MARKETING COLLOQUIA
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INFERRING INDIVIDUAL PREFERENCES AND INTRAGROUP DYNAMICS WITH AGGREGATE AND DE-IDENTIFIED DATA: AN APPLICATION TO TARGETED TV ADVERTISING

ABSTRACT: When there is a lack of rich individual-level data, marketers are typically restricted to modeling choices and consumption processes at the aggregate level (e.g., household level) and ignore intragroup heterogeneous individual preferences and intragroup dynamics, thus potentially misunderstanding individual-level preferences. This paper proposes a joint consumption model that accounts for intragroup dynamics, state dependence, and observed and unobserved heterogeneity, which marketers can estimate with just aggregate and de-identified data. The proposed model can disentangle three confounded components of intragroup dynamics: 1) preference revision or when an individual's preferences depend on the preferences of others, 2) behavioral interaction or when an individual's consumption utility depends on the choices of other group members, and 3) decision power or the influence an individual exerts when his or her group makes a decision. The identification relies on two main sources: single-member households and variation of available choices over time, which is demonstrated by theoretical proofs, a series of simulations and empirical validations. In a series of simulations, we show that ignoring intragroup heterogeneous individual preferences and intragroup dynamics results in biased estimates and yields several consequences. We apply our model to a household TV viewing and targeted TV advertising setting using Nielsen People Meter (NPM) data by pretending that we don't know which individual within the household is watching. Finally, we conduct a series of calibrated counterfactual simulations demonstrating that our proposed model will enable advertisers to significantly improve the efficiency of targeting intragroup individuals.

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