



$$\begin{aligned}
 r_{Y1}^2 &= a + c \\
 r_{Y2}^2 &= b + c \\
 R_{Y12}^2 &= a + b + c \\
 (3.3.7) \quad sr_1^2 &= r_{Y(1\cdot2)}^2 = R_{Y12}^2 - r_{Y2}^2 = a, \\
 sr_2^2 &= r_{Y(2\cdot1)}^2 = R_{Y12}^2 - r_{Y1}^2 = b, \\
 (3.3.10) \quad pr_1^2 &= r_{Y1\cdot2}^2 = \frac{R_{Y12}^2 - r_{Y2}^2}{1 - r_{Y2}^2} = \frac{a}{a + e}, \\
 pr_2^2 &= r_{Y2\cdot1}^2 = \frac{R_{Y12}^2 - r_{Y1}^2}{1 - r_{Y1}^2} = \frac{b}{b + e}.
 \end{aligned}$$

FIGURE 3.3.1 The Ballantine for X_1 and X_2 .

A formula for sr for the two IV case may be given as a function of zero-order r 's as

$$\begin{aligned}
 (3.3.8) \quad sr_1 &= \frac{r_{Y1} - r_{Y2}r_{12}}{\sqrt{1 - r_{12}^2}}, \\
 sr_2 &= \frac{r_{Y2} - r_{Y1}r_{12}}{\sqrt{1 - r_{12}^2}}.
 \end{aligned}$$

For our running example (Table 3.2.1), these values are

$$\begin{aligned}
 sr_1 &= \frac{.618 - .461(.683)}{\sqrt{1 - .683^2}} = .416, \\
 sr_1^2 &= .1730,
 \end{aligned}$$