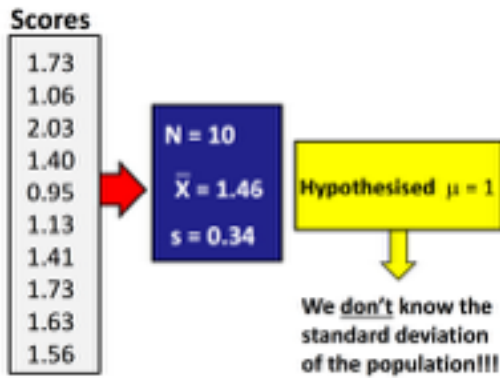


SHORT ANSWER NOTES

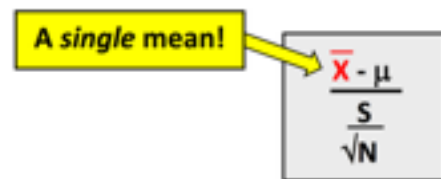
ONE-SAMPLE T-TEST

- Calculate a **sample mean** from scores collected from a group of participants
- Compare with a **hypothesised mean** (e.g., from a theory of what you believe every person **should** do)



DEGREES OF FREEDOM

- Consider the numbers 6, 8 and 10 The mean is 8
- Question: How many of these three numbers are "free" to **vary** such that the mean stays 8? Only two!
- Thus "degrees of freedom" (**df**) = **N-1**
- In our example **df** is: **3-1 = 2**
- If you use a mean in your statistical formula, you lose a degree of freedom!



Thus "degrees of freedom" (**df**) = **N-1** = 10 - 1 = 9

That's what we test against using the tables

Use formula

$$\frac{\bar{X} - \mu}{\frac{s}{\sqrt{N}}}$$

Calculation

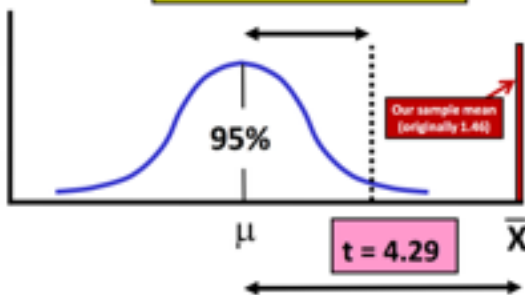
$$\frac{1.46 - 1}{\frac{0.34}{\sqrt{10}}} = +4.29$$

If we let **SPSS** do this calculation, we would be given the t-value AND the probability

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean
SCORE	10	1.46333	.34089	.107173

One-Sample Test						
Test Value = 1						
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
				Lower	Upper	
score	4.298	9	.002	.46333	.2151	.7115

t-critical at 5% = 1.83



Where does 1.83 come from?

TABLE B-1 DISTRIBUTION CRITICAL VALUES

df	Tail probability p									
	.10	.05	.025	.01	.005	.0025	.001	.0005	.00025	.0001
1	1.645	1.960	2.306	3.078	3.581	4.015	4.608	5.024	5.401	5.881
2	1.106	1.601	1.960	2.576	2.924	3.183	3.689	4.015	4.303	4.608
3	.978	1.500	1.848	2.479	2.771	2.992	3.500	3.747	3.982	4.303
4	.941	1.429	1.761	2.401	2.690	2.897	3.408	3.634	3.856	4.177
5	.917	1.385	1.706	2.353	2.643	2.848	3.363	3.589	3.811	4.132
6	.896	1.350	1.671	2.319	2.618	2.824	3.339	3.565	3.787	4.108
7	.878	1.326	1.646	2.292	2.599	2.809	3.324	3.550	3.772	4.093
8	.863	1.307	1.626	2.271	2.583	2.796	3.312	3.538	3.760	4.081
9	.850	1.292	1.611	2.255	2.571	2.786	3.303	3.529	3.751	4.071
10	.839	1.280	1.600	2.241	2.562	2.779	3.296	3.522	3.744	4.063
11	.830	1.271	1.593	2.230	2.556	2.774	3.291	3.517	3.739	4.058
12	.823	1.264	1.588	2.222	2.551	2.770	3.287	3.513	3.735	4.054
13	.817	1.259	1.584	2.216	2.547	2.767	3.284	3.510	3.732	4.051
14	.812	1.255	1.581	2.211	2.544	2.765	3.282	3.508	3.730	4.049
15	.808	1.252	1.578	2.207	2.542	2.763	3.280	3.506	3.728	4.047
16	.804	1.249	1.576	2.204	2.540	2.762	3.279	3.505	3.727	4.046
17	.801	1.247	1.574	2.201	2.539	2.761	3.278	3.504	3.726	4.045
18	.798	1.245	1.572	2.199	2.538	2.760	3.277	3.503	3.725	4.044
19	.796	1.243	1.571	2.197	2.537	2.759	3.276	3.502	3.724	4.043
20	.794	1.242	1.570	2.196	2.536	2.759	3.275	3.501	3.723	4.042
22	.791	1.240	1.568	2.193	2.535	2.758	3.274	3.500	3.722	4.041
24	.788	1.238	1.566	2.191	2.534	2.757	3.273	3.499	3.721	4.040
26	.786	1.237	1.565	2.189	2.533	2.756	3.272	3.498	3.720	4.039
28	.784	1.236	1.564	2.188	2.532	2.755	3.271	3.497	3.719	4.038
30	.782	1.235	1.563	2.187	2.531	2.754	3.270	3.496	3.718	4.037
32	.780	1.234	1.562	2.186	2.530	2.753	3.269	3.495	3.717	4.036
34	.779	1.233	1.561	2.185	2.529	2.752	3.268	3.494	3.716	4.035
36	.777	1.232	1.560	2.184	2.528	2.751	3.267	3.493	3.715	4.034
38	.776	1.231	1.559	2.183	2.527	2.750	3.266	3.492	3.714	4.033
40	.775	1.230	1.558	2.182	2.526	2.749	3.265	3.491	3.713	4.032
42	.773	1.229	1.557	2.181	2.525	2.748	3.264	3.490	3.712	4.031
44	.772	1.228	1.556	2.180	2.524	2.747	3.263	3.489	3.711	4.030
46	.771	1.227	1.555	2.179	2.523	2.746	3.262	3.488	3.710	4.029
48	.770	1.226	1.554	2.178	2.522	2.745	3.261	3.487	3.709	4.028
50	.769	1.225	1.553	2.177	2.521	2.744	3.260	3.486	3.708	4.027
52	.768	1.224	1.552	2.176	2.520	2.743	3.259	3.485	3.707	4.026
54	.767	1.223	1.551	2.175	2.519	2.742	3.258	3.484	3.706	4.025
56	.766	1.222	1.550	2.174	2.518	2.741	3.257	3.483	3.705	4.024
58	.765	1.221	1.549	2.173	2.517	2.740	3.256	3.482	3.704	4.023
60	.764	1.220	1.548	2.172	2.516	2.739	3.255	3.481	3.703	4.022
62	.763	1.219	1.547	2.171	2.515	2.738	3.254	3.480	3.702	4.021
64	.762	1.218	1.546	2.170	2.514	2.737	3.253	3.479	3.701	4.020
66	.761	1.217	1.545	2.169	2.513	2.736	3.252	3.478	3.700	4.019
68	.760	1.216	1.544	2.168	2.512	2.735	3.251	3.477	3.699	4.018
70	.759	1.215	1.543	2.167	2.511	2.734	3.250	3.476	3.698	4.017
72	.758	1.214	1.542	2.166	2.510	2.733	3.249	3.475	3.697	4.016
74	.757	1.213	1.541	2.165	2.509	2.732	3.248	3.474	3.696	4.015
76	.756	1.212	1.540	2.164	2.508	2.731	3.247	3.473	3.695	4.014
78	.755	1.211	1.539	2.163	2.507	2.730	3.246	3.472	3.694	4.013
80	.754	1.210	1.538	2.162	2.506	2.729	3.245	3.471	3.693	4.012
82	.753	1.209	1.537	2.161	2.505	2.728	3.244	3.470	3.692	4.011
84	.752	1.208	1.536	2.160	2.504	2.727	3.243	3.469	3.691	4.010
86	.751	1.207	1.535	2.159	2.503	2.726	3.242	3.468	3.690	4.009
88	.750	1.206	1.534	2.158	2.502	2.725	3.241	3.467	3.689	4.008
90	.749	1.205	1.533	2.157	2.501	2.724	3.240	3.466	3.688	4.007
92	.748	1.204	1.532	2.156	2.500	2.723	3.239	3.465	3.687	4.006
94	.747	1.203	1.531	2.155	2.499	2.722	3.238	3.464	3.686	4.005
96	.746	1.202	1.530	2.154	2.498	2.721	3.237	3.463	3.685	4.004
98	.745	1.201	1.529	2.153	2.497	2.720	3.236	3.462	3.684	4.003
100	.744	1.200	1.528	2.152	2.496	2.719	3.235	3.461	3.683	4.002

SIGNIFICANCE TESTING

- If $p < 0.05$, probability of score is less than 1 in 20 (less than 5% in population)
- We arbitrarily call this "**SIGNIFICANT**" - score is very unlikely in population
- Very likely from another population!
- if $p < 0.05$ for a score, then it is less than the **significance** (or rejection) level
- A probability of 0.05 corresponds approx. to a z-score of **1.64**
- If $z = +1.64$ away from mean, then the score is **greater** than 95% of the rest of the population - (vice versa).

