

# Package ‘rextor’

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**Title** Prepare 'WEXTOR' Data

**Version** 1.1.0

**Depends** R (>= 4.1.0)

**Description** Facilitate data preparation for data collected on 'WEXTOR' <<https://wextor.eu>>, created by Reips and Neuhaus (2002) <[doi:10.3758/bf03195449](https://doi.org/10.3758/bf03195449)>. Perform plausibility and other checks and make use of cool color palettes and themes for data visualization.

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**VignetteBuilder** knitr

**URL** <https://iscience-kn.github.io/rextor/>

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ask_rex	<i>Ask Rex</i>
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## Description

This function lets you ask dino Rex for help. You can try to ask for specific functions and topics or just use the function as-is for some motivational words of encouragement. :)

## Usage

```
ask_rex(topic = "?")
```

## Arguments

topic	What you want to know about; either leave it blank for motivation or specify 'ttest', 'mean'... Input must be in quotes!
-------	--

## Value

Returns advice and explanations on R; sometimes Rex asks follow-up questions

## Examples

```
# Get motivation
ask_rex()

# Get specific information
ask_rex("mean")
ask_rex(topic = "ttest")
```

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BiFiX_data_raw	<i>BiFiX - Big Five raw data</i>
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**Description**

Raw data from the BiFiX study (submitted for publication in BRM)

**Format**

A data frame with 760 rows and 81 columns:

**\$validation\_var** validation variable

**.wx.1.id** ID

**.wx.3.experimental\_condition** Experimental condition

**big\_...** Big Five items (A - Agreeableness, C - Conscientiousness, E - Extraversion, N - Neuroticism, O - Openness) ...

**Source**

<https://github.com/iscience-kn/BiFiX>

---

check_ok	<i>Check whether a plausibility condition is satisfied</i>
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**Description**

Returns a logical vector indicating whether a given check column equals "ok". If the column does not exist in the data, all cases are treated as passing.

**Usage**

```
check_ok(data, col)
```

**Arguments**

**data** A data frame containing plausibility check variables.

**col** A character string specifying the column name to check for "ok" entries (case-sensitive).

**Details**

Used inside the `plausicheck()` function.

**Value**

A logical vector of length `nrow(data)`.

**Examples**

```
example_df <- data.frame(check_ip = c("ok", "nope", "ok", "OK"))
check_ok(example_df, "check_ip")
```

---

getmode

*Get the mode of a vector or variable*


---

**Description**

The mode is the number that appears the most often in a vector or variable. This measure is especially important for nominal variables since the mean or median cannot meaningfully be reported.

**Usage**

```
getmode(v)
```

**Arguments**

v                    a vector of variable in dataframe

**Value**

Returns the mode of v, i.e., the value occurring most often

**Examples**

```
vec <- c("A", "A", "B")
getmode(vec)
```

---

getperc

*Get percentage of a value*


---

**Description**

Get percentage of a value

**Usage**

```
getperc(data, var, val)
```

**Arguments**

data                A dataframe  
var                 A variable in the dataframe, written as a character in quotes, e.g. "var"  
val                 A value of variable var of which to get the percentage, also in quotes

**Value**

Returns the percentage of value val in relation to all values of var

**Examples**

```
getperc(data.frame(a = c("duck", "duck", "goose")),
        "a",
        "duck")

# Also works when val is indexed (alphabetically)
getperc(data.frame(a = c("duck", "duck", "goose")),
        "a",
        2)
```

---

informed_consent	<i>Informed Consent Filter</i>
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**Description**

One of the best practices in data collection is including an informed consent question. With this function you can automatically filter out rows where participants did not explicitly consent to their data being used.

**Usage**

```
informed_consent(dataframe, varname = "informedconsent")
```

**Arguments**

dataframe	A dataframe of data collected with 'WEXTOR'
varname	character. Variable name of informed consent variable. Defaults to "informed-consent".

**Value**

Returns data with cases filtered out that did not check the informed consent box

**Examples**

```
data <- data.frame(informedconsent = c("checked", "not checked", "checked"))
informed_only <- informed_consent(data)
```

---

ip_check	<i>Check for duplicate IP addresses</i>
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### Description

`ip_check()` identifies potential duplicate participations in a dataset by checking for repeated IP addresses. Cases with duplicated IPs are flagged as "possible duplicate", while unique IPs are labeled "ok". Keep in mind that in some cases, duplicate IP addresses should not lead to exclusion, for example when different participants (such as siblings or flatmates) plausibly use the same device.

### Usage

```
ip_check(dataframe)
```

### Arguments

dataframe	A data frame containing the study data. Must include a variable named <code>ip</code> representing participants' IP addresses.
-----------	--

### Details

If WEXTOR-style prefixes (i.e. `.wx.`) are detected in the variable names, they are removed prior to performing the check.

The function uses `duplicated()` to flag repeated IP addresses. Only subsequent occurrences are marked as duplicates; the first instance of each IP is treated as valid.

### Value

A data frame with an additional column `check_ip`, indicating whether each case has a unique IP ("ok") or is a potential duplicate ("possible duplicate").

### Examples

```
data <- read_WEXTOR(path_to_file("BiFiX_data_raw.csv"))
# The example data does not contain real IPs (data protection), so we will use simulate ones
data$ip <- sample(1:1000, nrow(data), replace = TRUE)

new_data <- ip_check(data)
```

---

namepref	<i>Add variable name prefix (with substitution)</i>
----------	---

---

**Description**

This function strips the old prefix from the variable names of the dataframe. It then adds the new prefix where the old one was and changes the dataframe's names to the new ones.

**Usage**

```
namepref(dataframe, pref_old, pref_new)
```

**Arguments**

dataframe	A dataframe
pref_old	Old prefix character that some or all variables in the dataframe have
pref_new	New prefix character to replace the old one

**Value**

Returns dataframe with those variables renamed that start with the old prefix.

**Examples**

```
bla <- tibble::tibble(x_ar = 1:5, y_ar = 6:10)
blo <- namepref(bla, "x_", "z_")
names(bla)
names(blo)
```

---

namepref0	<i>Add variable name prefix (without substitution)</i>
-----------	--

---

**Description**

This function adds the new prefix and changes the dataframe's names to the new ones.

**Usage**

```
namepref0(dataframe, pref_new)
```

**Arguments**

dataframe	A dataframe
pref_new	New prefix character to add to all variable names in the dataframe have

**Value**

Returns dataframe with all variables renamed to start with the new prefix.

**Examples**

```
bla <- tibble::tibble(x_ar = 1:5, y_ar = 6:10)
blo <- namepref0(bla, "var")
names(bla)
names(blo)
```

---

path_to_file	<i>Get file path to example data file</i>
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---

**Description**

This function makes the example data from the BiFiX study (submitted for publication in BRM) easy to access.

**Usage**

```
path_to_file(path = NULL)
```

**Arguments**

path                    Name of file in quotes with extension; "BiFiX\_data\_raw.csv" will work. If NULL, the example file will be listed.

**Value**

Gives the path to the example file included in the package. Meant for use in read\_WEXTOR().

**Source**

This function is adapted from palmerpenguins (which is adapted from readxl::readxl\_example()).

**Examples**

```
path_to_file()
path_to_file("BiFiX_data_raw.csv")
head(read.csv(path_to_file("BiFiX_data_raw.csv")))
```

---

plausicheck	<i>Plausibility check on WEXTOR study data</i>
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---

### Description

plausicheck() performs basic plausibility checks on a study dataset to identify potentially invalid or suspicious participation. The function can check whether participants visited a minimum number of pages, whether the recorded session length appears plausible, and whether IP addresses indicate duplicate participation.

### Usage

```
plausicheck(dataframe, min_pages, check_sess_length = TRUE, check_ip = TRUE)
```

### Arguments

dataframe	A data frame containing the study data (needs to contain variables page_trail for the trail of webpages in the study & session_length for the overall time each participant spent on the study (if session length is to be checked) and ip for participants' IP addresses (if IP is to be checked)).
min_pages	Numeric. The minimum number of pages a participant must have visited in the study for their participation to be considered plausible.
check_sess_length	Logical. Should the session length plausibility check be performed? Defaults to TRUE.
check_ip	Logical. Should the IP address plausibility check be performed? Defaults to TRUE.

### Details

If WEXTOR prefixes are detected in the variable names, they are removed before the plausibility checks are applied.

### Value

A data frame with additional plausibility check variables. The final variable check\_plausibility indicates whether all selected checks were passed ("all ok") or whether the case should be excluded ("exclude"). Keep in mind that researchers are advised to make sure that the "exclude"-cases were correctly identified and are indeed of poorer data quality to avoid unnecessary data loss.

### Examples

```
data <- read_WEXTOR(path_to_file("BiFiX_data_raw.csv"))
# The example data does not contain real IPs (data protection), so we will use simulate ones
data$ip <- sample(1:1000, nrow(data), replace = TRUE)

plausi_data <- plausicheck(dataframe = data,
```

```
min_pages = 6,  
check_sess_length = TRUE,  
check_ip = TRUE)
```

---

read\_WEXTOR

*Read 'WEXTOR' Data*

---

### Description

With this function, you can easily read in your 'WEXTOR' generated data. By default, it will be exported as a "CSV" file, which stands for "comma-separated values". R has many available options of reading in this type of data, which can make it hard to navigate which one to use - especially for beginners.

### Usage

```
read_WEXTOR(filepath, keep_validation = TRUE)
```

### Arguments

`filepath`            Location of the WEXTOR CSV file on your computer.  
`keep_validation`      Should the validation variable from WEXTOR be kept? TRUE by default.

### Details

In the `read_WEXTOR()` function, you just need to provide the `filepath`, i.e. the location of the CSV data file that you downloaded from 'WEXTOR'. If you want, you can already decided whether to keep the first column containing a so-called validation variable, but you don't have to. With no other input, `read_WEXTOR` will keep the variable for you. You can explicitly set `keep_validation` to `FALSE` if you like your data neat and do not need this extra measure. The usage is explained in the examples down below using the open source BiFiX data with psychological Big Five personality traits.

This function prepares the 'WEXTOR' data so that it is readable by both R and you as a human. It will give you your original data and also make the start and end time of each participation easier to read and work with later (by default, 'WEXTOR' will return these values as date and time separately, cluttering your dataset).

### Value

The WEXTOR data as an R data object.

## Examples

```
data <- read_WEXTOR(path_to_file("BiFiX_data_raw.csv"))

# If you don't need the validation variable, try
data_noval<-read_WEXTOR(path_to_file("BiFiX_data_raw.csv"),
                        keep_validation = FALSE)
```

---

removepref	<i>Remove 'WEXTOR' variable name prefixes (automatic)</i>
------------	---

---

## Description

This function strips the old prefix from the server variable names of the dataframe. It identifies such variables that start with ".wx.#." where # stands for any number, or simply ".wx." and then removes these prefixes for more easily legible and usable variable names in your data!

## Usage

```
removepref(dataframe)
```

## Arguments

dataframe      A dataframe, usefully containing variables that have the server prefix ".wx.#."

## Value

Returns dataframe with those variables renamed that start with the old prefix.

## Examples

```
bli <- tibble::tibble(.wx.1.ar = 1:5, y_ar = 6:10, .wx.z = 11:15)
blu <- removepref(bli)
names(bli)
names(blu)
```

---

 scale\_rextor

*Coloring Scale for Data Visualization*


---

## Description

This scale is very versatile and powerful. It offers several color palettes to choose from and automatically recognizes whether to use a discrete or continuous scale depending on the data type of the mapping object. It can also be used for both color and fill aesthetics by defining aesthetic accordingly directly inside the function!

## Usage

```
scale_rextor(pal = "cute", direction = 1, aesthetic = "color", ...)
```

## Arguments

pal	Color palette. Use either numbers from 1 to X or one of the names: 'arby', 'cute'...
direction	Direction of the color palette. Keep blank or use 1 for the default direction or use -1 to reverse the colors.
aesthetic	Which aesthetic to use the scale on; either color or fill, defaults to color.
...	Other common scale parameters.

## Value

ggplot plot object

## Examples

```
library(ggplot2)
ggplot(iris, aes(Species, Petal.Width, color = Petal.Width)) +
  geom_jitter() +
  theme_wob() +
  scale_rextor()

data <- data.frame(Time = rep(c("Time 1", "Time 2", "Time 3", "Time 4",
  "Time 5", "Time 6", "Time 7", "Time 8"),
  each = 2),
  cont = 1:16,
  Value = c(8, 5, 10, 3, 8, 5, 10, 3, 8, 5, 10, 3, 8, 5, 10, 3))

ggplot(data, aes(x = Time, y = Value, color = Time, fill = Time)) +
  geom_boxplot(alpha = 0.95) +
  theme_wob() +
  scale_rextor(pal = "neon") +
  scale_rextor(pal = "neon", aesthetic = "fill")

ggplot(data, aes(x = cont, y = Value, color = cont, fill = cont)) +
```

```
geom_jitter(alpha = 0.8, size = 8) +
theme_minimal() +
scale_xextor(pal = "wextor") +
scale_yextor(pal = "wextor", aesthetic = "fill")
```

---

serious\_check

*Filter data frame by seriousness check*


---

### Description

Filter your data frame by your item for the "seriousness check". If the data comes from 'WEXTOR' with no previous changes to the automatically created variable, you will be able to accept all defaults in this function and simply input the data frame.

### Usage

```
serious_check(dataframe, varname = "seriousness", keep = "participate")
```

### Arguments

dataframe	Data which contains a variable for the seriousness check.
varname	Variable for the seriousness check. Defaults to "seriousness".
keep	Values from the variable to keep. Defaults to "participate"

### Value

Filtered data

### Examples

```
data <- read_WEXTOR(path_to_file("BiFiX_data_raw.csv"))
serious_only <- serious_check(data)
```

---

sess\_length\_check

*Session Length Check*


---

### Description

This function takes a dataframe as input as well as the minimum number of webpages in your web experiment or study, that a participant should have seen in order to be considered a complete (or plausible) participation. It flags the most extreme 10% of complete participations in the data as very slow or very fast.

**Usage**

```
sess_length_check(dataframe, min_pages = 6)
```

**Arguments**

dataframe	A dataframe containing WEXTOR data (needs to contain variables <code>page_trail</code> for the trail of webpages in the study and <code>session_length</code> for the overall time each participant spent on the study)
min_pages	Numeric. The minimum number of pages a participant must have visited in the study for their participation to be considered plausible. Defaults to 6.

**Value**

A dataframe with added variables `sess_length_clean` for only completed session lengths, otherwise NA and `check_sess_length` for a flag of the most extreme 10% of time needed to finish participation

**Examples**

```
data <- read_WEXTOR(path_to_file("BiFiX_data_raw.csv"))
new_data <- sess_length_check(data)
```

---

 theme\_wob

*Theme White on Black*


---

**Description**

This theme option is built to be used with a ggplot2 plot. It offers several options for a dark theme, i.e. dark background with light writing.

**Usage**

```
theme_wob(max_font_size = 14, contrast = "high")
```

**Arguments**

max_font_size	Maximum font size, used for the plot title (other font sizes are automatically adjusted accordingly).
contrast	Character to indicate the choice of color palette depending on the desired contrast. Defaults to "high". Should be one of "max", "high", "medium", "low", "pink" or "rex".

**Value**

Plot theme.

**Examples**

```
# Load the data
data <- read_WEXTOR(path_to_file("BiFiX_data_raw.csv"))

# Create any plot
library(ggplot2)
ggplot(data, aes(age, color = gender, fill = gender)) +
  geom_density(alpha = .5) +
  theme_wob(contrast = "rex")
```

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