

PSYCHOMETRICS, PARTIAL 2  
TYPE B

④  $r_1 = s_j \cdot r_{xj} = 0.26 \cdot 0.31 = 0.08$

⑤  $\alpha = \frac{n}{n-1} \left( 1 - \frac{\sum S_j^2}{S_x^2} \right) = \frac{3}{3-1} \left( 1 - \frac{(10+10+8)}{30} \right) = 1.5 \left( 1 - \frac{28}{30} \right) = 1.5 \cdot 0.07 = 0.11$

number of subtests (elements)

$n_E = 15$   
 $n_{ES} = 25$   
 $n_A = 15$   
 $S_x^2 = 30$   
 $S_E^2 = 10$   
 $S_{ES}^2 = 10$   
 $S_A^2 = 8$

⑥  $\beta = \frac{S_x^2 - \sum S_j^2}{S_x^2 \left[ 1 - \sum \left( \frac{n_j}{n} \right)^2 \right]} = \frac{30 - (10+10+8)}{30 \left[ 1 - \left[ \left( \frac{15}{55} \right)^2 + \left( \frac{25}{55} \right)^2 + \left( \frac{15}{55} \right)^2 \right] \right]} =$

$n = 15 + 25 + 15 = 55$

$= \frac{30 - 28}{30 \left[ 1 - [0.07 + 0.2 + 0.07] \right]} = \frac{2}{30 \cdot 0.66} =$

$= \frac{2}{19.8} = 0.1$

⑧  $r_{ex} = 0.3$   
 $S_x^2 = 49$   
 $X = 12$   
 $S_x = \sqrt{49} = 7$

CL = 90% -  $z_c = 1.64$

Lim =  $X \pm E_{max} = 12 \pm 3.44 < \begin{matrix} 15.44 \\ 8.56 \end{matrix}$

$E_{max} = z_c \cdot S_e = 1.64 \cdot 2.1 = 3.44$

$S_e = S_x \sqrt{1 - r_{xx'}} = 7 \sqrt{1 - 0.91} = 7 \sqrt{0.09} = 7 \cdot 0.3 = 2.1$

$r_{xx'} = 1 - r_{xe}^2 = 1 - 0.3^2 = 1 - 0.09 = 0.91$

⑨  $\alpha = 0.01 \rightarrow CL = 99\% \rightarrow z_c = 2.58$

Lim =  $X \pm E_{max} = 12 \pm 21 < \begin{matrix} 33 \\ -9 \end{matrix}$

$E_{max} = S_e \cdot k = 2.1 \cdot 10 = 21$

$k = \sqrt{\frac{1}{0.01}} = \sqrt{100} = 10$

⑩  $\bar{X} = 10$   
CL 95% -  $z_c = 1.96$

Lim =  $T' \pm E_{max} = 11.82 \pm 3.92 < \begin{matrix} 15.74 \\ 7.9 \end{matrix}$

$T' = r_{xx'} (X - \bar{X}) + \bar{X} = 0.91 \cdot (12 - 10) + 10 = 0.91 \cdot 2 + 10 = 1.82 + 10 = 11.82$

$E_{max} = z_c \cdot S_{TX} = 1.96 \cdot 2 = 3.92$

$S_{TX} = S_e \sqrt{r_{xx'}} = 2.1 \sqrt{0.91} = 2.1 \cdot 0.95 = 2$