



THE UNIVERSITY OF
CHICAGO

DEPARTMENT OF STATISTICS

MASTER'S THESIS PRESENTATION

KWONG WAI MAN
Department of Statistics
The University of Chicago

Modeling subject-level variances on intensive longitudinal data: An application of mixed-effects location scale model

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ABSTRACT

Longitudinal studies with intensive collection of repeated measurements from subjects generate a relatively large amount of data, compared with traditional longitudinal study designs. The intensive nature of the data aids the modeling of variances both at a between-subject level and at a within-subject level, which could be of substantial research interests. Mixed-effects location scale model augments the linear mixed-effects model by modeling the between-subject and within-subject variance as functions of the covariates, along with the random scale effect term that enables within-subject variance to differ beyond the effect of the covariates. In this article, the theoretical foundations of the mixed-effects location scale model are presented, followed by an application of the model on two prior research studies that only examined how the covariates are associated with the mean but not the variances of psychological and cognitive metrics outcome variables.