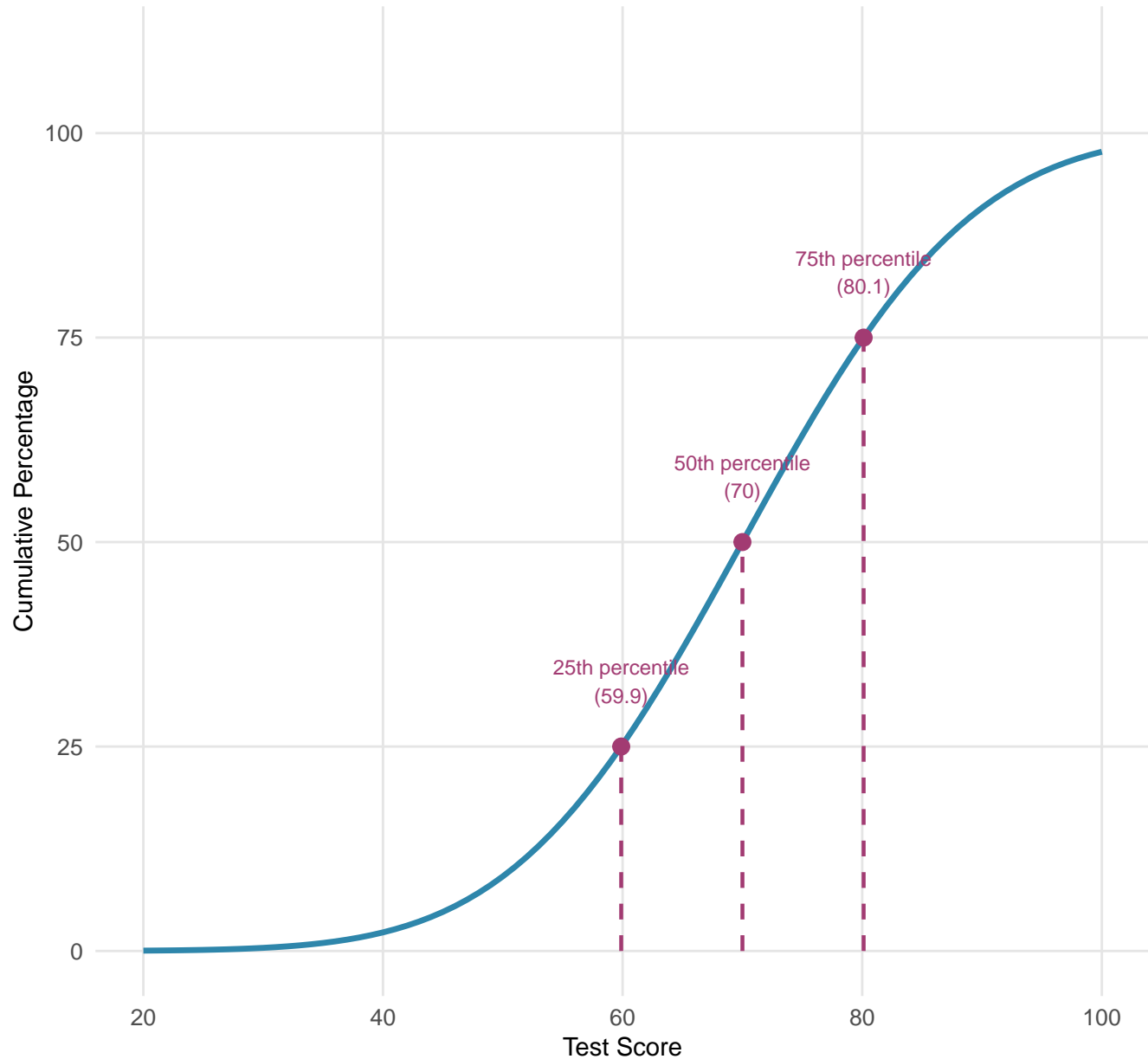


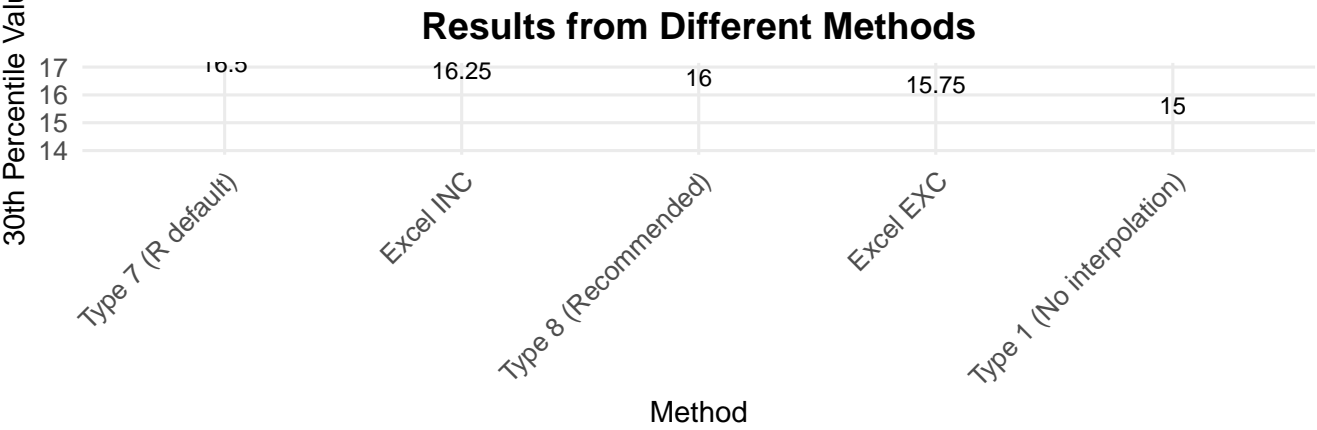
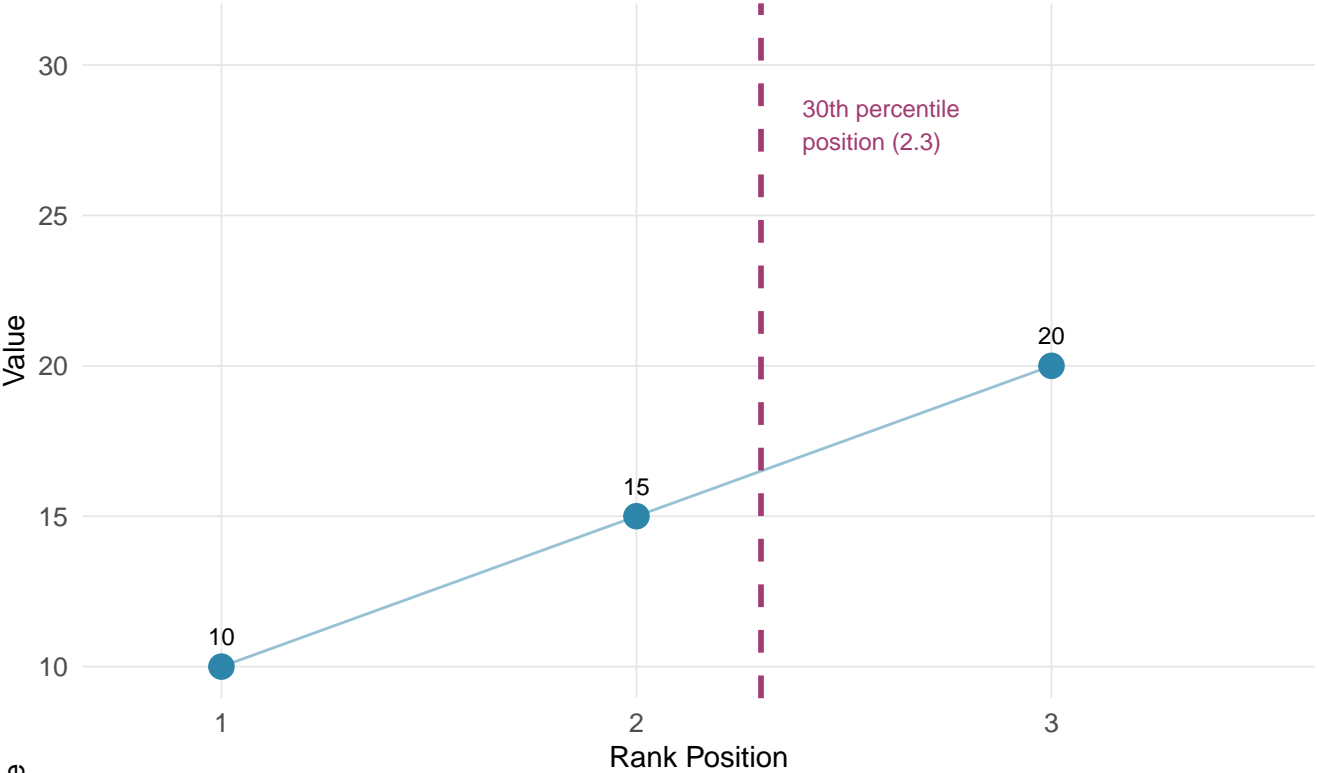
# Conceptual Understanding of Percentiles

Example: Normally distributed test scores ( $\mu=70$ ,  $\sigma=15$ )



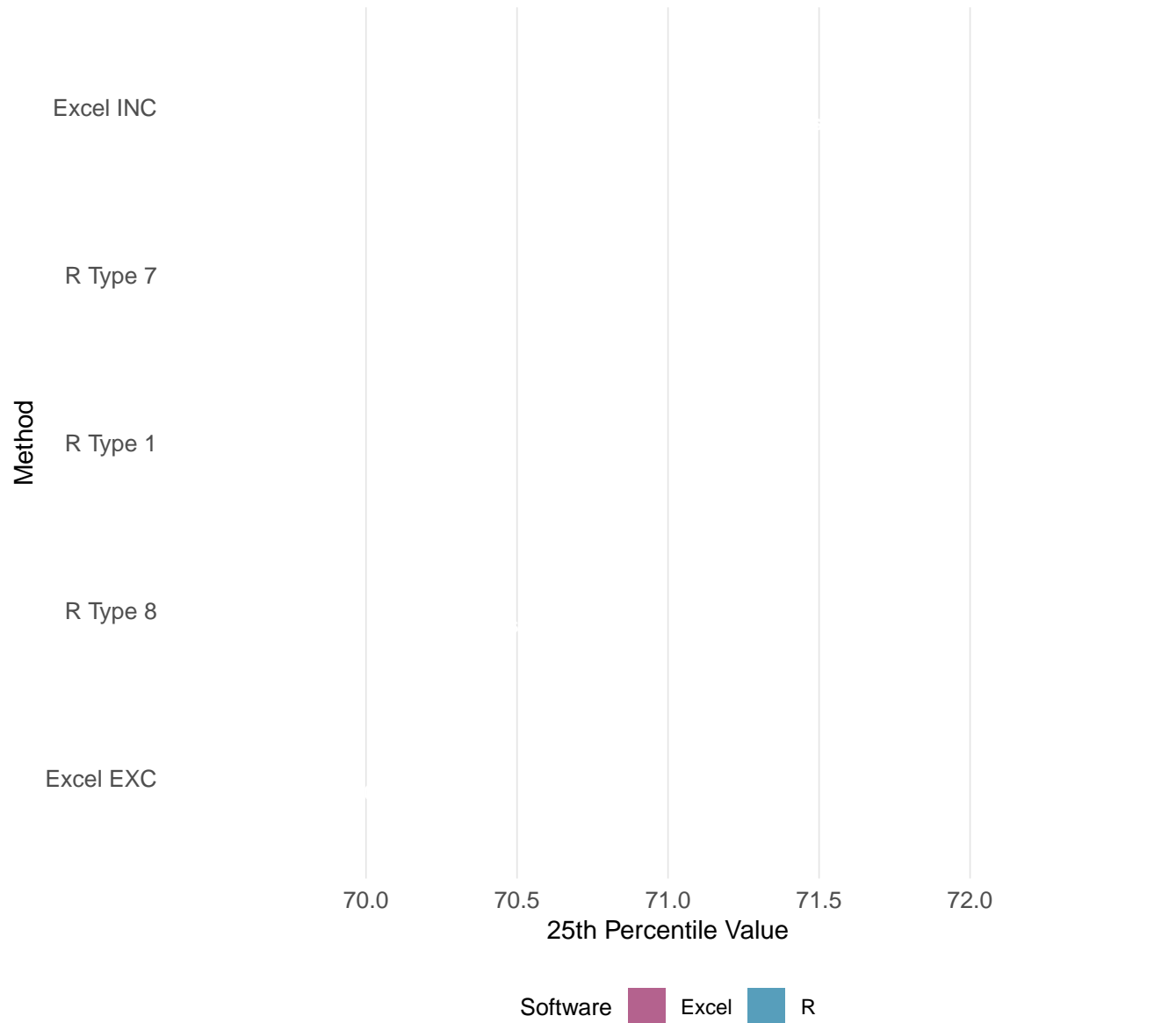
# How Different Methods Interpolate Between Data Points

Dataset: [10, 15, 20, 25, 30] – Finding 30th percentile



# 25th Percentile Comparison: Student Test Scores

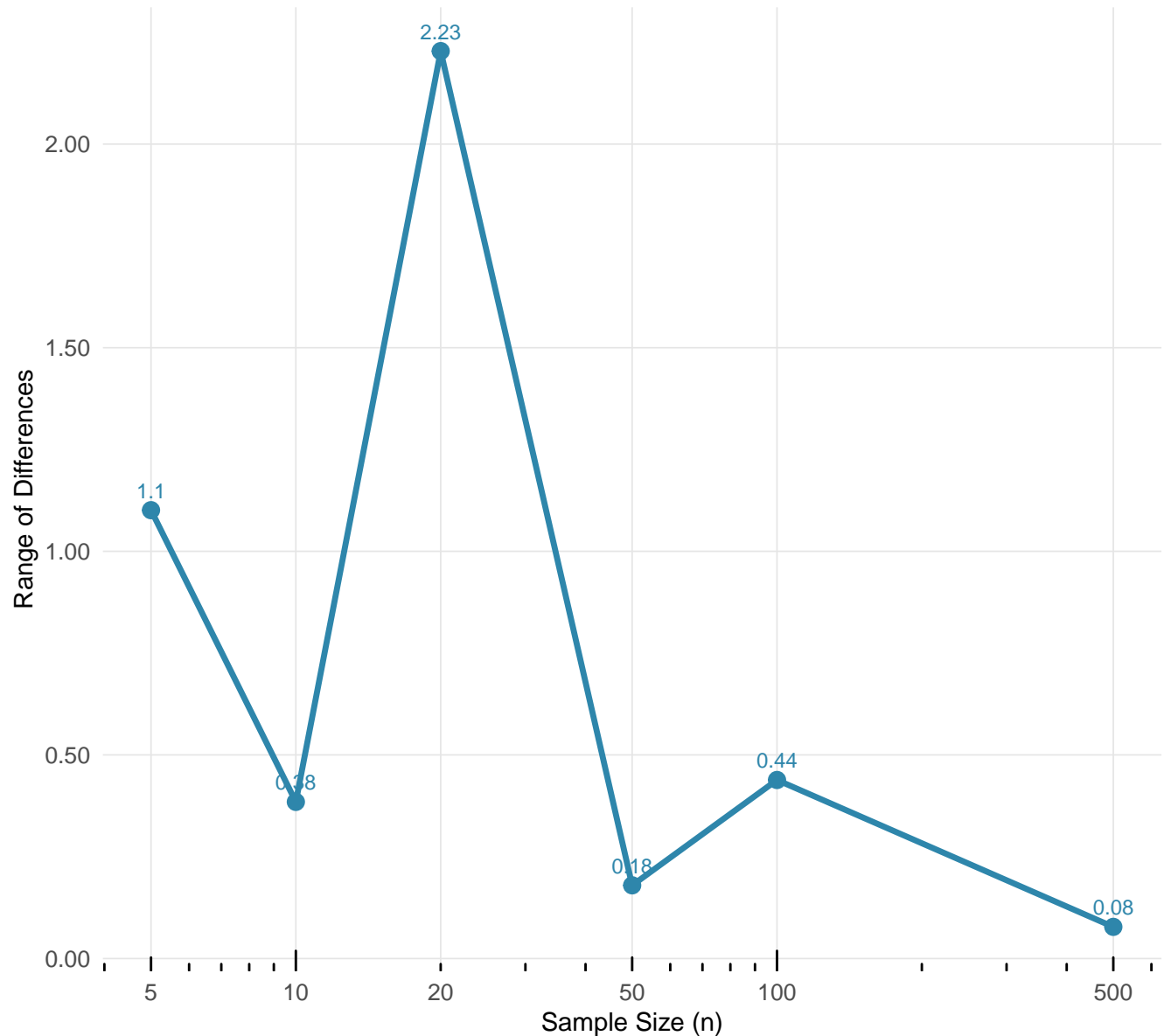
Dataset: [62, 68, 71, 73, 75, 78, 82, 85, 88, 92] (n=10)



Range: 1.5 points difference between methods

# How Sample Size Affects Method Differences

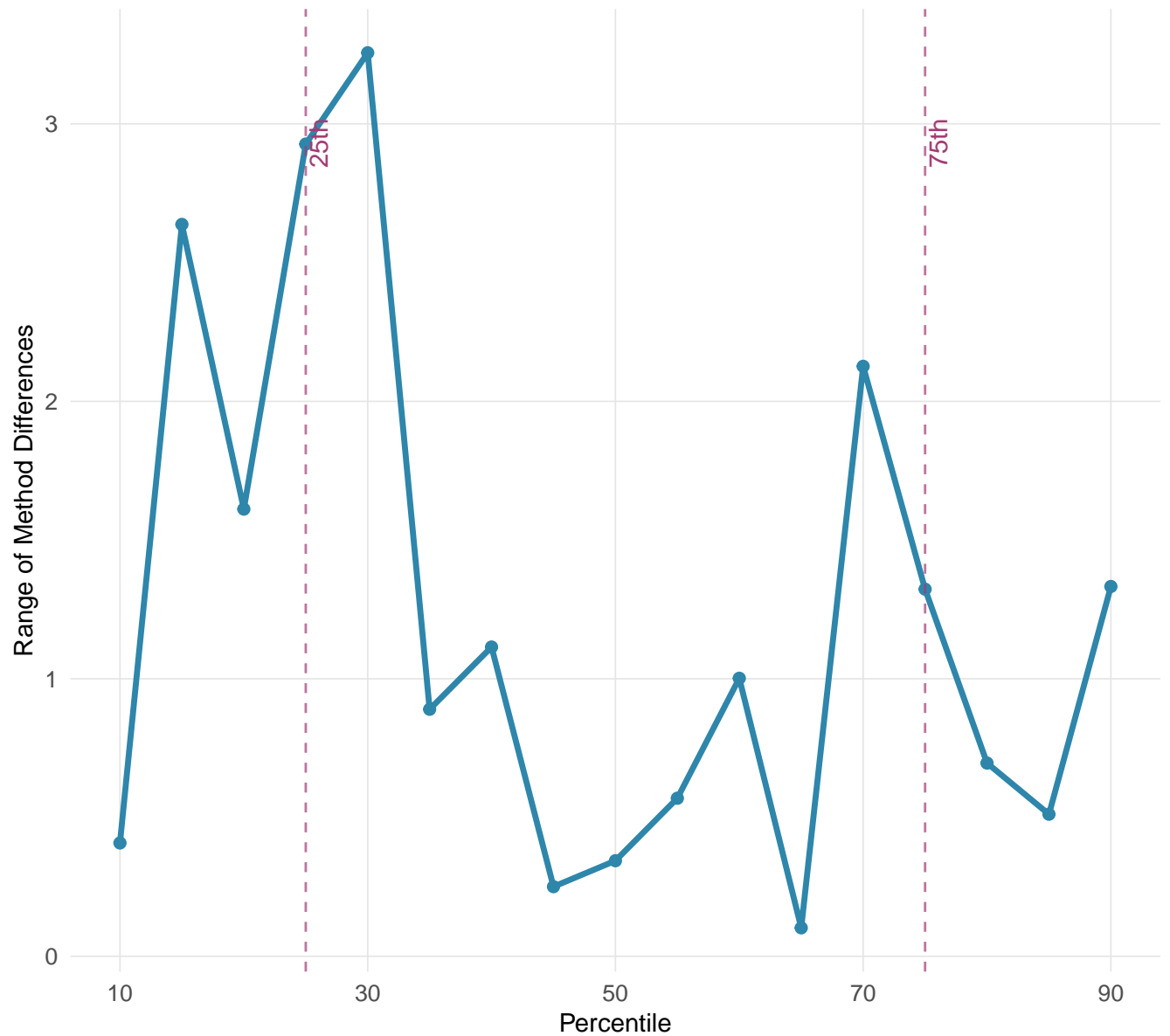
Range of 25th percentile values across R Types 1, 7, and 8



Larger samples → smaller differences between methods

# Method Sensitivity Across Percentiles

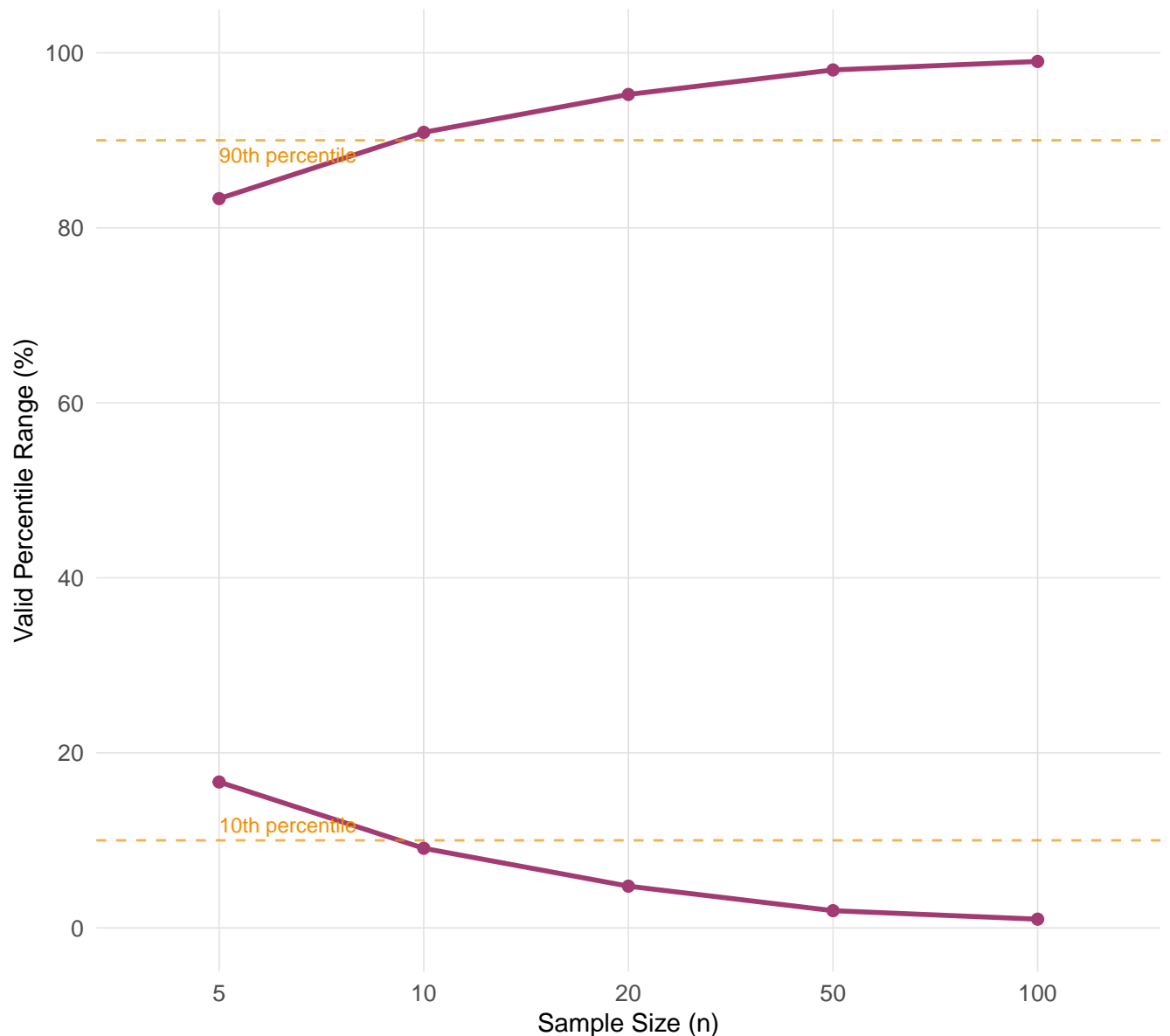
Range of differences between R Types 1, 7, and 8 (n=20)



Quartiles (25th, 75th) show highest sensitivity

# Excel PERCENTILE.EXC Valid Range by Sample Size

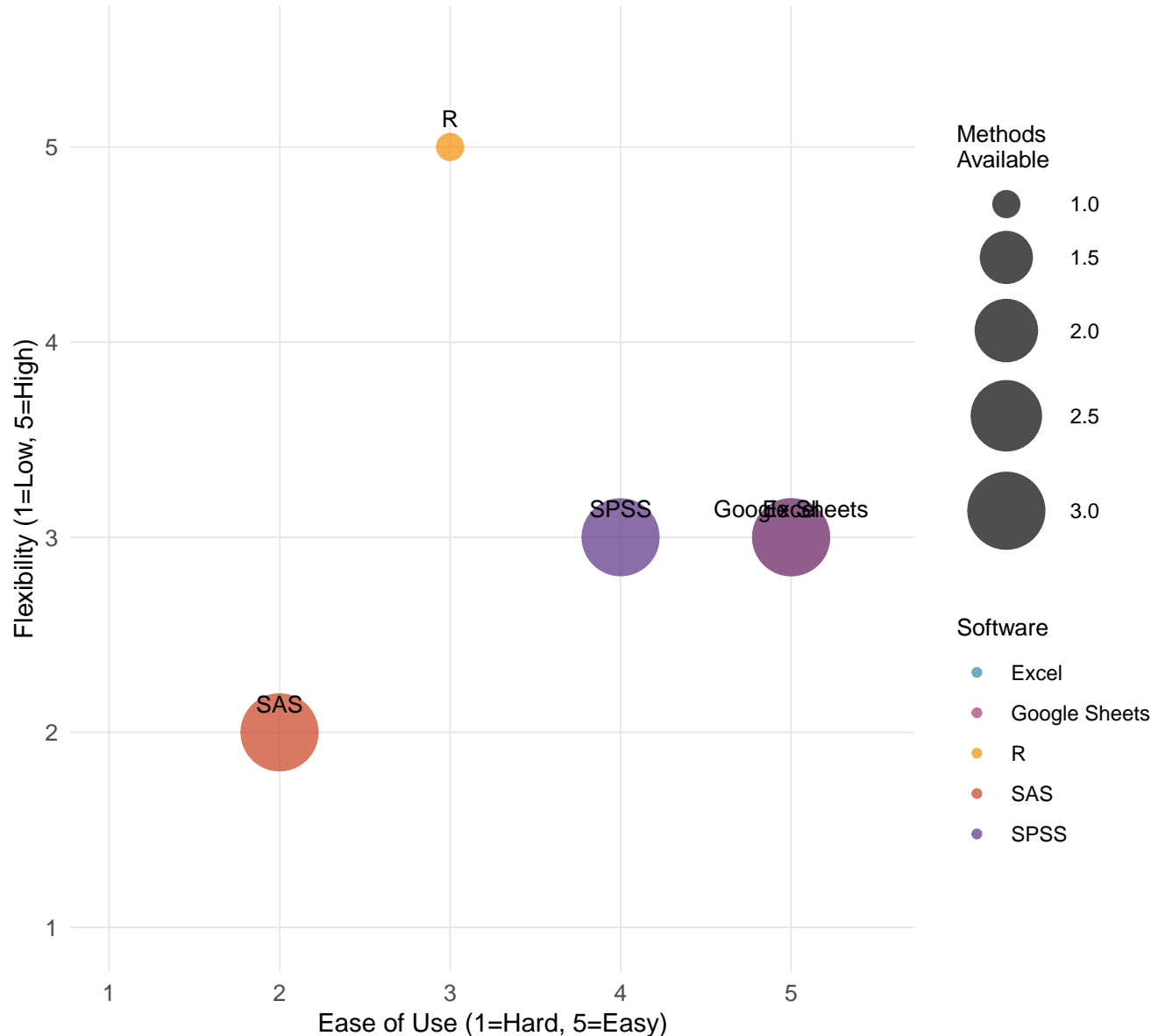
Shaded area shows valid percentiles for PERCENTILE.EXC



Smaller samples cannot calculate extreme percentiles with EXC method

# Software Comparison: Ease vs Flexibility

Bubble size = number of different percentile methods available



R offers most flexibility, Excel/Sheets balance ease and functionality