

Figure S1: Parallel boxplots for scenarios where data were generated from normal distributions with equal mean and equal variance. Upper panel: Type I error rates (The red horizontal line indicates Type I error rate = 0.05); Lower panel: powers. Left panel: 20 subjects per group; middle panel: 50 subjects per group; right panel: 200 subjects per group.

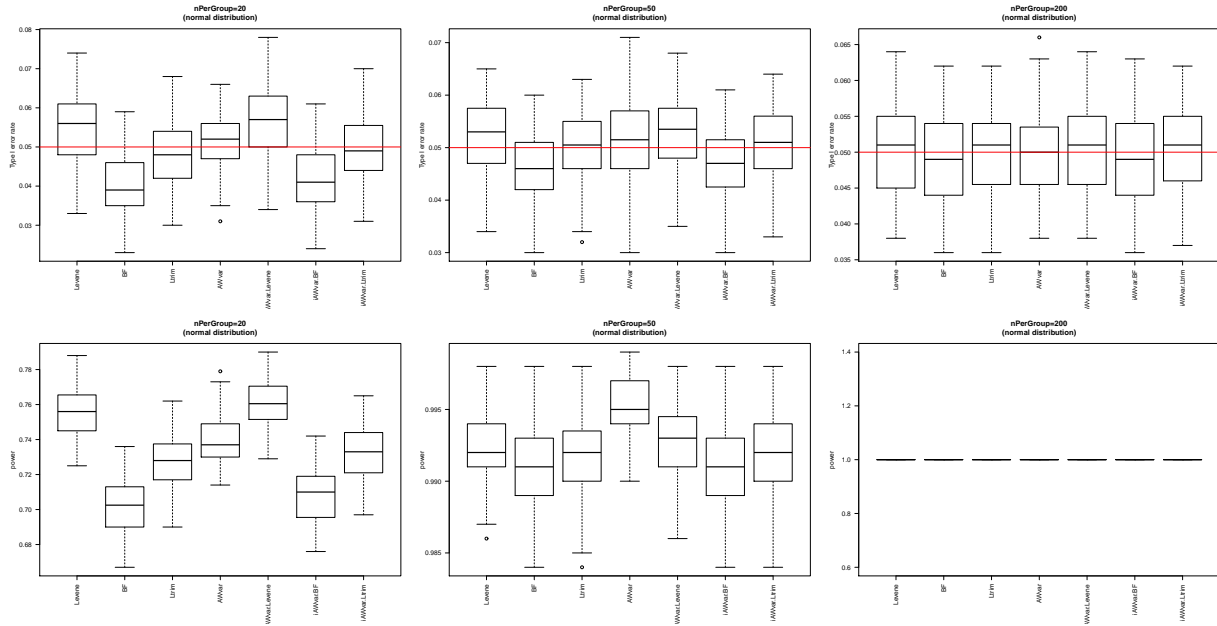


Figure S2: Parallel boxplots for scenarios where data were generated from normal distributions with different means. Upper panel (equal variance): Type I error rates (The red horizontal line indicates Type I error rate = 0.05); Lower panel (different variances): powers (The red horizontal line indicates power = 0.05). Left panel: 20 subjects per group; middle panel: 50 subjects per group; right panel: 200 subjects per group.

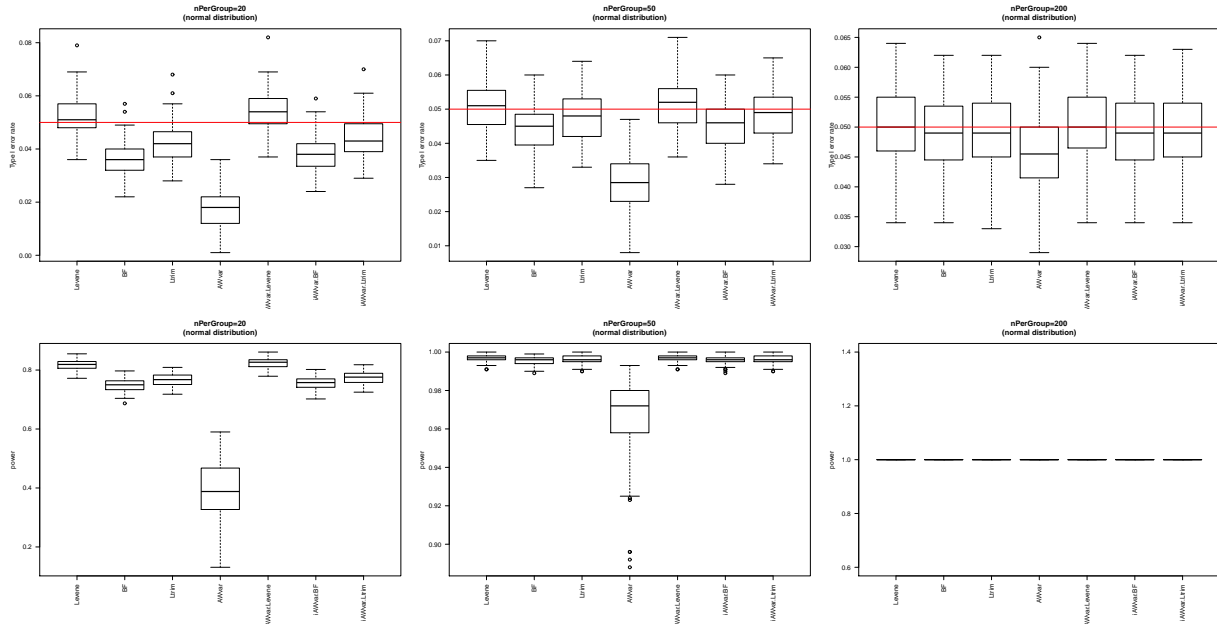


Figure S3: Parallel boxplots for scenarios where data were generated from normal distributions with equal means and outliers. Upper panel: Type I error rates (The red horizontal line indicates Type I error rate = 0.05); Lower panel: powers (The red horizontal line indicates power = 0.95). Left panel: 20 subjects per group; middle panel: 50 subjects per group; right panel: 200 subjects per group.

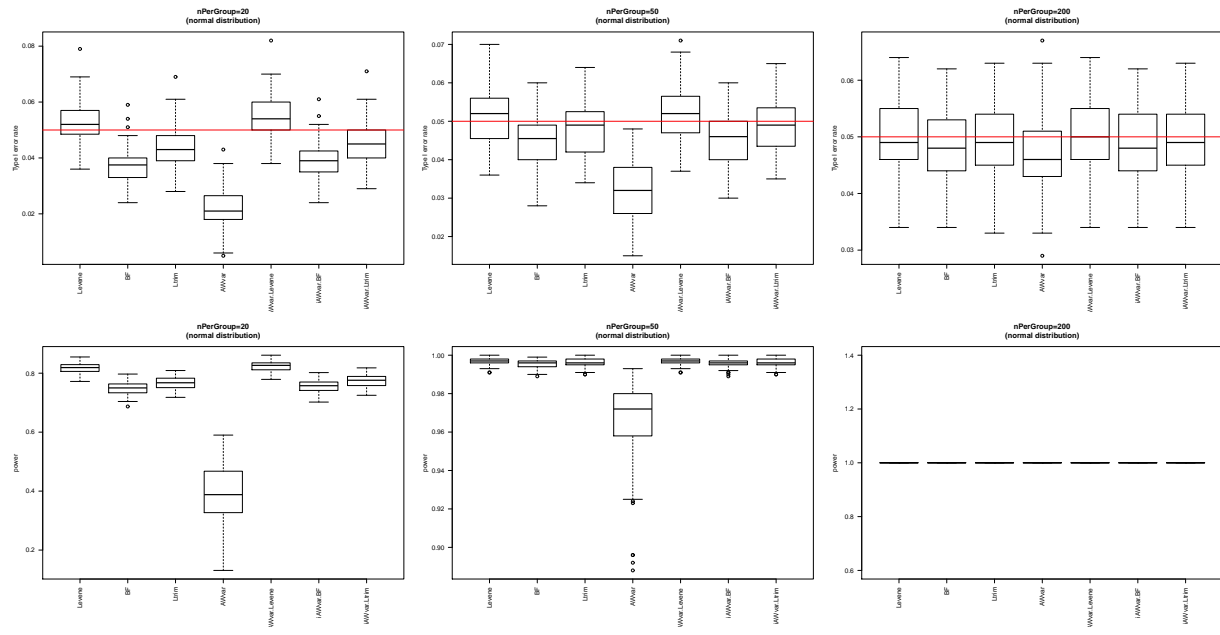


Figure S4: Parallel boxplots for scenarios where data were generated from normal distributions with different means and outlier. Upper panel: Type I error rates (The red horizontal line indicates Type I error rate = 0.05); Lower panel: powers (The red horizontal line indicates power = 0.05). Left panel: 20 subjects per group; middle panel: 50 subjects per group; right panel: 200 subjects per group.

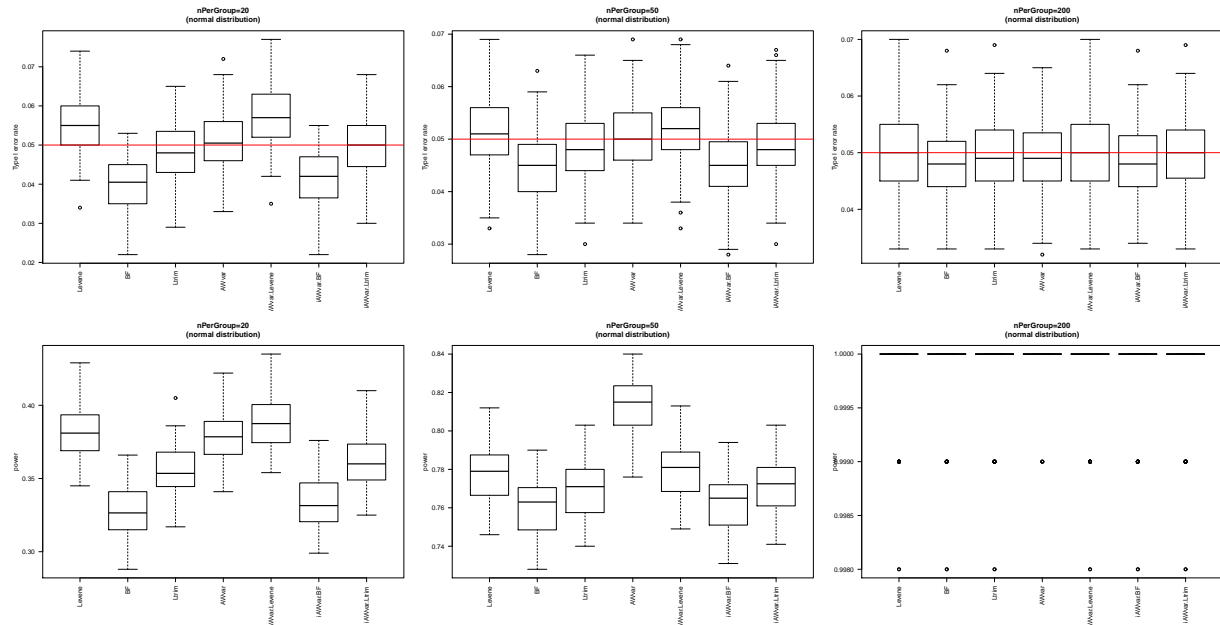


Figure S5: Parallel boxplots for scenarios where data were generated from Bayesian hierarchical models with conditional normal distributions having different means. Upper panel: Type I error rates (The red horizontal line indicates Type I error rate = 0.05); Lower panel: powers (The red horizontal line indicates power = 0.05). Left panel: 20 subjects per group; middle panel: 50 subjects per group; right panel: 200 subjects per group.

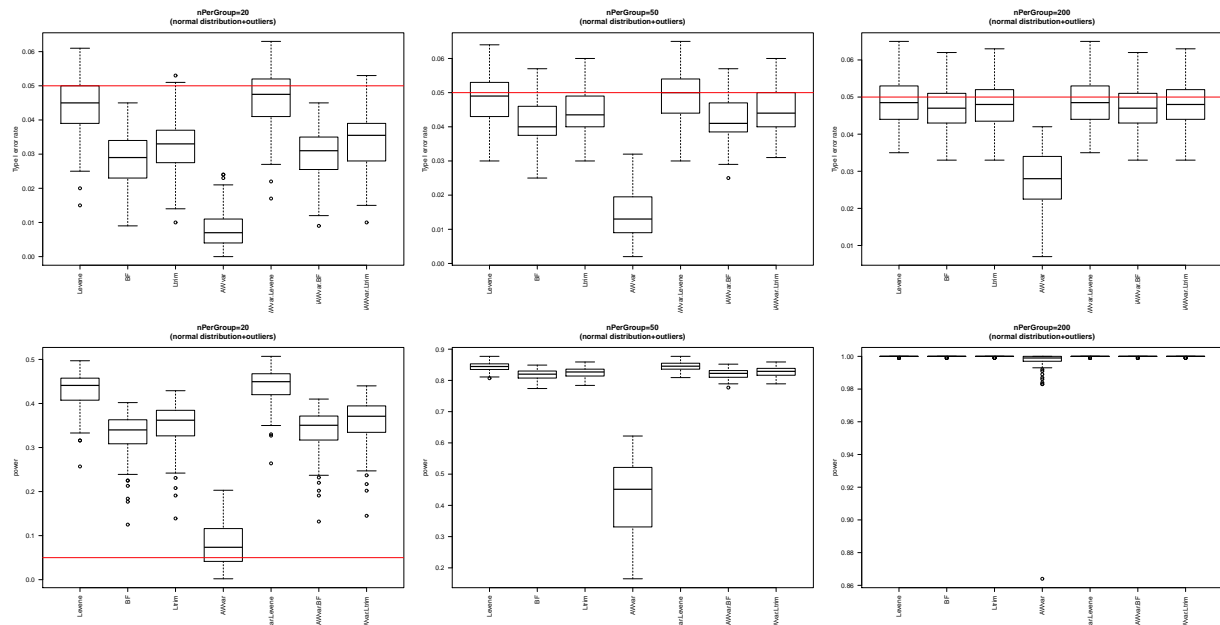


Figure S6: Parallel boxplots for scenarios where data were generated from Bayesian hierarchical models with conditional normal distributions having different means and outlier. Upper panel: Type I error rates (The red horizontal line indicates Type I error rate = 0.05); Lower panel: powers (The red horizontal line indicates power = 0.05). Left panel: 20 subjects per group; middle panel: 50 subjects per group; right panel: 200 subjects per group.

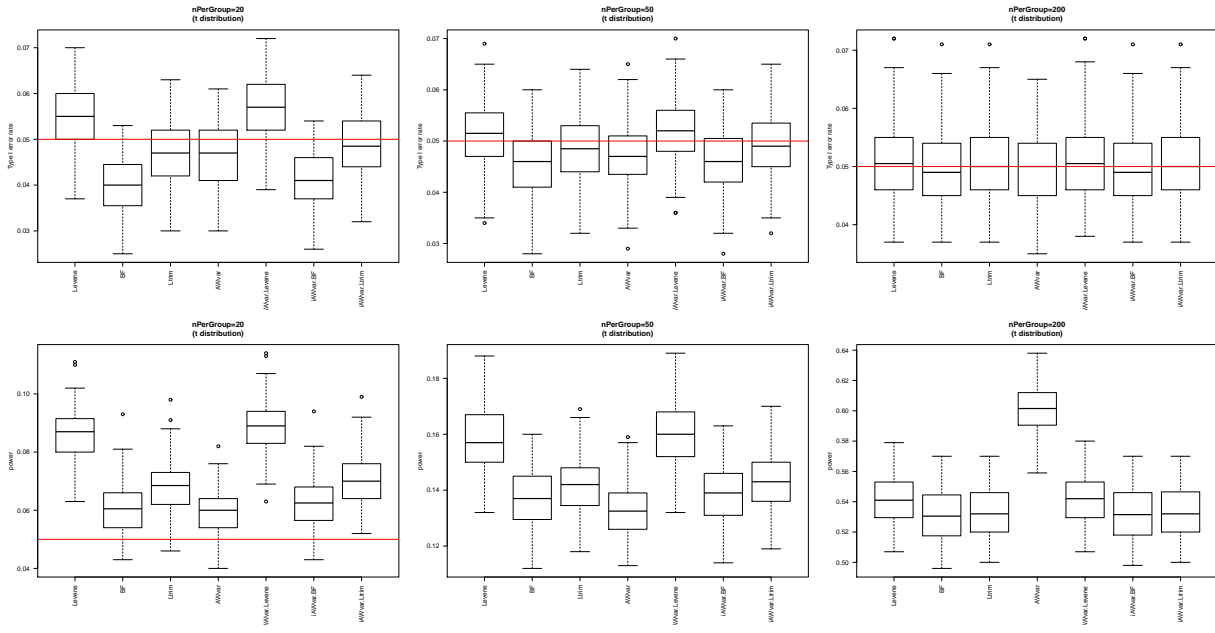


Figure S7: Parallel boxplots for scenarios where data were generated from t distributions with equal means. Upper panel: Type I error rates (The red horizontal line indicates Type I error rate = 0.05); Lower panel: powers (The red horizontal line indicates power = 0.05). Left panel: 20 subjects per group; middle panel: 50 subjects per group; right panel: 200 subjects per group.

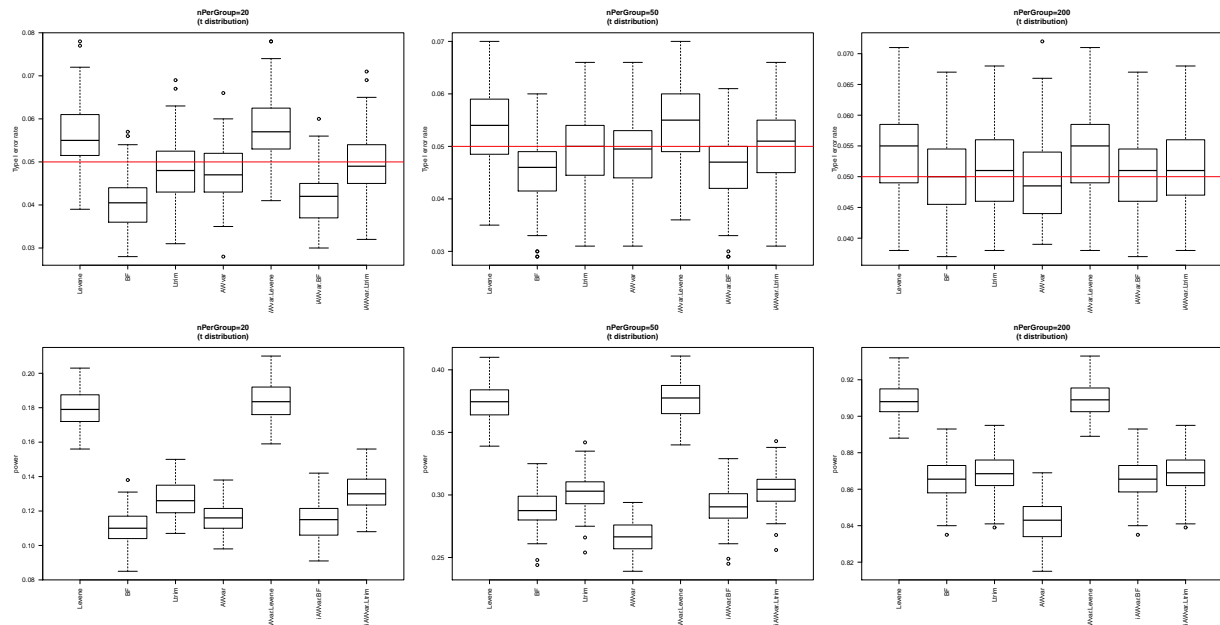


Figure S8: Parallel boxplots for scenarios where data were generated from t distributions with different means. Upper panel: Type I error rates (The red horizontal line indicates Type I error rate = 0.05); Lower panel: powers (The red horizontal line indicates power = 0.05). Left panel: 20 subjects per group; middle panel: 50 subjects per group; right panel: 200 subjects per group.



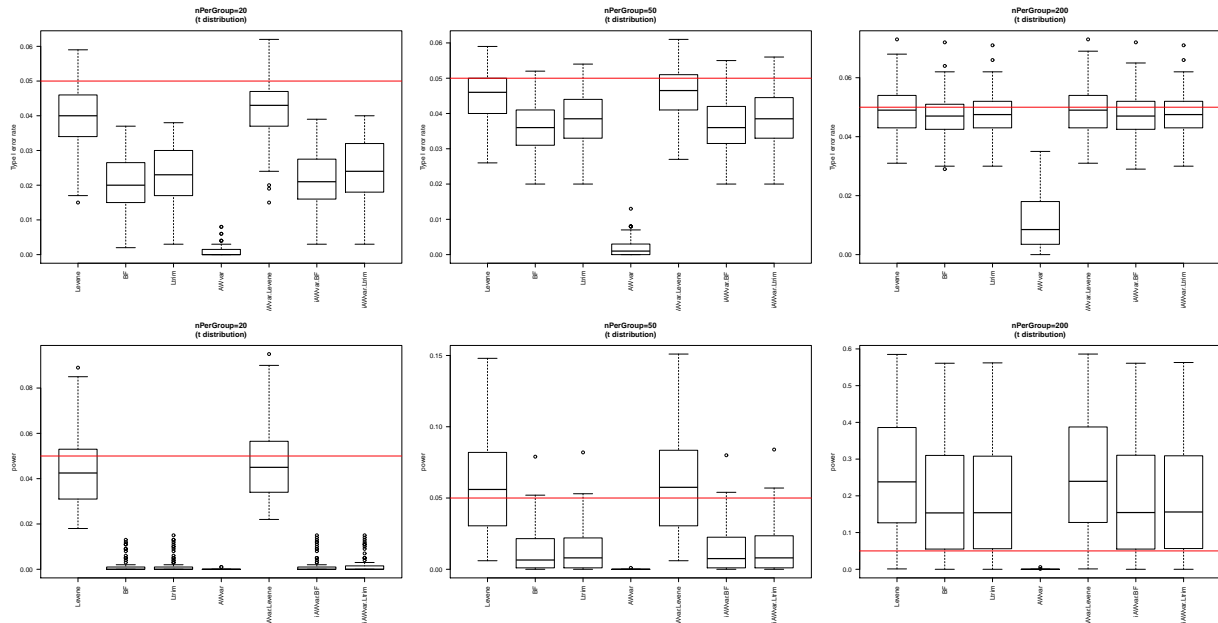


Figure S9: Parallel boxplots for scenarios where data were generated from t distributions with equal means and outlier. Upper panel: Type I error rates (The red horizontal line indicates Type I error rate = 0.05); Lower panel: powers (The red horizontal line indicates power = 0.05). Left panel: 20 subjects per group; middle panel: 50 subjects per group; right panel: 200 subjects per group.

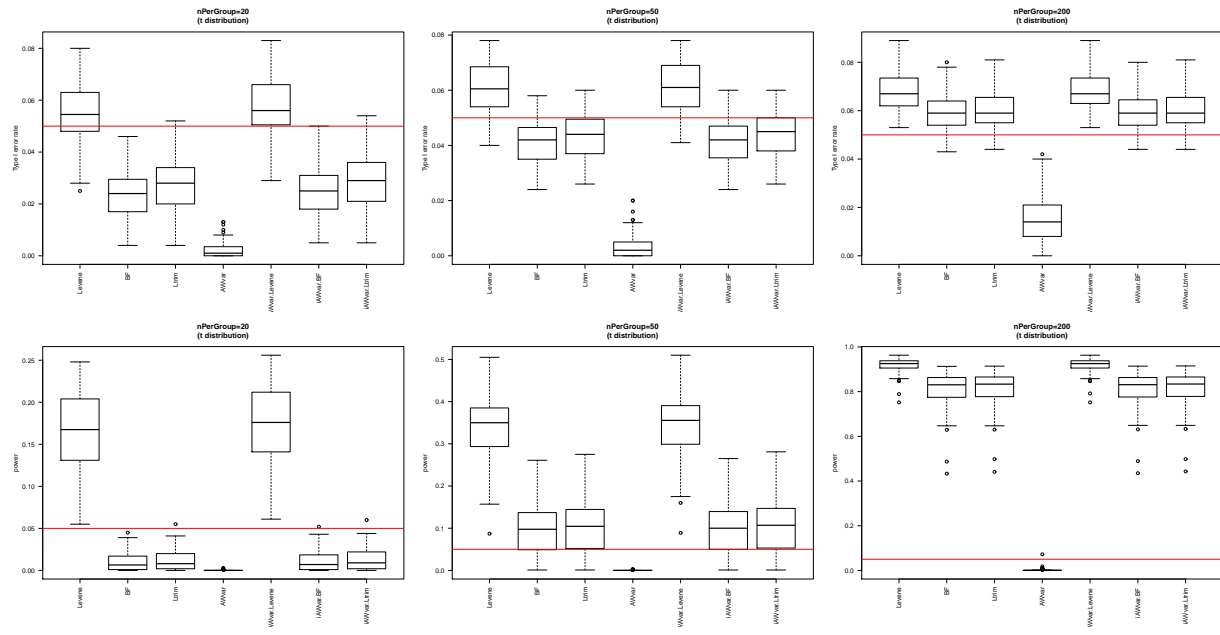


Figure S10: Parallel boxplots for scenarios where data were generated from t distributions with different means and outlier. Upper panel: Type I error rates (The red horizontal line indicates Type I error rate = 0.05); Lower panel: powers (The red horizontal line indicates power = 0.05). Left panel: 20 subjects per group; middle panel: 50 subjects per group; right panel: 200 subjects per group.

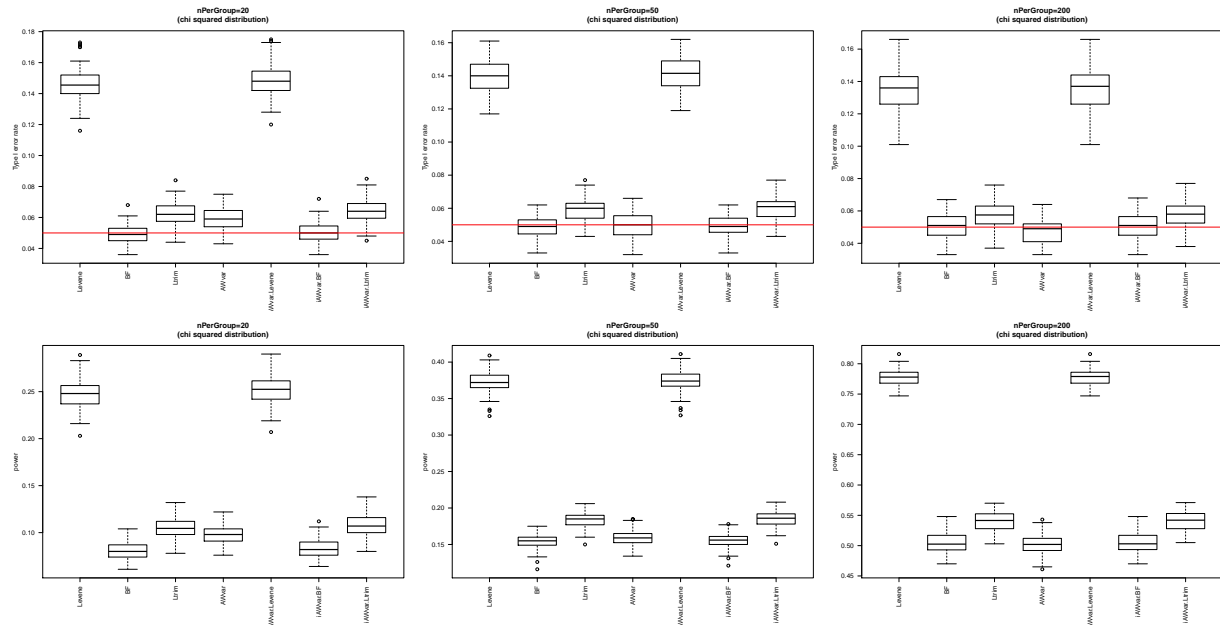


Figure S11: Parallel boxplots for scenarios where data were generated from chi squared distributions with equal means. Upper panel: Type I error rates (The red horizontal line indicates Type I error rate = 0.05); Lower panel: powers (The red horizontal line indicates power = 0.05). Left panel: 20 subjects per group; middle panel: 50 subjects per group; right panel: 200 subjects per group.

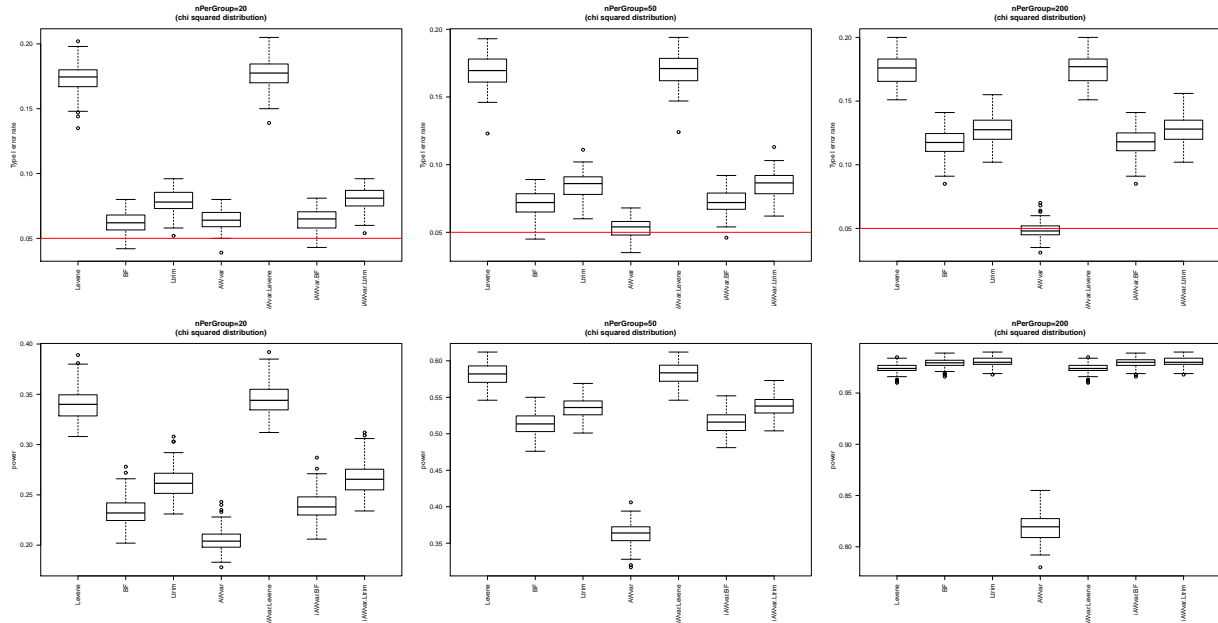


Figure S12: Parallel boxplots for scenarios where data were generated from chi squared distributions with different means. Upper panel: Type I error rates (The red horizontal line indicates Type I error rate = 0.05); Lower panel: powers (The red horizontal line indicates power = 0.05). Left panel: 20 subjects per group; middle panel: 50 subjects per group; right panel: 200 subjects per group.

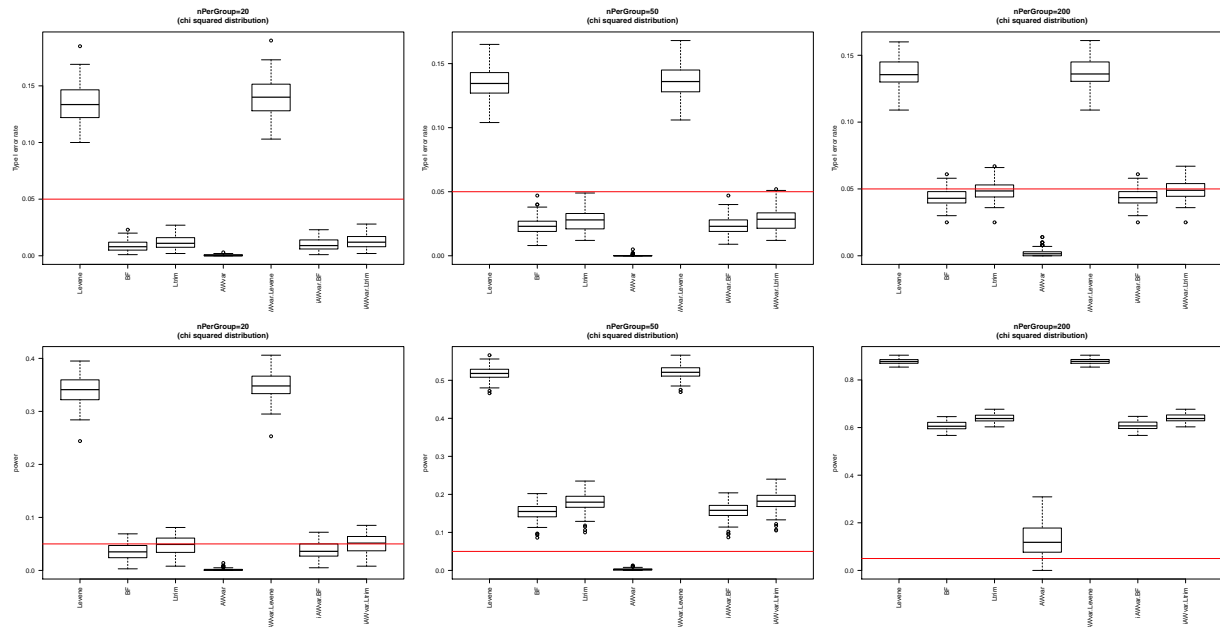


Figure S13: Parallel boxplots for scenarios where data were generated from chi squared distributions with equal means and outlier. Upper panel: Type I error rates (The red horizontal line indicates Type I error rate = 0.05); Lower panel: powers (The red horizontal line indicates power = 0.05). Left panel: 20 subjects per group; middle panel: 50 subjects per group; right panel: 200 subjects per group.

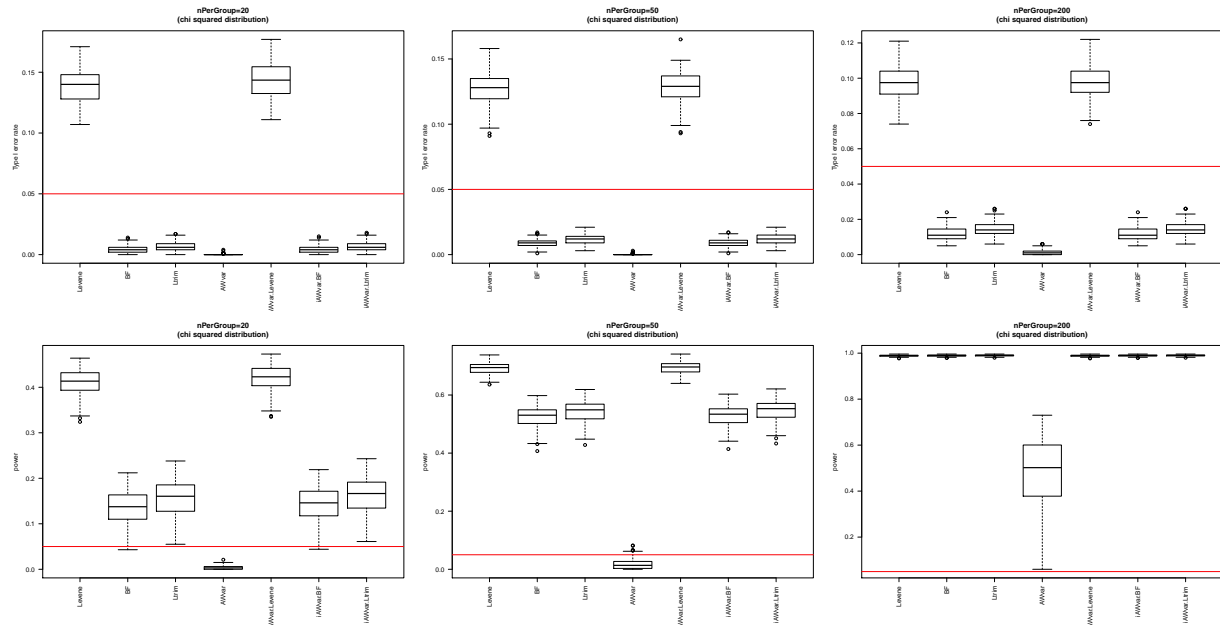


Figure S14: Parallel boxplots for scenarios where data were generated from chi squared distributions with different means and outlier. Upper panel: Type I error rates (The red horizontal line indicates Type I error rate = 0.05); Lower panel: powers (The red horizontal line indicates power = 0.05). Left panel: 20 subjects per group; middle panel: 50 subjects per group; right panel: 200 subjects per group.

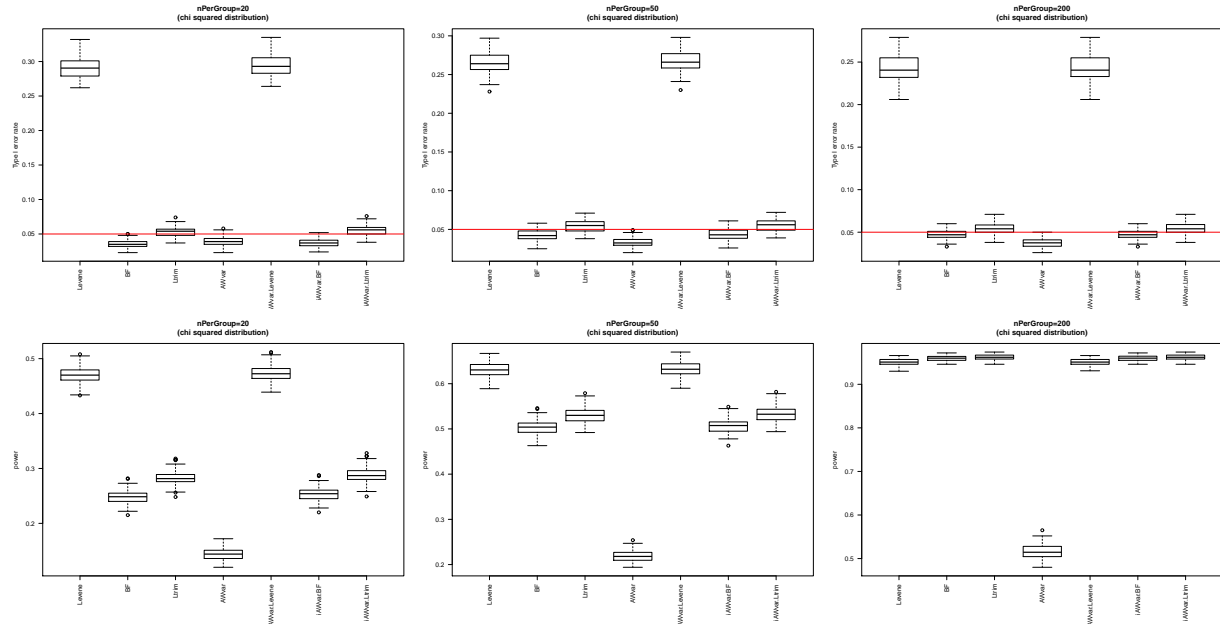


Figure S15: Parallel boxplots for scenarios where data were generated from Bayesian hierarchical models with conditional chi squared distributions having different means. Upper panel: Type I error rates (The red horizontal line indicates Type I error rate = 0.05); Lower panel: powers (The red horizontal line indicates power = 0.05). Left panel: 20 subjects per group; middle panel: 50 subjects per group; right panel: 200 subjects per group.

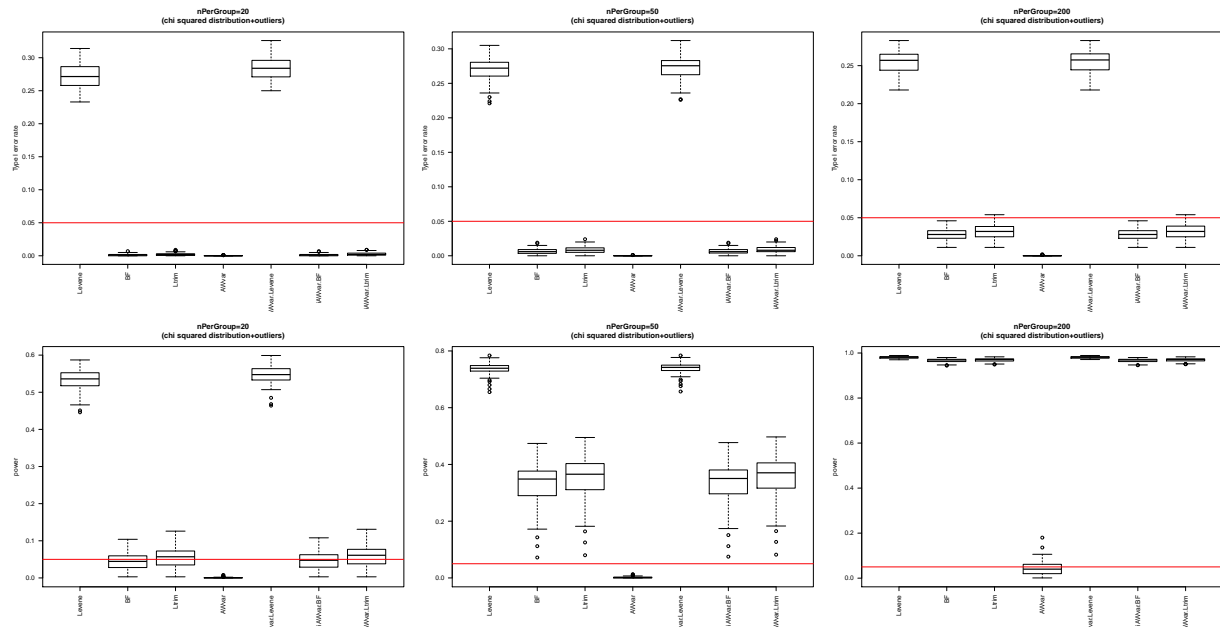


Figure S16: Parallel boxplots for scenarios where data were generated from Bayesian hierarchical models with conditional chi squared distributions having different means and outlier. Upper panel: Type I error rates (The red horizontal line indicates Type I error rate = 0.05); Lower panel: powers (The red horizontal line indicates power = 0.05). Left panel: 20 subjects per group; middle panel: 50 subjects per group; right panel: 200 subjects per group.