Do Interviewers moderate the effect of monetary incentives on response rates in household interview surveys?

Eliud Kibuchi, Patrick Sturgis, Gabriele Durrant, Olga Maslovskaya
University of Southampton

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Background and motivation

- Monetary incentives are known to increase response rates (Singer et al 1999)

- Some interviewers are more effective at eliciting cooperation than others (Durrant et al. 2010; Durrant, D’Arrigo, and Steele 2013)

- But little is known about whether & how interviewers differ in effectiveness of deploying incentives to promote survey response and cooperation

- How might this happen?
  - Interviewers ‘tailor’ deployment by highlighting incentives at addresses where they are most effective (Groves and Couper 1996)
  - Interviewers vary in their beliefs about effectiveness of incentives (Singer et al 2000; Lynn 2001)
Research Questions & empirical strategy

• RQ1: Do interviewers differentially influence the effectiveness of incentives in increasing survey participation?

• RQ2: Are interviewer characteristics associated with effectiveness of incentive deployment?

• ES1: face-to-face household surveys containing randomised incentive experiments

• ES2: Multi-level models predicting response outcome as function of incentive condition and covariates

• ES3: Interviewer level random coefficient for incentive condition
Data

Understanding Society Innovation Panel

- wave 1 data consisting of three random experimental group:
  - Group 1: £5 per adult interviewed; Group 2: £10 per adult interviewed; Group 3: £5 per adult interviewed rising to £10 if all adults in household are interviewed
  - Each household also received unconditional cash voucher
  - Combined groups 2 and 3 into one incentive group

National Survey for Wales 2015

- One randomly selected adult aged 16+
- Conditional incentive
- experimental groups: Group 1: £10 incentive Group 2: no incentive
Data

• NSW 2016
  ▪ Each address on odd numbered quota offered a conditional £5, and addressed on even numbered offered no incentive
  ▪ Experiment terminated earlier due to low response and a new £10 incentive offered onwards

• Number of households issued incentives grouped into incentive or no incentive

<table>
<thead>
<tr>
<th>Survey</th>
<th>Incentive (£10)</th>
<th>Low (no) Incentive</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP</td>
<td>1,680</td>
<td>843 (£5 incentive)</td>
</tr>
<tr>
<td>NSW 2015</td>
<td>2,960</td>
<td>2,828</td>
</tr>
<tr>
<td>NSW 2016</td>
<td>3,640</td>
<td>3,467</td>
</tr>
</tbody>
</table>
Response rate by incentive group for both surveys

<table>
<thead>
<tr>
<th></th>
<th>Response Frequency (%)</th>
<th>Nonresponse Frequency (%)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Innovation Panel</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incentive</td>
<td>1,020 (61.4%)</td>
<td>640 (38.6%)</td>
<td>1,660</td>
</tr>
<tr>
<td>No Incentive</td>
<td>469 (56.1%)</td>
<td>367 (43.9%)</td>
<td>836</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1489</td>
<td>1007</td>
<td>2,496</td>
</tr>
<tr>
<td><strong>NSW 2015</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incentive</td>
<td>1,504 (58.7%)</td>
<td>1,059 (41.3%)</td>
<td>2,563</td>
</tr>
<tr>
<td>No Incentive</td>
<td>1,319 (54.1%)</td>
<td>1,119 (45.9%)</td>
<td>2,439</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>2823</td>
<td>2178</td>
<td>5,001</td>
</tr>
</tbody>
</table>
# Data

- Cooperation rate by incentive group for both surveys

<table>
<thead>
<tr>
<th></th>
<th>Response Frequency (%)</th>
<th>Nonresponse Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Innovation Panel</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incentive</td>
<td>1,020 (69.2%)</td>
<td>453 (30.8%)</td>
</tr>
<tr>
<td>No Incentive</td>
<td>469 (66.8%)</td>
<td>233 (33.2%)</td>
</tr>
<tr>
<td>Total</td>
<td>1,489</td>
<td>686</td>
</tr>
<tr>
<td><strong>NSW 2015</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incentive</td>
<td>1,504 (71.8%)</td>
<td>591 (28.2%)</td>
</tr>
<tr>
<td>No Incentive</td>
<td>1,319 (67.0%)</td>
<td>649 (33.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>2,823</td>
<td>1,240</td>
</tr>
</tbody>
</table>
Data

Explanatory and Response Variables

• Interviewer observations (only for IP data)

• Geographical and area variables (urban/rural, UK regional indicator (IP only))

• Interviewer characteristics (Age, gender, interviewer experience, and race)

• Response Outcome

\[ y_{i(j)} = \begin{cases} 
1 & \text{household response} \\
0 & \text{household nonresponse} 
\end{cases} \] : for household and interviewer

• Gives the probability that contacted household and interviewed by interviewer will cooperate to a survey
Data

Definition of outcome

- Survey response based on AAPOR RR2

\[ RR2 = \frac{(I + P)}{(I + P) + (R + NC + O) + (UE(NC) + UE)} \]

- Survey cooperation

\[ CR2 = \frac{(I+P)}{(I+P)+(R)} \]

RR = Response Rate, I = Interview,
P = Partial Interviews, R = Refusals,
NC = Non-Contacts, O = Other Unproductive,
UE(NC) = Unknown Eligibility (non-contacted), and UE = Unknown Eligibility
Models

• Multilevel cross-classified response propensity logistic models

• Why cross-classified multilevel models?
  ▪ Allows the variation in the response outcome to be partitioned into household, interviewer and area levels
  ▪ Disentangles interviewer and area effects on survey response and cooperation
  ▪ Enables to vary incentives effects on survey response and cooperation across interviewers
Models

- Model takes the form

\[ \text{logit}(\pi_{i(jk)}) = \log \left( \frac{\pi_{i(jk)}}{1 - \pi_{i(jk)}} \right) = \beta_0(jk) + \sum_{h=1}^{r} \beta_{hi(jk)} x_{hi(jk)} + \mu(jk) + \nu_k \]

- \( \mu_0 \) and \( \nu_0 \) represent variance for intercept across interviewers and areas assumed to have a normal distribution with means zero and variance \( \sigma_{\mu_0}^2 \) and \( \sigma_{\nu_0}^2 \) respectively.

- \( \mu_1 \) represents variance for incentive across interviewers and assumed to have a mean zero and variance \( \sigma_{\mu_1}^2 \).

- The changes in random coefficient with respect to random intercept are assessed using covariance defined as \( \sigma_{\mu_01} \).

- Standard multilevel models used for NSW 2015 and NSW 2015
  - Areas not provided to protect interviewers identity.
## Models

### Specification of models fitted

<table>
<thead>
<tr>
<th>Model</th>
<th>Fixed and random components specified</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: Base</td>
<td>Incentive</td>
</tr>
<tr>
<td>2: Random Intercept (interviewers)</td>
<td>Model 1 + random intercept (interviewers)</td>
</tr>
<tr>
<td>3: Random Intercept (areas)</td>
<td>Model 1 + random intercept (areas)</td>
</tr>
<tr>
<td>4: Random Intercept (interviewers &amp; areas)</td>
<td>Model 1 + random intercept (interviewers + areas)</td>
</tr>
<tr>
<td>5: model 4 + Random coefficient (interviewer)</td>
<td>M4 + incentive random coefficient across interviewers</td>
</tr>
<tr>
<td>6: model 5 + interviewer observations</td>
<td>M5 + interviewer observations</td>
</tr>
<tr>
<td>7: model 6 + geographical areas</td>
<td>M6 + area level variables</td>
</tr>
<tr>
<td>8: model 7 + interviewer characteristics</td>
<td>M7 + interviewer characteristics</td>
</tr>
</tbody>
</table>

Area effects are only accounted for in IP data. Data obtained from National Survey for Wales did not have smaller geographical regions to protect interviewers identity.
Results summary

- The DIC change between random intercept and random coefficient models for response and cooperation respectively indicate that incentives do vary significantly across interviewers for IP and NSW.

- Size of effect reduced when controlling for area differences.

- Positive covariance between random intercept & random slope (interviewer effect on incentives higher at higher response rates).

- None of the interviewer characteristics are significantly related to incentive effectiveness.
Results

Predicted probabilities for survey response and cooperation in IP with no area controls
Results

Predicted probabilities for survey response and cooperation in IP with area controls
Results

Predicted probabilities for survey response and cooperation in NSW 2015, no area controls

![Graphs showing predicted probabilities for survey response and cooperation]
Conclusions

• Incentive effect on response and cooperation varies across interviewers

• This is reduced when differences in area composition are controlled for

• Interviewers who obtain higher response rates without incentives get ‘more bang from the incentive buck’

• Interviewer characteristics unrelated to deployment effectiveness

• Possible that other interviewer characteristics (attitudes, beliefs) might be more influential