FOUR

Erling Berge

Comparing the Factorial Ecology of Helsinki and Oslo

A recent review of substantive findings in Social Area Analysis and Factorial Ecology (Hamm, 1982) cites 78 studies involving a total of 66 cities. Of the 78 studies 41 are concerned exclusively with cities in the U.S.A. Only 9 studies report on the factorial ecology of cities in non-industrialised countries.

Scandinavian cities have got its share of studies. Most work has been done on Helsinki (Gronholm' 1961; Sweetser 1965a,c,1969,1973). Copenhagen (Pedersen, 1967) has been studied, and Janson (1971, 1976) by pooling data from several cities has studied the spatial structure of Swedish cities. Trondheim was studied by Dale (1981) and Oslo by Berge and Tember (1982). The present article reports the findings for Oslo and compares the factorial ecology of Oslo with that of Helsinki.

The Factorial Ecology of Oslo

Oslo is the capital city of Norway. By international standards it is a small city. In 1980 it had 452.023 inhabitants, in 1970 477.898 people lived there. The urban area, however, is larger.

Adding the population of 9 surrounding municipalities to the population of Oslo shows that in 1980 a total of 698.283 people were living in an area which might be called "Greater Oslo" (see figure 4.1). In 1970 the area had only slightly fewer: 693.026 inh.

The present analysis is a study of "Greater Oslo" in 1970. But it does not include quite the 10 municipalities referred to above. The population and housing census of 1970 utilised 621 census tracts within these 10 municipalities. The tracts without population or only very sparsely populated at the outer edge of the area were removed so that 562 tracts were left covering a contigous area mostly densely settled. Census tracts with less than 500 inhabitants were added to neighbouring tracts. This left 442 analytical units. Data on these 442 units were readily available from the Census tract data bank of the Norwegian Social Science Data Services. From these data 37 variables were computed. Their definitions are detailed in table 4.1. In order to compare the factorial ecology of Oslo with that of Helsinki an effort was made to replicate the variables used by Sweetser (1973, table 4.1) in his study of Helsinki. For 21 of the 33 variables used by Sweetser, the definitions are very similar. For another variable a reasonable approximation was found. The comparison of Oslo and Helsinki will be based on these.

Of the 37 variables those numbered 32-38 (var. no. 30 was discovered to contain random noise and excluded) were essentially uncorrelated with the others and according to established procedures (Sweetser, 1974) removed from the factor analysis. The remaining 30 variables (nos. 1-31) were then analysed by the principal factors method (PA2 option in the FACTOR program of SPSS: Nie, et al., 1975) and rotated to simple structure according to the varimax criterion. This gave the factor matrix with four factors reported in table 4.2.

Factor analysis does not produce any "best" solution automatically. Both the number of factors and the rotation to simple structure has to be decided upon by the researcher. Solutions with six and five factors were examined. Four factors seemed, however, to give the most parsimonious and meaningful description of the data. But evidence suggests that choice of factor model and criterion for rotation do not have much substantial impact (Berge, 1981, page 312-18, Hamm, 1979, p.31-36).

The four factors of table 4.2 account for 77.2 per cent of the variance of the observations. The strongest factor accounts for 31.3 per cent, the weakest only 6.9 per cent. Only one of the variables has communality less than .50. That is variable 7

FIG. 4.1 Small-scale map of selected units in Oslo and Akershus.
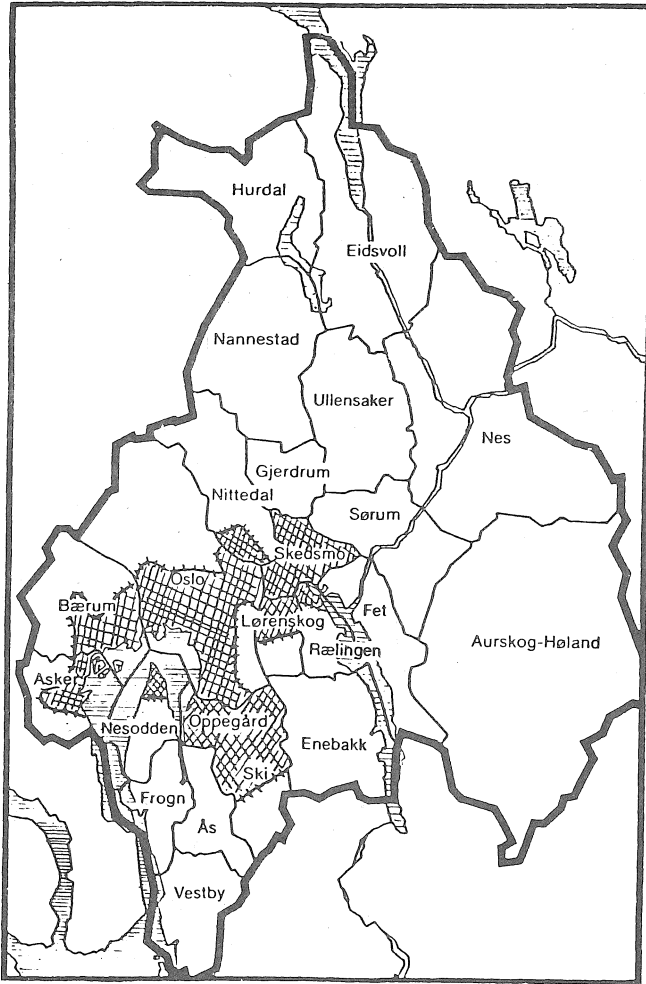
border of region

border of municipality

border of selected areas within a municipality

Oslo as it is defined here, includes parts of the municipalities Asker, Baerum, Oslo, Nittedal, Raelingen, Lorenskog, Ski and Nesodden, and all of Skedsmo and Oppegard.

"Regionplan for Oslo og Akershus". Regionplankontoret for Oslo og Akersus. Oslo 1976.

TABLE 4.1
Ecological Variables in Oslo and Helsinki
(transformations in parenthesis)

OSLO VARIABLES		HELSINKI VARIABLES[b]		Replic Status[a]
No. Name	Definition	No. Name		
1. Age 0-4	% of population age 0-4 years	2. % 0-4 years		R-1
2. Age 5-14	% of population age 5-14 years	3. % 5-14 years		R-1
3. Preadolescent ratio	% of population under 16 who are 0-4	4. % u.15 who are 0-4		R-2
4. Young middle age	% of population 20-69 who are 20-39	5. % who are 20-39		R-2
5. Age 60 +	% of population who are 60 and over	6. % who are 65 and over		R-2
6. % male	% of population male	7. % male		R-1
7. Foreigners	% of population not born in Norway	8. % speaking Swedish as principle language		A
8. Married	% of population who are married	9. % 15 years and older who are married		R-2
9. Fertility ratio	Number of children 0-4 years per 1000 males age 20-49	10. Number of children 0-4 per 1000 males 20-49		R-1
10. Unmarried women	% unmarried women age 30-39	11. % 15 years and older who are widowed or divorced		S
11. One-person families	% of population over 16 years in one-person households	12. % 15 years and older in one-person households		R-2

(a) R-1 = exact replication, R-2 = very close approximation, A = approximation, S = substitute, E = "extra" variable.
(b) Helsinki variables no. 1 (median age) and 15 (living space) could not be matched or ammproximated.

Table 4.1 continued....

OSLO VARIABLES			HELSINKI VARIABLES[b]		
No. Name	Definition		No. Name		Replic Status[a]
12. Size of household	Mean number of persons in families with two or more persons		13.	Mean number of persons in house-holds with two or more persons	R-1
13. Room crowding	% dwellings with room crowding less than 0.50 per room		14.	Number of persons per 100 rooms	S
14. Home ownership	% of dwellings occupied by owners		16.	% of dwellings occupied by owners (incl. share-holders)	R-1
15. Working women	% of women 16-69 years who are economically active (full-time)		17.	% of females age 15 and older who are economically active (excl. those unemployed and seeking work	R-2
16. Manufacturing	% of economically active dependent on manufacturing industry ["naer-ingskode" 11-39, 51-52 (b)]		19.	Proportion of total population economically dependent on manufactur-ing industry (deciles)	R-2
17. Service	% of economically active dependent on services ["naeringskoldes" 67-69, 81-93 (b)]		20.	Proportion of total population economically dependent on services, incl. transportation, commerce, etc. (declies)	R-2
18. Employers	% of population bdY&g leaders of manufacturing a d organisations ["yrkeskode" 11 (c)]		21.	% of economically active who are employers of labor	S
19. Blue collar	% of population who are manual workers ["yrkeskode" 50-59,		22.	% of economically active who are manual workers	R-1

(a) For definitions see above.
(b) Standard for naeringsgruppering í offentlig norsk statistikk. SSB Handbker nr. 9.
(c) Standard for yrkesgruppering i offentling norsk statistikk. Nordisk yrkesklassifisering. Arbeidsdirektoratet

Table 4.1 continued....

OSLO VARIABLES			HELSINKI VARIABLES[b]		Replic Status[a]
No.	Name	Definition	No.	Name	
20.	Primary education	% of population age 25–69 who have "folkeskole" education as their highest degree	23.	% of population age 15 and older who have passed middle school or student examinations	S
21.	Female higher education	Number of females with university education per 100 females with "gymnas"	24.	Number females who have passed student examination (for university admission) per 100 females who have passed middle school examination	R-1
22.	Apartment house size	% dwellings in building with 3 or more floors	28.	Number of dwellings per residential building	S
23.	Detached dwellings	% of dwellings in one or two dwelling buildings	29.	% of dwellings in one or two dwelling buildings	R-1
24.	Small dwellings	% of dwellings with one room (excluding kitchen)	30.	% of dwellings with one or two rooms (incl. kitchen)	R-1
25.	New Housing	% of dwellings built 1961-1970	31.	% of dwellings built 1951-1960	R-2
26.	Telephone	% of dwellings with telephone			E
27.	Dwellings without toilet	% of dwellings lacking toilet	33.	% of dwellings lacking flush toilet	R-1
28.	Sanitary standard	Dwellings lacking water, joint water conduit or sewerage (divided with total dwellings multiplied with 3. Square root)			E

(a) For definitions see above.
(b) Helsinki variables no. 25 (population density), no. 26 (Public buildings), no. 27. (Industrial buildings) and no. 32.
(building defect heat) could not be matched or approximated.

Table 4.1 continued......

OSLO VARIABLES			HELSINKI VARIABLES[b]		Replic Status[a]
No.	Name	Definition	No.	Name	
29.	Ec. active mothers	% women age 16-59 with children age 0-12 who are economically active (full time)			E
30.		random noise			
31.	Ec. active pension-er/ratio	Number of pensioners per 100 persons who are economically active			E
32.	(b) Agriculture	% of economically active dependent on agriculture. ("naeringskode" 01-02) (square root)	18.	Proportion of total population economically dependent on agriculture (deciles)	R-2
33.	Trade	% of economically active dependent on trade (naeringskode" 61-66)			E
34.	Total pop.	The total number of people (logarithm)			E
35.	Sex ratio	Number of women 16-39 years, per 100 men age 16-39 (square root)			E
36.	Dependency ratio	The population under 20 years plus the population above 60 years divided by the population between 20-59, all multiplied by hundred			E
37.	Non-family	% of one-person households with one person aged 30-66			E
38.	Work place	% of population who are occupied within commune of residence			E

(a) For definitions see above.
(b) Variables 32 to 38 were essentially uncorrelated with others in the matrix.

TABLE 4.2
Four Dimensions of Neighbourhood Differentiation, Oslo 1970
(Varimax Rotations of Principal Components solution)

| Variables | | Replication Status[a] | Factor Coefficients[b] (Decimal Points Omitted) | | | | Communality |
No.	Name		"Deprivation"	Socioeconomic Status	Familism	"Detached dwellings"	
1.	Age 0-4	R-1	-07	-11	93	13	39
2.	Age 5-14	R-1	-67	11	57	27	86
3.	Preadolescent ratio	R-2	72	24	15	-19	64
4.	Young middle age	R-2	11	24	89	15	89
5.	Age 60+	R-2	50	-12	-68	-28	80
6.	% male	R-1	-56	-22	32	39	62
7.	Foreigners	A	21	65	01	12	48
8.	Married	R-2	-69	-32	06	06	58
9.	Fertility ratio	R-1	04	-15	78	07	63
10.	Unmarried women	S	73	04	-37	-37	81
11.	One-person families	R-2	86	-04	-27	-28	89
12.	Size of household	R-1	-59	28	56	37	88
13.	Room crowding	A	-08	70	-34	18	64
14.	Home ownership	R-1	-43	32	15	77	89
15.	Working women	R-2	67	23	-12	-39	66
16.	Manufacturing	R-2	-12	-81	04	-06	67
17.	Services	R-2	14	77	17	-21	67

Table 4.2 continued....

18. Employees	S	-35	74	-13	26	76
19. Blue collar	R-1	16	-95	-06	-03	93
20. Primary educ.	A	34	-88	-20	-11	95
21. Female higher educ.	R-1	-09	73	17	17	59
22. Apartment house size	S	46	-26	-21	-74	87
23. Detached dwellings	R-1	-40	24	12	81	89
24. Small dwellings	R-1	80	-19	-11	-17	72
25. New housing	R-2	-25	14	78	-05	69
26. Telephone	E	-59	67	-32	-08	91
27. Dwellings without toilet	R-1	65	-35	-02	29	63
28. Sanitary standard	E	-04	01	12	70	50
29. Ec. active mothers	E	-26	-12	72	01	60
31. Ec. active/pensioner ratio	E	41	-02	-54	-23	50
FACTOR VARIANCE		11.67	5.89	3.50	1.85	
% OF TOTAL VARIANCE		38.3	19.9	12.1	6.9	77.±

a) R-1 = exact replication, R-2 = very close replication, A = approximation, S = substitute, E = "extra" variable.
b) Coefficient of ±, 45 or more in parentheses _____

(Foreigners) with 0.48. Total of 26 variables have communalities above 0.60. Table 4.2 presents the factor loadings of the variables on the four factors along with communalities and factor variances. Factor loadings with absolute value of 0.45 or more have been put in parenthesis. They are usually taken to be large enough to be of interest in judging the nature of the social relations the factor is a measure of. In table 4.3 the variables have been arranged according to the size of the loading for each of the four factors.

Interpretation of the analysis

Factorial ecology (see f.e. Timms, 1971 or Sweetser, 1982) has established beyond doubt the general validity of the three dimensions hypothesised by social area analysis (Shevky and Williams, 1949; Shevky and Bell, 1955). These dimensions are now usually labelled socio-economic status, ethnicity and familism. And they are taken to be basic dimensions of the social structure.

The present writer has argued (Berge, 1981, 1982; Berge and Tamber, 1982) that a factor identifies the relative strength of one position in a dichotomized dimension of the social structure.

Basically there are two types of social structural dimensions. One type will when dichotomized, have a top-position and a bottom position. The other type will have a member position and a non-member position. The first type might be called inequality dimensions, the second one equality dimensions.

The first factor is by far the strongest. It accounts for 38.3 per cent of the variance of the data. This factor is dominated by variables like "one person families" and "small dwellings". The old people and single women might suggest a life cycle factor, but the small dwellings and the relative lack of telephones as well as the relative scarcity of men suggests the importance of material conditions of living and the relative deprivation of the population described by these variables.

The distribution of material conditions of living has been shown to be more sqewed in cities than in the country as a whole (Aase and Dale, 1978). It, therefore, seems right to stress the aspects of living conditions suggested by the factor.

The dimension of the social structure identified by this factor is an inequality dimension identifying the relative strength of a "have not" position, and, by logical implication, the "have"

TABLE 4.3
Four Ecological Factors, Oslo 1970
(Decimal points omitted)

Variable No. Name (a)	Factor +	Coefficient −	Variable No. Name	Factor +	Coefficient −
FACTOR I "DEPRIVATION"			FACTOR II "SOSIOECONOMIC STATUS"		
11. One-person families	86		19. Blue collar		−95
24. Small dwellings	80		20. Primary educ.		−88
10. Unmarried women	73		16. Manufacturing		−81
3. Preadoelscent ratio	72		17. Service	77	
8. Maried		−69	18. Employers	74	
15. Working women	67		21. Female higher educ.	73	
2. Age 5-14		−67	13. Room crowding	70	
27. Dwellings without toilet	65		26. Telephone	67	
12. Size of household		−59	7. Foreigners	65	
26. Telephone		−59			
6. % male		−56			
5. Age 60+	50				
22. Apartment house size	46				
FACTOR III "FAMILISM"			FACTOR IV "DETACHED DWELLINGS"		
1. Age 0-4	93		23. Datached dwellings	81	
4. Young middle age	89		14. Home ownership	77	
9. Fertility ratio	78		22. Apartment house size		−74
25. New housing	78		28. Sanitary standard	70	
29. Ec. active mothers	72				
5. Age 60+		−68			
2. Age 5-14	57				
12. Size of household	56				
31. Ec. active pensioner ratio		−54			

(a)For further definitions see table 1.

position. This suggests the name "Deprivation" for this factor.

The second strongest factor is dominated by variables like "proportion of the economically active population in service occupations", "self-employed people" and "women with high education" with positive loadings and "blue collar workers" and "proportion with primary education" with negative loadings. The aggregates described by these variables seem to be dominated by inequalities in educational and occupational resources. The factor analysis identifies the relative strength of a top position in a dichotomized structure where presence of socio-economic status resources suggest the name:"Socio-economic Status" for the factor. The one variable which might indicate otherwise is "porportion not borne in Norway" since immigrants usually will be low status workers. But before 1970 most immigrants to Norway were high status workers from the other Scandinavian countries and the U.S.A.

The third factor is clearly a life cycle factor. It is dominated by variables like "proportion of population aged 0–4", "proportion of population aged 20–69 who are of age 20–39", "fertility ratio" and "new dwellings".

The aggregates described by these variables are related to the social structure in a way different from the former two factors. While the former two factors described hierachical structures, the present factor seems to indicate a structure of the membership/non-membership type. The variables loading high on the factor seem to suggest that the position identified, is the "standard" complete nuclear family. Hence the label "familism" for this factor.

The fourth factor is very weakly defined, accounting for only 6.9 per cent of the variance. Only four variables loads on the factor and all of them concern housing. The variables seem to have something to do with low standard rural dwellings, and might suggest the relative strength of the "native" population of a census tract or the degree to which the area was used for holiday cabins before city growth made the area a part of the city. If the first possibility is the case, the factor is of the same type as the Familism factor. It reports the relative strength of a member position. The second possibility would make the factor a candidate for exclusion from the analysis. It would then describe the environment of the social structure proper (Berge, 1982). In order to resolve this question one would have to include additional data in a new factor analysis. Lacking these data the case must rest unresolved.

The factor scores on the three major dimensions identified, measure the strength of a position in the social structure relative to the average strength of the position within the area studied. One of the more interesting results of a factor analysis like the present one, is thus the picture it offers of the spatial distribution of the social structure.

The city of Oslo is divided into 60 zones. Taking the average of the factor scores on the analytical units within each zone and dividing these zone scores into 6 size classes make it possible to show the spatial distribution of structural positions on a man of Oslo by giving each size class a shade of gray.

In figures 4.2 - 4.4 this is done for the three major dimensions identified. Dark shading indicates high factor score values. Deprivation is most clearly present in the east part of the central city. Socio-economic status is relatively highest in the western parts of the city and familism strongest on the northeastern part and the municipalities outside of Oslo (not shown on map).

If spatial clustering is a general tendency for actors in the same position in the social structure, factor scores on census tracts within zones ought to be more like each other than scores on tracts in other zones. There ought to be less variation in factor score values within zones than between zones. A test of variances confirms the general tendency for spatial clustering. (The F-statistic for the Deprivation factor is 8.6, for the Socio-economic status factor it is 14.5 and for the Familism factor it is 4.2 with 62 and 379 degrees of freedom.)

The general validity of the three societal dimensions——Socio-economic status, Familism/Urbanism and Ethnicity/Immigrant status——proposed by Shevky and his colleagues is well documented (Hamm, 1982). The discovery of a Socio-economic status factor and a Familism factor in Oslo is, therefore, no surprise. Neither is the absence of an ethnicity/immigrant status factor surprising (Sweetser, 1969). The interesting fact here is the appearance of a "Deprivation" factor as the major factor of differentiation in the Oslo metropolitan region. A comparison of the factor pattern in Oslo with the pattern in Helsinki may help clarify the meaning of the Deprivation factor.

Comparing Oslo and Helsinki

Of the 21 variables with similar definitions in this study of Oslo and Sweetser's study of Helsinki, one dropped out of the analysis because of low correlations with other variables. Of
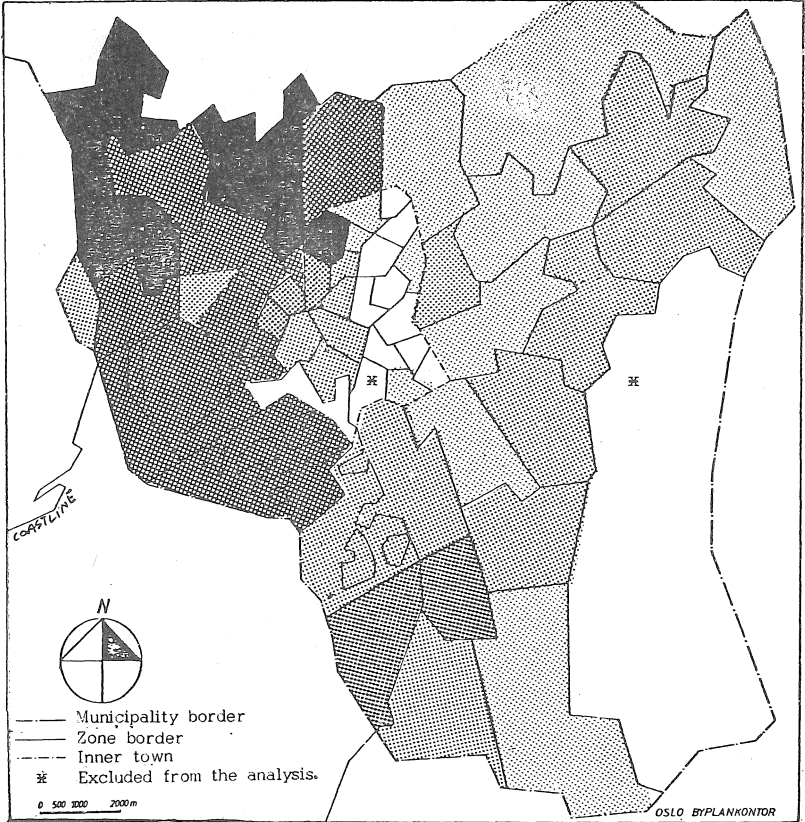
FIG. 4.2 Geographical location of various neighbourhood types. (mean of factor scores).
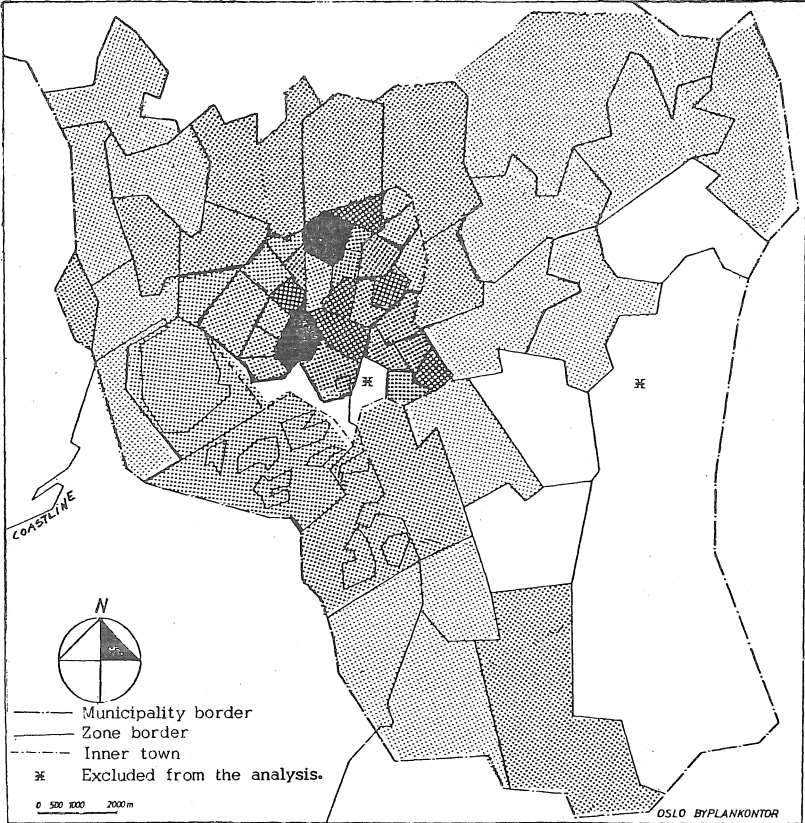
FACTOR I "Deprivation". Oslo.
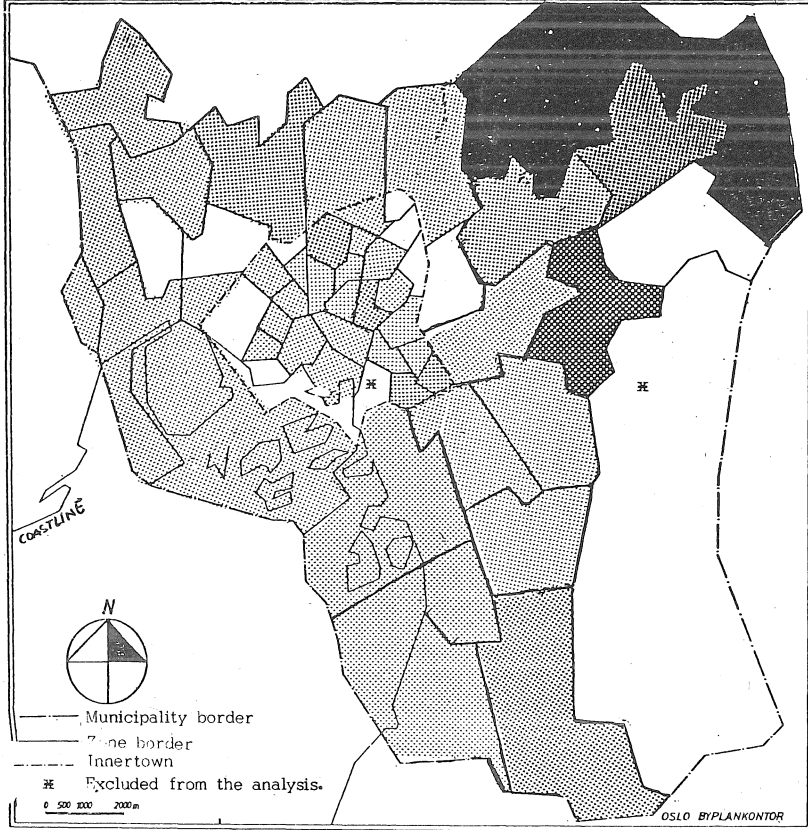
Dark shadings = high values.

FIG. 4.3 Geographical location of various neighbourhood types (mean of factor scores).

FACTOR II "Socio-Economic Status (SES)". Oslo.

Dark shadings = high values

FIG. 4.4. Geographical location of various neighbourhood types. (mean of factor scores).

Factor III "Familism". Oslo.

Dark shadings = high values.

the approximations only one per cent of population not born in Norway (approximation of per cent Swedish speaking Finns), could be included. The others were defined reciprocally in relation to the variable they were approximations of. Table 4.4 is taken from table 4.14 in Sweetser, 1973 and gives for the comparable variables the factor loadings on the six factors identified by Sweetser as describing the social structure of Helsinki. From tables 4.2 and 4.4 one may compute the coefficient of factor congruence (Harmon, 1967, pp. 269-271) between factors identified in Oslo and Helsinki. The results are reported in table 4.5. In table 4.6 the factors from the two cities are compared variable by variable.

The Socio-economic status factor is clearly the same in both cities. From table 4.6 it is seen that the largest differences are found for the variables "detached dwellings" and "foreigners". These differences are easily explained since Oslo had "Detached dwellings" as a separate factor and Helsinki had "Swedish language".

The Familism and Deprivation factors of Oslo are each related to two of the Helsinki factors.

Coefficients of Congruence

OSLO	Familism		Deprivation	
	.83	-.77	.64	-.61
HELSINKI	Young Familism	Postgeniture		Familism/ Ruralism

The Familism factor in Oslo resembles both Young Familism and Postgeniture in Helsinki. Postgeniture also resembles the Deprivation factor in Oslo and so does the Familism-Ruralism factor. The picture is a bit complicated, but it is not random. The factors are closely related, but even so the conclusion must be that the factorial ecology of Oslo, 1970 is different from Helsinki's in 1960.

The comparison has suggested that the Deprivation factor of Oslo is some kind of family cycle factor. This is a contradiction of the interpretation of this factor as an inequality dimension and deserves some further investigation.

TABLE 4.4
Six Dimensions of Neighbourhood differentiation, Helsinki Region 1960.
Factor Coefficients of 21 Variables replicated in Oslo[a]
(Varimax rotations of Principle Components Solution.)

Variables		Factor Coefficients (Decimal Points Omitted)					
No.	Name	Socio-Economic Status	Postgeniture	Familism Ruralism	Young Familism	Residenti-alism	Swedisn Language
1.	Age 0-4	-27	-50	17	75	23	-02
2.	Age 5-14	-12	-51	68	24	01	-20
3.	Preadolescent ratio	-26	-28	-27	72	29	11
4.	Middle age ratio	-07	-57	-08	67	15	-12
5.	Age 65+	14	87	16	-20	-08	15
6.	Prop. male	-43	-72	28	06	04	03
7.	Swedish speaking Finns	29	20	07	02	01	72
8.	Married	-29	-74	11	34	34	-02
9.	Fertility ratio	-21	-21	40	80	16	01
11.	One-person families	19	57	-42	-38	-44	-08
12.	Size of household	02	-49	73	31	03	-04
14.	Home ownership	10	-33	34	02	73	-15
15.	Working women	22	11	-73	-05	-29	-34
16.	Manufacturing	-76	-44	-01	15	10	-15
17.	Services	76	06	-46	-05	-09	02
19.	Blue collar	-95	-14	-01	04	-08	00
21.	Female higher educ.	64	05	09	-08	-06	-03
23.	Detached dwellings	-47	-33	59	09	39	30
24.	Small dwellings	-59	52	-26	10	-28	-32
25.	New housing	17	-61	-09	39	41	-29
27.	Dwellings without toilet	-70	-21	46	19	20	25
	Factor variance (33 variables)	6.88	6.33	5.78	3.56	2.63	1.98
	% of total variance (33 variables)	20.9	19.2	17.5	10.8	8.0	6.0

[a]Sweetser, F. L. (1973) page 45. See also table 1 above.

TABLE 4.5
Coefficients of Congruence[a] between Factors
Derived from Oslo Analysis, 1970 and Factors Derived from
Metropolitan analysis, Helsinki, 1960.
(21 Matched Variables)

Helsinki factors   Oslo factors

	Deprivation	Socio-Economic Status	Familism
Socio-Economic Status	-.02	.83	-.11
Postgeniture	.64	.12	-.77
Familism-Ruralism	-.61	-.04	.37
Young Familism	-.11	-.13	.83
Residentialism	-.48	.01	.48
Swedish Language	.04	.17	-.21

[a]Cf. Harmon, H. H. (1967) page 269-271.

To aid the reinterpretation it will be compared to the reflected Familism/Urbanism factor of the "Urban Residential areas in Australia" (Sweetser, 1982, Appendix table 1).

Variable by variable for all variables correlation with an absolute value of .50 or more with either of the two factors, it came out like shown in table 4.7.

TABLE 4.6
Comparison of factor loadings from similar factors in
Helsinki and Oslo Variable

No.	Name	Oslo	Helsinki status
SOCIO-ECONOMIC STATUS			
17. Dependent on services	.77	.76	R-2
21. Female high education	.73	.64	R-1
07. Foreigners	.65	.29	A
23. Detached dwellings	.24	-.47	R-1
24. Small dwellings	-.19	-.59	R-1
27. HU's without toilet	-.35	-.70	R-1
16. Dependent on manufacturing	-.81	-.76	R-2
19. Blue collar	-.95	-.95	R-1
COEFFICIENT OF CONGRUENCE		.83	

			Post-gen.	Young Fam.	
FAMILISM					
1.	Age 0-4	.93	-.50	.75	R-1
4.	Young middle age	.89	-.57	.67	R-2
9.	Fertility ratio	.78	-.21	.80	R-1
25.	New housing	.78	-.61	.39	R-2
2.	Age 5-14	.57	-.51	.24	R-1
12.	Size of HH	.56	-.49	.31	R-1
6.	% male	.32	-.72	.06	R-1
3.	Preadolescent ratio	.15	-.28	.72	R-2
8.	% Married	.06	-.74	.34	R-2
24.	Small dwellings	-.11	.52	.10	R-1
11.	One person families	-.27	.57	-.38	R-2
5.	Age 60+	-.68	.87	-.20	R-2
COEFFICIENT OF CONGRUENCE			-.77	.83	

			Post-gen.	Fam/Rur.	
DEPRIVATION					
11.	One person families	.86	.57	-.42	R-2
24.	Small dwellings	.80	.52	-.26	R-1
3.	Preadolescent ratio	.72	-.28	-.27	R-2
15.	Working women	.67	.11	-.73	R-2
27.	HU's without toilet	.65	-.21	.46	R-1
5.	Age 60+	.50	.87	.16	R-2
17.	Dependent on services	.14	.06	-.46	R-2
4.	Young middle age	.11	-.57	-.08	R-2
1.	Age 0-4	-.07	-.50	.17	R-1
25.	New housing	-.25	-.61	-.09	R-2
23.	Detached dwellings	-.40	-.33	.59	R-1
6.	% male	-.56	-.72	.28	R-1
12.	Size of HH	-.59	-.49	.73	R-1
2.	Age 5-14	-.67	-.51	.68	R-1
8.	% married	-.69	-.74	.11	R-2
COEFFICIENT OF CONGRUENCE			.64	-.61	

Comment:

If the definition of the Australian variables are close to the Oslo variables or the definition rather obvious from the short description used here, no more is noted. The important differences are as follows:

(1) The Oslo variables are married and unmarried women. If the complement had been used only the sign of the coefficient would change. Hence they are included in the comparison with signs changed.

(2) The Oslo variables were defined as Age 5-14 and Age 60+.

TABLE 4.7
Coefficient of correlation between variables and factors:
the Deprivation factor of Oslo and the Familism/Urbanism factor
(reflected) of the "Urban Residential Areas of Australia"

	Familism/ Urbanism –Australia	Deprivation Oslo
One-person HH	.92	.86
HH size	-.89	-.59
Married women 1)	-.88	-.73
Detached dwellings	-.88	-.40
Age 5-10	-.85	
Separated or divorced	.85	
HH with unrelated members	.85	
HH with no automobile	.84	
Small dwellings	.83	.80
Married men	-.77	
HH population in flats 4)	.76	
Age 11-15 2)	-.73	-.67
Preadolesent ratio 5)		.72
Age 65+ 2)	.68	.50
Never married 1)	.66	.69
Fertility ratio 3)	-.66	
Dwellings without toilet		.65
Women in labour force	.65	.67
Owner occupied dwellings	-.64	-.43
Private kitchen & bath	-.63	
Telephone		-.59
% male		-.56
Persons per 100 rooms	-.56	
HH with TV	-.50	
Large apartment bldg. 4)	.50	.46

(3) The Fertility ratio in Oslo was defined as children 0-4 per
     100 men (like in Helsinki) and was not found to be
     comparable.

(4) The definitions of the Australian variables are as follows:
     "% of HH population in 2 flat bldg." and "% of flat popula-
     tion in bldg. with 9 flats". The Oslo variable apartment
     house size is taken to indicate roughly the same as the
     Australian Large Apartment Buildings.

(5) The Australian variable "primary-secondary ratio" was
     defined as age 5-10 as proportion of age 5-15 and not

judged comparable.

Of the 25 variables included in table 4.7 only 11 are in any way comparable. For these 11 the coefficient of factor congruence (Harman 1967, pp. 270) can be computed to 0.98. This only confirms the striking similarities which can be observed in the table.

The factor labelled "Deprivation" in Oslo is closely related to the factors usually found and identified as Familism/Urbanism factors. The Oslo factor should perhaps have been labelled Urbanism if tradition were to be followed. But looking again at table 4.7, it is seen that one third of the variables are direct indicators of a distribution of material standards of living and the others are more or less all indicators of the distribution of (dis)advantaged groups. Rather than weaken the interpretation of the factor as indicating a state of relative deprivation the comparison seems to support it. This indicates that the traditional interpretation of the factor may have focused on the wrong aspects when familism aspects were emphasised. It is suggested here that a better label would be Affluence/Deprivation instead of Familism/Urbanism.

Returning then to the comparison of Oslo and Helsinki, one may ask why no clear Familism/Urbanism or Affluence/Deprivation factor emerges? One reason may be related to the problem raised by Sweetser (1969, pp. 45) in a comparison of Boston and Helsinki. If care is not shown in choosing the boundaries of the study area, either inner city differentiation will dominate the date (if the study area is too small) or urban-rural differentiation will dominate the data (if the study are is too wide). The Familism/Ruralism factor of the Helsinki metropolitan area suggest that the latter has happened. Presumably removing the rural fringe from the metropolitan area should have resulted in two factors, one Familism factor and one Deprivation/Affluence (or Urbanism/Familism).

Conclusions

The factorial ecology of metropolitan Oslo in 1970 revealed clearly three dimensions. Two were found to be inequality dimensions and labelled Socio-economic status and Deprivation. A third was found to be an equality dimension and labelled Familism.

A comparison of the factors in Oslo with factors found in metropolitan Helsinki in 1960 (Sweetser, 1965,a.b.,1969) showed the Socio-economic status factors to be the same. But it turned

up a problem in the interpretation of the Deprivation factor. Comparing the Deprivation factor of Oslo with the Familism/Urbanism factor of the Australian urban residental areas (Sweetser, 1982) suggested that the traditional interpretation of the Familism/Urbanism factor has overlooked its relation to distributions of material standards of living. It is suggested that a better label for this factor would be Affluence/Deprivation.

The reason for the absence of this factor in the Helsinki study is suggested to be a relative domination of rural/urban differentiation in the data used due to too inclusive definition of the study area.

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