Single sample *t* tests

For each problem:

Identify whether an independent variable is present.

Write out your H0 and HA.

Do your statistical test.

What do you conclude about your Null Hypothesis? (Use α = .05)

What does this conclusion mean about why your sample and population means are different?

What error might you be making with this conclusion?

Describe what this error means.

Approximately how often will this error happen?

1. You have 10 kids with attention problems. Their average attention span is 32 with a standard deviation of 3.2. Can you consider them randomly drawn from a (normally distributed) population of kids with a mean attention span of 34?

2. Mice are naturally cautious about new things, with a (normally distributed) population mean of 20 on the scale for cautiousness. You take a sample of 23 mice and give them lots of exposure to new toys when they are young to see what effect this has on them as adults. Your sample when they grow up has a cautiousness score of 17.5 (with a standard deviation of 4.7).

3. Your new job-training program is supposed to give applicants more confidence during interviews. The population mean confidence is 48. Your sample of 36 applicants after your program have a mean confidence level of 49.5 with a standard deviation of 5.

Answers:

1. No IV

H0 = Sample was randomly selected.

HA = Sample was not randomly chosen.

*t* = 1.98; probability for a 2 tailed test with 9 df = 7.91

Retain H0.

Probably because of coincidence.

Type 2; the could have been chosen randomly all along.

Up to 95%

2. IV

H0 = Extra toys during development has no effect on cautiousness (Sample is still from the H0 pop).

HA = Extra toys during development affects cautiousness.

*t* = -2.55; probability for a 2 tailed test with 22 df = 1.79

Reject H0.

Probably because of the extra toys.

Type 1; the difference could still be due to chance.

1.79%

3. IV

H0 = Job training program has no effect (Sample still belongs in the null population).

HA = Job training program increases confidence.

*t* = 1.80; probability for a 1 tailed test with 35 df = 4.02

Reject H0.

Probably because job training program.

Type 1; the increase in confidence could have been random differences

4.02%