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Impact of University Admission on Freshmen' Egocentric Network

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Quantitative understanding about the structure and dynamics of social systems has been developed considerably during the last years due to the recent availability of large datasets collecting digital footprints of millions of individuals. One of the most promising direction of studies involves call detail records (CDR) as mobile phones became personal items of our everyday life. These advancements give us the opportunity to capture automatically temporal data of human interactions.

Based on these advancements, we provide insight about the effects of marking events on the structure and the dynamics of egocentric networks. More precisely, we study the impact of university admission on the composition and evolution of the egocentric networks of freshmen. We use an anonymized CDR sequence provided by a single telco operator in Mexico, which records time resolved call and SMS interaction events between 92M individuals over 2 years [1]. The anonymized ids of this social communication network are coupled with a bank dataset providing individual attributes (age, gender, postal code), and the evolution of the economic status (wealth, income, and debts) over 6 months of 6M customers of a single bank in Mexico, from which 12,000 are freshmen at different universities. This combined dataset gives us the opportunity to estimate the socioeconomic status of students, and to follow their egocentric network evolution starting 6 months before their university admission, up to 18 months after this marking event.

We study two questions about the impact of university admission on egocentric networks of freshmen. Taking the initial "before school" period as a reference, we study the creation and decay of social ties after the ego was placed in a new social environment. Using Jensen-Shannon divergence, we show how the structure and composition of one's egocentric network dynamically change over time. Earlier studies [2] suggest persistent individual patterns in the egocentric network structure, which are invariant of the actual social environment. Second, we are interested in the role of status homophily in the creation of new social ties. In other words, we study whether university helps to build connections between egos from different socioeconomic classes, or new social ties emerge via homophilic effects between students of similar economic status.

References

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[2] C. Sarraute, P. Blanc, and J. Burrone, *ASONAM, IEEE/ACM* 836 - 843 (2014).