



*Exchange and Specialization
as a Discovery Process*

Sean Crockett, Vernon L. Smith, Bart J. Wilson

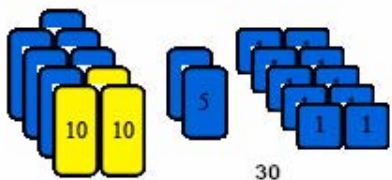


Motivation

- “As it is the power of exchanging which gives occasion to the division of labour, so the extent of this division will always be in proportion to the extent of that power.”

--Adam Smith, *Lectures on Jurisprudence (Appendix)*

- What are the dynamics of the discovery process for specialization and exchange?
- In an unstructured, decentralized economy, how do people spontaneously order their production, exchange, and consumption decisions?



Blue 100% Prod. % Red 0%

Select All Blue Show %s Select All Red

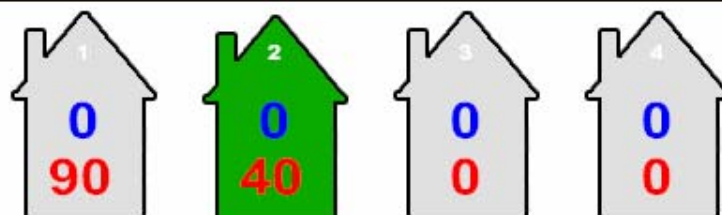
Summary Information

Potential Profit = 0
Need 2 blue for each
1 red to to earn 2 cents.

80 blue needed or
40 red wasted

Total Profit (cents)	26
Time	69
Period	2 - B

1
0
0



2
110
0

Chat Room A Chat Room B

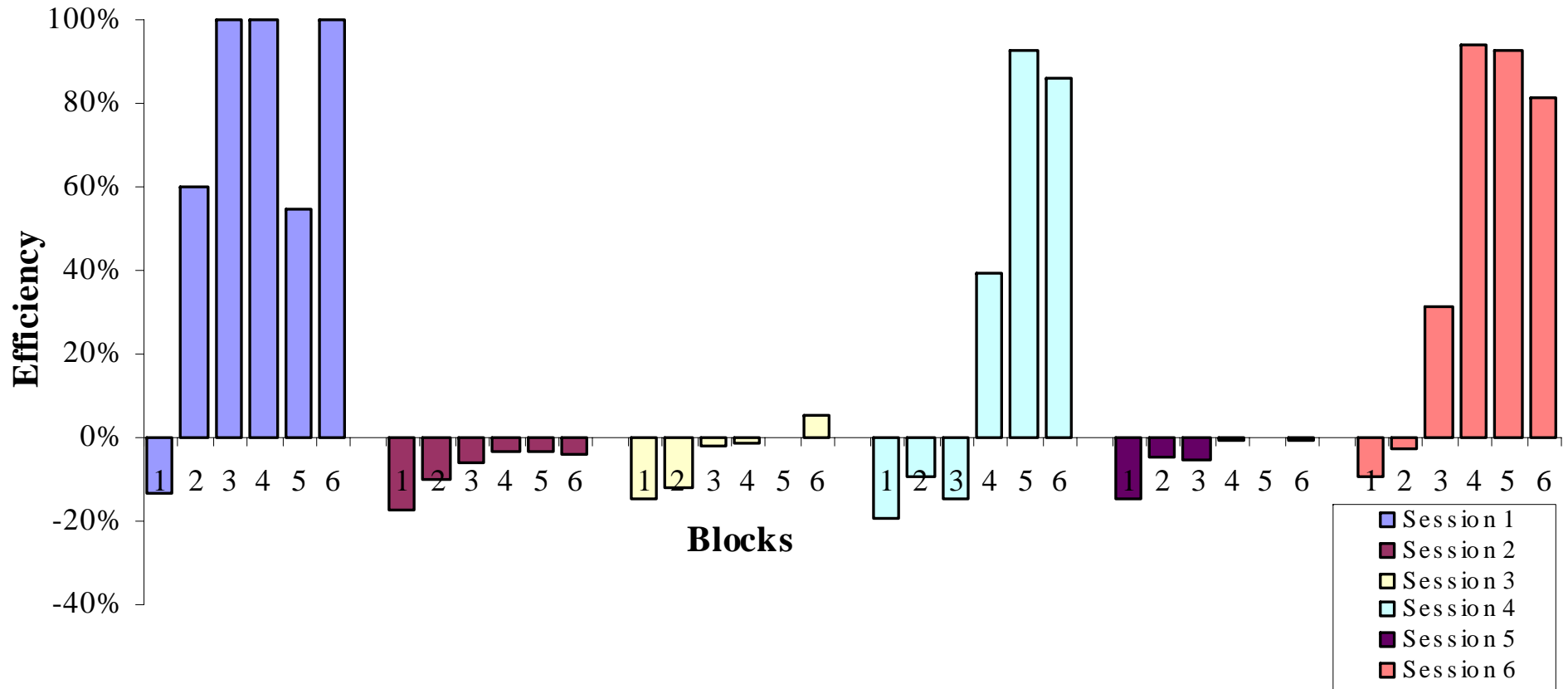
```
***** Period 1-A *****  
<Person 1>: What 's up?  
***** Period 1-B *****  
***** Period 2-A *****  
***** Period 2-B *****  
[You received 40 red from person 1]
```

Send

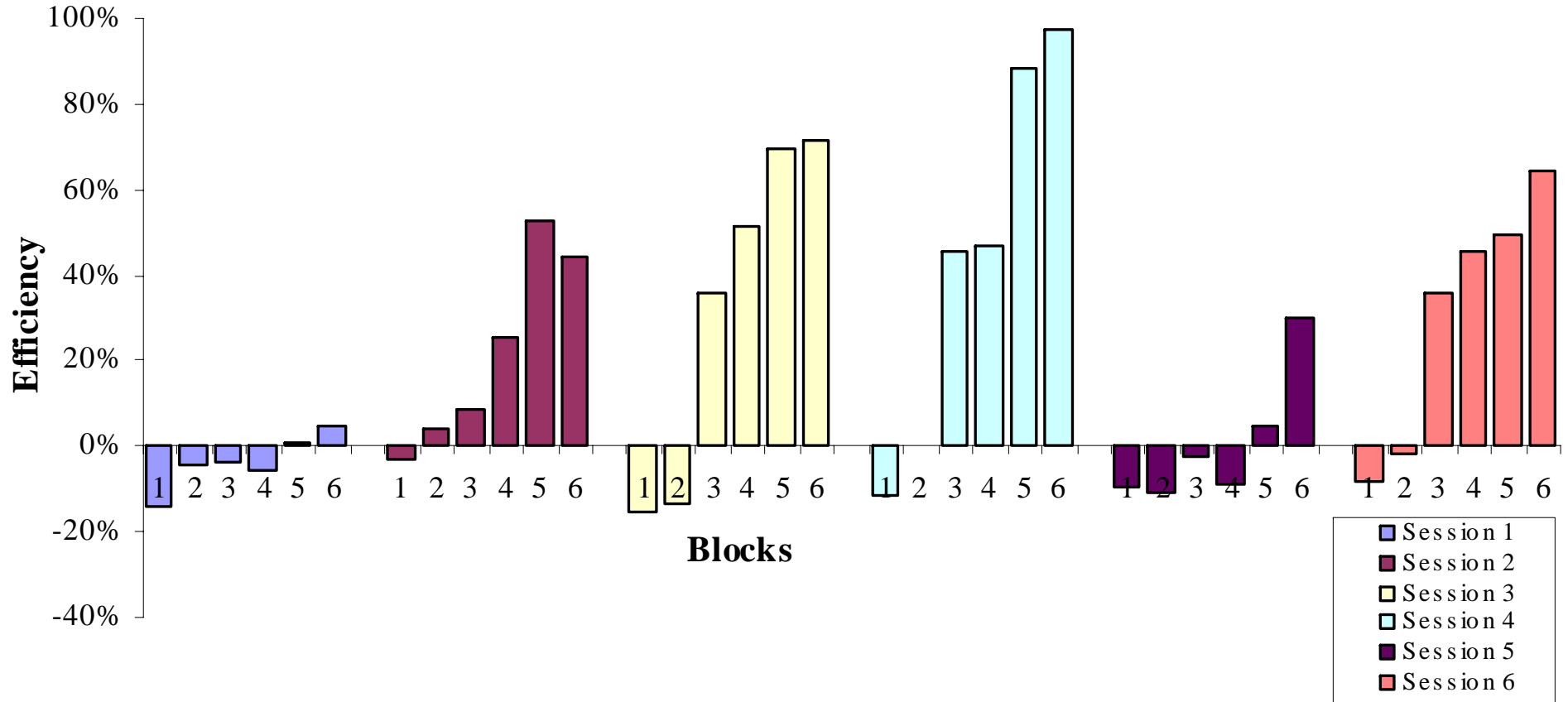
3
11
24

4
36
11

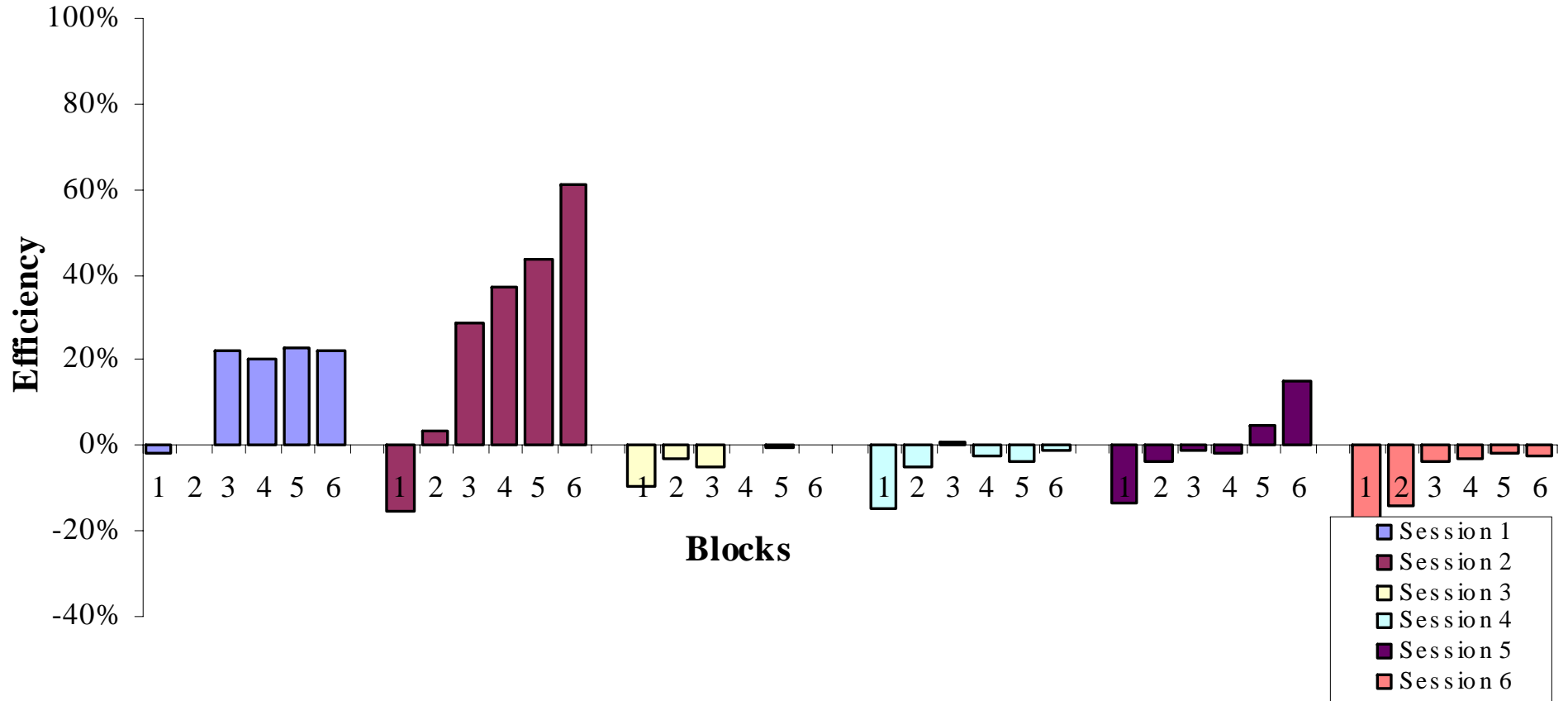
Efficiency: *Unknown2*



Efficiency: *Unknown4*



Efficiency: *Unknown8*





Observations

- There seem to be three discovery steps:
 - Arriving at the idea to trade
 - Finding a suitably endowed trading partner with whom one can exploit the power of exchanging through specialization
 - Building the relationship by increased specialization over time
- The tone in the transcripts clearly indicates that the emergence of (a natural propensity to) exchange is indeed personal and social.
- Exchange in this setting is increasingly bilateral over time.



Transcript

***** Period 16-B *****

1: i want more money

2: so do i

1: i wish i knew what i was doing

2: i wish i knew how to make more

1: me too

1: i hope we have time to figure it out

***** Period 17-A *****

2: yea, but i doubt it

***** Period 17-B *****

2: can i put them things in your house?

1: i dont think so

1: oh thats ur house

***** Period 18-B *****

2: you can put them in each others house

1: oh ok

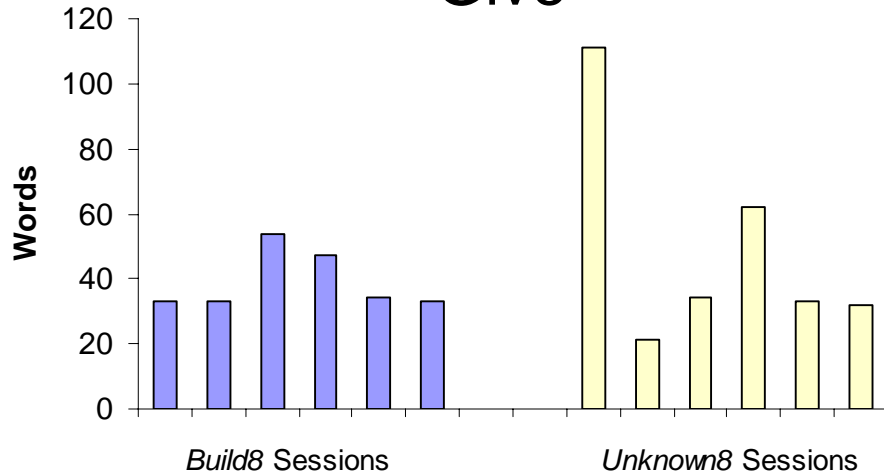
2: do you know which one you make faster

***** Period 19-B *****

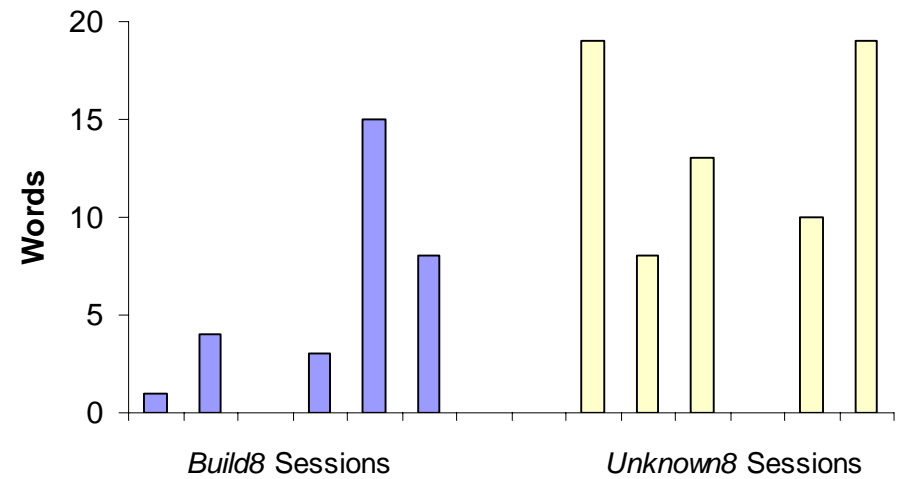
2: im trying to think how maybe we could help each other

Instances of Specific Words

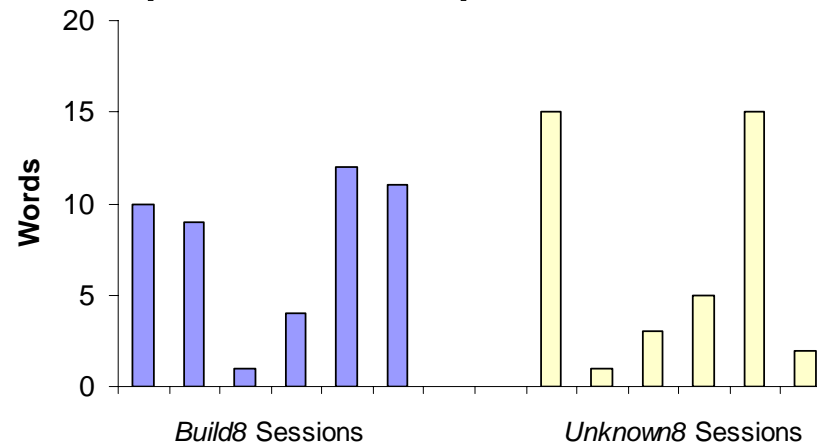
Give



Trade



Share, Help, Team, Split, Partner, Together





Conclusions

- Finding a suitable trading partner is key to exploiting specialization.
- We do not observe **impersonal** and **multilateral** trading emerge spontaneously.
- It is clear that whatever tradeoffs spawn impersonal markets, such institutions must emerge from highly personal exchange.



*Building a Market:
From Personal to Impersonal Exchange*

Erik Kimbrough, Vernon L. Smith, Bart J. Wilson

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Economic History of Exchange

- Informal norms based on reciprocity are adequate for small-scale exchange within villages and hunter and gatherer societies.
- As exchange expands across a larger area, these informal norms are offloaded onto what are generally more formal, centralized rule systems.
- But what is this process of institutional evolution?
- What spawns transitions from the explicit reciprocity of personal exchange to the implicit cooperation of impersonal exchange?
- How and to what extent do yesterday's institutions constrain future trajectories?

Token Selector (House)

Select All Goods 0

Production %

Red 100%
Blue 0%

Summary Info

Earnings 0 Round 3 - B
Time Remaining 112

Potential Earnings

RedBlue Earnings 90
x Pink Multiplier 1.7
Potential Profit 153

Need 3 Red for each 1 Blue to earn 3 cents.
0 Red needed or 0 Blue wasted.

Chat Room | Production Table | Pink Multiplier Table

```

***** Period 1-A *****
***** Period 1-B *****
***** Period 2-A *****
***** Period 2-B *****
<Person 4>: anyone need pinks
***** Period 3-A *****
***** Period 3-B *****
[You received 5 Pink from person 4]
[Person 2 received 5 Pink from person 4]
[Person 3 received 4 Pink from person 4]
[You received 30 Blue from person 2]
[Person 4 received 10 Blue from person 2]
[Person 2 received 35 Red from you]
[Person 4 received 5 Red from you]
    
```

Type here and click the "Send" button Send

Token Selector

0 0 0

Summary Info

Earnings	Round
0	1 - B
Time Remaining	
103	



I need pinks



```

***** Period 1-A *****
***** Period 1-B *****
<You>: 14 blues for 14 pinks

```

<<Home Send

Type here and click the "Send" button Send

```

***** Period 1-B *****
***** Period 1-A *****

```



Red-Blue Village: Day 14

Person 1: ok
4: 55 blues
1: i can make 130 reds
4: usually
1: which is what i've been doing
2: correction, 110 blues
1: ah, right
1: wait
2: ok, what about 3 and 4?
3: what r these pinks for?
1: i can actually make 130 red
4: pinks are a multiplier
2: ok so $110 + 55 = 165$ blues
1: the pinks multiply profits
4: yea
2: 3, how many reds can you make?
3: 70
3: how can i increase it
2: ok so $70 + 130 = 200$ red

1: the production scroller on the top
2: me and 4 need more blues than red
4: right
2: 1 and 3 need more red than blue
3: two of us can make more reds and 2 can amke more blues
4: we need extra blues to trade for pinks also
1: what should we change for next round?
3: then we can excahnge if required
2: 1 and 3 maximize reds
1: i'm alrady at red producing max
2: me and 4 will max blues
1: okay
2: ok
1: #3 you got it?
3: ok



Pink-Red Village: Day 14

9: lemme get re

9: man

11: 10 where you at

10: yo

11: who you know is the business man

10: 10

11: nah i get those great deals

11: those meal deals

10: if i had that bucket i wouldve
bankrupted every other chat room

11: produce something

11: doing all that typing

11: produce something

11: do something

10: naw

10: im chillin

9: yeah i wish i had that bucket

11: you wouldnt know what to do
with it

9: i would do better then y'all 2

11: yall probably just wear it on
your head

10: i come back with at least 1
million blue

11: and get no deals

11: im helping everyone come up

11: when i eat everyone eat

11: you know who said

10: oh for real



Red-Blue Village: Day 15

[Person 4 receives 20 Red from person 1.]

2: ok so lets to 25 reds and 50 blues for me and 4

[Person 2 received 20 Red from person 1.]

3: i made only 61 this time on 100% reds

2: and 25 blues and 75 red for 1 and 3

1: oh, ok

2: does that work out?

3: ok

1: right, but we now only need to decide, of those red to you and 4, how many i give

1: and how many #3 gives

[Person 1 received 30 Blue from person 2.]

4: extra blues?

2: hmm

4: 2 i need the extras

2: how about 20 blues and 40 reds for me and 4

[Person 4 received 40 Blue from person 2.]

1: work your bucket magic

1: are you talking to me?

1: #2

2: just throwing out some ideas

2: actually 20 reds and 40 blues for me and 4

1: oh ok, i was just wondering

1: right

2: 20 blues and 60 red for 1 and 3

[Person 1 received 5 Pink from person 4.]

[Person 4 received 5 Pink from person 4.]

[Person 2 received 5 Pink from person 4.]



Merchant Area: Day 15

3: any pinks for reds

8: yea i got it

3: how many

7: I need 5 redsa

8: i have 12.. u want em all

7: ok

7: yes

3: pinks please

7: person 8 what do you want

3: can i get some pinks

8: red

12: 7 pinks for 7 blues?

8: 3..ill give u 12 pink for 12 red

4: got pinks for blues

11: 20 20

3: person 11 can i get some pinks for 10 reds

11: yo 4

7: who has reds

11: 20/20

12: 7 pinks for 7 blues 4?

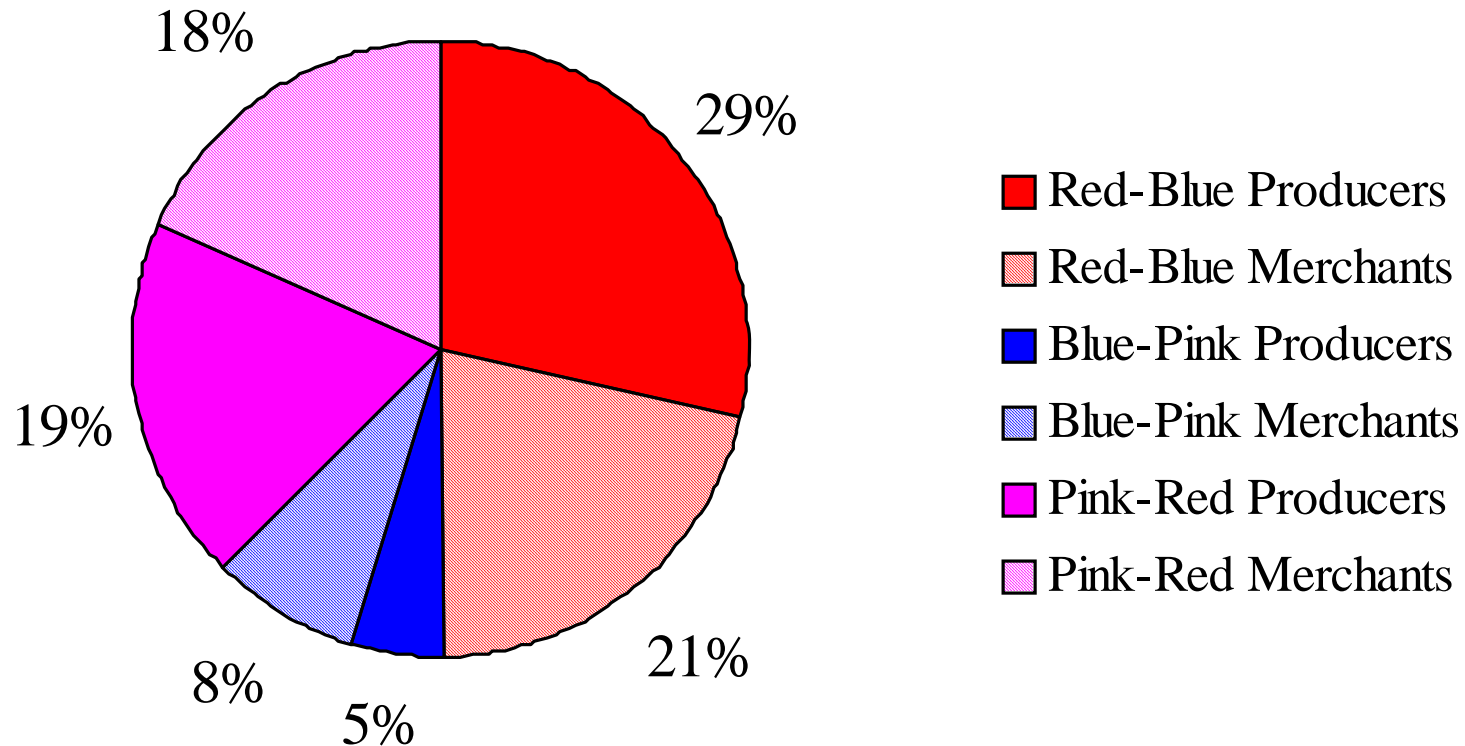
8: person 3.. i can give u 12 pinks



Merchant Discussion

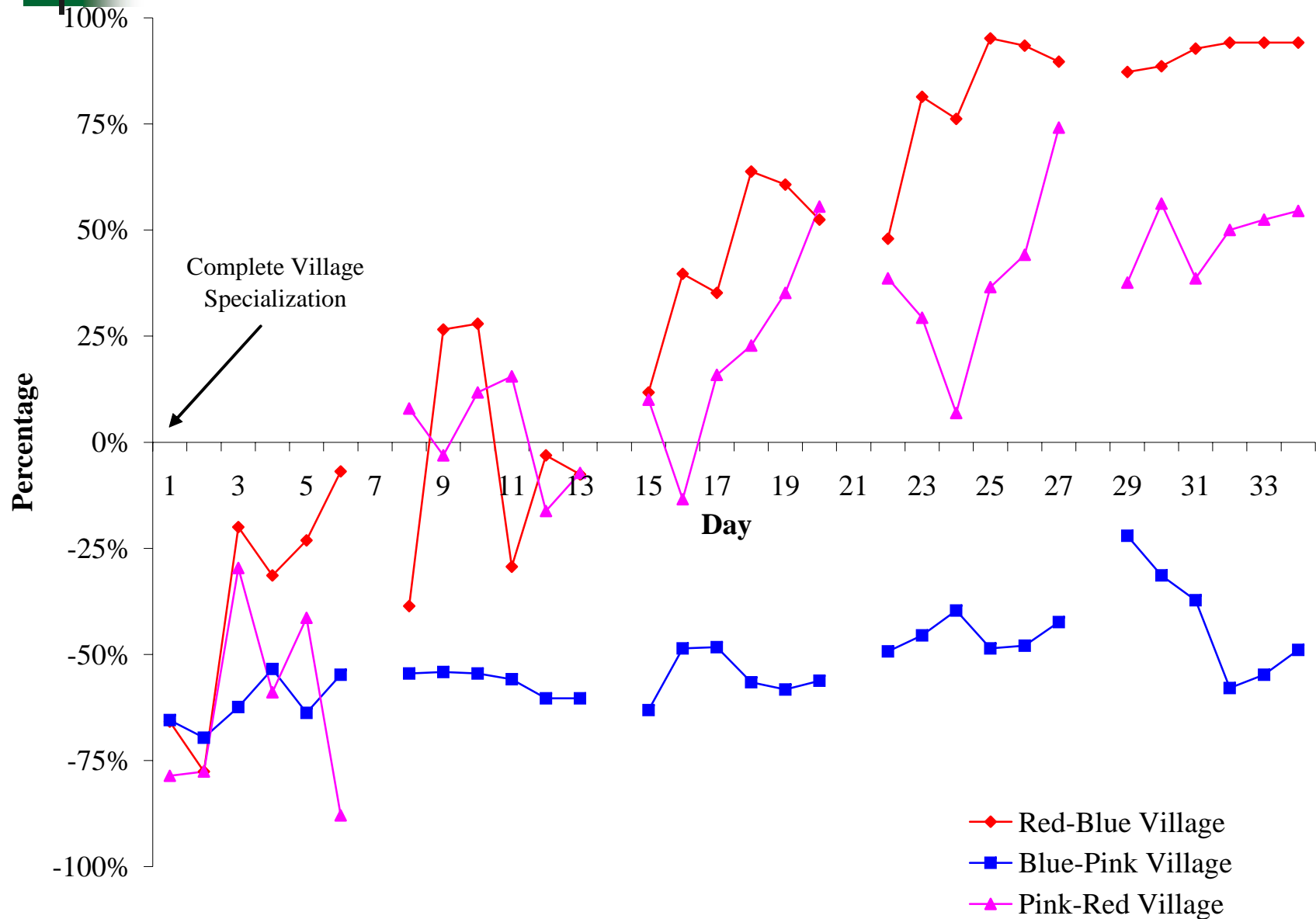
- Clearly lack idle chitchat
- Filled with price quotes
 - “20/20”
 - “7 pinks for 7 blues”
- The merchants arrive at the area, make their “deals”, and return to their village community.
- The cooperation in the merchant area is implicit—
when I give 20 pinks, *you* will give 20 blues, and you and I will each be better off.
- There is no discussion of how the consumption of the goods generates earnings, nor is it visible just exactly how *we* will be better off from the transaction.

Distribution of Earnings



Merchants may take their cut, but the role they play in their villages is closer to that of a fellow villager returning from a successful hunt than that of a broker fulfilling orders for clients at the Chicago Mercantile Exchange.

% of Gains from Exchange Realized





*Historical Property Rights, Sociality,
and the Emergence of Impersonal
Exchange in Long-distance Trade*

Erik Kimbrough, Vernon L. Smith, Bart J. Wilson

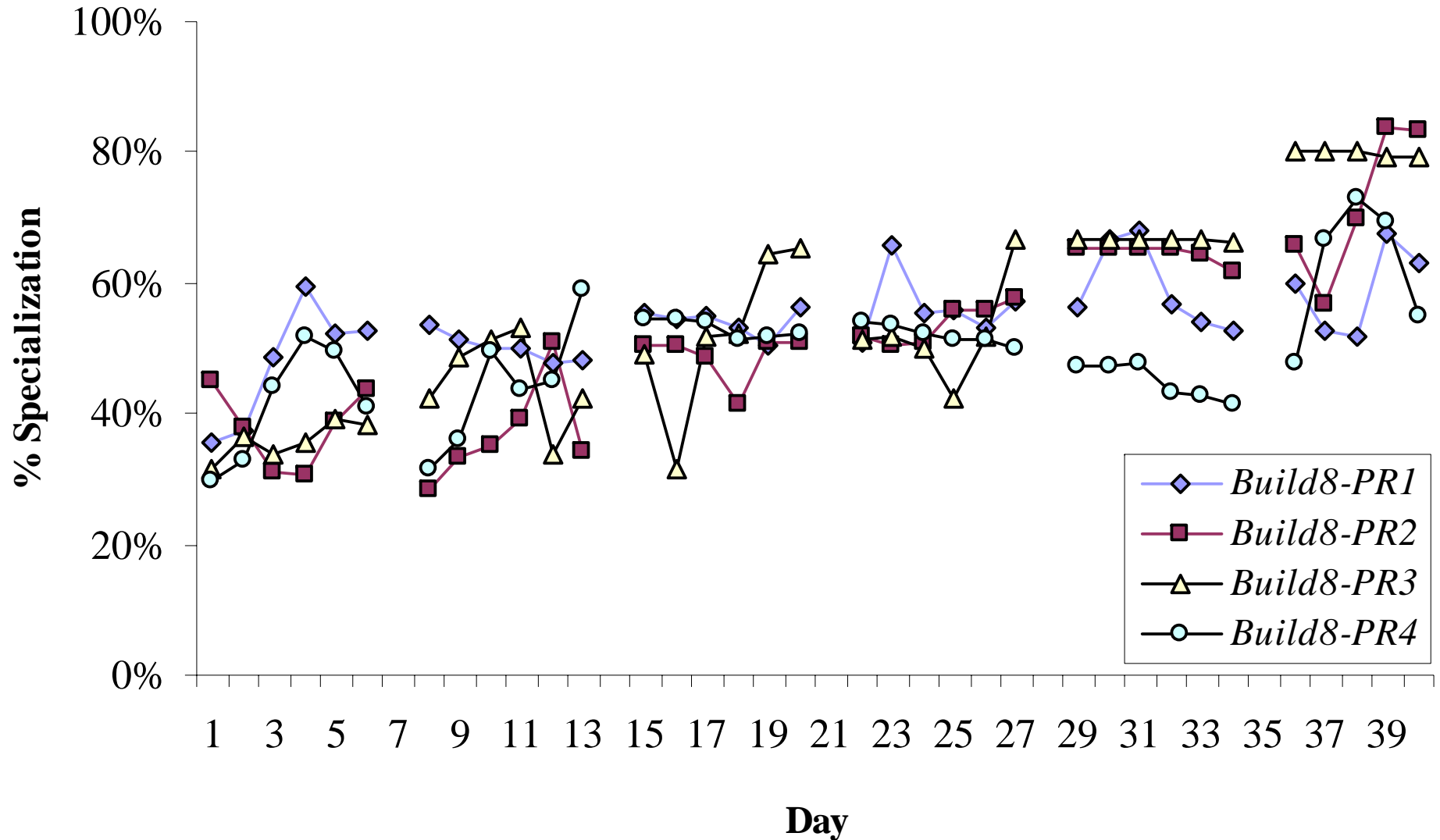
Interdisciplinary Center for Economic Science
George Mason University



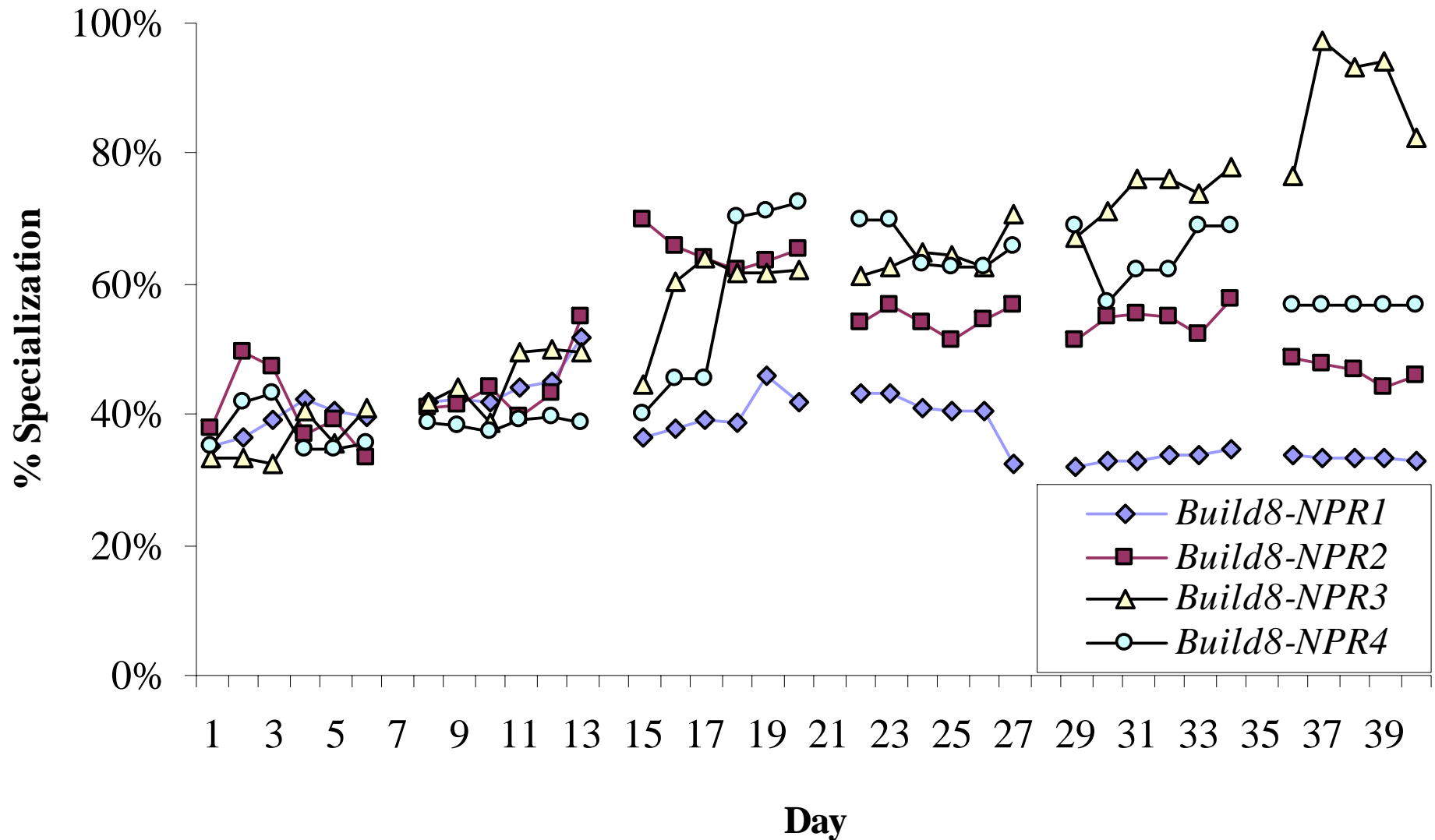
Economic History in the Laboratory

- North (2006) argues that belief systems and the stock of local knowledge are intimately intertwined with the institutions that humans build.
- Two History-Induced Treatments
 - Property rights are perfectly enforced for all of the participants, though they must rely on trust and repeat interactions to enforce exchange agreements (*PRH*)
 - No property rights of any kind are enforced (*NPRH*).

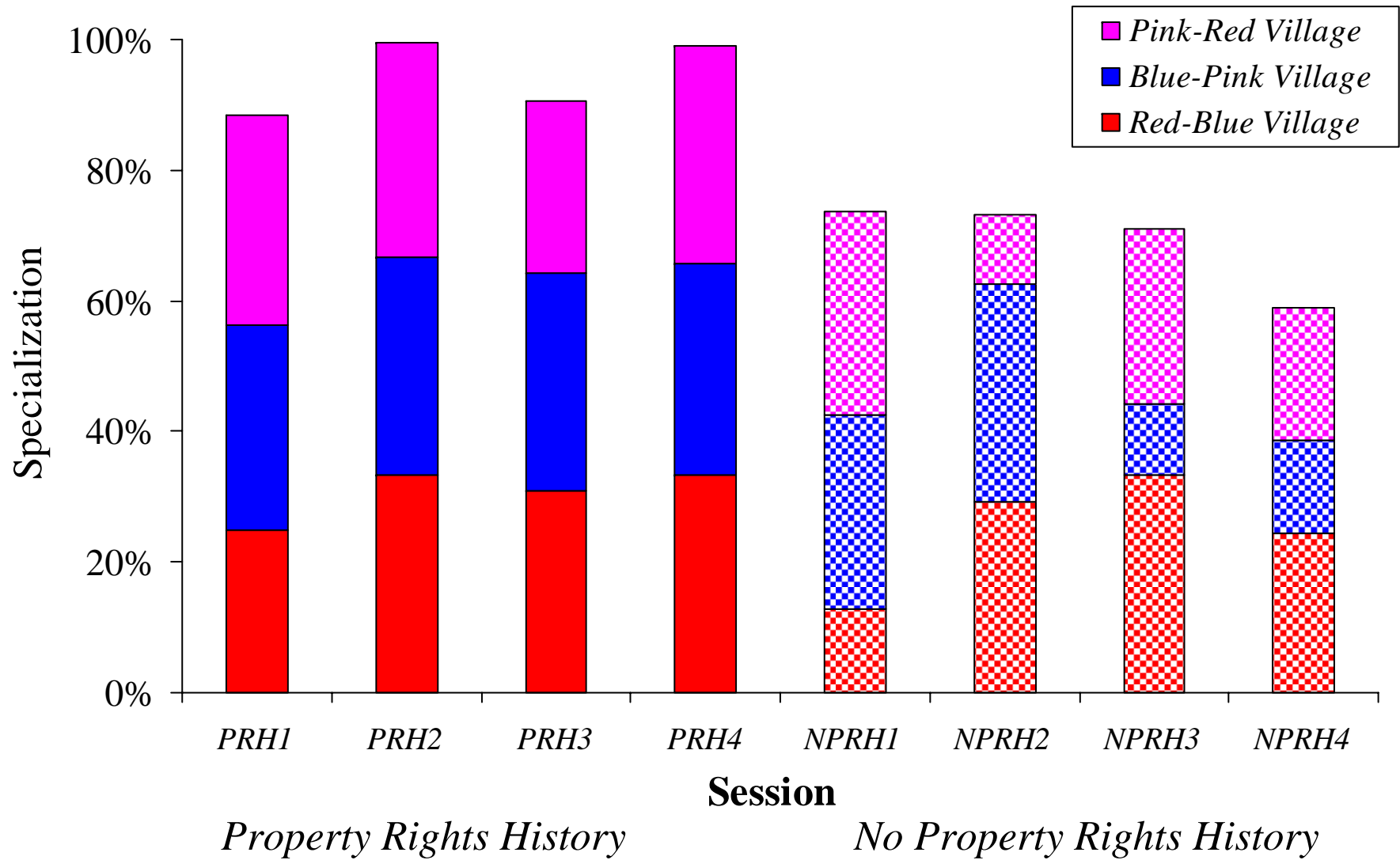
Historical Rates of Specialization: *PRH*



Historical Rates of Specialization: *NPRH*

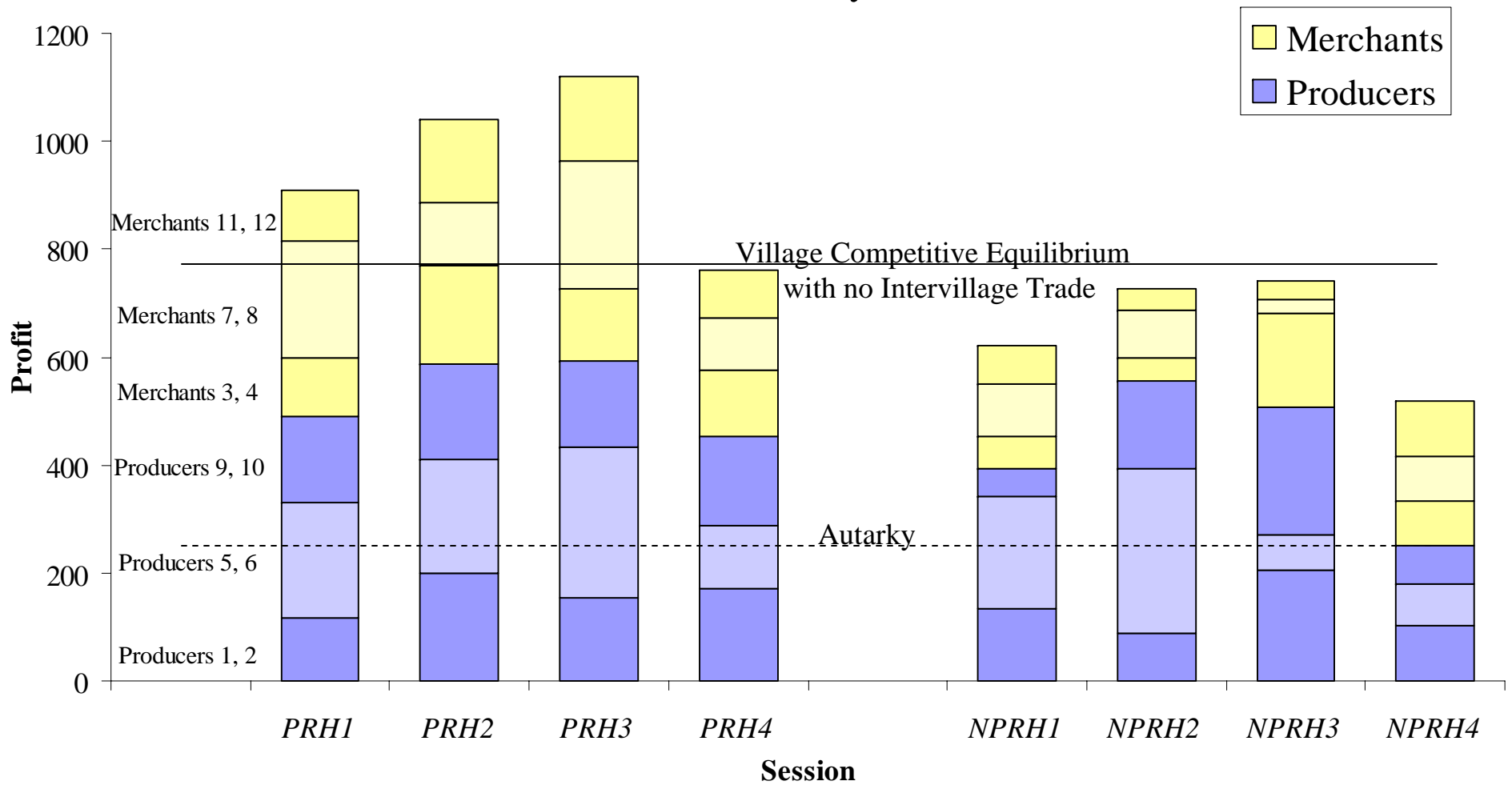


Rates of Specialization



Impact of History on Wealth

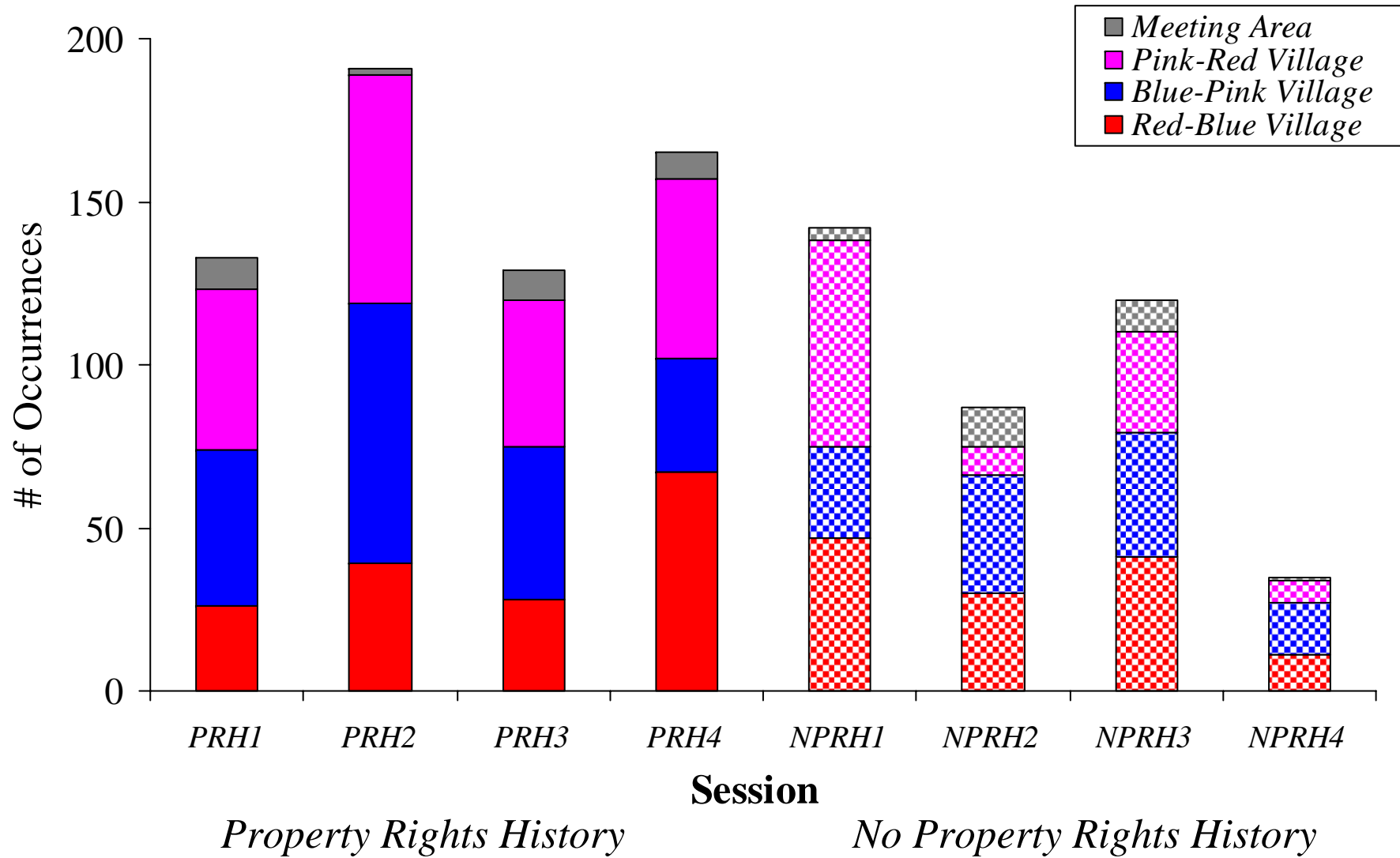
Week 5: Days 29-34



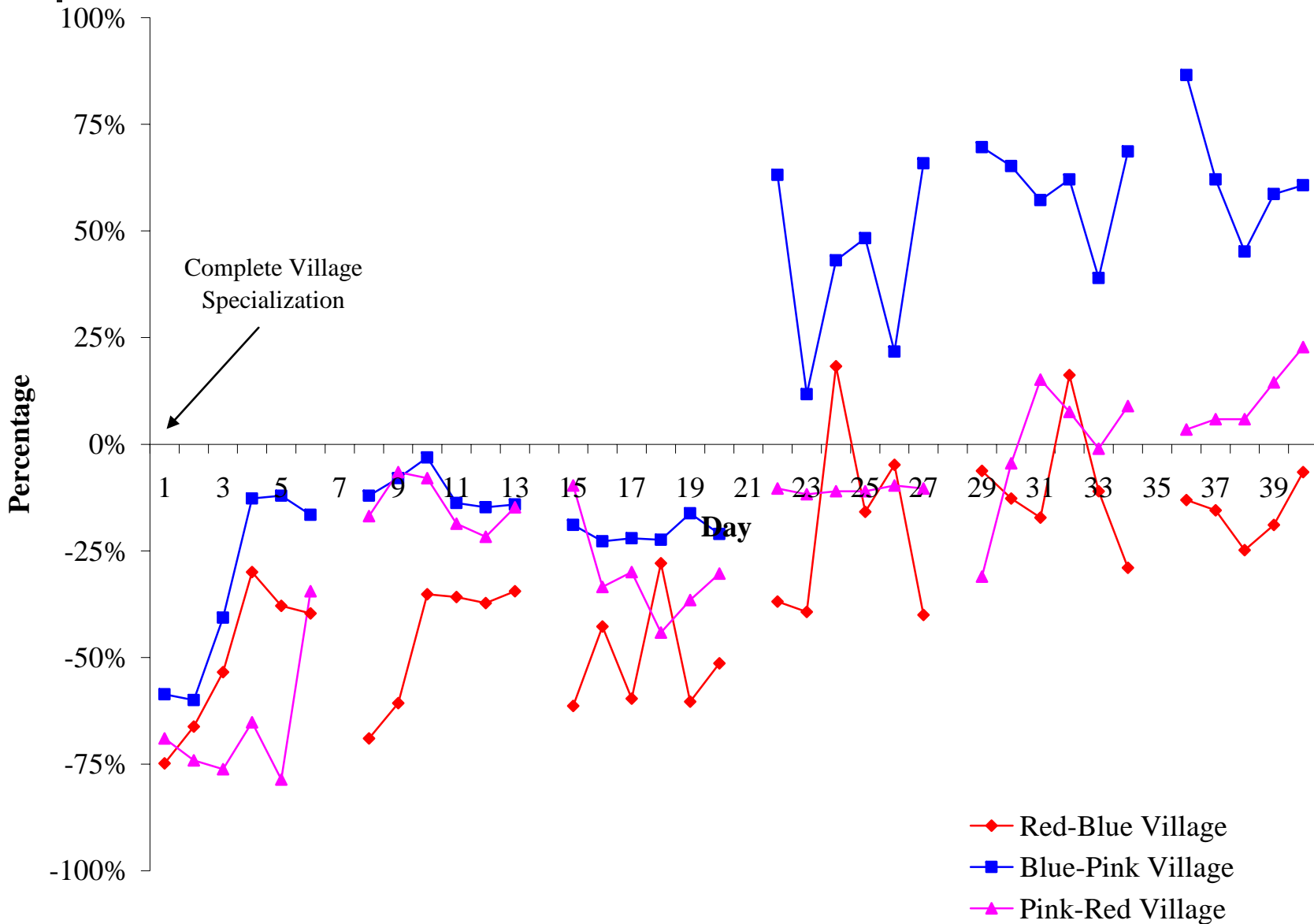
Property Rights History

No Property Rights History

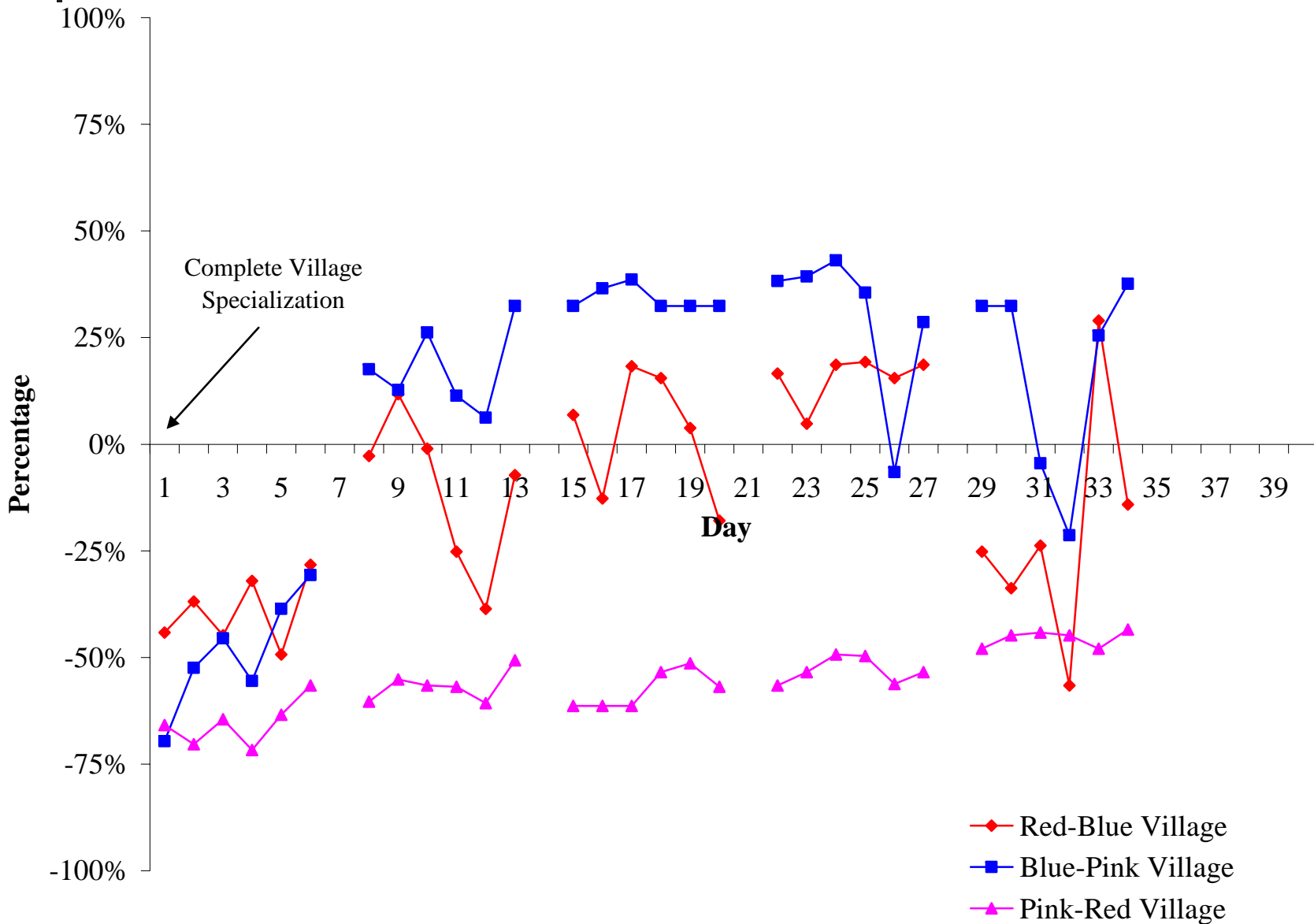
Sociality: Usage of “we”



Property Rights History 1



No Property Rights History 1





Impersonal and Personal Exchange

Blue-Pink Village - Day 33

5: is the other room cooler than this one?

6: i wanna travel...

8: not really

8: you just make deals

8: it has a chat board

8: and buckets

8: thats it

7: yea

7: pretty much

Merchant Area - Day 33

12: Why does it feel like we're selling illegal drugs behind Denny's when we're doing this?

4: cause we are



Summary

“Path dependence is a fact of history and one of the most enduring and significant lessons to be derived from studying the past...the learning process by which we arrive at today’s institutions constrains future choices.”

“No economic model can capture the intricacies of economic growth in a particular society. The process of economic growth is going to vary with every society, reflecting the diverse cultural heritages and the equally diverse geographic, physical, and economic settings...

You must have an intimate understanding of the individual characteristics of that society before you are ready to try to change it.”

--Douglass North, *Understanding the Process of Economic Change*

(Even if you believe you have an intimate understanding of a society, it remains to be seen that trying to change it will be successful.)