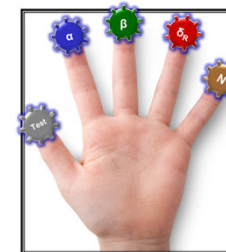


Preference without a Significant Sensory Difference: A Resolution of the Paradox

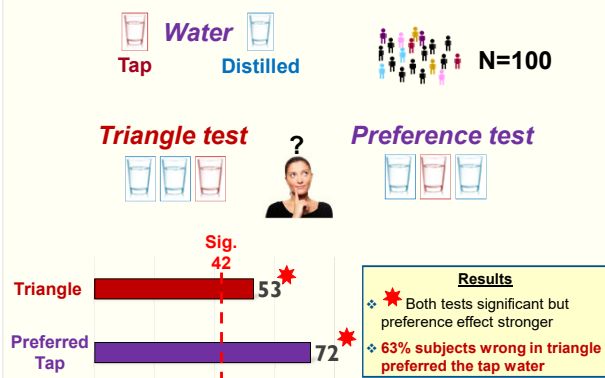
B. Rousseau* & D.M. Ennis, *The Institute for Perception, Richmond, USA*



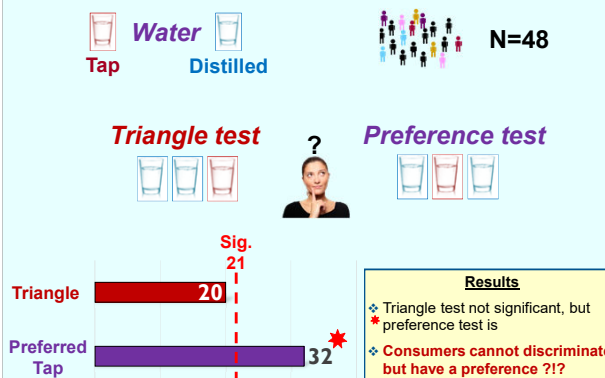
Introduction

- On many occasions, a discrimination test will conclude that two products are not different while consumers, given the same products, might prefer one over the other
- How is that possible? How can consumers have a preference if there is no difference?
- Are discrimination tests unable to predict consumer behavior?
- Here we review results which explain why such an effect occurs
- This solves the paradox by outlining the importance of taking into account:
 - Statistical power
 - Relative performance of sensory and consumer tasks
 - The size of the sensory difference relevant to the consumer (δ_R)

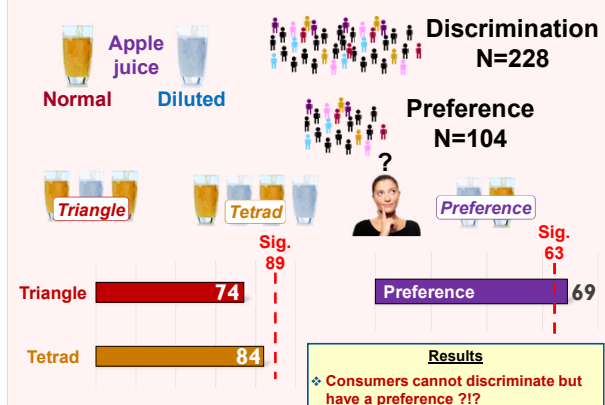
MacRae & Geelhoed, 1992



Geelhoed, MacRae & Ennis, 1994



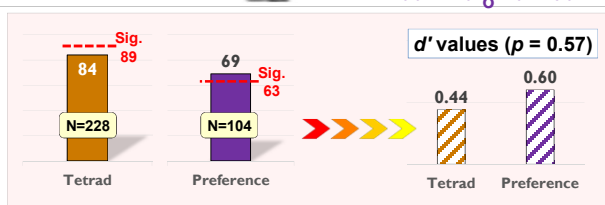
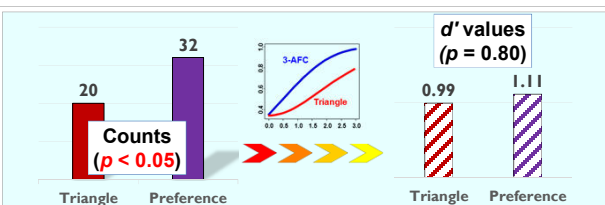
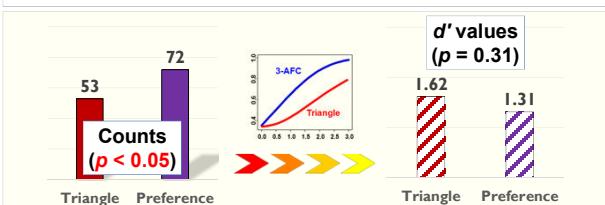
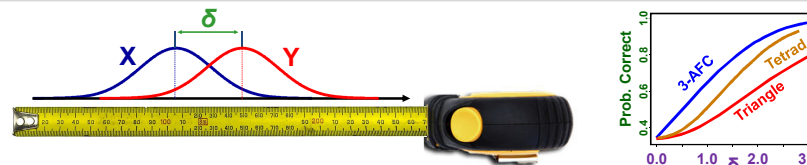
Ishii, O'Mahony & Rousseau, 2014



Thurstonian Theory

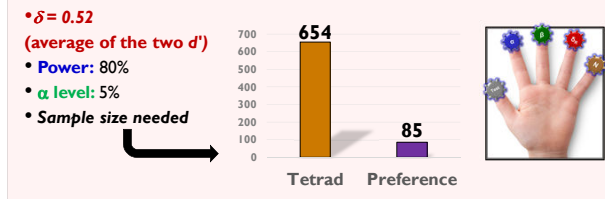
- Two products will always be different
- Methodologies differ in power

- Thurstonian theory → Can measure the underlying size of the sensory difference – δ
- Independent of the methodology
- Two ideas: Variability & Decision rule
- d' = Experimental estimate of δ



Conclusions

- The paradox of a preference without a difference exists because protocols used in sensory and consumer research differ in performance
- Thurstonian theory taking into account variability and decision rules estimates the relative power of methodologies and resolves the paradox
- Preference tests involve more efficient decision rules which in turn will yield a significant result with a smaller sample size
- Thus, discrimination testing investigation must involve better methodologies or greater sample sizes
- Thurstonian modeling allows the estimation of optimal sample sizes based on the size of the sensory difference relevant to consumers (δ_R)



References

- Geelhoed, E. N., & MacRae, A. W. (1992). Preference can be more powerful than detection of oddity as a test of discriminability. *Perception & Psychophysics*, 51, 179-181.
- Geelhoed, E. N., MacRae, A. W., & Ennis, D. M. (1994). Preference gives more consistent judgments than oddity only if the task can be modeled as forced choice. *Perception & Psychophysics*, 55, 473-477.
- Ishii, R., O'Mahony, M., & Rousseau, B. (2014). Triangle and tetrad protocols: Small sensory differences, resampling and consumer relevance. *Food Quality & Preference*, 31, 49-55.