

T₂. H₀: 两组认知无区别. 即 $\mu_1 = \mu_2$

H₁: 两组认识有区别. 即 $\mu_1 > \mu_2$

$$\bar{X}_1 = 5.1 \quad \bar{X}_2 = 2.95 \quad F = \frac{S_1^2}{S_2^2} = \frac{SS_1}{SS_2} = \frac{49.8}{38.95} \doteq 1.28$$

$$SS_1 = 570 - 520.2 = 49.8$$

$$SS_2 = 213 - 174.05 = 38.95$$

$$S_p^2 = \frac{SS_1 + SS_2}{df_1 + df_2} = \frac{49.8 + 38.95}{19 + 19} \doteq 2.34$$

$$S_{\bar{X}_1 - \bar{X}_2} = \sqrt{\frac{S_p^2}{n_1} + \frac{S_p^2}{n_2}} \doteq 0.48 \quad t = \frac{\bar{X}_1 - \bar{X}_2}{S_{\bar{X}_1 - \bar{X}_2}} \doteq 4.48$$

$$t_{crit} = 2.429 \quad \because t > t_{crit}.$$

\(\therefore\) 拒绝 H₀. 认为数据支持该预测.

T₃. H₀: $\mu_1 = \mu_2$

H₁: $\mu_1 \neq \mu_2$

$$\bar{X}_1 \doteq 7.07 \quad \bar{X}_2 \doteq 3.14 \quad F = \frac{S_1^2}{S_2^2} = \frac{SS_1}{SS_2} \doteq 1.33$$

$$SS_1 \doteq 36.93 \quad SS_2 \doteq 27.71$$

$$S_p^2 = \frac{SS_1 + SS_2}{df_1 + df_2} = \frac{36.93 + 27.71}{13 + 13} \doteq 2.49$$

$$S_{\bar{X}_1 - \bar{X}_2} = \sqrt{\frac{S_p^2}{n_1} + \frac{S_p^2}{n_2}} \doteq 0.25 \quad t = \frac{\bar{X}_1 - \bar{X}_2}{S_{\bar{X}_1 - \bar{X}_2}} = 15.72$$

$$t_{crit} = 2.056 \quad \because t > t_{crit}$$

\(\therefore\) 拒绝 H₀. 认为有显著差异

T4.

| 被试对 | 锻炼2小时组 | 锻炼5小时组 |
|-----|--------|--------|
| A | 15 | 18 |
| B | 12 | 14 |
| C | 16 | 12 |
| D | 9 | 11 |
| E | 13 | 14 |
| F | 16 | 16 |
| G | 17 | 16 |

D

 $H_0 = \text{无差异}$ $H_1 = \text{有差异}$

-3

-2

4

-2

-1

0

1

$$\bar{D} = -0.43$$

$$SS_D = \sum D^2 - \frac{(\sum D)^2}{N} \doteq 33.71$$

$$S_D^2 = \frac{SS_D}{6} \doteq 5.62 \quad S_{\bar{D}} = \sqrt{\frac{S_D^2}{n}} \doteq 0.90$$

$$t = \frac{\bar{D} - \mu_D}{S_{\bar{D}}} = \frac{-0.43}{0.9} \doteq -0.48$$

$$t_{crit} = 2.447$$

|t| < t_{crit}. 接受 H_0 .

$$(\alpha = 0.05)$$

T5. $H_0 = \text{无显著影响}$. $H_1 = \text{有显著影响}$.

$$SS_D = \sum D^2 - \frac{(\sum D)^2}{n}$$

$$\doteq 51.43$$

$$S_D^2 = \frac{SS_D}{6} \doteq 8.57$$

$$S_{\bar{D}} = \sqrt{\frac{S_D^2}{n}} \doteq 1.1$$

$$t = \frac{2.29}{1.1} \doteq 2.08$$

| 被试 | 前测 | 后测 |
|----|----|----|
| A | 31 | 30 |
| B | 34 | 31 |
| C | 29 | 29 |
| D | 33 | 29 |
| E | 35 | 32 |
| F | 32 | 34 |
| G | 35 | 28 |

D

1

3

0

4

3

-2

7

$$\bar{D} \doteq 2.29$$

$$t_{crit} = 2.447$$

t < t_{crit}. 接受 H_0 .

T₆ (a) H₀ = 无显著差异

H₁: 有显著差异

$$F = \frac{S_2^2}{S_1^2} = \frac{SS_2}{SS_1} = \frac{150}{134} \approx 1.12$$

$$S_p^2 = \frac{SS_1 + SS_2}{df_1 + df_2} = \frac{134 + 150}{4 + 4} = 35.5$$

$$S_{\bar{x}_1 - \bar{x}_2} = \sqrt{\frac{S_p^2}{n_1} + \frac{S_p^2}{n_2}} = \sqrt{\frac{35.5}{5} + \frac{35.5}{5}} \approx 3.77$$

$$t = \frac{\bar{x}_1 - \bar{x}_2}{S_{\bar{x}_1 - \bar{x}_2}} = \frac{-2}{3.77} \approx -0.53$$

$$t_{crit} = 2.306 \quad |t| < t_{crit}$$

∴ 接受 H₀. 认为无显著差异.

(b) H₀: 无显著差异 H₁: 有显著差异

$$S_D^2 = \frac{SS_D}{n-1} = \frac{4}{4} = 1 \quad S_D = \sqrt{\frac{S_D^2}{n}} = \sqrt{\frac{1}{5}} \approx 0.45$$

$$t = \frac{\bar{D} - \mu_0}{S_D} = \frac{2}{0.45} \approx 4.44$$

$$t_{crit} = 2.776 \quad t > t_{crit}$$

∴ 拒绝 H₀. 认为有显著差异.

(c) 重复指标设计的实验属于相关样本设计, 消除了因样本不同引起的误差, 能更准确地进行检验, 因此检验到有显著差异