

# Package: attenuation (via r-universe)

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**Type** Package

**Title** Correcting for Attenuation Due to Measurement Error

**Version** 1.0.0

**Description** Confidence curves, confidence intervals and p-values for correlation coefficients corrected for attenuation due to measurement error. Implements the methods described in Moss (2019, <[arxiv:1911.01576](https://arxiv.org/abs/1911.01576)>).

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**URL** <https://github.com/JonasMoss/attenuation/>

**BugReports** <https://github.com/JonasMoss/attenuation/issues>

**Encoding** UTF-8

**LazyData** true

**Suggests** testthat, covr, spelling

**RoxygenNote** 6.1.1

**Language** en-US

**Repository** <https://jonasmoss.r-universe.dev>

**RemoteUrl** <https://github.com/jonasmoss/attenuation>

**RemoteRef** HEAD

**RemoteSha** ef819d6ea0ac47cfd1f3ed89e524af9015d51540

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`cc`*Confidence curves for attenuated correlation coefficients.*

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## Description

Confidence curves for attenuated correlation coefficients.

## Usage

```
cc(r, N, lower = -1, upper = 1, by = 0.001, method = "corr",  
   k = NULL)
```

## Arguments

<code>r</code>	Numeric vector of three elements in [-1,1]. <code>r[1]</code> is the correlation between the noisy measures <code>X'</code> and <code>Y'</code> , <code>r[2]</code> is the correlation between the noisy <code>X'</code> and the true <code>X</code> , while <code>r[3]</code> is the correlation between the noisy <code>Y'</code> and the true <code>Y</code> .
<code>N</code>	Numeric vector of three positive integers. <code>N[i]</code> is the sample size for <code>r[i]</code> .
<code>lower</code>	Lower bound for the curve. Defaults to -1.
<code>upper</code>	Upper bound for the curve. Defaults to 1.
<code>by</code>	Increment of the sequence from lower to upper.
<code>method</code>	The type of confidence curve. Can be "corr", "cronbach", "HS" or "free". See the details of <a href="#">p_value</a> .
<code>k</code>	Numeric vector of two positive integers. <code>k[i]</code> is the number of testlets for the for <code>r[i+1]</code> . Only needed for method "cronbach".

## Value

An object of class `ccaf`.

## Examples

```
r = c(0.20, sqrt(0.45), sqrt(0.55))  
N = c(100, 100, 100)  
plot(cc(r, N))
```

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ci	<i>Calculate a confidence interval for an attenuated correlation coefficient.</i>
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**Description**

Calculate a confidence interval for an attenuated correlation coefficient.

**Usage**

```
ci(r, N, level = 0.95, method = "corr", k = NULL)
```

**Arguments**

r	Numeric vector of three elements in [-1,1]. r[1] is the correlation between the noisy measures X' and Y', r[2] is the correlation between the noisy X' and the true X, while r[3] is the correlation between the noisy Y' and the true Y.
N	Numeric vector of three positive integers. N[i] is the sample size for r[i].
level	Numeric in [0, 1]. Confidence level of the interval. Defaults to 0.95.
method	The type of confidence curve. Can be "corr", "cronbach", "HS" or "free". See the details of <a href="#">p_value</a> .
k	Numeric vector of two positive integers. k[i] is the number of testlets for the for r[i+1]. Only needed for method "cronbach".

**Value**

Numeric in [0, 1]. The p-value under null-hypothesis rho.

**Examples**

```
r = c(0.20, sqrt(0.45), sqrt(0.55))
N = c(100, 100, 100)
ci(r, N) # Calculates 95% confidence set for rho.
```

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lines.ccaf	<i>Add a plot a confidence curve of attenuated correlation coefficients.</i>
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**Description**

Add a plot a confidence curve of attenuated correlation coefficients.

**Usage**

```
## S3 method for class 'ccaf'
lines(x, type = "l", col = "red3", lwd = 2, ...)
```

**Arguments**

x	An object of class ccaf. The confidence curve to plot.
type	The type of plot.
col	The color of the curve.
lwd	The thickness of the curve.
...	Passed to lines.

**Value**

An invisible copy of x.

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plot.ccaf	<i>Plot a confidence curve of attenuated correlation coefficients.</i>
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**Description**

Plot a confidence curve of attenuated correlation coefficients.

**Usage**

```
## S3 method for class 'ccaf'
plot(x, y, level = 0.95, ...)
```

**Arguments**

x	An object of class ccaf. The confidence curve to plot.
y	Ignored; supported for compatibility with the plot generic.
level	Level to highlight. Defaults to 0.95. If NULL, highlights no level.
...	Passed to plot.

**Value**

An invisible copy of x.

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print.ccaf	<i>Print method for ccaf</i>
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**Description**

Print method for ccaf

**Usage**

```
## S3 method for class 'ccaf'
print(x, digits = 3, ...)
```

**Arguments**

x	Object of class ccaf.
digits	Passed to signif.
...	Ignored.

**Value**

Invisible copy of x.

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p_value	<i>Calculate the p-value for an attenuated correlation coefficient.</i>
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**Description**

This function calculates four types of p-values for correlations coefficients corrected for attenuation, chosen in "method". The different p-values are described in Moss (2019). "corr" is the correlation based p-value, "cronbach" is the Cronbach alpha based p-value, "HS" is the Hunter-Schmidt p-value, while "free" is the correlation based p-value without positive constraints.

**Usage**

```
p_value(rho, r, N, method = "corr", k = NULL)
```

**Arguments**

rho	Numeric vector in [-1,1]. The correlation under the null hypothesis.
r	Numeric vector of three elements in [-1,1]. r[1] is the correlation between the noisy measures X' and Y', r[2] is the correlation between the noisy X' and the true X, while r[3] is the correlation between the noisy Y' and the true Y. They are the square root of the reliabilities. Must be positive method to "corr" and "cronbach".
N	Numeric vector of three positive integers. N[i] is the sample size for r[i].

method	The type of p-value. Can be "corr", "cronbach", "HS" or "free". See the details.
k	Numeric vector of two positive integers. $k[i]$ is the number of testlets for the for $r[i+1]$ . Only needed for method "cronbach".

**Value**

Numeric in  $[0, 1]$ . The p-value under the null-hypothesis that the true correlation is rho.

**Examples**

```
r = c(0.20, sqrt(0.45), sqrt(0.55))
N = c(100, 100, 100)
p_value(rho = 0, r, N) # Tests rho = 0.
```

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