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**CULTURAL INDICATORS AND THE DEMAND FOR PRODUCTS
BASED ON RURAL RESOURCES**

Abstract:

In MMI's biannual survey "Norwegian Monitor" from 1991 the question:

"If you had to wait for an hour to get onto the ferry somewhere in rural Norway where would you spend the time: a) at the local art gallery, b) at a café or restaurant, c) in the shopping center, or d) in the local art shop ("husfliden"). Of the 2948 persons answering, 13% chose to spend the hour at the local art gallery, 44% chose to spend it at a café or restaurant, 23% chose the shopping center, and 18% chose the local art shop.

The alternatives of the forced choice were designed to indicate products of four types a local community may offer. The products may be either movable or immovable, and they may be either mass-products or signature products. The local art gallery is taken to symbolize the immovable signature product. You can only take along your experience of it. The café is taken to indicate the immovable mass-product. One café is much like another no matter where it is. The shopping center is taken to indicate preference for the movable mass products and similarly the local art shop is taken to indicate preferences for the movable signature products.

Interestingly, the people indicating they would choose the local art gallery also are characterized by modern and idealistic values, while those preferring the local art shop were characterized by traditional and idealistic values. The majority chose to go to the café and they were mildly characterized by modern and materialistic values, while those preferring the shopping center were more traditional and materialistic.

The paper examines two ways of explaining this choice: 1) a values explanation using the value indices going into the map of values from the Norwegian Monitor (MMI 1992b), and 2) a structural position explanation using age, sex, urbanization, etc. as explanatory variables. The impact of the variables is estimated through a multinomial logit model. Also a model where the two types of variables are pooled is estimated. In terms of explained variance there is considerable room for improvement in the models.

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**CULTURAL INDICATORS AND THE DEMAND FOR PRODUCTS
BASED ON RURAL RESOURCES**

The quality of life in rural society depends on the number of people living there and the speed of changes in this number. For a long time rural society in Norway has been changing through a process of thinning. Most of the settled areas have experienced a declining population (with concomitant problems of decline and thinning) while a few central locations have seen an increasing population (with concomitant problems of growth and crowding). The number of people in rural society is partly a function of the number of children in each family and partly a consequence of the number of jobs generating sufficient income for a household. Increasingly Norwegian households need more than one job (1.5-2 jobs) to provide the culturally prescribed standard of living. With the declining number of persons in each household one have seen the last 30-50 years, rural society needs to more than double the number of jobs just to keep the population constant. Since there is no legitimacy for a public policy trying to affect the number of children in a household, the number of jobs is left as the prime target for policies trying to affect the quality of life in rural society through keeping up the number of people living there.

One direct way to affect the number of people in rural society is to facilitate the creation of new jobs. To create jobs outside of public service has proved difficult for public authorities. Despite a continuous effort for several decades, the evidence for more than a marginal impact is not strong. Therefore it is important to understand what the problems consist of and if possible to improve the performance of the policy measures.

To generate income, a job, even in rural Norway, has to produce “something” someone is willing to pay for¹. Looking for customers outside the local population, the urban population is obviously a much larger market than the rural population. For policy makers it is interesting to investigate what kind of products from rural Norway the urban population might be interested in. For producers located in rural society it is interesting to investigate what kind of people are interested in their products and the prospects for growth in their number.

In the present paper I will try to investigate a bit of both these questions.

¹ In sociology the study of consumers and their behavior is a fairly new theme (Otnes 1988). In economics it has a long history (Deaton and Muellbauer 1980). But even so, investment in consumer products is more art than science, even if structural characteristics of the social system condition which new products will have success (P.M. Hirsch 1972).

PRODUCTS

The number of different products is too large to be used directly in an investigation of preferences for the various kinds of products. A classification of products is needed. I have argued elsewhere (Berge 1989, 1990) that a fourfold classification based on whether a good is alienable or inalienable on the one hand and on the other whether there is rivalry or non-rivalry in consumption of the good, is theoretically interesting in terms both of the motivations for acquisition and the processes of consumption. The fourfold classification generates the four types of goods labeled private, club, positional and public goods (see also Cornes and Sandler (1986) and F. Hirsch ([1976] 1978).

TABLE 1 TYPE OF GOODS AVAILABLE FOR CONSUMERS

		The good is	
		- Alienable	- inalienable
Consumption	- Rivalry	private	positional
	- Non-rivalry	club	public

The characteristics alienable/ inalienable and rivalry/ non-rivalry in consumption are, however too “abstract” to be of any help in a particular investigation. If we look at the products from the point of view of the rural producer, the distinction alienable/ inalienable corresponds to whether the customer can take the product away in order to consume it somewhere else or if the customer has to consume the product on the spot. In other words the interesting aspect is whether the product is movable or land locked. If we look at the product from the point of view of the consumer the interesting aspect of the rivalry/ non-rivalry distinction in this situation might be whether the product is unique for this producer or whether an indistinguishable and as good product can be obtained elsewhere. In other words, does the product carry a signature or is it just another mass product of standard quality? Table 2 gives some examples of products of the four types.

**TABLE 2 CLASSIFICATIONS OF PRODUCTS FROM RURAL
NORWAY**

	PRODUCT IS	
	-MOVABLE	-LAND LOCKED
PRODUCT WITH -A UNIQUE QUALITY (SIGNATURE PRODUCTS)	art and handicraft education	landscape local culture
PRODUCT WITH -STANDARD QUALITY (MASS PRODUCTS)	industrial products agricultural products	tourist service public transport

This classification of products is interesting because strategies of acquisition and management of portfolios of the various types of goods are very different. Emphasis on one or the other of the types is presumed to correspond to emphasis on different types of values.

At the outset one would presume a preference for signature goods would correspond to values like status and competition for position in a hierarchy of distinctions (Bourdieu [1979] 1984) while preferences for the standard quality products corresponded to the more ordinary frugality and equality values. Likewise one might presume that preferences for the land locked products would correspond to values like hedonism and a taste for new experiences while preference for the movable products might indicate more traditional values like forethought and investment.

To test this rather vague idea a question was formulated with the intent of forcing the respondent to reveal interest for one of the four types of products. To reveal the preference, rather than invoking the budget constraint, the question was formulated as having to do with spending an hour of otherwise wasted time: the hour or so they occasionally have to spend waiting for a ferry. A visit to the local art gallery was presumed to indicate interest in land locked signature products, choosing the local arts and handicraft shop was taken to represent interest in movable signature products, using time to visit the shopping center indicated preferences mostly for movable mass products and going to the local restaurant indicated interest in land locked mass products.

Table 2 shows that 44% chose the café, 23% chose the shopping center, 18% the local arts and handicraft shop, and 13% the local art gallery. The question to be studied is what kind of differences there exist between people choosing the different types of value and whether the people choosing the different types of products also have different values.

TABLE 2 PREFERRED USE OF TIME IN RURAL NORWAY*

One hour waiting for ferry would be used for the

Local art gallery	13.1%
Local arts and handicraft shop	17.5%
Shopping center	22.8%
Café or restaurant	<u>44.4%</u>
Sum	97.8%
N	2948

* Source: MMI (1992b), Norwegian Monitor, 1991-92. Answers to the question 290, page 29 in questionnaire 2: "If you were traveling in rural Norway and had to wait one hour for the ferry, which of the following places would you prefer to visit?"

VALUES

The question was asked in a large bi-annual survey called "Norwegian Monitor" (MMI 1992a). This survey maps in detail the values and attitudes of the Norwegian population. Out of some 200 questions about opinions and attitudes in the 1991 survey 49 indexes were constructed. The choice of questions to go into an index is based partly on empirical correlation, partly on substantive evaluation of the meaning of their common underlying theme. The common underlying theme is indicated by the name put on the indexes. Eighteen of the 49 indexes are bi-polar. Both the high score and the low score represent meaningful values. The data thus reveals 67 different values. The 49 indexes summarize a lot of information, but are still too numerous to present a meaningful picture of the various clusters of values in different subgroups of a population.

To map out the various clusters of values and attitudes, the 49 value-indexes are dichotomized or trichotomized (the bi-polar indexes). The 25% of the sample scoring highest on an index is given the code 1 and are said to have the value, the rest do not have the value (score 0). For the bi-polar indexes the same is done for the 25% scoring lowest. For each person in the sample this gives 67 variables where a "1" indicates that the person has a certain value and a "0"

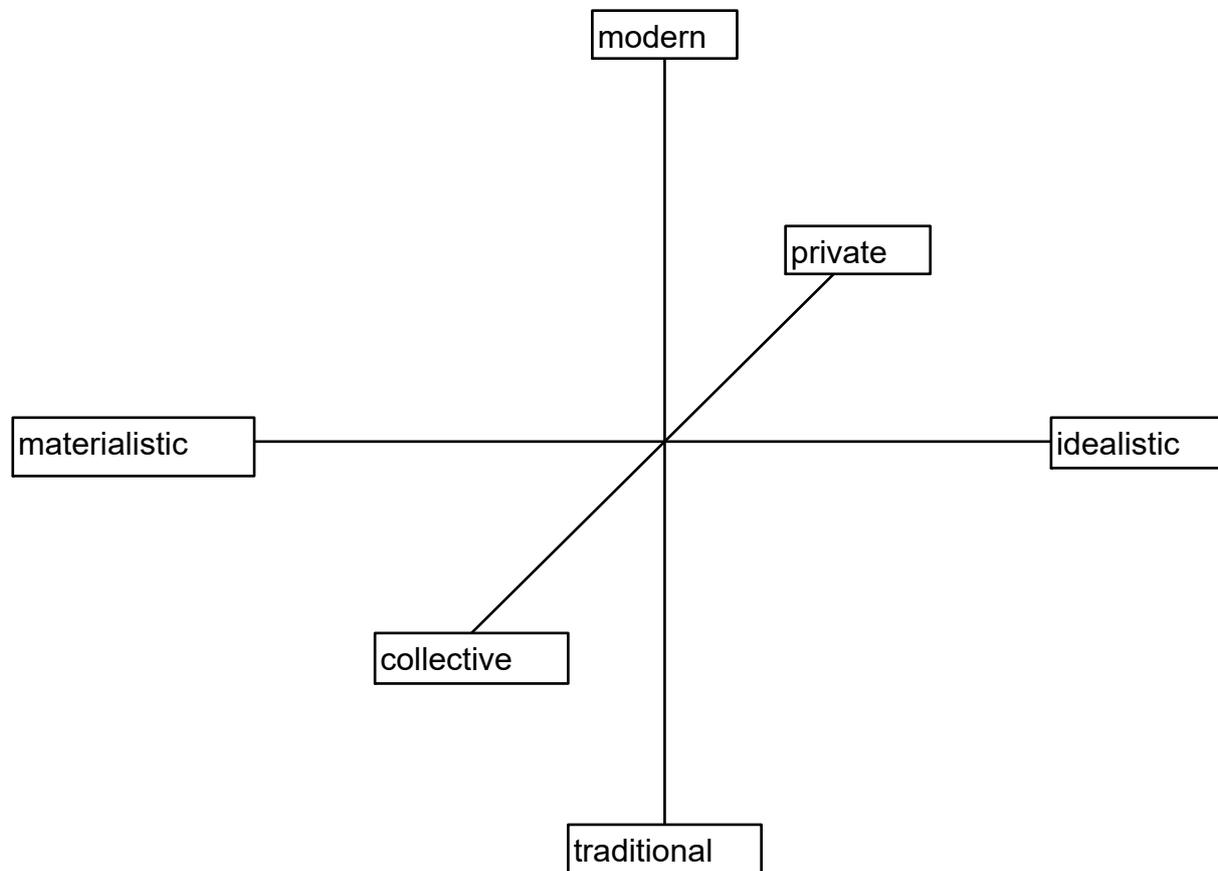
indicates that the person does not have the value. This value-profile is the point of departure for the construction of a map of the values of the population.

The correlation between two value profiles is also a measure of the distance between the value systems of the two persons. Each of the 2948 persons of the sample can thus be mapped into a unique position in a $(2948 \times 2947)/2$ -dimensional space giving a true picture of the relative distances among them. In a 4.343.878-dimensional map, however, it is not particularly handy to grasp how various values go together. Persons with similar value profiles will be located together in this space. If some have approximately reversed value profiles they will be located at the opposite side of the space and together the two groups can be seen to be located along a common axis which may be used as an approximation in the description of the location of their value profiles. Hence, by grouping together similar profiles one may reduce the number of dimensions needed to map the interrelations of the value profiles. If, in fact, values cluster in persons, the reduction of the number of dimensions will not reduce the information content of the data. Instead it will make them more accessible for interpretation.

In the study of the first "Norwegian monitor" in 1985, MMI found three important dimensions in the data. The clustering of values indicated that the most important dimension was one differentiating between change oriented, modern values and stability oriented, traditional values. The second most important dimension differentiated between materialistic values and idealistic values. The third most important dimension was primarily a right-left political dimension and differentiated between private/ bourgeois values and collective/ socialist values.

FIGURE 1
THREE DIMENSIONS OF NORWEGIAN CULTURE

Source: Norwegian Monitor, MMI (1992a, 24)²



The research group at MMI found little connection between socio-political values and the individual and humanitarian values of the other two dimensions. In connection with market research the two main dimensions have proved most useful. The map of Norwegian values thus usually is presented in two dimensions, convenient for easy comprehension.

The values used to define the map of values in 1985 were used also in 1987, 89, and 91. But both in 87, 89 and 91 new values were added to the list of values. These values were not actively used in the definition of the map of values for these years. They were called passive values and put onto the map after it had been defined by the original, active, values. According to MMI the passive values tend to regress toward the common origo of the values (they are now

² In MMI (1992b) and MMI (1992a) the axis that here is called collective-private is labelled radical-conservative.

closer to the origo than if they had been part in the definition of the dimensions). This must be kept in mind in the interpretation of the map of values.

After having identified the dimensions of value systems as described each value is put onto the map by computing the mean location of the 25% of the sample which by definition has the value.

Figure 2 present the map of values in 1991.

VALUES OF PEOPLE CHOOSING DIFFERENT TYPES OF PRODUCTS FROM RURAL NORWAY

The technique used to put each value onto the map of values, can also be used to compute the location of any suitably defined group of persons. In figure 3 the four groups defined by their choice of place to visit while “wasting” an hour in rural Norway, is located in the map of values.

From this figure it is apparent that the people indicating they would prefer to visit the local art gallery are characterized by modern and idealistic values like an emphasis on self-realization and community. Those indicating a preference for the local arts and handicraft shop are characterized by idealistic and traditional values like family and modesty. Those wanting to visit the local shopping center are characterized by traditional and materialistic values like lack of ambition and reason. And those choosing to spend time at the local restaurant are characterized by materialistic and modern values like appearance and gambling. The four groups of people are located in the map of values exactly as expected. This would seem to confirm that the various types of products do relate to different value systems.

But how do different groups of people choose? We are in particular interested in the choices of urban people, but shall also differentiate between men and women, and young (up to 30 years) and old (over 30 years).

Figure 4 differentiates between people living in towns and people living outside of towns. Urban people have consistently more modern values than those living outside the towns, and approximately the same location as non-urban people in the materialistic-idealistic dimension. The exception to this is those choosing to visit the local arts and handicraft shop. Here the urban dwellers are also more idealistic than those living outside the towns.

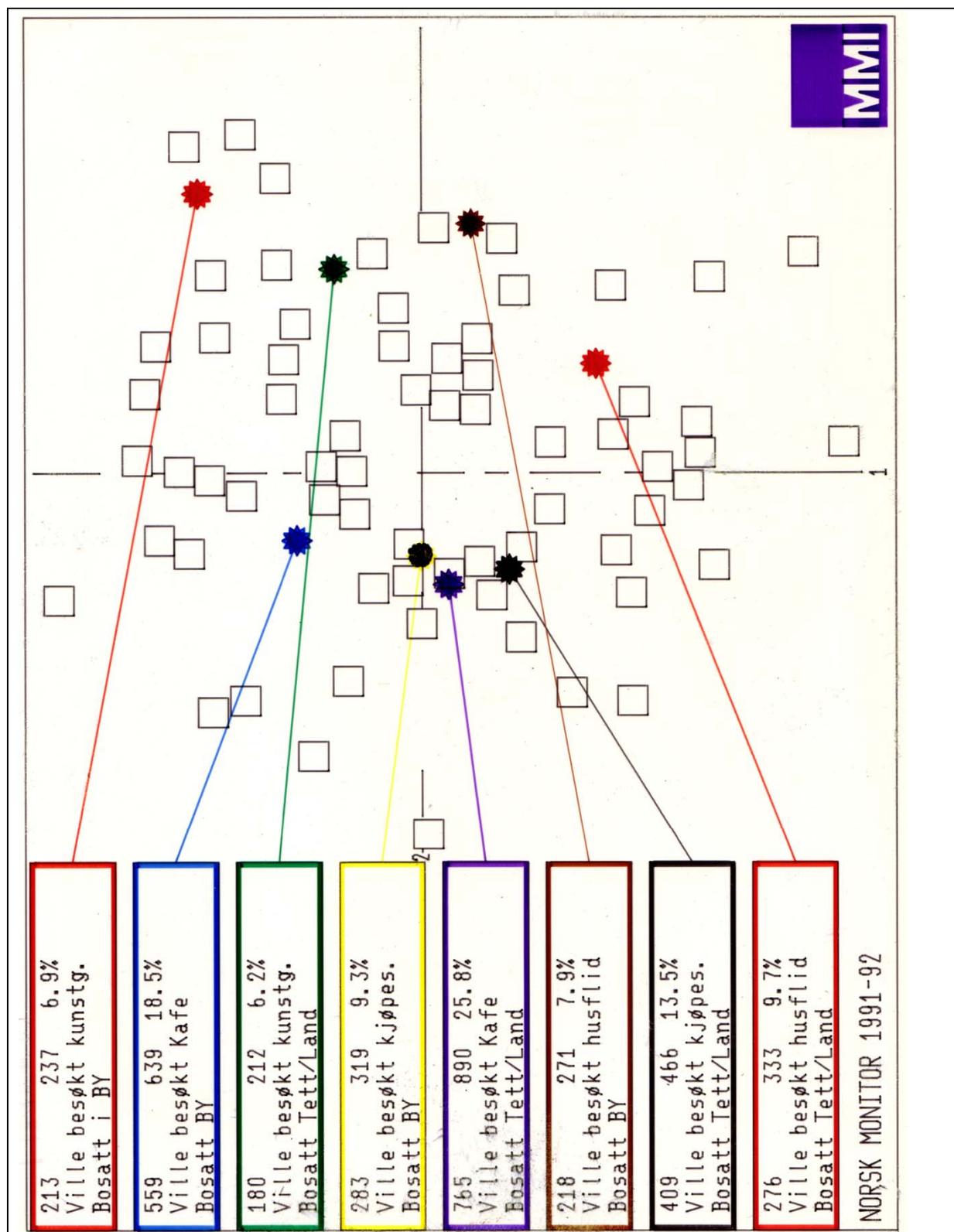
If one in addition to urban/ non-urban living differentiates between men and women, we find that the groups of men consistently are more materialistic and modern, while women are more idealistic and traditional. The exception is women living in non-urban areas and choosing to visit the local art gallery. They are more modern than men living in non-urban areas and choosing to visit the art gallery.

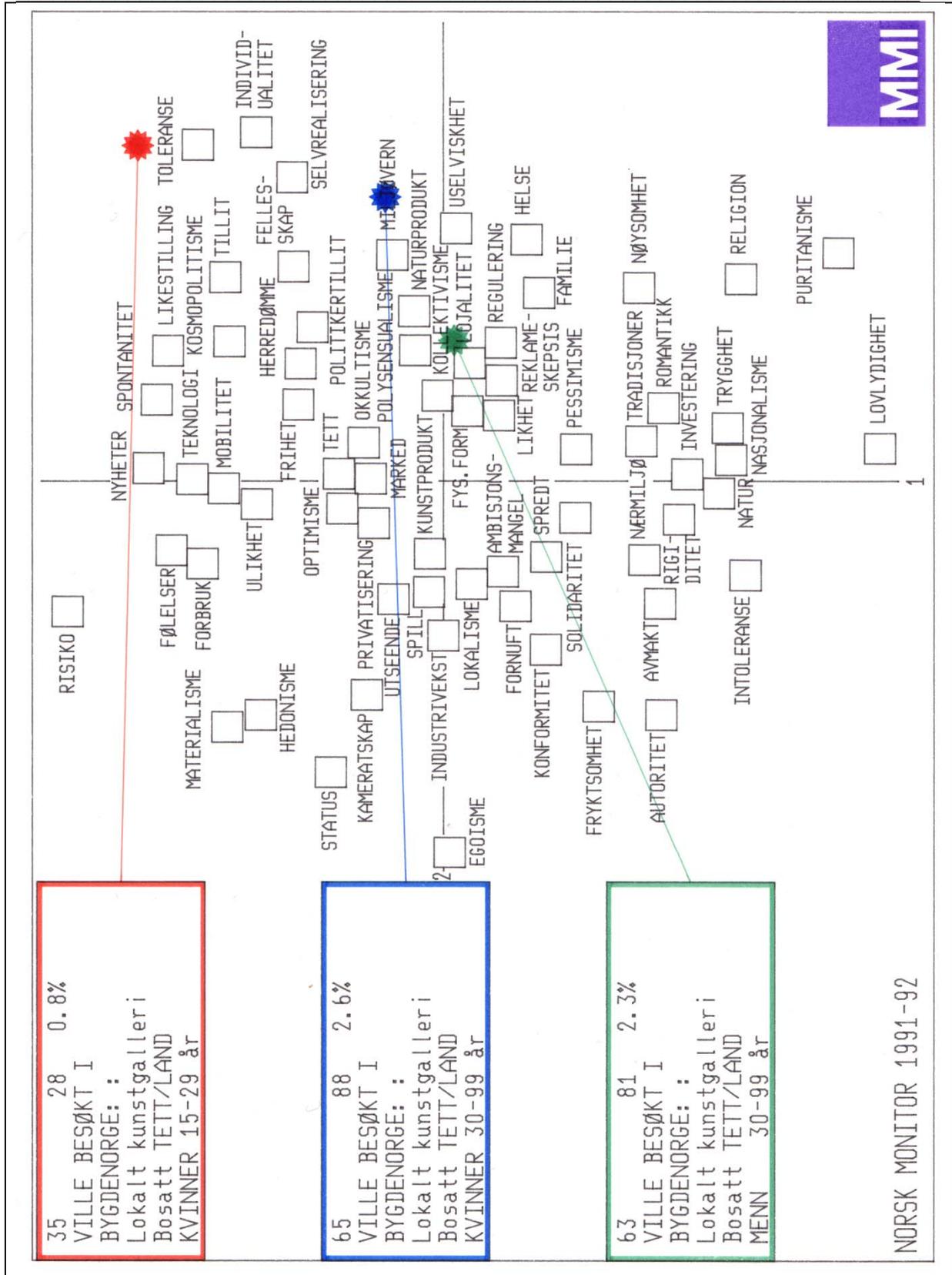
Introducing age as a third variable and distinguishing between those under 30 years and those 30 or above, make the picture more complicated. There are not enough young men either from urban or non-urban areas that choose to visit the local arts and handicraft shop to locate them in the map of values. Neither are there enough young men from non-urban areas who choose the local art gallery. For the rest of the groups we find that there are large differences along the modern-traditional axis both for men and women regardless of whether they are from urban or non-urban areas. But the differences are consistently larger for women than for men. Figure 5 shows the location of values of the 7 groups in two maps (1 is missing: young men from non-urban areas were too few) among those who chose the local art gallery.

Of the three variables, age means more than sex, and sex means more than living in an urban or rural community. Age and urban/ non-urban living differentiates along the modern-traditional axis, and sex along the materialistic-idealistic axis. The large differences between age groups, the gender differences and the urban-rural differences indicates that if different values in fact are the explanation behind the choice of product type, then the value systems of these groups must be remarkably different. A second or alternative explanation could be that different structural position within the society entails different interest with an impact on the choice of product type.

FIGURE 4
MEAN LOCATION WITHIN THE MAP OF VALUES OF URBAN (BY)
AND NON-URBAN PERSONS (TETT/LAND) CHOOSING FOUR
ALTERNATIVES OF SPENDING ONE HOUR VACANT TIME

Source: Norwegian Monitor, MMI 1991





DO VALUES EXPLAIN THE CHOICES OF TYPE OF PRODUCT?

To test the explanatory power of the values identified in these data, a multinomial logit model were estimated (see Aldrich and Nelson (1984)).

In this model the choice of individual i can be one of four possibilities,

$$Y_i = \begin{cases} 1 & \text{if the individual choose the local art gallery,} \\ 2 & \text{if the individual choose the local arts and handicraft shop} \\ 3 & \text{if the individual choose the shopping center, or} \\ 4 & \text{if the individual choose the café or restaurant,} \end{cases}$$

Then it is assumed that

$$(1) \quad Z_{ij} = \log [\Pr(Y_i=j)/\Pr(Y_i=4)] = \sum_k b_{jk} X_{ik},$$

for $j=1,2, \text{ and } 3$, and $k=1,2,3,\dots,49$

This means that the logarithm of the odds for finding $Y_i=j$ relative to finding $Y_i=4$ is supposed to be a linear function of the $K=49$ value indices X_{ik} , with the choice Y_i determined by the K coefficients b_{jk} , different for each choice j .

From (1) it will be seen that

$$(2) \quad \Pr(Y_i=j) = [\exp(Z_{ij})/\Pr(Y_i=4)] \quad \text{for } j=1,2, \text{ and } 3.$$

Since $\sum_j \Pr(Y_i=j) = 1$, for $j=1,2,3,4$, it follows that

$$(3) \quad \Pr(Y_i=4) = 1/[1 + \sum_j \exp(Z_{ij})], \quad j=1,2,3, \text{ and hence}$$

$$(4) \quad \Pr(Y_i=j) = \exp(Z_{ij})/[1 + \sum_j \exp(Z_{ij})], \quad j=1,2,3.$$

Not all 49 values are expected to contribute to explanation of the choice, Y_i . The first step was to estimate a model containing all the 49 value indices and exclude all indices which through a chi-square test with a .05 significance level did not contribute to the explanation. Then the model was re-estimated with the following 21 value indices explaining a total of 10.6% of the variance in the data.

Effect Test

Value-index	Nparm	DF	Wald ChiSquare	Prob>ChiSq
HEALTH	3	3	31.397452	0.0000
SELF-REALIZATION	3	3	39.818579	0.0000
MATERIALISM	3	3	16.629253	0.0008
NATURE	3	3	10.874863	0.0124
RELIGION	3	3	10.516070	0.0147
POLY-SENSUALISM	3	3	21.462011	0.0001
RISK/SECURITY	3	3	14.098709	0.0028
LACK OF AMBITION	3	3	14.325664	0.0025
STATUS	3	3	13.131089	0.0044
INDIVIDUALITY/ CONFORMITY	3	3	31.577097	0.0000
LAW-ABIDINGNESS	3	3	7.914855	0.0478
POWERLESSNESS/ DOMINATION	3	3	18.141323	0.0004
AUTHORITY	3	3	11.517149	0.0092
NATIONALISM	3	3	16.804267	0.0008
REGULATION/ MARKET	3	3	8.539943	0.0361
TECHNOLOGY	3	3	8.251280	0.0411
ADVERTISING SCEPTISISM	3	3	22.100480	0.0001
COSMOPOLITANISM/ LOCALISM	3	3	16.451410	0.0009
COMRADSHIP	3	3	12.043371	0.0072
GAMBLING	3	3	17.918374	0.0005
LOYALTY	3	3	9.311359	0.0254

To determine the impact of these values on each particular choice ($Y_i=j$, $j=1,2,3$)³, we look at the regression coefficients, b_{jk} , $k=1,2,3,\dots,21$, for each category j .

For $Y_i=1$ we find 9 value-indices with coefficients different from 0 at the .05-level.

³ If we can determine the choice of either category 1, 2 or 3, the fourth category must by default be those not choosing category 1, 2, or 3.

Parameter Estimates				
Term ⁴	Estimate	Std Error	ChiSquare	Prob>ChiSq
Intercept				
HEALTH	0.11559621	0.0324965	12.65	0.0004
SELF-REALIZATION	0.10980911	0.0212419	26.72	0.0000
MATERIALISM	-0.0690091	0.0237284	8.46	0.0036
NATURE				
RELIGION				
POLY-SENSUALISM	0.09852069	0.0275026	12.83	0.0003
RISK/ SECURITY				
LACK OF AMBITION	-0.0912057	0.0291402	9.80	0.0017
STATUS				
INDIVIDUALITY/ CONFORMITY	-0.1230637	0.023074	28.45	0.0000
LAW-ABIDINGNESS				
POWERLESSNESS/ DOMINATION	0.08612531	0.0221691	15.09	0.0001
AUTHORITY				
NATIONALISM				
REGULATION/ MARKET				
TECHNOLOGY				
ADVERTISING SCEPTISISM				
COSMOPOLITANISM/ LOCALISM	-0.0916895	0.0278849	10.81	0.0010
COMRADSHIP				
GAMBLING	-0.1031052	0.0250982	16.88	0.0000
LOYALTY				

Rearranging the variables with significant impact on the choice of going to the local arts gallery we find:

Value-index	b_1
HEALTH	0.115
SELF-REALIZATION	0.109
POLY-SENSUALISM	0.098
POWERLESSNESS/ DOMINATION	0.086
MATERIALISM	-0.069
LACK OF AMBITION	-0.091
COSMOPOLITANISM/ LOCALISM	-0.091
GAMBLING	-0.103
INDIVIDUALITY/ CONFORMITY	-0.123

This means that high scores on the values health, self-realization, poly-sensualism, and domination increases the probability of saying you want to go to the local art gallery, while high scores on the values materialism, lack of ambition, localism, gambling, and conformity decreases the probability of so doing.

⁴ Note that for to poled indices, the high score of the index is named last.

Looking back at figure 3 we see that the values increasing the probability lie roughly between the idealistic and modern axes while the values decreasing the probability lie between the materialistic and traditional axes.

For $Y_i=2$ we find 11 values with coefficients different from 0 at the 0.05 level.

Term	Parameter Estimates			
	Estimate	StdError	ChiSquare	Prob>ChiSq
Intercept	-2.5638791	0.7344284	12.19	0.0005
HEALTH	0.14717775	0.0285151	26.64	0.0000
SELF-REALIZATION	0.05109022	0.0187707	7.41	0.0065
MATERIALISM	-0.0738271	0.021312	12.00	0.0005
NATURE				
RELIGION				
POLY-SENSUALISM	0.09055683	0.0243805	13.80	0.0002
RISK/ SECURITY	0.06472474	0.0175458	13.61	0.0002
LACK OF AMBITION	-0.0710478	0.0254175	7.81	0.0052
STATUS	-0.0759719	0.0248685	9.33	0.0023
INDIVIDUALITY/CONFORMITY	-0.0456546	0.0200549	5.18	0.0228
LAW-ABIDINGNESS	0.07818596	0.0287934	7.37	0.0066
POWERLESSNESS/DOMINATION				
AUTHORITY				
NATIONALISM	0.09195503	0.0233192	15.55	0.0001
REGULATION/MARKET				
TECHNOLOGY				
ADVERTISING SCEPTISISM				
COSMOPOLITANISM/ LOCALISM	-0.0681087	0.0243345	7.83	0.0051
COMRADSHIP				
GAMBLING				
LOYALTY				

Rearranging the variables with significant impact on the choice of going to the local at arts and handicraft shop we find:

Value	b_2
HEALTH	0.147
NATIONALISM	0.091
POLY-SENSUALISM	0.090
LAW-ABIDINGNESS	0.078
RISK/ SECURITY	0.064
SELF-REALIZATION	0.051
INDIVIDUALITY/CONFORMITY	-0.045
COSMOPOLITANISM/ LOCALISM	-0.068
LACK OF AMBITION	-0.071
MATERIALISM	-0.073
STATUS	-0.075

This means that high scores on the values health, nationalism, poly-sensualism, law-abidingness, security, and self-realization increases the probability of choosing to go to the local arts and handicraft shop, while high scores on the values conformity, localism, lack of ambition, materialism, and status decreases the probability of going there.

Looking back at figure 3 we see that the values increasing the probability lie roughly between the idealistic and traditional axes while the values decreasing the probability lie between the materialistic and idealistic axes.

For $Y_i=3$ we find 8 values with coefficients significantly different from 0.

Parameter Estimates				
Term	Estimate	StdError	ChiSquare	Prob>ChiSq
Intercept				
HEALTH				
SELF-REALIZATION				
MATERIALISM				
NATURE	-0.0385392	0.0168680	5.22	0.0223
RELIGION	0.0347451	0.0107255	10.49	0.0012
POLY-SENSUALISM				
RISK/SECURITY				
LACK OF AMBITION				
STATUS				
INDIVIDUALITY/ CONFORMITY				
LAW-ABIDINGNESS				
POWERLESSNESS/ DOMINATION				
AUTHORITY	0.0299388	0.0125100	5.73	0.0167
NATIONALISM				
REGULATION/ MARKET	-0.0547693	0.0204291	7.19	0.0073
TECHNOLOGY	-0.0484078	0.0197521	6.01	0.0143
ADVERTISING SCEPTISISM	-0.0749097	0.0160638	21.75	0.0000
COSMOPOLITANISM/ LOCALISM				
COMRADSHIP	0.0705848	0.0269548	6.86	0.0088
GAMBLING				
LOYALTY	-0.0564069	0.0270830	4.34	0.0373

Rearranging the variables with significant impact on the choice of going to the local shopping center we find:

Value	b_3
COMRADSHIP	0.070
RELIGION	0.034
AUTHORITY	0.029
NATURE	-0.038
TECHNOLOGY	-0.048
REGULATION/ MARKET	-0.054
LOYALTY	-0.056
ADVERTISING SCEPTISISM	-0.074

This means that high scores on the values comradeship, religion, and authority increases the probability of going to the shopping center, while high scores on the values nature, technology, market, loyalty, and advertising skepticism decreases the probability.

Looking back at figure 3 we see that the values increasing the probability lie roughly between the materialistic and traditional axes while the values decreasing the probability lie along the traditional-modern axes from nature to technology.

From equation (3) above we see that all values decreasing the probability of choosing the local art gallery, the local arts and handicraft shop or the shopping center, will increase the probability of choosing the café. Looking back at figure 3 we see that these values lie along the traditional-modern axis on both sides of the materialistic axis.

CAN POSITION IN SOCIAL STRUCTURE EXPLAIN THE CHOICE OF PRODUCT TYPE?

Structural position in society imparts the persons with particular interests and indicates possibilities for certain lifestyles. Structural position is usually easier to observe than values and preferences. It will be interesting to see if one can predict choice of product type as well from information of structural position as from information about values.

Above it was shown that age, sex and urban or non-urban living affected the choice of product type. But also the type of household (large or small) a person lives in, the total income of the household, the personal income, the education, the industry, and whether a person works full time or part time are related to lifestyles and preferences and may be conceived to have an impact. If the formulation of the question about use of time were successful, the budget constraint (the income) should not have any effect. Hence income would not be expected to contribute in this model. But since status was a significant contributor to the previous model, perhaps high or low income may also indicate high or low social status. However, the way income is measured here with 8 categories and 400.000+ as the highest; it probably will not measure the “symbol” part of income in any meaningful way. In any case one may speculate that in Norway income, however much an indicator of status, may be a rather poor “symbol” of status both in peoples own eyes and in other people' minds. Part time or full time work may also be of doubtful value as an explanatory variable. It is closely interrelated to both sex and industry

To compare the structural explanation with the values explanation of the choice, a multinomial logit model of the same type as described above was estimated. The nine variables age, sex, urban or non-urban living, # of persons in the household, total income of household, personal income, education, industry, and full time or part time work. In this case, however there are only two interval scale variables (age and # persons in household). Two variables are ordinal scale (personal and household income), and 5 are nominal scale. The interpretation of the regression parameters is different from interval scale variables both for nominal and ordinal scale variables, and ordinal variables are different from nominal.

Estimating the model with these 9 variables indicating structural position, showed that the income variables, the industry, and the working full time or part time variables did not have an impact (at the 0.05 level). The nominal variables in this model have the following codes:

SEX	1= male 2= female
URBANIZATION	1= center of city
URBANIZATION	2= suburb of city
URBANIZATION	3= town
URBANIZATION	4= rural village
URBANIZATION	5= scattered rural settlement
EDUCATION	1= primary school (up to 8 years)
EDUCATION	2= secondar school (9-10 years)
EDUCATION	3= high school (11-13 years)
EDUCATION	4= college/ university level (more then 12 years plus studies)
INDUSTRY	1= manufacturing/ crafts
INDUSTRY	2= trade /
INDUSTRY	3= transport / mail/ telecommunications
INDUSTRY	4= primary industires
INDUSTRY	5= health / social security
INDUSTRY	6= education / research
INDUSTRY	7= bank / insurance / finance
INDUSTRY	8= private service industries
INDUSTRY	9= public administration / police / court-system / national defence
INDUSTRY	10= other occupations
INDUSTRY	11= no occupation
WORKING	1= full time
WORKING	2= part time
WORKING	3= variable
WORKING	4= no job

The kind of work people do is an important indicator of the values they hold and the interests they pursue. Hence industry was retained in the next model and proved in this model to have a significant impact. But a closer inspection of the

regression coefficients showed most of them to be not significantly different from the average impact of the variable. The existence of the categories 10, other occupations, and 11, no occupation, may indicate that the interesting aspect, after all, might be the differentiation between full time, part time and no work. A second reduced model of structural effects was estimated substituting working part time/ full time for industry.

Re-estimating the model with these four variables plus age and # of persons in household, showed that a total of 7.8% of the variance in the data could be explained, some 20% less than in the values explanation.

Variable	Effect Test		Wald ChiSquare	Prob>ChiSq
	Nparm	DF		
URBANIZATION-262	12	12	23.39157	0.0246
SEX	3	3	195.15587	0.0000
AGE	3	3	98.25309	0.0000
EDUCATION (OWN)	9	9	143.89732	0.0000
#PERSONS IN HOUSEHOLD	3	3	14.83678	0.0020
WORKING FULL TIME/ PART TIME	9	9	25.60910	0.0024

For nominal variables the program estimates the impact of each category of the variable compared to the average impact. The parameter of the last category of each variable is not estimated, but defined to be the negative sum of the parameters for all the other categories. Thus, in the table below, which estimates the impact on the choice of going to the local art gallery ($Y_i=1$), being male (sex=1) has a negative impact on the probability. Being female will then have an impact of the same size and opposite sign.

We see that increasing age, being female, and coming from (sub-) urbanized areas increase the probability of choosing the local art gallery, while being male, coming from rural villages and having low education decrease it. Number of persons in the household and the working part time / full time does not have an impact on this choice.

Parameter Estimates				
Term	Estimate	Std Error	ChiSquare	Prob>ChiSq
Intercept	-2.3186769	0.2682765	74.70	0.0000
URBANIZATION [1-AVERAGE]				
URBANIZATION [2-AVERAGE]	0.23560993	0.1169872	4.06	0.0440
URBANIZATION [3-AVERAGE]				
URBANIZATION [4-AVERAGE]	-0.3395673	0.114155	8.85	0.0029
SEX [1-AVERAGE]	-0.4060365	0.0644009	39.75	0.0000
AGE	0.02489775	0.0043808	32.30	0.0000
EDUCATION [1-AVERAGE]	-0.8621673	0.1999341	18.60	0.0000
EDUCATION [2-AVERAGE]	-0.3953181	0.1387232	8.12	0.0044
EDUCATION [3-AVERAGE]				
#PERSONS IN HOUSEHOLD				
WORKING [1-AVERAGE]				
WORKING [2-AVERAGE]				
WORKING [3-AVERAGE]				

The next table looks at the choice of going to the local arts and handicraft shop ($Y_i=2$). Age, being female, coming from towns and larger households, and working part time increase the probability of choosing to go there. Being male and having low education decrease it.

Parameter Estimates				
Term	Estimate	Std Error	ChiSquare	Prob>ChiSq
Intercept	-3.0088727	0.2781014	117.06	0.0000
URBANIZATION [1-AVERAGE]				
URBANIZATION [2-AVERAGE]				
URBANIZATION [3-AVERAGE]	0.25031644	0.1209502	4.28	0.0385
URBANIZATION [4-AVERAGE]				
SEX [1-2]	-0.884789	0.066477	177.15	0.0000
AGE	0.03611711	0.0042773	71.30	0.0000
EDUCATIO [1-AVERAGE]	-0.4381343	0.1482787	8.73	0.0031
EDUCATIO [2-AVERAGE]				
EDUCATIO [3-AVERAGE]				
#PERSONS IN HOUSEHOLD	0.1416941	0.0496944	8.13	0.0044
WORKING [1-AVERAGE]				
WORKING [2-AVERAGE]	0.2684597	0.1274928	4.43	0.0352
WORKING [3-AVERAGE]				

For the choice of going to the local art gallery, being female from suburban locations (with higher rather than lower age) were of most importance.

For the choice of going to the local arts and handicraft shop, being female from a town, with a large household and working part time were most important.

Both descriptions sound very much like a particular kind of life-style, probably with the kind of values identified above.

In the next table the probability of choosing to go to the local shopping center is studied ($Y_i=3$). Age, urbanization, and working hours do not have an impact. Being male and having high education contributes to decreasing this probability, while being female, having low education and living in big households increase it.

Term	Parameter Estimates			
	Estimate	Std Error	ChiSquare	Prob>ChiSq
Intercept	-0.89933100	0.2148797	17.52	0.0000
URBANIZATION [1-AVERAGE]				
URBANIZATION [2-AVERAGE]				
URBANIZATION [3-AVERAGE]				
URBANIZATION [4-AVERAGE]				
SEX [1-2]	-0.37527230	0.0519449	52.19	0.0000
AGE				
EDUCATION [1-AVERAGE]	0.31686403	0.1207544	6.89	0.0087
EDUCATION [2-AVERAGE]				
EDUCATION [3-AVERAGE]	-0.23367680	0.0820736	8.11	0.0044
#PERSONS IN HOUSEHOLD	0.13031946	0.0406658	10.27	0.0014
WORKING [1-AVERAGE]				
WORKING [2-AVERAGE]				
WORKING [3-AVERAGE]				

In addition, the variables age, sex, and urbanization, which we studied above in figures 3-5, education, and number of persons in the household all have large impacts. Working part time proved important for the choice of the arts and handicraft shop, but otherwise it does not appear to contribute much explanatory power.

The variables important for choosing the first two types of products indicated a kind of life-style syndrome, perhaps going together with the kind of values identified earlier. But as indicators of life-style values, the structural indicators need supplement. The values and structural variables may be complementary rather than competing explanations. In any case, since both in reality explain too little to be of much interest, the question is whether a combined model may fare better.

COMBINING VALUES AND STRUCTURAL EXPLANATIONS

The structural explanations did not predict choices better than the value-indices. But structural variables are fewer and more easily observed than the value-indices. Hence, if one were to choose between them, they are to be preferred. Here both values and structural indicators are available. Both kinds of variables may be entered in the same model.

Estimating a model of the same type as before with the pooled variables of the two previous models, showed that the values poly-sensualism, risk/ security, law-abidingness, technology, comradeship, and loyalty did not have overall effects significantly (at the 0.05 level) different from 0, neither did urbanization of the structural indicators.

Leaving out these variables from the model and re-estimating it, 13.4% of the variance was explained by the following variables.

Source	Effect Test			
	Nparm	DF	Wald ChiSquare	Prob>ChiSq
HEALTH	3	3	35.40816	0.0000
SELF-REALIZATION	3	3	35.33533	0.0000
MATERIALISM	3	3	14.20005	0.0026
NATURE	3	3	10.83819	0.0126
RELIGION	3	3	12.73282	0.0053
LACK OF AMBITION	3	3	9.60533	0.0222
STATUS	3	3	10.06404	0.0180
INDIVIDUALITY / CONFORMITY	3	3	30.00131	0.0000
POWERLESSNESS / DOMINATION	3	3	16.16456	0.0010
AUTHORITY	3	3	13.35853	0.0039
NATIONALISM	3	3	14.22622	0.0026
REGULATION / MARKET	3	3	11.72422	0.0084
ADVERTISING SCEPTISISM	3	3	20.64678	0.0001
COSMOPOLITANISM / LOCALISM	3	3	11.43248	0.0096
GAMBLING	3	3	13.24663	0.0041
AGE	3	3	55.71336	0.0000
SEX	3	3	144.88942	0.0000
EDUCATION (OWN)	9	9	33.16642	0.0001
#PERSONS IN HOUSEHOLD	3	3	11.23041	0.0105
WORKING FULL TIME / PART TIME	9	9	17.96513	0.0356

For the choice $Y_i=1$ the next table shows that the same values and structural variables as identified in the previous models (minus the one's dropped) are significant.

Parameter Estimates				
Term	Estimate	StdError	ChiSquare	Prob>ChiSq
Intercept				
HEALTH	0.12480825	0.033052	14.26	0.0002
SELF-REALIZATION	0.10883055	0.0216292	25.32	0.0000
MATERIALISM	-0.0646795	0.024165	7.16	0.0074
NATURE				
RELIGION				
LACK OF AMBITION	-0.0838405	0.0296879	7.98	0.0047
STATUS				
INDIVIDUALITY / CONFORMITY	-0.1155439	0.0237362	23.70	0.0000
POWERLESSNESS / DOMINATION	0.08905798	0.0227692	15.30	0.0001
AUTHORITY				
NATIONALISM				
REGULATION / MARKET				
ADVERTISING SCEPTISISM				
COSMOPOLITANISM / LOCALISM	-0.0758204	0.0290929	6.79	0.0092
GAMBLING	-0.089136	0.0257636	11.97	0.0005
AGE	0.01734271	0.0049164	12.44	0.0004
SEX [1 -AVERAGE]	-0.2567261	0.0711758	13.01	0.0003
EDUCATION [1 -AVERAGE]	-0.4525055	0.205375	4.85	0.0276
EDUCATION [2 -AVERAGE]				
EDUCATION [3 -AVERAGE]				
#PERSONS IN HOUSEHOLD				
WORKING [1 -AVERAGE]				
WORKING [2 -AVERAGE]				
WORKING [3 -AVERAGE]				

The next table presents the coefficients affecting the choice $Y_i=2$. In relation to the first two models studied, the value nature now contributes while individuality/ conformity do not contribute. Also, working part-time drops out from the list of explanatory variables with non-zero coefficients.

From the map of values (fig. 2) it is seen that nature is closely related to values like security and law-abidingness. Since these were dropped from the model it seems probable that nature picks up some of the role of these values.

Term	Parameter Estimates			
	Estimate	StdError	ChiSquare	Prob>ChiSq
Intercept	-3.5296831	0.717136	24.23	0.0000
HEALTH	0.16379335	0.0297369	30.34	0.0000
SELF-REALIZATION	0.0452949	0.0196028	5.34	0.0209
MATERIALISM	-0.0733926	0.0222726	10.86	0.0010
NATURE	0.05260032	0.0224063	5.51	0.0189
RELIGION				
LACK OF AMBITION				
STATUS	-0.0536358	0.026407	4.13	0.0422
INDIVIDUALITY / CONFORMITY				
POWERLESSNESS / DOMINATION				
AUTHORITY				
NATIONALISM	0.08706543	0.0244317	12.70	0.0004
REGULATION / MARKET				
ADVERTISING SCEPTISISM				
COSMOPOLITANISM / LOCALISM	-0.0686548	0.0261696	6.88	0.0087
GAMBLING				
AGE	0.02734516	0.0045899	35.49	0.0000
SEX [1 -AVERAGE]	-0.7896636	0.0698902	127.66	0.0000
EDUCATION [1 -AVERAGE]	-0.3207094	0.1520539	4.45	0.0349
EDUCATION [2 -AVERAGE]				
EDUCATION [3 -AVERAGE]				
#PERSONS IN HOUSEHOLD	0.11959841	0.0491049	5.93	0.0149
WORKING [1 -AVERAGE]				
WORKING [2 -AVERAGE]				
WORKING [3 -AVERAGE]				

The next table presents variables significantly affecting the choice $Y_i=3$. Comparing this model to the two previously discussed, it is seen that the only difference is that nature and low education drops out of the list.

Term	Parameter Estimates			
	Estimate	StdError	ChiSquare	Prob>ChiSq
Intercept				
HEALTH				
SELF-REALIZATION				
MATERIALISM				
NATURE				
RELIGION	0.03818854	0.0109467	12.17	0.0005
LACK OF AMBITION				
STATUS				
INDIVIDUALITY / CONFORMITY				
POWERLESSNESS / DOMINATION				
AUTHORITY	0.04088144	0.0131521	9.66	0.0019
NATIONALISM				
REGULATION / MARKET	-0.0668547	0.0209876	10.15	0.0014
ADVERTISING SCEPTISISM	-0.0747769	0.0167845	19.85	0.0000
COSMOPOLITANISM / LOCALISM				
GAMBLING				
AGE				
SEX [1 -AVERAGE]	-0.3870473	0.0549531	49.61	0.0000
EDUCATION [1 -AVERAGE]				
EDUCATION [2 -AVERAGE]				
EDUCATION [3 -AVERAGE]	-0.2028727	0.0824463	6.05	0.0139
#PERSONS IN HOUSEHOLD	0.10307479	0.0402804	6.55	0.0105
WORKING [1 -AVERAGE]				
WORKING [2 -AVERAGE]				
WORKING [3 -AVERAGE]				

Overall it would seem that the values and structural explanations complement each other rather than compete. Urbanization and 6 values dropped out. Investigating the interrelationships between urbanization and the variables retained in the model it was found that the simple Pearson's product-moment correlation between urbanization and nature is 0.35, between urbanization and education it is =.33, and between nature and education it is -0.22. Also age and # of persons in the household are correlated with urbanization.

These interrelations and also some of the pattern of the significant coefficient above suggest that a slightly more complicated model might do better at explaining the choice of product type.

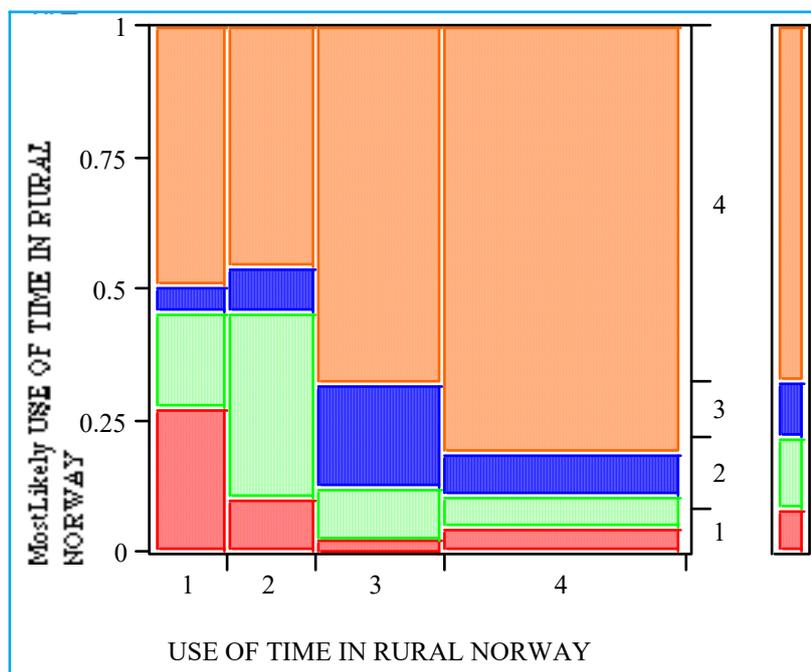
But before we go on to test a more complicated model an overall evaluation of the present pooled model might be in order.

EVALUATION OF THE MODEL

Using the formulas above one may compute the probability for individual i to be in category j , for $j=1,2,3,4$. Assigning person i to the category j with the largest probability gives a new variable “Most likely USE OF TIME IN RURAL NORWAY”. This predicted choice can then be compared to the actual choice.

In the table below the computed choice is compared to the actual choice.

Most Likely USE OF TIME IN RURAL By USE OF TIME IN RURAL NORWAY



The correct predictions lie along the diagonal. The large squares off the diagonal are “errors”. From the tables below it will be seen that of those actually choosing alternatives 1, 2, or 3 the model correctly predicts the choice in about 20-35% of the cases. Since category 4 is the residual category, most “errors” will of course be allocated this code.

Response Counts

	USE OF TIME IN RURAL NORWAY				Total
	1	2	3	4	
Most likely USE OF TIME IN RURAL NORWAY					
1	105	49	16	62	232
2	71	167	68	75	381
3	18	41	129	106	294
4	190	217	456	1027	1890
	384	474	669	1270	2797

Response Profiles

	USE OF TIME IN RURAL NORWAY				All
	1	2	3	4	
Most likely USE OF TIME IN RURAL NORWAY					
1	0.2734	0.1034	0.0239	0.0488	0.0829
2	0.1849	0.3523	0.1016	0.0591	0.1362
3	0.0469	0.0865	0.1928	0.0835	0.1051
4	0.4948	0.4578	0.6816	0.8087	0.6757
	384	474	669	1270	2797

It would seem to be room for considerable improvement in the understanding of what affects the choice of the four types of products considered here.

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APPENDIX

VALUES IN NORWEGIAN MONITOR 1991 (MMI 1992a, 43-85)

One or two-poled indices (two-poled indices have the high-score end labeled last):

1. HEALTH
2. FITNESS
3. SELF-REALIZATION
4. MATERIALISM
5. COMMUNITY
6. NATURE
7. RELIGION
8. MODESTY / HEDONISM
9. APPEARANCE
10. POLY-SENSUALISM
11. CONSUMPTION / INVESTMENT
12. TRADITION / NOVELTY
13. RISK / SECURITY
14. PESSIMISM / OPTIMISM
15. SPONTANEITY / RIGIDITY
16. REASON
17. FEELINGS
18. OCCULTISM
19. LACK OF AMBITION
20. MOBILITY
21. EGOISM / UNSELFISHNESS
22. FAMILY
23. LOCAL COMMUNITY
24. STATUS
25. SEXUAL EQUALITY
26. INTOLERANCE / TOLERANCE
27. INDIVIDUALITY / CONFORMITY
28. PURTANISM
29. LAW-ABIDINGNESS
30. TRUSTFULNESS / TIMIDITY
31. POWERLESSNESS / DOMINATION
32. AUTHORITY
33. ROMANICISM
34. NATIONALISM
35. INEQUALITY / EQUALITY
36. INDUSTRIAL GROWTH / ENVIRONMENTAL PROTECTION
37. COLLECTIVISM / PRIVATIZATION
38. REGULATION / MARKET
39. TRUST IN POLITICIANS
40. TECHNOLOGY
41. ARTIFICIAL PRODUCTS / NATURAL PRODUCTS
42. ADVERTISING SCEPTICISM
43. COSMOPOLITANISM / LOCALISM
44. SCATTERED / DENSITY
45. COMRADSHIP
46. GAMBLING
47. LOYALTY
48. FREEDOM
49. SOLIDARITY