The Effects of Physical Location on Communication Patterns (Continued)

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Some Obvious Points

- $s_2 < s_1$
- $p_2 < p_1$
- $s_3 < s_1$
- $p_3 > p_1$
A Typical Grouping of Offices Around a Secretarial Area.
Same Area Converted to the 'Cave and Commons' Concept.
Office Configuration to Vary Privacy and Accessibility.

- Exterior Wall With Window
- Floor to Ceiling Panels
- Sliding Glass Panels
- High Panels
Combining Physical & Organizational Barriers & Bonds
## The Effects and Organizational Separation as Measured in One Organization

<table>
<thead>
<tr>
<th></th>
<th>Different Departments and Projects</th>
<th>Same Department Different Projects</th>
<th>Same Project Different Departments</th>
<th>Same Department and Project</th>
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<tbody>
<tr>
<td><strong>SAME WING</strong></td>
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<td>0.69</td>
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</tbody>
</table>
Two Departments in Separate Locations

LOCATION I

LOCATION II

$C_{AA}$

$C_{AB}$

$C_{BB}$
The Effect of Transferring Staff Between Locations

LOCATION I

A

C_{AA}

C_{Ab}

b

C_{bb}

LOCATION II

a

C_{Aa}

C_{aB}

B

C_{ab}

C_{bB}

C_{aa}

C_{BB}
Moving Staff Between Sites to Increase Interdepartmental Communication
(Examples from Laboratories ‘H’ & ‘I’)

![Graph showing proportional increase in interdepartmental communication versus proportional decrease in intradepartmental communication for Labs 'H' and 'I'.](image-url)
Moving Staff Between Buildings to Increase Interdepartmental Communication
(An Example from Laboratory ‘H’)

Proportional Decrease in Intradepartmental Communication

Proportional Increase in Interdepartmental Communication

- 10%
- 20%
- 30%
- 40%
- 50%
Moving Staff Between Floors of a Building to Increase Interdepartmental Communication
(An Example from Laboratory ‘I’)

Proportional Decrease in Intradepartmental Communication

Proportional Increase in Interdepartmental Communication

Proportion Moved

- 10%
- 20%
- 30%
- 40%
- 50%
Communication Within a Biotech Cluster
An extensive literature has developed in recent years arguing for the benefits of firms sharing a common technology to cluster geographically.

- Aids in attracting specialized staff.
- May attract venture capital, suppliers, support services, etc.

Claims have also been made for the synergistic benefits of firms sharing scientific knowledge, especially if there are university laboratories near the cluster.

Prior studies have inferred inter-firm communication from the evidence of co-publishing and co-patenting across firms, however, a good amount of scientific exchange may occur that does not appear in such publicly accessible records.

- No one has ever actually measured whether less formal scientific exchange across firms really occurs, to what degree what the actual dynamics look like and what the results are.
Earlier Research

• As discussed earlier, we developed a method for measuring the structure of scientific communication networks within firms.

• Why not adapt that method for the study of scientific communication among firms and other organizations.
Experimental and Control Groups

• Geographic limits of the cluster are defined in terms of location within a limited set of postal (Zip) code regions.

• Scientists reporting from similar Biotech firms outside of the postal code regions of the main study but within 100 km of Boston.
  – Comparative density of communication
  – Connections between the two groups
  – Connections with the universities and with local ‘Big Pharma’ companies.
Length of connecting links is *inversely* proportional to the amount of communication reported.
A Super Cluster?
Inside The Super Cluster

Figure by MIT OCW.
Where are the Universities?
Universities

Figure by MIT OCW.
What About ‘Big Pharma’?
The Major Pharmaceutical Firms

• A number of ‘Big Pharma’ companies have located R&D operations in the region.
  – Their purpose, obviously is to tap into the network.
    • Search to license candidates for their new product pipeline.
    • Search for potential acquisitions.
  – Are they successful in joining the network?
Where is ‘Big Bio’?
Large Bio Firms

• Some of the Biotech firms have grown quite large.
  – How do they fit into the network now?
‘Big Bio’

Figure by MIT OCW.
Where To From Here?

• What more can we learn?
  – Analyses of the network to relate network position to firm performance.
    • Comparison between cluster ‘members’ and firms in the control group.
    • Long term growth.
      – Size, valuation, etc.
    • Patent filings
    • Investigatory New Drug Applications
    • Etc.
  – Follow-up interviews to flesh out the network results.
  – Advice to the many geographic regions attempting to stimulate the growth of similar Biotech clusters.

• Is this the new model for doing R&D?
  – How do individual firms capture the gains?
Where are the Universities?

- Mean Distance From Other Organizations (Miles)
- Level of Communication with Other Organizations

Graph showing the relationship between mean distance from other organizations and the level of communication.
Where is Big Pharma?

Mean Distance From Other Organizations (Miles)

Level of Communication with Other Organizations
Where is Big Pharma?

Mean Distance From Other Organizations (Miles)

Level of Communication with Other Organizations

0 10 20 30 40 50 60 70 80 90 100 110

4 5 6 7 8 9 10 11
Mean Distance From Other Organizations (Miles)

Level of Communication with Other Organizations

- Other
- Universities
- Big Pharma
- Big Bio