Searching Our Cognitive Social Networks: How We Remember Who We Know

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Abstract

Recalling people we know is a key cognitive function, influencing studies of contagious disease, how we see our relative position in the world, and who we invite to our weddings. Whereas social memory has often been studied independently from other memory research (e.g., Bond et al., 1985; Brewer et al., 1995), we focus here on possible parallels with search in other domains—in particular the thesis that search of social memory is governed by similar rules and processes as those that guide search in semantic memory and may involve executive processes. Such a connection would involve two claims: First, search in social memory dynamically transitions between local and global search strategies (similar to search of associative memory; SAM, Raaijmakers & Shiffrin, 1981). Second, as proposed for a domain general executive search process (Hills et al., 2010; Hills et al., 2008), dynamic transitions from local to global search criteria should recruit the general control of attention.

We investigated these possibilities by modeling how people recall social contacts and also by investigating to what extent this search process correlates with working memory capacity. We examined the role of social categories, social proximity, and frequency factors as well as the dynamic character of search in social memory by developing a new task, the *social fluency task*, which asks participants to recall the first 35 'people that they know'. Participants then reconstructed the social network based on all pair-wise interactions between those 35 individuals (see Figure 1), and provided, for each recalled individual, their frequency of encounter with them as well as their social category (partner, family member, friend, or acquaintance). Participants also took a working memory span task, the automated operation span task (Unsworth et al., 2005).

To disentangle the possible role of different retrieval structures, we compared several computational models that differed in the assumed cues governing the underlying sequential search process. We used a model framework similar to SAM (Raaijmakers & Shiffrin, 1981), which probes memory with a specific set of cues. Local cues were taken to represent social category or social proximity, based on the last item recalled. Frequency, being independent of recent recall, was taken as the global cue.

We found that while—consistent with prior research (Bond et al., 1985; Brewer et al., 1995)—recall was structured in terms of social categories, models using social proximity and frequency information predicted participants' recall patterns best. Furthermore, dynamic models that made local-to-global transitions where they were predicted by social proximity outperformed dynamic models making transitions predicted by social category. Finally, as proposed by a domain general executive search process, the observed dynamic transition rate between different retrieval structures was inversely correlated with working memory. Importantly, clustering coefficient for individual social networks did not differ in relation to operation span. Our results highlight a neglected parallel between semantic and social memory, and support the thesis of a domain-general executive search process that directs search by maintaining perseveration on local subgoals while inhibiting competition from other potential goals (i.e., targets of attention).

References and Relevant Publications

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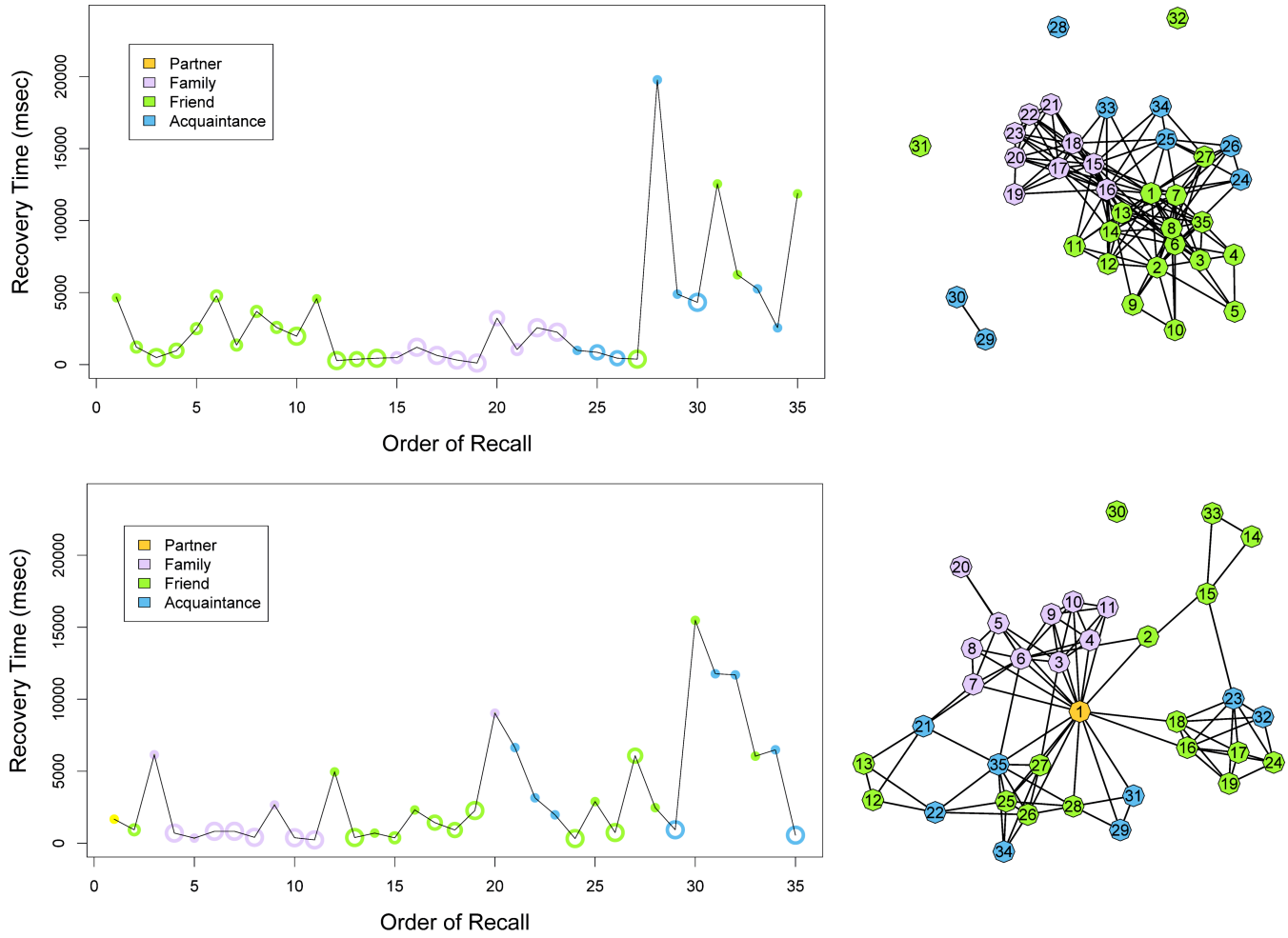

Figure 1. Typical retrieval patterns for two participants and their corresponding social networks. Dots represent individual recoveries. Size indicates the social proximity with the individual retrieved previously, with the smallest, closed dots having no social proximity with the prior individual, and larger dots having the highest social proximity with the prior individual. Social networks to the right correspond with the retrieval patterns on the left. Numbers inside vertices indicate the order of retrieval. The participant in the upper frame has an operation span of 44. The participant in the lower frame has an operation span of 27.