Known-Effects Validation

We built a synthetic dataset with attribute effects we picked in advance, then ran it through the same analysis path Conjoint Survey uses on real responses. Three attributes: one that helps a profile get chosen, one that hurts, one that does nothing at all. If the estimator is sound, it hands back the numbers we put in, give or take sampling noise.

It did.

That's a narrower claim than it may sound like. Passing here means the code turns randomized profile choices into attribute effects correctly. It says nothing about whether any particular study design is a good one - that part is still on the researcher.

Result: Passed · 5,000 synthetic respondents · 80,000 profile-level observations · 5,000 respondent clusters

Citation

Conjoint Survey Research Team. (2026). Synthetic known-effects validation report: Recovery of positive, negative, and null conjoint effects in Conjoint Survey [Working paper]. Conjoint Survey. https://conjointsurvey.com/validation

Why bother

A conjoint table can look perfectly respectable and still be wrong. The standard way to find out is to hand the software a problem you already know the answer to. Because we set the coefficients before generating a single response, there is a correct answer to check against rather than a plausible-looking one.

The three cases are the ones that come up constantly in applied work: a level that raises selection probability, a level that lowers it, and a level that does neither.

Simulation design

Three dichotomous randomized attributes, with true effects on the binary choice outcome of +0.10, -0.10, and 0.00. Five thousand synthetic respondents, eight tasks each, two profiles per task - 80,000 profile rows.

Every profile carries one level from each attribute. The outcome is whether that profile won its forced-choice task, drawn probabilistically from the known effects. Any gap between the true and recovered values is therefore either sampling error or a bug. There is no third option, which is the whole point of doing it this way.

Rows cluster within respondents, sixteen apiece. Real conjoint studies have the same structure, and the standard errors need to reflect it.

Estimator

The same one the app exposes for publication use: a profile-level linear probability model with indicators for every non-reference randomized attribute level entered jointly. The outcome is a 0/1 for whether the profile was chosen. Standard errors are clustered by respondent.

Each attribute here has two levels, Absent and Present, with Absent as the reference. The Present coefficient is the estimated change in selection probability associated with that level, holding the other randomized attributes in the model.

Recovery

Attribute level	True	Estimate	SE	95% CI	Abs. error	Pass
Positive Signal: Present	0.100	0.099	0.003	0.093 to 0.106	0.001	Yes
Negative Signal: Present	-0.100	-0.102	0.003	-0.109 to -0.096	0.002	Yes
Null Signal: Present	0.000	-0.001	0.004	-0.008 to 0.006	0.001	Yes

Pass criteria

Every coefficient has to land within 0.015 of its true value, and every 95% confidence interval has to have a half-width of 0.020 or less. Both are tighter than anyone would demand of a live field study. They're calibrated to catch implementation errors, not to settle substantive uncertainty in real samples.

What the numbers say

0.099 against a true 0.100. -0.102 against a true -0.100. -0.001 against a true zero. The worst absolute error in the set is 0.002, and every interval clears the half-width threshold with room to spare.

Read this as a check on the software and the estimator, nothing more. When assignment is clean and the truth is known, Conjoint Survey finds it.

Reproducing this

Fixed seed, and the script lives in the source repository. If you're reading this on the website there's nothing to run - the table above is the current output.

With a local checkout and Node.js dependencies installed:

```
npm run validate:simulation
```

That regenerates the synthetic data, fits the model, checks the pass criteria, and writes the report artifacts.

Seed: conjoint-survey-known-effects-v1