

A stylized, dark blue tree logo with a central trunk and multiple horizontal branches, resembling a pine or spruce tree, positioned on the left side of the slide.

Trust and Technology

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This research was supported by the Institute for Security Technology Studies at Dartmouth College under grant 2005-DD-BX-1091 awarded by the US Bureau of Justice Assistance. Points of view or opinions in this document are those of the authors and do not represent the official position or policies of the US Department of Justice or of other sponsors. We thank Clare Fortuna-Agan, Linda Lomelino and Sara del Nido for excellent research assistance.



Joint work with:

- James Kitts, Columbia Univ.
- Tristan Henderson, St. Andrews Univ.
- Sean Smith, Dartmouth
- Chris Masone, Google
- Sara Sinclair, Dartmouth

Outline



- Problems of Trust
 - Periods of social change
 - Defining trust
- Internet: new institutional environment
- Trust Online – 2 experimental studies
 - Trust in exchange
 - Trust in distributed groups
- Implications for trustable systems and reliable networks

Social Change

= problems of trust

- Cooperation/Exchange difficult when:
 - High Uncertainty: do not know what exchange partners will do;
 - don't know who is reliable/capable?
 - don't know what signals reliability/capability?
 - High Vulnerability: outcomes depend on actions of others

Requires TRUST

Social Change = problems of trust

- Industrial Revolution
 - Demographic shifts:
 - immigration
 - movement to cities
 - interaction with unknown individuals
 - new forms of organization:
 - Factories - wages
 - bureaucracy
 - New mechanisms to facilitate exchange
(Zucker, Shapiro) – new type of trust
 - Credit scoring by banks
 - Licensing, regulation, etc



What is trust?

A stylized tree logo in a dark blue color, positioned on the left side of the slide. It has a central trunk and several horizontal branches with small leaf-like shapes.

Sociology of Trust

Expectations by one actor about another actor's (future) behavior

- 3 part relation: A trusts B to do X (Hardin 1991, 2000)

Sociology of Trust

Bob asks to borrow \$10 from Alice

If Alice trusts Bob...

- Alice expects Bob to repay \$10

Sociology of Trust

Bob asks to borrow \$10 from Alice

If Alice trusts Bob...

- Alice *expects* Bob to repay \$10
- Alice lends \$10 to Bob
 - vulnerability: Alice risks losing \$10 (or more); Alice getting \$10 back depends on Bob's behavior
 - Uncertainty: Alice is uncertain about Bob repaying \$10 (though trust makes Alice *feel* certain)
 - Capability – can B do X? Does Bob have an income?
 - Reliability – will Bob do X? (for A?)

Three types of Trust

1. Interpersonal trust (Fine, Gambetta, Hardin)

Trust in a specific actor based on *reliability*:

- Reliability is about history
 - Past experience
 - Relationship and/or social ties
 - Reputation – social networks

(Capability of B to do X is assumed to be 100%)

Three types of Trust

2. Institutional trust (Zucker, Heimer)

3rd Party 'Assurance' mechanisms (Yamigishi)
- assure capability or reliability or both

Capability

- Certification
- Licensing / Accreditation
- Audits
- Organizational position, role, situation

Reliability

- Incentives for B to do X
 - Laws, contracts, insurance
- BBB seal – past behavior
- Reputation – history



Three types of Trust

3. System-level Trust (Giddens)

- Multiple, overlapping mechanisms:
 - Institutional assurance mechanisms
 - Laws, regulations, contracts
 - Institutional organizations, roles
 - Professional groups, accrediting agencies
 - Economic incentives & reputation
 - Social norms and cultural values
 - Situational expectations, assumptions
 - Experience
 - Individual knowledge and experience

New IT: rapid technological and *social* change

- *Internet is new environment*
 - Communication, Exchange, Cooperation
 - eBay, Amazon, Facebook, MySpace, Wikipedia
- Cannot rely on existing mechanisms for reliable interaction
 - What signals reliability? Capability?
 - Evidence of problems, fraud, crime

T4T Experimental Study

Institutional Trust on Internet

- What information matters for “trusting” online vendors re: secure transactions
 - Content: reliability or capability?
 - History of secure transactions
 - Capability for secure transactions
 - Source: Institutional third party or other consumers?
 - Independent 3rd party, non-profit
 - Consumer ratings from customers

T4T Experimental Study

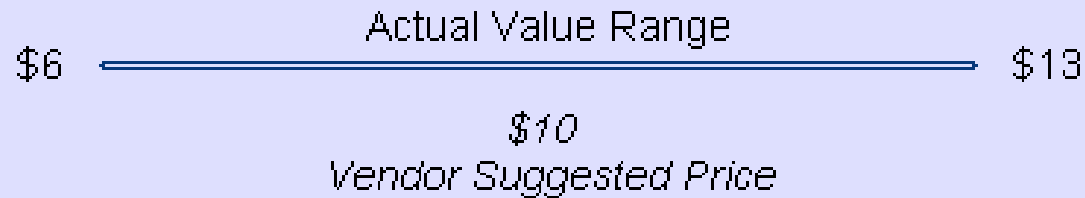
- Make purchase decisions from a series of vendors on a simulated website:

What'sThePrice.com

- For each vendor, decide whether to make a purchase or not, at given price (EXIT game)
 - Content and Source of information about vendor
 - Other factors: price of good, rating of vendor
- Not real purchases or actual products

What'sThePrice.com

Where consumer choice rules



Price information about item for sale:

- 1) *Vendor Suggested Price*: Vendor claims that this price is the fair market value
- 2) *Actual Value Range*: Verified estimate that value of the item is within this range.


INFORMATION ON THE VENDOR



Vendor *rating* based on varying information:

CONTENT: Security (capability) versus Reliability
Vendor has *capability* to conduct secure online transactions vs. vendor has *history* of conducting secure online transactions

SOURCE: Consumers versus Institutional Third Party
Information about Vendor (security vs. reliability) comes from (many) Consumers versus Institutionalized 3rd party



	Institutional 3 rd Party	Consumers
Reliability	Center for Online Purchase Reporting www.COPR.org Your <i>independent</i> source for reliable information!	<i>BuyReliable.org</i> Reliable information from <i>consumers</i> like you!
Capability	Center for Secure Online Transactions www.CSOT.org Your source for <i>independent</i> security information!	<i>BuySecure.org</i> Use the power of <i>consumer</i> feedback for online security!

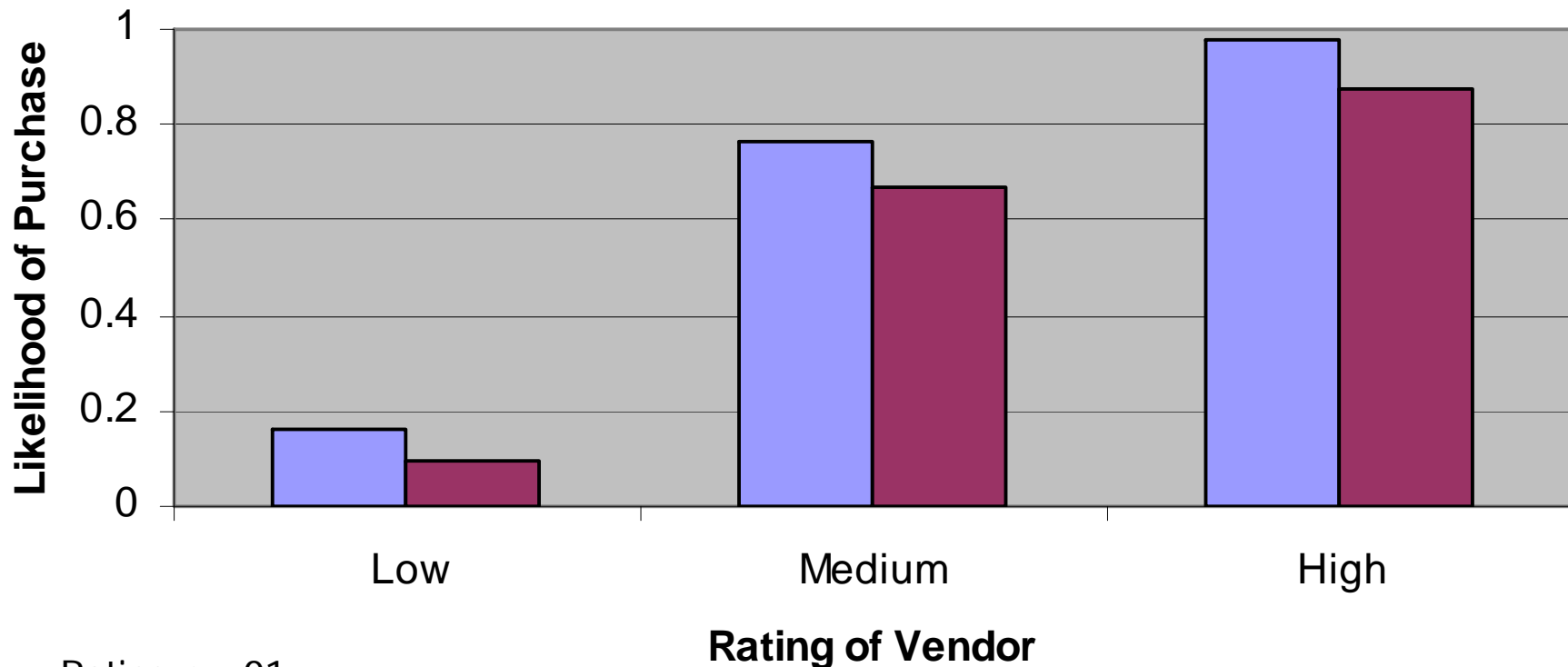
T4T Experimental Setting

- Between subjects design (R1 n=73 subjects) [and within subjects (R2 n=61)]
 - Subjects paid \$5-20, mean=\$12;
 - 12 minutes
- Additional factors
 - Price of item: cheap (\$15) vs expensive (\$88)
 - Quality rating of vendor on 1-5 scale:
 - low (3) vs Medium (4) vs High (5)

T4T Experimental Setting

- R1: Between subjects design
 - 12 rounds: $73 \times 12 = 876$ observations
 - 68% women (n=50)
 - 60% white (n=44)
- Influence of information
 - CONTENT (reliability vs. capability) and
 - SOURCE (Institutional 3rd party vs. consumer rating)
 - Controlling for: price, rating level, and individual characteristics
- On making a purchase (i.e., *trusting* vendor)

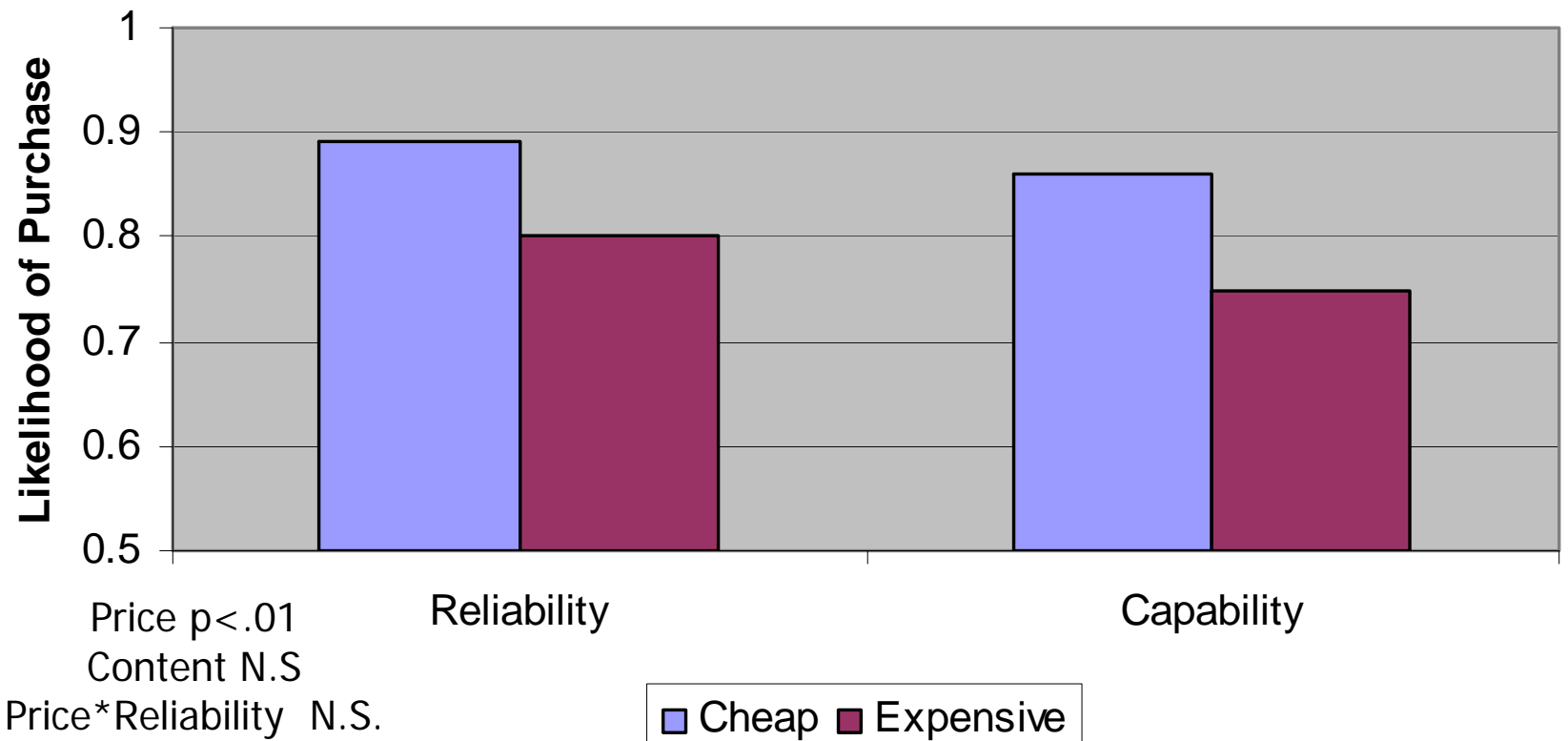
T4T Exit Game R1



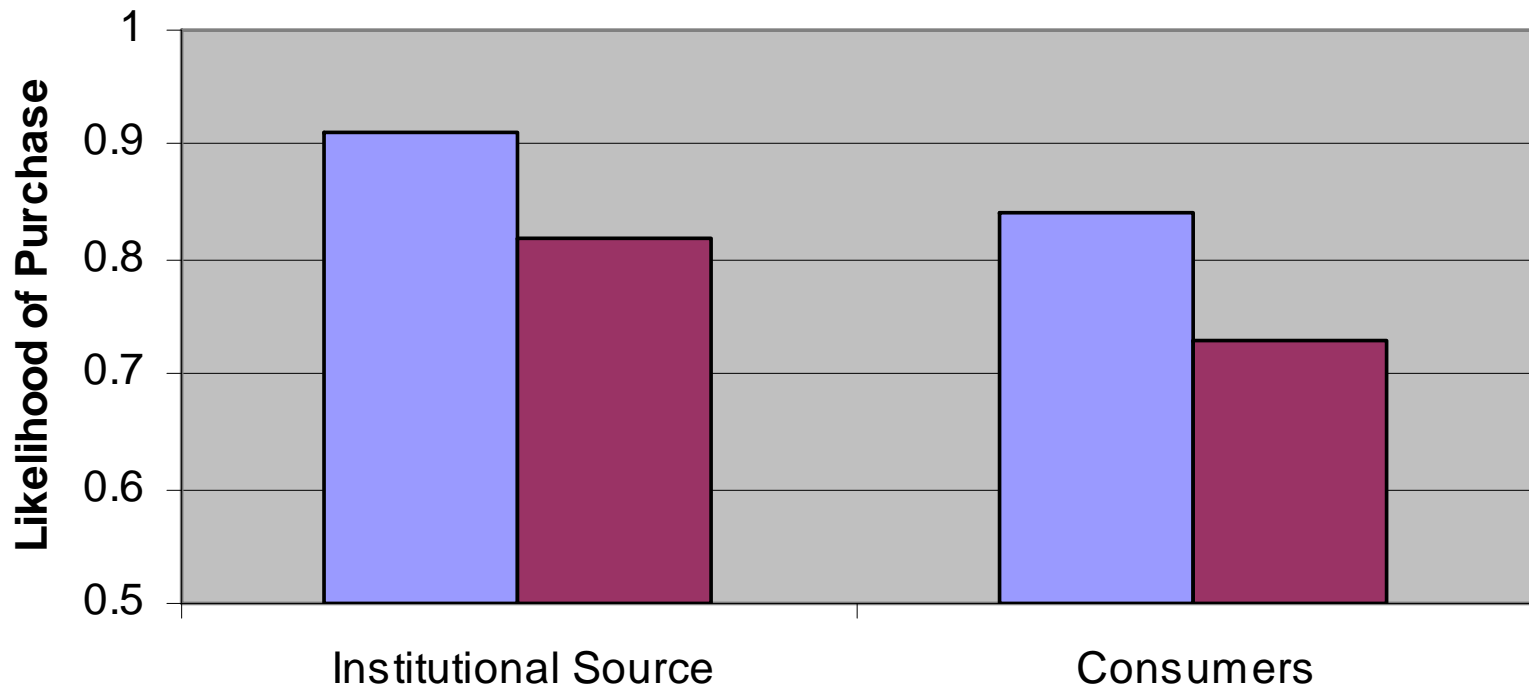
Rating $p < .01$
Price $p < .01$
Price*Rating $p < .05$

■ Cheap ■ Expensive

Role of Information Content (Vendors Rated 4 or 5)



Role of Information Source (Vendors Rated 4 or 5)



Price $p < .01$

Source $p < .05$

Price*Institution N.S.

■ Cheap ■ Expensive

Implications for Technology and Trust

- Want 'assurance' that system trustworthy
 - Third party assurance not other consumers
 - No difference between capability/reliability
- Many Users already 'trust' infrastructure
 - Rely on reputation of company
 - Familiarity with system increases 'trust'
 - Expectation that technology is secure

Limitations of Experiment

- Other aspects of Vendor
- More info about actual products
- Still to do:
 - More subject characteristics (e.g., experience)
 - Within subjects comparisons



PLACE: Privacy in Location Aware Computing Environments Study

New IT enables:

- Distributed groups and shared resources (commons)
 - *wikis*
 - sensor-networks in community spaces
- How ensure/manage privacy and security?
 - Sensors in room, but actors have different preferences for privacy
 - Group *wiki* with private information

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PLACE Experimental Study

1. Does an individual's own privacy behavior affect behavior toward group privacy?
2. Do people use others' privacy behavior as a signal of trustworthiness? (i.e., does others' privacy affect behavior toward group privacy?)

PLACE Experimental Study

- Members of geographically distributed work teams
- Secure project *wiki* with valuable information
 - Rewards for finished project-maintaining password
 - Incentives to sell password
- Subjects have info re:
 - Own privacy
 - Teammates privacy
- 6 rounds (different team configurations) and decide whether to sell password or not
($n=110*6 = 660$ observations)

PLACE Experimental Study

- Subject Privacy level
 - Based on questions regarding privacy practices (lock door; facebook practices; willingness to share private info):
 - Rated as Private – Moderate – Open
- Teammates Privacy
 - Paired with 2 different teammates in each round: teammates privacy level
 - Rated as Private – Moderate – Open

Personal Privacy and Trustworthiness

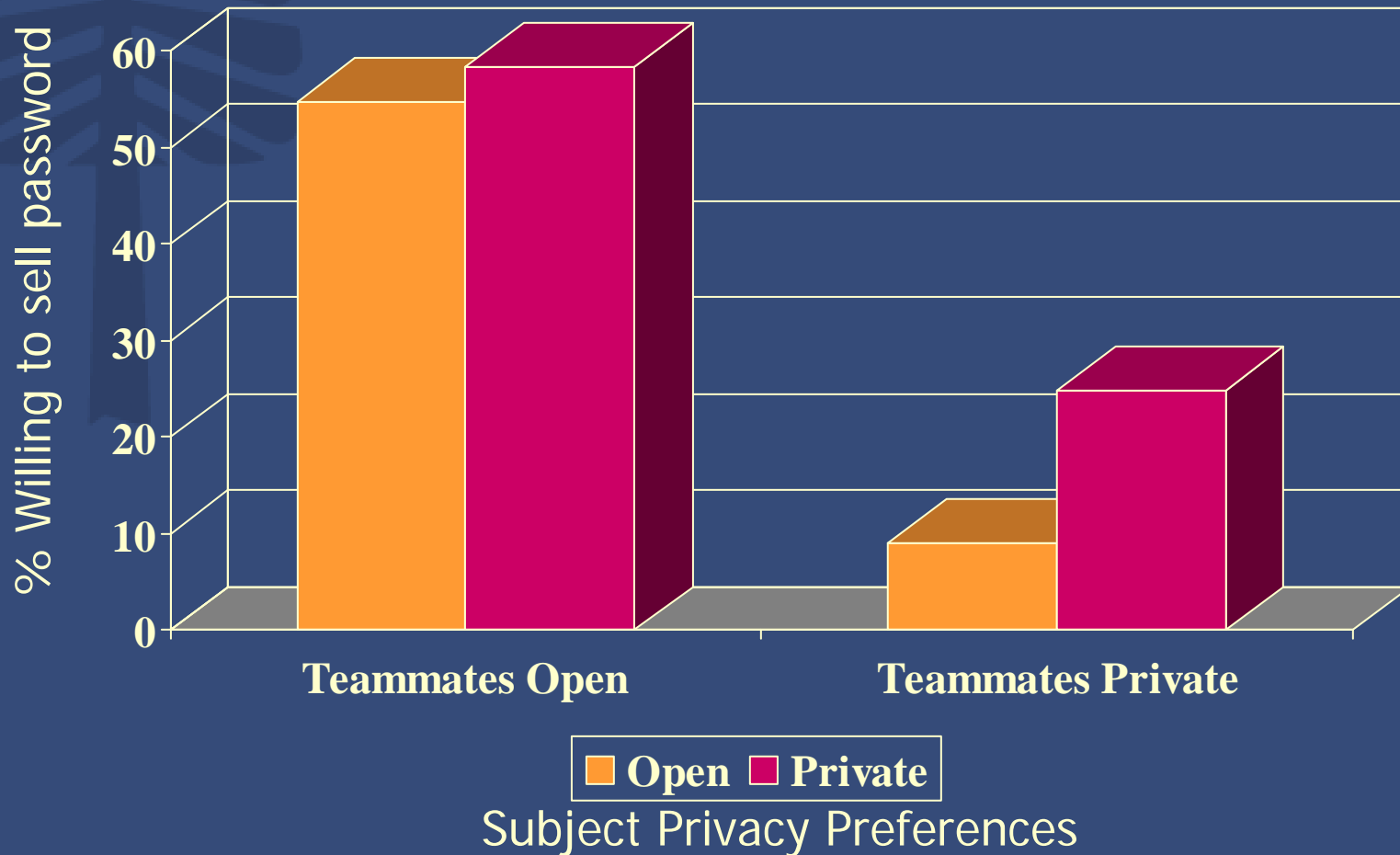
Privacy Behavior	% willing to sell password	P-value
Private	48.1	F = 2.56 p < .10 Bonferroni Priv > Open p < .10
Moderate	40.2	
Open	35.6	

Impact of others' privacy on % willing to sell

Teammate 2= Teammate 3	Open	Moderate	Private	P-value
Open	61%	46%	---	T2: p<.001
Moderate	---	39%	---	
Private	47%	33%	21%	T3: p<.001

Logistic regression model, adjusted for own privacy level and size of incentive to sell, robust standard errors.

Interaction of Subject Privacy and Team-mates Privacy



Implications for Technology and Trust

- Users' own privacy preferences matter for group privacy behavior
 - more private, more likely to sell
- Others' privacy preferences affect trust
 - More private, more trusted
- Interaction between subjects' privacy and teammates privacy
 - Private users distrust private teammates much more than Open users

Implications for Technology and Trust

- Users will use privacy preferences as “signals” of trustworthy behavior in group
- BUT, signals not associated with behavior
- Managing privacy in online group/commons may be more difficult than expect
- Social context matters as much (or more) than technology