Copresence Seasonality in Egocentric Personal Networks

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Study Description

Opportunities for individuals to interact with their friends, kin, and colleagues wax and wane with the various schedules they follow. While the growing literature on network dynamics has uncovered periodic and episodic effects on discrete interactions (such as email exchanges in an organization) over time, little is known about the extent to which copresence in individual networks varies in everyday settings. Using data from the American Time Use Survey, the amount of time individuals are copresent with members of personal networks is analyzed for temporal variability. Because children and life partners (e.g., unmarried couples, spouses) tend to occupy a disproportionately large share of individuals' social lives, analyses here are limited to friends, non-immediate family members, and others.

Data

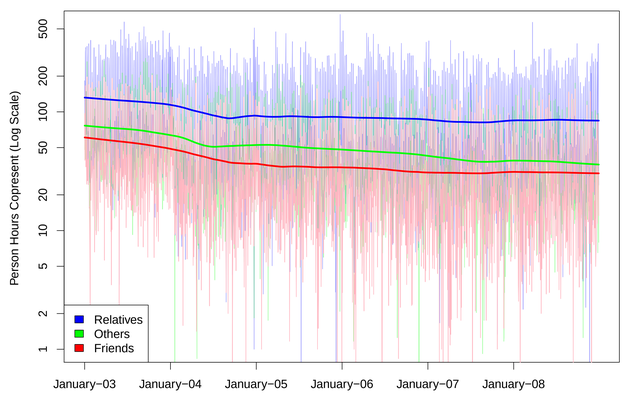
The data come from the pooled 2003-2008 American Time Use Survey (ATUS), collected by the U.S. Census Bureau. The ATUS dataset contains information about how Americans spend their time, and whom they spend their time with, on a single day in their lives. The data used here have been adjusted for uneven sampling across the days of the week.

Data Descriptives

- Individuals = 85,643
  54% Female, Median Age = 44
- No. Activities = 1,325,235
  (excludes sleeping/personal acts)
- 55% of Time Use Copresent with Others
- Copresence Time by Relation:
  52% Family, 21% Friends, 27% Others
- No. of Days = 2,134

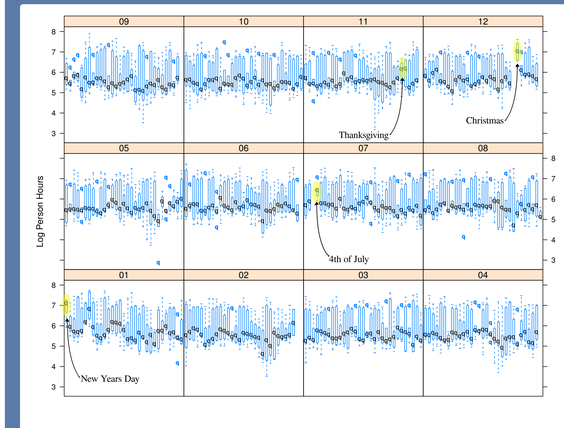
Seasonality Plots

Time Series of Copresence by Day Comparing Relation Types (2003–2008)



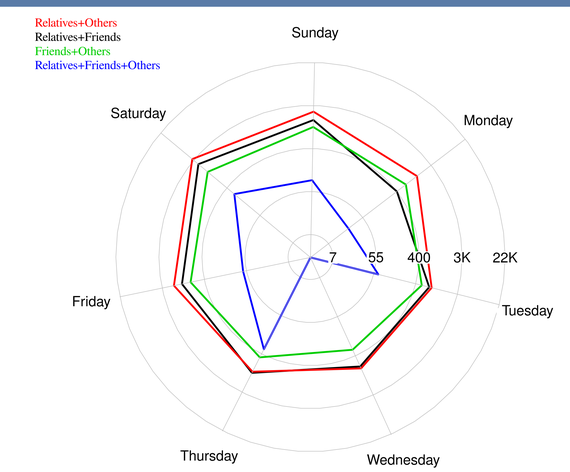
This time series plots six years of copresence volume, as measured in person hours (logged), in egocentric personal networks for three types of relations. The time series illustrates that the differences in long term copresence volume for these types of relations tend to be a matter of scale. Kernel-smoothed lines are fitted through each time series. Interestingly, copresence with non-immediate family members (i.e., the relatives line) and friends tend to have similar trajectories over time, with non-friends (i.e., the others line) exhibiting a more erratic series.

Time Series of Weekly Copresence Distributions by Month Major Holidays Highlighted



Averaging across all years, this time series plots the copresence volume in the ATUS dataset by days nested in months for all types of relations analyzed here. Weekly seasonality effects with no obvious trend are apparent in each month. Some peaks and outliers in the data appear to be associated with major US Holidays, demonstrating the importance of discrete events in interrupting both seasonality effects, in particular, and the probability of interaction more generally.

Radial Plot of Mutual Copresence by Day of the Week



The previous two plots used a "union rule" in aggregating person hours copresent with a particular type of relation, which ignored combinations of copresence between different types of alters. Here, we consider mutual copresence, which is defined as exclusive combinations of spending time with two or more relation types. While overall copresence tends to follow weekly seasonality, mutual copresence tends to be rather stationary for these groups. Egos tend to get together collectively with their relatives, friends and others on the weekend and tend to not do so in the middle of the week.

Summary

- Seasonal patterns in copresence volume, as measured in person hours spent between egos and their alters, were evident across weeks and months.
- No strong seasonal patterns emerged from the year-to-year time series, though a slight negative trend was observed, which may be due to error
- Weekly seasonality tends to arise for aggregated copresence volume but is less dominant in mutual copresence volume.

Applications

- Population-level summaries of social interaction
- Relates micro-level behavior to macro-level phenomenon
- Illustrate importance of discrete schedules on likelihood of interaction with different types of relations
- Useful in selecting informative priors

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