Package ‘cofad’

Type Package
Title Contrast Analyses for Factorial Designs
Version 0.1.1
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Description Contrast analysis for factorial designs is an alternative to the classical ANOVA approach with the advantage of testing focused hypothesis. The method is mainly based on Rosenthal, Rosnow and Rubin (2000, ISBN:978-0521659802) and Sedlmeier and Renkewitz (2018, ISBN:978-3868943214).
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calc_contrast

Description

Calculate contrast analysis for factorial designs

Usage

calc_contrast(
  dv,
  between = NULL,
  lambda_between = NULL,
  within = NULL,
  lambda_within = NULL,
  ID = NULL,
  data = NULL
)

Arguments

dv dependent variable. Values must be numeric.
between independent variable that divides the data into independent groups. Vector must be a factor.
lambda_between contrast weights must be a named numeric. Names must match the levels of between. If lambda_between does not sum up to zero, this will be done automatically.
within independent variable which divides the data into dependent groups. This must be a factor.
lambda_within contrast must be a named numeric. Names must match the levels of between. If lambda_between does not sum up to zero, this will be done automatically.
ID identifier for cases or subjects is needed for within- and mixed contrast analysis.
data optional argument for the data.frame containing dv and groups.

Details

For multi-factorial designs, the lambda weights of the factors must be connected.

Value

Calculates the significance of the contrast analysis. given.

References

calc_contrast

Examples

# Example for between-subjects design Table 3.1 from
# Rosenthal, Rosnow and Rubin (2001)

`tab31 <- data.frame(`
```
  Val = c(2, 6, 8, 4, 10, 6, 8, 10, 4, 12, 8,
          16, 10, 14, 12, 12, 18, 14, 20, 16),
  Let = as.factor(rep(c("A", "B", "C", "D"), c(5, 5, 5, 5)))
```
`)

`contr_bw <- calc_contrast(`
```
  dv = Val,
  between = Let,
  lambda_between = c("A" = -3, "B" = -1, "C" = 1, "D" = 3),
  data = tab31)
```
`
`contr_bw
```
`summary(contr_bw)

# Example for within-subjects design Calculation 16.6 from
# Sedlmeier and Renkewitz (2018, p. 537)

`sedlmeier537 <- data.frame(`
```
  Var = c(27, 25, 30, 29, 30, 33, 31, 35,
          25, 26, 32, 29, 30, 32, 34,
          21, 25, 23, 26, 27, 26, 29, 31,
          23, 24, 24, 28, 24, 26, 27, 32),
  within = as.factor(rep(1:4, c(8, 8, 8, 8))),
  ID = as.factor(rep(1:8, 4))
```
`)

`contr_wi <- calc_contrast(`
```
  dv = Var,
  within = within,
  ID = ID,
  lambda_within = c("1" = 0.25, "2" = -.75, "3" = 1.25, "4" = -.75),
  data=sedlmeier537
```
`
`)contr_wi
```
`summary(contr_wi, ci=.90)

# Example for mixed-designs Table 5.3 from
# Rosenthal, Rosnow and Rubin (2001)

`tab53 <- data.frame(`
```
  Var = c(3, 1, 4, 4, 5, 5, 6, 5, 7, 2, 2, 5,
          5, 6, 7, 6, 6, 8, 3, 1, 5, 4, 5, 6,
          7, 6, 8, 3, 2, 5, 6, 6, 7, 8, 8, 9),
  bw = as.factor(rep(rep(LETTERS[1:3], c(3, 3, 3)), 4)),
  wi = as.factor(rep(1:4, c(9, 9, 9, 9))),
  ID = as.factor(rep(1:9, 4))
```
`)

`lambda_within <- c("1" = -3, "2" = -1, "3" = 1, "4" = 3)
```
`lambda_between <-c("A" = -1, "B" = 0, "C" = 1)
```
`
`contr_mx <- calc_contrast(dv = Var, between = bw, `
print.cofad_mx

within = wi,
lambda_within = lambda_within,
ID = ID, data = tab53
)

contr_mx
summary(contr_mx)

print.cofad_bw

Description
Output of between-subject design contrast analysis

Usage
## S3 method for class 'cofad_bw'
print(x, ...

Arguments
x

output of calc_contrast

...

further arguments

Value
Displays the significance of the contrast analysis. The contrastweights, the corresponding group
and an effectsize are given.

print.cofad_mx

Description
Output of a mixed design contrast analysis

Usage
## S3 method for class 'cofad_mx'
print(x, ...

Arguments
x

output of calc_contrast

...

further arguments
### print.cofad_wi

**Value**

Displays the significance of the contrast analysis. The contrast weights, the corresponding group and an effect size are given.

**Description**

Output of a within subject design contrast analysis

**Usage**

```r
## S3 method for class 'cofad_wi'
print(x, ...)
```

**Arguments**

- `x`: output of calc_contrast
- `...`: further arguments

**Value**

Displays the significance of the contrast analysis. The contrast weights, the corresponding group and an effect size are given.

### summary.cofad_bw

**Summary of between subject design contrast analysis**

**Description**

Summary of between subject design contrast analysis

**Usage**

```r
## S3 method for class 'cofad_bw'
summary(object, ...)
```

**Arguments**

- `object`: output of calc_contrast
- `...`: further arguments

**Value**

Displays ANOVA table of the contrast analysis and the typical effect sizes.
**summary.cofad_mx**  
*Summary of a mixed design contrast analysis*

**Description**

Summary of a mixed design contrast analysis

**Usage**

```r
## S3 method for class 'cofad_mx'
summary(object, ...)
```

**Arguments**

- `object`: output of `calc_contrast`
- `...`: further arguments

**Value**

Displays ANOVA table of the contrast analysis and the typical effect sizes.

---

**summary.cofad_wi**  
*Summary of within subject design contrast analysis*

**Description**

Summary of within subject design contrast analysis

**Usage**

```r
## S3 method for class 'cofad_wi'
summary(object, ci = 0.95, ...)
```

**Arguments**

- `object`: output of `calc_contrast`
- `ci`: confidence interval for composite Score (L-Values)
- `...`: further arguments

**Value**

Displays ANOVA table of the contrast analysis and the typical effect sizes.
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