检验心理学现象

1: 自变量: 文字条件是否一致, 因变量: 任务完成时间

2:零假设:文字条件是否一致不会影响任务完成时间, $H_0: \mu_b = \mu_a (\alpha < 0.05)$ 。

对立假设:文字条件不一致,会增加任务完成时间, $H_a: \mu_b > \mu_a$ 。

变量意义:

 H_0 :零假设, H_a :对立假设

 μ_a :文字条件一样时总体的均值, μ_b :文字条件不一样是总体的均值

应该执行t检测,在本次检验中,我们的对立假设是文字条件不一致时,会增加任务完成时间, 因此使用t检测中的单尾检测。

选择t检测原因:样本数小于30并且不知道总体方差。

是否可以执行t检测: 1.两个样本的其他条件都一致只是文字条件不一样,因此是相依样本。2。根据 直方图观察,大概符合正态分布

Congruent(xa)	Incongruent(x _b)	$X_{ab} = X_b$ - X_a	差值平均值
12.079	19.278	7.199	7.96479166666666
16.791	18.741	1.95	
9.564	21.214	11.65	
8.630	15.687	7.057	
14.669	22.803	8.134	
12.238	20.878	8.64	
14.692	24.572	9.88	
8.987	17.394	8.407	
9.401	20.762	11.361	
14.480	26.282	11.802	
22.328	24.524	2.196	
15.298	18.644	3.346	
15.073	17.510	2.437	
16.929	20.330	3.401	
18.200	35.255	17.055	
12.130	22.158	10.028	
18.495	25.139	6.644	
10.639	20.429	9.79	
11.344	17.425	6.081	
12.369	34.288	21.919	
12.944	23.894	10.95	
14.233	17.960	3.727	

19.710	22.058	2.348	
16.004	21.157	5.153	

根据上表计算出差值平均值=7.96

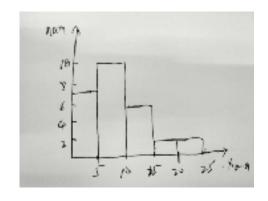
对上表 x_{ab} ,进行排序得下表,只看第三列。中位数 $M=(x^{ab12}+x_{ab}^{13})/2=7.67$

四份为法: Q1,Q2,Q3,见下表.IQR = Q3-Q1 = 6.63

异常区间为: <Q1-1.5IQR 或>Q3+1.5IQR 即: <-6.54或>20,所以异常值为最后一列21.91

16.791 18.741 1.95 22.328 24.524 2.196 19.710 22.058 2.348 15.073 17.510 2.437 15.298 18.644 3.346 16.929 20.330 3.401 Q1 14.233 17.960 3.727 16.004 21.157 5.153 11.344 17.425 6.081 18.495 25.139 6.644 8.630 15.687 7.057 12.079 19.278 7.199 Q2 14.669 22.803 8.134 8.987 17.394 8.407 12.238 20.878 8.64 10.639 20.429 9.79 14.692 24.572 9.88 12.130 22.158 10.028 12.944 23.894 10.95 9.401 20.762 11.361 9.564 21.214 11.65 14.480 26.282 11.802 18.200 35.255 17.055 12.369 34.288 21.919<	71.112.5.1-323	٠٠٠٠٠٠	1 - A COTT. OTGIT AP. (0:0:0:0	/4X/H / J= : : • :
19.710 22.058 2.348 15.073 17.510 2.437 15.298 18.644 3.346 16.929 20.330 3.401 Q1 14.233 17.960 3.727 16.004 21.157 5.153 11.344 17.425 6.081 18.495 25.139 6.644 8.630 15.687 7.057 12.079 19.278 7.199 Q2 14.669 22.803 8.134 8.987 17.394 8.407 12.238 20.878 8.64 10.639 20.429 9.79 14.692 24.572 9.88 12.130 22.158 10.028 Q3 12.944 23.894 10.95 9.401 20.762 11.361 9.564 21.214 11.65 14.480 26.282 11.802 18.200 35.255 17.055		16.791	18.741	1.95	
15.073 17.510 2.437 15.298 18.644 3.346 16.929 20.330 3.401 Q1 14.233 17.960 3.727 16.004 21.157 5.153 11.344 17.425 6.081 18.495 25.139 6.644 8.630 15.687 7.057 12.079 19.278 7.199 Q2 14.669 22.803 8.134 8.987 17.394 8.407 12.238 20.878 8.64 10.639 20.429 9.79 14.692 24.572 9.88 12.130 22.158 10.028 Q3 12.944 23.894 10.95 9.401 20.762 11.361 9.564 21.214 11.65 14.480 26.282 11.802 18.200 35.255 17.055		22.328	24.524	2.196	
15.298 18.644 3.346 16.929 20.330 3.401 Q1 14.233 17.960 3.727 16.004 21.157 5.153 11.344 17.425 6.081 18.495 25.139 6.644 8.630 15.687 7.057 12.079 19.278 7.199 Q2 14.669 22.803 8.134 8.987 17.394 8.407 12.238 20.878 8.64 10.639 20.429 9.79 14.692 24.572 9.88 12.130 22.158 10.028 Q3 12.944 23.894 10.95 9.401 20.762 11.361 9.564 21.214 11.65 14.480 26.282 11.802 18.200 35.255 17.055		19.710	22.058	2.348	
16.929 20.330 3.401 Q1 14.233 17.960 3.727 16.004 21.157 5.153 11.344 17.425 6.081 18.495 25.139 6.644 8.630 15.687 7.057 12.079 19.278 7.199 Q2 14.669 22.803 8.134 8.987 17.394 8.407 12.238 20.878 8.64 10.639 20.429 9.79 14.692 24.572 9.88 12.130 22.158 10.028 Q3 12.944 23.894 10.95 9.401 20.762 11.361 9.564 21.214 11.65 14.480 26.282 11.802 18.200 35.255 17.055		15.073	17.510	2.437	
14.233 17.960 3.727 16.004 21.157 5.153 11.344 17.425 6.081 18.495 25.139 6.644 8.630 15.687 7.057 12.079 19.278 7.199 Q2 14.669 22.803 8.134 8.987 17.394 8.407 12.238 20.878 8.64 10.639 20.429 9.79 14.692 24.572 9.88 12.130 22.158 10.028 12.944 23.894 10.95 9.401 20.762 11.361 9.564 21.214 11.65 14.480 26.282 11.802 18.200 35.255 17.055		15.298	18.644	3.346	
16.004 21.157 5.153 11.344 17.425 6.081 18.495 25.139 6.644 8.630 15.687 7.057 12.079 19.278 7.199 Q2 14.669 22.803 8.134 8.987 17.394 8.407 12.238 20.878 8.64 10.639 20.429 9.79 14.692 24.572 9.88 12.130 22.158 10.028 Q3 12.944 23.894 10.95 9.401 20.762 11.361 9.564 21.214 11.65 14.480 26.282 11.802 18.200 35.255 17.055		16.929	20.330	3.401	Q1
11.344 17.425 6.081 18.495 25.139 6.644 8.630 15.687 7.057 12.079 19.278 7.199 Q2 14.669 22.803 8.134 8.987 17.394 8.407 12.238 20.878 8.64 10.639 20.429 9.79 14.692 24.572 9.88 12.130 22.158 10.028 Q3 12.944 23.894 10.95 9.401 20.762 11.361 9.564 21.214 11.65 14.480 26.282 11.802 18.200 35.255 17.055		14.233	17.960	3.727	
18.495 25.139 6.644 8.630 15.687 7.057 12.079 19.278 7.199 Q2 14.669 22.803 8.134 8.987 17.394 8.407 12.238 20.878 8.64 10.639 20.429 9.79 14.692 24.572 9.88 12.130 22.158 10.028 Q3 12.944 23.894 10.95 9.401 20.762 11.361 9.564 21.214 11.65 14.480 26.282 11.802 18.200 35.255 17.055		16.004	21.157	5.153	
8.630 15.687 7.057 12.079 19.278 7.199 Q2 14.669 22.803 8.134 8.987 17.394 8.407 12.238 20.878 8.64 10.639 20.429 9.79 14.692 24.572 9.88 12.130 22.158 10.028 Q3 12.944 23.894 10.95 9.401 20.762 11.361 9.564 21.214 11.65 14.480 26.282 11.802 18.200 35.255 17.055		11.344	17.425	6.081	
12.079 19.278 7.199 Q2 14.669 22.803 8.134 8.987 17.394 8.407 12.238 20.878 8.64 10.639 20.429 9.79 14.692 24.572 9.88 12.130 22.158 10.028 Q3 12.944 23.894 10.95 9.401 20.762 11.361 9.564 21.214 11.65 14.480 26.282 11.802 18.200 35.255 17.055		18.495	25.139	6.644	
14.669 22.803 8.134 8.987 17.394 8.407 12.238 20.878 8.64 10.639 20.429 9.79 14.692 24.572 9.88 12.130 22.158 10.028 Q3 12.944 23.894 10.95 9.401 20.762 11.361 9.564 21.214 11.65 14.480 26.282 11.802 18.200 35.255 17.055		8.630	15.687	7.057	
8.987 17.394 8.407 12.238 20.878 8.64 10.639 20.429 9.79 14.692 24.572 9.88 12.130 22.158 10.028 Q3 12.944 23.894 10.95 9.401 20.762 11.361 9.564 21.214 11.65 14.480 26.282 11.802 18.200 35.255 17.055		12.079	19.278	7.199	Q2
12.238 20.878 8.64 10.639 20.429 9.79 14.692 24.572 9.88 12.130 22.158 10.028 Q3 12.944 23.894 10.95 9.401 20.762 11.361 9.564 21.214 11.65 14.480 26.282 11.802 18.200 35.255 17.055		14.669	22.803	8.134	
10.639 20.429 9.79 14.692 24.572 9.88 12.130 22.158 10.028 Q3 12.944 23.894 10.95 9.401 20.762 11.361 9.564 21.214 11.65 14.480 26.282 11.802 18.200 35.255 17.055		8.987	17.394	8.407	
14.692 24.572 9.88 12.130 22.158 10.028 Q3 12.944 23.894 10.95 9.401 20.762 11.361 9.564 21.214 11.65 14.480 26.282 11.802 18.200 35.255 17.055		12.238	20.878	8.64	
12.130 22.158 10.028 Q3 12.944 23.894 10.95 9.401 20.762 11.361 9.564 21.214 11.65 14.480 26.282 11.802 18.200 35.255 17.055		10.639	20.429	9.79	
12.944 23.894 10.95 9.401 20.762 11.361 9.564 21.214 11.65 14.480 26.282 11.802 18.200 35.255 17.055		14.692	24.572	9.88	
9.401 20.762 11.361 9.564 21.214 11.65 14.480 26.282 11.802 18.200 35.255 17.055		12.130	22.158	10.028	Q3
9.564 21.214 11.65 14.480 26.282 11.802 18.200 35.255 17.055		12.944	23.894	10.95	
14.480 26.282 11.802 18.200 35.255 17.055		9.401	20.762	11.361	
18.200 35.255 17.055		9.564	21.214	11.65	
		14.480	26.282	11.802	
12.369 34.288 21.919		18.200	35.255	17.055	
		12.369	34.288	21.919	

4: 直方图,找不到工具只能手画了。。。,横坐标: 样本差值,纵坐标: 在区间内的个数。组距: 5



5.

总体个数n: 24 自由度df: 23

相依样本ab的差值平均值:7.96 相依样本ab的标准误差为: 4.76

t=8.19

t检验在α<0.05,样本自由度为23时t的临界区为1.714

t>1.714,所以拒绝零假设,与期望一致。因此我们可以认为在文字条件不一致的情况下,会增加任务的完成时间。实际意义:在又干扰的情况下,人们区分同样事物的时间会变长。