COMPARING THE FACTORIAL
ECOLOGY OF HELSINKI AND OSLO

Erling Berge

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Abstract

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

   A comparison of the factors in Oslo with the factors found
in metropolitan Helsinki in 1960 (Sweetser 1965a,b 1969) showed
the Socio-economic status factors to be tha same. But it turned
up a problem in the interpretation of the Deprivation factor.
Comparing the Deprivation factor of Oslo with the Familism/Urban-
ism factor of the Australian urban residential areas (Sweetser 1982)
suggested that the traditional interpretation of the Familism/
Urbanism factor has overlooked its relation to distributions of ma-
terial 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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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 (Grønholm 1961, Sweetser 1965a,c,1969l,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 Tamber (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 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 neighboring 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 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 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 (no 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

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Figure 1   Small-scale map ·of   selected units in Oslo and
            Akershus.
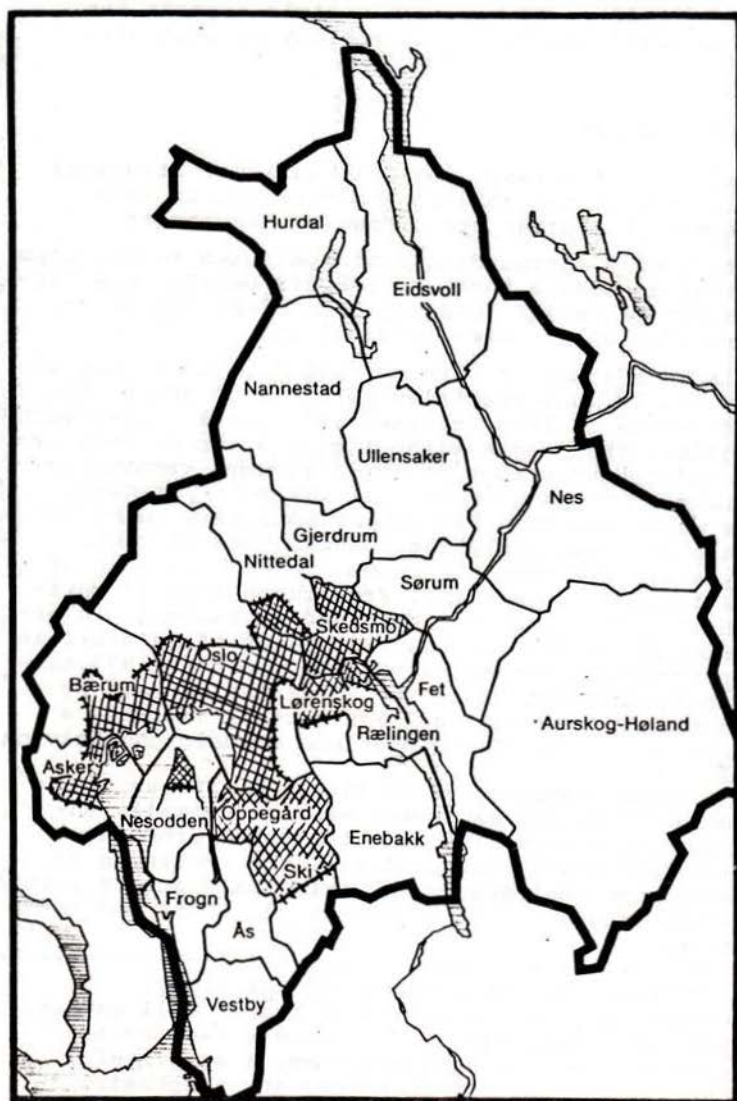
Oslo as it is de-
fined here, includ
parts of the municipali-
ties Asker, Bærum, Oslo,
Nittedal, Rælingen,
Lørenskog, Ski and Nes-
odden , and all of Skedsmo
and Oppegård.

Hurdal

Eidsvoll

Nannestad

Ullensaker

Nes

Gjerdrum

Nittedal

Sørum

Skedsmo

Oslo

Bærum

Lørenskog   Fet

Rælingen

Aurskog-Høland

Asker

Nesodden   Oppegård

Enebakk

Frogn

Ski

Ås

Vestby

──────── border of region

──────── border of munici-
          pality
++++++++ border of se-
          lected areas
          within a muni-
          cipality

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

Table. 1   Ecological Variables in   Oslo and Helsinki
(transformations in parenthesis)

OSLO VARIABLES			HELSINKI VARIABLES b)		Replic a)
No.	Name	Definition	No.	Name	Status
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.	% 20-64 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
12.	Size of houshold	Mean number of persons in families with two or more persones	13.	Mean number of persons in households 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

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 approximated.

Table 1   continued

	OSLO VARIABLES		HELSINIKI VARIABLES		Replic [a) status
No. Name	Definition		No. Name		
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 ecnomomically active (excl.those unemployed and seeking work		R-2
16. Manufacturing	% of economically active dependent on manufacturing industry ("næringskode" 11-39,51-52 b))		19. Proportion of total population economically dependent on manufacturing industry (deciles)		R-2
17. Service	% of economically active dependent on services ("næringskode" 67-69, 81-93 b))		20. Proportion of total population economically dependent on services,incl.transportation, commerce, etc. (deciles)		R-2
18. Employers	% of population being 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, 70-89 c))		22. % of economically active who are manual workers		R-1
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

a) For definitions see above.

b) Standard for næringsgrupperi[ ] i offentlig norsk statistikk. SSB håndbøk[ ] nr. 9.

c) Standard for yrkesgruppering i offentlig norsk statistikk. Nordisk yrkesk[ ]ssifisering. Arbeidsdirektoratet 1969

Table 1 continued

| OSLO VARIABLES | | HELSINKI VARIABLES b) | |
No. Name	Definition	No. Name	Replic status a)
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
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 pensioner/ ratio	Number of pensioners per 100 persons who are economically active		E

a) For definitions see above.

b) Helsinki variables no. 25 (Population density)
   no 26. (Public buildings), no. 27. (Industrial buildings) and no. 32. (Housing defect heat) could not be matched or approximated.

Table 1   continued

OSLO VARIABLES		HELSINKI VARIABLES		Replic status a)
No. Name	Definition	No. Name		
b)				
32. Agriculture	% of economically active dependent on agriculture. ("næringskode" 01-02) (square root)	18. Proportion of total population economically dependent on agriculture (deciles)		R-2
33. Trade	% of economically active dependent on trade ("næringskode" 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.

according to the varimax criterion. This gave the factor matrix
with four factors reported in tabele 2.

Factor analysis does not produce any "best" solution automati-
cally. Both the number of factors and the rotation to simple struc-
ture 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 page 31-36).

The four factors of table 2 account for 77.2 % of the variance
of the observations. The strongest factor accounts for 31.3%,the
weakest only 6.9%. Only one of the variables has communality less
than .50. That is variable 7 (Foreigners) with 0.48. A total of
26 variables have communalities above 0.60. Table 2 presents the fac-
tor loadings of the variables on the four factors along with communa-
lities 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 3 the variab-
les 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 dimen-
sions hypothesised by social area analysis (Shevky and Williams 1949,
Shevky and Bell 1955). These dimensions are now usually labeled
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.
Basicly 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 dimen-
sions, the second one equality dimensions.

The first factor is by far the strongest. It accounts for
38.3% 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 materi-
al conditions of living and the relative deprivation of the popu-
lation 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 liv-
ing conditions suggested by the factor.
The dimension of the social structure identified by this factor is
an

Tabel 2. Four Dimensions of Neighborhood Differentiation, Oslo 1970.

(Varimax Rotations of Principal Components Solution)

Variables	Repli-ca-tion Sta-tus [a]	Factor Coefficients[b] (Decimal Points Omitted)				Commu-nali-ty
No. Name		"Depri-va-tion"	Socio-Economic Status	Fami-lism	"Detach-ed dwell-ings"	
1. Age 0-4	R-1	-07	-11	(93)	13	89
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
18. Employers	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 dwell-ings	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/pen-sioner 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= "ekstra" variable.

[b] Coefficient of ±.45 or more in parentheses ().

Tabel 3   Four Ecological Factors,   Oslo 1970.
          (Decimal points omitted)

Variable	Factor Coefficient		Variable	Factor Coefficient	
No.Name[a)	+	−	No.Name	+	−
Factor I "DEPRIVATION"			**FACTOR II "SOSIOECONOMIC STATUS"**		
11.One-person families	.86		19.Blue collar		−95
24.Small dwellings	80		20.Primary educ.		−88
30.Unmarried			16.Manufacturing		−81
women	73		17.Service	77	
3.Preadoelscent			18.Employers	74	
ratio	72		21.Female higher		
8.Married		−69	educ.	73	
15.Working women	67		13.Room crowding	70	
2.Age 5-14		−67	26.Telephone	67	
27.Dwellings without			7.Foreigners	65	
toilet	65				
12.Size of house-					
hold		−59			
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.Detached dwell-		
4.Young middle			ings	81	
age	89		14.Home ownership	77	
9.Fertility ratio	78		22.Apartment house		
25.New housing	78		size		−74
29.Ec. active			28.Sanitary stand-		
mothers	72		ard	70	
5.Age 60+		−68			
2.Age 5-14	57				
12.Size of house-					
hold	56				
31.Ec. active					
pensioner ratio		−54			

a) For further definitions see table 1.

inequality dimension identifying the relative strength of a "have not" position, and, by logical implication, the "have" 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", "selfemployed 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 w' ' h 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 "porportion 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 hierarchical 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% 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 strenght 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 2-4 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. Socioeconomic status is relatively highest in the western parts of the city and familism strongest on the north-eastern 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 ough 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 apperance 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 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 is taken from table 14 in

Figure 2
Geographical location of various neighborhood types.
(mean of factor scores).
FACTOR I "Deprivation". Oslo.
Dark shadings = high values.
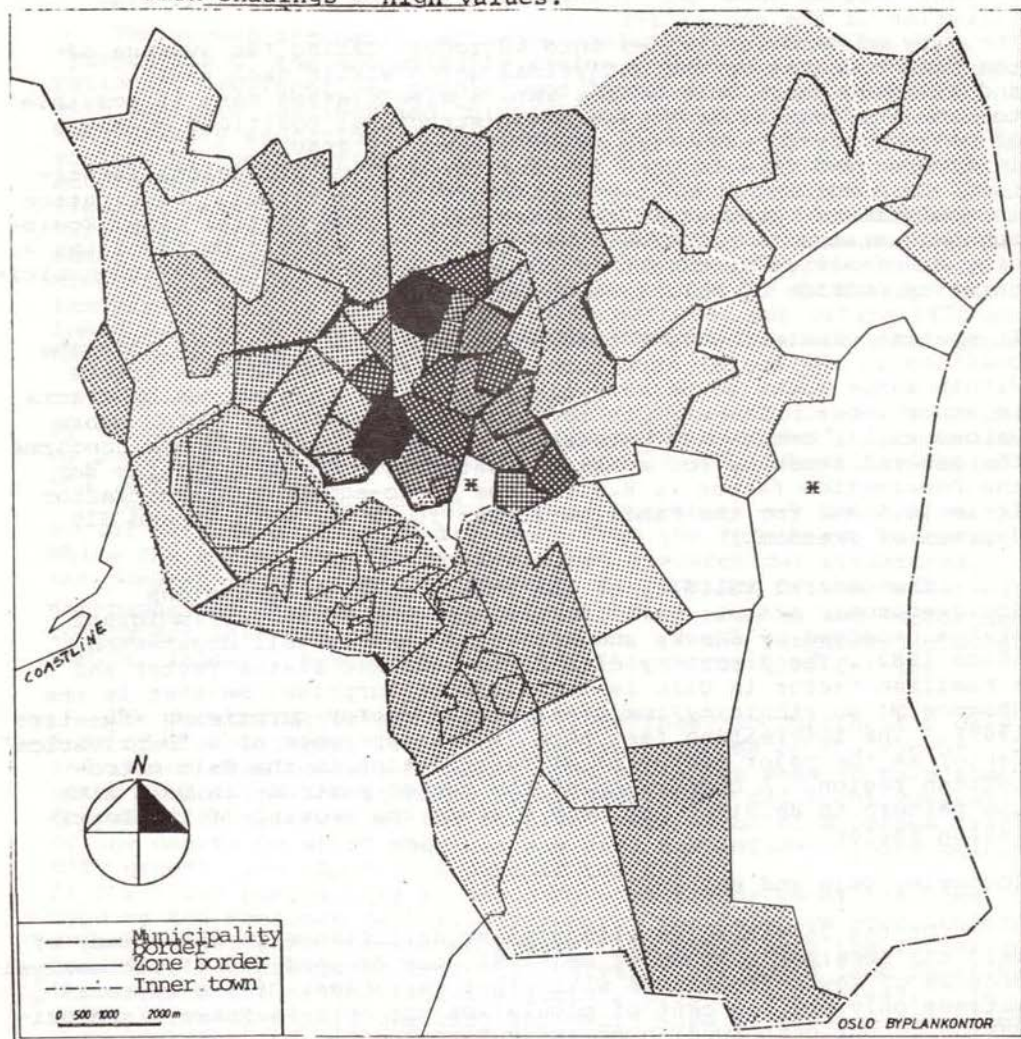
* Excluded from the analysis.

Figure 3

Geographical location of various   neighborhood types
(mean of factor scores).

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

Dark shadings = high values

Municipality border
Zone border
Inner town

0 500 1000   2000m

OSLO BYPLANKONTOR

* Excluded from the analysis.

Figure 4
Geographical location of various neighborhood
types (mean of factor scores).
Factor III "Familism" . Oslo.
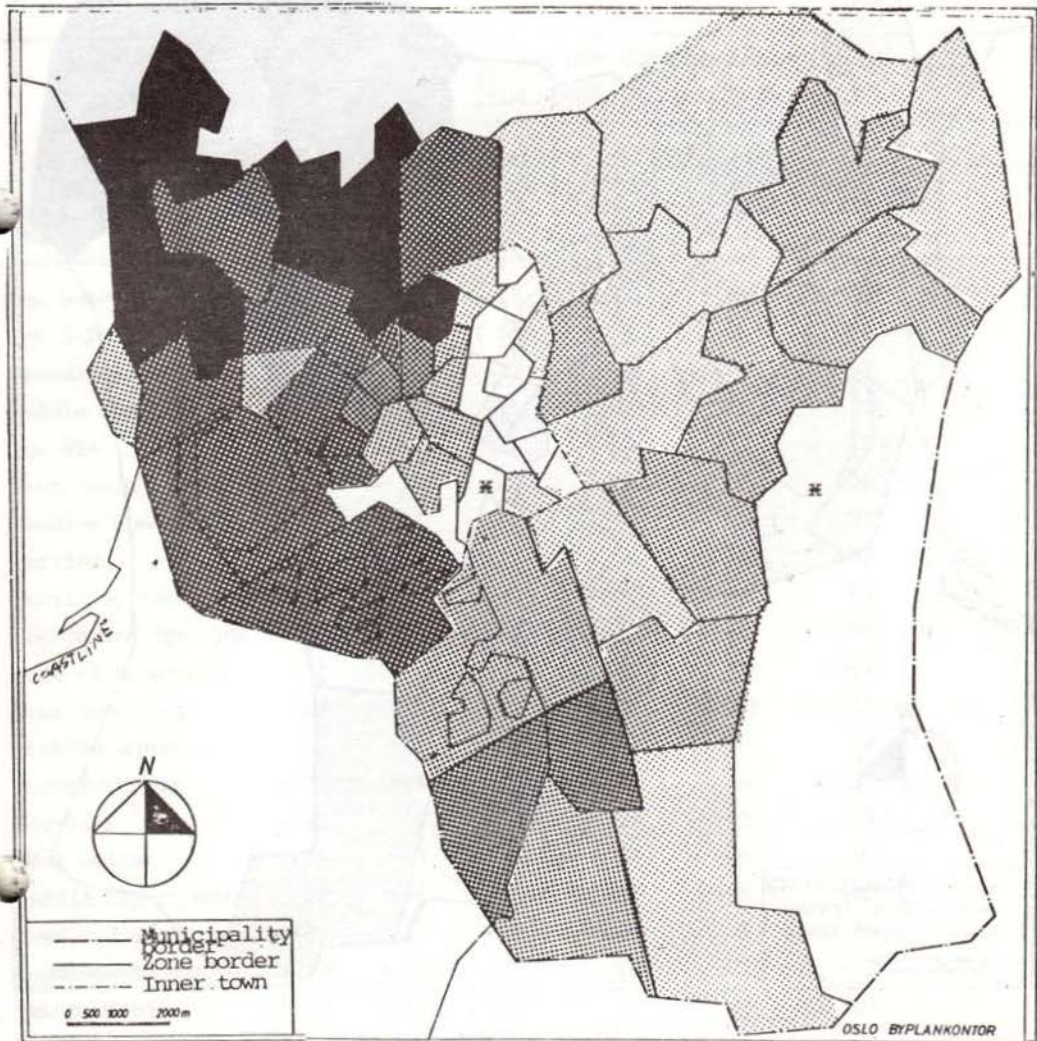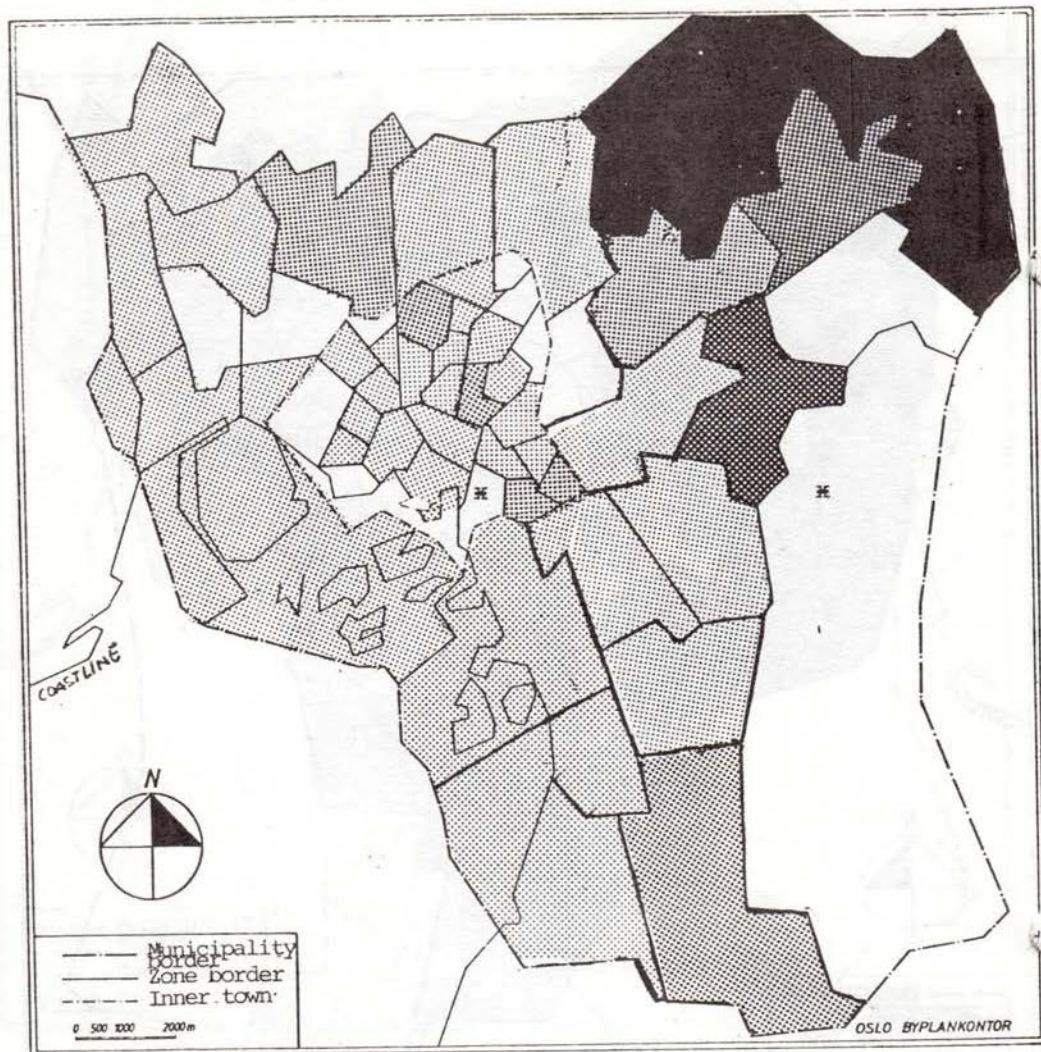Dark shadings = high values.

* Excluded from the analysis.

Tabel 4   Six Dimensions of Neighborhood differentiation,
            Helsinki Region 1960. Factor Coefficients of
            21 Variables replicated in   Oslo.[a]
            (Varimax rotations of Principle Components Solution.)

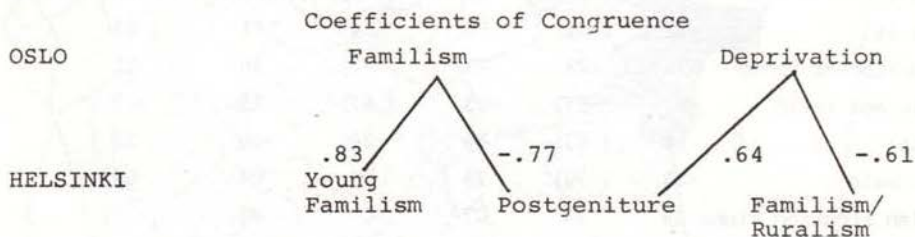| Variables	Factor Coefficients (Decimal Points Omitted)					
No. Name	Socio-Econo-mic Status	Post-geni-ture	Famil-ism Rural-ism	Young Famil-ism	Resi-denti-alism	Swedisn Langu-age
1. Age 0-4	-27	(-50)	17	(75)	23	-02
2. Age 5-14	-12	(-51)	(68)	24	01	-20
3. Preadolescent ratio	-26	-28	-27	(72)	29	11
4. 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.

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 table 2 and 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 5. In table 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 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 langua".

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

<div align="center">Coefficients of Congruence</div>

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 Depri-
vation 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.

To aid the reinterpretation it will be compared to the
reflected Familism/Urbanism factor of the "Urban Residental 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 7.

Tabel 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		
	Depri-vation	Socio-Economic Status	Famil-ism
Socio-Economic Status	-.02	(.83)	-.11
Post-geniture	(.64)	.12	(-.77)
Familism-Ruralism	(-.61)	-.04	.37
Young Familism	-.11	-.13	(.83)
Residen-tialism	-.48	.01	.48
Swedish Language	.04	.17	-.21

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

Tabel 6   Comparison of factor loadings from similar
           factors in Helsinki and   Oslo.

Variable				Replic.
No Name		Oslo	Helsinki	status

SOCIO-ECONOMIC STATUS

	Oslo	Helsinki	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

FAMILISM

	Oslo	Post gen.	Young Fam.	
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

Tabel 6
continued

Variable		Oslo	Helsinki		Replic.
No	Name				status

			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	

Table 7   Coefficient of correlation between variables and factors:
the Deprivation factor of Oslo and the Familisn/Urbanism
factor (reflected) of the "Urban Residental Areas of
Australia".

	Familisn/ 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 automobil	.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

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+.

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 population in bldg. with 9 flats". The
   Oslo variable apartment house size is taken to indi-
   cate roughly the same as the Australian Large Apart-
   ment 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 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 labeled "Deprivation" in Oslo is closely related to
the factors usually found and identified as Familism/Urbanism factors.
The Oslo factor should perhaps have been labeled Urbanism if tradi-
tion were to be followed. But looking again at tabel 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 rela-
tive 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 differentitation will dominate the data (if the study area is
too small) or urban-rural differentiation will dominate the data
(if the study area 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 resultated in two factors, one Familism factor and one
Deprivation/Affluence (or Urbanism/Familism).

Conclusion.

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

A comparison of the factors in Oslo with the 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 standa of living. It is suggested that a better label for this factor would be Affluence/Deprivation.

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

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