Weighted Mean

Multiplying the weight of a particular event or outcome with its associated quantitative outcome and then summing all the products

Finding the Overall Mean for Two Separate Groups

The Weighted Mean

Finding the Overall Mean for Two Separate Groups

Weighted Mean Formula

$$\text{Weighted Mean} = \frac{(Mean\ Group\ 1)(N_1)+(Mean\ Group\ 2)(N_2)}{N_1+N_2}$$

N_1 = size of first group

N_2 = size of second group

Weighted Mean Formula: Unequal group sizes

$N_1 = 10$; mean group 1 = 90
$N_2 = 30$; mean group 2 = 110

$$\text{Weighted Mean} = \frac{(Mean\ Group\ 1)(N_1)+(Mean\ Group\ 2)(N_2)}{N_1+N_2}$$

$$\text{Weighted Mean} = \frac{(90)(10)+(110)(30)}{10+30} = \frac{900+3300}{10+30} = \frac{4200}{40}$$

$$\text{Weighted Mean} = 105$$

(Closer to mean of 110 than mean of 90: larger group size, greater influence.)

Weighted Mean Formula: Unequal group sizes

$N_1 = 30$; mean group 1 = 90
$N_2 = 10$; mean group 2 = 110

$$\text{Weighted Mean} = \frac{(Mean\ Group\ 1)(N_1)+(Mean\ Group\ 2)(N_2)}{N_1+N_2}$$

$$\text{Weighted Mean} = \frac{(90)(30)+(110)(10)}{30+10} = \frac{2700+1100}{30+10} = \frac{3800}{40}$$

$$\text{Weighted Mean} = 95$$

(Closer to mean of 90 than mean of 110: larger group size, greater influence.)

Weighted Mean

Summary of results:

Equal group sizes: $N_1 = 20$; mean group 1 = 90; $N_2 = 20$; mean group 2 = 110
Weighted mean = 100 (**exactly in the middle with equal *N***)

Unequal group sizes: $N_1 = 10$; mean group 1 = 90; $N_2 = 30$; mean group 2 = 110
Weighted mean = 105 (**closer to mean with larger *N***)

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Weighted mean = 95 (**closer to mean with larger *N***)

Weighted Mean

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Weighted mean = 95 (**closer to mean with larger *N***)

Weighted Mean

The weighted mean takes into account the size of each group. When group sizes are equal, the weighted mean is exactly in-between the two group means. When group sizes are unequal, the mean with the larger *N* has greater influence, pulling the overall (weighted) mean of the two groups closer to it.