

Measuring Consumer Preferences Using Conjoint Poker

Olivier Toubia
Daniel Stieger
Martijn De Jong
Johann Fueller

The problem

Johnson (2008): “Although respondents do seem to use simplification strategies when filling out questionnaires, they probably work harder when making important real-life choices. So simplification in answering questions is not a good thing. We learn less than we might if we pushed respondents to use deeper processing. We need to find ways to do that.”

One solution: incentive alignment

Each choice made by the respondent has a probability of being realized

Induces truth telling: respondents choose honestly, given the information they process

Does *not* imply that respondents pay as much attention as they would in a real choice

Each choice only has a *small* probability of being realized

Conjoint Poker

Incentive-compatible preference measurement mechanism

Provides formal incentives in an engaging environment

Increases the amount of profile-related information considered by respondents

Conjoint Poker???

Consumer choice model: choose preferred card from hand

$$\text{Prob}(j | h_{i,r}) = \begin{cases} \frac{\exp(x_j \beta_i)}{\sum_{j' \in h_{i,r}} \exp(x_{j'} \beta_i)} & \text{if } j \in h_{i,r} \\ 0 & \text{otherwise} \end{cases}$$

Consumer choice model: choose a hand

$$V_h^{i,r} = P_{h|r}^w (\alpha_i + \max_{j \in h} \{x_j \beta_i\})^{\sigma_i}$$

$$\text{Prob}(h) = \frac{\exp(\delta \cdot V_h^{i,r})}{\sum_{h' \in r} \exp(\delta \cdot V_{h'}^{i,r})}$$

Statistical efficiency of a Conjoint Poker design

$$\Omega = \sum_r \left[\sum_{h_r \in r} \tilde{z}_{h_r}^r \text{Prob}(h_r) \tilde{z}_{h_r}^{rT} + \text{Prob}(h_r) \sum_{j \in h_r} z_{j|h_r} \text{Prob}(j | h_r) z_{j|h_r}^T \right]$$

$$\tilde{z}_{h_r}^r = \delta \cdot \nabla V_{h_r}^r - \sum_{h_r'} \delta \cdot \nabla V_{h_r'}^r \text{Prob}(h_r')$$

$$z_{j|h_r} = x_j^T - \sum_{j' \in h_r} x_{j'}^T \text{Prob}(j' | h_r)$$

$$\nabla V_{h_r}^r = \sigma P_{h_r|r}^w (\alpha + x_{j_{h_r}^*} \beta)^{\sigma-1} x_{j_{h_r}^*}^T$$

Experiment 1

Condition 1: Product Poker ($N=318$)

- [External validity task](#)
- Two practice poker rounds
- [20 poker rounds](#) (against computer)
- [Survey + Poker quiz](#)

Condition 2: Incentive compatible Choice-Based-Conjoint ($N=318$)

- External validity task (identical across conditions)
- [20 CBC questions](#)
- Survey + Poker quiz

Respondents from commercial online panel

All partworths estimated using hierarchical Bayes

Experiment 1: differences in partworths

Partworths obtained from incentive-compatible CBC are more heterogenous and more varied at the individual level, compared to Conjoint Poker

Incentive-compatible CBC respondents tend to make choices based on more limited information

74 out of 318 respondents selected profiles that all had one attribute in common (e.g., 320GB hard drive)

→ extreme partworth estimates (e.g., all we really learn is that this person really likes 320 GB hard drives)

Experiment 1: predictive ability

	Individual-level predictions: Hit rate	Choice-share predictions: correlation
Incentive-Compatible CBC	0.330 [0.296,0.368]	0.432 [0.354,0.522]
Conjoint Poker	0.318 [0.236,0.315]	0.890 [0.839,0.921]

Experiment 1: follow-up questionnaire

Conjoint Poker perceived as being significantly more complex, more effortful and more time-consuming

Conjoint Poker is objectively more time-consuming compared to Incentive-Compatible CBC

Conjoint Poker perceived to be significantly more enjoyable

Consumers require similar incentives to participate in a future Conjoint Poker study versus CBC study

Experiments 2 and 3: eye tracking

Each subject does both Conjoint Poker and CBC (in random order)

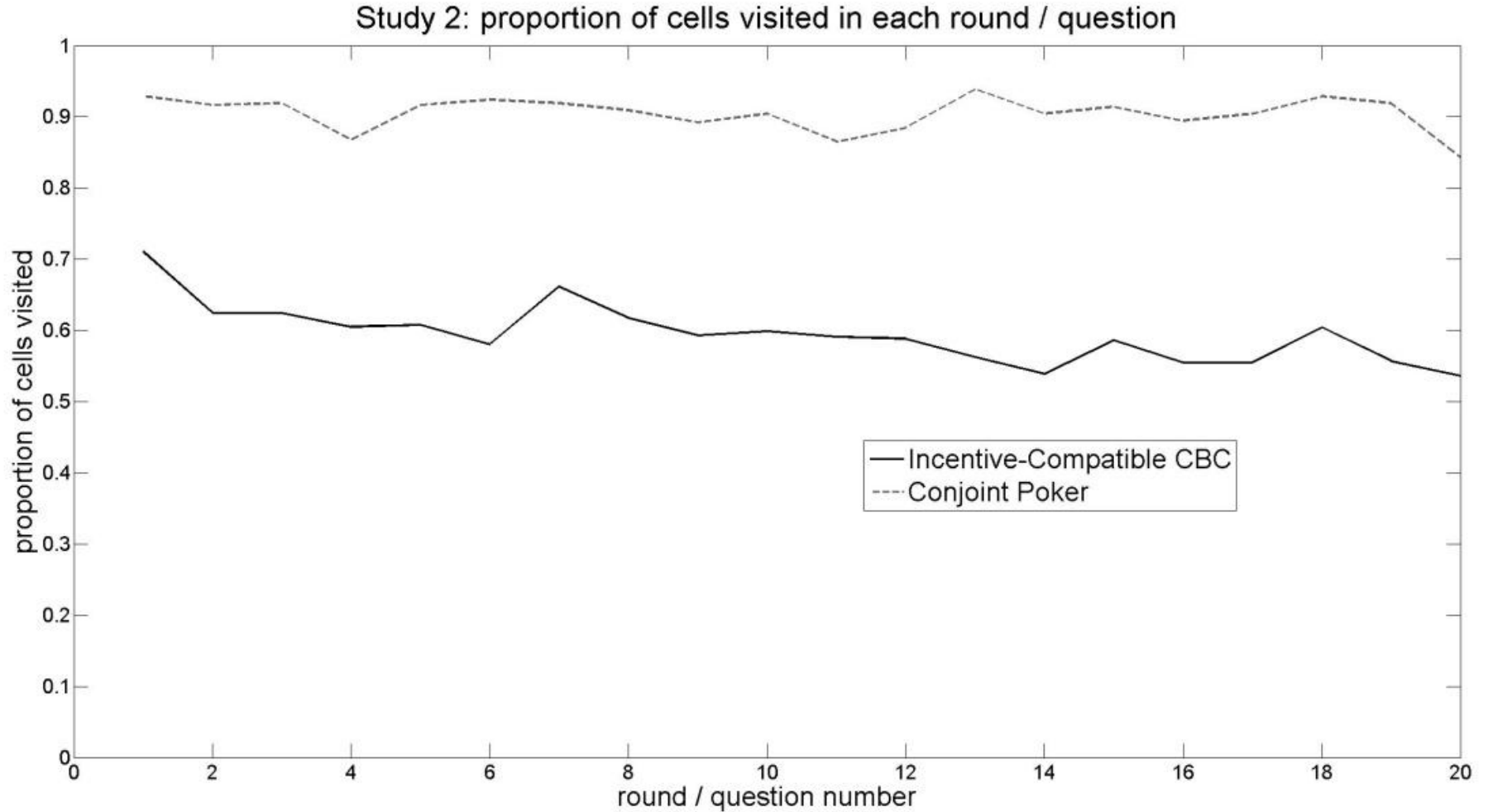
Experiment 2:

- Same designs (sets of cards) as in experiment 1
- N=17

Experiment 3:

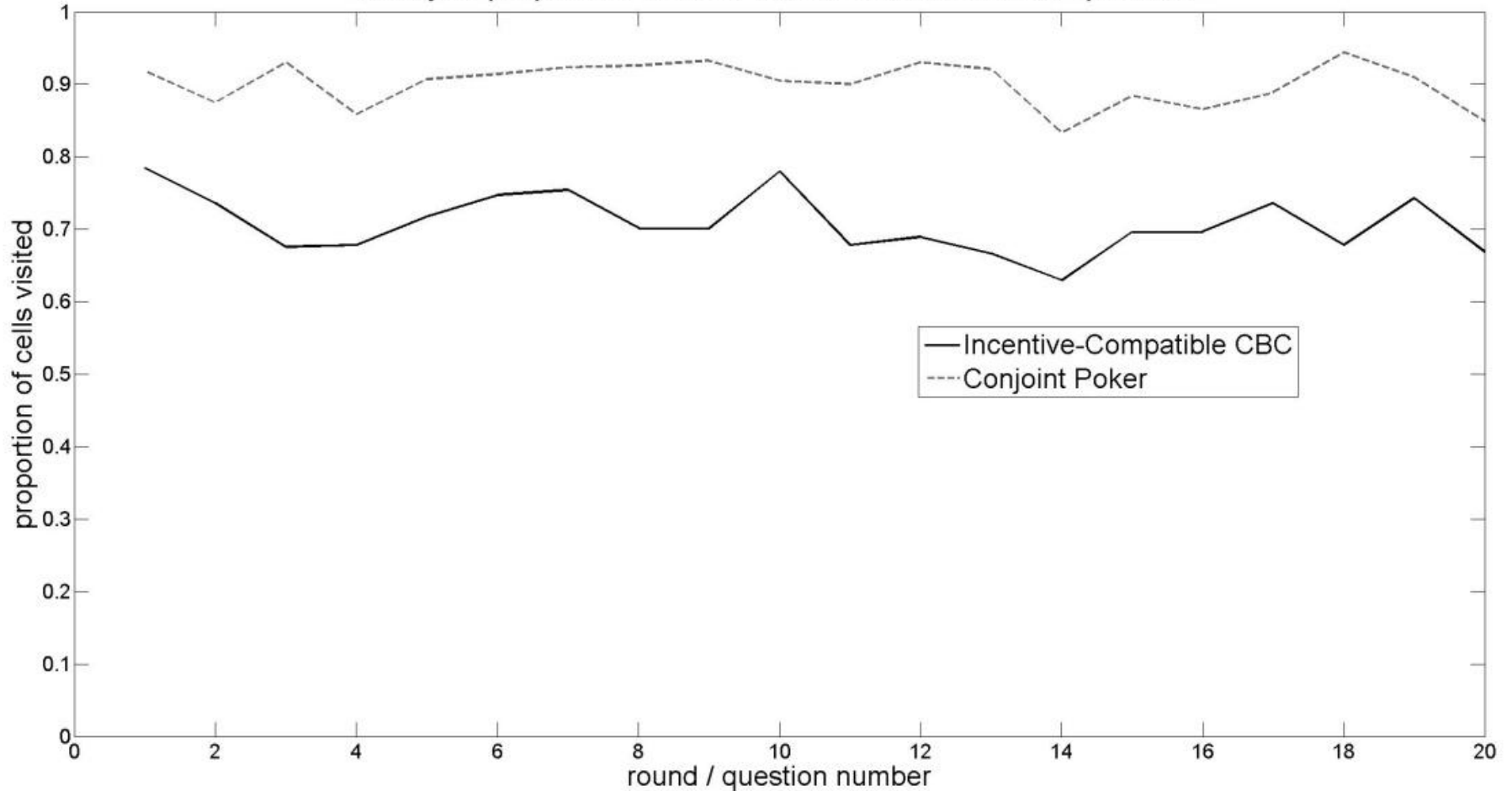
- Conjoint Poker and CBC use same sets of cards
- N=18

Experiment 2



Experiment 3

Study 3: proportion of cells visited in each round / question



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Increases the amount of profile-related information considered by respondents

THANK YOU!



Color:
ice blue

Warranty:
2 years in-home

Security software:
24 months

Hard drive:
320 GB

Accessory:
headphones

Price:
\$600

Color:
jade green

Warranty:
3 years in-home

Security software:
30 days

Hard drive:
160 GB

Accessory:
black cordless mouse

Price:
\$600

Color:
promise pink

Warranty:
2 years in-home

Security software:
15 months

Hard drive:
250 GB

Accessory:
wireless router

Price:
\$650

Color:
obsidian black

Warranty:
1 year in-home

Security software:
15 months

Hard drive:
320 GB

Accessory:
black cordless mouse

Price:
\$650

SUBMIT HAND

Color:
ice blue

Warranty:
2 years in-home

Security software:
24 months

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Accessory:
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SUBMIT HAND