

t-Test for Independent or Correlated Samples

[Traducción en español]

The logic and computational details of two-sample t-tests are described in Chapters 9-12 of the online text [Concepts & Applications of Inferential Statistics](#). For the independent-samples t-test, this unit will perform both the "usual" t-test, which assumes that the two samples have equal variances, and the alternative t-test, which assumes that the two samples have *unequal* variances. (A good formulaic summary of the unequal-variances t-test can be found on the [StatsDirect](#) web site. A more thorough account appears in the online journal [Behavioral Ecology](#).)

Setup	Procedure																																
<div><div>Independent Samples</div><div>Correlated Samples</div><div>Correlated Samples</div></div>	<p><i>Initial Setup:</i></p> <p>Click the button for either 'Independent Samples' or 'Correlated Samples' to indicate which version of the two-sample t-test you wish to perform. If the Setup operation is not performed, the programming will default to the independent-samples design.</p>																																
<div>Data Entry</div> <table><thead><tr><th>Sample A</th><th>Sample B</th></tr></thead><tbody><tr><td>64</td><td>74</td></tr><tr><td>60</td><td>70</td></tr><tr><td>59</td><td>65</td></tr><tr><td>65</td><td>67</td></tr><tr><td>64</td><td>62</td></tr><tr><td>62</td><td>67</td></tr><tr><td>54</td><td>51</td></tr><tr><td>68</td><td>93</td></tr><tr><td>67</td><td>56</td></tr><tr><td>79</td><td>78</td></tr><tr><td>45</td><td>58</td></tr><tr><td>48</td><td>52</td></tr><tr><td>59</td><td>60</td></tr><tr><td>65</td><td>76</td></tr><tr><td>87</td><td>74</td></tr></tbody></table> <div>Please be sure to perform the Data Check procedure.</div> <div><div>Reset</div><div>Calculate</div></div>	Sample A	Sample B	64	74	60	70	59	65	65	67	64	62	62	67	54	51	68	93	67	56	79	78	45	58	48	52	59	60	65	76	87	74	<p><i>Entering Data Directly into the Text Fields:</i></p> <p>After clicking the cursor into the scrollable text area for sample A, enter the values for that sample in sequence, pressing the carriage return key after each entry except the last. (On a Macintosh platform, the carriage return key is labeled 'Return'; on a Windows platform it is labeled 'Enter'.) Perform the same procedure for sample B.</p> <p><i>Importing Data via Copy & Paste:</i></p> <p>Within the spreadsheet application or other source of your data, select and copy the column of data for sample A. Then return to your web browser, click the cursor into the text area for sample A and perform the 'Paste' operation from the 'Edit' menu. Perform the same procedure for sample B.</p> <p><i>Data Check:</i></p> <p>For each sample, make sure that the final entry is not</p>
Sample A	Sample B																																
64	74																																
60	70																																
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45	58																																
48	52																																
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65	76																																
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Data Summary			
	A	B	Total
n	28	28	56
- $\sum X$	1770	1765	3535
- $\sum X^2$	116964	116461	233425
SS	5074.7143	5202.9643	10278.125
mean	63.2143	63.0357	63.125

Results_Q

Mean _a —Mean _b	t	df	P	one-tailed	0.464476
0.1786	+0.09	27		two-tailed	0.928952

For independent samples, these results pertain to the "usual" t-test, which assumes that the two samples have equal variances.

F-Test for the Significance of the Difference between the Variances of the Two Samples_Q

df ₁	df ₂	F	P
---	---	---	not applicable
[Applicable only to independent samples.] P>.05 indicates no significant difference detected between the variances of the two samples.			

t-Test Assuming Unequal Sample Variances [Applicable only to independent samples.]_Q

Mean _a —Mean _b	t	df	P	one-tailed	not applicable
---	---	---		two-tailed	not applicable

	Observed	Confidence Intervals	
		0.95	0.99
Mean _a	63.2143	± 5.3113	± 7.1767
Mean _b	63.0357	± 5.378	± 7.2668
Mean _a —Mean _b [Assuming equal sample variances.]	0.1786	± 3.965	± 5.3576
Mean _a —Mean _b [Assuming unequal sample variances.]	---	± ---	± ---
Correlated Samples			

For purposes of significance tests and calculation of confidence intervals, values of df associated with the unequal-variance condition are rounded to the nearest integer.

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