



Rotterdam, The Netherlands
July 26th, 2010



Recommendations for 'No Preference' Responses

Presented By:

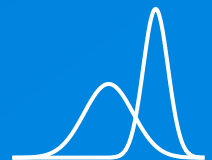
Dr. John M. Ennis

The Institute for Perception

john.m.ennis@ifpress.com

+001 804 675 2980

www.ifpress.com



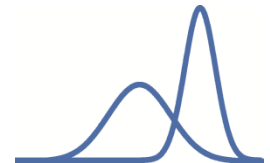
Preference testing



- Do you prefer **A**, **B** or have no preference?

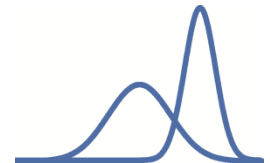
Prefer A	Prefer B	No Preference
x	x	x

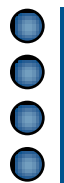
- What to do with 'No preference' responses?
 - ❖ Discard?
 - ❖ Redistribute?
 - Equally?
 - Proportionally?
 - ❖ ...



●●● | 'No preference' responses

- Should we offer 'No preference' option?
 - ❖ Binomial test simple
 - ❖ Thurstonian 2-AFC well established
 - ❖ Respondents 'should' have preferences
 - ❖ Can collect 'No preference' responses if volunteered
- Reasons to offer 'No preference' option
 - ❖ Legal considerations
 - ❖ Differences may not be meaningful if forced
 - ❖ Greater resolution to data
- What analysis to perform?



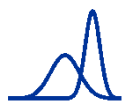


Summary of options

- Two types of statements:
 - ❖ Unsurpassed
 - ❖ Superiority
- 'No preference' responses support unsurpassed statements

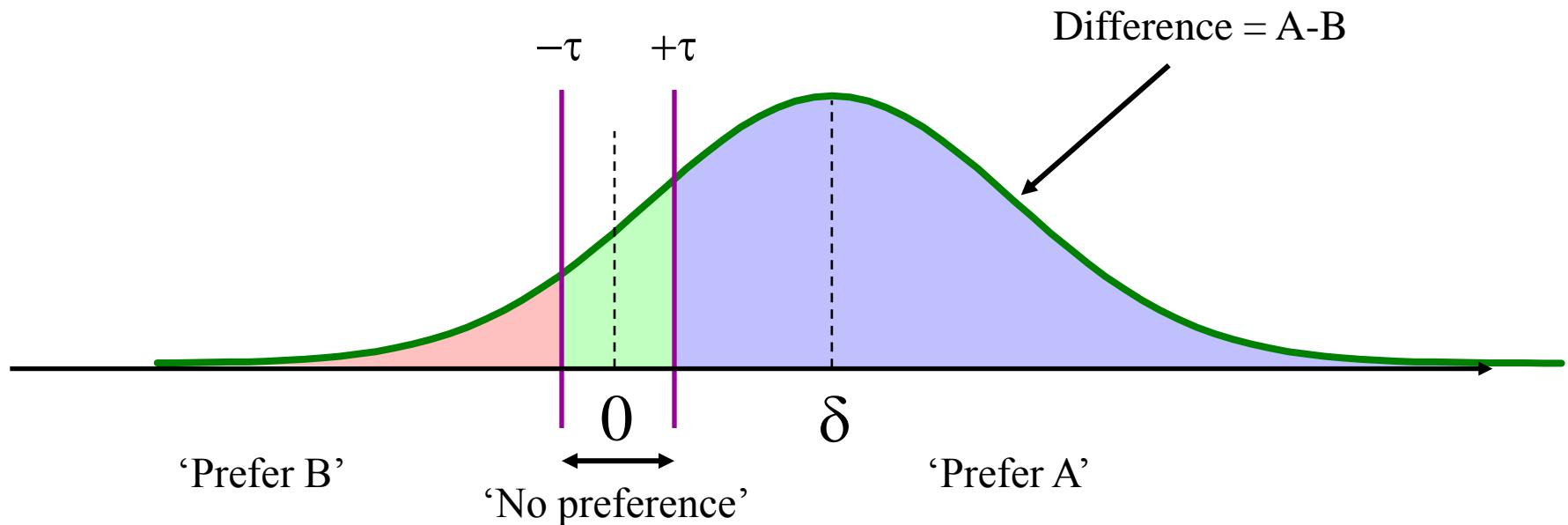
Statement	NP Responses	Model
Unsurpassed	Include with own	Binomial with 45% null
Superiority	Discard	Binomial
	Distribute equally	Binomial
	Distribute proportionally	Binomial
	Include in analysis	Thurstonian 2-AC

- Comments:
 - ❖ 45% null based on equivalence using (45%,55%) bounds
 - ❖ ASTM: 'No preference' responses can be discarded if less than 20% when statement is among those who express preference

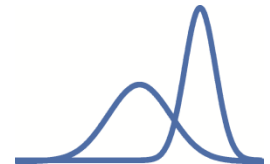


Thurstonian 2-AC

- Consider difference distribution:

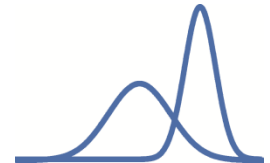


- Difference between means is δ
- 'No preference' region is $(-\tau, \tau)$
- 'Prefer B' if difference less than $-\tau$
- 'Prefer A' if difference greater than τ



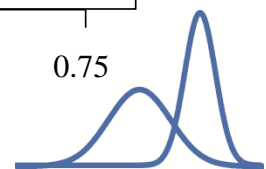
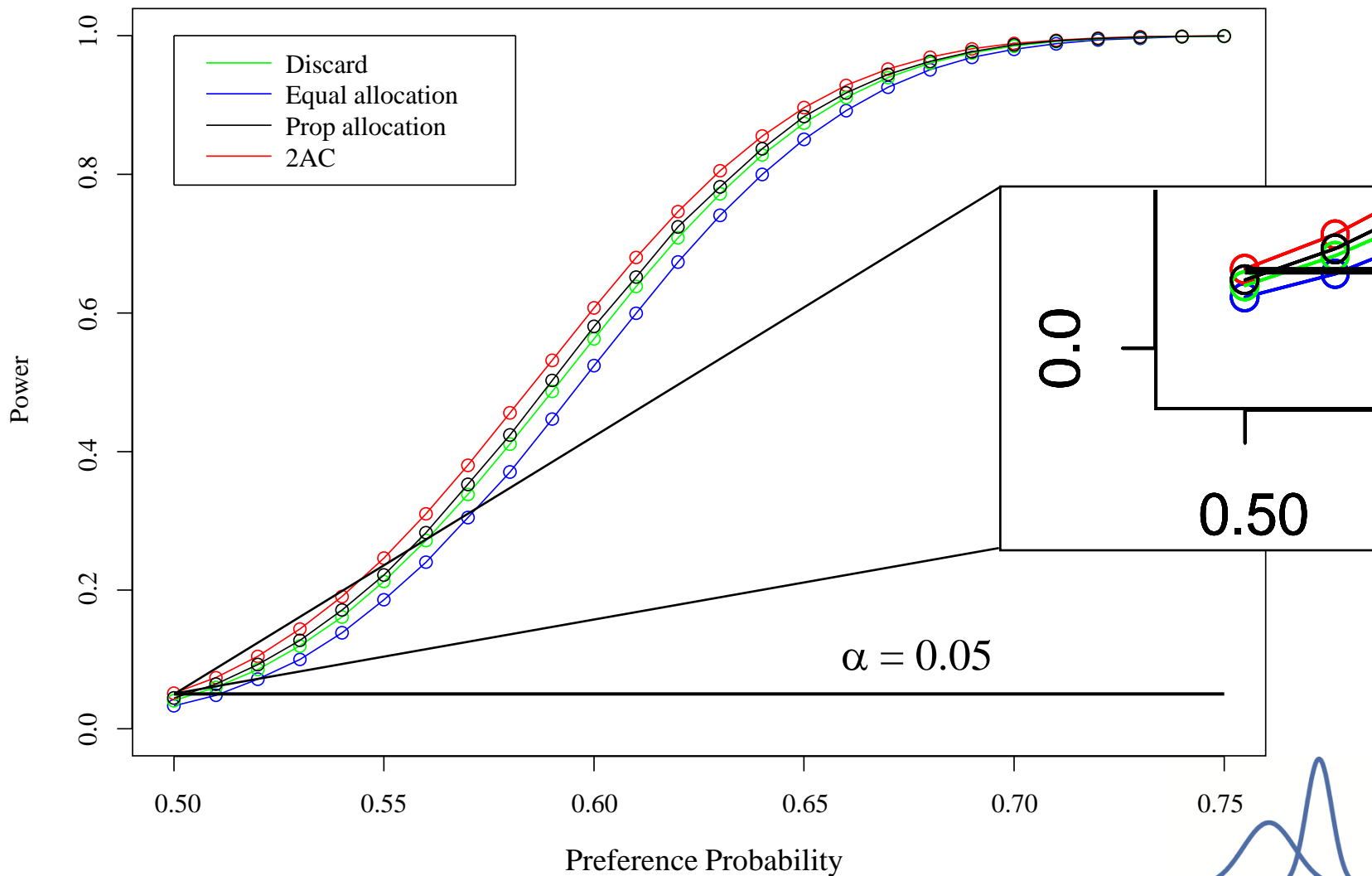
Power analysis

- Four methods evaluated in one-tailed test for superiority
 - ❖ Discard 'No preference' responses
 - Conduct binomial test on remaining data
 - Report results among those who expressed a preference
 - ❖ Distribute 'No preference' responses equally
 - Assign extra response to competitor if needed
 - Conduct binomial test
 - ❖ Distribute 'No preference' responses proportionally
 - Assign extra responses to competitor if needed
 - Conduct binomial test
 - ❖ Apply Thurstonian 2-AC model to full dataset
- Power as a function of preference probability computed
- Power curves for variety of sample sizes and 'No preference' probabilities created



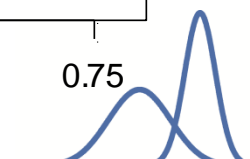
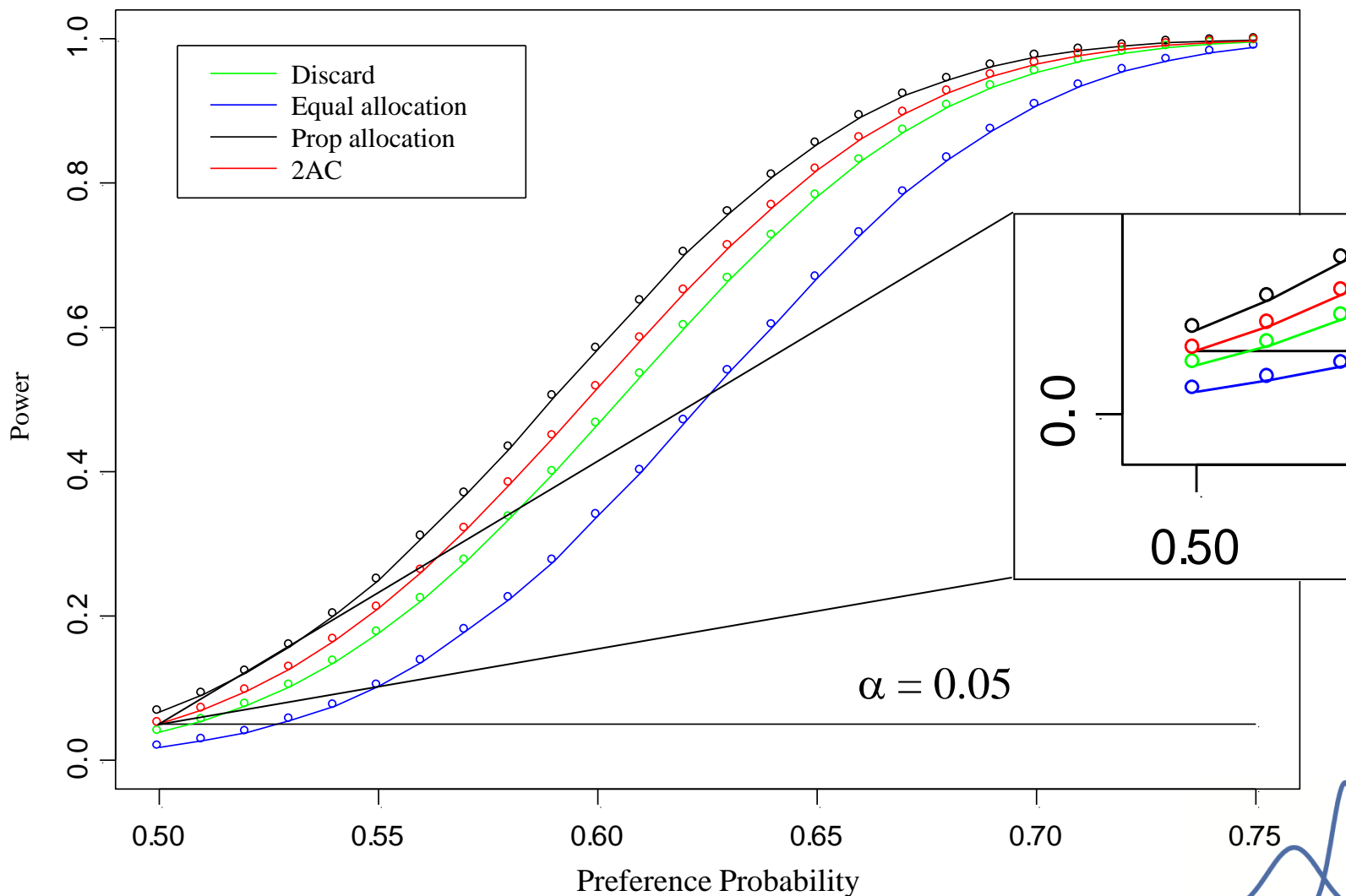


$n = 100$, 'No preference' Probability = 10%



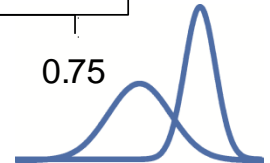
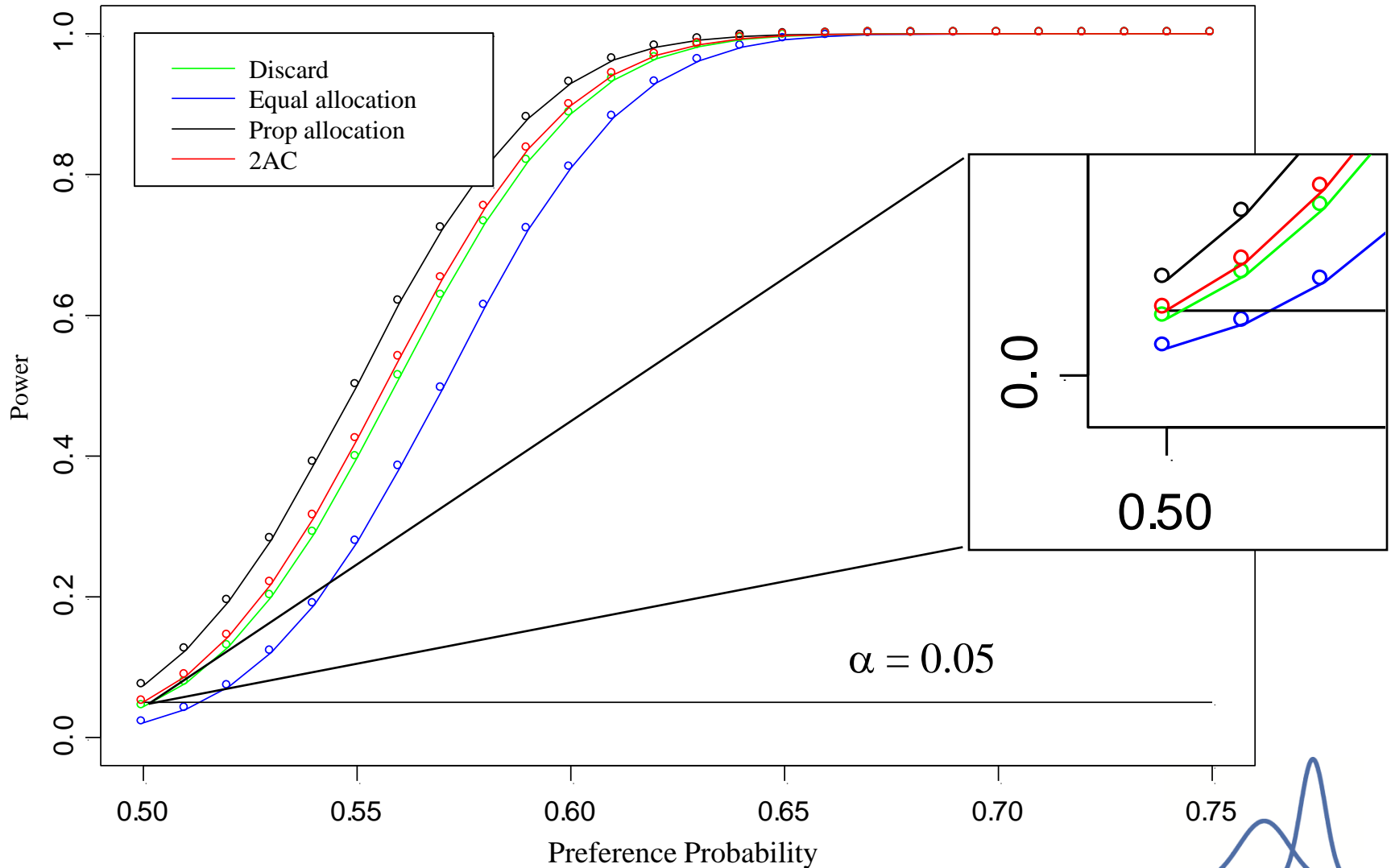


$n = 100$, 'No Preference' Probability = 30%





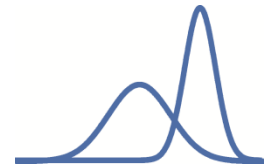
$n = 300$, 'No Preference' Probability = 30%





Summary

- Discarding 'No Preference' responses results in qualified statements and is less powerful than Thurstonian 2-AC
- Equal distribution method is conservative but useful when more sophisticated methods not available
- Proportional distribution method is liberal and is not recommended
- Thurstonian 2-AC method is most powerful non-liberal method and is recommended when available





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