Using Principal Stratification to Detect Mode Effects in a Longitudinal Setting

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Longitudinal studies serve the purpose of measuring changes over time; however, the validity of such estimates can be threatened when the modes of data collection vary across periods, as different modes can result in different levels of measurement error. This study provides a general framework to accommodate different mixed-mode designs and thus has the potential to support mode comparisons across studies or waves. Borrowing from the causal inference literature, we treat the mode of data collection as the treatment. We employ a potential outcome framework to multiply impute the potential response status of cases if assigned to another mode, along with the associated potential outcomes. After imputation, we construct principal strata based on the observed and the predicted response status of each case to adjust for whether a participant is able to respond via a certain mode when making inference about mode effects. Next, we estimate mode effects within each principal stratum. We then combine these estimates across both the principal strata and the imputed datasets for inference. This analytical strategy is applied to the Health and Retirement Study 2016 and 2018 core surveys.