12.2: Critical Values for t-Test

Assuming we have calculated t_{exp}, there are two approaches to interpreting a *t*-test. In the first approach we choose a value of α for rejecting the null hypothesis and read the value of $t(\alpha, \nu)$ from the table below. If $t_{exp} > t(\alpha, \nu)$, we reject the null hypothesis and accept the alternative hypothesis. In the second approach, we find the row in the table below that corresponds to the available degrees of freedom and move across the row to find (or estimate) the a that corresponds to $t_{exp} = t(\alpha, \nu)$; this establishes largest value of α for which we can retain the null hypothesis. Finding, for example, that α is 0.10 means that we retain the null hypothesis at the 90% confidence level, but reject it at the 89% confidence level. The examples in this textbook use the first approach.

Table 12.2.1: Critical Values of t for the t-Test

Values of t for…				
…a confidence interval of:	90%	95%	98%	99%
…an α value of:	0.10	0.05	0.02	0.01
Degrees of Freedom				
1	6.314	12.706	31.821	63.657
2	2.920	4.303	6.965	9.925
3	2.353	3.182	4.541	5.841
4	2.132	2.776	3.747	4.604
5	2.015	2.571	3.365	4.032
6	1.943	2.447	3.143	3.707
7	1.895	2.365	2.998	3.499
8	1.860	2.306	2.896	3.255
9	1.833	2.262	2.821	3.250
10	1.812	2.228	2.764	3.169
12	1.782	2.179	2.681	3.055
14	1.761	2.145	2.624	2.977
16	1.746	2.120	2.583	2.921
18	1.734	2.101	2.552	2.878
20	1.725	2.086	2.528	2.845
30	1.697	2.042	2.457	2.750
50	1.676	2.009	2.311	2.678
∞	1.645	1.960	2.326	2.576

The values in this table are for a two-tailed *t*-test. For a one-tailed test, divide the α values by 2. For example, the last column has an α value of 0.005 and a confidence interval of 99.5% when conducting a one-tailed *t*-test.