Package 'unifyR'

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Type Package

Title Unified Scores, Reliabilities and Validities from Multiple Tests

Version 1.0.0

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Description In diagnostic contexts, individuals are often assessed using multiple tests that measure the same latent variable (e.g., intelligence). These test scores are typically not exactly identical. Simple averaging neglects the correlation between tests and the reduced variance of their combination. The 'unifyR' package provides functions to compute statistically accurate unified scores, reliabilities and validities of multiple tests. The underlying algorithms build on and extend the method proposed by Evans (1996, <DOI:10.3758/BF03204767>) and have been validated through simulations.

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Encoding UTF-8

RoxygenNote 7.3.2

Depends R (>= 4.2.0)

NeedsCompilation no

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Contents

uniRel *uniRel*

Description

A function for unifying the reliabilities of multiple tests

Usage

```
uniRel(rel, b = NULL, corm)
```

Arguments

rel	Vector of reliabilities of the tests
b	Vector of weightings for the reliabilities; must match order of 'rel'. Default: 1
corm	Correlation matrix of the tests; must be square with 1s on the diagonal

Value

A single value of the class 'numeric' representing the unified reliability estimate across multiple tests

Examples

```
rel = c(0.70, 0.90, 0.80)
b = c(1, 1, 1)
corm = matrix(c(1, 0.50, 0.35, 0.50, 1, 0.75, 0.35, 0.70, 1), nrow = 3, ncol = 3)
uniRel(rel, b, corm)
```

uniScore *uniScore*

Description

A function for unifying a person's scores from multiple tests

Usage

```
uniScore(scores, M = NULL, SD = NULL, b = NULL, corm, method = "composite")
```

Arguments

scores	a vector with a person's score from multiple tests
M	Vector of means of the tests; must match the order of 'scores'. Default: 0
SD	Vector of standard deviations of the tests; must match the order of 'scores'. Default: 1
b	Vector of weightings for the test scores; must match the order of 'scores'. Default: 1
corm	a matrix that contains the correlations between the tests. There must be ones on the diagonal.
method	the specification of the method for computing a unified score. "composite" (default) computes a non-latent unified score and "pca" computes the unified score on the principle component.

Value

z	A z score of the class 'numeric' corresponding to the unified person's score; M = 0, SD = 1
IQ	An IQ score of the class 'numeric' corresponding to the unified person's score; M = 100, SD = 15
T	A T score of the class 'numeric' corresponding to the unified person's score; M = 50, SD = 10
SW	A SW score of the class 'numeric' corresponding to the unified person's score; M = 100, SD = 10
C	A C score of the class 'numeric' corresponding to the unified person's score; M = 5, SD = 2
PR	The percentile rank of the unified person's score of the class 'numeric'

Examples

```
scores = c(110, 130, 120)
M = c(100, 100, 100)
SD = c(15, 15, 15)
b = c(1, 1, 1)
corm = matrix(c(1, 0.50, 0.35, 0.50, 1, 0.75, 0.35, 0.70, 1), nrow = 3, ncol = 3)
uniScore(scores, M, SD, b, corm, method = "composite")
```

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uniVal *uniVal*

Description

A function for unifying the correlations of multiple tests with a criterion (i.e., the validity)

Usage

```
uniVal(val, b = NULL, corm)
```

Arguments

val	Vector of validities of the tests
b	Vector of weightings for the validities; must match order of ‘val‘. Default: 1
corm	Correlation matrix of the tests; must be square with 1s on the diagonal

Value

A single value of the class ‘numeric‘ representing the unified validity estimate across multiple tests

Examples

```
val = c(0.20, 0.40, 0.30)
b = c(1, 1, 1)
corm = matrix(c(1, 0.50, 0.35, 0.50, 1, 0.75, 0.35, 0.70, 1), nrow = 3, ncol = 3)
uniVal(val, b, corm)
```

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