Longitudinal Multidimensional Item Response Modelling in Preschool Children's Mental State Understanding

Vilma Susana Romero Romero[1]

[1] Department of Mathematics and Statistics, Lancaster University, UK

Theory of Mind is the ability that allows an individual to understand what others believe, desire or think and to anticipate how they might react in a given situation based on that knowledge. This ability is known to be developed at around 4 to 5 years old and its acquisition is very important as it helps us to interact properly in the social environment. Researchers have been studying this topic since many years ago and there exist different mental states tasks to assess the ability in young children. In this study, 86 very young children (starting with ages around 32 months) were assessed with different mental state tasks three times over 4 months intervals in order to evaluate if there is an important manifestation and improvement of the ability for this range of age, which is over a year before they are supposed to pass the tests in this context. For this purpose, Multidimensional Item Response Theory was employed first to reduce the dimensionality concerning Theory of Mind. Then, each latent dimension found was evaluated under the Bayesian Longitudinal approach and the continuous unobservable abilities of the child at each time point were obtained. This last output helped us to build a causality diagram in which it can be shown how each ability is affected by all the others abilities at previous times. One of the main findings was that the construct of Theory of Mind can be comprised of 6 latent dimensions which are Non Verbal False Belief, Pretense, Desire and Think, Verbal False Belief, Deceptive Box, Narrative and Location Change. Moreover, it was found that Pretense, Desire and Non Verbal False Belief tasks were the abilities that evolved more in the study period of time. Finally, regarding the causal analysis, it can be highlighted that Time 3 measures are best predicted by Desire, Pretense and Think measures at Time 2.