Social contagion in new product trial and repeat

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Research Questions

- Not only <u>trial</u> but also <u>repeat</u>?

- Who is most <u>influential</u> at each stage?

- Who is most <u>influenceable</u> at each stage?

Basic premise

- Peer influence can be <u>informational</u> or <u>normative</u> (Deutsch and Gerard 1955)

- Informational influence
  - Affects beliefs about what is -- risks and benefits
    - Increases with sources' credibility or expertise
    - Decreases with decision maker's self-confidence

- Normative influence
  - Affects beliefs about how one should behave
    - Higher within than across groups
    - Middle-status conformity

Additional premises

- Informational influence
  - Greater uncertainty in trial than repeat.
  - Trial > Repeat

- Normative influence
  - As time progresses, social acceptability becomes more important than functionality (Westphal et al. 1997).
  - Deviations from the norm are easier to condone for trial than for repeat (Bosk 2003).
  - Trial < Repeat

In a nutshell

	Trial	Repeat
Mechanism	Informational	Normative
Source	Trusted peers	Group members
Moderator	Self-confidence	Status
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Hypotheses

- **H1:** New product _adoption_ is affected by social contagion from _trusted peers_, and people with _low confidence_ in their judgments are more susceptible to it.

- **H2:** Social contagion from trusted peers and that is negatively moderated by the recipients' self-confidence is _more pronounced in trial than in repeat_.

- **H3:** New product _repeat_ behavior is affected by social contagion from _group members_, and people with _middle-status_ are more susceptible to it.

- **H4:** Social contagion from group members and that is non-monotonically moderated by the recipients' status is _more pronounced in repeat than in trial_.

Research Setting

- Product
  - New prescription drug.
  - Chronic but life threatening disease.
  - Different from prior two drugs in therapeutic class.
  - Uncertainty about long-term clinical benefits.

- Marketing effort
  - Only sales calls.
  - No samples, no direct to consumer advertising, no price cuts.

Data

o **Physician Survey**
  - o Who prescribed in the category before launch
  - o 185 physicians; 65 adopted new drug
  - o Discussion & referral ties vs. Immediate colleagues
  - o Confidence (SRL) vs. Status (Indegree)
  - o Demographic data such as city, solo practice, univ hospital, etc.

o **Physician-level prescription data**
  - o 17 months, starting with time of launch of focal drug (trial and repeat).
  - o Prescription data of the other two drugs before launch.

o **Physician-level detailing data**
  - o 17 months, starting with time of launch.

Contagion Variables

For physician i at time t,

- Contagion from discussion and referral ties
  - Volume of prescription of the drug at $t-1$ by physicians named as discussion or referral tie by physician i.

- Contagion from immediate colleagues
  - Share of prescription of the drug at $t-1$ among immediate colleagues of physician i.

Model

- Two binary probit equations

- Trial
  - $U_{it}^a = \beta_{0i}^a + X_{it}^a \beta_1^a + \varepsilon_{it}^a$, where $\beta_{0i}^a \sim N(\bar{\beta}_0^a, \sigma_a^2)$ and $\varepsilon_{it}^a \sim N(0,1)$
  - X_{it}^a consists of contagion variables, their interactions with confidence and status, sales calls, period-fixed effect, and other control variables.

- Repeat
  - $U_{it}^r = \beta_{0i}^r + X_{it}^r \beta_1^r + \varepsilon_{it}^r$, where $\beta_{0i}^r \sim N(\bar{\beta}_0^r, \sigma_r^2)$ and $\varepsilon_{it}^r \sim N(0,1)$
  - X_{it}^r consists of all variables included in X_{it}^a and physician i's prescription volume at *t-1*.
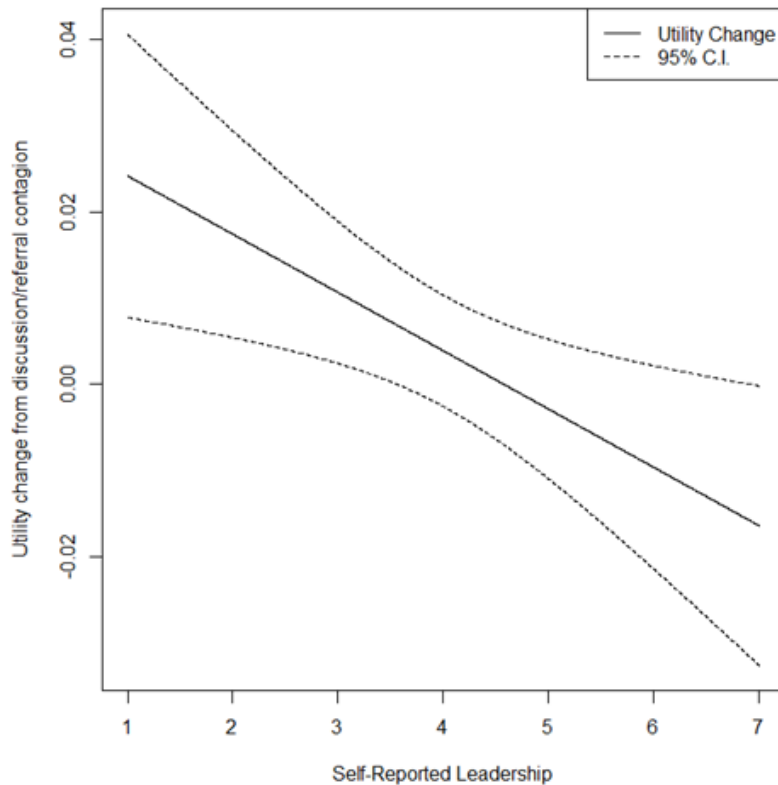
Controls

- Time
  - Monthly dummies.

- Heterogeneity
  - Physician specific random intercept (allowing for cor relation between trial and repeat equation).
  - Nonparametric baseline (for trial)
  - Lagged prescription volume (for repeat).

- Endogeneity
  - Control function approach for sales calls
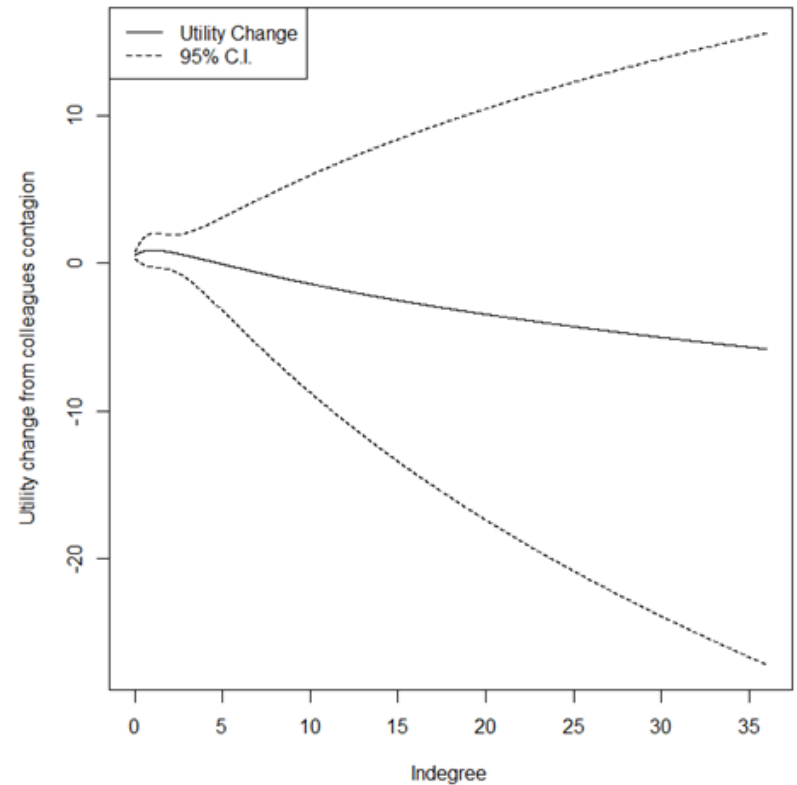 - Lagged prescription volume (for repeat).

Main Results

Variables	Trial Hazard	Repeat Probability
Intercept	-2.069 ***	-0.333
	(0.312)	(0.467)
SRL	0.133	-0.088
	(0.069)	(0.157)
$Ln(Indegree + 1)$	0.106	0.073
	(0.228)	(0.425)
$Ln(Indegree + 1)^2$	0.020	0.126
	(0.132)	(0.299)
Contagion from Dis / Ref Ties (00s)	0.056	-0.067
	(0.344)	(0.423)
Contagion from Dis / Ref Ties (00s) × SRL	-0.677 **	0.390
	(0.250)	(0.260)
Contagion from Colleagues	0.759 *	0.479
	(0.377)	(0.257)
Contagion from Colleagues × $Ln(Indegree + 1)$	0.625	2.533 ***
	(0.917)	(0.686)
Contagion from Colleagues × $Ln(Indegree + 1)^2$	-0.787	-0.840 *
	(1.213)	(0.305)

Social Contagion in Trial

- Contagion from ref/dis ties
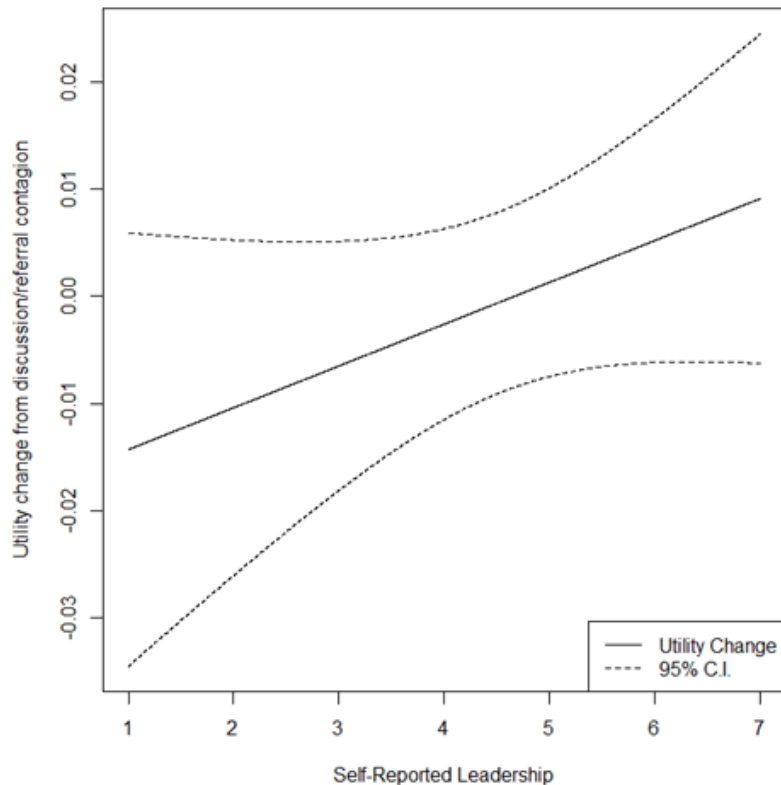 - Significant for lower SRL
- Contagion from colleagues
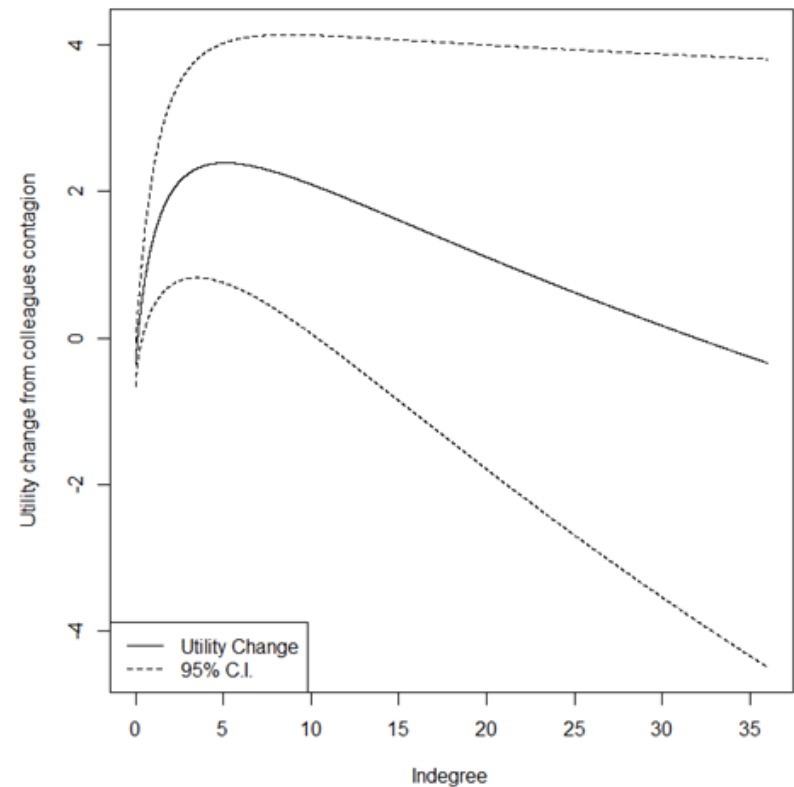 - Not moderated by Status

Social Contagion in Repeat

- Contagion from ref/dis ties
  - Insignificant

- Contagion from colleagues
  - Middle-status conformity

Trial vs. Repeat

- Contagion from discussion/referral ties
  - Not significantly different b/w trial and repeat (p>0.1).
  - ~ Credence good

- Contagion from immediate colleagues
  - Significantly different b/w trial and repeat ($p < .01$).

Threats to Internal Validity

- Instrumentation bias
    - SF: Before launch
    - LA/NYC: 10 months after launch

- Endogeneous tie formation
    - Discussion/referral ties: SF vs. LA/NYC
    - Immediate colleagues: Trial vs. Repeat

- Reflection / Simultaneity

- Truncation bias

- Correlated unobservables

- Mere duration dependence in usage

Robustness Checks

- Different operationalization of contagion
  - Volume-weighted vs. Share-weighted

- Different specification of models
  - Adding additional interactions

- Carry-over of Salescalls

- Correlation b/w status and status-squared

- Spatial variation in demand within cities

Conclusion

- Not only <u>trial</u> but also <u>repeat</u>?
  - Yes
  - Mechanisms: most likely informational v. normative

- Who is most <u>influential</u> at each stage?
  - Trusted peers v. Group members

- Who is most <u>influenceable</u> at each stage?
  - Low-confidence v. Middle-status