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ESCALONAMENTO DO PRESTÍGIO SOCIAL POR MÉTODOS PSICOFÍSICOS DIRETOS E INDIRETOS.

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Resumo: O prestígio profissional social sustentado por Assistentes Sociais, Biólogos, Dentistas, Enfermeiros, Engenheiros, Farmacêuticos, Físicos, Fisioterapeutas, Fonoaudiólogos, Médicos, Psicólogos, Químicos e Sociólogos foi escalonado pelos métodos psicofísicos de comparação aos pares (indireto) e estimação de magnitude (direto). Os resultados mostraram que: 1) ambos os métodos forneceram escalonamentos substancialmente diferentes; 2) a escala de comparações aos pares (proporção de z) é uma função logarítmica da escala de estimação de magnitude; 3) a escala de comparação aos pares (proporção de z) é uma função linear dos logaritmos da escala de estimação de magnitude; e 4) obteve-se uma alta correlação (rho = 0, 95) entre os graus de prestígio atribuídos às profissões nos dois métodos. Com estes resultados, podemos concluir que: 1) o contínuo do prestígio social (não-métrico) escalonado por estes dois métodos permite uma relação similar à obtida no contínuo sensorial (métrico); e 2) o contínuo do prestígio social possui as seguintes características: quantitativo, protético e não-quanlitativo (metatético).

Palavras-chave: Psicofísica social, lei de Stevens, prestígio social, estimação de magnitude

SCALING OF SOCIAL PRESTIGE BY DIRECT AND INDIRECT PSYCHOPHYSICAL METHODS.

Abstract: The professional social prestige practiced by: Social Assistants, Biologists, Dentists, Nurses, Engineers, Pharmacists, Physicists, Physical Therapists, Phonoaudiologists, Physicians, Psychologists, Chemists, and Sociologists was scaled by psychophysical methods of pair comparisons (indirect) and the magnitude estimations (direct). The results showed: 1) both of the methods yield substantially different scaling; 2) the pair comparisons scale (proportion or z) is a logarithmic function of the magnitude estimations scale; 3) the pair of comparison scale (proportion or z) is a linear function of the logarithms of the magnitude estimations scale; and 4) a high correlation (rho = .95) between the degrees of prestige attributed to the professions obtained by both methods. With these results we can conclude that: 1) the continuous of social prestige (not metric) scaled by these two methods yield a relation similar to the obtained in the sensorial continuous (metric); and 2) the continuous of social prestige has the following characteristics: quantitative, prothetic and non-qualitative (metathetic).

Key-Words: Social psychophysics, Stevens Law, social prestige, magnitude estimates.

Measurement of preferences, professional and occupational prestige

One of the first studies investigated professional and occupational prestige with psychophysical scaling methods was accomplished by Perloe (1963). He compared the methods of magnitude and category estimations in order to scale a list of 100 occupations (for details on psychophysical methodology applied to social and clinical continuous, see Faleiros-Sousa & Da Silva, 1996). The data revealed that the category estimation scale of occupational prestige is a function approximately logarithmic of the magnitude

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estimation scale, when the subjects did not limit the range of the judgment from professions considered to be of very high prestige. He also analyzed separately, the existent relation between category and magnitude estimates with or without range limitation of professional judgments. This analysis revealed that with limited range of judgments the scale of categories is a linear function of the scales of magnitudes indicating that the subjects are making judgments of differences and not of ratios. With limited range of professional judgments, the relation between these two scales is a logarithmic function, indicating that the subjects are making rations judgments of professional prestige. Moreover, the data showed that when compared to the scales of magnitudes of professional prestige containing limited range of judgments with the scales of magnitude containing unlimited range the relation was curvilinear, indicating that the first is a logarithmic function of the second, such as it usually occurs in the relationship between category ratings and magnitude estimates for sensorial or perceptual domains. In short, Perloe (1963) data strongly indicates that the continuous of professional prestige has prothetic characteristics. But, it also shows that the judgments range is a very important variable in this indication, when it is unlimited, the results of the magnitude estimates sustain that the subjects are judging ratio among the stimuli. The reverse is true, when they are limited, the results of the estimates indicate that the subjects are fulfilling judgments of differences among the stimuli. In other words, the logarithmic relationship between the magnitude estimates and category estimates are only obtained when the range of the first is unlimited.

Künnapas and Wikströem (1963) used two methods of direct scales (magnitude estimations and ratio estimations) and an indirect method (pair comparisons) for constructing a scale of occupational preferences. 74 university students participated in this study, in which they judged 17 different belonging occupations, according to the Swedish Statistics Norms, to three different social groups. The results showed that the scales of occupational preferences constructed by means of the direct methods of magnitude estimations and ration estimations were linearly related. The scale constructed by the indirect method of pair comparison was a logarithmic function of the scale of magnitude estimations and also the scale of ratio estimations. Likewise, similar to what occurs with the metric continuous, the variability expressed by the standard deviation of the average is a linear function of the magnitude estimates, therefore, providing Ekman's Law. In short, the data by Künnapas and Wikströem (1963) sustains that the continuous of occupational preference has prothetic characteristics. Wegener (1982) conducted a similar study with a sample of 1.796 subjects whom assessed the preference of 16 different occupations by the methods of category ratings and magnitude estimations. Consistent with data obtained from the metric continuous, Wegener found that both scales are not linearly related to each other, or rather, the continuous of occupational preferences has prothetic characteristics.

Dawson and Brinker (1971), and Dawson and Mirando (1976) conducted studies in which they investigated occupational preference through the cross-modality matching. In the first study (Dawson & Brinker, 1971), 24 subjects paired the intensity of sound and dynamometric forces to 17 occupations, of which were selected from Künnapas and Wikströem experiment (1963). The pairing of sounds and dynamometric forces for the different occupations were designed in logarithmic coordinates, in function of each other. The inclination of the straight line (exponent of the power function) was .29, whose value was relatively near to the one of .38 predicted from the ratio between the exponents characteristics for the intensities of sounds and dynamometric forces (.64/1.70), indicating that the subjects are able to proportionally judge the stimuli when these are paired to sounds and the dynamometric forces. The rank order correlation of Spearman (rho) between the pairing of sounds and dynamometric forces was .94, indicating that the subjects were consistent in their judgments of ratio using two different modalities of responses, one auditive and the other muscular.

In the second study (Dawson & Mirando, 1976), 38 subjects paired apparent duration to indicate the preference and no preference (inverse attributes) of the same 17 occupations used in the previous study. The data showed that the relation

between the geometric averages of the apparent duration of preference and no preference pairing for each of the professions was a power function with an exponent of -1.10, which value is nearest to the expected –1.0. In the same manner as the average data, the individual data were also described by functions of power in which the exponents were near –1.0 but varied between –.49 to –.47, meaning that even though the average exponent obtained was near the expected, the individual exponents are very variable.

From the view of the general theory of measurement, recently Hardin and Birnbaum (1990) analyzed the malleability of ratio estimates of occupational prestige. 50 subjects performed estimates of ratios and the differences of prestige for 12 different occupations. The results showed that the judgments of ratios and the differences were monotonously related and were consistent with the hypothesis that the subjects use the same operation for the judgment of differences as well as of ratios.

Taken together, the data of these experiments show that the continuous of prestige and of occupational and professional preferences have prothetic characteristics and that among the American and Swedish students, the medical profession had the highest prestige or it is the preferred profession. In addition, the data sustains that the procedures of magnitude estimations and cross modality matching provide scales of prestige at level of ratio measurement and these are stable, valid and credible.

Purpose

In this experiment the professional prestige was assessed by means of the two independent psychophysical methods: magnitude estimations and pair comparisons estimations. The goals of this experiment were: 1) to verify the generality of the logarithmic relationship between the magnitude estimates and the category ratings; 2) to verify if the degree order of professional prestige derived from both of the scale methods are similar to each other; 3) to verify the generality of Ekman's Law, usually obtained from the metric continuous, for social continuous (non metric).

Method

Participants. 32 university students with ages between 19 and 39, (23 female and 9 male) from the different undergraduate and graduate courses at the USP Campus of Ribeirão Preto.

Material. Two writing pads containing specific instructions on the first page for each type of psychophysical method, on the following pages there was a list of 13 professions (Chemists, Sociologist, Dentist, Engineer, Pharmacist, Biologist, Nurse, Physician, Physicist, Social Assistant, Physical Therapist, Psychologist and Phonoaudiologist).

Procedure. All of the 32 subjects judged social prestige by both methods, in which, together with the professions, were presented in different order for each subject. In the pair comparisons method, the subjects task consisted in judging social prestige appointing which profession, always presented to the pairs, had more social prestige in our society. In the magnitude estimation method, the subjects' task consisted in appointing a number for each profession that was proportional to the quantity of social prestige attributed to each one. Modulus or standard stimulus were not previously designated.

The instructions given to the subjects, independent from the psychophysical method used, required that the judgments be conducted in terms of prestige attributed to a profession given by the majority of the population. The same 32 subjects participated in the two tasks, half judged firstly by the method of magnitude estimation and secondly, by the method of pair comparison, and the other half judged in the inverse order. The experiment was accomplished in a laboratory and the subjects made their judgments individually.

Results and Discussion

The first column of Table 1 shows the geometric averages of the magnitude estimates of prestige for each profession judged by the 32 subjects. The second column shows the rank order for these professions. In the third column, based on Case V by Thurstone, the proportional averages of indicated professions with the most prestige derived from a matrix 13 x 13 containing the 78 judgments (pairs of

non-identical professions) established by each one of the 32 subjects. In the fourth column, the rank order of prestige for these professions are shown. The fifth column shows the average z scores derived from the respective z scores of each matrix proportion of the indicated professions of major prestige. These scores represent the psychological distances between each of the professions. (Thurstone, 1927; Guilford, 1954; Baird & Noma, 1978). The sixth column contains the scale values adjusted after establishing for the profession of minor prestige the average scale value to zero. This was done because the method of pair comparisons generates an interval scale in which the addition of any constant (in this case, +.81, value for the average z score of the profession with minor prestige) makes the scale intact. The seventh column shows the rank order of prestige for these professions, based on the adjusted scale values.

Table 1. geometric average of magnitude estimates (ME), average proportions (AP), z score averages and adjusted scale values (ASV), derived from the matrix of judgments by the method of paired comparisons, with their respective prestigious positions in order judged for each profession.

PROFESSIONS	ME	PO	AP	PO	Z	ASV	PO
Chemist	15,2	10th	0,30	10th	-0,67	0,14	10th
Sociologist	12,36	13th	0,26	13th	-0,80	0,01	12th
Dentist	36,14	2nd	0,85	2nd	1,30	2,11	2nd
Engineer	34,73	3rd	0,78	3rd	1,03	1,84	3rd
Pharmacist	17,38	5th	0,45	6th	-0,23	0,58	6 th
Biologist	13,80	11th	0,28	11th	-0,74	0,07	11th
Nurse	16,23	8th	0,40	8th	-0,38	0,43	7th
Physician	42,80	1st	0,95	1st	1,80	2,61	1st
Social Assistant	12,52	12th	0,27	12th	-0,81	0,00	13 th
Physical Therapist	16,73	7th	0,49	5th	-0,12	0,69	5 th

The data presented in Table 1 also shows an good agreement between the derived order from both of the methods and between the two alternatives of description of the data from the judgments of paired comparisons estimations. In fact, the coefficient of concordance by Kendall (W), corrected for ties, obtained through the rank orders of the professions resulting from the magnitude estimates, average proportions and adjusted scale values, was .986 ($p < .001$). For instance, in the method of magnitude estimation for the sociologist profession it was considered to be of lower prestige whereas, the physician was of major prestige. Considering the average proportions resulting from the matrix of judgment from the paired comparison, the rank order of these two professions was identical. Considering the adjusted scale values derived from the average z score, the profession with the lowest prestige was of the social assistant, followed by the sociologist, and the physician was of major prestige. The nurse profession, considering the magnitude estimates and the average proportions, it was the eighth place in prestige, while considering the average adjusted scales, it was the seventh in prestige. Therefore, both of the methods and alternatives of rank orders resulting from the method of pair comparisons were highly in concordance among each other.

Notwithstanding, a fundamental difference persists among the obtained results in both of the methods. That is, in the method of magnitude estimations we could establish the order, the differences and mainly the ratios between the degrees of prestige for each of the different profession. In the method of pair comparisons, similarly to the method of category estimations, we

could only establish the order and differences between the degrees of prestige. With this method we are not able to know about the ratios between the degrees of prestige. For instance, results from the data presented in Table 1, referring to magnitude estimates, we can state that the dentist profession (ME = 36.14) is approximately three times larger than the Sociologists (ME = 12.36), equal to the Engineer (ME = 34.73), and two times larger than the pharmacist (ME = 17.38). Any other statistic operations and ratios are permitted with data of this nature.

To check if the non metric continuous of professional prestige has prothetic or metathetic characteristics, the average proportions and the average adjusted z scores were plotted as a function of the geometric averages of the magnitude estimates in linear and non-logarithmic coordinates. Figure 1 shows the relationship between the average proportions and the geometric averages of the magnitude estimates. We can verify that the function shows and accented descendent concavity or an almost logarithmic function.

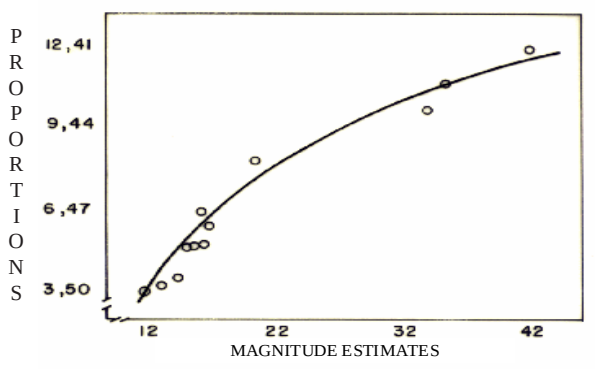

Figure 1. The relation between the average proportions and the geometric averages of the magnitude estimates of prestige from different professions in linear coordinates.

When these same proportions are plotted as a function of logarithms from the magnitude estimates (Fig. 2) the relationship shows a slight ascendant concavity.

Likewise, when the adjusted scale values, in z grades, are plotted as a function of the magnitude estimates, in linear coordinates, the relationship again, shows an accented descendent concavity or an almost logarithmic function (Figure 3). On the other hand, when the adjusted values are plotted as a function of the logarithms from the magnitude estimates, the relationship shows a slight ascendant concavity, (Figure 4).

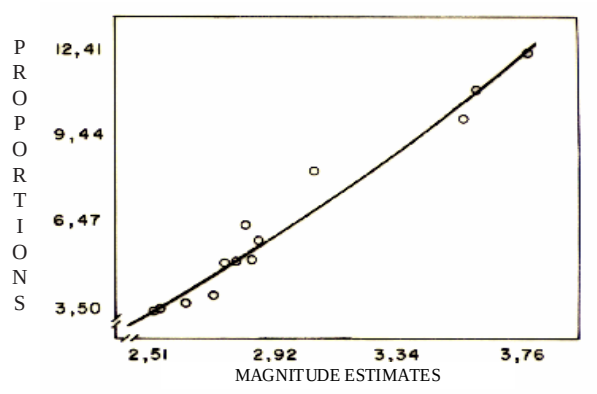

Figure 2. The relation between the average proportions and logarithms of the geometric averages of the magnitude estimates of prestige for different professions.

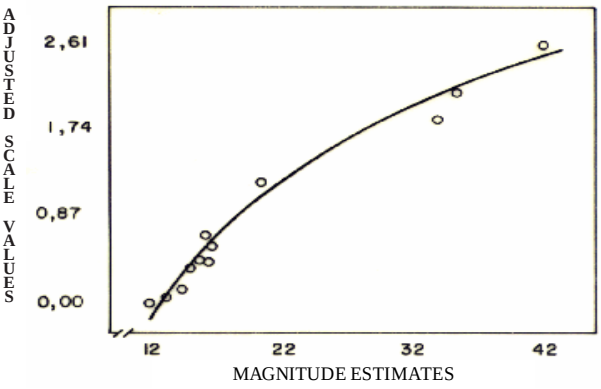

Figure 3. The relation between the adjusted scale values and the geometric averages of the magnitude estimates of prestige of different professions in linear coordinates.

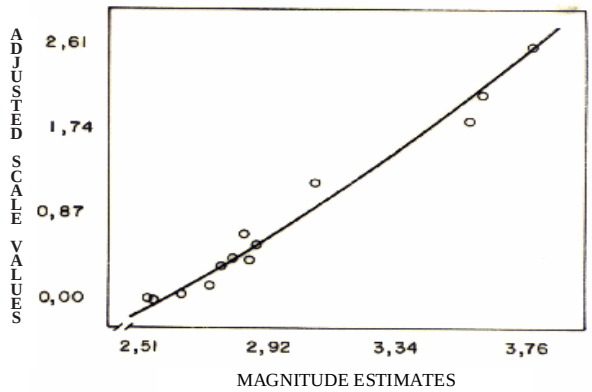

Figure 4. The relation between the adjusted scale values and the logarithms of the averages of magnitude estimates of the prestige of different professions.

The relationship, represented in Figure 5, shows that the standard error of the geometric average increases linearly as a function of the magnitude estimates. Therefore, this pattern of results confirms the Ekman Law, or rather, the variability of the estimates is a linear function of the magnitude estimates.

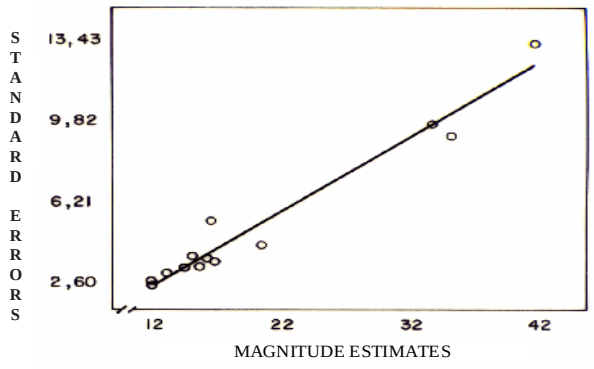

Figure 5. The standard error of the geometric average in function of the geometric average of the magnitude estimates of prestige of the different professions.

Taken together, the data presented in these figures, support strongly that the professional prestige has characteristics of a prothetic or additive continuous.

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