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Demo: Analyzing an MSA

For this video, we use the file Micrometer.jmp to demonstrate how to analyze an MSA in JMP.

In this MSA, the measurement system of interest is a hand micrometer, and the quality characteristic is the diameter of metal bearings. The study involves three inspectors measuring 10 parts, with each inspector measuring each part twice.

For this analysis, we use the Measurement Systems Analysis platform from the Analyze menu under Quality and Process.

We select Diameter as Y, Response, Part as Part, Sample ID and Inspector as X, Grouping.

This runs the Evaluate Measurement Process (or Wheeler's EMP) Measurement System Analysis.

Average and range charts are display by default.

From the average chart, we see that the control limits are wide, and that most of the points fall within these limits. This tells us that there is a lot of within, or repeatability, variation.

To understand the sources of variation, we conduct a variance components analysis. To do this, we select Variance Components from the top red triangle.

65.9% of the variation is attributable to Part, 5.1% is due to the Inspector*Part interaction, and 29% is Within, or repeatability, variation.

The variance component for Inspector is 0.00. So none of the variation is attributed to differences between the inspectors.

On average, the inspectors are getting the same measurements.

To view the repeatability and reproducibility components grouped into Gauge R&R, select EMP Gauge R&R Results from the top red triangle.

Additional options, for a more comprehensive analysis, are available from the top red triangle.

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