Emerging from the cocoon?  
Revisiting the tele-cocooning hypothesis in the smartphone era

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Outline

• Survey study on tele-cocooning effect
  – Representative national sample of JP adolescence
  – 2009
    • “Feature phone” era

• Field experiment study using smartphones
  – Kobayashi et al. (under review)
  – Sample of JP smartphone users
  – 2012
    • “Smartphone” era
Bonding nature

• Voice calls and texts are predominantly exchanged among intimate and homogeneous peers (e.g. Campbell & Kwak, 2012a; Ishii, 2006; Ling, 2004, 2008; Wilken, 2011)
  – “Connected presence” (Licoppe, 2003)

• Half of an individual’s messages go to only five persons on average (Ling et al., 2012)
  – Actual traffic in Norway during a period in 2007
Bonding nature

• Relatively few calls and texts go to those who live beyond a postal code away (Ling et al., 2014)
Network privatism

• “intensive mobile com in the intimate realm of social life can be detrimental for being connected to others more broadly” (Campbell, forthcoming)

• “tightening of the inner realm of personal ties may come at the expense of being connected more broadly” (Campbell, forthcoming)
Overshadowing

Communication with strong ties

Communication with weak ties

Communication with strong ties

Communication with weak ties
Dependent variables

• Social networks
  – Size
  – Homogeneity / Heterogeneity
  – Density / Clustering
  – Geographical dispersion

• Attitudinal / Cognitive impact?
  – General trust
General trust

• A general belief in human benevolence
  – "Generally speaking, would you say that most people can be trusted, or that you cannot be too careful in dealing with people?"

• High-trusters are not gullible people
  – Socially intelligent
  – Useful in situations with high opportunity costs and social uncertainty
Low general trust in Japan

- “Most people in society are trustworthy”

Low general trust in Japan

• “Assurance destroys general trust” (Yamagishi, 2011)

• Low social mobility
  – Lifetime employment system
  – Low divorce rate

• The consequences of being ostracized is severe

• JP people do not have to judge the trustworthiness of others
Application to tele-cocooning

• If mobile comm has a tele-cocooning effect, it should facilitate the formation of committed relationships

• Heavy users will have lower levels of general trust
Measurement of general trust

• Who are the “most people”?  
  – Narrow in Confucian countries  
  – Wider in wealthy countries

• Overestimated if known others (rather than anonymous strangers) are assumed

• How Rs interpret the phrase “most people” may be correlated with mobile comm
Hypothesis

- $H_1$: Frequency of MC is negatively associated with the perceived scope of “most people.”
  - Intensive MC may shrink users’ personal networks into small cocoons by decaying weaker ties
  - Intensive MC may cognitively limit users’ social horizons
    - Accessibility heuristics
Hypothesis

• $H_2$: The frequency of MC is positively associated with levels of general trust when the perceived scope of “most people” is NOT controlled.
  – Spurious

• $H_{2a}$: The positive association between the frequency of MC and levels of general trust becomes negative when the perceived scope of “most people” is controlled.
  – Tele-cocooning
Corollaries

- $H_{3a}$: MC is positively associated with caution in dealing with others
  - Trust as social intelligence

- $H_{3b}$: MC is negatively associated with social tolerance
  - Reducing opportunity costs
Survey

- Japanese adolescents (8-18 yrs old)
  - Summer of 2009
  - Nationally representative drop-and-collect survey
  - N=1,002 (RR=59%)
  - Weighted using post-stratification weights calculated from distributions of sex, age, and the population of each stratum
Measurement

- **General trust** (Yamagishi & Yamagishi, 1994)
  - Most people are trustworthy
  - Most people trust others
  - Most people are basically good and kind

- **Follow-up question**
  - “What kind of people did you imagine as ‘most people’ when answering the three items above [general trust items]?” (MA)
Measurement

• Caution in dealing with others (Yamagishi & Yamagishi, 1994)
  – People are only interested in their own welfare
  – In this society, one has to be alert or someone will take advantage of you
  – In this society, one must be constantly afraid of being cheated
Measurement

• **Social tolerance** (Ikeda & Kobayashi, 2008; Kobayashi, 2010)
  – What do you think when you and the following people have different views or opinions?
    • Father
    • Mother
    • Close friends of the same generation
    • Acquaintances of the same generation
Freq. of mobile texting

• Average # of outgoing and incoming texts
  – 1 = less than one message; 2 = 1–5 messages; 3 = 6–10 messages; 4 = 11–25 messages; 5 = 26–50 messages; 6 = 51 messages or more
Frequency of texting is negatively associated with the perceived scope of “most people.”

Figure 1  How respondents interpreted the phrase “most people” (MA, %)
Table 1  Logistic regression model predicting the interpretations of “most people”

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Scope of “most people” (0: Narrow scope cluster, 1: Broad scope cluster)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>coef. (B)</td>
</tr>
<tr>
<td>Sex</td>
<td>−0.54** (0.19)</td>
</tr>
<tr>
<td>Age</td>
<td>0.01 (0.09)</td>
</tr>
<tr>
<td>Junior high school</td>
<td>1.92* (0.80)</td>
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<tr>
<td>High school</td>
<td>2.33* (0.95)</td>
</tr>
<tr>
<td>Some college</td>
<td>2.32† (1.16)</td>
</tr>
<tr>
<td>Academic-track school</td>
<td>−0.02 (0.08)</td>
</tr>
<tr>
<td>General trust of the guardian</td>
<td>−0.16* (0.06)</td>
</tr>
<tr>
<td>Participation in voluntary association</td>
<td>−0.14** (0.05)</td>
</tr>
<tr>
<td>Generalized reciprocity</td>
<td>0.03 (0.03)</td>
</tr>
<tr>
<td>Frequency of mobile texting</td>
<td>−0.09* (0.04)</td>
</tr>
<tr>
<td>Constant</td>
<td>0.36 (1.15)</td>
</tr>
<tr>
<td>N</td>
<td>437</td>
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<tr>
<td>Pseudo R-squared</td>
<td>0.08</td>
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<td>Dependent variable:</td>
<td>General trust model 1</td>
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<tr>
<td></td>
<td>coef. (B)</td>
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<td>Sex</td>
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<td></td>
<td>(0.18)</td>
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<tr>
<td>Age</td>
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<td></td>
<td>(0.07)</td>
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<td>Junior high school</td>
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<td></td>
<td>(0.39)</td>
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<td>High school</td>
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<tr>
<td></td>
<td>(0.53)</td>
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<tr>
<td>Some college</td>
<td>-1.13†</td>
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<tr>
<td></td>
<td>(0.65)</td>
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<tr>
<td>Academic-track school</td>
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<tr>
<td></td>
<td>(0.06)</td>
</tr>
<tr>
<td>General trust of the guardian</td>
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<tr>
<td></td>
<td>(0.06)</td>
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<tr>
<td>Participation in voluntary association</td>
<td>0.20**</td>
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<tr>
<td></td>
<td>(0.06)</td>
</tr>
<tr>
<td>Generalized reciprocity</td>
<td>0.12*</td>
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<tr>
<td></td>
<td>(0.05)</td>
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<tr>
<td>Frequency of mobile texting</td>
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<td></td>
<td>(0.03)</td>
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<tr>
<td>Scope of “most people”</td>
<td>-1.93**</td>
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<td></td>
<td>(0.15)</td>
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<tr>
<td>Constant</td>
<td>4.86**</td>
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<td></td>
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<td>430</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.14</td>
</tr>
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</table>
Discussion

• Positive association btwn general trust and texting is spurious
  – Heavy texters have narrower social scope

• Heavy texters tend to be cautious in dealing with others

• Heavy texters tend to be less socially tolerant

• Support tele-cocooning hypothesis
  – But again, see the review by Campbell (forthcoming)
Revisiting the tele-cocooning hypothesis in the smartphone era

• Most of the mobile phone users used “feature phones” in 2009

• Smartphone as a game-changer?
  – Unprecedented level of customizability with apps
Revisiting the tele-cocooning hypothesis in the smartphone era

• RQ: Can smartphones be used to mitigate tele-cocooning?

• Yes
  – By stimulating interaction with weak ties
  – By promoting the acquisition of information through those weak ties

• Smartphones can be utilized to promote access to social capital
Social capital

• “the resources embedded in social networks accessed and used by actors for actions” (Lin, 2001: 25)

• Strong ties
  – Expressive returns such as well-being and mental health

• Weak ties
  – Instrumental returns such as wealth, power, and reputation
  – “the weaker the tie, the more likely ego will have access to better social capital for instrumental action” (Lin, 2001: 67)
“out of sight, out of mind”

• It is quite difficult for people to recall their personal networks accurately (Krackhardt, 1987; Brands, 2013)
  – More likely to forget weak ties than strong ties (Brewer, 2000)

• Tele-cocooning would expand the blind spots in the cognitive map of personal networks and hamper the mobilization of social capital through weak ties
Can smartphones mitigate the tele-cocooning effect?

• However, apps can potentially help users maintain weak ties
  – Reminding former classmates
  – Reminding decaying work-related ties
Challenges

• How can we identify weak ties?

• How can we send reminders to stimulate interaction with weak ties?

• Adopt a novel method that automatically identifies weak ties using mobile communication logs.
Network Navigator

Automatically records non-identifying information regarding all voice calls, text messages, and Gmail messages
Reminder message

- Weak ties: At least one communication has occurred in the past through voice calling, text messaging, or Gmail, but 60 days or more have passed since the last logged communication.
Field experiment

• Pre-treatment survey
  – N=259

• Install the app for 2 months
  – Randomly assigned into treatment and control group
  – N=231

• Post-treatment survey
  – N=193

• Reliability check
  – N=173
  • $N_{\text{Control}} = 82$, $N_{\text{Treatment}} = 91$
  • 53% Female
  • 59% with a college degree
  • Average: 34.65
  • Smartphone use: 7.59 months
Manipulation check

• “How often did the application ask you to contact the following categories of people?”
  – 9 categories
  – Factor analysis
    • 1\textsuperscript{st} factor: e.g. “Someone you had not contacted in a while”
    • 2\textsuperscript{nd} factor: e.g. “Someone you are very friendly with”
  – 1\textsuperscript{st} factor > 2\textsuperscript{nd} factor
    • Cohen’s $d = 1.06$, $t = 7.40$, $p < .001$
Analysis using behavioral logs

• Identified weak ties
  – # of weak ties per participant: 1 to 127 ($M = 12.3$, $SD = 17.3$)
  – 2,345 reminders were sent
  – # of reminders per participant: 2 to 70 ($M = 29.1$, $SD = 15.2$)
### Analysis using behavioral logs

- **Survival analysis (Cox proportional hazard model)**
  - The activation of weak ties corresponds to “death”

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of reminders</td>
<td></td>
<td></td>
</tr>
<tr>
<td>β</td>
<td>0.08</td>
<td>0.37</td>
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<tr>
<td>Robust Standard Error</td>
<td>(0.02)</td>
<td>(0.16)</td>
</tr>
<tr>
<td>p-value</td>
<td>0.00</td>
<td>0.02</td>
</tr>
<tr>
<td>Hazard Ratio</td>
<td>1.08</td>
<td>1.45</td>
</tr>
</tbody>
</table>

| Number of reminders (log-transformed) |               |               |
| β                           |               |               |
| Robust Standard Error       |               |               |
| p-value                     |               |               |
| Hazard Ratio                |               |               |
| ρ                           | 0.01          | 0.02          |
| P-value                     | 0.88          | 0.64          |
| AIC                         | 2623.12       | 2623.80       |
| Number of events            | 194           | 194           |
Analysis using behavioral logs

• The reminders positively predicted the activation of weak ties
  – One reminder is expected to increase the probability of the activation of a weak tie by 8%
Analysis using self-report survey data

• Freq. of activating weak ties
  – “During the two months that you had the application installed, did any of the following occur?”
    • “I contacted a former classmate I had not contacted in a while”
    • “I contacted a co-worker I had not contacted in a while”
    • etc (6 items)
  – Marginally significant
    • Cohen’s $d = 0.30$, $t = 1.95$, $p = .052$
    • Largest effect on activating ties with “former classmates”
**Analysis using self-report survey data**

- Information acquisition through *weak ties*
  - “In the past two months, how often did you obtain the following types of information from *someone you are not particularly friendly with*?”
    - people outside of family, close friends, or co-workers you are close with
    - “Information that is useful for your work (schoolwork)”
    - “Information that is useful for your monetary decisions such as daily finances or savings”
    - etc (5 items)
  - Significant
    - Cohen’s $d = 0.36$, $t = 2.34$, $p = .020$
Analysis using self-report survey data

• Information acquisition through \textit{strong ties}
  – “In the past two months, how often did you obtain the following types of information from someone you feel very close to?”
    • people outside of family, close friends, or co-workers you are close with
  – Placebo test
  – Insignificant
    • Cohen’s $d = 0.16$, $t = 1.02$, $p = .306$
Summary

• Reminders have a facilitating effect on weak ties activation
  – Consistent across behavioral and self-report data

• Reminders have a facilitating effect on information acquisition through weak ties
Implications

• Technology can facilitate access to social capital
  – Strong causal inference obtained from a randomized field experiment

• Fruitfulness of a perspective that asks whether technology can be used to complement people’s limited cognitive abilities
  – Apps can help to fill in incomplete cognitive maps
Revisiting tele-cocooning

- No longer appropriate to assume every mobile phone user is using the same device

- Future work need to focus on apps instead of devices
General discussion

• Tele-cocooning effect of “feature phone” use
• Mitigation of tele-cocooning with smartphone app
• Smartphone supports “networked individualism” (Rainie & Wellman, 2012)
  – “Diversified search for specialized social capital”
• LINE, Kakao Talk, Texting, and localized social media