# Assessment of recent social attitudes in Japan: a latent class item response theory model for web survey data

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**Abstract** We illustrate a latent variable model included in the class of finite mixture models to analyze data from the Social Stratification and Social Psychology Project in Japan. The aim of the web-based survey carried out in December 2018 by an internet marketing research company is to identify and examine recent tendencies among the Japanese society by considering responses on social cognition and attitudes. It is important to understand the views that people hold about the social world and their evaluations of it. It is also important that how and whether diverse types of social attitudes differ by people's position in the society, such as social stratification position, generation, region, and gender. Survey requests were sent by email to target individuals chosen from a panel of more than 10 million members aged between 20 and 64 who have agreed to participate in online surveys and that are selected according to demographic quotas such as prefectural census population, age distribution, and gender. All participants received modest amount of voucher-based incentives for their time and effort.

We deal with a latent class-item response theory model for multivariate polytomous responses that is adapted to account for the web survey features. The model allows us to identify individual differences through the items of the questionnaire. Maximum likelihood estimation is performed through the Expectation-Maximization algorithm and the individuals are clustered by considering model selection principles such as BIC or the AIC. The model allows for predictions according with the maximum a-posteriori probability of the latent variable.

**Keywords** classification; Expectation Maximization algorithm; latent trait model; survey methodology

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