INDUZIONI
Demografia, probabilità, statistica a scuola

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ABSTRACTS

CRYPTOGRAPHY: AN INTERPLAY AMONG DIFFERENT DISCIPLINES

ALFREDO RIZZI

Cryptography (from κρυπτός, hidden), the study and creation of secret writing systems in numbers or codes, is essential to the development of digital communication which is absolutely private insofar as being impossible to be read by anyone to whom it is not addressed. Cryptography seeks to study and create systems for ciphering, verifying and authenticating the integrity of data. One must make the distinction between cryptanalysis, the research of methods an enemy might use to read the messages of others, and cryptography. Cryptography and cryptanalysis are what make up cryptology.

MESSAGGES FROM THE HILL
THE STATISTICAL ANALYSIS OF TEXTUAL DATA
AND THE END-OF-YEAR ADDRESS
OF THE PRESIDENT OF THE ITALIAN REPUBLIC (1948-2006)

ARJUNA TUZZI

The traditional End-of-Year Address is an important media event and a peculiar civil ritual (unique in its kind) because the President addresses directly the Italian citizens. Besides the obvious contents of good wishes and solemnity, the texts of the presidential addresses are a rich source of information on the last fifty years of the Italian history. The comparison and contrast of the addresses is revealing of the changing habits and morals of the country and of the differing personalities of the Presidents. For this reason, an interdisciplinary research team of the University of Padova, composed of linguists, historians, politologists, sociologists, and statisticians, has started a research project aimed at analyzing the corpus of all the Italian presidential addresses from different disciplinary perspectives (Cortelazzo and Tuzzi, 2007).

Statistical and linguistic procedures were implemented to analyse the corpus composed of fiftyseven addresses delivered by nine Presidents of the Italian Republic in the period 1948-2006. These addresses were compared and contrasted in order to identify the characteristic lexical features of the Presidents' language and to highlight differences and similarities in discourse practices. The results evidenciate that individual characteristic features and personal traits are more important than other factors: End-of-Year Addresses topics often appear unpredictable because what the President decides to say (or not to say) and how remains to a large extent a personal choice. The proposed methodology is an attempt to link traditional qualitative methods and modern statistical analysis of textual data.

STATISTICAL REASONING: A FUNDAMENTAL TOOL FOR THE CITIZEN

DANIELA COCCHI

Statistics is an important aid for citizens, but it is not actually taught in schools. Instead, it is used as a tool for better understanding fundamental mathematical concepts. But its added value stands in applied problems: statistics is able to manage variability and uncertainty, and requires the elicitation of the starting hypotheses and resulting interpretation.

STATISTICS IN THE SCHOOL OF TODAY: HOW AND WHY

ALBERTO ZULIANI

To know how to find, read and interpret statistical data is essential for every citizen. Statistics and Probability introduce uncertainty, help to handle it, promote tolerance towards the ideas of others and clear the mind of superstitions. Statistics can interact with other disciplines: physics, chemistry, geography, history, literature; it is a bridge to deal with interdisciplinary problems. It is a task of academic and official statisticians to produce and make available simple teaching materials and support teachers in their use at school.

PROBABILITY AND STATISTICS, ARM IN ARM IN SCHOOL, UNDER A MATHEMATICS TEACHING UMBRELLA

GIUSEPPE ANICHINI

In this paper, we address two Roundtable topics: the frequent absence of statistics topics in the usual school curriculum and the efforts jointly done by the Italian Mathematical Union (UMI) and the Italian Statistical Society (SIS) in order to develop both teachers' familiarity with statistics (and probability) and their willingness to deal with these subjects. We try to describe, as a result of the UMI and SIS joint work, a new professional development program for primary and secondary school mathematics teachers in which mathematics (i.e. numbers, geometry, relationships, probability and statistics), is considered from the point of view of its usefulness for citizens. A crucial attention will be paid to coping with uncertainty, seen as the main mathematics topic related to statistics and to probability and chance.

DATA AND PREVISIONS IN THE FIRST CYCLE SCHOOL LEVEL IN ITALY: A PRACTICAL EXPERIENCE

GRAZIA LAGANÀ

The teaching/learning of statistics at primary and lower secondary level in the "Istituto Maria Ausiliatrice" of Soverato (Catanzaro-Italy) were concretely experienced from 2002 to 2008 with the aim of educating students to think deeply about facts, not remaining at their surface. The teaching method consisted in joining real world and theoretical knowledge. Interdisciplinary vision of problems, implementation of a scientific research methods, focus groups, and seminars of expert people were the basis for facing the statistical study of social phenomena. Students' discussions and their contributions to posing and solving problems came in

evidence as a way to construct students' knowledge. From 2002 to 2008, 199 students exposed to this kind of teaching/learning activities firmly conceived the basic descriptive statistics concepts.

STATISTICS ITEMS IN THE ITALIAN STUDENTS' ASSESSMENT CARRIED OUT BY THE ITALIAN NATIONAL INSTITUTE FOR THE EVALUTATION OF THE EDUCATION SYSTEM (INVALSI)

MARIA PIA PERELLI D'ARGENZIO

The evaluation of the education system in Italy began in the late 1990s due to the "school autonomy" law. In that occasion a National service (INVALSI: National Institute for the Evaluation of the Education System) was established in order to evaluate the productivity and the effectiveness of the school system as a whole as well as of each school in the country. Concurrent with this, activities began to be developed in order to construct a widespread self evaluation culture in the Country.

This article presents both the general tasks of the Institute, the Pilot Projects and the Census Assessment Plans organised in the last years aiming to measure, school by school, the extent to which the national objectives established by the Ministry of Education have been achieved and to enable to identify any critical points. This article presents also the framework concerning Data and Previsions contents and abilities utilised for mathematics assessment. A selection of statistics items with relative scores is showed and the results are analyzed in order to get information about how Italian students actually perform in the " Data and Previsions" domain.

A SURVEY ON BULLYING AT SCHOOL

ANNA CANONICO

This work describes an activity in statistics carried out by the 19 students (aged 12) of a class of a lower secondary school and their behaviour while organizing a statistical survey on bullying at school.

The organisation of the survey, the preparation of the questionnaire, the collection and tabulation of data as well as their graphical representation asked for the definition of some technical statistics terms. The concepts of population, sample, qualitative and quantitative characteristics, absolute frequency, percentage, became familiar to the students. Finally, the students learned how to work together co-operatively, to use a spreadsheet, and a visual communication tool.