HOJA N°

FECHA

TALLER GAUSSEY

TP ESTADÍSTICA

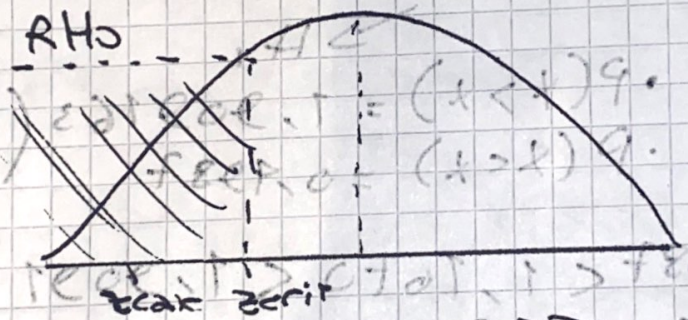
1) $N = 236$ $\alpha = 0,05$

HOMBRES	MUJERES
$\sigma_H = 8$	$\sigma = 10$
$n = 149$	$n = 87$
$\bar{x} = 49,3624$	$\bar{x} = 55,1436$

TDH: MUESTRA independiente → se conoce σ → caso 1

$\mu_H < \mu_M \rightarrow H_1 \rightarrow$ se acepta

$\mu_H \geq \mu_M \rightarrow H_0 \rightarrow$ no se acepta



$z_{crítico} = -1,64 \rightarrow$ APP

$$z_{calc} = \frac{(49,3624 - 55,1436)}{\sqrt{\frac{8^2}{149} + \frac{10^2}{87}}} = -4,6007$$

$z_{calc} < z_{crítico}$

es posible aceptar la hipótesis ya que z_{calc} es menor al $z_{crítico}$ por lo que rechaza H_0

NOTA

2) Hombres 20-30

$n = 30$

$\bar{x} = 8$

$S^2 = 20,7586$

Hombres 30-40

$n = 46$

$\bar{x} = 8,1087$

$S^2 = 17,7879$

muestra independiente → no se conoce σ → test F

$$F_{calc} = \frac{20,7586}{17,7879} = 1,1670$$

TDH CASO F:

$\mu_{20-30} = \mu_{30-40}$ → CASO 2 → H0

$\mu_{20-30} \neq \mu_{30-40}$ → CASO 3 → H1

$F_{crítico} = \cdot P(x > x) = 1,909163$ (se resta a)

$\cdot P(x < x) = 0,4987$

$0,4987 < 1,1670 \leq 1,9091$

f_{crit} f_{calc} f_{crit}

NO RHO → ES CASO 2

TDH CASO 2:

H0 → $\mu_{20-30} \geq \mu_{30-40}$ → no es posible

H1 → $\mu_{20-30} < \mu_{30-40}$ → es posible

$t_{crítico} = -1,993$ → WEB

$t_{calc} = -0,10639$ → WEB → NO RHO

Como t_{calc} es mayor a $t_{crítico}$ no es posible aceptar la hipótesis de si μ_{20-30} entrega menos que μ_{30-40}

Statistical Inference for $\mu_1 - \mu_2$

$n_1 =$	39	$\bar{x}_1 =$	54.5513	$s_1 =$	5.9291
$n_2 =$	48	$\bar{x}_2 =$	55.625	$s_2 =$	8.4661

95% CI for $\mu_1 - \mu_2$:

$$\bar{x}_1 - \bar{x}_2 \pm t_{\alpha/2,n_1+n_2-2}(s_p)\sqrt{\frac{1}{n_1}+\frac{1}{n_2}} = 54.5513 - 55.625 \pm 1.988(7.4396)\sqrt{\frac{1}{39}+\frac{1}{48}}$$
$$= -1.07370 \pm 3.18884$$
$$= (-4.26254, 2.11514)$$

$$s_p = \sqrt{\frac{(n_1-1)s_1^2 + (n_2-1)s_2^2}{n_1+n_2-2}} = \sqrt{\frac{(39-1)5.9291^2 + (48-1)8.4661^2}{39+48-2}} = 7.4396$$

$H_0 : \mu_1 - \mu_2$ = 0

$H_a : \mu_1 - \mu_2$ ≠ 0

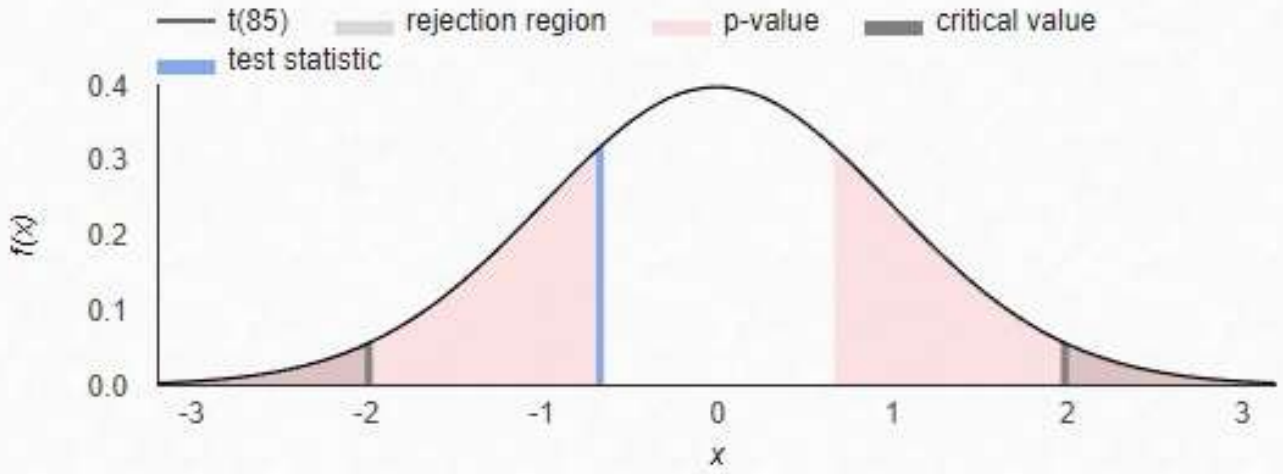
Significance level: $\alpha =$ 0.05

Critical value: $\pm t_{\alpha/2,n_1+n_2-2} = \pm t_{0.025,85} = \pm 1.988$

Test statistic:

$$t^* = \frac{(\bar{x}_1 - \bar{x}_2) - (\Delta_0)}{s_p\sqrt{\frac{1}{n_1}+\frac{1}{n_2}}} = \frac{(54.5513 - 55.625) - (0)}{7.4396\sqrt{\frac{1}{39}+\frac{1}{48}}} = -0.669$$

p-value: $2P(t_{(n_1+n_2-2)} > |t^*|) = 2P(t_{(85)} > 0.669) = 0.50502$



Show equations ☑

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HOJA Nº

FECHA

TRABAJO GRUPAL

3)

$n_1 > 40$ | $n_2 < 40$

$n_1 = 32$ | $n_2 = 48$

$\bar{x}_1 = 54,5513$ | $\bar{x}_2 = 55,625$

$s_1^2 = 35,1552$ | $s_2^2 = 71,6755$

muestra independiente → no se conoce σ → TEST F

$$F_{calc} = \frac{35,1552}{71,6755} = 0,490477$$

TDH CASO F:

$N_{>40} = N_{<40}$ → CASO 2 → H_0

$N_{>40} \neq N_{<40}$ → CASO 3 → H_1

$F_{crítico} = P(x \geq x) = 1,827583$ (se repite α)

$P(x < x) = 0,536291$

$0,490477 < 0,536291 < 1,827583$

$F_{calc} \quad F_{crit} \quad F_{crit}$

ES CASO 3 ← RHO

Como T_{calc} es menor a $T_{crítico}$ no se rechaza H_0 no se puede probar si $n > 40$ tendrán más tiempo que $n < 40$

TDH CASO 3:

$H_0 \rightarrow N_{>40} \leq N_{<40}$

$H_1 \rightarrow N_{>40} > N_{<40}$

$T_{crítico} = 1,988 \rightarrow$ WEB

$T_{calc} = -0,669 \rightarrow$ WEB → NO RHO

NOTA

Statistical Inference for $\mu_1 - \mu_2$

$n_1 =$ 39 $\bar{x}_1 =$ 54.5513 $s_1 =$ 5.9291

$n_2 =$ 48 $\bar{x}_2 =$ 55.625 $s_2 =$ 8.4661

95% CI for $\mu_1 - \mu_2$:

$$\bar{x}_1 - \bar{x}_2 \pm t_{\alpha/2,n_1+n_2-2}(s_p)\sqrt{\frac{1}{n_1}+\frac{1}{n_2}} = 54.5513 - 55.625 \pm 1.988(7.4396)\sqrt{\frac{1}{39}+\frac{1}{48}}$$
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$H_0 : \mu_1 - \mu_2$ = 0

$H_a : \mu_1 - \mu_2$ ≠ 0

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$$t^* = \frac{(\bar{x}_1 - \bar{x}_2) - (\Delta_0)}{s_p\sqrt{\frac{1}{n_1}+\frac{1}{n_2}}} = \frac{(54.5513 - 55.625) - (0)}{7.4396\sqrt{\frac{1}{39}+\frac{1}{48}}} = -0.669$$

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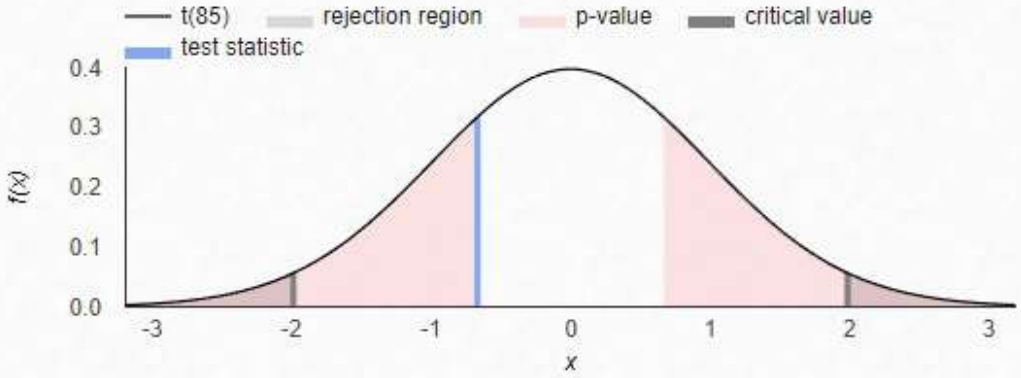

Show equations

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4) GRUPO 1 $n = 8$ $\alpha = 0{,}05$
GRUPO 2 $n = 8$

individuo	1	2	3	4	5	6	7	8
tiempo antes	53	48	64	45	61	57	54	46
tiempo después	50	43	47	43	53	52	49	41
$\overline{D}$	3	5	17	2	3	5	5	5

→ muestra independiente → CASO 4

$\overline{D} = 5{,}625$

$S_{\overline{D}} = 4{,}7490$

$$t_{calc} = \frac{5{,}625}{\frac{4{,}7490}{\sqrt{8}}} = 3{,}3502$$

TDH:

$\mu_1 \leq \mu_2 \rightarrow H_0 \rightarrow$ NO promocionar método

$\mu_1 > \mu_2 \rightarrow H_1 \rightarrow$ promocionar método

$t_{crítico} = 1{,}8945 \rightarrow$ APP

$t_{calc} > t_{crítico} \rightarrow RH_0$

como t_{calc} es mayor a $t_{crítico}$ y se rechaza H_0 se acepta promocionar el nuevo método