# Package 'catekappa'

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**Type** Package

**Title** Design and Analysis of Consistency Tests Based on Kappa Statistic

**Version** 0.1.0

**Description** Provides a 'Shiny' application and supporting functions for the design and analysis of consistency tests based on Kappa statistic with categorical responses. Wraps 'irr' and 'kappaSize' packages.

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**Author** Gai Zheng [aut, cre],
Xincheng Li [aut],
Yingjie Jiangwang [aut],
Panwei Zhao [aut]

**Maintainer** Gai Zheng <z2118778229@163.com>

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## Contents

catekappa-package . . . . . 2
analyze_kappa . . . . . 2
calc_sample_size_kappa . . . . . 3
interpret_kappa . . . . . 4
kappa_fixed_n . . . . . 4
print.cate_analysis . . . . . 5
print.cate_design . . . . . 5
print.cate_fixed_n . . . . . 6
run_cate_app . . . . . 6
summary.cate_analysis . . . . . 7

**Index** **8**

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`catekappa-package` *catekappa: Design and Analysis of Categorical Agreement Tests Based on Kappa Statistics*

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## Description

CATEKAPPA (Categorical Agreement Test Evaluation) provides a Shiny interactive application and supporting functions for the design and analysis of categorical agreement tests.

## Details

This package wraps the core functionality of the `irr` and `kappaSize` packages:

- **Design stage**: Use `calc_sample_size_kappa` to calculate sample size, supporting 2–5 categories and 2+ raters.
- **Analysis stage**: Use `analyze_kappa` to compute Cohen's, Fleiss', and Light's Kappa statistics.
- **Interactive app**: Use `run_cate_app` to launch the Shiny interface.

## Author(s)

Gai Zheng <z2118778229@163.com> Xincheng Li <lxc409014@qq.com> Yingjie Jiangwang <2312055564@qq.com> Panwei Zhao <1581729526@qq.com>

## See Also

`run_cate_app`, `calc_sample_size_kappa`, `analyze_kappa`

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`analyze_kappa` *Analyze Agreement Using Kappa Statistics*

---

## Description

Analyze consistency between raters using Cohen's, Fleiss', or Light's Kappa. Wraps functions from the irr package.

## Usage

```
analyze_kappa(data, type = "cohen", detail = FALSE)
```

## Arguments

| | |
|---|---|
| `data` | A data frame or matrix with subjects as rows and raters as columns. |
| `type` | Type of kappa: "cohen" (2 raters), "fleiss" (3+ raters), or "light" (3+ raters, pairwise). |
| `detail` | Logical. If TRUE, returns detailed output including individual scores. |

## Value

A list with kappa results, interpretation, and data summary.

## Examples

```
data <- data.frame(
  Rater1 = c("Yes", "No", "Yes", "Yes", "No"),
  Rater2 = c("Yes", "No", "Yes", "No", "No")
)
analyze_kappa(data, type = "cohen")
```

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`calc_sample_size_kappa`

*Calculate Sample Size for Kappa Statistic*

---

## Description

Calculate required sample size for consistency tests. Directly wraps kappaSize::PowerBinary / Power3Cats / Power4Cats / Power5Cats.

## Usage

```
calc_sample_size_kappa(
  kappa0 = 0.4,
  kappa1 = 0.6,
  props = c(0.5, 0.5),
  alpha = 0.05,
  power = 0.8,
  raters = 2
)
```

## Arguments

| | |
|---|---|
| `kappa0` | Null hypothesis value of kappa (H0). |
| `kappa1` | Alternative hypothesis value of kappa (H1). |
| `props` | Expected proportions of categories. Must sum to 1. |
| `alpha` | Significance level. Default 0.05. |
| `power` | Desired power. Default 0.8. |
| `raters` | Number of raters (>=2). Default 2. |

## Value

A list with sample size n and parameters.

## Examples

```
calc_sample_size_kappa(kappa0 = 0.4, kappa1 = 0.6, props = c(0.5, 0.5))
calc_sample_size_kappa(kappa0 = 0.4, kappa1 = 0.6,
                       props = c(0.6, 0.3, 0.1), raters = 3)
```

---

`interpret_kappa` *Interpret Kappa Value*

---

## Description

Interpret the strength of agreement based on Landis and Koch criteria.

## Usage

```
interpret_kappa(kappa)
```

## Arguments

| | |
|---|---|
| `kappa` | Numeric value of Kappa statistic. |

## Value

A named list with level, description, and color code.

## Examples

```
interpret_kappa(0.3)
interpret_kappa(0.75)
```

---

`kappa_fixed_n` *Fixed N Analysis for Kappa Statistic*

---

## Description

Given a fixed sample size, estimate the lower confidence bound. Wraps kappaSize::FixedNBinary / FixedN3Cats / FixedN4Cats / FixedN5Cats.

## Usage

```
kappa_fixed_n(n, kappa0 = 0.4, props = c(0.5, 0.5), alpha = 0.05, raters = 2)
```

### Arguments

| | |
|---|---|
| n | Sample size. |
| kappa0 | Anticipated value of kappa. |
| props | Category proportions. |
| alpha | Significance level. |
| raters | Number of raters. |

### Value

List with kappaSize raw result and parameters.

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## print.cate_analysis *Print Method for cate_analysis Objects*

---

### Description

Print Method for cate_analysis Objects

### Usage

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

### Arguments

| | |
|---|---|
| x | An object of class cate_analysis. |
| ... | Additional arguments. |

---

## print.cate_design *Print Method for cate_design Objects*

---

### Description

Print Method for cate_design Objects

### Usage

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

### Arguments

| | |
|---|---|
| x | An object of class cate_design. |
| ... | Additional arguments. |

## print.cate_fixed_n *Print Method for cate_fixed_n Objects*

### Description

Print Method for cate_fixed_n Objects

### Usage

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

### Arguments

| | |
|---|---|
| x | An object of class cate_fixed_n. |
| ... | Additional arguments. |

## run_cate_app *Run CATE Shiny Application*

### Description

Launch the Shiny application for design and analysis of consistency tests based on Kappa statistic with categorical responses.

### Usage

```
run_cate_app(
  port = getOption("shiny.port"),
  launch.browser = getOption("shiny.launch.browser", interactive()),
  host = getOption("shiny.host", "127.0.0.1")
)
```

### Arguments

| | |
|---|---|
| port | The TCP port for the application. Defaults to random available port. |
| launch.browser | Logical. Whether to launch browser automatically. |
| host | The IPv4 address to listen on. |

### Value

A Shiny application object (invisible).

## Examples

```
if(interactive()){
run_cate_app()
}
```

---

`summary.cate_analysis` *Summary Method for cate_analysis Objects*

---

## Description

Summary Method for cate_analysis Objects

## Usage

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

## Arguments

| | |
|---|---|
| `object` | An object of class cate_analysis. |
| `...` | Additional arguments. |

# Index

∗ **package**
catekappa-package, 2

analyze_kappa, *2*, 2

calc_sample_size_kappa, *2*, 3
catekappa *(*catekappa-package*)*, 2
catekappa-package, 2

interpret_kappa, 4

kappa_fixed_n, 4

print.cate_analysis, 5
print.cate_design, 5
print.cate_fixed_n, 6

run_cate_app, *2*, 6

summary.cate_analysis, 7