EVALUATING THE SOCIOECONOMIC RELATION WITH READING HABIT BETWEEN THE STUDENTS FROM A PARTICULAR SCHOOL AND A PUBLIC SCHOOL

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This work shows a statistical methodological procedure that focuses to verify whether the students socioeconomic relation from a public school and another particular school both of metropolitan region of Belém city, Pará state, Brazil, intervenes in the students reading habit. The procedure involves the use of multivariate statistical techniques Correspondence Analysis and Chernoff Faces to analyse the data that is composed in its majority qualitative data. It was observed that the relation socioeconomic of the researched students does not influence in the students reading habit when theses techniques were used.

INTRODUCTION

Brazil is extremely worry about the reading habit last years. This fact can be verified with the great existent number of researches that focuses this kind of activity. In this perspective and supposing that reading is important to the human development, this work has strong importance, therefore through its content will be possible that students, teachers and others professionals involved in this subject explore and analyse the reading act from the statistical techniques. Silva (2003), one of the major reading stimulator, shows that the book brazilian consume is just 1,2 books/habitant-year. To him, the factors that contribute to low numbers of readers are: the economic depression, the fact of Brazil being a country where people like to watch TV and in addition, schools and cities are vey poor in relation to appropriate environment to reading. Based on the researches about reading and mainly in these three factors mentioned up by Silva (2003), this work has as principal objective presents a statistical methodological procedure that views to verify if the students of the studied schools have or not the reading habit; to evaluate if their socioeconomic situation influences in this habit and the type of predominant reading between them.

First of all, it was carried through some points about reading and how it was treated before and how it is being worked nowadays at schools and by investigators of this subject. In a second moment, it was applied a questionnaire at these schools to verify these student socioeconomic profile. But before these questionnaire application, it was used the statistical technique of stratified sampling to determinate the correct size of the sample at both schools, therefore it will be difficult to work using all the population. After the collection and tabulation of theses data, we used descrutive analysis to verify the data behavior.

In this work, the majority of the collected variables is qualitative and according many researchers is hard to analyse this kind of variable therefore they do not know statistical resource more advanced than descrutive statistics. Qualitative variables are important to the study of reading, otherwise it will be difficult obtain the due answers without make questions like: "Do you read frequently?" or "What is your sex?". Correspondence Analysis and Chernoff Faces are two of the most used techniques applied in these types of variables. These multivariate techniques are easy to work and to interpret.

METHOD

The data which were studied in this work were collected at a public school and a particular one, both of metropolitan region in Belém, in the years of 2004 to 2005. The research considered only students who studies in the morning and courses 5th to 8th grades with ages upper to 10 years. At Public School, the total of students was 200 and at Particular School, 331. To obtain the information, a socioeconomic questionnaire with 12 objective questions was applied to the students. From this questionnaire, it was collected a sample from both populations through the statistical technique of proportional stratified sampling. This technique divided these populations in strates of grade and group. Two samples were obtained, one to the Public School and the other one to

Particular School. To the population of 200 students from Public School and 331 students from Particular School, it was used maximum sampling error of approximately 10% for both samples with confidence level of 95% and due to unknown total variability it was adopted the maximum variance of ¼. The samples sizes were obtained using the equation of proportional stratified sampling to finite population, showed by

$$n \geq \frac{N\sigma^2 Z^2}{\sigma^2 Z^2 + (N-1)\varepsilon^2},$$

where n= sample size; N = population size; σ^2 = variance; Z^2 = score value of standard normal distribution; ε = adopted sample error. It was acquired, through this technique, a sample of 84 students to be investigated at Public School and 103 at Particular School. According Bolfarine and Bussab (2005), this technique objectives mainly to control the sample variability.

The multivariate statistical techniques called Correspondence Analysis and Chernoff Faces were used to analyse the collected data about the researched students. The Correspondence Analysis technique is a multivariate statistical technique of exploratory and descritive character. It is used to analyse category data where the point position that corresponde to variables or categories of variables can be interpreted as associations. This technique analyses the geometric relations of the variables crossing, and the graphic representation is done in symmetric projection analyzing simultaneuosly the relations between lines and columns of the contingency table, in other words, it studies the relations between all of categories of both variables.

Chernoff Faces is a method used to represent graphically multivariate data. Thus, it is understood easily by human being due to its hability of realizing detailed differences in facial characteristic. This method was developed by Herman Chernoff, who was statistician, in 1973. The method consists in representing points in K dimensions by faces draws whose characteristics are detemined by position points. In this approach, each facial characteristic denotes a variable, that is, the father education level is associated to the eyes size; the mother education level is associated to the ray ear size; the family gains is associated to the mouth curvature and the student reading habit is associated to the face shape: oval or round. According to Chernoff (1973), this method has some advantages as: (1) increases the usuary hability in discovering important phenomenon; (2) serves as a mnemonic dispositive to remember of principal conclusions; (3) communicates principal conclusions to others; (4) provides the facility to do relativily precise calculation. The technique applied to the data allows to verify, through the arrangement done by the method, that the socioeconomic situation of the investigated students does not influence in the reading habit of them. Each school was separately analysed to verify if the parents educational grade and the family income influence in the students reading habit. Totally, it was inteviewed 187 students.

RESULTS

From the Correspondence Analysis application to the collected data at schools, it was verified that: 5th grade students of both schools prefer to read Comic Books (RQ), while 6th grade ones read more Tale (CONT), the 7th grade students like to read Diverse Books (LDIVERS) and Others types (OUTROS). The 8th grade students prefer to read Romance (ROM) and Magazines: Veja, IstoÉ, and Época (RVIE). And based on residue of variables, it was verified the catogories: Adventure (AVENT), Religious Books (LRELIG), Comic (COM) and Fiction (FICC) are not associated to any category of the Grade variable. It can verified this result in the Figure 1.

It also can be observed the students which have families that receive between 2 and 3 minimum salaries (2 a 3 SAL) read Comic Books, the ones which receive between 4 and 5 minimum salaries (4 a 5 SAL) read Comic and Adventure. Those which receive between 11 and 20 minimum salaries (11 a 20 SAL) read Diverse Books and Others types. The categories Romance, Tale, Fiction, Magazines and Religious Books are not associated to any category of the Income variable. It can verified this result in the Figure 2.

To analyse if the parents educational level and the family income influence in the investigated students reading habit it was used the Multivariate Chernoff Faces Technique, pointing out the following points: (1) The face shape represents the student reading habit, if the face is oval, the student has reading habit and if it is round, the student does not have reading habit; (2) The ear
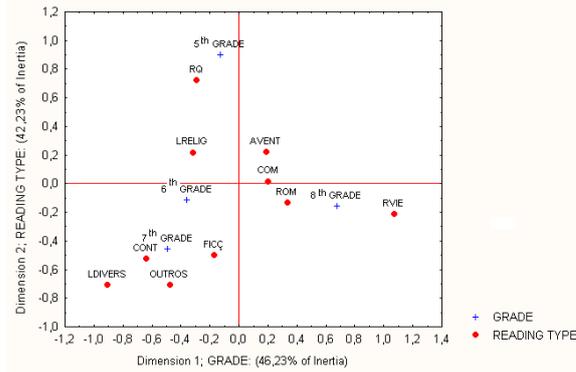
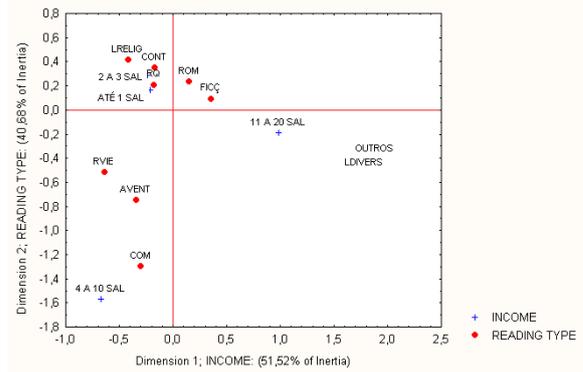Figure 1: Correspondence analysis percentual map of variables grade versus reading type


Figure 2: Correspondence analysis percentual map of variables income versus reading type

ray size represents the mother educational level, the bigger the ear ray, the more instructed the mother is; (3) the eyes eccentricity represents the father educational level, the bigger the eyes size, the more instructed the father is; (4) the mouth curvature indicates the family income: (*i*) if the mouth is curved down, indicates that there is not information about the family income, (*ii*) if the mouth has a soft curvature down, the family gains until 1 minimum salary (*ATÉ 1 SAL*), (*iii*) if the mouth is straight, the family receives between 2 and 3 minimum salaries (*2 a 3 SAL*), (*iv*) if it is a mouth slight curvature up, the family receives between 4 and 10 minimum salaries (*4 a 10 SAL*) and (*v*) if the mouth curvature is to up (like a smile) the family receives between 11 and 20 minimum salaries (*11 a 20 SAL*).

Each grade was separately analysed to verify if the parents educational level and the family income influence in the students reading habit. Totally, it was interviewed 187 students. In the grades arrangement of the Particular School, it was observed that the majority of students parents are graduated and their children read frequently, but it also was verified that parentes that get Incomplete or Complete *Ensino Médio* and Incomplete or Complete *Ensino Fundamental*, the children frequently read. In relation to Income, it was observed that these students families receive around 11 to 20 minimum salaries. At Public Schools, the educational level more observed among investigated students parents is Incomplete *Ensino Fundamental* and their children has reading habit and the income of majority of these families is until 1 minimum salary.

PARTICULAR SCHOOL
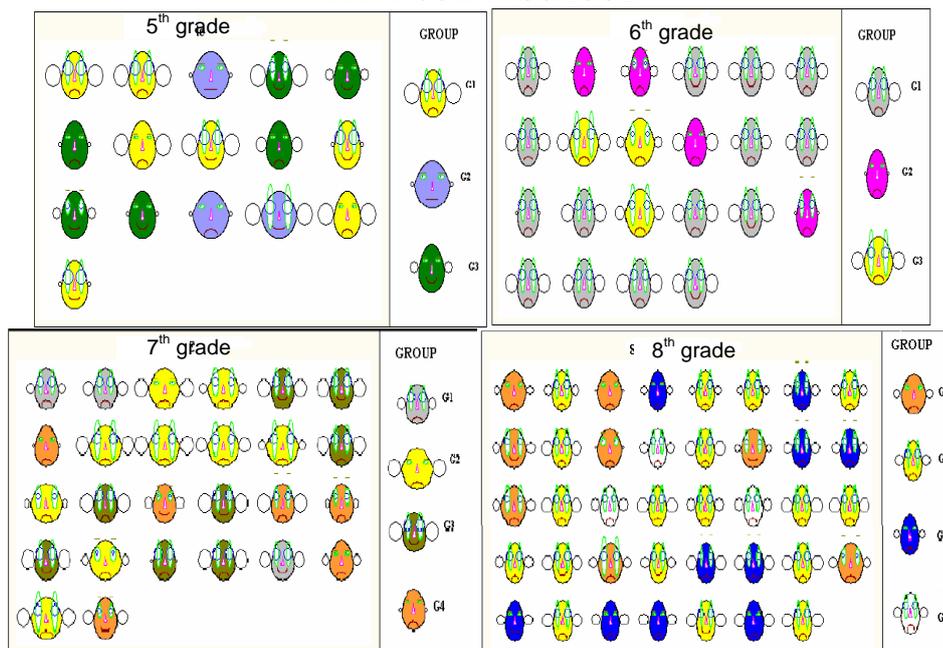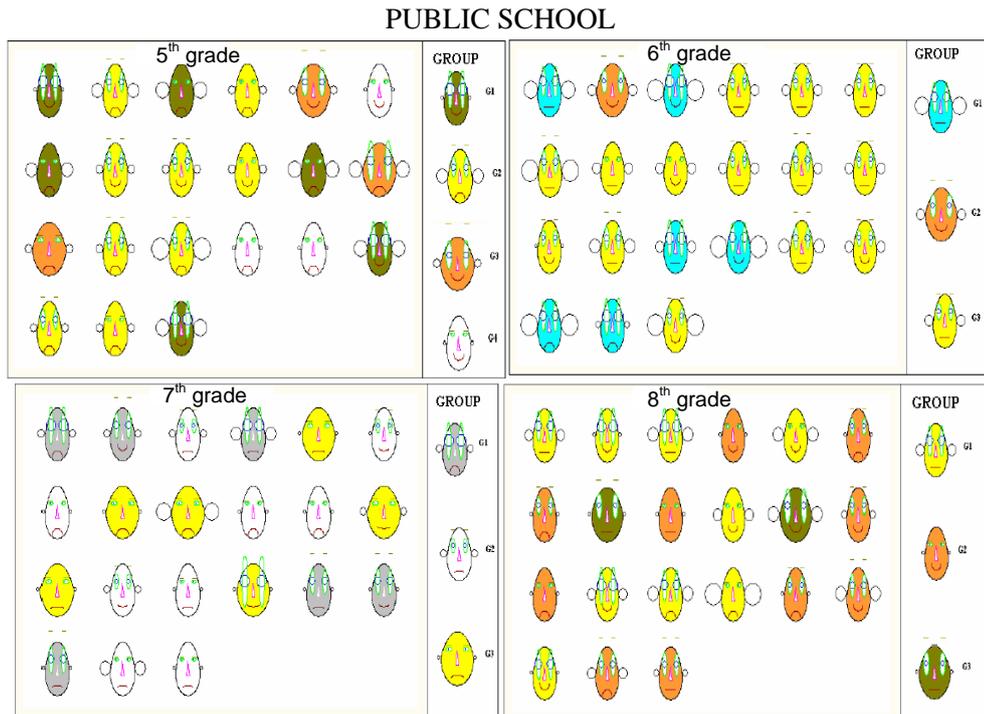
PUBLIC SCHOOL

CONCLUSION

This work presents a statistical methodologic procedure that has as objective to verify if the students socioeconomic relation from a Public School and other from a Particular School, both from Belém of Pará, Brazil, intervenes in the students reading habit. For that, it was used the statistical techniques of Stratified Sampling, Correspondence Analysis and Chernoff Faces as a combined form. In Correspondence Analysis was showed that 5th grade students from both schools prefer to read comic books, while 6th grade students read tales, the ones from 7th grade like to read diverse books and others types of magazines and the 8th grade students prefer to read romance and magazines like: *Veja, IstoÉ* and *Época*. In relation to students family income, it was verified that: the families which receive between 2 and 4 minimum salaries read comic books, the ones which reveive between 4 and 10 minimum salaries read comic and adventure. Families which gains between 11 and 20 minimum salaries read diverse books and others. In the Chernoff Faces technique, it was verified that these students family income does not intervene in the students reading habit as it does not matter they gain 1 or 20 minimum salaries, these students reading habit is the same. As for the parents educational level, it was observed that as parents who has university level as the ones who has *Ensino Fundamental* or *Ensino Médio* stimulate their children to read, so the socioeconomic relation of these investigated students does not influence in their reading habit. Thus, it is concluded that the found results indicate that lower class students with parents of little education get the reading habit at school through programs of reading incentive.

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