

The basic p-friendship model:

$$\log\left(\frac{p_{ij}}{1 - p_{ij}}\right) = \beta_0 + \beta_s s_i + \beta_r r_j + \delta X_{ij} - |z_i - z_j|$$

★ **p-Model:**

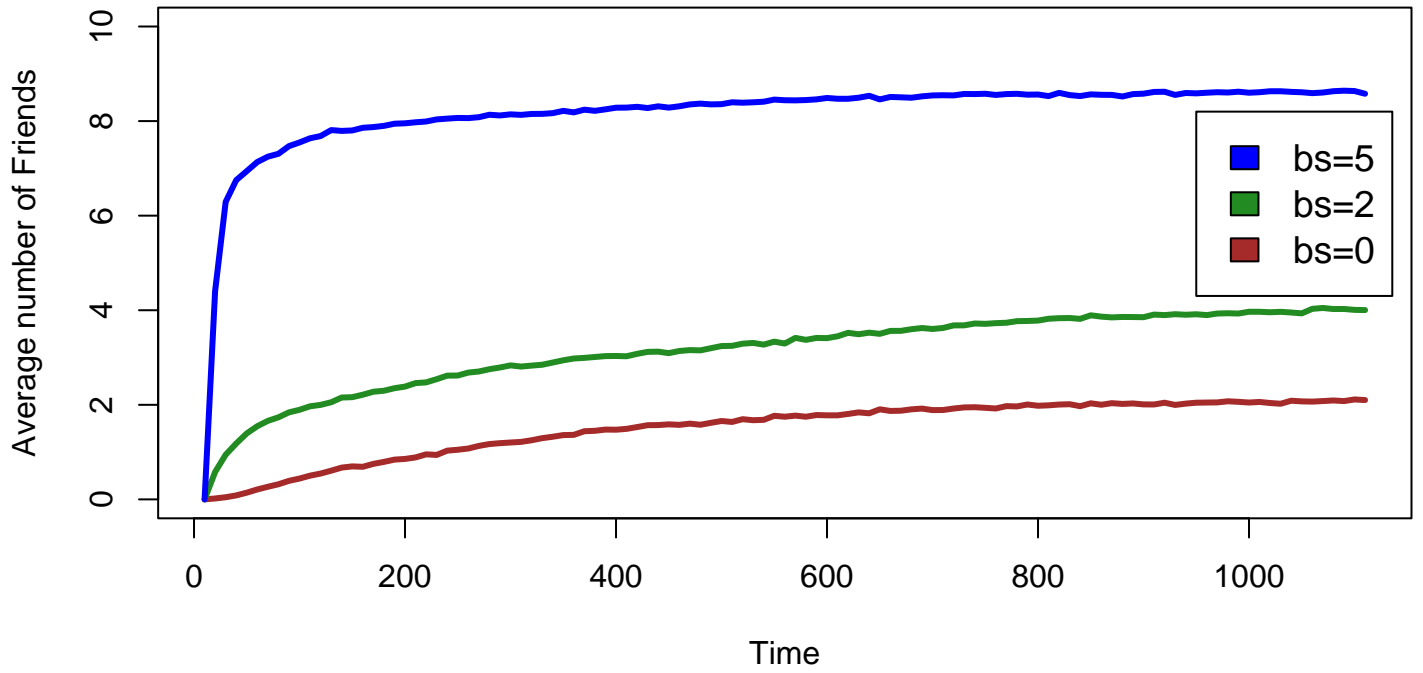
$$\text{logit}(p_{ij}) = \beta_0 + \delta_1 \left( \mathbf{I}(\text{Sex}_i = \text{Sex}_j) - \overline{\mathbf{I}(\text{Sex}_i = \text{Sex}_j)} \right) + \beta_s (s_i + s_j) - |z_i - z_j|$$

- $\text{logit}(p_{ij})$  is the *degree* of friendship between agents  $i$  and  $j$ .  $p_{ii}$  is undefined.
- $\beta_0$  is the baseline degree of friendship between any two agents.
- $\mathbf{I}(\text{Sex}_i = \text{Sex}_j)$  is an indicator whether agents  $i$  and  $j$  are of the same **Sex**. This dyadic covariate is centered about its mean to retain the interpretation of the baseline degree of friendship  $\beta_0$ .
- $\delta_1$  is the sensitivity of friendships to same **Sex**.
- **Charisma**  $s_i \sim N(0, 1)$ . Both the sender and the receiver have **Charisma** and both are equally weighted when making friendships.
- $\beta_s$  is the sensitivity of friendships to **Charisma**.

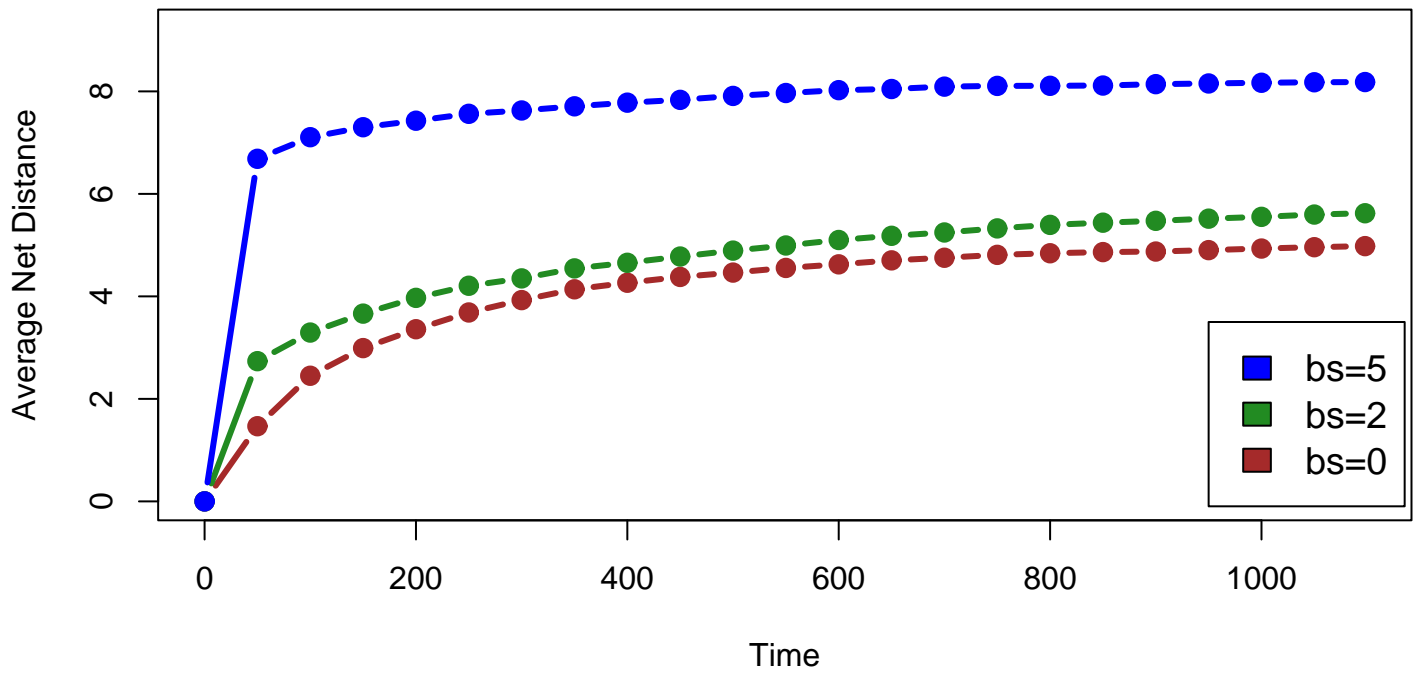
## ★ Rules for Agent Model:

- Rule 0. Twenty agents start randomly at time=1 on a  $(20 \times 20)$  grid in 2-dimensional Social Space.
- Rule 1. Agents are split evenly between the sexes.  $\delta_1$  is the sensitivity of friendships to same **Sex**.
- Rule 2. The **Charisma** (sociality  $s_i$ ) of each agent is added to the model.  $s_i \sim N(0, 1)$ .  $\beta_s$  is the sensitivity of friendships to **Charisma**.
- Rule 3. At every time step each agent  $i$  proffers a friendship to all agents  $j \neq i$ , and these proffers are accepted with probability  $p_{ij}$ .
- Rule 4. After new friendships are created, agents move a “**move.fraction**” ( $\frac{1}{3}$ ) towards the average of their friends’ locations in Social Space.

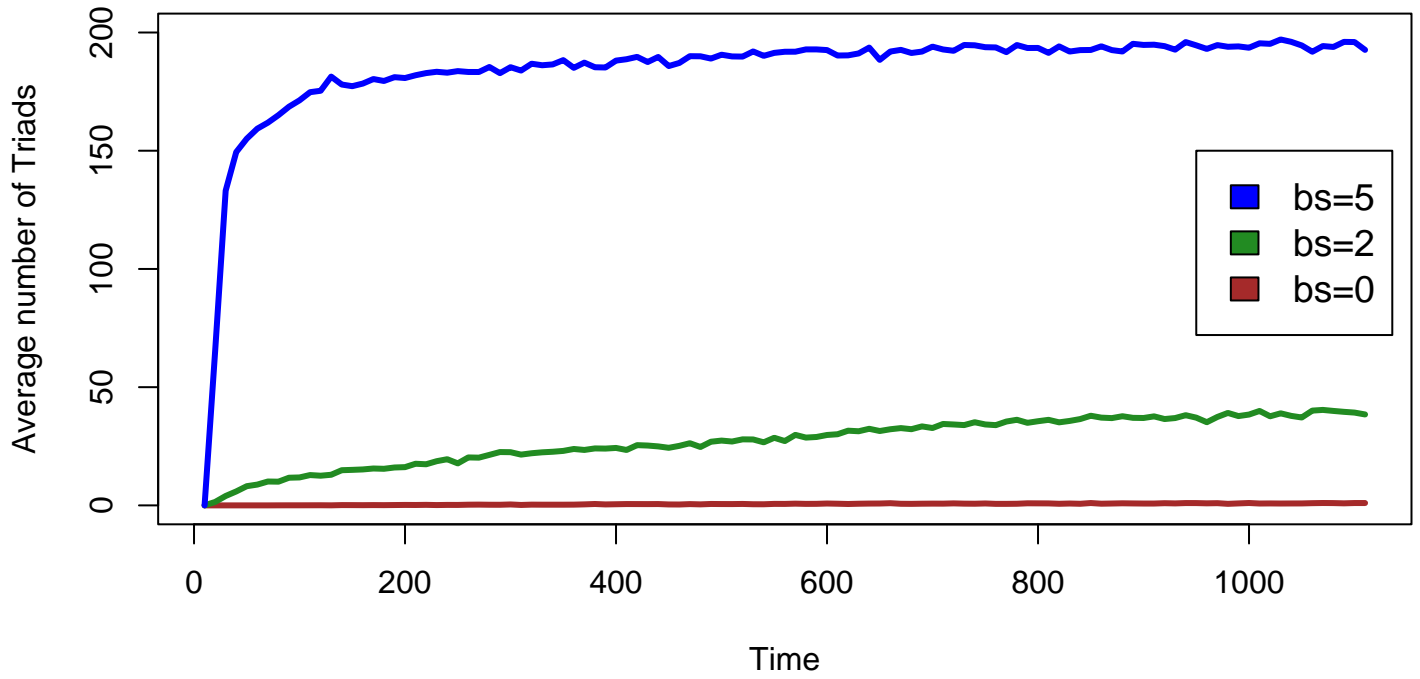
### Average # of Friends, d1=0



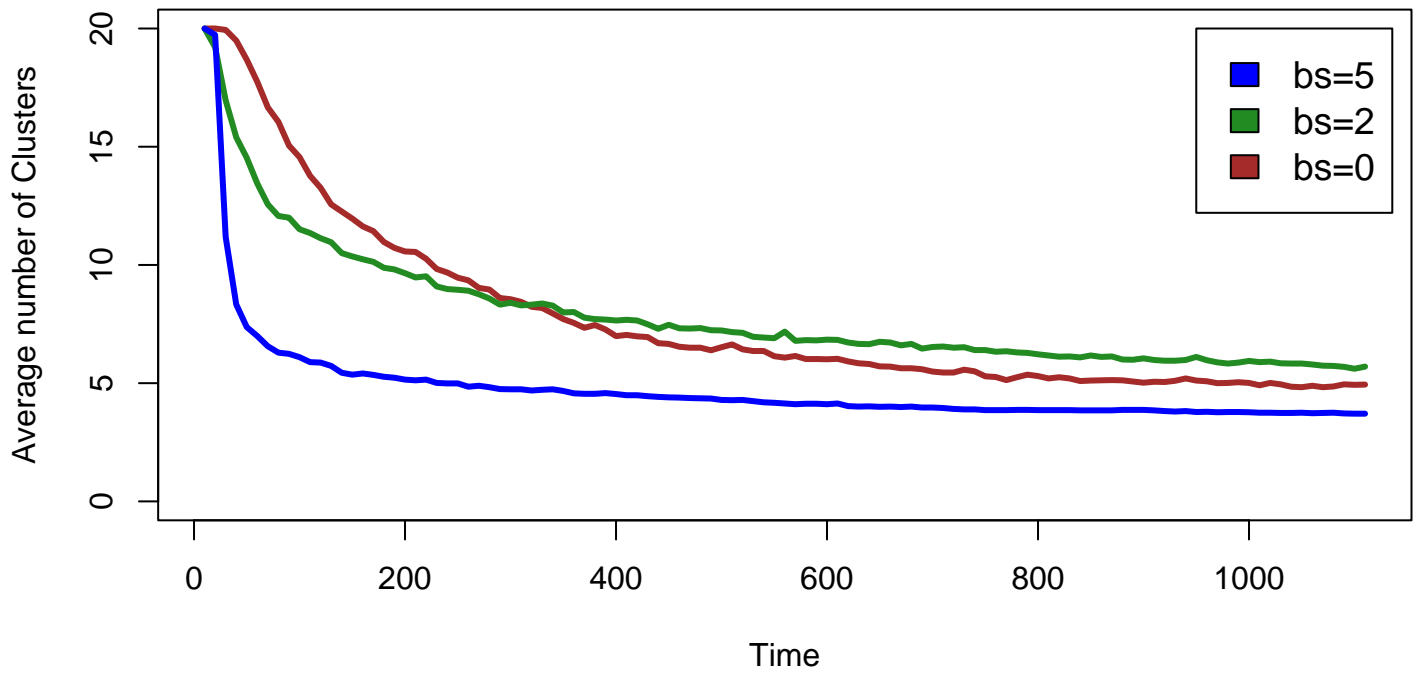
### Avg Net Dist Moved, d1=0



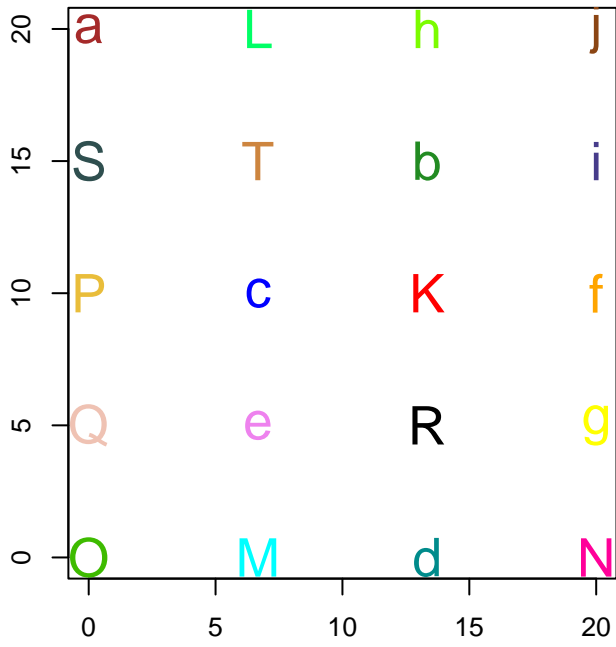
**Average number of Triads, d1=0**



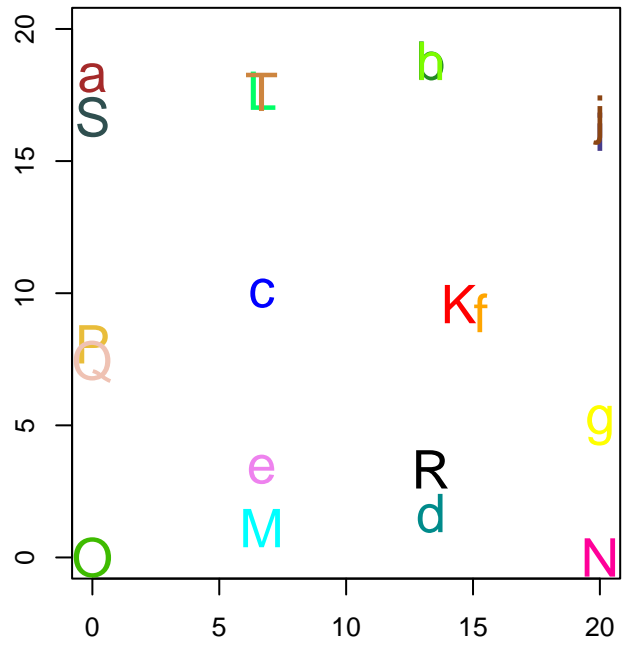
**Average number of Clusters, d1=0**



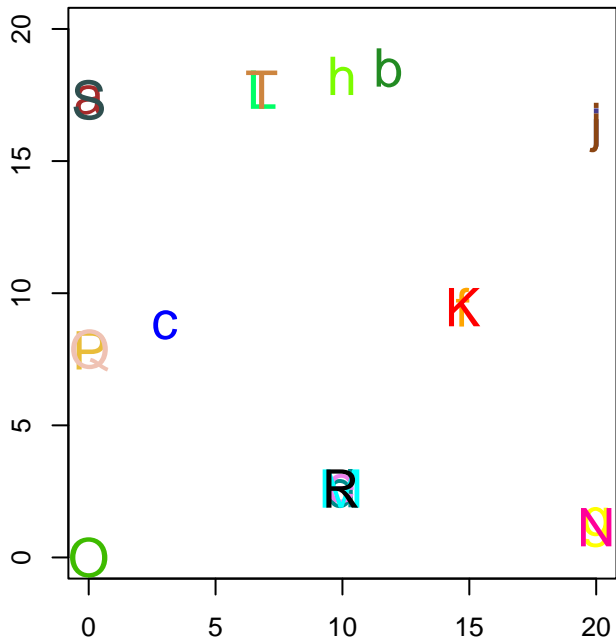
Social Space, d1=0, bs=0: Time=1



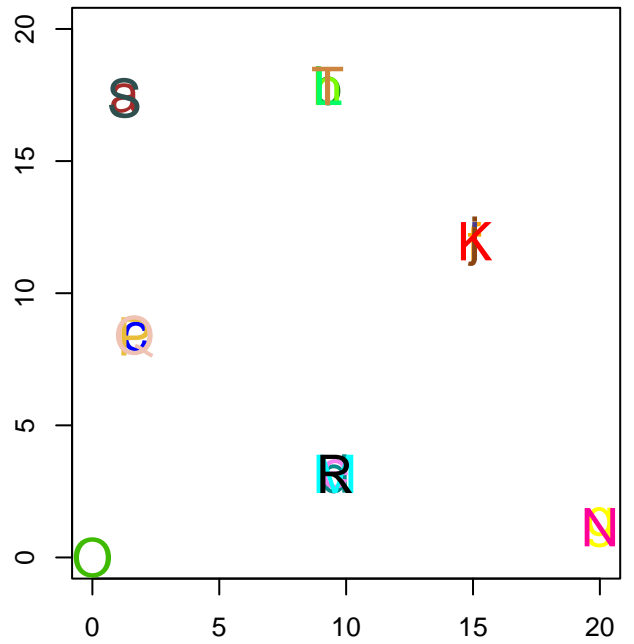
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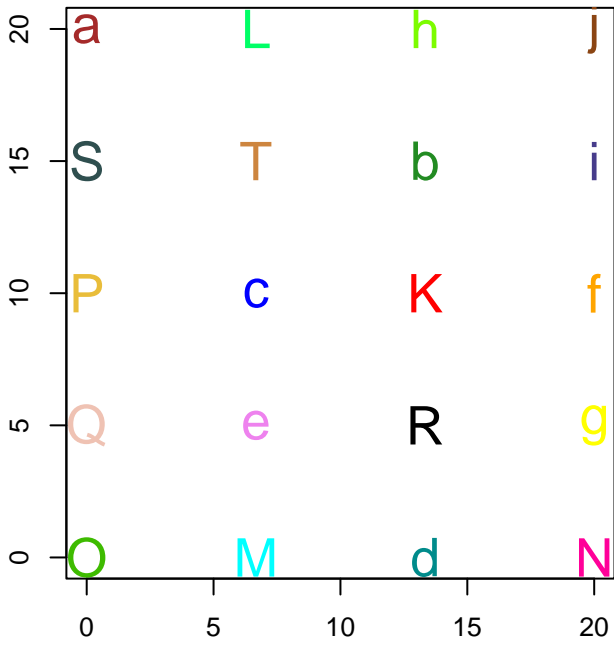
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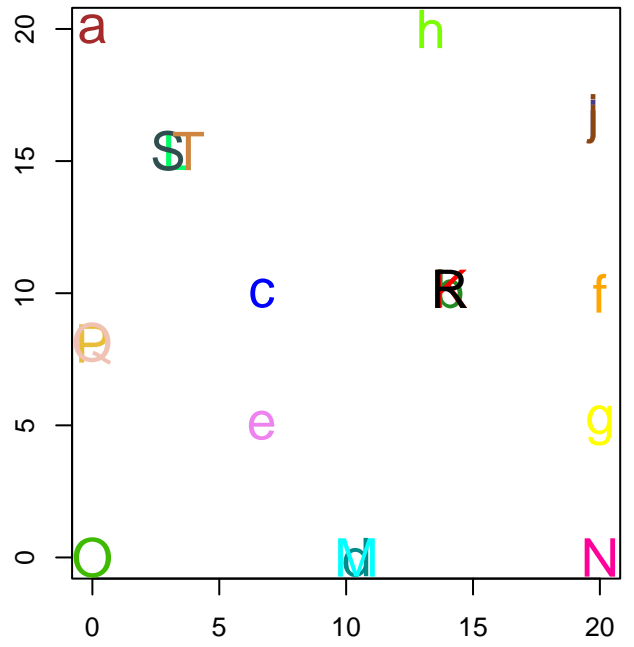
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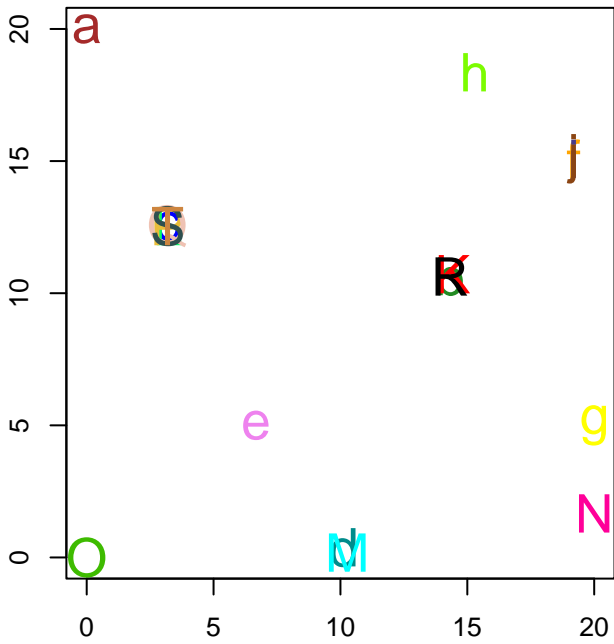
Social Space, d1=0, bs=2: Time=1



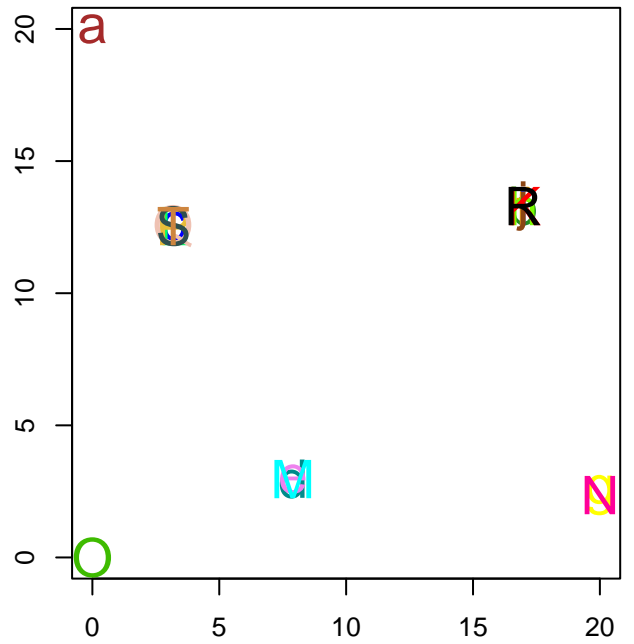
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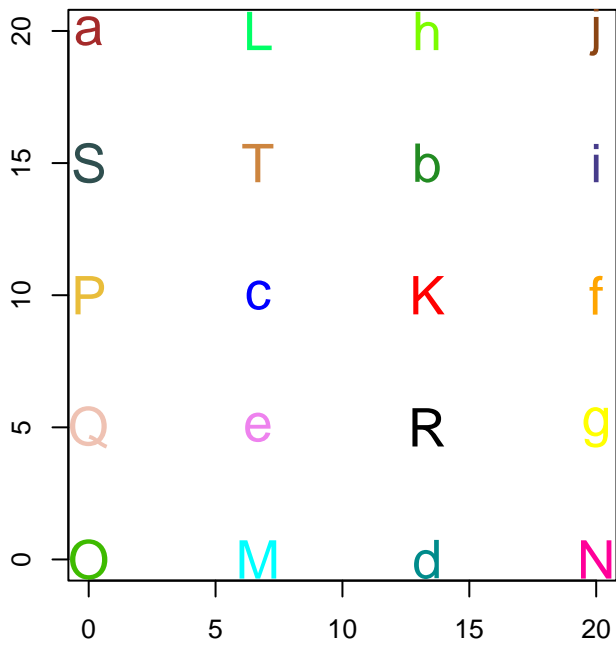
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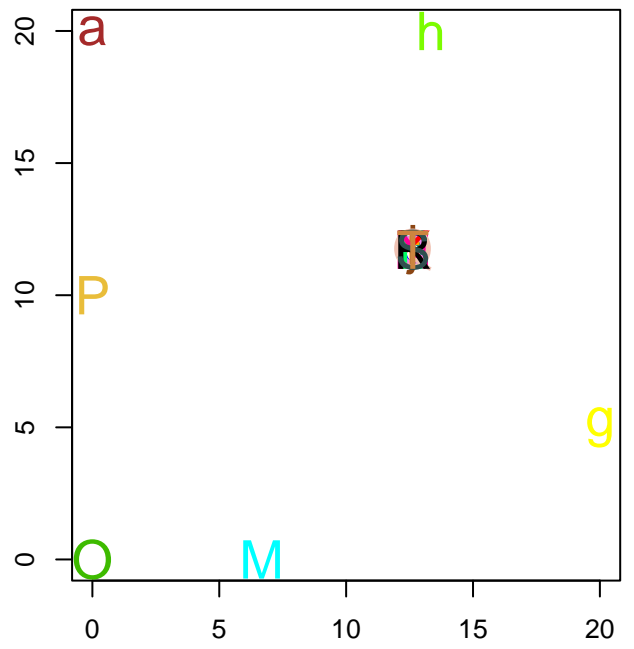
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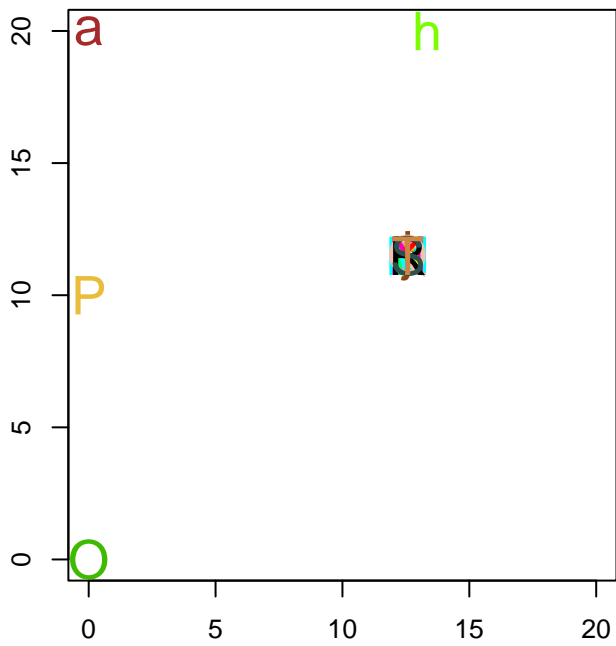
Social Space, d1=0, bs=5: Time=1



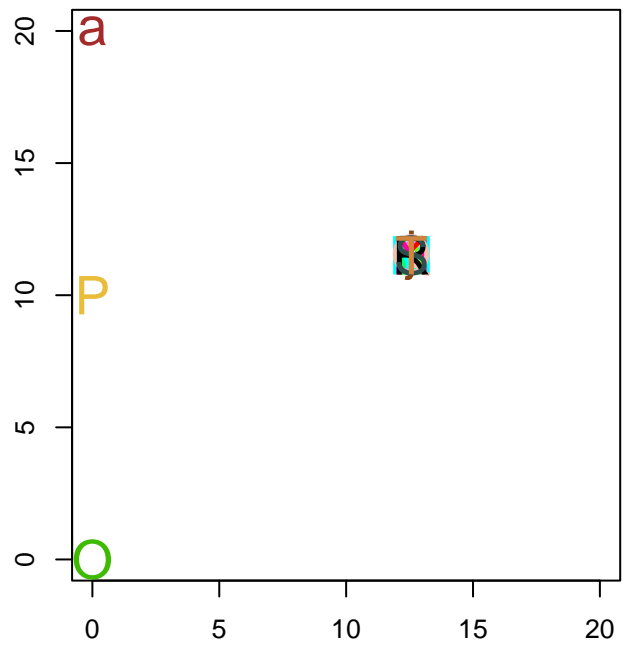
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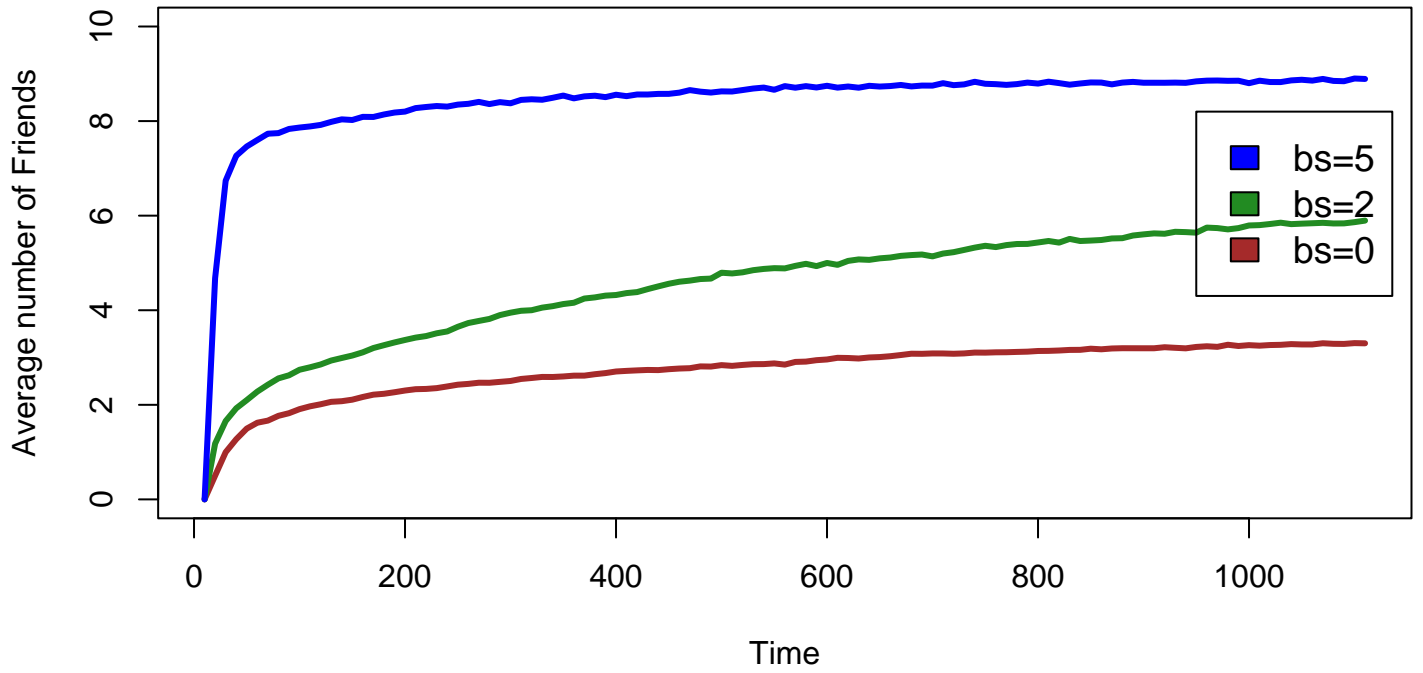
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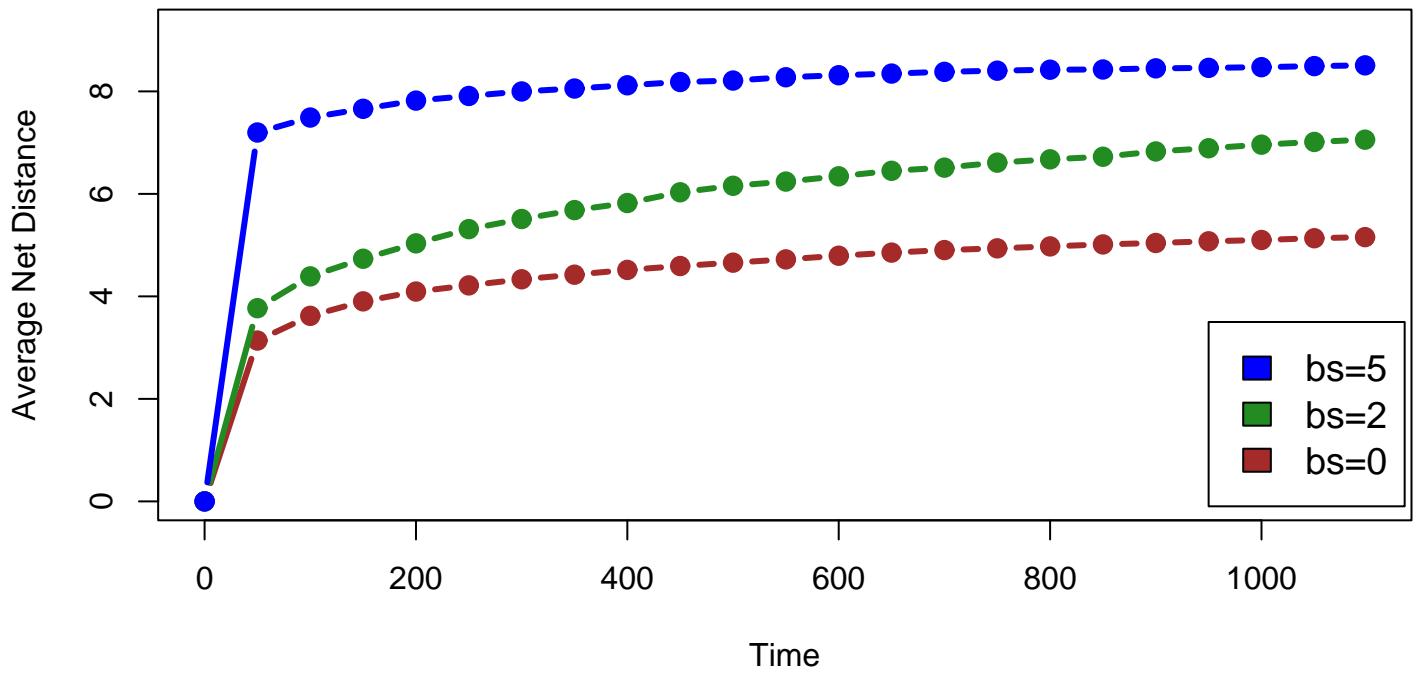
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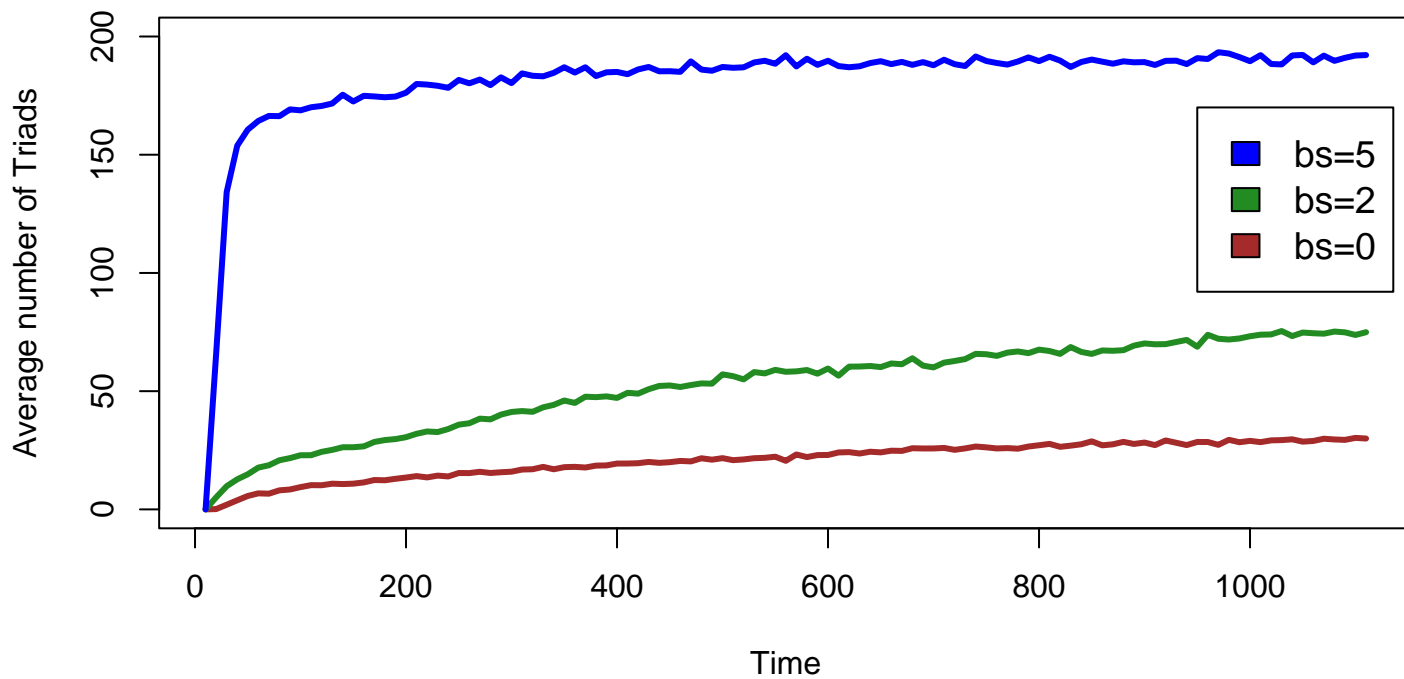
### Average # of Friends, d1=5



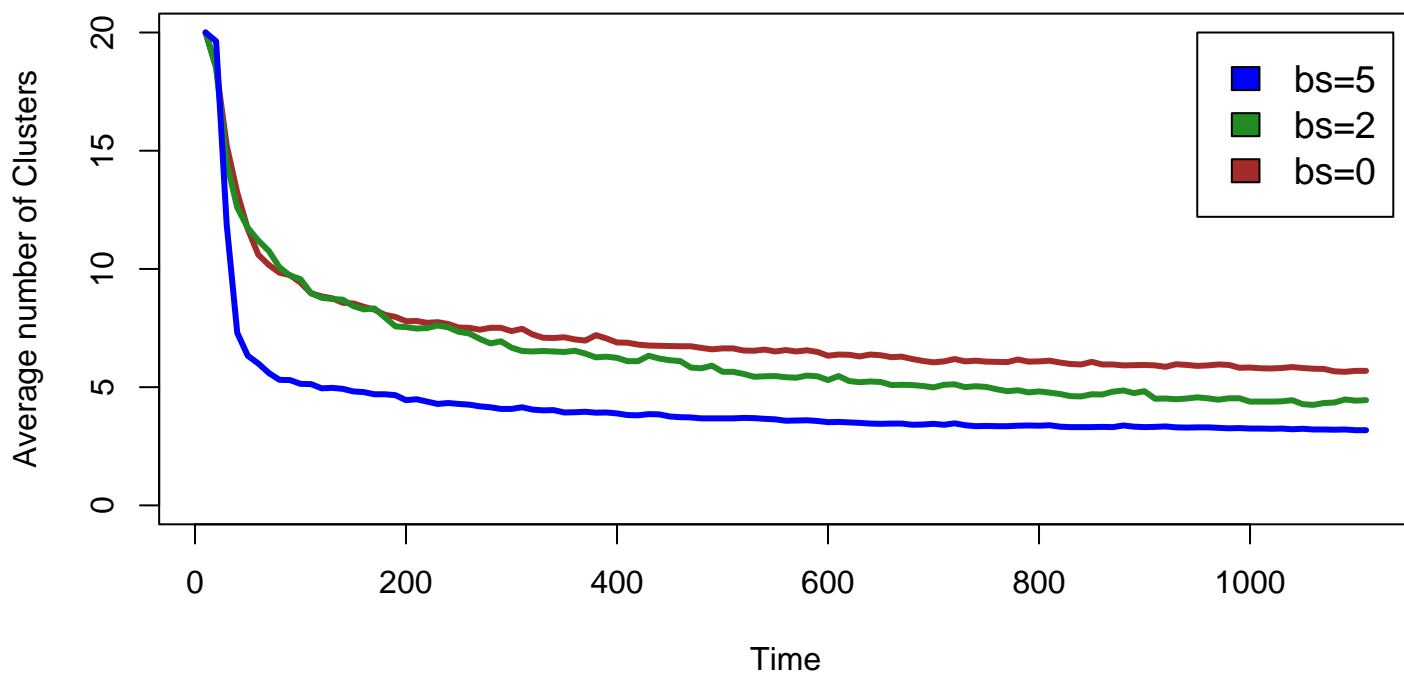
### Avg Net Dist Moved, d1=5



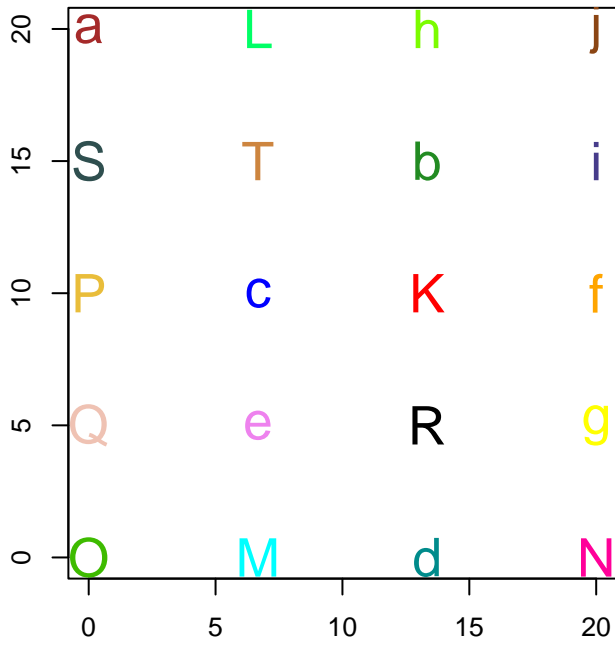
### Number of Triads, d1=5



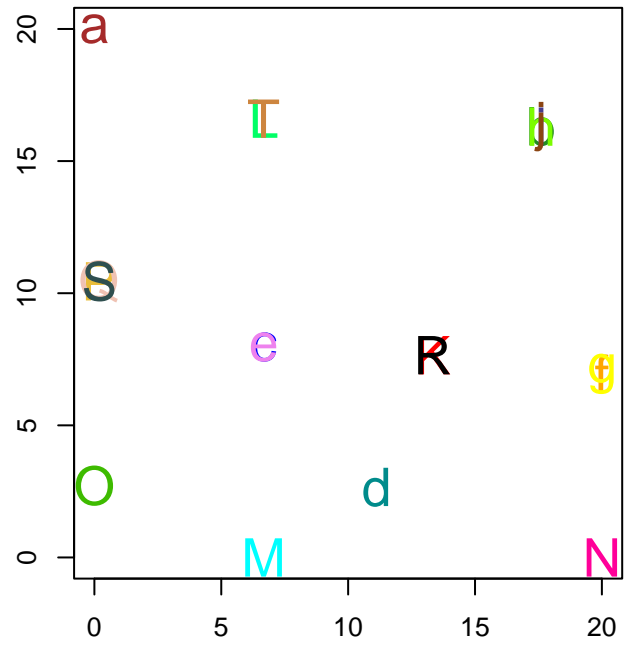
### Number of Clusters, d1=5



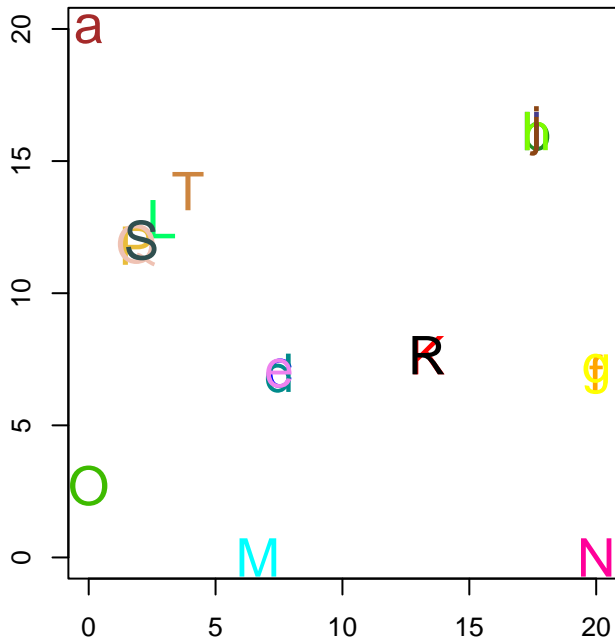
Social Space, d1=5, bs=0: Time=1



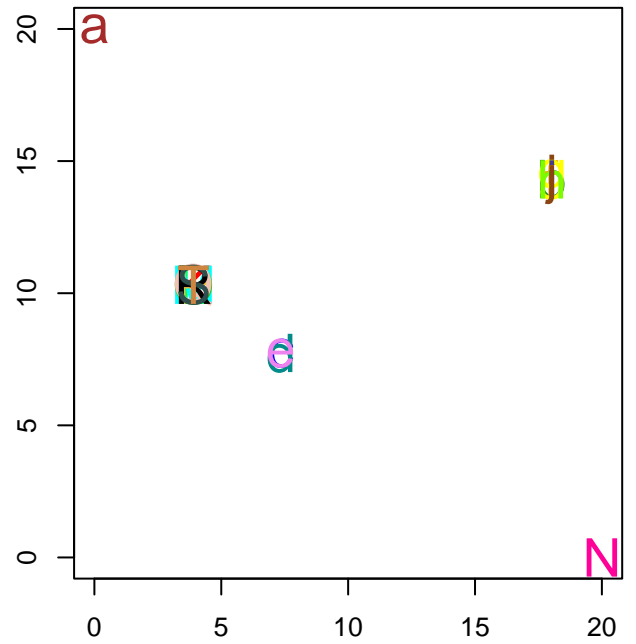
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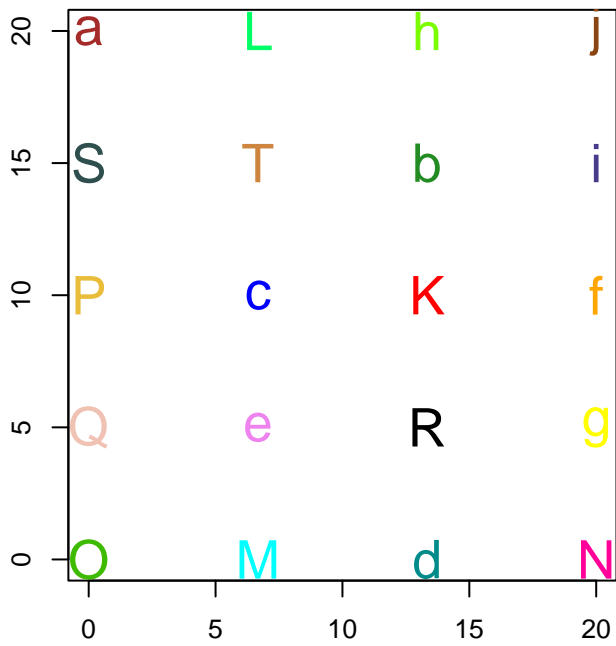
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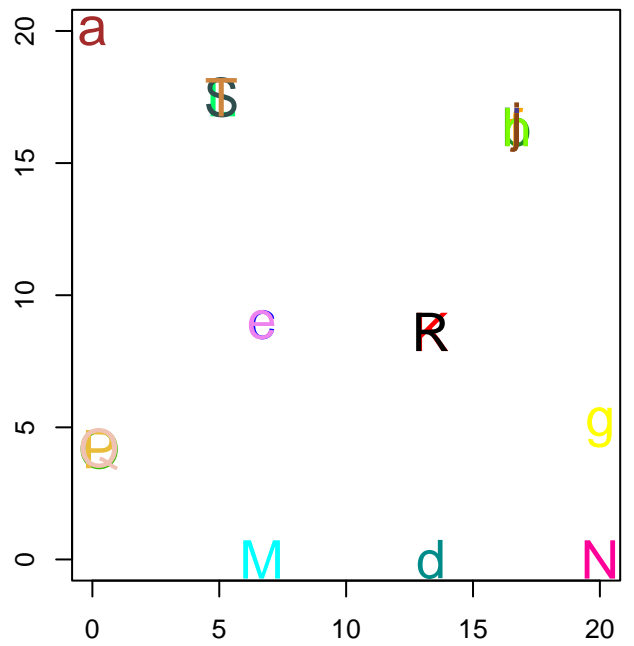
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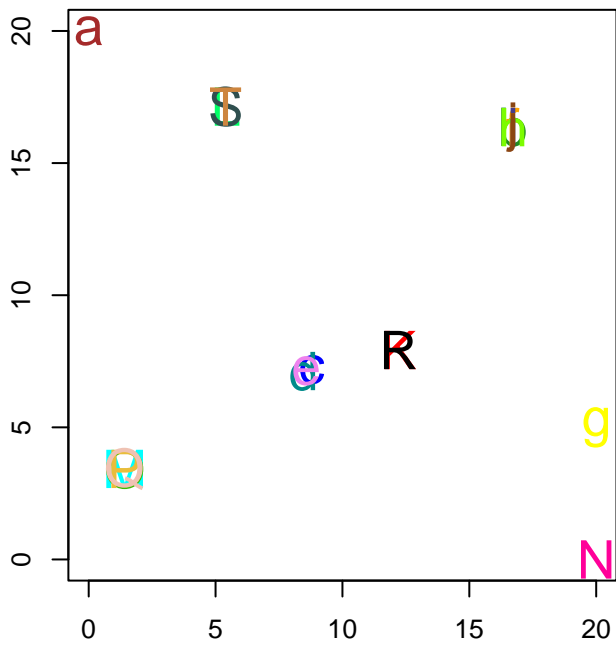
Social Space, d1=5, bs=2: Time=1



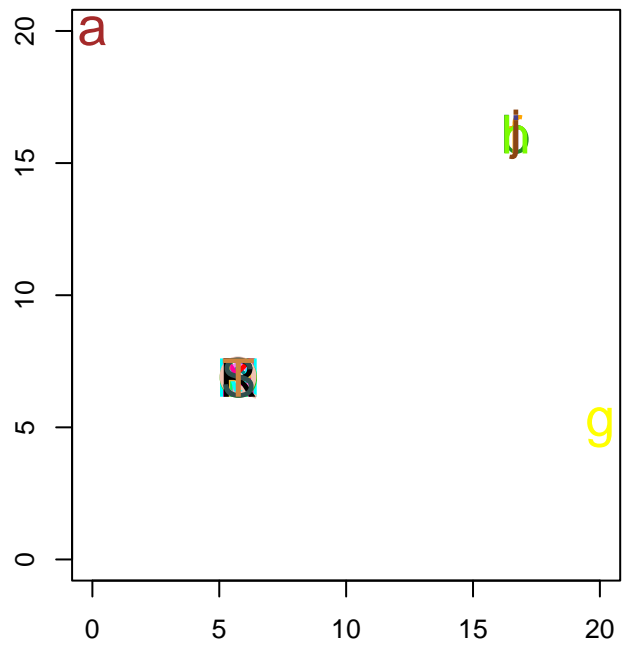
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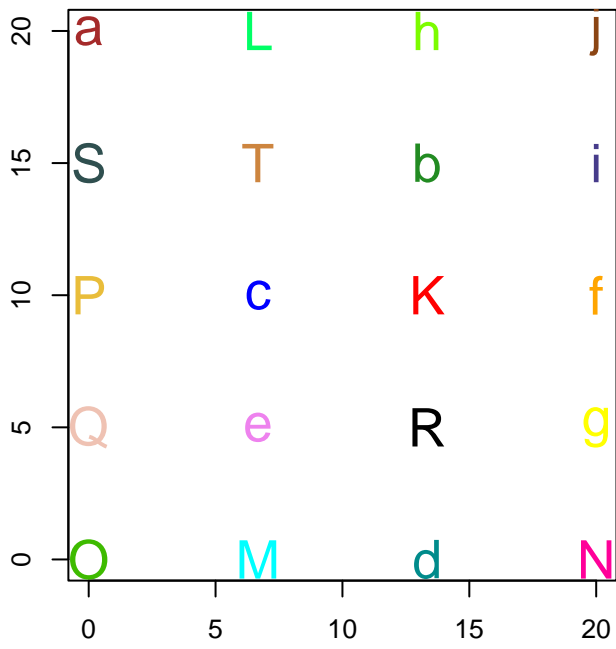
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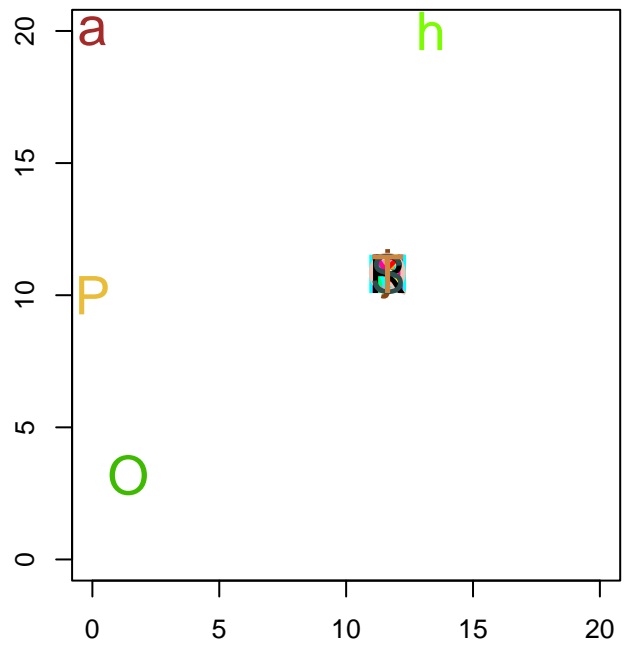
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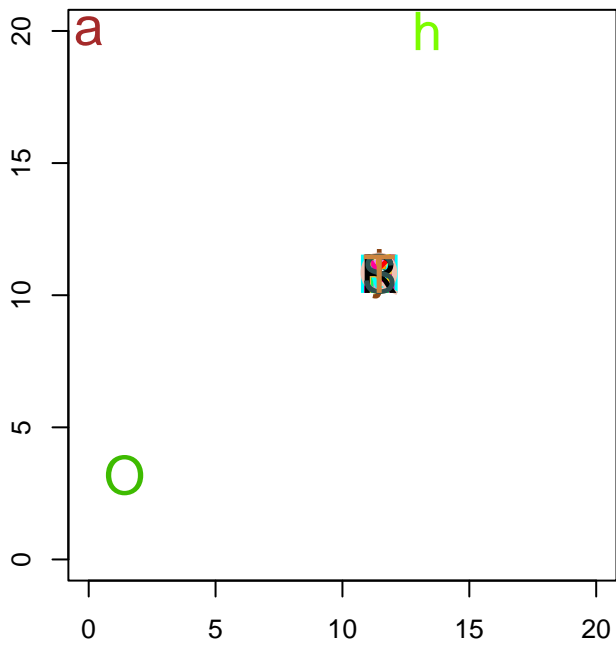
Social Space, d1=5, bs=5: Time=1



Time=50



Time=200



Time=1000

