# Package 'psyverse'

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Type Package

Title Decentralized Unequivocality in Psychological Science

Version 0.2.6

Maintainer Gjalt-Jorn Peters <psyverse@opens.science>

License GPL (>= 3)

Description The constructs used to study the human psychology have many definitions and corresponding instructions for eliciting and coding qualitative data pertaining to constructs' content and for measuring the constructs. This plethora of definitions and instructions necessitates unequivocal reference to specific definitions and instructions in empirical and secondary research. This package implements a human- and machine-readable standard for specifying construct definitions and instructions for measurement and qualitative research based on 'YAML'. This standard facilitates systematic unequivocal reference to specific construct definitions and corresponding instructions in a decentralized manner (i.e. without requiring central curation; Peters (2020) <doi:10.31234/osf.io/xebhn>).

BugReports https://gitlab.com/r-packages/psyverse/-/issues

URL https://psyverse.one

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Author Gjalt-Jorn Peters [aut, cre, ctb] (<https://orcid.org/0000-0002-0336-9589>), Rik Crutzen [ctb] (<https://orcid.org/0000-0002-3731-6610>) Repository CRAN Date/Publication 2023-03-05 22:00:07 UTC

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apply\_graph\_theme Apply multiple DiagrammeR global graph attributes

## Description

Apply multiple DiagrammeR global graph attributes

## Usage

```
apply_graph_theme(dctGraph, ...)
```

## Arguments

dctGraph	The DiagrammeR::DiagrammeR graph to apply the attributes to.
	One or more character vectors of length three, where the first element is the attribute, the second the value, and the third, the attribute type (graph, node, or edge).

## base30toNumeric

## Value

The DiagrammeR::DiagrammeR graph.

#### Examples

base30toNumeric

*Conversion between base10 and base30 & base36* 

#### Description

The conversion functions from base10 to base30 are used by the generate\_id() functions; the base36 functions are just left here for convenience.

#### Usage

```
base30toNumeric(x)
base36toNumeric(x)
numericToBase30(x)
numericToBase36(x)
```

#### Arguments

```
х
```

The vector to convert (numeric for the numericTo functions, character for the base30to and base36to functions).

#### Details

The symbols to represent the 'base 30' system are the 0-9 followed by the alphabet without vowels but including the y. This vector is available as base30.

#### Value

The converted vector (numeric for the base30to and base36to functions, character for the numericTo functions).

#### Examples

```
numericToBase30(654321);
base30toNumeric(numericToBase30(654321));
```

cat0

#### Concatenate to screen without spaces

#### Description

The cat0 function is to cat what paste0 is to paste; it simply makes concatenating many strings without a separator easier.

#### Usage

cat0(..., sep = "")

## Arguments

	The character vector(s) to print; passed to cat.
sep	The separator to pass to cat, of course, "" by default.

#### Value

Nothing (invisible NULL, like cat).

#### Examples

```
cat0("The first variable is '", names(mtcars)[1], "'.");
```

dct\_from\_spreadsheet Import a DCT specification from a spreadsheet

## Description

This function reads a spreadsheet (from a Google sheet URL or a local file in .xlsx, .csv, or .sav format) and imports the DCT specifications in it.

dct\_object

## Usage

```
dct_from_spreadsheet(
    x,
    path = NULL,
    sheet = NULL,
    localBackup = NULL,
    exportGoogleSheet = TRUE,
    xlsxPkg = c("rw_xl", "openxlsx", "XLConnect"),
    preventOverwriting = psyverse::opts$get("preventOverwriting"),
    encoding = psyverse::opts$get("encoding"),
    silent = psyverse::opts$get("silent")
)
```

## Arguments

The URL or path to a file.		
The path to save the DCT specifications.		
Optionally, the name(s) of the worksheet(s) to select.		
If not NULL, a valid filename to write a local backup to.		
exportGoogleSheet		
If x is a URL to a Google Sheet, instead of using the googlesheets4 package to download the data, by passing exportGoogleSheet=TRUE, an export link will be produced and the data will be downloaded as Excel spreadsheet.		
Which package to use to work with Excel spreadsheets.		
preventOverwriting		
Whether to prevent overwriting.		
The encoding to use.		
Whether to be silent or chatty.		

## Value

Invisibly, an object with the worksheets and the DCT objects.

dct\_object

Create a DCT object

## Description

Create a DCT object

## Usage

```
dct_object(
  version = as.character(utils::packageVersion("psyverse")),
  id = NULL,
 prefix = paste(sample(letters, 4), collapse = ""),
 label = "",
 date = as.character(Sys.Date()),
 dct_version = "1",
 ancestry = "",
retires = "",
 definition = "",
 measure_dev = ""
 measure_code = "",
 aspect_dev = "",
 aspect_code = "",
 comments = "",
 rel = NULL
)
```

## Arguments

version	The version of the DCT specification format (normally the version of the psyverse package).
id	The Unique Construct Identifier (UCID); if not provided, this is created using the prefix.
prefix	The prefix to use to construct the Unique Construct Identifier (UCID); ignored i id is provided.
label	The human-readable label for the construct.
date	The date at which the construct was created.
dct_version	The version of the DCT specification. This can optionally be used to manage consecutive DCT versions.
ancestry	The DCT specification or specifications that this DCT was based on.
retires	The DCT specification or specifications that this DCT renders obsolete (note that this doesn't mean anything in itself; psyverse does not enforce this automatically, nor does PsyCoRe, without configuration).
definition	The definition of the construct. This has to be comprehensive, detailed, accurate, and clearly delineate the relevant aspects of the human psychology.
measure_dev	Instructions for developing measurement instruments that measure this con- struct.
measure_code	Instructions for coding measurement instruments (e.g. in systematic reviews) as measurement instruments that measure this construct. Note that explicitly defining boundary conditions often helps, for example by explaining the features that coders should look for to distinguish this construct from closely related constructs (ideally linking to those other constructs using the dct:UCID notations).

aspect_dev	Instructions for eliciting construct content. Note that this is not sensible for all constructs; some may be defined at a very general level, rendering their content insufficiently specific to discuss or describe.
aspect_code	Instructions for coding construct content (i.e. aspects). Note that explicitly defining boundary conditions often helps, for example by explaining the features that coders should look for to distinguish this construct from closely related constructs (ideally linking to those other constructs using the dct:UCID notations).
comments	Any additional comments.
rel	Relationships with other constructs.

## Value

The DCT object.

## Examples

```
exampleDCT <-
psyverse::dct_object(
    prefix = "exampleConstruct",
    label = "An example construct",
    definition = "The definition goes here",
    measure_dev = "Here you can explain how to measure the construct"
);</pre>
```

dct\_object\_to\_html Create an HTML fragment showing a DCT object

## Description

Create an HTML fragment showing a DCT object

#### Usage

```
dct_object_to_html(
   dctObject,
   headingLevel = 3,
   hyperlink_UCIDs = TRUE,
   collapseButtons = TRUE,
   urlPrefix = "#",
   sortDecreasing = FALSE
)
```

## Arguments

dctObject	The DCT object
headingLevel	The level of the heading in the Markdown output that is produces.
hyperlink_UCIDs	
	Whether to create hyperlinks to UCIDs.
collapseButtons	
	Whether to include buttons to show/hide the definition and instructions.
urlPrefix	The prefix to insert before the URL in the produced hyperlink. The default, "#", results in a link to an anchor (an HTML a element) on the current page.
sortDecreasing	Whether to sort the constructs in decreasing order (TRUE), in increasing order (FALSE), or not at all (NULL).

## Value

A character vector.

#### Examples

```
exampleDCT <-
    psyverse::dct_object(
        prefix = "exampleConstruct",
        label = "An example construct",
        definition = "The definition goes here",
        measure_dev = "Here you can explain how to measure the construct"
    );
### Only run this in an interactive R session,
#### as it shows the HTML in the viewer.
if (interactive()) {
    dct_object_to_html(exampleDCT);
}</pre>
```

dct\_object\_to\_yaml Convert a DCT object to YAML

#### Description

Convert a DCT object to YAML

#### Usage

```
dct_object_to_yaml(dctObject)
```

#### Arguments

dct0bject The DCT object

## Value

A character vector.

dct\_sheet\_to\_dct Create a DCT object from a DCT sheet

#### Description

Create a DCT object from a DCT sheet

#### Usage

dct\_sheet\_to\_dct(dct\_sheet)

#### Arguments

dct\_sheet A dataframe containing a DCT specification.

#### Value

A DCT created by dct\_object().

generate\_construct\_overview

Generate construct overviews and instruction overviews

#### Description

These functions use a DCT specification to generate a construct overview or an instruction overview.

## Usage

```
generate_construct_overview(
  dctSpec,
  include = c("definition", "measure_dev", "measure_code", "manipulate_dev",
    "manipulate_code", "aspect_dev", "aspect_code", "rel"),
  hideByDefault = NULL,
  divClass = "btn btn-secondary",
  headingLevel = 3,
  collapseButtons = TRUE,
  hyperlink_UCIDs = TRUE,
 HTMLoutput = FALSE,
  urlPrefix = "#",
  sortDecreasing = FALSE
)
generate_definitions_overview(
  dctSpecDf,
  headingLevel = 3,
```

```
hyperlink_UCIDs = "Markdown",
urlPrefix = "#",
sortDecreasing = FALSE
)
generate_instruction_overview(
dctSpecDf,
type,
headingLevel = 3,
hyperlink_UCIDs = "Markdown",
urlPrefix = "#",
sortDecreasing = FALSE
)
```

## Arguments

dctSpec	The DCT specification, as resulting from a call to load_dct_specs() or load_dct_dir().	
include	Which elements to include in the construct overview.	
hideByDefault	Which elements to hide by default.	
divClass	The class of the button to collapse/expand sections.	
headingLevel	The level of the heading in the Markdown output that is produces.	
collapseButtons		
	Whether to include buttons to show/hide the definition and instructions.	
hyperlink_UCID	S	
	Whether to create hyperlinks to UCIDs.	
HTMLoutput	Whether to output to Markdown (FALSE) or HTML (TRUE).	
urlPrefix	The prefix to insert before the URL in the produced hyperlink. The default, "#", results in a link to an anchor (an HTML a element) on the current page.	
sortDecreasing	Whether to sort the constructs in decreasing order (TRUE), in increasing order (FALSE), or not at all (NULL).	
dctSpecDf	The DCT specification dataframer, as produced by a call to load_dct_specs() or load_dct_dir(), and stored within the resulting object.	
type	For instruction overviews, the type of instruction to generate can be specified: must be one of "measure_dev", "measure_code", "manipulate_dev", "manipulate_code", "aspect_dev", or "aspect_code".	

## Value

A character string with the overview.

## Examples

```
exampleDCT <-
   psyverse::dct_object(
    prefix = "exampleConstruct",
    label = "An example construct",</pre>
```

```
definition = "The definition goes here",
    measure_dev = "Here you can explain how to measure the construct"
);
generate_construct_overview(exampleDCT);
```

generate\_dct\_template DCT templates

## Description

These functions can generate one or more empty DCT templates.

#### Usage

```
generate_dct_template(
    prefix = paste(sample(letters, 4), collapse = ""),
    output = NULL,
    overwrite = FALSE,
    createDirs = FALSE,
    addComments = TRUE,
    stopOnIllegalChars = FALSE
)
generate_dct_templates(
    x,
    outputDir = NULL,
    createDirs = FALSE,
    addComments = FALSE,
    stopOnIllegalChars = FALSE
)
```

## Arguments

prefix, x	The prefix (prefix) or vector of prefixes (x) to use.
output, outputDi	ir
	The filename or directory to which to write the templates.
overwrite	Whether to overwrite any existing files.
createDirs	Whether to recursively create the directories if the path specified in output or outputPath does not yet exist.
addComments	Whether to add comments to the DCT specification as extra explanation.
stopOnIllegalCh	ars
	DCT identifier prefixes can only contain upper- and lowercase letters and un-
	derscores. This argument specifies whether to remove illegal characters with a warning, or whether to throw an error (and stop) if illegal characters are found,

## Value

The DCT template(s), either invisibly (if output or outputDir is specified) or visibly.

generate\_id

## Description

To allow unique reference to constructs, they require unique identifiers. These functions generate such identifiers by combining one or more identifier prefixes (usually a human-readable construct name such as 'attitude') with a unique identifier based on the second the identifier was generated. The identifier prefix may only contain lowercase and uppercase letters and underscores.

#### Usage

```
generate_id(
   prefix = paste(sample(letters, 4), collapse = ""),
   stopOnIllegalChars = FALSE
)
```

```
generate_ids(x, stopOnIllegalChars = FALSE)
```

## Arguments

prefix	An identifier prefix.
stopOnIllegalChars	
	Whether to base::stop() or produce a base::warning() when encountering illegal characters (i.e. anything other than a letter or underscore).
x	A vector of identifier prefixes.

#### Value

a character vector containing the identifier(s).

#### Examples

```
generate_id('attitude');
```

invert_id Invert identifier
-----------------------------

#### Description

Invert the identifier (generated by generate\_id() for one or more constructs. This means that the identifier prefix is stripped and the last part is converted back from base 30 to base 10.

#### Usage

invert\_id(x)

## load\_dct\_dir

#### Arguments

х

The identifier(s) as a character vector.

#### Value

The identifier(s) as a numeric vector.

#### Examples

invert\_id(generate\_id('example'));

load\_dct\_dir

Load DCT specifications from a file or multiple files

## Description

These function load DCT specifications from the YAML fragments in one (load\_dct\_specs) or multiple files (load\_dct\_dir).

#### Usage

```
load_dct_dir(
  path,
  recursive = TRUE,
  extension = "\\.rock|\\.dct\\.yaml|\\.yaml|\\.yml",
  regex,
  dctContainer = "dct",
  headingLevel = 2,
  delimiterRegEx = "^---$",
  ignoreOddDelimiters = FALSE,
  encoding = "UTF-8",
  sortDecreasing = FALSE,
  silent = TRUE
)
load_dct_specs(
  text,
  file,
  delimiterRegEx = "^---$",
  dctContainer = "dct",
  headingLevel = 2,
  ignoreOddDelimiters = FALSE,
  encoding = "UTF-8",
  silent = TRUE
)
## S3 method for class 'dct_specs'
```

```
print(x, ...)
```

```
## S3 method for class 'dct_specs'
plot(x, ...)
```

## Arguments

path	The path containing the files to read.
recursive	Whether to also process subdirectories (TRUE) or not (FALSE).
extension	The extension of the files to read; files with other extensions will be ignored. Multiple extensions can be separated by a pipe ( ).
regex	Instead of specifing an extension, it's also possible to specify a regular expres- sion; only files matching this regular expression are read. If specified, regex takes precedece over extension,
dctContainer	The container of the DCT specifications in the YAML fragments. Because only DCT specifications are read that are stored in this container, the files can contain YAML fragments with other data, too, without interfering with the parsing of the DCT specifications.
headingLevel	The level of the Markdown headings that are produced.
delimiterRegEx	The regular expression used to locate YAML fragments
ignoreOddDelimi	iters Whether to throw an error (FALSE) or delete the last delimiter (TRUE) if an odd number of delimiters is encountered.
encoding	The encoding to use when calling readLines(). Set to NULL to let readLines() guess.
sortDecreasing	Whether to sort the constructs in decreasing order (TRUE), in increasing order (FALSE), or not at all (NULL).
silent	Whether to be silent (TRUE) or informative (FALSE).
text, file	As text or file, you can specify a file to read with encoding encoding, which will then be read using base::readLines(). If the argument is named text, whether it is the path to an existing file is checked first, and if it is, that file is read. If the argument is named file, and it does not point to an existing file, an error is produced (useful if calling from other functions). A text should be a character vector where every element is a line of the original source (like provided by base::readLines()); although if a character vector of one element <i>and</i> including at least one newline character (\\n) is provided as text, it is split at the newline characters using base::strsplit(). Basically, this behavior means that the first argument can be either a character vector or the path to a file; and if you're specifying a file and you want to be certain that an error is thrown if it doesn't exist, make sure to name it file.
x	The parsed parsed_dct object.
	Any other arguments are passed to the print command.

#### opts

## Details

load\_dct\_dir simply identifies all files and then calls load\_dct\_specs for each of them. load\_dct\_specs loads the YAML fragments containing the DCT specifications using yum: :load\_yaml\_fragments() and then parses the DCT specifications into a visual representation as a DiagrammeR::DiagrammeR graph and Markdown documents with the instructions for creating measurement instruments or manipulations, and for coding measurement instruments, manipulations, or aspects of a construct.

## Value

An object with the DiagrammeR::DiagrammeR graph stored in output\$basic\_graph, a DiagrammeR::DiagrammeR graph with a summary of which specifications are provided for each construct in output\$completeness\_graph and the instructions in output\$instr.

#### Examples

## End(Not run)

opts

Options for the psyverse package

#### Description

The psyverse::opts object contains three functions to set, get, and reset options used by the escalc package. Use psyverse::opts\$set to set options, psyverse::opts\$get to get options, or psyverse::opts\$reset to reset specific or all options to their default values.

#### Usage

opts

## Format

An object of class list of length 4.

It is normally not necessary to get or set psyverse options.

The following arguments can be passed:

... For psyverse::opts\$set, the dots can be used to specify the options to set, in the format option = value, for example, encoding = "UTF-8". For psyverse::opts\$reset, a list of options to be reset can be passed.

option For psyverse::opts\$set, the name of the option to set.

**default** For psyverse::opts\$get, the default value to return if the option has not been manually specified.

The following options can be set:

encoding The default encoding used to read or write files.

## Examples

```
### Get the default encoding
psyverse::opts$get(encoding);
### Set it to UTF-8-BOM
psyverse::opts$set(encoding = "UTF-8-BOM");
### Check that it worked
psyverse::opts$get(encoding);
### Reset this option to its default value
psyverse::opts$reset(encoding);
### Check that the reset worked, too
psyverse::opts$get(encoding);
```

parse\_dct\_specs Parse DCT specifications

#### Description

This function parses DCT specifications; it's normally called by load\_dct\_dir() or load\_dct\_specs(), so you won't have to use it directly.

#### Usage

```
parse_dct_specs(
    dctSpecs,
    headingLevel = 2,
    hyperlink_UCIDs = TRUE,
```

```
urlPrefix = "#",
HTMLoutput = FALSE,
sortDecreasing = FALSE
)
```

## Arguments

dctSpecs	The DCT specifications (a list).
headingLevel	The heading level for Markdown output.
hyperlink_UCIDs, urlPrefix, HTMLoutput	
	Passed on to the generate_instruction_overview() and generate_construct_overview() functions.
sortDecreasing	Whether to sort the constructs in decreasing order (TRUE), in increasing order (FALSE), or not at all (NULL).

## Value

The object of parsed DCT specifications.

read\_spreadsheet Convenience function to read spreadsheet-like files

## Description

Currently reads spreadsheets from Google Sheets or from xlsx, csv, or sav files. Normally, you don't use this, but instead you use dct\_from\_spreadsheet().

## Usage

```
read_spreadsheet(
    x,
    sheet = NULL,
    columnDictionary = NULL,
    localBackup = NULL,
    exportGoogleSheet = TRUE,
    flattenSingleDf = FALSE,
    xlsxPkg = c("rw_xl", "openxlsx", "XLConnect"),
    failQuietly = FALSE,
    silent = psyverse::opts$get("silent")
)
```

#### Arguments

х	The URL or path to a file.
sheet	Optionally, the name(s) of the worksheet(s) to select.

columnDictionar	^y	
	Optionally, a dictionary with column names to check for presence. A named list of vectors.	
localBackup	If not NULL, a valid filename to write a local backup to.	
exportGoogleSheet		
	If x is a URL to a Google Sheet, instead of using the googlesheets4 package to download the data, by passing exportGoogleSheet=TRUE, an export link will be produced and the data will be downloaded as Excel spreadsheet.	
flattenSingleDf		
	Whether to return the result as a data frame if only one data frame is returned as a result.	
xlsxPkg	Which package to use to work with Excel spreadsheets.	
failQuietly	Whether to give an error when x is not a valid URL or existing file, or just return NULL invisibly.	
silent	Whether to be silent or chatty.	

## Value

A list of dataframes, or, if only one data frame was loaded and flattenSingleDf is TRUE, a data frame.

## Examples

```
### Note that this example requires an internet connection!
read_spreadsheet(
    paste0(
        "https://docs.google.com/",
        "spreadsheets/d/",
        "1bHDzpCu4CwEa5_3_q_9vH2691XPhCS3e4Aj_HLhw_U8"
    )
);
```

repeatStr

## Repeat a string a number of times

## Description

Repeat a string a number of times

## Usage

repeatStr(n = 1, str = " ")

## save\_to\_yaml

#### Arguments

n, str	Normally, respectively the frequency with which to repeat the string and the
	string to repeat; but the order of the inputs can be switched as well.

## Value

A character vector of length 1.

## Examples

```
### 10 spaces:
repStr(10);
### Three euro symbols:
repStr("\u20ac", 3);
```

```
save_to_yaml
```

Save a psyverse object or YAML character vector to a file

## Description

Pretty much what it says on the box. But check the bit about encoding.

## Usage

```
save_to_yaml(
    x,
    file,
    preventOverwriting = psyverse::opts$get("preventOverwriting"),
    encoding = psyverse::opts$get("encoding")
)
```

## Arguments

х	The object to save.
file	The file to save to.
preventOverwriting	
	Whether to prevent overwriting.
encoding	The encoding to use. Note that in general, encoding seems to have been invented primarily as a source of frustration, and it rarely disappoints. If unsure, use UTF-8. If using UTF-8, the approach from https://kevinushey.github.io/blog/2018/02/21/string-encoding-and-r/ will be used.

## Value

The character vector that was written to the file.

vecTxt

## Description

Easily parse a vector into a character value

## Usage

```
vecTxt(
  vector,
  delimiter = ", ",
  useQuote = "",
  firstDelimiter = NULL,
  lastDelimiter = " & ",
  firstElements = 0,
  lastElements = 1,
  lastHasPrecedence = TRUE
)
vecTxtQ(vector, useQuote = "'", ...)
```

## Arguments

vector	The vector to process.	
delimiter, firstDelimiter, lastDelimiter		
	The delimiters to use for respectively the middle, first firstElements, and last lastElements elements.	
useQuote	This character string is pre- and appended to all elements; so use this to quote all elements (useQuote="""), doublequote all elements (useQuote='"'), or anything else (e.g. useQuote=' '). The only difference between vecTxt and vecTxtQ is that the latter by default quotes the elements.	
firstElements, lastElements		
	The number of elements for which to use the first respective last delimiters	
lastHasPrecedence		
	If the vector is very short, it's possible that the sum of firstElements and lastEle- ments is larger than the vector length. In that case, downwardly adjust the num- ber of elements to separate with the first delimiter (TRUE) or the number of ele- ments to separate with the last delimiter (FALSE)?	
	Any addition arguments to vecTxtQ are passed on to vecTxt.	

#### Value

A character vector of length 1.

## viewHTML

## Examples

vecTxtQ(names(mtcars));

viewHTML

Display HTML

## Description

This function displays HTML in the viewer, adding <body> and <head> tags (which should therefore not be included in the fragment).

## Usage

```
viewHTML(x, title = "Psyverse", css = "body {font-size: 16px;}")
```

## Arguments

х	The HTML fragment
title	The title
css	CSS

## Value

Invisibly, x, with the extra HTML bits added.

#### Examples

```
### Only run this example in an interactive R session,
### as it shows the HTML in the viewer.
if (interactive()) {
    psyverse::viewHTML("<strong>Hello world!</strong>");
}
```

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