Package 'GreyZones'

January 20, 2025

Type Package

Title Detection of Grey Zones in Two-Way Inter-Rater Agreement Tables

Version 0.0.5

Date 2024-09-18

Author Haydar Demirhan [aut, cre, cph]
  (<https://orcid.org/0000-0002-8565-4710>),
  Ayfer Ezgi Yilmaz [aut]

Maintainer Haydar Demirhan <haydar.demirhan@rmit.edu.au>

Description Grey zones locally occur in an agreement table due to the subjective evaluation of raters based on various factors such as not having uniform guidelines, the differences between the raters' level of expertise or low variability among the level of the categorical variable. It is important to detect grey zones since they cause a negative bias in the estimate of the agreement level. This package provides a function for detecting the existence of grey zones in two-way inter-rater agreement tables (Demirhan and Yilmaz (2023) <doi:10.1186/s12874-022-01759-7>).

Depends irrCAC (>= 1.0)

License GPL-3

RoxygenNote 7.2.3

NeedsCompilation no

Repository CRAN

Date/Publication 2024-09-18 13:40:02 UTC

Contents

---

detectGreyZones   *Detection of Grey Zones in Two-way Inter-rater Agreement Tables*

Description

Detects the existence of grey zones in in two-way inter-rater agreement tables.

Usage

```
detectGreyZones(table)
```

Arguments

table   A `matrix` object that has equal number of columns and rows showing the agree-
                ment table for two raters.

Details

See Demirhan and Yilmaz (2023) for the details of the approach implemented by this function.

If a grey zone is detected in the agreement table, the function reports AC2 and BP with quadratic
weights.

If no grey zone is detected in the agreement table, the function reports kappa, AC2 and BP with
linear and quadratic weights.

Value

delta   A matrix that shows the relative magnitude of deviance from the perfect agree-
                ment to the level of agreement for each cell of the given agreement table. Cor-
                responds to Eq. (6) of Demirhan and Yilmaz (2023).

Delta   A value that shows the maximum of the values in `delta`. Corresponds to Eq.
                (7) of Demirhan and Yilmaz (2023).

tau_Delta   The value of the threshold for the detection of grey zones. If `Delta > tau_Delta`
                then there is a grey zone exists in the agreement table. Corresponds to Eq. (10)
                of Demirhan and Yilmaz (2023).

result   Verbal result of the comparison of `Delta` and `tau_Delta`.

agreement   Weighted agreement coefficient with linear and quadratic weights. See details.

Author(s)

Haydar Demirhan and Ayfer Ezi Yilmaz

Maintainer: Haydar Demirhan <haydar.demirhan@rmit.edu.au>

References

Demirhan, H., Yilmaz, A.E., 2023, Detection of grey zones in inter-rater agreement studies, BMC Medical Research Methodology, 23, Article number: 3, DOI: 10.1186/s12874-022-01759-7.

Tran, D., Demirhan, H., Dolgun, A., 2021, Bayesian approaches to the weighted kappa-like inter-rater agreement measures, Statistical Methods in Medical Research, 30, 10, 2329-2351, DOI: 10.1177/09622802211037068.

Tran, D., Dolgun, A., Demirhan, H., 2021, The impact of grey zones on the accuracy of agreement measures for ordinal tables, BMC Medical Research Methodology, 21:70, DOI: 10.1186/s12874-021-01248-3.

Examples

```
table <- matrix(c(10, 2, 7, 1, 3, 3, 0, 8, 80), nrow = 3, ncol = 3, byrow = TRUE)
detectGreyZones(table)
```

Index