

# Package ‘metapro’

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**Type** Package

**Title** Robust P-Value Combination Methods

**Version** 1.5.11

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**Description** The meta-analysis is performed to increase the statistical power by integrating the results from several experiments. The p-values are often combined in meta-analysis when the effect sizes are not available. The 'metapro' R package provides not only traditional methods (Becker BJ (1994, ISBN:0-87154-226-9), Mosteller, F. & Bush, R.R. (1954, ISBN:0201048523) and Lancaster HO (1949, ISSN:00063444)), but also new method named weighted Fisher's method we developed. While the (weighted) Z-method is suitable for finding features effective in most experiments, (weighted) Fisher's method is useful for detecting partially associated features. Thus, the users can choose the function based on their purpose. Yoon et al. (2021) "Powerful p-value combination methods to detect incomplete association" <doi:10.1038/s41598-021-86465-y>.

**License** GPL (>= 2)

**Encoding** UTF-8

**Imports** metap, stats

**RoxygenNote** 7.2.3

**Suggests** testthat (>= 3.0.0)

**Config/testthat/edition** 3

**NeedsCompilation** no

**Repository** CRAN

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F_i	<i>Beta probability</i>
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**Description**

Beta probability

**Usage**

F\_i(p, i, n)

**Arguments**

p	p-value
i	rank
n	The number of inputs

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lancaster	<i>Lancaster</i>
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**Description**

P-value combination based on Lancaster's procedure

**Usage**

lancaster(p, weight, is.onetail = TRUE, eff.sign)

**Arguments**

p	A numeric vector of p-values
weight	A numeric vector of weights (e.g., samples sizes)
is.onetail	Logical. If set TRUE, p-values are combined without considering the direction of effect, and vice versa. Default: TRUE.
eff.sign	A vector of signs of effect sizes (1 or -1). It works when is.onetail = FALSE

**Value**

p : Combined p-value  
 overall.eff.direction : The direction of combined effects.

**References**

Becker BJ (1994). "Combining significance levels." In Cooper H, Hedges LV (eds.), A handbook of research synthesis, 215–230. Russell Sage, New York.

Lancaster HO (1949). "Combination of probabilities arising from data in discrete distributions." Biometrika, 36, 370–382.

**Examples**

```
lancaster(p=c(0.01,0.2,0.8), weight=c(20,50,10), is.onetail=FALSE, eff.sign=c(1,1,1))
```

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wFisher

*wFisher*


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**Description**

sample size-weighted Fisher's method

**Usage**

```
wFisher(p, weight = NULL, is.onetail = TRUE, eff.sign)
```

**Arguments**

p	A numeric vector of p-values
weight	A numeric vector of weight or sample size for each experiment
is.onetail	Logical. If set TRUE, p-values are combined without considering the direction of effects, and vice versa. Default: TRUE.
eff.sign	A vector of signs of effect sizes. It works when is.onetail = FALSE

**Value**

p : Combined p-value

overall.eff.direction : The direction of combined effects.

**References**

Becker BJ (1994). "Combining significance levels." In Cooper H, Hedges LV (eds.), A handbook of research synthesis, 215–230. Russell Sage, New York.

Fisher RA (1925). Statistical methods for research workers. Oliver and Boyd, Edinburgh.

**Examples**

```
wFisher(p=c(0.01,0.2,0.8), weight = c(50,60,100),is.onetail=FALSE, eff.sign=c(1,1,1))
```

wZ

wZ

**Description**

P-value combination based on weighted Z-method

**Usage**

```
wZ(p, weight = NULL, is.onetail = TRUE, eff.sign)
```

**Arguments**

p	A numeric vector of p-values
weight	A numeric vector of weights (e.g., sample sizes)
is.onetail	Logical. If set TRUE, p-values are combined without considering the direction of effect, and vice versa. Default: TRUE.
eff.sign	A vector of signs of effect sizes. It works when is.onetail = FALSE

**Value**

p : Combined p-value  
 overall.eff.direction : The direction of combined effects.  
 sumz : Sum of transformed z-score

**References**

Becker BJ (1994). "Combining significance levels." In Cooper H, Hedges LV (eds.), A handbook of research synthesis, 215–230. Russell Sage, New York.

Stouffer SA, Suchman EA, DeVinney LC, Star SA, Williams RMJ (1949). The American soldier, vol 1: Adjustment during army life. Princeton University Press, Princeton.

Mosteller, F. & Bush, R.R. (1954). Selected quantitative techniques. In: Handbook of Social Psychology, Vol. 1 (G. Lindzey, ed.), pp. 289–334. Addison-Wesley, Cambridge, Mass.

**Examples**

```
wZ(p=c(0.01,0.2,0.8), weight = c(20,10,40), is.onetail=FALSE, eff.sign=c(1,-1,1))
```

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