project 4: STDs

Internet mediated prostitution: sexual contacts between 6,624 escorts and 10,106 sex buyers extracted from an online community

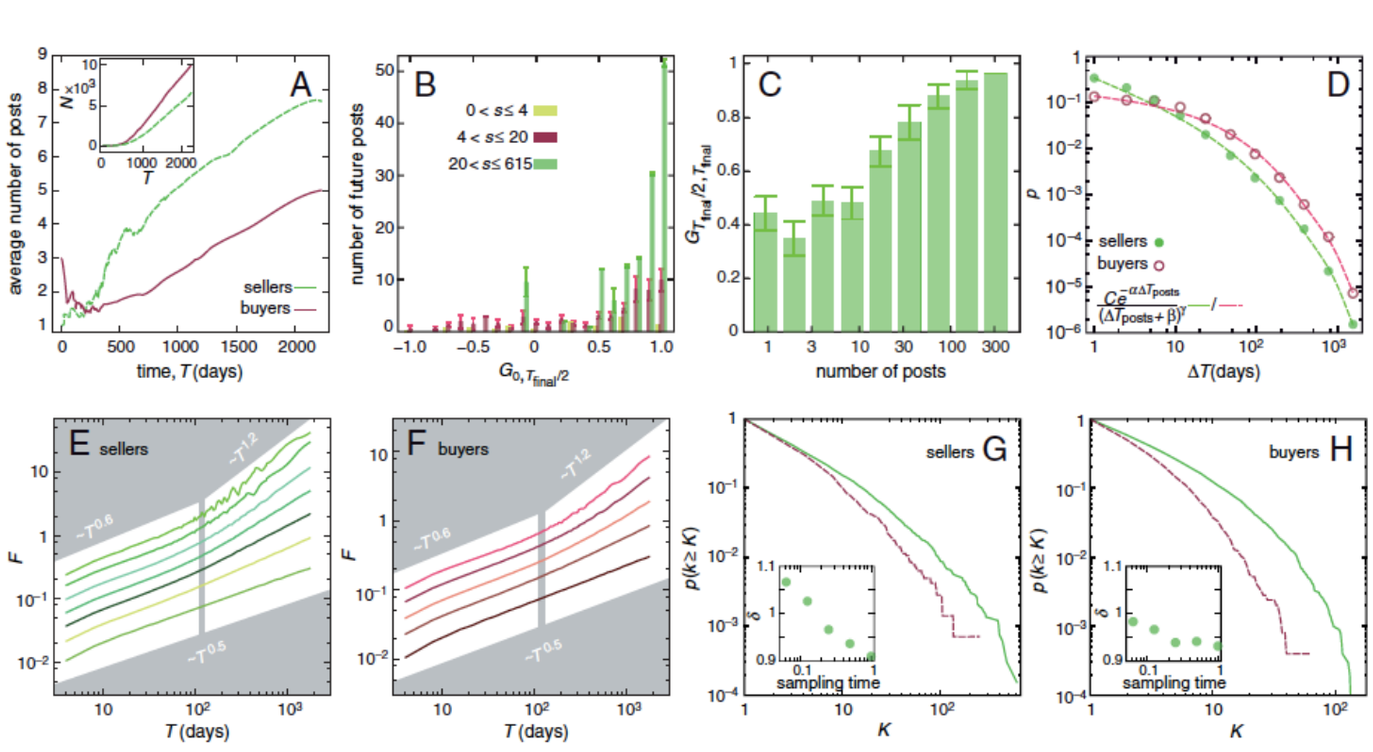

Fig. 1. Statistics of the dynamics of the community. (*A*) Time evolution of the average number of posts by sex buyers and about sex buyers. The *Inset* shows the growth in the number of sex sellers and sex buyers in the data. (*B*) The number of new posts according to the previous average grade at $T_{\text{final}}/_{2=1,116\ \text{days}}$ for three different activity levels, or total number of posts, *s*. The R^2-values of these data are 0.19 ($0 < s \leq 4$), 0.29 ($4 < s \leq 20$), and 0.33 ($20 < s$). (*C*) The average future grade of sellers as a function of their number of contacts at half of the total sampling time (the data is logarithmically binned along the abscissa). (*D*) Shows the distribution of the time elapsed between two posts T_{posts} for buyers and sellers. Many posts were written during the same day, respectively, $p(T_{\text{posts}} = 0) = 0.495$ and $p(T_{\text{posts}} = 0) = 0.246$. The distributions are well fitted by $p(T_{\text{posts}}) = C\exp(-\alpha T_{\text{posts}}) = (T_{\text{posts}} + \beta)^{\gamma}$, with: $C = 2.9 \pm 0.5$ days$^{\gamma}$, $\alpha = 0.0023 \pm 0.0001$ days^{-1}, $\beta = 3.1 \pm 0.4$ days, and $\gamma = 1.49 \pm 0.04$ (for sellers); and $C = 12 \pm 8$ days$^{\gamma}$, $\alpha = 0.0021 \pm 0.0002$ days^{-1}, $\beta = 18 \pm 4$ days, and $\gamma = 1.5 \pm 0.1$ (for buyers). (*E*) and (*F*) shows statistics the DFA fluctuation function as a function of the time-scale ΔT for sellers and buyers, resp. The different curves correspond to different activity levels—from bottom to top they represent less than 3, 3–7, 8–20, 21–54, 55–148, 149–403, and more than 403 posts (about sellers or from buyers) resp. *Black Lines* are inserted for reference. $T^{1/2}$ corresponds to uncorrelated interaction. (*G*) and (*H*) show degree distributions for sex sellers (*G*) and buyers (*H*) cumulative degree distributions for the full sampling time (*Solid Line*) and a yearlong window (starting one year after the full dataset; *Dashed Line*) for sex sellers and -buyers, resp. The *Insets* show the exponent of preferential attachment (Eq. 1).

Dataset made available
[LEC. Rocha, et al, PNAS 2009]

Study the impact of the structure of the network on the dynamics of an infection by comparing simulations on this network with simulations on randomized reference models