Network size: Measurement and errors
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Ai Rene Ong, Yibo Wang

Respondent driven sampling (RDS) is a sampling method that leverages the respondents' networks to reach more members of the target population. In RDS, the size of the respondents' social network (also known as personal network size (PNS), or respondent's degree) is important in both the study operations and in estimation. A commonly used estimation of degree is the self-reported data from the interview, which typically has substantial measurement error, and, specifically, is found to be frequently rounded to a multiple of five. Measurement error in the PNS can introduce biased estimates for RDS, especially if the misreporting of the degree is associated with the outcome to be estimated.

This brown bag will present two related studies on the measurement of PNS. The first study uses two sets of data; 1) semi-structured in-depth interviews conducted over Zoom with 19 adult respondents of various ages, gender identities (transgender, nonbinary, cisgender), race, and sexual orientations (gay, lesbian, bi), 2) an RDS web survey targeting the adult LGBT population (n = 394). Thematic analysis conducted on the semi-structured interview transcripts showed a large variation in how respondents define "knowing" someone; for some respondents, it covers a larger network than the "recruitable" network (the network of people respondents are likely to think of recruiting to an RDS study). Meanwhile, the web-RDS shows that the more restrictive PNS questions yielded more realistic ranges for a "recruitable" network, with less proportion of rounded responses on the more restrictive PNS questions.

Motivated by the desire to improve the degree estimation in RDS, the second study presents a latent variable model to make inferences about participants' actual degrees and potential reporting behaviors. Specifically, individual-level degree estimation will be obtained by revealing the association between the actual degree and relevant personal characteristics and blending their response to "How many [a particular sub-population] do you know in the target population?" Simulation studies demonstrate that the proposed method delivers sensible estimations about the individual degree.

Bios:

Ai Rene Ong works at American Institutes for Research (AIR) as a Researcher/Survey Methodologist in the area of Education Statistics. She graduated with a PhD in Survey Methodology from the University of Michigan in 2022. Her dissertation research was on the measurement of network size and the mechanism of peer recruitment in Respondent Driven Sampling — a sampling method typically used for hard-to-sample populations.

Yibo Wang is a 3rd year Ph.D. candidate from the department of Biostatistics. She is now working with Dr. Sunghee Lee and Dr. Michael Elliott on measurement estimation in Respondent Driven Sampling