Paid Media Analytics with Click-Rate Confidence Intervals

3.0%

leading click rate, from 30 clicks on 1,000 impressions. Its interval overlaps the runner-up, so the ranking is not settled.

92% chance A truly has the highest rate	**p = 0.15** A against B, not significant	**30%** power of this week's test for A vs B	**3,823** impressions per channel for a clear answer

EXHIBIT 1

Observed click rates with intervals



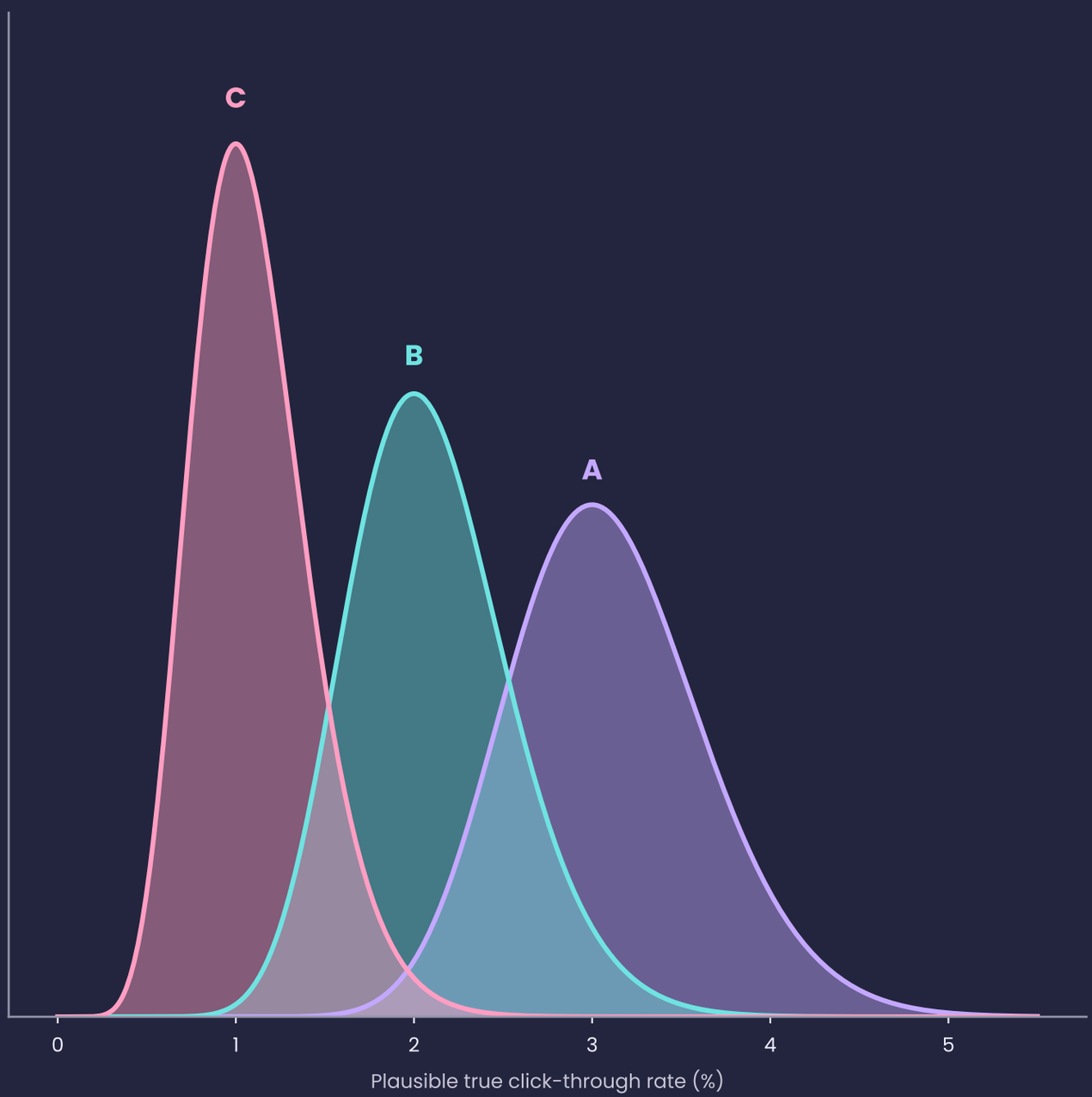
A and B overlap; C sits below A but brushes B.

What the analysis shows

- A leads at 3.0% against 2.0% and 1.0%, but its 95% interval (2.1–4.3%) overlaps B's (1.3–3.1%).
- A against C is clear (p = 0.001). A against B is not (p = 0.15), and B against C is borderline (p = 0.066).
- Read as probabilities, A has about a 92% chance of being the best channel and B about 8%. C is effectively out.
- One thousand impressions per channel had only a 30% chance of separating a true 3% from a true 2%. About 3,823 per channel are needed for 80%.
- Clicks are not orders. The ranking should be confirmed on paid conversions and margin before the budget moves.

EXHIBIT 2

What the data allow each true rate to be

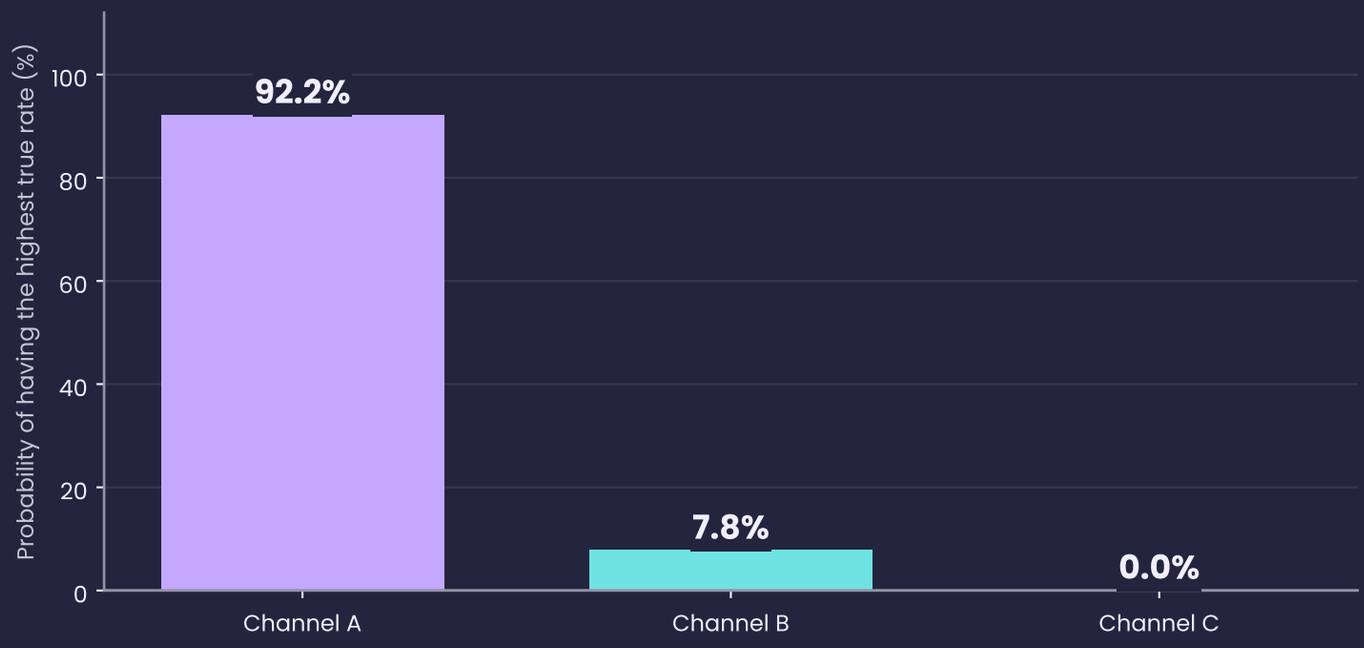


Posterior curves from 30, 20 and 10 clicks. A and B share a wide band between 2% and 3%.

Inside the numbers

EXHIBIT 3

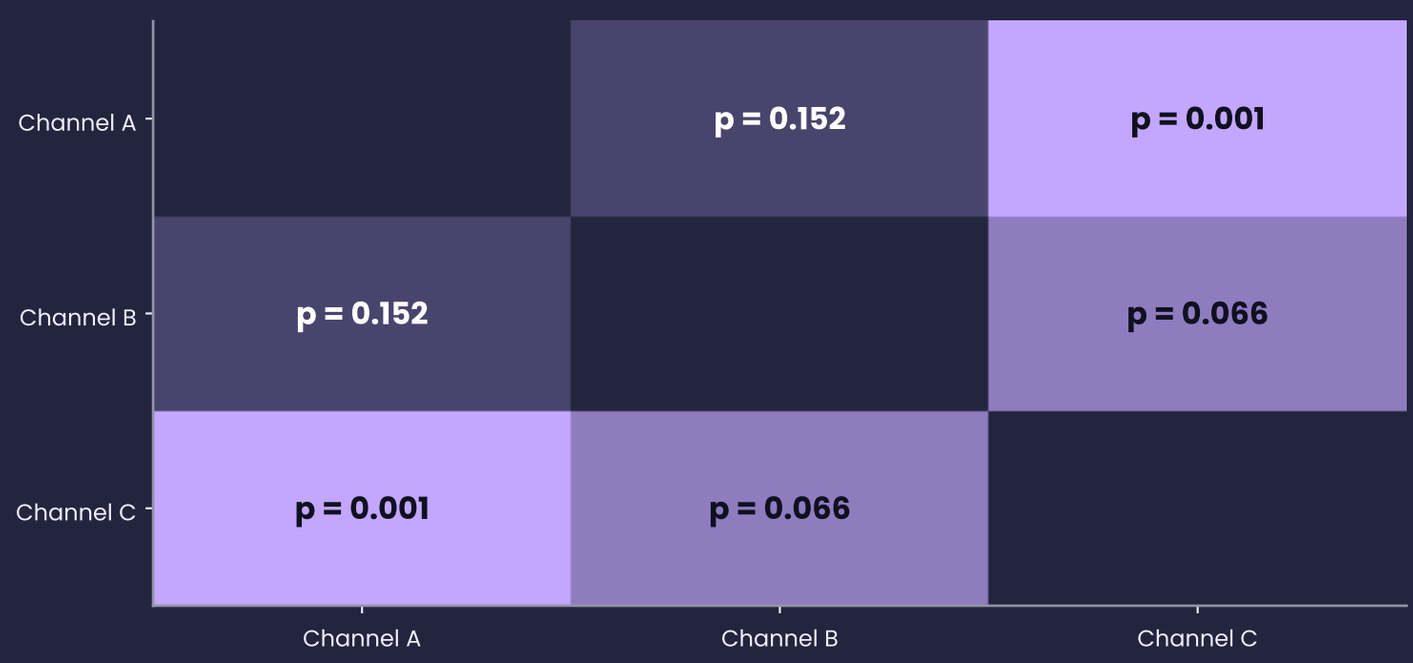
Probability each channel is truly best



From 200,000 draws of the three posteriors.

EXHIBIT 4

Pairwise tests

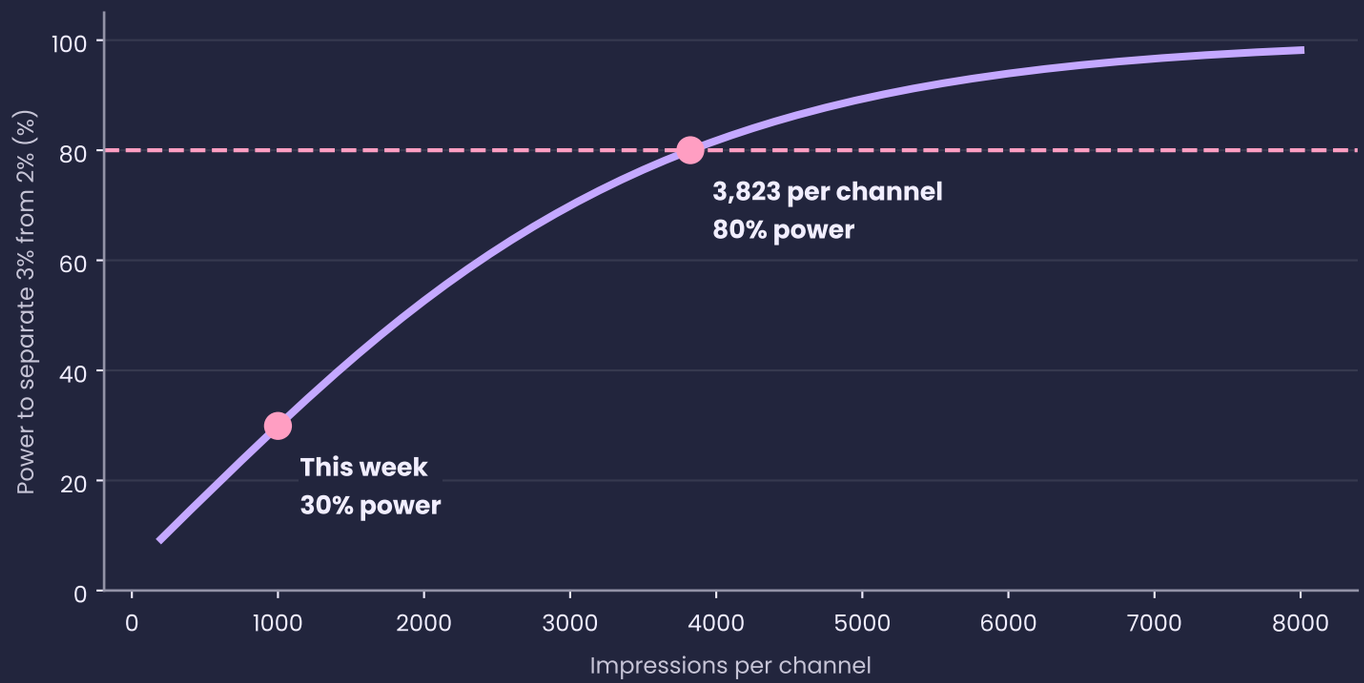


Two-proportion z-tests. Only A against C clears the 5% level.

What changes the answer

EXHIBIT 5

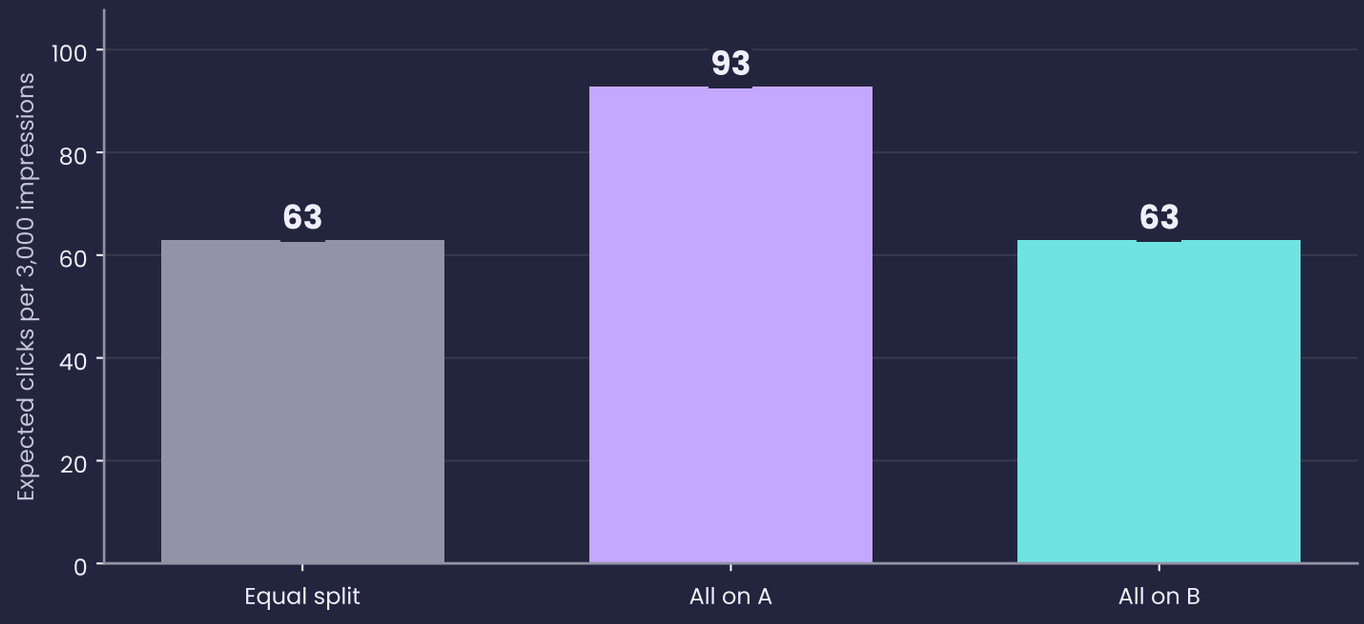
Power of the follow-up test



The curve reaches 80% near 3,800 impressions per channel, almost four times this week's volume.

EXHIBIT 6

Expected clicks under three allocations



Posterior-mean expected clicks. All-in on A averages about 30 more than an equal split or all-in on B; these are averages over the uncertainty, not outcomes conditional on which channel is truly best.

How it was built and how far it goes

RECOMMENDED USE

- Drop C from the next test and split a larger budget between A and B.
- Buy at least 3,800 impressions per channel before declaring a winner.
- Track orders and contribution margin in the same test; do not scale on click rate alone.

METHOD

- Click-through rate with 95% Wilson intervals; pairwise two-proportion z-tests with pooled variance.
- Probability-best uses Beta(clicks + 1, non-clicks + 1) posteriors and 200,000 seeded draws.
- Power uses the normal approximation for 3% against 2% at two-sided 5% significance.

LIMITS

- Worked media week with equal impressions; real placements differ in audience and cost.
- No cost-per-click, conversion or margin data, so the best channel by clicks may not be the best by profit.
- Three comparisons are made without multiplicity adjustment.

NUMBERS RECONCILED

Quantity	Value	How it was checked
Rate A	3.0%	30 ÷ 1,000
Rate B	2.0%	20 ÷ 1,000
Rate C	1.0%	10 ÷ 1,000
Interval A	2.1–4.3%	Wilson, matches project file
Interval B	1.3–3.1%	Wilson, matches project file
Impressions	3,000	1,000 per channel