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by

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ABSTRACT

Feelings of social justice and injustice are related to social distance which will be the subject of this paper. Apart from two types of social distance, a concept of interaction and of similarity, we introduce a reference concept. What counts is the weight other people carry for a person and the influence they exert on him when forming an opinion concerning certain objects and subjects, or put in other words which people are part of a person's frame of reference and to what extent. The concept of social distance is operationalized on the basis of the social filter function that translates the objective income distribution into the subjective norm on incomes as reflected by the response to the income evaluation question. Our asymmetric concept can be applied to both person-to-person, person-to-group and group-to-group relationships alike. The social distance concept is empirically illustrated with respect to income for a moderate sample of less than 500 respondents.

1. Introduction

Social justice refers according to Jasso (1980) to a distribution of goods. As long as we may assume that all citizens have the same distribution in mind, we may concentrate on the definition of a social justice index. Preliminary to that problem is the question whether all citizens perceive the same distribution of goods. In this paper we show that different people in different layers of society will have different perceptions of the distribution. This is due to the fact that there exists a varying social distance between citizens.

One of the most elusive sociological concepts is the one of social distance. Apart from being hard to describe in objective terms this phenomenon also is difficult to treat in a quantitative way. Our feeling that we perceive less distance to one person than to another does not automatically provide us with an empirically measurable social distance concept. Devising a method of measuring attitudes on disputed social issues has never been a matter of course (see e.g. Thurstone and Chave (1929)). It is often felt (see Krech, Crutchfield and Ballachey (1962), Katz (1960), Katz and Stotland (1959)) that an attitude consists of various components: an action-tendency or conative component which refers to the behavioral aspects of the attitude or put in other words to the potential or readiness to respond, an affective or feeling component which relates to the emotional aspects of the attitude and a cognitive or belief component which concerns the interpretations, expectations, and evaluations of an individual with regard to an object. A similar distinction is made in AIO which is used interchangeably with psychographics and stands for activities, interests and opinions (see Reynolds and Darden (1974)). Our manner of treating the social distance concept will be in a cognitive-evaluative sense. We are interested not only in the way things are, say the objective element, but especially in the way people think things are, the subjective element. Perception of things and persons, the determinants of people's opinions and their frame of reference concerning certain objects and subjects are important to us.

The concept of social distance has very often been used for the study of intergroup relations and is associated with research on social stratification (see e.g. Westie (1959)). Jackson and Curtis (1968) describe stratification as the study of units (roles, individuals, families, groups or whatever a given theorist wishes to specify) distributed along one or more rank systems (dimensions of value, facilities, or evaluation); they use rank to mean the location of a unit along a rank system, and status to mean some (specified) composite of unit's ranks. Following conventions in the literature of social stratification (see e.g. Barber (1957)) the social status of a household chosen as the basic unit of social stratification is its evalutation in the eyes of other members of society. In our research the ranking of households and the weight assigned to them are not important from a society point of view. What counts is the weight other people carry for a person and the influence they exert on him when forming an opinion concerning certain objects and subjects, or put in other words which people are part of a person's frame of reference and to what extent. We do not restrict our concept to person-to-person relationships but also concentrate on person-to-group and group-to-group relationships like Bogardus (1947) did. Laumann (1972) who gave a short history of social distance made a distinction between two types of social distance:

- an interaction notion (see e.g. Bogardus (1933), (1955)) which is related to the chance of social interaction between individuals or groups, like e.g. intermarriage;
- a similarity notion (see e.g. Sorokin (1927)) which has to do with the degree of similarity of individuals or groups on certain attributes like e.g. income.

In this paper we introduce a different type of social distance for which we use the term a reference notion.

In Section 2 we discuss the concepts in a general setting. In Section 3 we describe an empirical tool, the income evaluation question (IEQ). In Section 4 we describe the theory of the Social Filter Process (SFP), first proposed in Van Praag (1981), that may be thought to generate the responses to the IEQ. In Section 5 we operationalize the sociological concepts described in Section 2. In Section 6 we describe our dataset and specify the notions to be measured. In Section 7 we present the empirical results. In Section 8 we discuss the results and draw some conclusions.

2. The concepts

In this paper we are not interested in particular individuals but in social types. Social types will be described by a vector of social characteristics x, the dimensions of which may correspond to income, age, religion etc. Generally the vector x is defined on a space of social characteristics X.

Let us now consider the social distance between two persons, described by $x^{(1)}$ and $x^{(2)}$. The distance is defined by $d(x^{(1)};x^{(2)})$. Let us assume that the first person is the owner of a mansion and the second person his servant. What may be the intuitive meaning of social distance between the two? In our view we call a person "near" to us, if he has a strong influence on our value pattern, our judgments and our resulting social behavior. If the other person has practically no influence, we call him "socially far away" from us. It follows that the mansion owner is socially near to the servant but most probably not inversely. It follows that $d(.;.)$ is in general not symmetric. More precisely if $d(x^{(1)};x^{(2)})$ reflects the social distance between owner $x^{(1)}$ and servant $x^{(2)}$ as perceived by the servant, we most probably find that $d(x^{(1)};x^{(2)})$ is large, but that $d(x^{(2)};x^{(1)})$ is much larger.

Is it true that people feel minimal distance to their own type, e.g., after suitable normalization $d(x;x) = 0$? We do not believe that people as a rule are mostly influenced in their value pattern by their social equals, hence as a rule $d(x;x) \neq 0$. If the value range of $(d.;.)$ is $[0,\infty)$, for a type x we may find a social type $x_0(x)$, such that $d(x_0;x) = 0$. The $x_0(x)$ is the type that has most influence on the pattern of x. We call $x_0(x)$ the <u>social focal point</u> of the social type x. In general $x_0(x) \neq x$. That is, x has not itself as social focal point. If x is the social focal point of y, it is also not necessary that y is the social focal point of x. If $d(x;x) \neq 0$, it implies that people assign more social weight to other types than to their own kind. We call this <u>social schizophenia</u> and $d(x;x)$ is a measure for it.

Let us now consider a hypothetical <u>social distance</u> table.

Table 1. A hypothetical social distance table.

$x^{(1)}$ \ $x^{(2)}$	10	20	30	40
10	1	2	3	4
20	0	1	2	3
30	1	0	1	2
40	2	1	0	1

In Table 1 we split up society according to one social dimension, income. We consider four income brackets of \$ 10,000, \$ 20,000 and so on. We assume here that each income bracket has the next higher bracket as its social focal point. For instance, the \$ 10,000 bracket assigns zero distance to the \$ 20,000 bracket, as $d(20;10) = 0$. Inversely, the \$ 20,000 bracket perceives a considerable distance between themselves and the \$ 10,000 bracket as $d(10;20) = 2$. The columns stand for the distance concept just defined.

From the table it is obvious that there are actually <u>two</u> distance concepts. The <u>passive</u> distance concept, reflecting the influence other social types exert on us and an <u>active</u> distance concept, reflecting in how far our own social type is able to exert influence on others. The latter one is reflected in the table by considering it row-wise. We see for instance that the \$ 30,000 bracket exerts most influence on the \$ 20,000 bracket for which it serves as social focal point, an equal but smaller influence on the \$ 10,000 bracket and on the own bracket and still less influence on the \$ 40,000 bracket. Notice that each type has the same schizophrenia $d(x;x) = 1$.

The limiting case clearly is that where $d(x^{(1)};x^{(2)}) = \infty$. In that case $x^{(2)}$ is not directly influenced by $x^{(1)}$. This does not imply that there is no indirect influence by $x^{(1)}$ on $x^{(2)}$. For instance, let $x^{(1)}$ be the \$ 50,000 bracket, $x^{(2)}$ be the \$ 20,000 bracket and $x^{(3)}$ be the \$ 40,000 bracket, then it may very well be that the \$ 50,000 bracket has influence on $x^{(3)}$ and $x^{(3)}$ on $x^{(2)}$. This is the well-known phenomenon that norms and values trickle down through society from the upper class through the middle class to the lower class.

Let us now consider the idea of a <u>social reference group</u> (SRG). We say that type $x^{(1)}$ belongs to $x^{(2)}$'s social reference group, if $d(x^{(1)};x^{(2)}) < \infty$. If all social types $x^{(1)}$ have finite distance to $x^{(2)}$, it would imply that the whole society acts as social reference group to $x^{(2)}$. Although this is true in a sense, we may assume that some types $x^{(1)}$ carry more weight for $x^{(2)}$ than others, and this is reflected by the fact that $d(x^{(1)};x^{(2)})$ is not constant in $x^{(1)}$. Then it follows quite naturally that the social reference group of $x^{(2)}$ may be defined as the set in X with $\{x^{(1)} \epsilon X | d(x^{(1)};x^{(2)}) < \alpha\} = SRG(\alpha;x^{(2)})$. The radius of the SRG is α. Notice that if X is more-dimensional, $SRG(\alpha;x^{(2)})$ will be a more-dimensional set. Another way of defining the concept may be in terms of percentile definition. Let the percentage of the population belonging to $SRG(\alpha;x^{(2)})$ be denoted by $\pi_R(\alpha;x^{(2)})$ then we may solve the equation $\pi_R(\alpha;x^{(2)}) = 0.90$ for α yielding a $\alpha_{R,0.90}$. In such a way we get a more practical delineation in terms of social characteristics. We notice that, due to the asymmetric distance definition, it follows that, if $x^{(1)}$ belongs to $x^{(2)}$'s SRG, this does not automatically imply that $x^{(2)}$ belongs also to $x^{(1)}$'s SRG.

The SRG is derived and defined by the passive distance definition, where we look at Table 1 column-wise. In a similar way we may define the social (direct) influence group (SIG) of social type $x^{(1)}$ by looking at Table 1 row-wise. We define

$$SIG(\alpha;x^{(1)}) = \{x^{(2)} \epsilon X | d(x^{(1)};x^{(2)}) < \alpha\}$$

and likewise $\alpha_{I,0.90}$ as the solution of $\pi_I(\alpha;x^{(1)}) = 0.90$.

The concept of social stratification does not fit very well in this framework, as it suggests a partition of society into social strata, such that one social type has nothing to do with another one, but there is always social interaction. The definition of two individuals $x^{(1)}$ and $x^{(2)}$ as belonging to different strata would be $d(x^{(1)};x^{(2)}) = \infty$ and $d(x^{(2)};x^{(1)}) = \infty$. Then we do not have automatically distinct subsocieties as there may be indirect links between the two social types. A more likely situation would be that $x^{(2)} \epsilon SIG(\alpha,x^{(1)})$ for some α but $x^{(1)} \epsilon SRG(\alpha;x^{(2)})$, or in words $x^{(2)}$ is influenced by $x^{(1)}$ but not vice-versa. Then we may speak of a one-way stratification with $x^{(1)}$ being in the substratum.

Nevertheless, in the present conceptual framework where social distance is a continuous and not a discontinuous function on X, the concepts of SRG and SIG are relative concepts (depending on α or π) as $d(.;.) < \infty$ as a rule and not absolute concepts which the term social stratum would suggest.

We considered a social distance tabel $D = [d_{ij}]$ where $d_{ij} = d(i;j)$ stands for the influence i exerts on j. The matrix D is asymmetric. If d_{ij} stands for the passive distance, d_{ji} stands for the active distance between i and j. It is now easy to define the distance concept between groups A and B in the population. We define the passive distance between A and B

$$d_{AB} = \frac{1}{n_A n_B} \sum_{i \in A} \sum_{j \in B} d_{ij}$$

where n_A and n_B stand for the number of people in A and B. Analogously we define the active distance between A and B as d_{BA}. It may be that A is identical with B. In that case we get the average schizophrenia in group A, say d_{AA}. It is the average passive and active distance of members of A among themselves. We may call it also the schizophrenia in group A.

In this section we dealt with the concepts, assuming that d(.;.) is a known function. In the following sections we shall try to define a measurement procedure in order that we can specify the function d(.;.).

3. The income-evaluation question as a tool

In the introduction we suggested that social distance between persons may be measured by the impact one person has on the norms or value patterns of another person. This may correlate with geographical nearness or with frequent communication but that is not necessarily so. The Queen of the Netherlands, for example, has a strong influence on the value patterns of Dutch citizens, but perhaps not vice-versa.

If someone may dictate more or less what type of clothing I am wearing, I have a short distance to that person with respect to clothing norms. If my ethical or religious norms are influenced to a large extent by what another person thinks, that person is socially near to me on the ethics dimensions. The same holds for music, for food, for children, for education,and for my perception of what is a good income.Then it follows that social distance perception depends on the aspect of life the value pattern refers to. This gives a somewhat schizophrenic character to the idea of social distance. Two individuals may be buddies in sport, but professionally they may belong to different classes.

However, if we take the value pattern to a rather fundamental issue, the social distance concept derived from it may be considered important too. We shall not consider in this paper the possibility of how to derive a (simultaneous) social distance concept based on several aspects of life. The aspect of life we shall consider here is net household income. Properly speaking this paper deals with the social distance concept on the income dimension only. We shall assume that someone's value pattern may be described by his response to the so-called Income Evaluation Question (IEQ) that runs as follows:

> "Please try to indicate what you consider to be an appropriate amount for each of the following cases? Under my (our) conditions I would call a net household income per week/month/year of:
> about .... very bad
> about .... bad
> about .... insufficient
> about .... sufficient
> about .... good
> about .... very good
> Please enter an answer on each line, and underline the period you refer to".

The response to this battery of attitude questions may be denoted by the vector $c = (c_1,...,c_6)$ where c_1 stands for the response to what income level amounts to a "poor" situation and c_6 to a "prosperous" situation. Obviously the response to the IEQ describes the respondent's value pattern with respect to income. The IEQ has been posed in many oral and written questionnaires since 1969 and it appears to be a very handsome and reliable tool of research. We refer to Van Praag (1971), Van Praag (1985), Van Praag, Van der Sar (1986). In Van Praag (1985) a review of the main results thus far has been given.

The response variation between individuals is wide. The variation may be due to two factors. First, it may be that individuals n give different answers, because they are in different circumstances. For instance, one respondent may have a large family and another may be single. Second, it may be that two individuals in identical circumstances respond differently because the verbal labels "very bad" to "very good" may have different emotional connotations between them. In other papers (Van Praag, Van der Sar (1986), Van der Sar, Van Praag, Dubnoff (1986)) we show that there is much evidence that the connotation difference is not important. We briefly summarize the arguments.

First, there is the general reason that words are information transmitters and that the very essence of a language for a community is that words convey the same meaning to different members of the language community. It is obvious, although hard to show, that this ideal is not completely realized in the real world, but this is far from saying that that ideal is not even approximately realized. It is hard to believe that a language that serves well in courts, business, love affairs and filosofy, would not serve well in conveying a concept in interview questions.

A second argument yielding the same conclusion is more empirical. Let us consider per individual n his answers c_{in}. As usual to free ourselves from the money-unit dimension we consider from now on the natural logarithm of the answers, their log-average μ_n and their log-variance σ_n^2. Let us now consider the log-standardized answers

$$u_{in} = \frac{\ln c_{in} - \mu_n}{\sigma_n},$$

where $\mu_n = \frac{1}{6} \sum_{i=1}^{6} \ln c_{in}$ and $\sigma_n^2 = \frac{1}{5} \sum_{i=1}^{6} (\ln c_{in} - \mu_n)^2$.

We have

$$\ln c_{in} = \sigma_n u_{in} + \mu_n.$$

If u_i would be constant over respondents n (or random but not dependent on characteristics of respondent n), we would have separated the label effect from the respondent's characteristics.

In Table 2 we present the average

$$\bar{u}_i = \frac{1}{N} \sum_{n=1}^{N} u_{in}$$

over a sample of about 500 individuals in an American sample survey, which is described more precisely in Section 6.

Table 2. Average and sample s.d. of u_i and $N(u_i)$

Label	u_i	$\sigma(u_i)$	$N(u_i)$	$\sigma(N(u_i)$	Equal interval
1	-1.291	0.236	0.104	0.041	0.083
2	-0.778	0.190	0.222	0.059	0.250
3	-0.260	0.241	0.400	0.091	0.417
4	0.259	0.239	0.600	0.091	0.583
5	0.760	0.190	0.773	0.061	0.750
6	1.311	0.229	0.899	0.040	0.917

We present behind it its standard deviation (s.d.)

$$\text{s.d.}(u_i) = \sqrt{\frac{1}{N-1} \sum_{n=1}^{N} (u_{in} - \bar{u}_i)^2}.$$

We see from Table 2 that the standardized answers u_i are nearly symmetric about zero and that the s.d.'s are of the same order of magnitude over the six levels and relatively small. We could find no interdependency between u_{in} and characteristics of n. Although the choice of the six verbal labels has an impact on the values of μ_n and σ_n, it is obvious that μ_n and σ_n are only weakly dependent on the response to a specific level i, and if it would have been possible to offer more than six levels that specific influence would be reduced even further. So it may be assumed that μ_n, σ_n depend in the limit only on the individual characteristics of the respondent n, while u_i stands for the specific level and depends only on the verbal label i. We have

$$\ln c_{in} = u_i\sigma_n + \mu_n.$$

It follows that the verbal labels "very bad" to "very good" are translated on a numerical scale on $(-\infty,+\infty)$ into numbers $u_1,\ldots,u_6$. Obviously, this numerical scale may be subjected to a second order-preserving transformation $\hat{U}_i = N(u_i)$. As evaluations by individuals are always performed on bounded scales, say a (0,10)-scale or a letter scale A,...,F, where the endpoints stand for the best and the worst evaluation possible, this suggests that we should select N(.) to be a distribution function on $(-\infty,+\infty)$ and with a view on the symmetry of the u_i's about zero the standard-normal distribution lies at hand. The values $N(\bar{u}_i)$ with their s.d.'s over the sample have been tabulated in Table 2 as well. It follows then that the "evaluation" of c_{in} is

$U(c_{in}) = N(\frac{\ln c_{in} - \mu_n}{\sigma_n};0,1)$. We notice that our procedure is a non-cardinal one; although the function U = N(.) may be interpreted as a cardinal utility function of income, that is not necessary (cf. Van Praag (1971), Van Praag (1975), Van Praag (1985)).

The main points that emerge from this section are that the six responses to the IEQ are basically explained by two individual parameters (μ_n, σ_n), that the values $u_1,\ldots,u_6$ are symmetric about zero and that $\hat{U}_1,\ldots,\hat{U}_6$ may be interpreted as values on a zero-one scale attached by individual n to income levels $\{c_{in}\}_{i=1}^{6}$.

In the next section we shall discuss whether this finding is just an empirical regularity or whether it can be put into the perspective of a theoretical model context.

4. The social filter process

In the previous section we discovered a surprising regularity in the response pattern to the IEQ which may be described as if the individual answers to a verbal label i by solving the equation

$$N(\frac{\ln c_{in} - \mu_n}{\sigma_n}; 0,1) = \hat{U}_i \qquad (i=1,\ldots,6)$$

for c_{in}.
In this section we shall try to interpret this result in the context of a model.

It is well-understood that norms on nearly any subject are acquired through life by comparing situations with others. This holds as well for how sweet a cup of tea is or how tasty our food is, as for questions on a more abstract level, as whether a human being is "young" or "old" or what income level corresponds to "very bad" or "very good". If nearly everybody in our environment is less than thirty years old, a person older than 30 will be called "old". If nearly everybody in our environment earns more than \$ 60,000 a year, an income of \$ 30,000 amounts to being "poor". This is a relative definition of poverty. More specifically with a view on incomes we may operationalize the idea as follows. Let the income distribution of our environment be described by an income distribution function F(y) or a density function $f(y) = \frac{dF(y)}{dy}$. Then a specific income level y is associated with poverty, say, if 20% of our environment earns less than $y_{0.20}$, where $y_{0.20}$ is the solution of F(y) = 0.20. Indeed, this is the poverty line definition advocated by some people (Miller, Roby (1970)). Similarly, you may have 25%-poverty, and so on. In this approach the poverty-concept is purely relative, it depends on the threshold percentage accepted and the income distribution perceived. Similarly the concepts of "old" and "young" may be defined with reference to the age distribution.

In some form or another this theory has been proposed inter aliis by Layard (1980), Kapteyn (1977), Duesenberry (1949), Scitovsky (1976), Van Praag (1981) and Frank (1985). We follow and develop here the theory proposed by Van Praag (1981).

The consequence of identifying verbal qualifications of income levels with specific quantiles in the income distribution is that every individual would respond the same income level when asked "what is poor". If this is not found in practice, it implies that people have different perceptions of the income distribution in their environment. Consider a rich man B and a poor man A with corresponding environmental income distribution depicted in Figure 1. As they refer themselves to different income distributions $F_A(y)$ and $F_B(y)$ they answer with different estimates y_{poorA} and y_{poorB} of what is poor. The perceived income density $f_n(y)$ will now be set equal to the density of the evaluation function $U_n(y) = N(\frac{\ln y - \mu_n}{\sigma_n};0,1)$ in the previous section. It follows that the observed response behavior may be a clue to deriving the income distribution the respondent refers to.

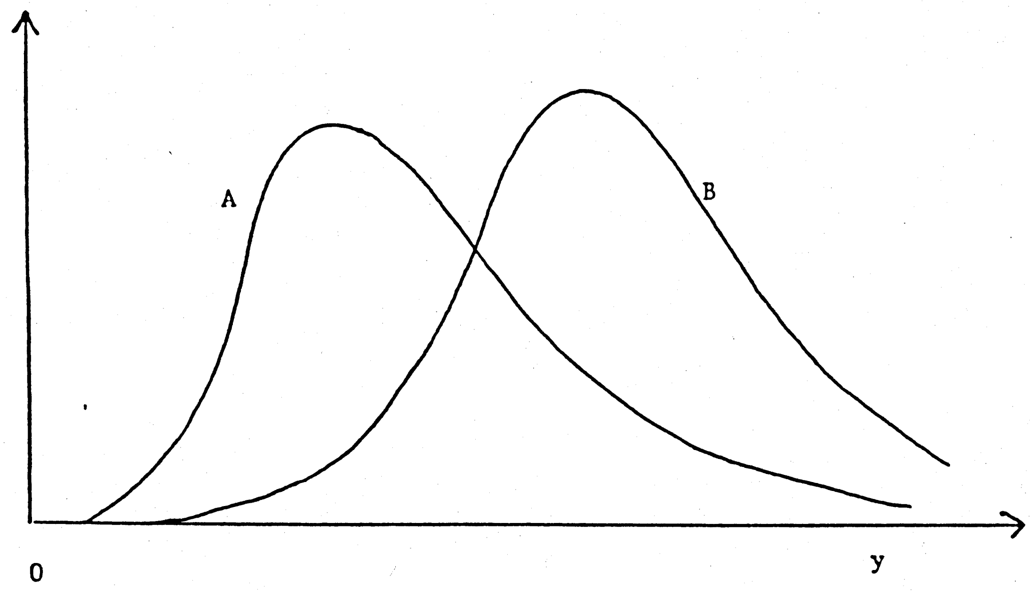

Figure 1. The perceived income density functions of person A and B.

Let us denote the objective income density by $f(y)$ and let us assume the density perceived by n to be $f_n(y)$, then we may define $\phi_n(y)$ by

$$f_n(y) \equiv \phi_n(y).f(y).$$

Let us now interpret $f(y_0)\Delta dy$ as the real fraction of the population in the income bracket of width Δy about y_0 and $f_n(y_0)\Delta y$ as the perceived fraction in that same bracket. Then the interpretation of the factor $\phi_n(y)$ is straightforward. If $\phi_n(y) > 1$, it implies n exaggerates the numbers in that bracket by $\phi_n(y)$ and if $\phi_n(y) < 1$, it implies that the size of that bracket is perceived as less than there really is.

We call $\phi_n(y)$ the <u>social filter</u> applied by n on the income distribution. If $\phi_n(y) \equiv 1$ there is no distortion of our perception. The reason that $\phi_n(y)$ differs from one may be due either to the fact that people are actually not seen by n or that they are seen but do not carry special weight. We cannot distinguish between both. The function $\phi_n(.)$ is the sum result of both phenomena.

If $f_n(y)$ is set equal to $\frac{dU_n(y)}{dy}$ and f(y) is known by observation, $\phi_n(y)$ is directly assessed as well. We have

$$\ln f_n(\ln y) \equiv \ln \phi_n(\ln y) + \ln f(\ln y),$$

Let us assume that the income distribution F(y) is lognormal as is approximately true and that $F_n(y) \equiv U_n(y)$ is a lognormal distribution function as well, in that case we may write

$$+\left(\frac{\ln y - \mu_n}{\sigma_n}\right)^2 \propto \ln \phi_n(y) + \left(\frac{\ln y - \mu_0}{\sigma_0}\right)^2$$

where (μ_0, σ_0^2) are the log-median and the log-variance of the income distribution, where $\propto$ means "neglecting constants", and where both members have been multiplied by minus. From the formula it appears that $\ln \phi_n(y)$ must be of the same form, i.e., we have

$$+\frac{1/q_n^2}{\sigma_0^2}(\ln y - \mu_n)^2 \propto \left(\frac{1/q_n^2 - 1}{\sigma_0^2}\right)(\ln y - \hat{\mu}_n)^2 + \frac{1}{\sigma_0^2}(\ln y - \mu_0)^2$$

where $\sigma_n^2/\sigma_0^2 = q_n^2$ and where $\hat{\mu}_n$ is implicitly defined.

Setting coefficients equal we find

$$\mu_n = (1 - q_n^2)\hat{\mu}_n + q_n^2\mu_0.$$

Consider now the interpretation of $\ln \phi_n(y)$. If $1/q_n^2 - 1 = 0$, it is constant. If $q_n^2 < 1$ it implies that $\ln \phi_n(y)$ (do not forget the <u>minus!</u>) is maximal at

$\ln y = \hat{\mu}_n$ and vanishes to the tails. Or in more plain terms, it assigns most social weight to people with income equal to $\exp(\hat{\mu}_n)$ and it reduces the importance of individuals away from $\hat{\mu}_n$. Actually the social filter may be interpreted as an optical lens with focal point at $\hat{\mu}_n$ and myopia factor q_n^2. In general
$q_n^2 < 1$, or $\sigma_n^2 < \sigma_0^2$, i.e., the perceived distribution is more concentrated than the real one. We also see that the perceived log-median μ_n is a weighted mean of the social focal point $\hat{\mu}_n$ and the true log-median μ_0. If $q_n^2 = 1$ the filter is constant and the perceived median coincides with the true one. If $q_n^2 = 0$, the perception does not bear any relation to reality and $\mu_n = \hat{\mu}_n$; the myopia is complete.
We notice that q_n^2 and $\hat{\mu}_n$ differ among individuals.

In the next section we shall consider the empirical operationalization and estimation.

5. Operationalization and estimation

Our data set is a sample of about 500 heads of household in the Boston area (U.S.A.). The survey was designed and carried out by Steve Dubnoff and was created for methodological purpose only; it is not exactly representative for the Boston population, although it covers the whole population. Each respondent n considered has responded to the IEQ, so we have for each respondent six observations that have to satisfy approximately the following model

$$\ln c_{in} = u_i \sigma_n + \mu_n \qquad (i=1,\ldots,6)$$

$$= u_i \sigma_0 q_n + [(1 - q_n^2)\, \hat{\mu}_n + q_n^2 \mu_0].$$

It follows that if we specify $\hat{\mu}_n$ and q_n to depend on personal characteristics of n, it becomes possible to estimate the relationship. We assume that the social focus $\hat{\mu}_n$ depends on two factors, viz. own current income y_n and family size fs_n. The social focal point will be most probably in the neighbourhood of own income and it will increase with the income bracket one belongs to. Similarly the family size of one's social reference group is related to one's own family size, albeit to a lesser extent than may be assumed for income.

So we hypothesize

$$\hat{\mu}_n = \beta_0 + \beta_1 \ln y_n + \beta_2 \ln fs_n.$$

Obviously it might be possible to suggest a host of other variables that may be important as well, but practice has taught us that this is the specification that works. We assume both effects β_1 and β_2 to be positive, but $\beta_1 > \beta_2$. Similarly q_n^2 is specified (after some experimentation) as

$$q_n^2 = \exp(\phi_0)\ sc_n^{\phi_1}\ pex_n^{\phi_2}$$

where sc_n is the years of schooling of n and pex_n his potential years of labor experience, defined as ($age_n - sc_n - 6$), i.e. age <u>minus</u> years at school <u>minus</u> infant years.
The parameters β_1, β_2, ϕ_1 and ϕ_2 together with the constants β_0 and ϕ_0 have been estimated by a non-linear estimation procedure (see Marquardt (1963)). The resulting estimates, borrowed from Van der Sar, Van Praag, Dubnoff (1986), are given in Table 3.

Table 3. Estimation results for N = 448 persons, with standard deviations between brackets.

β_0 = -5.393 (0.649)	γ_0 = -1.005 (0.156)
β_1 = 1.520 (0.065)	γ_1 = 0.223 (0.051)
β_2 = 0.260 (0.031)	γ_2 = -0.053 (0.012)
$\bar{R}^2$ = 0.774	

Let us now make some remarks on the empirical results:

1. <u>the myopia factor</u>:
   - q_n^2 varies positively with sc_n which reflects the fact that better educated people have more fantasy concerning income than the less

educated;

- q_n^2 varies negatively with pex_n which may have to do with the fact that "much experienced" people are more or less set in their income habits, left with only a small income sensitivity;
- in general $q_n^2 < 1$, i.e. individual n is short-sighted;

2. the social focal point:
   - since on average $q_n^2 < 1$ the social filter function generally peaks and has a maximum at $\tilde{\mu}_n$;
   - $\tilde{\mu}_n$ varies positively with own income which reflects the fact that the mode of the social filter function shifts with shifting income;
   - $\tilde{\mu}_n$ is positively correlated with family size indicating that the larger fs_n the higher the income level needed;
   - generally $\tilde{\mu}_n > \ln y_t$ which shows people's tendency to focus their attention especially on people earning more than themselves; it may be explained by the fact that people are trying "to keep up with the Jones's", their mind is put on people being somewhat more fortunate; this view stresses the relative aspect;

3. the parameter μ_n:
   the larger one's μ_n, the larger the income one needs in order to reach a specific income evaluation; μ_n may be interpreted as an individual want parameter; assuming that $q_n^2 < 1$ we have
   - the elasticity coefficient $(1-q_n^2)\beta_1$, which reflects the well-known tendency of people to adapt their (income) judgments to their own (income) circumstances; the so-called preference drift effect (see Van Praag (1971)), is about 0.66; as distinct from earlier research results it varies among individuals: the higher q_n^2, the smaller the preference drift rate which may be explained by a broader view on incomes;
   - the family size elasticity $(1-q_n^2)\beta_2$ is about 0.11; it varies among individuals with q_n^2 in the same way as the preference drift rate;
   - if society's income and thus μ_0 rises, then because of interdependency one's needs also rise; the effect depends on the value of q_n^2: the larger q_n^2, the broader one's income horizon and the bigger the effect of a rise of μ_0 on μ_n; there is, however, no reason that the effect should be proportional ($q_n^2 = 1$).

Considering the individual's social filter function with respect to income we derive the following propositions on the individual's social reference group loosely defined as the income class to which the social filter function assigns considerable importance

I. it especially contains those people with an income, (somewhat) bigger than one's own,

II. the width of the group is positively correlated with one's years of schooling and negatively with one's potential labor market experience; the effect of the latter being smallest in absolute terms.

6. The social distance concept

Now we return to the concept of social distance as loosely defined in Section 2. What is the relationship between the social distance and the social filter? We defined the (passive) social distance between a person and another as small, if the other has a strong influence on the person considered. In filter terms this is equivalent to saying that the social weight of the other person is high, so its corresponding filter value and social distance are two sides of the same coin. Let us write $d(y;y_n)$ for the passive social distance, that is, the distance individual n perceives between himself and a person earning income level y, then we define

$$d^2(y;y_n) = \left(\frac{1/q_n^2 - 1}{\sigma_0^2}\right)(\ln y - \hat{\mu}_n)^2.$$

As we saw that $(\hat{\mu}_n, q_n^2)$ depends on (y_n, fs_n, sc_n, pex_n) we see that we may tabulate $d^2(y;y_n,fs_n,sc_n,pex_n)$ like in Table 1. Such social distance tables are presented below for various decompositions of the sample population. The most interesting point is clearly the asymmetry of this distance. Let there be two individuals n and n' with incomes y_n and $y_{n'}$ respectively. Then in general

$$d^2(y_{n'};y_n) \neq d^2(y_n;y_{n'})$$

and also the social focal point $\hat{\mu}_n$ generally does not coincide with y_n. If we call an income bracket <u>self-centered</u> if it perceives distance to the own bracket as smaller than to any other, an income bracket is only self-centered if $\hat{\mu}_n = \ln y_n$.

This is only true if

$$\ln y_n = \beta_0 + \beta_1 \ln y_n + \beta_2 \ln fs_n$$

with solution

$$\ln y_n^* = \frac{-\beta_0 - \beta_2 \ln fs_n}{\beta_1 - 1} = \frac{+5.393 - 0.260 \ln fs_n}{0.520} .$$

For $fs_n = 4$ we find $y_n^* = \$ 15,962$; for $fs_n = 2$ we have $\$ 35,446$.

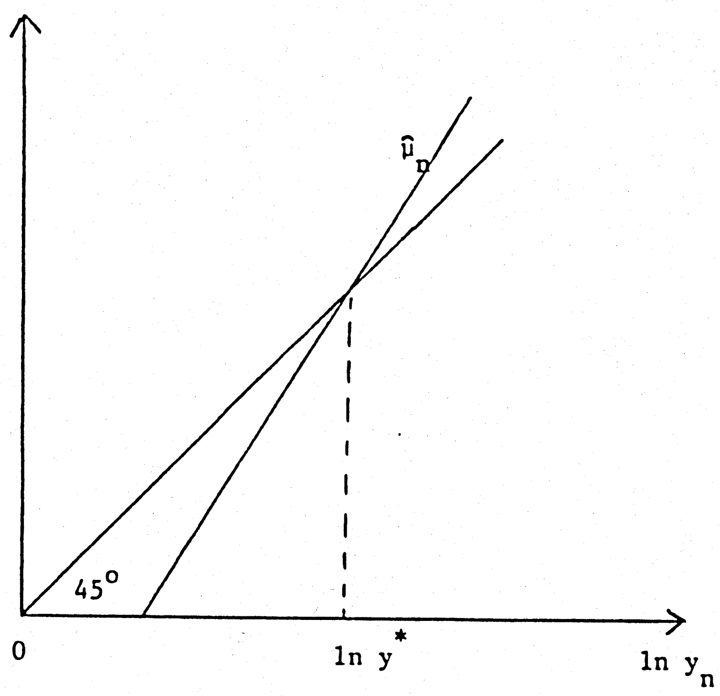

Figure 2. The social center y^* is determined by the intersection of the social focal point $\hat{\mu}_n$ as a function of log-income and the 45°-line.

In Figure 2 we draw $\hat{\mu}_n$ as a function of $\ln y_n$.
It follows that rather poor people look to the poorer as their social focal point and rich people to the richer. People with income below y_n^* look downwards, and those above y_n^* look upwards. We notice that family size has a surprisingly strong influence on y_n^*. We did not perform a similar analysis on

European datasets, so we do not have any basis for comparison. However, as a preliminary interpretation, we see that family size is a social characteristic of major importance. If people have a large family they are more inclined to look upwards than a couple without children with the same income. The reason may be that the latter household although it has a large income due to two breadwinners, socially belongs to a lower class than its total household income suggests.

Obviously, the fact that classes are <u>not</u> self-centered implies a certain social schizophrenia. One's most important example for the derivation of norms and values is not one's own class but another one. Can we give a measure for this schizophrenia? We propose

$$S = \frac{1}{N} \sum_{n \in \Omega} d^2(y_n;y_n) = \frac{1}{N} \sum_{n \in \Omega} \left(\frac{1/q_n^2 - 1}{\sigma_0^2}\right)(\ln y_n - \hat{\mu}_n)^2.$$

where we denote the whole society by Ω.
There are several other distance measures of interest. What is the average passive distance APD of n to society Ω? That is, what is $d_{\Omega,n} = \frac{1}{N} \sum_{i \in \Omega} d(i;n)$?

We write it as

$$d_{\Omega,n} = \frac{1}{N} \sum_{m \in \Omega} \left(\frac{1/q_n^2 - 1}{\sigma_0^2}\right)(\ln y_m - \hat{\mu}_n)^2 = \left(\frac{1/q_n^2 - 1}{\sigma_0^2}\right)(\sigma_0^2 + (\mu_0 - \hat{\mu}_n)^2).$$

We notice that the average passive distance increases when $(\mu_0 - \hat{\mu}_n)^2$ increases; that is, the social focal point $\hat{\mu}_n$ is farther away from the median μ_0. The distance decreases if $1/q_n^2$ decreases, i.e., if myopia reduces. Average passive distance is felt to be minimal, q_n kept constant, at the median bracket $\hat{\mu}_n = \mu_0$ where it equals $(1/q_n^2 - 1)$.

By means of this concept it is also possible to compute the passive/active distance between subgroups in the population.

Finally we may conceive the average APD over the whole society. For q_n^2

constant this is seen to be equal to $[(1/q_n^2 - 1)/\sigma_0^2]2\sigma_0^2 = 2/q_n^2 - 2$. In Table 4 we tabulate social distances between various social types.

In Section 2 we distinguished a passive distance concept, corresponding to column-wise comparison in Table 1 and an active distance concept. If d_{ij} stands for the passive distance between i and j, d_{ji} stands for the active distance.

The average active distance is then

$$d_{n,\Omega} = \frac{1}{N} \sum_{j\in\Omega} \left(\frac{1/q_j^2 - 1}{\sigma_0^2}\right)(\ln y_n - \hat{\mu}_j)^2.$$

When averaging over j, two factors $1/q_j^2$ and $\hat{\mu}_j$ are not necessarily mutually independent. If they are not independent, the only way of calculation is numerically by calculating the corresponding average over the sample. Those values are numerical sample averages. Finally, we may calculate the average of AAD over n, this equals

$$\overline{AAD} = \frac{1}{N^2} \sum_{i\in\Omega} \sum_{j\in\Omega} d_{ij}^2$$
$$= \overline{APD}$$

where we interchanged the order of summation.

If q_n and $\hat{\mu}_n$ are dependent this expression can only be assessed numerically. If q_n is constant we may use the previous result and we have

$$\overline{APD} = 2(1/q_n^2 - 1).$$

The last measure $\overline{APD} = \overline{AAD}$ may be seen as an overall stratification measure for the society as a whole. For our sample it equals 2.84.

7. Empirical results

In this section we present some empirical results, where we depart from the parameter estimates, presented in Table 3.

For an "average" respondent, that is a household with \$ 22,500 net-income, a family size of 2.6, a schooling of 14.4 years and labor experience of 22.1 years, that is an average age of 22.1 + 14.4 + 6 = 42.5 years, we find a $\exp(\hat{\mu})$ of \$ 24,146 and a q^2 of 0.5632.
Let us now consider the social distance table for schooling; the population is decomposed into three subgroups, viz. schooling $\leq$ 12 years, schooling between 12 and 16, schooling > 16 years.

Table 4a. Social distance between schooling groups.

		sc $\leq$ 12	12 < sc $\leq$ 16	sc > 16	AAD
sc $\leq$ 12	(149)	3.24	2.63	2.62	2.83
12 < sc $\leq$ 16	(200)	4.00	2.27	1.98	2.78
sc > 16	(99)	4.59	2.35	1.89	2.99
APD		3.88	2.41	2.17	2.84
					($\overline{AAD} = \overline{APD}$)

First we consider the diagonal terms, that describe the average social distance within the group, the schizophrenia. In the population as a whole it is 2.84. In the low-schooling subgroup it is much higher, viz. 3.24, while in the two higher education groups it is lower than the average figure. The (sc > 16)-group which consists of university graduates and the like is knit together with an average distance of 1.89.

Consider now the distance of the lowest group to the higher groups. The passive distance to the (12 < sc $\leq$ 16)-group is 4.00 and the active distance is 2.63. It follows that the low-schooling group exerts more influence on the high-schooling groups than inversely. The average passive distance to the whole society is 3.88, while the active distance is 2.83. Social distance seems to be more strongly perceived by low schooling classes than by people

with higher education.
Consider now Table 4b computed in the same way as 4a.

Table 4b. Social distance between labor experience groups.

		PEX $\leq$ 10	10 < PEX $\leq$ 30	PEX > 30	AAD
PEX $\leq$ 10	(130)	2.09	2.79	3.40	2.75
10 < PEX $\leq$ 30	(197)	2.35	2.63	4.10	2.95
PEX > 30	(121)	2.05	3.02	3.16	2.78
APD		2.19	2.78	3.64	2.84

We see that schizophrenia is much less in the group PEX $\leq$ 10 than in the low-schooling group in Table 4a. This is not true for the groups with intermediate and long labor experience. The passive distance of a group increases with labor experience. As PEX has much to do with age, it reflects the fact that older people seem to be less subsceptible to influences from other people. On the other hand their active distance to others is on the average 2.78 which is caused by their strong influence on young people (2.05) with short labor experience. On the whole young people are more susceptible than older people.

Table 4c. Social distance between income classes.

		INC$\leq$10000	10000<INC$\leq$20000	20000<INC$\leq$40000	40000<INC	AAD
INC $\leq$ 10000	(92)	1.75	1.06	4.51	12.79	3.46
10000<INC$\leq$20000	(149)	4.82	0.35	1.24	6.60	2.11
20000<INC$\leq$40000	(171)	8.82	1.40	0.29	3.44	2.66
40000<INC	(36)	15.74	4.54	0.84	1.24	5.16
APD		6.59	1.23	1.52	6.23	2.84

From Table 4c we see that the average distance within each subgroup is not large but that the distance between the extreme subgroups is very large. It is somewhat less for the upper-income group than for the low-income group but the difference is not spectacular. The influence of the top-income bracket on other income brackets is not large except for the adjacent lower bracket. The passive distance is 0.84, which is even smaller than within the top-group itself. It is interesting that this is not reciprocated by the upper income group that sees an average passive distance of 3.44.

8. Discussion and conclusion

In this paper we make a first attempt to operationalize the concept of social distance. The crucial point seems to be that such a concept, unlike to what is suggested by its geometric background, is asymmetric. The distance between Peter and Paul is not necessarily equal to that between Paul and Peter. The social distance concept is measured in terms of influence. Paul may have a lot of influence on Peter, in which case we call Peter socially near to Paul, but Peter may have no influence on Paul in which case we call Peter far away from Paul. So it is better to speak about passive and active distance, say d(Peter;Paul) and d(Paul;Peter). The concept is operationalized on the basis of the social filter function that translates the objective income distribution into the subjective norm on incomes as reflected by the IEQ-response. On the basis of this measured concept we defined the concepts of average active and passive distance, the social focal point of an individual and a general social stratification measure. These concepts have been evaluated for a moderate sample of less than 500 respondents. The main virtue of this paper is its methodological contribution. The sample that is used is not created for deriving valid conclusions on the Bostonian society. It is evident that there is much to do in this field. Although norms on income are a major aspect of the complete norm pattern, it is not the only one. So it seems possible to construct a similar theory on different aspects of life as well. Will we then find similarity between the filters and how can we construct more-dimensional filters? A second issue is the validity of the IEQ. How sensitive are our constructs to modifications in the IEQ?

Finally we do not deny that in building this apparatus we have defined the primitive metaphysical concept of social distance by a measurement method. By doing so, we have applied a Procrustean bed on a fine and elusive concept; many people may feel that their view on the social distance concept does not conform to our empirical definition. We cannot prove or disprove that we are right, nor can they. The only thing we require from those who are nonbelieving is that they offer an empirically operational rival definition, such that two or more measured concepts may be compared.

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