

Measuring the multiple facets of tolerance using survey data.

Misurare le molteplici attitudini alla tolleranza usando dati di survey.

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Abstract In recent studies, there has been a growing interest toward tolerance and its implications in social and economic systems. So far, the openness of people to homosexuals or to foreign-born people has been considered the best indicator of tolerant attitudes. In this paper, we consider tolerance as a multi-faced phenomenon involving several different social domains. The aim is to provide some recommendations on how to develop a multidimensional index for tolerance in the case of survey's items measured by Likert-scale. Our discussion relies on a case study about a student survey carried out at Milan-Bicocca University

Abstract *In studi recenti, c'è stato un crescente interesse verso la tolleranza e le sue implicazioni nei sistemi sociali ed economici. Finora, l'apertura delle persone agli omosessuali o alle persone nate all'estero è stata considerata il miglior indicatore di atteggiamenti tolleranti. In questo lavoro, consideriamo la tolleranza come un fenomeno dalle molteplici sfaccettature che coinvolge diversi domini sociali. Presentiamo alcune raccomandazioni da tenere in considerazione quando si sviluppa un indice composito per valutare il livello di tolleranza in caso di items di un questionario misurati con una scala Likert. La nostra discussione si basa su un caso studio su un'indagine studentesca svolta all'Università Milano-Bicocca.*

Key words: Tolerance Measure; Multidimensional Index; Ordinal data; Survey

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1 Introduction

Most studies about tolerance focus on individuals' attitudes towards homosexual people, ethnic minorities and migrants. In these works, the analysis is usually based on surveys with questions such as “*Would you like to have homosexuals as your neighbors?*” or “*Would you like to have people of a different race as your neighbors?*”¹ They are simple yes/no questions, formally known as polar questions, that give a clear-cut understanding of people attitudes. The fraction of respondents giving a positive answer is the measure of tolerance (see, for example ref. [1]). References [3] and [4] argue that openness to homosexuals is the best available indicator of tolerant attitudes.

In this paper, we adopt a wider perspective and look at tolerance as a multi-faced phenomenon involving several different social domains, so that attitudes towards homosexuals and foreign-born people are only a partial aspect of this phenomenon. We provide some recommendations of statistical nature on how to develop a multidimensional index when ordinal data are used. This is the case of surveys with Likert scale type questions that, usually, uses statements such as “*Please rate the extent to which you agree/disagree with the following*” and the response scales use anchors such as 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree, etc. One of the advantages of Likert scale survey questions is that they allow to measure attitudes and opinions with a greater degree of nuance than a simple yes/no question.

Our attempt assesses different domains of the social environment and at the same time raises considerations about how to merge all the aspects together. We rely our analysis on a survey administered to a sample of students at University of Milan-Bicocca. The multidimensional approach aggregates different dimensions of tolerance into an index. The aggregation procedure requires an explicit choice on construction of variables and weighting of dimensions. We discuss these aspects considering a student survey carried out at the University of Milan-Bicocca.

The paper is organized as follows: Section 2 describes the data and in Section 3 we make preliminary considerations about a synthetic measure of tolerance.

2 Data

To study tolerance, we use a survey addressed to university students on religiosity and inter-religious dialogue. The survey has been developed by the University of Milan-Bicocca, and it is part of a framework agreement signed by 30 Italian Universities and 25 Research Centers. The objective of the study is to investigate the relationship between “Gender and Religions” among university students. Its purpose is to survey the opinion of university students about different topics, such as

¹ Both questions are from the World Value Survey [6].

inter-religious dialogue, women/religion relationship, multicultural society, homosexuality. Questions, measured by 7-points Likert scale ², are listed in Table 1.

Table 1 Questionnaire themes

Social Domain	Item topic
Inter-religious dialogue	Inter-religious dialogue mitigates conflicts in the Italian society
	Same freedom of religious practice for all religions in Italy
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Women/religion relationship	Women priests into Catholic Church
	Women can pray together with Muslim men
	Women rabbis into Jewish religion
Death/religion relationship	Voluntary interruption of pregnancy
	Eutanasia is socially acceptable
Multicultural society	The marriage between people of different religions
	The marriage between people of different ethnic communities
	Italian society is enriched by foreign people
Homosexuality	All States should legally recognize same-sex marriage.
	All States should legally recognize the child adoption by same-sex couples.

Because of the sensitivity of topics surveyed and in order to preserve the privacy of respondents, the questionnaire has been administered via Pencil And Paper Interview (PAPI) without saving any identification details. The sample interviewed is composed of 3,386 bachelor and master students from different fields: humanistic studies, legal, political, economic and statistical sciences .

The gender distribution is very unbalanced showing a severe prevalence of females (73.10%) respect to males (25.90%). However, we observe the same proportion for the students' population at the university of Milano-Bicocca. Also nationality and residence show an unimodal frequency distribution, with a maximum in correspondence of labels "Italian" (81.13%) and "Milan metropolitan area" (41.04%), respectively.

3 Measuring Tolerance: considerations for a quantitative synthesis

As mentioned in the Introduction, the main challenge of this work is to point out some issues arising when tolerance is analyzed from a multidimensional perspective.

First, the metric of variables included in the aggregation procedure should be homogeneous. Combining data measured by different scales or mixed data types

² The answers ranged between 1 = Strongly Disagree to 7=Strongly Agree.

means transforming one or more variables, to allow for statistical or thematic analysis on all information available [2].

Second, the functional form used to aggregate items should take into account the type of relationship between items. For example, a linear additive form assumes that items are independent. It should be verified that they are actually independent and, if so, this would be a necessary and sufficient condition for a proper composite indicator [5]. On the other hand, the additive aggregation function permits the assessment of the marginal contribution of each variable separately, therefore it would be optimal if a measure of tolerance could be defined into an algebraic sum of alternative domains. If items are correlated, then a geometric functional form should be preferred the linear one.

Third, the aggregation procedure should take into account the variability in the distribution of each item. Items with a uniform distribution across individuals should have a lower weight than items characterized by a dominant rating-value. Indeed a uniform distribution implies a strong heterogeneity in the subjects' responses.

In conclusion, an ideal composite index should be able to deal with all the issues listed above or, in alternative, should be the result of a compromise between different requirements.

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