call a relationship between two variables which exists both at the individual and at the

ecological level a '*strong etic*', using a distinction from anthropology (etic vs. emic) which separates interpretation by comparison across cultures (etic) from interpretation by unique meaning within a culture (emic).

Leung and Bond's individual analysis, pooling data from sub-populations after eliminating level effects, is not a new invention: the approach has been known for decades. Hofstede used it in his doctoral thesis (1967: 119–120) for pooling individual survey responses from six manufacturing plants, and it was a classic procedure at that time. However, it was not taught in mainstream behavioural science methodology classes. Its need was too rarely recognized due to the individualist bias in much of social science, which tends to obscure the recognition of level effects.

The pancultural analysis (1) deals with the combined variance from both the ecological and the individual analysis (3 and 4). Leung and Bond prove that, in general, correlation coefficients at the pancultural level resemble those at the ecological more than those at the individual level, so pancultural analysis can be considered an inaccurate approximation of ecological analysis. Paradoxically, therefore, as mentioned at the beginning of this article, the structure in the data from our N blind men pooled together does provide some information about the properties of the n elephants, but it remains contaminated by properties of the blind men.

Some authors criticize the aggregation of individual data to the social-system level, arguing that a mean score across a number of diverse individuals has no reality value ('the average human being is half man, half woman and does not exist'). This criticism betrays an individualistic bias, which tries to imagine the properties of a social system as properties of an individual. An aggregate score no longer describes an individual, but becomes an indicator distinguishing one social system from another. As such, it is basically no different from a lot of information about social systems derived from external sources, such as accident rates or average alcohol consumption. Accident and other rates represent an aggregate measure of a yes/no variable across the individuals in a social system; average consumption quantities are an aggregate measure of individual consumption behaviours.

Studying Organizational Cultures as Wholes

The metaphor of the N blind men and the n elephants fairly accurately describes the dilemma in the study of organizational cultures; except that in this case the 'elephants' do not exist independently of the blind men — but every metaphor has its limits. An organizational or corporate culture is an assumed characteristic of an entire organization, i.e. of a social system, and not of the individuals within it: individuals can be replaced over time, but the culture still remains. Yet, as culture is a 'soft' characteristic, one way to assess it is through perceptions by individuals who

function within the culture. This also applies if we study corporate cultures from statements by corporate maharajas; they perceive the elephant from their palanquin on top of it, but they are similarly blind. It even applies if we rely on reports by anthropologists as participant observers in the organizations; they are foreign gurus, but blind in their way, although they may believe they are the only ones who can see clearly.

What applies to the study of organizational cultures is equally true for the study of organizational climates. There is no commonly accepted set of definitions distinguishing the two (Denison 1990: Chapt. 2). 'Organizational climate' may just be an older term for 'organizational culture'; the two constructs are at least complementary (Schneider 1987). We prefer to use 'climate' to describe shorter-term and 'culture' to describe longer-term characteristics of organizations. Using this short-term vs. long-term distinction, one could argue that climate answers the question: 'how does this organization treat its people?', while culture answers the question 'what kind of people does this organization employ?' For the same reason, climate will be more a concern of the lower and intermediate management levels in organizations, but culture a concern of the top. Climate is a tactical, culture a strategic, concern; climates should be easier to change than culture. Nevertheless, climate, too, is an assumed characteristic of a social system, and not of the individuals within it. Unfortunately, a lot of research on climates has simply analyzed individuals' responses to questions panculturally (or, in this case, panclimatically!). Rousseau (1985) and Glick (1985) have drawn attention to this tendency towards confusion of levels in climate research. Glick's proposal is to study *psychological* climate and *organizational* climate, each in their own right, the first operationalized at the level of individuals and the second at the level of organizations. This is a suggestion which is also applicable in the culture case, as we will argue in the discussion part of this paper.

An extensive study of organizational cultures has recently been published in *Administrative Science Quarterly* by Hofstede et al. (1990). The data base contains answers from about 1,300 individuals (employees, stratified into one-third managers, one-third college-educated non-managers — 'professionals' — and one-third others) on questions about their organizational units (numbering 20, from a total of ten different organizations: five in Denmark and five in the Netherlands). The units' cultures were first described via in-depth interviews with nine respondents per unit from various levels, jobs and ages, both women and men. After, and largely on the basis of, these interviews, a questionnaire was constructed, and subsequently administered to a strictly random sample of about 25 managers, 25 professionals and 25 others within each unit. Completed returns of these questionnaires produced a data bank of 1,295 cases. At the same time, unit-level external information was collected with the help of the unit's top manager, controller and chief personnel officer.

The questionnaire contained 135 items, and a pancultural factor analysis of the 135 (items) $\times$ 1,295 (individuals) answer score matrix showed that the items could be divided into three separate groups with few intercorrelations across individuals: 57 values, 61 practices and 13 reasons for promotion and dismissal. In addition, four questions asked for demographic information about the respondent, such as age, gender and educational level. *Values* were the individual's personal preference in work- and life-related issues, such as his or her preferred type of boss, his or her answers to typical cultural dilemmas, such as whether competition among employees is a good or a bad thing, and his or her work goals, i.e. the characteristics considered most important in an ideal job. The latter were standardized before further analysis by converting the absolute scores on a 1–5 'importance' scale into relative scores across the set of 22 work goals, with a mean of 0 and a standard deviation of 1. This standardization eliminates acquiescence (yes-man-ship, the tendency to call all goals more or less important) which is a notorious problem with 'importance' scales. Most of the values questions were taken from the comparative study of national cultures described in Hofstede (1980) and its later replications. *Practices* were descriptive perceptions by the employee of aspects of the work environment. *Reasons for promotion and dismissal* equally referred to the employee's perception of the actual reasons applying in the organization.

The original study was directed at organization culture, which is a property of the organizational units and not of the individuals within them, so the analysis was done at the ecological level. Mean scores per unit were computed for each question, using the answers from the entire sample of one-third managers, one-third professionals and one-third others. An ecological correlation matrix of the mean scores for the 20 units on all 131 questions (excluding the demographics) again showed that values correlated with values, but rarely with practices; that practices correlated mainly among each other, and so did reasons for promotion and dismissal. The matrix of mean scores was therefore analyzed in three separate parts: 57 mean value scores $\times$ 20 units, 61 mean practice scores $\times$ 20 units and 13 reasons for promotion and dismissal $\times$ 20 units. These three partial matrices were subsequently factor analyzed, using a principal component analysis and an orthogonal varimax rotation.

Textbooks of factor analysis always contain the warning that the number of cases should exceed the number of variables, although authors differ as to the ideal ratio: two to one (Guiford 1954), ten to one (Nunnally 1978) or 'nobody has yet worked out what a safe ratio of the number of subjects to variables is' (Gorsuch 1983: 332). In the analysis of ecological data, even Guilford's requirement is difficult to meet, because the number of cases is the number of cultures or units of analysis and this is constrained by the problem of access: six cases is nice to have, 20 cases (as in Hofstede et al.'s organizational cultures study) is excellent and 40 cases (as in Hofstede's (1980) national cultures study) is incredible luck. In the last study, the final matrix to be factor analyzed counted 32

variables $\times$ 40 cases, which was still below Guilford's limit. In the organizational cultures study, the numbers of variables even exceeded the numbers of cases. In some parts of Hofstede (1980), data collected by others have been re-analyzed by factor analysis across as few as six cases.

For years, the first two authors of this paper have felt apologetic sinners on this account, feeling they were violating a respected rule of the profession. However, they proceeded regardless of it because the results, in spite of the warnings, made such excellent sense. First, where we used more modern (and complex) multivariate techniques other than factor analysis, which do not have the same number-of-cases constraint, we obtained very similar results. Second, the argument of the factor analysis textbooks is that for too few cases, factor structures and factor scores become unstable, i.e. unreliable — random variance blurs whatever information there is in the scores. Unreliable measures, however, cannot be valid. How then, we wondered, is it possible that Hofstede (1980) found 38 other studies derived from these unallowable factor analyses for which the results are significantly and meaningfully correlated with country index scores? These other studies provide ample external validation of the country index scores which, according to the textbooks, should have been unreliable. So they simply had to be reliable.

An accidental discussion with a statistician co-member of a thesis committee in 1988 resolved the dilemma. All textbooks on factor analysis implicitly assume that the cases in factor analysis derive from individuals; none known to us even mentions the possibility of factor analyzing ecological data. There is a good historical reason for this, because the original applications of factor analysis were for the development of tests of individuals. With data from individuals, a minimum limit on the number of cases in relation to the number of variables is necessary in order to prevent an odd answer by one individual from unduly distorting the factor structure. However, this limitation does not apply to *ecological* factor analyses, in which the score for each case is the mean of a large number of individual scores. Such means are extremely stable and independent of odd individual answers. The stability of results from ecological factor analyses will depend on the total number of individuals whose data produced the ecological scores, not on the number of cultures or ecological groups. In the case of the Hofstede et al. project on organizational cultures, the stability of the ecological factor analysis results is determined by the $N=1,295$ (individuals), not by the $n=20$ (organizational units).

On the basis of a scree test, the ecological factor analysis of the 57 values produced three factors, together explaining 62 percent of the variance. The factors were labelled: (V1) Need for Security, (V2) Work Centrality and (V3) Need for Authority. V1 and V3 resembled two ecological factors found in the Hofstede (1980) cross-national study: Uncertainty Avoidance and Power Distance, but the highest loading items in the cross-organizational studies were not the same as in the cross-national

study. V3, the Work Centrality factor, had not been found in the earlier cross-national study.

A scree test of the ecological factor analysis for the 61 practices indicated that six factors should be extracted, which together explained 73 percent of the variance. The six factors were called:

- P1. Process-Oriented vs. Results-Oriented
- P2. Employee-Oriented vs. Job-Oriented
- P3. Parochial vs. Professional
- P4. Open System vs. Closed System
- P5. Loose Control vs. Tight Control
- P6. Normative vs. Pragmatic.

Each of these factors corresponded with a classification of organizations well known from the sociological or management literature: P1 with mechanistic vs. organic management systems (Burns and Stalker 1961); P2 with consideration vs. initiating structure in leadership theory (e.g. Blake and Mouton 1964); P3 with local vs. cosmopolitan (Merton 1968); P4 with a similar distinction in communication theory (Poole 1985); P5 with a similar distinction in control theory (Hofstede 1967); and P6 with the widespread concern in the present-day management literature about moving from a weak towards a strong customer orientation. 'Normative' means that the organization imposes its norms on its outside contacts (clients or customers), and 'pragmatic' that the organization adapts to the wishes of the outside contacts — the customer is king.

The ecological factor analysis of the 13 reasons for promotion and dismissal produced two factors: (H1) promotion for present vs. past merits, and (H2) dismissal for on-the-job vs. off-the-job misbehaviour.

A second-order factor analysis re-analyzed the scores for the 20 units on the three value factors V1 to V3, the six practice factors P1 to P6, the two promotion and dismissal factors H1 and H2, and the four demographics (gender, age, seniority in the organization and education level) plus a dummy variable for nationality (Danish or Dutch). Three second-order clusters were found:

- 1. 'Bureaucracy', consisting of V3 (larger Need for Authority), P1 (Process-Oriented), H2 (dismissal for off-the-job morals) and mean age;
- 2. 'Professionalism', consisting of V2 (strong Work Centrality), P3 (Professional) and mean educational level;
- 3. 'Conservation', consisting of V1 (strong Need for Security), P4 (Closed System), H1 (promotion on past merits) and Dutch rather than Danish nationality.

The three remaining practice dimensions and the remaining demographics were not associated with any factor in the second-order analysis.

Individual Perceptions of Organizational Cultures

The Hofstede et al. (1990) study of organizational cultures did not analyze the structure in the answers of *individuals*: its concern was with the ecological phenomenon of organizational cultures. From a psychological point of view and also for methodological reasons, however, an individual-level analysis of the structure in the 1,295 answers is of interest. At the very least, it should illustrate the different conclusions that can be drawn from an ecological vs. an individual-level analysis.

The scores for the 1,295 individuals on the 57 values questions and on the 61 practices questions were transformed by deducting from each score on each question the unit mean for that question (the same mean score which had been the point of departure for the ecological analysis in Hofstede et al. 1990). The $57 \times 1,295$ transformed values matrix and the $61 \times 1,295$ transformed practices matrix were factor analyzed separately, using a principal component analysis with orthogonal varimax rotation.

A scree test of the values factors indicated that six factors should be retained for the rotation, together explaining 31 percent of the variance. The six factors are listed in Table 1 which uses the same description of the questions as Table 2 in Hofstede et al. (1990).

A scree test of the practices factors showed that, again, six factors should be retained, together explaining 27 percent of the variance. The six factors appear in Table 2 which uses the same wordings as Table 3 in Hofstede et al. (1990).

Both individual-level factor analyses explain a much smaller amount of variance than the corresponding ecological factor analyses in Hofstede et al. (1990), and the loadings are considerably lower too (the cut-off point for the ecological analyses was 0.60, and for the individual ones, 0.35). This is to be expected, because ecological data contain less random error (it has been averaged out) and therefore ecological correlation coefficients, which are at the root of ecological factor analyses, are usually much higher than individual factor analyses.

Of greater interest is the fact that for the ecological analyses, practices explained more variance than values (73 percent instead of 62 percent), while for the individual analyses they explained less (27 percent instead of 31 percent). One of the main conclusions from the ecological study was that organization cultures differ primarily in their practices, whereas organization membership *per se* does not account for much variance in values. Whatever value differences were found between units could be accounted for by their hiring practices reflected in the demographics of their personnel. Educational level, age, gender and nationality were the main sources of value differences in the units.

In the individual analysis, one can detect the mirror image of this conclusion. This time we have forcibly eliminated differences in organizational cultures, and we look at the remaining variance *within* organizational cultures. Practices have a strong unit-level component, leaving less vari-

Table 1
Results of Factor
Analysis of
Transformed
Individual Scores
on 57 Values
Items across 1,295
Individuals*

Factor IV1: Personal Need for Achievement

- .64 Contribution to success of organization important
- .63 Using skills and abilities on the job important
- .63 Variety and adventure in work important
- .60 Challenging tasks important
- .59 Opportunity for advancement important
- .57 Being consulted by boss important
- .54 Opportunities for training important
- .52 Freedom in job important
- .51 Prestigious company or organization important
- .48 Opportunity for high earnings important (first loading)
- .45 Recognition of good job important
- .43 Cooperation important (first loading)
- .42 Working relationship with boss important
- .41 Opportunities for helping others important (second loading)

Factor IV2: Need for Supportive Environment

- .50 Most organizations better off if conflict eliminated for ever
- .50 Working in well-defined job situation important
- .46 Job you like is more important than career
- .46 Good personal relations at work more important than income
- .45 Competition between employees harmful
- .45 Security of employment important
- .42 The successful in life should help the unsuccessful
- .42 Opportunities for helping others important (first loading)
- .40 Employee who quietly does duty is asset to organization
- .39 Cooperation important (second loading)
- .35 Main reason for hierarchical structure is knowing who has authority (second loading)

Factor IV3: Machismo

- .53 Parents should stimulate children to be best in class
- .50 When a man's career demands it, family should make sacrifices
- .45 When people have failed in life it's their fault
- .43 Decisions by individuals higher quality than by groups
- .40 Large corporation more desirable than small
- .39 Staying with one employer is best way for making career
- .39 Man likes work
- .39 Opportunity for high earnings important (second loading)
- .36 Main reason for hierarchical structure is knowing who has authority (first loading)
- .35 Husband and wife should have same opinion
- .35 Pursuing own interest is best contribution to society

Factor IV4: Workaholism

- .61 Time for personal or family life unimportant
- .57 Job is more important than leisure time
- .49 Having little tension and stress on the job unimportant
- .49 Would continue working if didn't need the money
- .42 Physical working conditions unimportant
- .42 Living in a desirable area unimportant
- .39 Fringe benefits unimportant
- .36 Opportunity for high earnings unimportant (third loading)

Factor IV5: Alienation

- .54 Employees afraid to disagree with superiors
- .49 Not proud working for this organization
- .45 Most people cannot be trusted
- .43 Authority crisis in organizations
- .42 Own manager autocratic or paternalistic
- .41 Plans to leave organization soon

Factor IV6: Authoritarianism

- .51 Parents should not be satisfied when children become independent
- .50 Undesirable that management authority can be questioned
- .46 Not right for young people to be critical of their teachers
- .39 Good manager has precise answers to subordinates' questions
- .36 Not efficient to bypass hierarchical lines

* Loadings of .35 and over are shown; items with negative loadings have been reworded negatively. The six factors together explain 31 percent of the variance.

Table 2
Results of Factor
Analysis of
Transformed
Individual Scores
on 61 Practices
Items across 1,295
Individuals*

Factor IP1: Professionalism

- .53 Try to be pioneers
- .51 People put in maximal effort
- .50 Results more important than procedures
- .44 Everybody knows purpose and importance of work
- .43 Ahead of others in technology and working methods
- .43 Subordinates organize own work
- .42 Everybody allowed to go own way
- .42 Think three years ahead or more
- .41 Comfortable in unfamiliar situations
- .38 Mistakes are tolerated (second loading)
- .36 People are told when they have done a good job
- .35 Top managers want different opinions (second loading)

Factor IP2: Distance from management

- .54 Little concern for personal problems of employees
- .54 Organization only interested in work people do
- .50 Management stingy with small things
- .46 Changes imposed by management decree
- .44 Decisions centralized at top
- .43 Ordinary members never meet top managers
- .38 People's private life is their own business
- .37 Top managers resent being contradicted (first loading)
- .37 Important decisions made by individuals
- .37 Managers keep good people for own department

Factor IP3: Trust in colleagues

- .69 Typical member direct
- .64 Typical member initiating
- .61 Typical member optimistic
- .60 Typical member fast
- .54 Typical member warm
- .48 Typical member well-groomed

Factor IP4: Orderliness

- .52 Meeting times kept punctually
- .41 Always speak seriously of organization and job
- .41 Top managers only decide on facts
- .38 Everybody cost-conscious
- .36 Departments develop own rules

Factor IP5: Hostility

- .43 Organization and people closed and secretive
- .43 Newcomers left to find own way
- .42 Competition and mistrust between departments frequent
- .42 Mistakes are severely punished (first loading)
- .38 New employees need more than a year to feel at home
- .37 Typical member hard

Factor IP6: Integration

- .52 Loyalty between employees and organization
- .51 People feel very secure about their jobs
- .39 Each day brings new challenges
- .36 Our department best of organization
- .36 We tell stories about history of organization
- .35 We appreciate people who act assertively

* Loadings of .35 and over are shown; items with negative loadings have been reworded negatively. The six factors together explain 27 percent of the variance.

ance for differences in the perception of practices among individuals within units. Values, with a weaker unit-level component, reside to a larger extent in individuals.

This conclusion can also be drawn in another way. From the 57 values questions, 3 have loadings above the cut-off point in the ecological analysis only, and 16 in the individual analysis only (34 values appear in both analyses, and 4 not at all). From the 61 practices questions, 12 appear in the individual analysis only and 10 in the ecological analysis only (31 appear in both, and 8 not at all). This illustrates once more that the values questions are more associated with the individual than with the ecological level, but the practices questions relatively less with the individual and more with the ecological level.

Scores for the 1,295 individuals on the 2×6 factors have been calculated by adding for each individual his/her scores on the questions loading 0.35 or over for each factor (taking account of the signs in the factor analysis). Questions with double loadings were excluded. These individual factor scores allow a test of the relationships between values and practices factors and between both kinds of factors and the demographic variables, which can help explain the sources of the individual differences found.

Table 3 shows the correlations between values and practices factor scores across the 1,295 individuals (as the products of an orthogonal analysis, the values scores have close to zero correlations among each other, as do the practices scores). From the 36 possible pairs, 19 are significantly correlated. The six strongest correlations are all with IV5: alienation. Alienation appears to affect the perceptions of all six practices clusters to a considerable extent. It is therefore less an enduring value than a state of mind, indicating a negative overall attitude about this work and this organization on the part of the employee. Alienated respondents score the organization as less professional (IP1), feel management to be more distant (IP2), trust colleagues less (IP3), see the organization as less orderly (IP4), feel more hostile (IP5) and perceive less integration between employees and organization (IP6).

The next highest correlations between values and practices are between IP4 (orderliness), on the one hand, and IV2 (need for supportive environment), as well as IV6 (authoritarianism). People with a greater

Table 3
Product-Moment
Correlation
Coefficients
between
Individual Values
Factor Scores and
Individual
Practices Factor
Scores*

	IV1	IV2	IV3	IV4	IV5	IV6
IP1				<u>.13</u>	<u>-.36</u>	
IP2					<u>.36</u>	
IP3		<u>.11</u>	.09		<u>-.32</u>	<u>.11</u>
IP4		<u>.15</u>	.09		<u>-.19</u>	<u>.14</u>
IP5		<u>-.09</u>			<u>.23</u>	<u>-.09</u>
IP6	<u>.13</u>	<u>-.11</u>		<u>.14</u>	<u>-.28</u>	<u>-.09</u>

* Only significant correlations are shown. Those coefficients underlined are significant at the .001 level, those not underlined are significant at the .01 level.

need for a supportive environment and authoritarians will perceive more orderliness. IP6 (integration) is correlated with both IV4 (workaholism) and IV1 (personal need for achievement). Workaholics and achievers tend to feel more integrated in the organization. Finally, IP1 (professionalism) correlates with IV4 (workaholism). People with professional values are more likely to be workaholics. The other correlations in Table 3 are lower and of marginal interest.

Table 4 shows the correlation coefficients between the individual values and practices factor scores and the demographic scores for nationality, gender, age, seniority with the organization, years of formal education and hierarchical level.

A comparison of the upper part of Table 4 (values) with the lower part (practices) shows the former to produce more and stronger correlations with the demographics than the latter. The absolute values of the 22 correlations between values and demographics vary from 0.08 to 0.32 with a median of 0.15; those of the 16 correlations between practices and demographics vary from 0.07 to 0.20 with a median of 0.115. This confirms that values are more enduring characteristics of the person, and that practices are more dependent on the situation.

From Table 4, one reads the following correlations between values and demographics:

IV1 (personal need for achievement): none, except a marginal correlation with being a manager

Table 4
Product-Moment
Correlation
Coefficients
between
Individual Factor
Scores and
Demographic
Variables*

Demographics	Individual Values Factor Scores					
	IV1	IV2	IV3	IV4	IV5	IV6
Nationality ¹				<u>-.31</u>	<u>.12</u>	<u>-.27</u>
Gender ²		<u>.15</u>	<u>-.09</u>		<u>.09</u>	<u>.11</u>
Age		<u>.10</u>	<u>.15</u>		<u>-.24</u>	
Seniority		<u>.09</u>	<u>.11</u>		<u>-.15</u>	
Education		<u>-.32</u>	<u>-.10</u>	<u>.21</u>	<u>-.11</u>	<u>-.18</u>
Managerial status ³	.08	<u>-.18</u>		<u>.16</u>	<u>-.15</u>	
Demographics	Individual Practices Factor Scores					
	IP1	IP2	IP3	IP4	IP5	IP6
Nationality ¹		<u>-.10</u>	<u>-.17</u>	<u>-.09</u>	<u>.20</u>	
Gender ²			<u>.07</u>	<u>.08</u>	<u>-.13</u>	
Age				<u>.17</u>		.07
Seniority				<u>.10</u>		
Education	<u>.11</u>			<u>-.13</u>	.07	<u>.16</u>
Managerial status ³		<u>-.07</u>				<u>.16</u>

* Only significant correlations are shown. Those coefficients underlined are significant at the .001 level, those not underlined are significant at the .01 level. Signs have been chosen such that a positive correlation indicates stronger support for the statements in the factor as described in Tables 1 and 2.

1. Danish = 1, Dutch = 2

2. Male = 1, female = 2

3. Non-manager = 1, manager = 2

IV2 (need for supportive environment): less educated, non-manager, female, older (and more senior)

IV3 (machismo): older, less educated, male

IV4 (workaholism): Danish, more educated, manager

IV5 (alienation): younger, non-manager, Dutch, less educated, female

IV6 (authoritarianism): Danish, less educated, female.

For practices, the pattern of correlations is:

IP1 (professionalism): more educated

IP2 (distance from management): Danish, non-manager

IP3 (trust in colleagues): Danish, female

IP4 (orderliness): older, less educated, Danish, female

IP5 (hostility): Dutch, male, less educated

IP6 (integration): more educated, manager, older.

Factor IP6, integration, was based on rather weak loadings (four of its six defining items loaded under 0.40). Any doubt as to the meaningfulness of keeping this factor on our list is eliminated by its unique correlation pattern with the demographics, different from any of the other practice factors. In fact, IP6 seems a most suggestive factor, worth pursuing with additional items in future studies.

As age and seniority in the organization are obviously mutually correlated, factor scores correlated with age are also correlated with seniority. However, the correlations with age are always stronger, which is why in the above analysis we omitted the references to seniority after the first case. The fact that age is the more decisive variable shows that what was measured are characteristics of the person as a person, not primarily as an employee.

The intercorrelations among the other demographics are minor. An analysis of stepwise regression coefficients of the values and practices on the various demographics taken together (which does take the interrelationships among demographics into account) provides no new insights to those already offered by Table 4.

With regard to the correlations with nationality (Danish or Dutch) the reader should bear in mind that the populations studied in the two countries were not matched, so that one should not conclude that these characteristics apply to Danes in comparison to Dutch *in general*, only to those Danes and Dutch working in the organizations in the Hofstede et al. study. Rather than suggesting any conclusion about the two nations, these correlations show that the cultural environment (national, regional, etc.) from which employees are recruited does affect their way of answering the values and practices questions. We did check the interactions between nationality and the other demographic variables in our data, and found only three interaction terms in 12 regression equations to be significant at the 0.05 level, which is only marginally more than would be expected by chance; so the correlations between our demographics and our factors can be safely considered 'culture-general' with regard to the nationality effect.

Discussion

This article has re-analyzed the data from a previous study of organizational cultures, this time at the individual rather than at the ecological level: focusing on the blind men rather than on the elephants. As far as we know — and have been able to find out from the literature — this is the first time that perceptions of organizational cultures have deliberately been analyzed *at the level of individuals from a variety of organizations, controlling for differences between these organizations*. The dimensions of organizational culture identified in a previous article, by analysis at the organizational level, were conspicuously missing in the present one. Instead, 12 entirely different dimensions were found — six of individual values and six of individual perceptions. Among the two sets of six, there were a number of meaningful relations. Earlier we referred to the distinction between ‘psychological climate’ and ‘organizational climate’ made by Glick (1985). Our analysis proves that a similar distinction is desirable for the concept of culture. There is a ‘psychological culture’ located in the mind of an individual, contributing to the way in which this individual experiences the organizational culture.

The six dimensions of individual values were labelled (Table 1):

IV1: Personal Need for Achievement

IV2: Need for Supportive Relationships

IV3: Machismo

IV4: Workaholism

IV5: Alienation

IV6: Authoritarianism.

These represent a combination of personality differences and effects of present and previous individual life and work experiences; especially IV1 (effect of education) and IV2 (effect of labour market). IV5 (alienation) reflects the overall attitude towards the present boss and organization, and shows the degree of (mis)fit between the individual’s aspirations and his or her present work situation. It is highest among young, less educated, Dutch female non-managerial employees.

The six dimensions of individual perceptions of practices were labelled (Table 2):

IP1: Professional

IP2: Distance from Management

IP3: Trust in Colleagues

IP4: Orderliness

IP5: Hostility

IP6: Integration.

These, again, partly reflect personality differences, but with an even greater contribution of present and previous life and work experiences: educational level for IP1; superiors for IP2; colleagues for IP3 (a response set effect is excluded because the semantic differential scales on which this dimension is based were worded partly in the optimistic, partly in the pessimistic direction); the interaction between the person

and the department of the entire organizational unit for IP5 and IP6.

In the ecological analysis, organizational values and practices were two clearly distinct kinds of phenomena, 'values' being based (with only a few exceptions) on things desired and desirable in general, and 'practices' being based entirely on descriptive perceptions of the actual work situation. In the individual analysis, the values and the perceptions of practices are not so distinct. Perceptions are partly affected by values (as part of the personality), and 'values' partly reflect perceptions of the work situation.

We believe we can support our suggestion that personality differences caused part of the differences we found among individuals. Fundamental research by McCrae and John (1992) and a broad review of the literature on personality measurement by Hogan (1992) converge on the conclusion that, within the myriad of personality tests available, there is a common denominator of five dominant separate and useful dimensions of personality variation (the so-called 'Big Five'):

- E*: extraversion vs. introversion;
- A*: agreeableness vs. ill-temperedness;
- C*: conscientiousness vs. undependability;
- N*: neuroticism vs. emotional stability;
- O*: openness to experience vs. rigidity.

In order to test whether these five are also present in our findings, we performed a *second-order factor analysis* on the factor scores for the six values factors IV1 to 6, and the six practices factors IP1 to 6. In this way, we analyzed 12 variables (first-order factor scores) for 1,295 individuals. As with the first-order factor analysis, we eliminated between-unit variance by deducting from the value of each variable (in this case, first-order factor score) the unit mean for that variable. Therefore, for each of the 20 organizational units, the unit mean on each variable again became zero. What we analyzed, therefore, is again the variance among individuals within units, excluding the variance between units.

A scree test of our second-order factor analysis data showed that either four or six factors should be retained, explaining either 54 percent or 69 percent of the total variance in the matrix. We decided to retain six factors, which consist of decimal figure loadings in the secondary analysis:

1. IP1 (professionalism) 0.75 and IP5 (hostility) -0.70 (IV5 and IP2, 3 and 6 also load on this factor, with the appropriate signs and with loadings between 0.05 and 0.65). This secondary factor resembles dimension *O* from the big five (some key adjectives for this dimension according to McCrae and John 1992: 178-179, are 'imaginative' and 'original').
2. IV4 (workaholism) 0.0 and IV2 (need for supportive environment) -0.74. This secondary factor resembles dimension *E* from the big five (key adjectives 'active' and 'energetic').
3. IP4 (orderliness) 0.88; this resembles dimension *C* (key adjectives 'efficient' and 'organized').

4. IV1 (personal need for achievement) 0.93; this resembles the reverse of dimension *N* (the low end of scales for such traits as 'anxiety' and 'hostility' — see again McCrae and John 1992: 178–179).

5. IV3 (machismo) 0.95; this resembles the reverse of dimension *A* (the low end of scales for 'altruism' and 'modesty').

6. IV6 (authoritarianism) 0.95; this does not resemble any of the 'big five' dimensions of personality (in fact, it is somewhat surprising that the big five do not include authoritarianism!).

Of course, the second-order factors do not fully overlap the 'big five' according to the descriptions of McCrae and John, but they get remarkably close. We conclude that our analysis of individual differences in the perceptions of organizational cultures has led us to the very heart of personality research.

The dramatic difference in results, depending on whether we analyze the same data at the ecological or at the individual level, should be a caution to look very carefully at the methods of analysis used when comparing the results of different studies. This can be illustrated by comparing a study of the organizational cultures of five French business companies published in *Organization Studies* (Calori and Sarnin 1991) with the Hofstede et al. (1990) study published in *Administrative Science Quarterly*. Both focus on organizational cultures across several distinct organizational units; both use a survey questionnaire; both include in this questionnaire 'values' and 'practices' (although differently defined); both compare survey results to external validation criteria (for Calori and Sarnin, company growth and profitability); and both use the homogeneity of answers within a culture as a measure of its strength. Yet the results are very different. Calori and Sarnin found 12 clusters of abstract values, divided into 'ethical' and 'economic' values. They did not cluster practices. Our main finding consisted of six dimensions of practices.

The differences between the two studies partly reflects the different intellectual cultural traditions between France on the one hand, and Denmark plus the Netherlands on the other. The French (and also the German) tradition has been described as deductive, reasoning from a known principle to a logical conclusion. The North European (and also the Anglo-American) tradition has been described as inductive, reaching a general conclusion by inference from particular facts (Hofstede and Kassem 1976; Hofstede 1991). Calori and Sarnin's approach was more deductive and ours more inductive, although neither were pure types; we also used some deduction and they used some induction.

The main explanation for the difference in results between the two studies resides in the distinction, depicted in the present article, between the pancultural, within-culture, ecological and individual levels of analysis. Calori and Sarnin used a pancultural analysis. They pooled the answers of the 280 respondents from five companies, and factor analyzed the 280 individual answers, interpreting the outcome as dimensions of organizational cultures. Because, as we saw, the pancultural analysis does include the ecological variance, this approach may still show meaningful differ-

ences between organizational units, but they are affected by random individual variance.

Pancultural analyses should preferably be avoided because of this blurring by irrelevant variance from another level. Ecological and individual analyses, which separate the variance in the pancultural analysis according to level, are both useful in their own right, as shown in the study by Lincoln and Zeitz (1980) described earlier in this article. Ecological analyses are indicated when the research is about social systems, exposed to forces operating at the system level, collectively affecting all individuals within these systems. Organizational cultures belong to this category. Individual analyses are indicated when the research focus is on the individuals within the systems, and the ways in which they respond to their social environment.

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