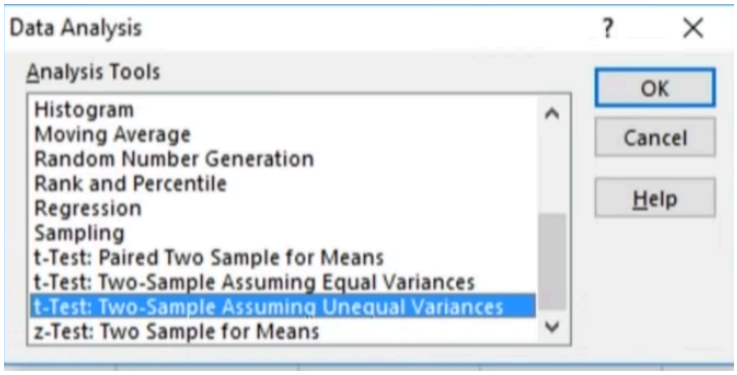
https://www.youtube.com/watch?v=fl9V0U2SGeI

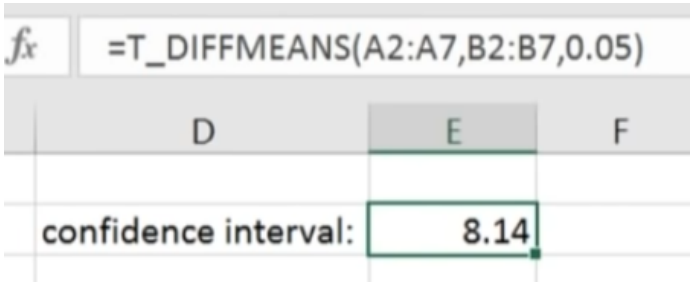
T MEAN STATISTICS TEST:

In Excel, select two columns, and go to the Data menu -> Data analysis -> T-test, choose the threshold in the alpha (if doubts, insert 0.05).



Use the Two Tail value.

What we care about in this statistic is the difference of means. Use T_DIFFMEANS() macro.



What if the interval straddles 0?

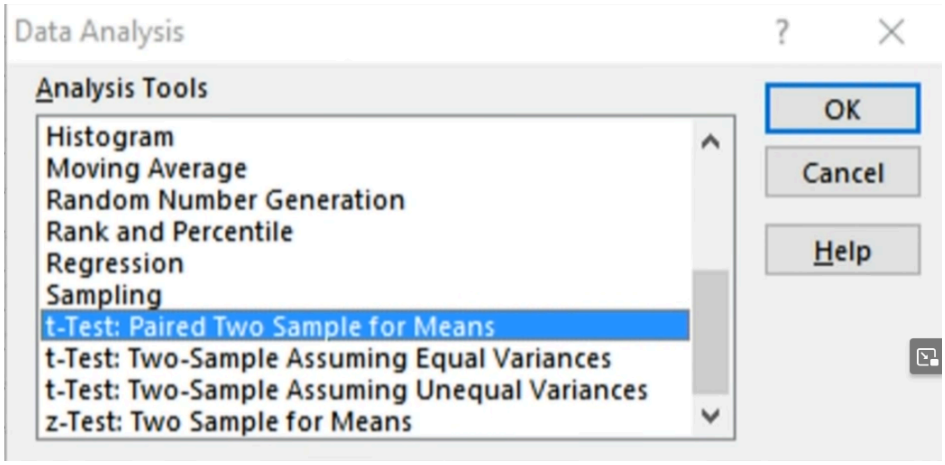
- "Improved by five minutes, ± ten":
  - "We're 95% sure we either made things better, worse, or the same."
- Confidence interval straddling 0 means the difference is *not significant*
  - (with the sample size you have, anyway)

When to use a t-test?

- *Continuous* outcomes – things you can measure with a float
- Normal-ish populations

PAIRED STATISTICS TEST:

Example: difficulty



player	Hours played, version E	Hours played, version H	difference (hard - easy)
a	2.63	1.72	-0.91
b	3.03	2.65	-0.38
c	1.18	0.98	-0.20
d	4.54	4.97	0.43
e	2.51	1.36	-1.15
f	2.82	2.20	-0.62
g	3.09	2.91	-0.19
h	2.66	2.91	0.25
i	2.63	2.97	0.34
j	3.48	2.91	-0.57
k	3.59	3.93	0.34
l	4.28	4.28	0.00
m	2.95	2.43	-0.52
n	2.19	2.19	0.01
o	2.52	2.67	0.15

p-value =T.TEST(B2:B51,C2:C51,2,1)

0.009

mean difference =AVERAGE(D2:D51)

-0.18

"People play the *hard* version about 11 minutes *less* per week. ($p < 0.01$)"

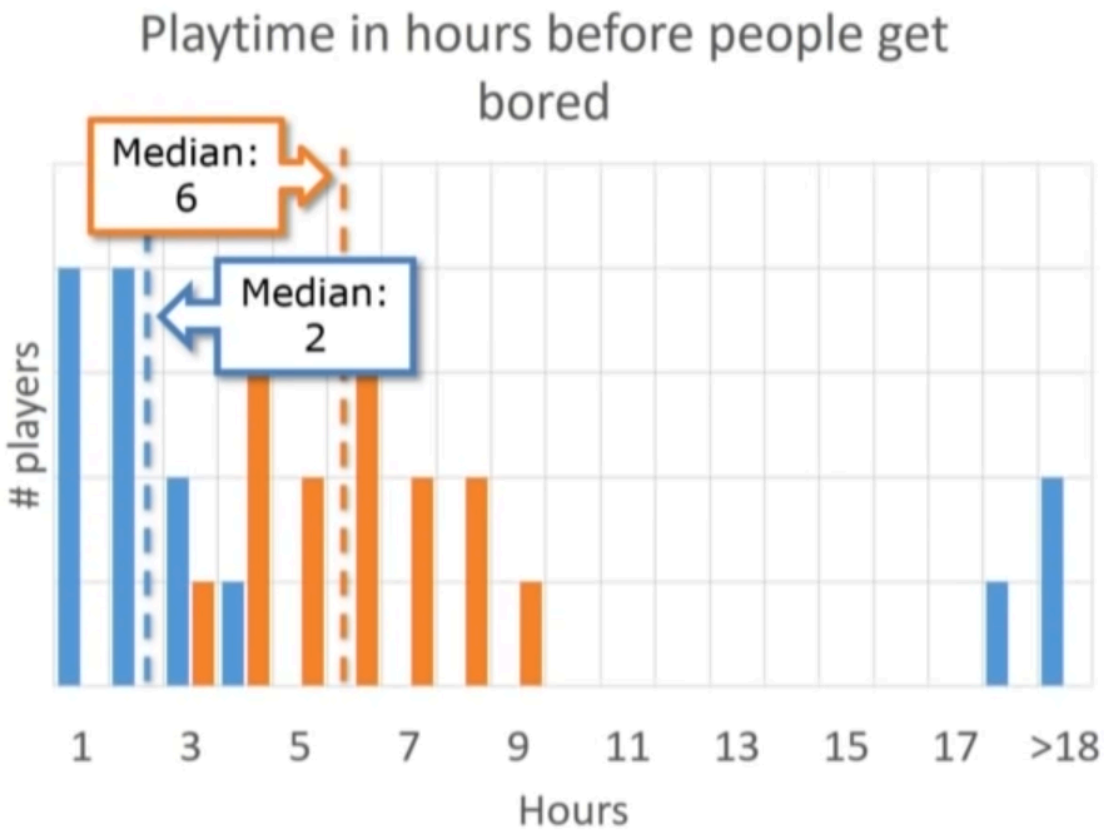
Do two groups (control and experimental)
Do hypothesis (ex. players with a dress coupon will buy more pants)

- Relative risk
  (*aka* "risk ratio")
  - "People who smoke are 4x more likely to be on fire than non-smokers"
- Two-sample z-test
  (*aka* "difference of proportions")
  - "Market share rose 5%, from 20% to 25%."

	95% confidence interval		
relative risk	low	high	p
2.375	1.071	5.268	0.029

macros:
=RRISK()
=RRISK_CONF_LO()
=RRISK_CONF_HI()

MANN-WHITNEY U STATISTICS TEST:



Mann-Whitney in Excel

blue

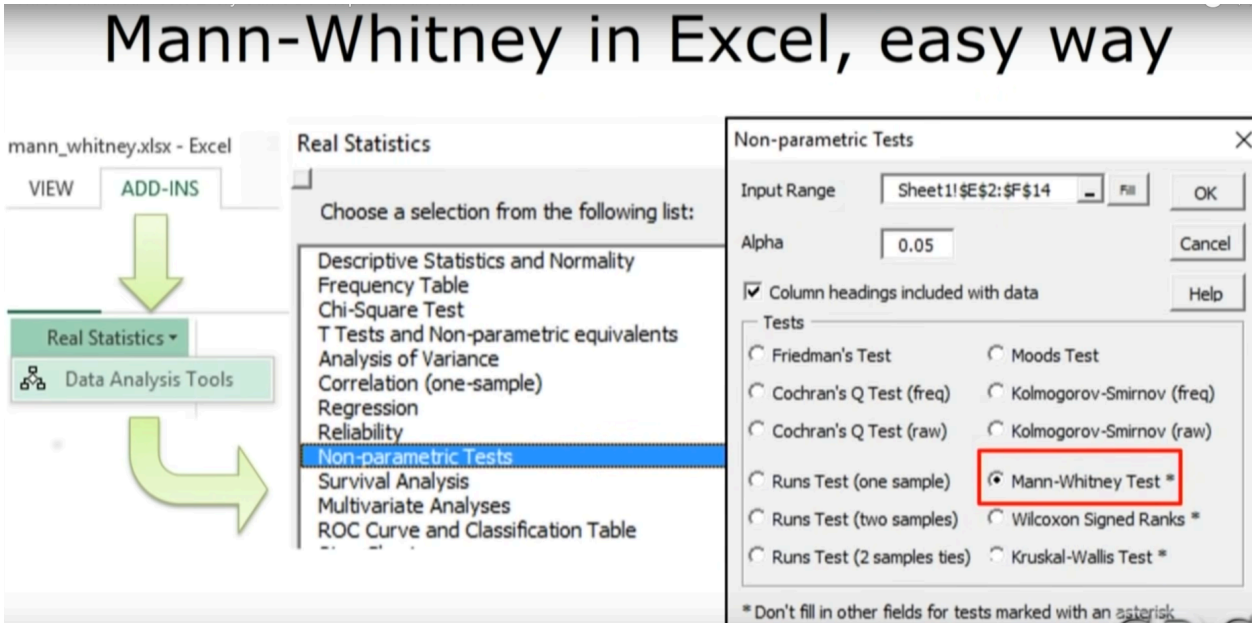
player	hours
a	1
b	1
c	1
d	1
e	2
f	2
g	2
h	2
i	3
j	3
k	4
l	18
dad	24
mom	21

orange

player	hours
m	3
n	3
o	4
p	4
q	5
r	5
s	6
t	6
u	6
v	7
w	7
x	8
y	8
z	9

ranked with =RANK.AVG()

blue	orange
2.5	10.5
2.5	10.5
2.5	14
2.5	14
6.5	16.5
6.5	16.5
6.5	19
6.5	19
10.5	19
10.5	21.5
14	21.5
26	23.5
27	25.5



→COMPARE P VALUES

THINGS TO AVOID

- Brand-type correlations (ex. xbox vs play)
- Avoid a lot of statistics
- Correlations NEED to have sense