

# likert: An R Package for Visualizing and Analyzing Likert-Based Items

Presentation for the 2013 useR! Conference

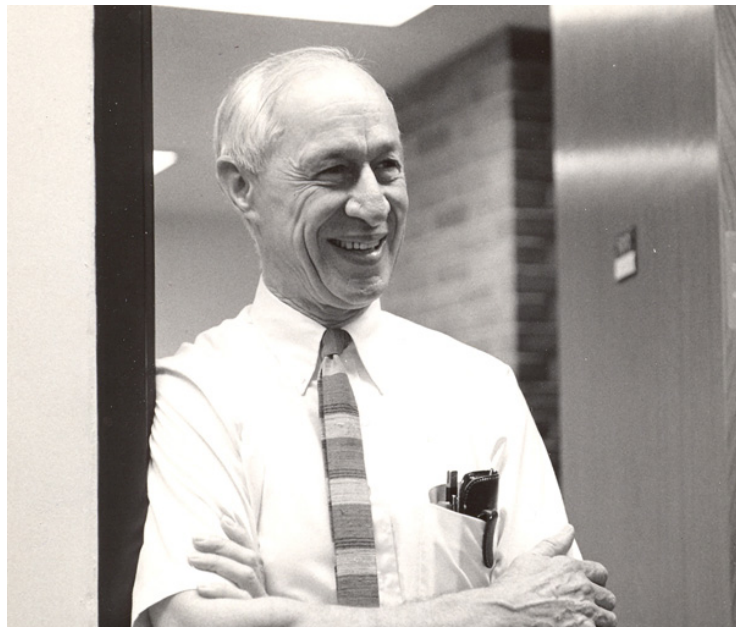
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# Background



## Categorical vs. Continuous

Categorical vs. Continuous

Know your data!

# likert: An R Package for Visualization and Analysis of Likert-Based Items

This package aims to provide the necessary tools to allow the user to make his/her own decisions about how the data should be treated, while also providing figures that may help clarify how well the assumptions discussed here hold up.

## Motivation

- summarize likert type items
- provide tabular results
- provide visualizations
- allow flexibility (e.g. `ggplot2` annotate)
- have a consistent aesthetic
- use familiar S3 generics (i.e. `print`, `plot`, `summary`)

# Data

```
> require(likert)
> require(pisa)
> data(pisaitems)
```

The figures to follow will use Item 24 regarding 'Reading Attitudes' from the Programme for International Student Assessment (PISA) from `pisaitems` dataframe in the `pisa` package, which asks:

- I read only if I have to.
- Reading is one of my favorite hobbies.
- I like talking about books with other people.
- I find it hard to finish books.
- I feel happy if I receive a book as a present.
- For me, reading is a waste of time.
- I enjoy going to a bookstore or a library.
- I read only to get information that I need.
- I cannot sit still and read for more than a few minutes.
- I like to express my opinions about books I have read.
- I like to exchange books with my friends.

# The likert Function

```
> l24 = likert(items24)
> class(l24)
[1] "likert"
> print(l24, row.names=FALSE)
```

	Item			
	I read only if I have to.			
	Reading is one of my favorite hobbies.			
	I like talking about books with other people.			
	I find it hard to finish books.			
	I feel happy if I receive a book as a present.			
	For me, reading is a waste of time.			
	I enjoy going to a bookstore or a library.			
	I read only to get information that I need.			
	I cannot sit still and read for more than a few minutes.			
	I like to express my opinions about books I have read.			
	I like to exchange books with my friends.			
Strongly disagree	Disagree	Agree	Strongly agree	
23	36	31	10.7	
20	36	32	11.4	

# Summary

```
> summary(124)
```

				Item	
1				I read only if I have to.	
2				Reading is one of my favorite hobbies.	
3				I like talking about books with other people.	
4				I find it hard to finish books.	
5				I feel happy if I receive a book as a present.	
6				For me, reading is a waste of time.	
7				I enjoy going to a bookstore or a library.	
8				I read only to get information that I need.	
9				I cannot sit still and read for more than a few minutes.	
10				I like to express my opinions about books I have read.	
11				I like to exchange books with my friends.	
	low	neutral	high	mean	sd
1	59	NA	41	2.3	0.94
2	57	NA	43	2.3	0.93
3	55	NA	45	2.3	0.91
4	65	NA	35	2.2	0.90
5	47	NA	53	2.5	0.94

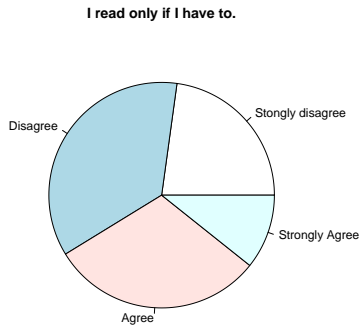


# Plots

```
> plot(124)
```

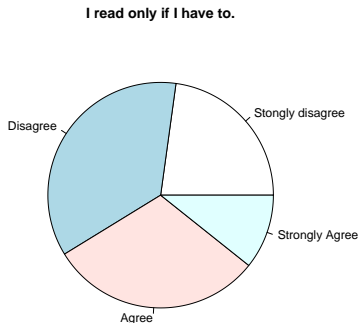
# Plots

```
> plot(124)
```



# Plots

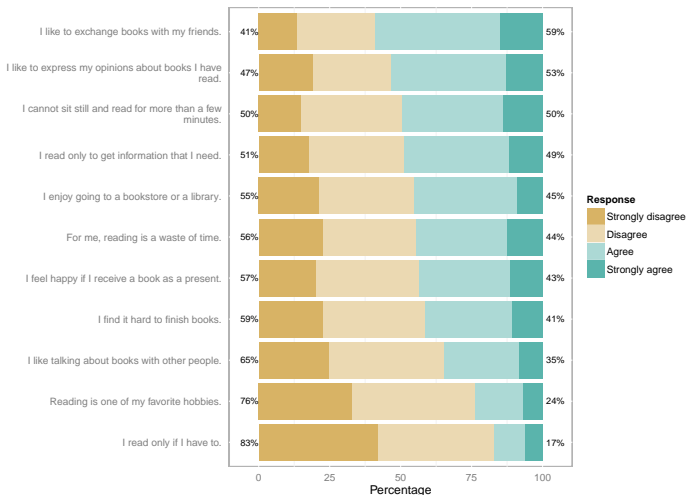
```
> plot(124)
```



# Just kidding!

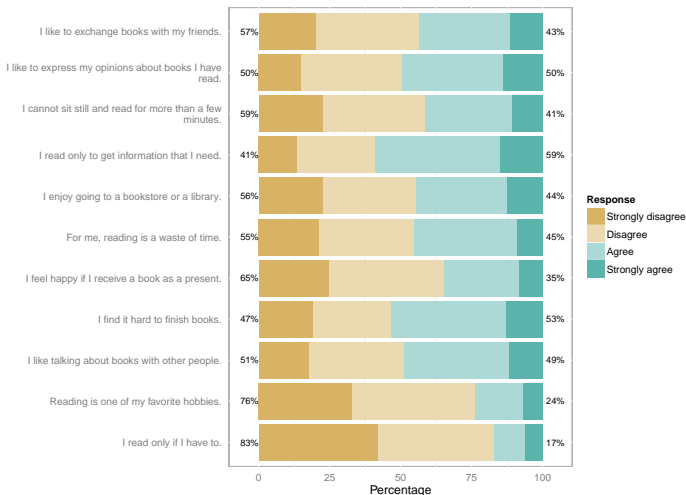
# Stacked Bar Chart

```
> plot(124)
```



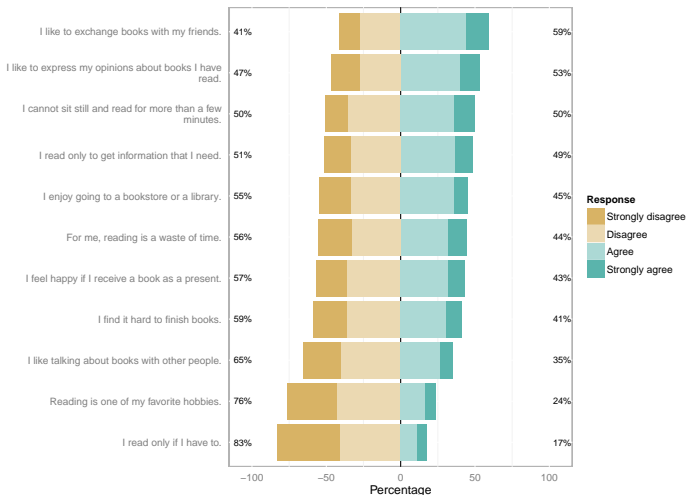
# Stacked Bar Chart

```
> plot(124, ordered=FALSE)
```

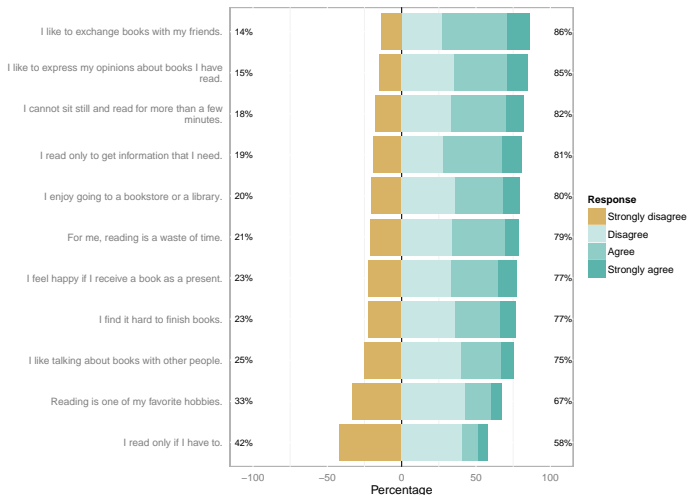


# centered

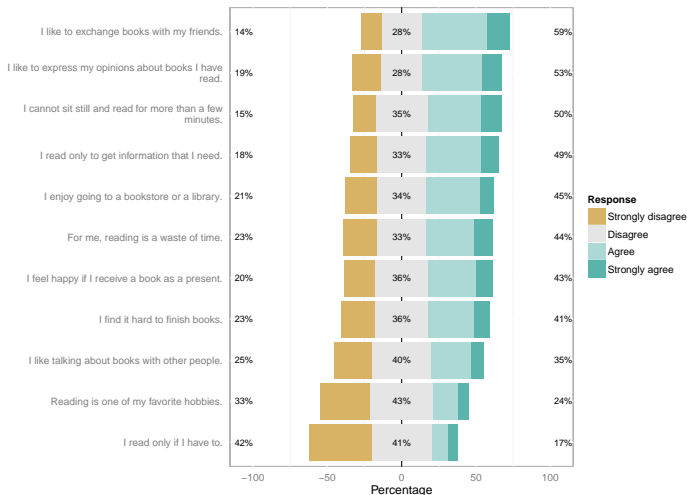
```
> plot(124, centered=TRUE)
```



```
> plot(124, centered=TRUE, center=1.5)
```



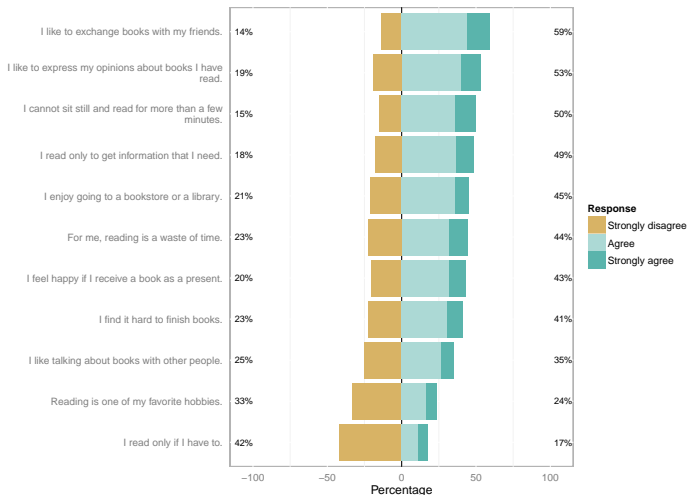
```
> plot(124, centered=TRUE, center=2)
```





# include.center=FALSE

```
> plot(124, centered=TRUE, center=2, include.center=FALSE)
```



# summary (defining the center group)

```
> summary(l24, center=1.5)
```

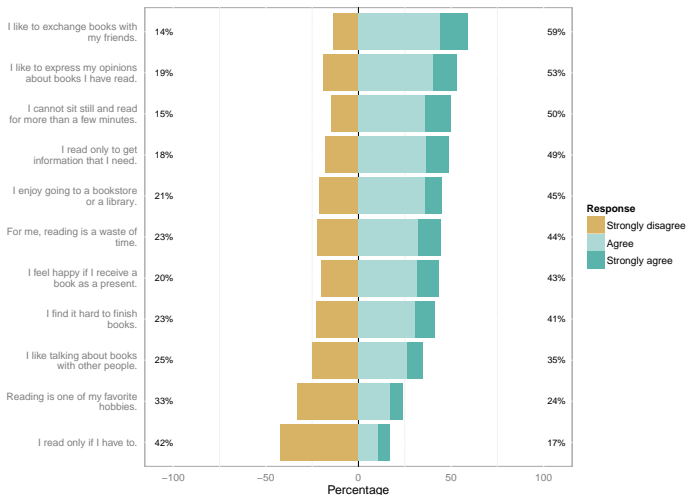
				Item	
1				I read only if I have to.	
2				Reading is one of my favorite hobbies.	
3				I like talking about books with other people.	
4				I find it hard to finish books.	
5				I feel happy if I receive a book as a present.	
6				For me, reading is a waste of time.	
7				I enjoy going to a bookstore or a library.	
8				I read only to get information that I need.	
9				I cannot sit still and read for more than a few minutes.	
10				I like to express my opinions about books I have read.	
11				I like to exchange books with my friends.	
	low	neutral	high	mean	sd
1	23	NA	77	2.3	0.94
2	20	NA	80	2.3	0.93
3	21	NA	79	2.3	0.91
4	25	NA	75	2.2	0.90
5	19	NA	81	2.5	0.94

# summary (defining the center group)

```
> summary(124, center=2)
```

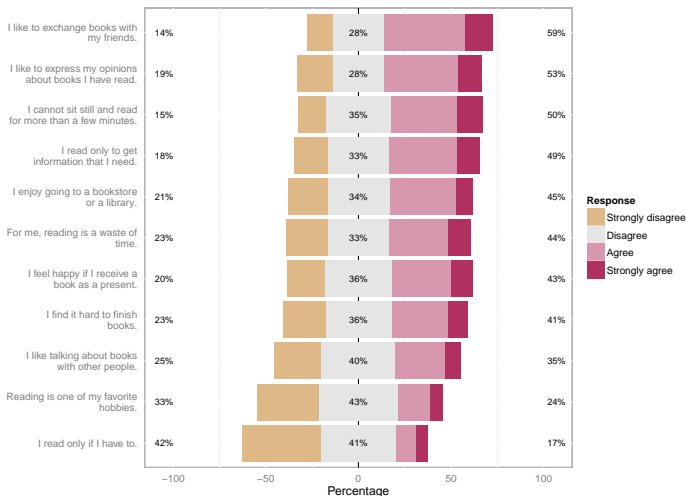
					Item
1					I read only if I have to.
2					Reading is one of my favorite hobbies.
3					I like talking about books with other people.
4					I find it hard to finish books.
5					I feel happy if I receive a book as a present.
6					For me, reading is a waste of time.
7					I enjoy going to a bookstore or a library.
8					I read only to get information that I need.
9					I cannot sit still and read for more than a few minutes.
10					I like to express my opinions about books I have read.
11					I like to exchange books with my friends.
	low	neutral	high	mean	sd
1	23	36	41	2.3	0.94
2	20	36	43	2.3	0.93
3	21	34	45	2.3	0.91
4	25	40	35	2.2	0.90
5	19	28	53	2.5	0.94

```
> plot(124, centered=TRUE, center=2, include.center=FALSE, wrap=30)
```



# changing colors

```
> plot(124, centered=TRUE, center=2, include.center=TRUE, wrap=30,  
      low.color='burlywood', high.color='maroon')
```

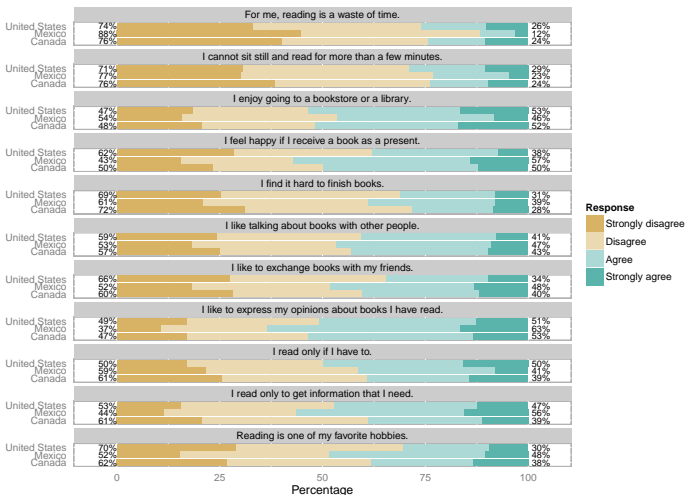


# grouping

```
> l24g <- likert(items24, grouping=pisaitems$CNT)
```

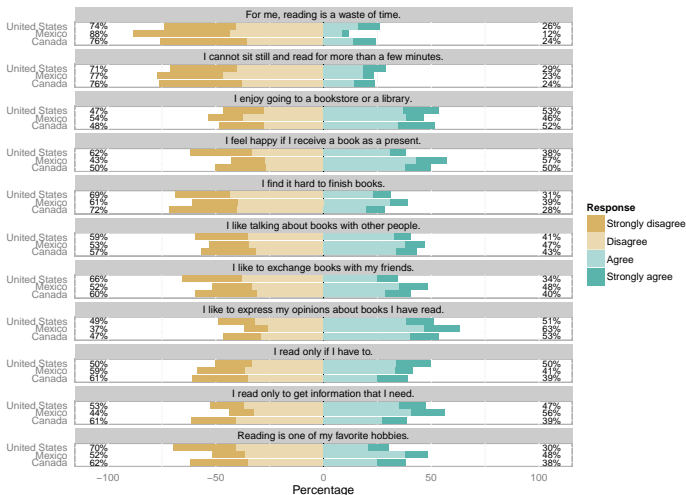
# Grouping

> `plot(124g)`



# Grouped Bar Plot

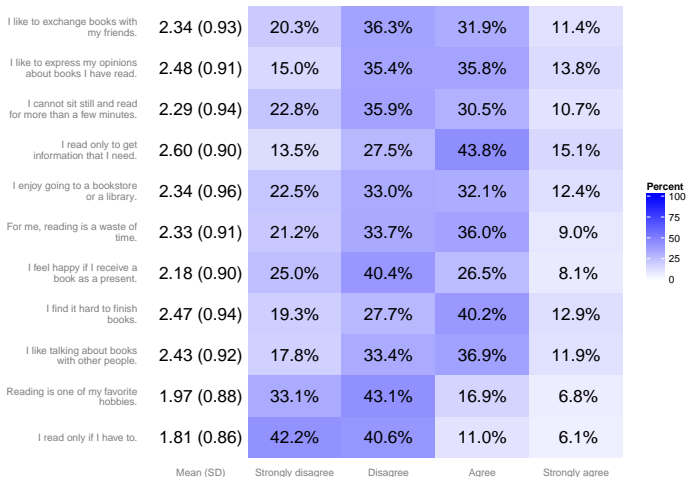
```
> plot(124g, centered=TRUE)
```





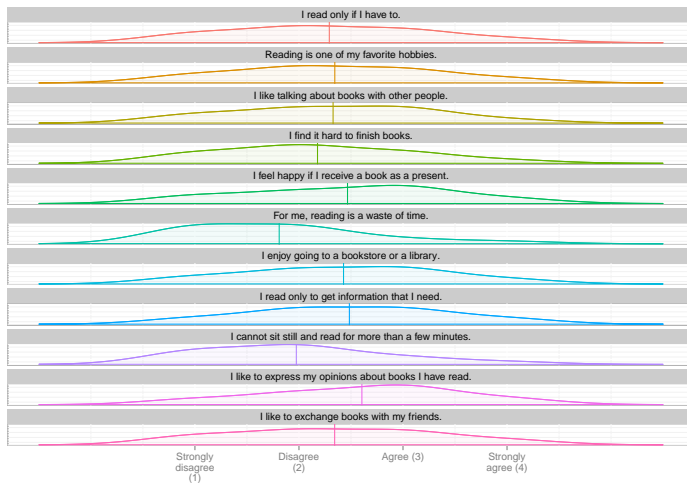
# Heat Plot

```
> plot(124, type='heat', wrap=30, text.size=6)
```



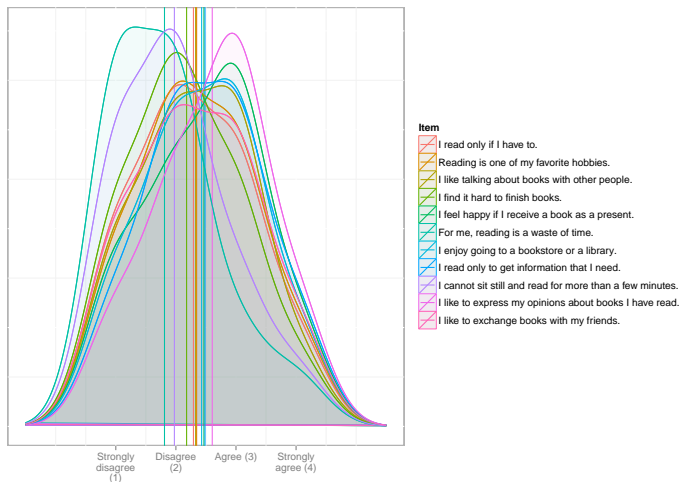
# Faceted Density Plot

```
> plot(124, type="density")
```



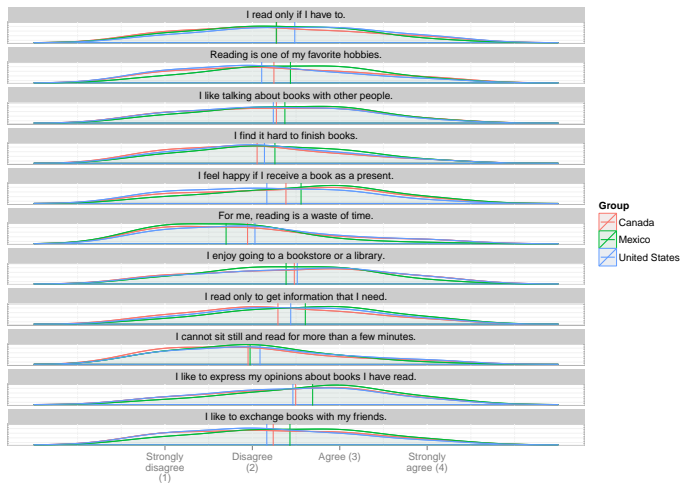
# Density Plot

```
> plot(124, type="density", facet=FALSE)
```



# Grouped Density Plot

```
> plot(l24g, type="density")
```



# Future Directions

- release version 1.1 to CRAN (probably next week, currently available on GitHub)  

```
> require(devtools)
```

```
> install_github("likert", "jbryer")
```
- xtable functions
- ability to analyze and visualize gap analysis (e.g. items with importance and satisfaction)
- matrix plot (currently experimental)

# Thank You

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<http://github.com/jbryer/likert>