Correspondence analysis and logistic modeling: Complementary use in the analysis of age at onset of and causes mental disorder in India

The problem of mental disability is gaining more and more importance all over the world. In the present era, mental disability is a major public health problem in the society. A person is considered as mentally disabled if he/she has difficulty in understanding routine communication, shows unusual behavior, such as self talking, laughing, crying, staring with no reason, violence without provocation or reason, fear and suspicion without reason and lack of coherent memory. Many of the mental disabilities are correctable if detected early. The planners of India very well understand the significance of the problem. The government of India and also state governments have framed various policies for persons with mental disabilities: reservation jobs, concession facilities in traveling, special training institutions etc. At the same time there is a network of NGOs working for the development of persons with mental disabilities. According to Census of India 2001, ten percent of total disabled are mentally disabled. Well-documented studies the factors affecting the age at onset and causes of mental disability in India are few.

Logistic or other modeling approaches are often appropriate for studying disability data. However, health surveys may be more complex. With numerous variables, there is a need for exploratory analysis. Parsimonious description of the data is also a useful complement to modeling. Correspondence analysis may be useful in such exploratory phases. In this paper, the complementary use of the two approaches is presented in the context of a disability survey among Indian population, which focused on the relationship between age at onset/causes of mental disability and different socio-demographic factors including geographic variation (Indian States).

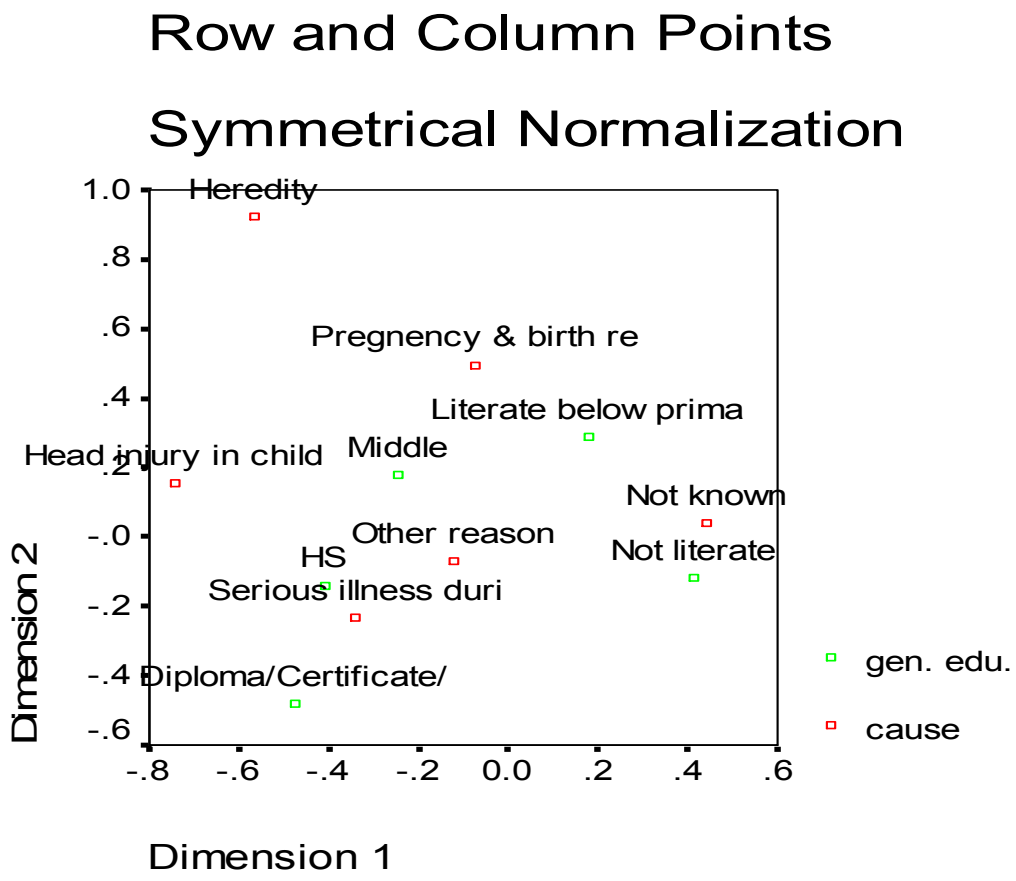
The data for this study is from the survey of disabled persons in India conducted nationwide by the National Sample Survey Organisation (NSSO), India in its 58th round during the year 2002. The survey adopts a stratified multi-stage sampling design with census villages as primary sampling units and households as second stage units which are stratified as households having at least one mentally disabled person, having at least a person with speech, hearing or visual disability and having at least a person with locomotor disability for the purpose of selecting nationally representative sample of disabled persons of these categories.

A logistic regression analysis is performed to search for significant associations of possible predicting factors with outcome after adjustment for other factors. Correspondence analysis represents a method for analyzing data in contingency tables. It is a descriptive/exploratory technique designed to analyze two-way and multi-way tables containing measures of correspondence between the row and column variables. The results produced by correspondence analysis provide information which is similar to that produced by principal components or factor analysis. Correspondence analysis seeks to represent the relationships among the

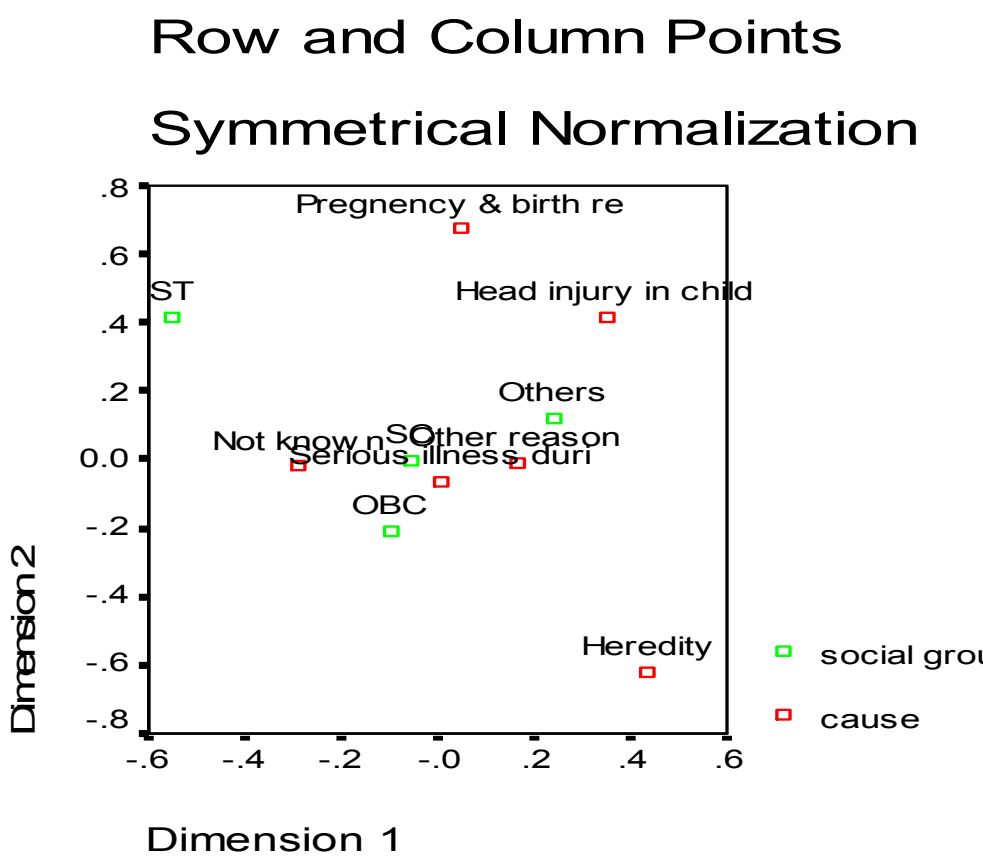
categories of row and column variables with a smaller number of latent dimensions. It produces a graphical representation of the relationships between the row and column categories in the same space. In the case of correspondence analysis, data may be nominal, ordinal or continuous. Correspondence analysis is a similar technique to factor analysis. Factor analysis determines which variable clusters are together, and correspondence analysis determines which category values are close to each other. Correspondence analysis visualizes these category values on a map, and these map values are plotted with their axes (See Figures1, 2, 3). Correspondence analysis measures the distance between variables on a map, where each variable is associated with each other.

Mental retardation can be caused by a many factors, both before and after the child is born. In India, mental disability is occurring mainly due to serious illness during childhood, head injury in childhood and pregnancy and birth related causes. The correspondence analysis is used to study socio-demographic factors that explain age at onset and causes of mental disability in India. According to this study of the dataset, age at onset and causes of mental disability in India varies with the factors like age, geographical location, caste, education, marital status, place of residency (urban and rural). The onset of mental disability peaks at ages (0-6) years and suddenly reduces at (6-15) years. But, further it peaks again at ages (15-30) years. The results indicate that around 75 percent of causes of mental disability have been reported as due to other reasons or reasons not known. Heredity is one of causes of mental disability among older age disabled. Regression analysis predicts that the causes of mental disability are found to be strongly associated with the marital status, region (urban-rural) and age-groups of mentally disabled persons. Mental problems are highest among working age

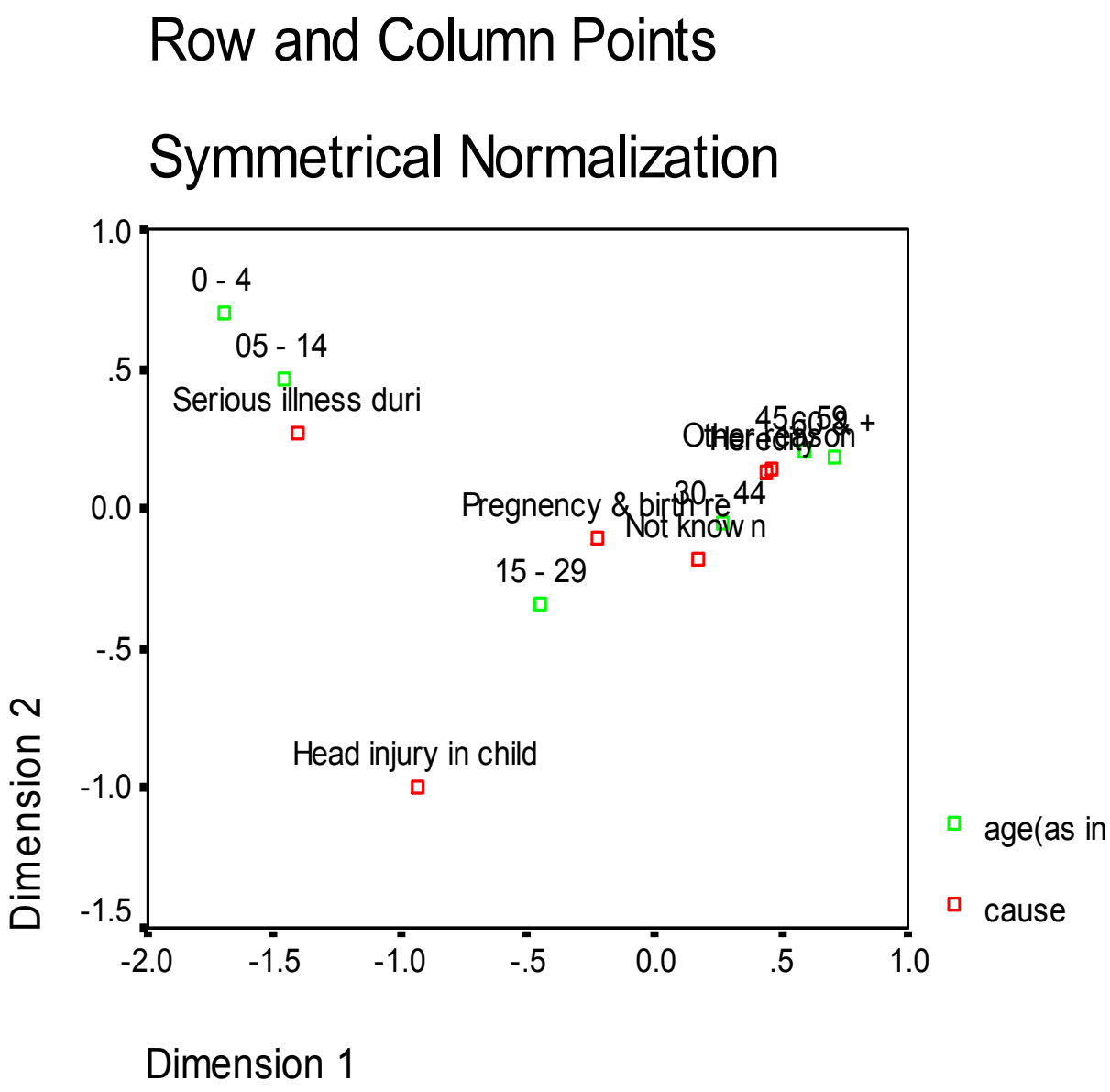
Correspondence analysis and logistic regression summarize more complex empirical observations (mental disabilities) and thus provide a means of understanding age at onset and causes of disability among Indian population. We this study will provide one of the primary steps towards proper health planning for mentally disabled persons in India.



Causes of Mental Disability Vs Education Level



Causes of Mental disability Vs Social Groups



Causes of Mental disability Vs age below 5 years