

Confidence intervals and two-sample t-tests

STAT 615 (Baron)

```
DATA C;
INFILE pulse;
INPUT ROW PULSE1 PULSE2 RAN SMOKES SEX HEIGHT WEIGHT ACTIVITY;
DIFF = PULSE2-PULSE1;
```

```
PROC TTEST DATA=C;
CLASS SEX;
VAR DIFF;
```

} Does the difference in pulses depend
on gender?

} on smoking?

```
PROC TTEST DATA=C;
CLASS SMOKES;
VAR DIFF;
```

```
RUN;
```

The TTEST Procedure

Statistics

Variable	SEX	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err	Minimum	Maximum
DIFF		1	57	2.6454	5.4561	8.2669	8.9434	10.593	1.4031	-8	42
DIFF		2	35	4.0221	9.8571	15.692	13.74	16.986	2.8712	-14	48
DIFF	Diff (1-2)			-10.11	-4.401	1.3041	11.672	13.373	15.658	2.8717	

T-Tests

Variable	Method	Variances	DF	t Value	Pr > t
DIFF	Pooled	Equal	90	-1.53	0.1289
DIFF	Satterthwaite	Unequal	50.4	-1.38	0.1745

} Two tests
for $H_0: \mu_1 = \mu_2$
vs $H_A: \mu_1 \neq \mu_2$

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
DIFF	Folded F	34	56	2.57	0.0017

} Test for
 $H_0: \sigma_1 = \sigma_2$
vs $H_A: \sigma_1 \neq \sigma_2$

The TTEST Procedure

Statistics

Variable	SMOKES	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err	Minimum	Maximum
DIFF		1	28	1.817	6.1786	10.54	8.8931	11.248	15.31	2.1257	-14
DIFF		2	64	3.9501	7.5469	11.144	12.265	14.399	17.439	1.7999	36
DIFF	Diff (1-2)			-7.459	-1.368	4.7226	11.81	13.531	15.843	3.0659	48

T-Tests

Variable	Method	Variances	DF	t Value	Pr > t
DIFF	Pooled	Equal	90	-0.45	0.6565
DIFF	Satterthwaite	Unequal	65.2	-0.49	0.6249

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
DIFF	Folded F	63	27	1.64	0.1579