Additional file 1 – Equalities (2) and (3)

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Derivation of equalities (2) and (3).

When defining the boundaries of a given probability interval we require that the differences of all expression values are within a constant number of standard deviations, i.e. for any values Y_1 and Y_2 we have a condition

$$-K_\alpha SD < Y_2 - Y_1 < K_\alpha SD\,. \tag{A1}$$

Using the condition (A1) we can express the upper limit of Y_2 in terms of Y_1 as

$$Y_U = K_\alpha SD + Y_1\,. \tag{A2}$$

Substituting for SD the expression

$$SD = a_1 + a_2 \frac{Y_1 + Y_2}{2} \tag{A3}$$

we obtain

$$Y_U = K_\alpha a_1 + Y_1 + \frac{K_\alpha}{2} a_2 (Y_1 + Y_{2U}) \tag{A4}$$

and subsequently

$$Y_U = \frac{Y_1 + K_\alpha (a_1 + a_2 Y_1 / 2)}{1 - K_\alpha a_2 / 2}\,. \tag{A5}$$

Similarly for the lower limit we write

$$Y_L = K_\alpha SD + Y_1 \tag{A6}$$

and, finally,

$$Y_L = \frac{Y_1 - K_\alpha (a_1 + a_2 Y_1 / 2)}{1 + K_\alpha a_2 / 2}\,. \tag{A7}$$