

Statistical Testing

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1 Methods

I performed independent t-tests and paired t-tests on the following columns: S, I, P, IP, SI, SP, SIP, SwL, IwL, and PwL. Independent t-tests were used to compare means between different datasets, while paired t-tests were used to compare means within paired samples from the datasets.

2 Results

2.1 Independent T-Tests

The independent t-test results are summarized in Table1. Significant results (p-value ≤ 0.05) indicate that there is a significant difference in the means of the compared datasets.

Column	Comparison	t-Statistic	p-value	Significant
S	u10 vs u25	-3.014	0.004	Yes
	u25 vs u50	-1.404	0.167	No
	u10 vs u50	-4.695	2.61×10^{-5}	Yes
I	u10 vs u25	-3.272	0.002	Yes
	u25 vs u50	-0.095	0.925	No
	u10 vs u50	-3.298	0.002	Yes
P	u10 vs u25	-3.146	0.003	Yes
	u25 vs u50	-0.892	0.377	No
	u10 vs u50	-3.839	0.0004	Yes
IP	u10 vs u25	-4.990	9.44×10^{-6}	Yes
	u25 vs u50	-0.272	0.787	No
	u10 vs u50	-5.318	3.12×10^{-6}	Yes
SI	u10 vs u25	-4.399	6.11×10^{-5}	Yes
	u25 vs u50	0.120	0.905	No
	u10 vs u50	-4.546	4.04×10^{-5}	Yes
SP	u10 vs u25	-4.625	3.20×10^{-5}	Yes
	u25 vs u50	0.205	0.838	No
	u10 vs u50	-4.144	0.00014	Yes
SIP	u10 vs u25	-4.543	3.82×10^{-5}	Yes
	u25 vs u50	-0.148	0.883	No
	u10 vs u50	-4.809	1.62×10^{-5}	Yes
SwL	u10 vs u25	-0.439	0.662	No
	u25 vs u50	-0.578	0.566	No
	u10 vs u50	-0.945	0.350	No
IwL	u10 vs u25	-0.735	0.466	No
	u25 vs u50	-0.759	0.452	No
	u10 vs u50	-1.404	0.167	No
PwL	u10 vs u25	-2.440	0.018	Yes
	u25 vs u50	-0.946	0.349	No
	u10 vs u50	-3.485	0.0011	Yes

Table 1: Independent t-test results

2.2 Paired T-Tests

The paired t-test results are summarized in Table 2. Significant results (p-value ≤ 0.05) indicate that there is a significant difference in the means within the paired samples.

Column	Comparison	t-Statistic	p-value	Significant
S	u10 vs u25	-3.091	0.005	Yes
	u25 vs u50	-1.447	0.161	No
	u10 vs u50	-4.518	1.41×10^{-4}	Yes
I	u10 vs u25	-3.263	0.003	Yes
	u25 vs u50	-0.103	0.919	No
	u10 vs u50	-2.964	0.007	Yes
P	u10 vs u25	-3.210	0.004	Yes
	u25 vs u50	-0.944	0.354	No
	u10 vs u50	-5.600	9.19×10^{-6}	Yes
IP	u10 vs u25	-4.923	5.05×10^{-5}	Yes
	u25 vs u50	-0.333	0.742	No
	u10 vs u50	-5.933	4.02×10^{-6}	Yes
SI	u10 vs u25	-6.123	2.52×10^{-6}	Yes
	u25 vs u50	0.127	0.900	No
	u10 vs u50	-4.055	4.58×10^{-4}	Yes
SP	u10 vs u25	-6.426	1.21×10^{-6}	Yes
	u25 vs u50	0.215	0.832	No
	u10 vs u50	-4.002	5.24×10^{-4}	Yes
SIP	u10 vs u25	-6.239	1.90×10^{-6}	Yes
	u25 vs u50	-0.161	0.874	No
	u10 vs u50	-5.017	3.99×10^{-5}	Yes
SwL	u10 vs u25	-0.450	0.657	No
	u25 vs u50	-0.598	0.555	No
	u10 vs u50	-0.891	0.382	No
IwL	u10 vs u25	-0.688	0.498	No
	u25 vs u50	-0.950	0.351	No
	u10 vs u50	-1.598	0.123	No
PwL	u10 vs u25	-2.360	0.027	Yes
	u25 vs u50	-1.117	0.275	No
	u10 vs u50	-5.245	2.24×10^{-5}	Yes

Table 2: Paired t-test results

3 MMy Interpretations:

The t-test results indicate several significant differences between the datasets. Notably:

- For most columns (S, I, P, IP, SI, SP, SIP, and PwL), there are significant differences between u10 and u25, as well as between u10 and u50.
- Comparisons between u25 and u50 generally show no significant differences, suggesting that these datasets are more similar to each other than to u10.
- The columns SwL and IwL show no significant differences across all comparisons, indicating stability in these measures across datasets.