Kahoot!

LaTeX for psychological researchers

Lecture 1: Introducton

Sacha Epskamp

University of Amsterdam
Department of Psychological Methods

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Contact Details

Workshop website:

- `http://sachaepskamp.com/latex-workshop`

Further reading:

- `http://en.wikibooks.org/wiki/LaTeX`

Workshop Outline

9-10: Introduction

11-12: Basics of writing in LaTeX

13-14: Writing APA style articles

Today's lecture

Introduction

What is LaTeX?

Why use LaTeX?
- LaTeX vs WYSIWYG

Obtaining LaTeX

Making a first LaTeX document

Hello world example

What is LaTeX?

LaTeX is...

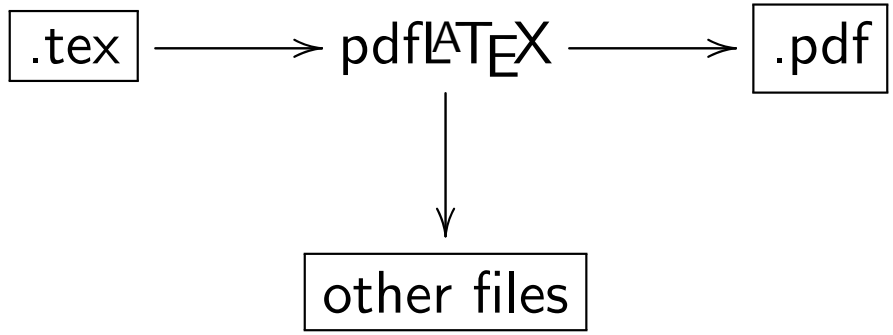
- A program that takes a plain text file with codes as input and produces a output document
  - This process is usually called *compiling*
  - The input is a plain text file with `.tex` extension
  - The output is a multipage vector based image file. In the past this was `.DVI` but nowadays mostly `pdf` and `postscript` are used
  - We will use `.pdf`, which can be created with the pdfLaTeX program
- The programming language in which the input file is written

What is LaTeX?

LaTeX refers to the *programming language* used to write the input file and the *program* used to interpret this file and compile the output file. It does **not** refer to an editor in which you write the input file.

What is LaTeX?

Simple representation:



WYSIWYG programs

- LaTeX is completely different from What You See Is What You Get programs (WYSIWYG) you are used to
- For example:
  - Microsoft Word
  - Openoffice.org
  - LibreOffice
- The main difference between the the two is that in WYSIWYG programs you directly edit the output file while with LaTeX you edit the input file

Disadvantages of LaTeX vs. WYSIWYG

- LaTeX takes some time to learn
- LaTeXdoes not show immediatly the resulting document
- You need to know a lot of commands to use LaTeX
- It can be harder to make very specific changes in LaTeX
- LaTeX can be very frustrating when it is not clear why your document does not look the way you want it to look
- Collaboration on LaTeX documents is harder

Advantages of LaTeX vs. WYSIWYG

- In LaTeX your documents will look very professional with minimal effort
- Produce your documents in PDF
  - Your audience reads your document in a lightweight reader instead of an editor
  - Your documents do not require special software to view
  - Your documents will always look the same
- All files are plain text
- Focus on content rather than layout
- Mathematical formulae can easily be included and look good!
- Flexibility

baseline of the six variables. For an arbitrarily chosen criterion variable *j,* the model equation is as follows:

$$Y_{pdtj} = \gamma_{0pdj} + \gamma_{1pdj} \cdot cheerful_{p,d,t-1} + \gamma_{2pdj} \cdot sad_{p,d,t-1} + \gamma_{3pdj} \cdot worry_{p,d,t-1} + \gamma_{4pdj} \cdot fear_{p,d,t-1} + \gamma_{5pdj} \cdot event_{p,d,t}$$

(1)

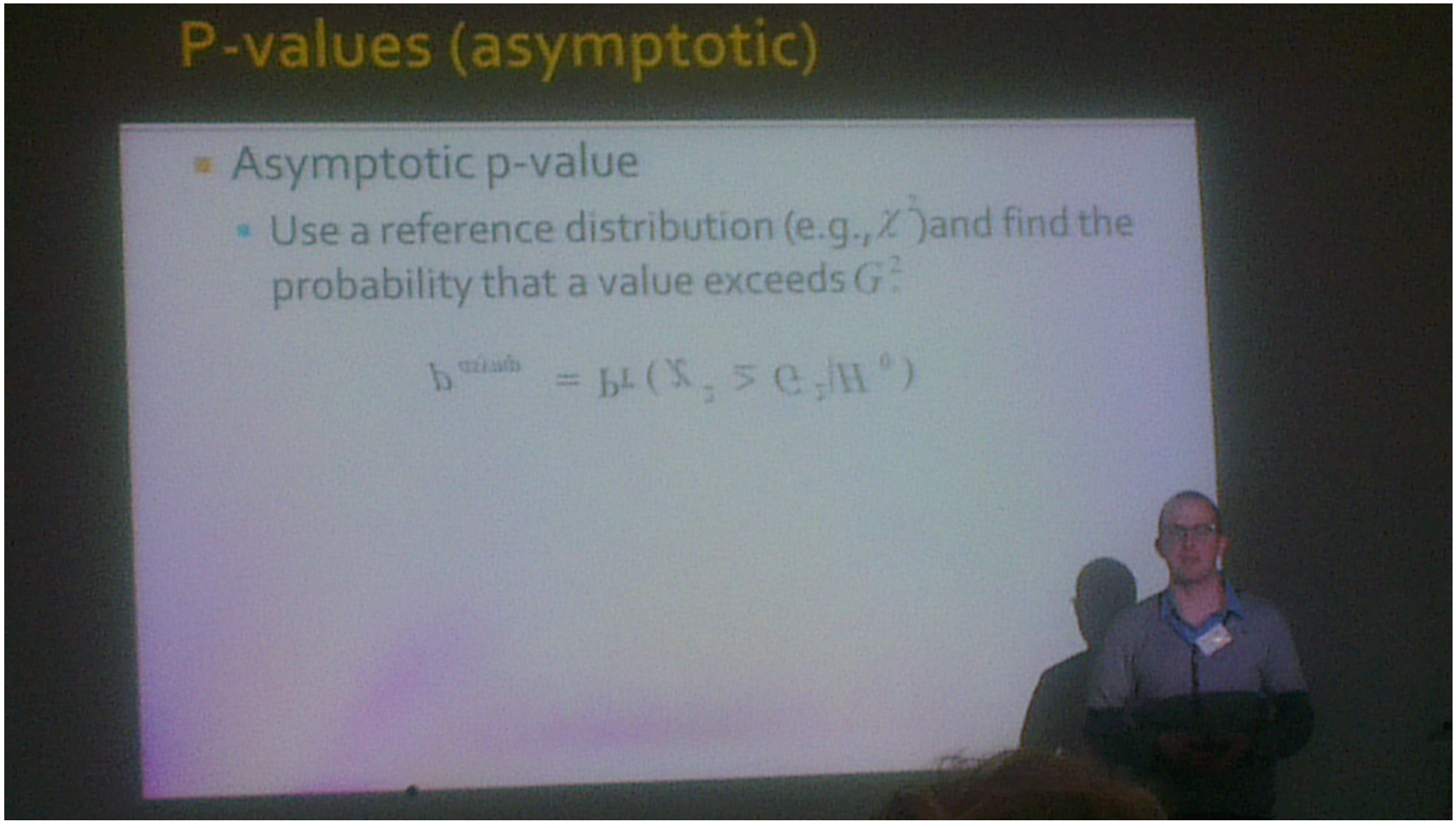
In our case, Y_{pdtj} represents the measurement for person p ($p = 1, 2, \ldots, 129$) at day d $(d = 1, 2, \ldots, 12)$ and time t of the j -th criterion variable (i.e., cheerful, relaxed, sad,

evaluated by comparing the average path length and clustering of the observed network, with a calculation of the average path length and clustering of a random network with the same amount of nodes and edges as the observed networks using the following equation;

$$SWI = \frac{\frac{Pathlengt\,h_{obs}}{Pathlengt\,h_{ran}}}{\frac{Clusterin\,g_{obs}}{Clusterin\,g_{ran}}}$$

When this small-world index is higher than 1, the network is said to exhibit the properties of a small-world network.

The results of this analysis show that both the schizophrenic and the healthy network adhere to the properties of small-


P-values (asymptotic)
Asymptotic p-value
Use a reference distribution (e.g., χ^2) and find the probability that a value exceeds G^2

Ambiguities in LaTeX vs. WYSIWYG

- LaTeX forces you to properly section your article
- Some journals require LaTeX format, and others do not accept LaTeX format

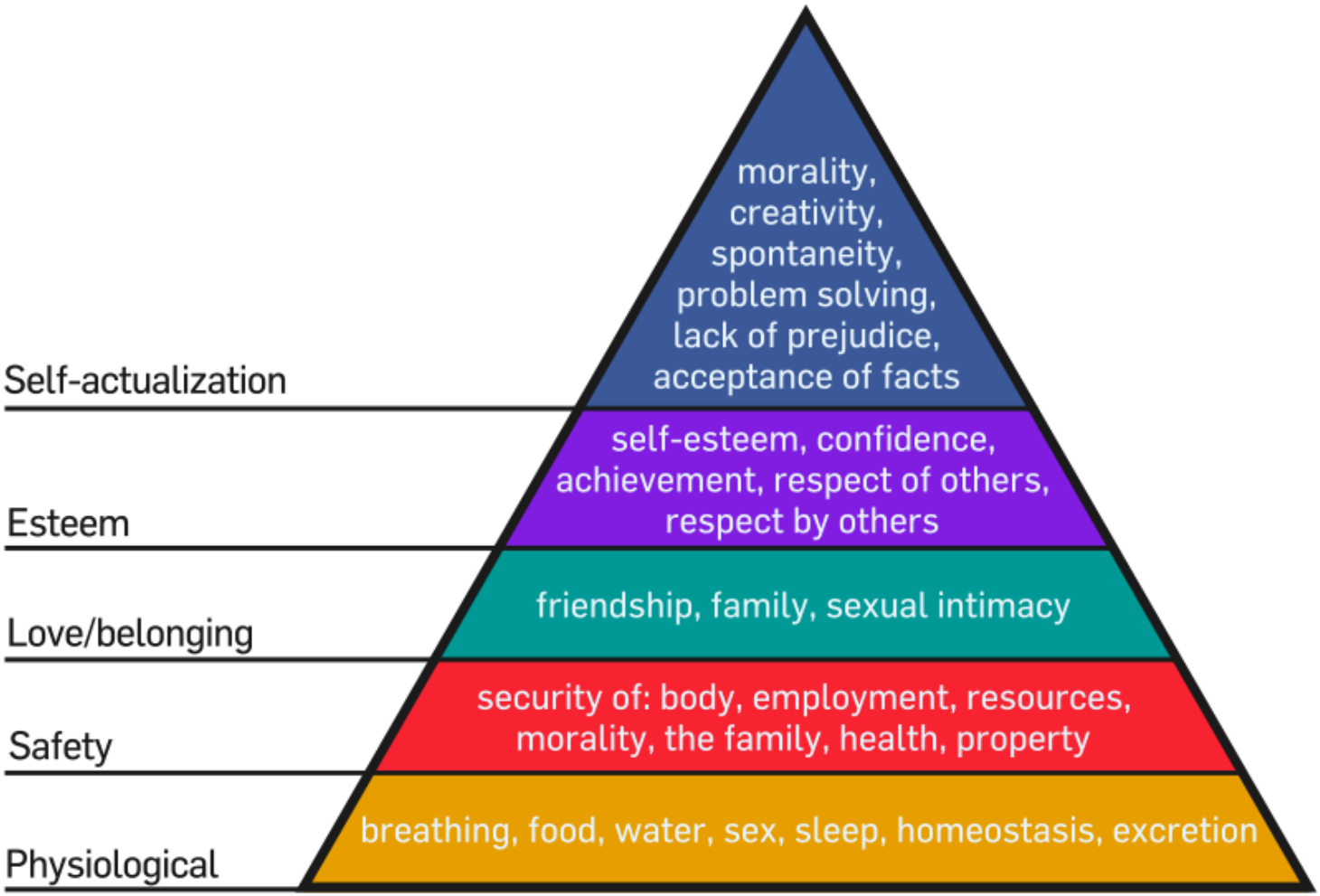
Why do **you** need to learn LaTeX?

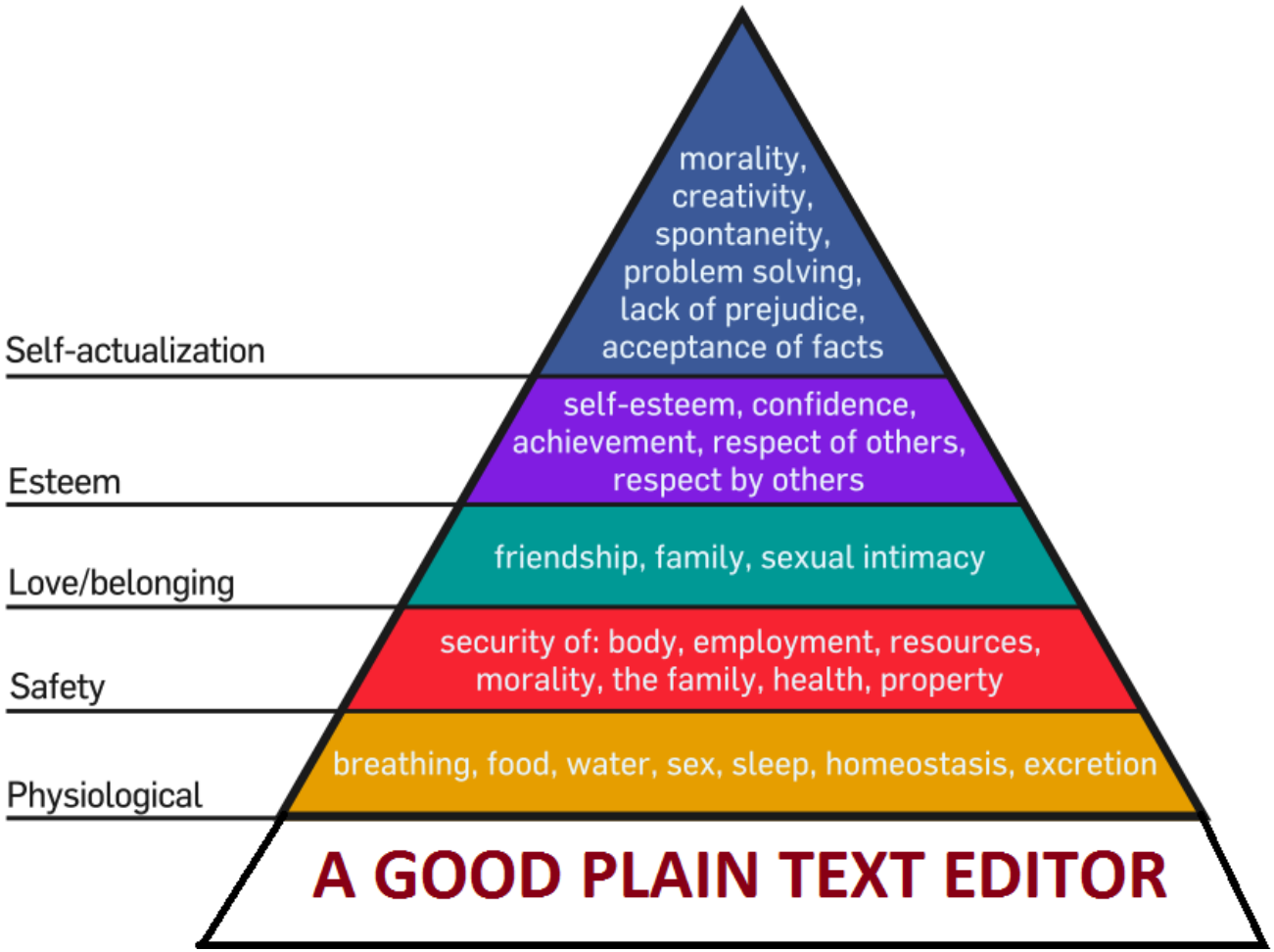
- LaTeX is vastly used, you will encounter it at some point
- Writing in LaTeX will make your work look much more professional
- LaTeX is very useful in writing assignments for the statistical courses
- Methodologists:
  - Writing mathematical texts without LaTeX is horrible
  - Most members of the department use LaTeX all the time
  - Some will require you to write in LaTeX

Obtaining LaTeX

To use LaTeX you need three things:

- A *plain text editor*
- A *LaTeX distribution*
- A program to view PDF files
  - Adobe Reader


morality, creativity, spontaneity, problem solving, lack of prejudice, acceptance of facts
Self-actualization
self-esteem, confidence, achievement, respect of others, respect by others
Esteem
friendship, family, sexual intimacy
Love/belonging
security of: body, employment, resources, morality, the family, health, property
Safety
breathing, food, water, sex, sleep, homeostasis, excretion
Physiological


Self-actualization
morality, creativity, spontaneity, problem solving, lack of prejudice, acceptance of facts
Esteem
self-esteem, confidence, achievement, respect of others, respect by others
Love/belonging
friendship, family, sexual intimacy
Safety
security of: body, employment, resources, morality, the family, health, property
Physiological
breathing, food, water, sex, sleep, homeostasis, excretion
A GOOD PLAIN TEXT EDITOR

LaTeX editors

- A LaTeX distribution supplies you with the programs needed to compile LaTeX documents
- But you also need an editor to write these documents
- As is the same with all programming languages, LaTeX documents are written in *plain text*
- Because of this, any plain text editor can be used
- Editors come in all sorts of sizes with highly different levels of complexity. In general the complexer an editor the more you can do with it
- Which editor is the best is a highly debated subject!

A good editor for LaTeX has syntax highlighting, bracket matching, included log output and shortcuts for compiling and viewing your document

plain text editors

Typically a programmer wants to use a single editor for all languages. These so called plain text editors can differ strongly. Some examples of such editors that can be used for LaTeX

Notepad++	A very nice and clean editor for Windows. Very lightweight, not much functionality besides writing code
Gedit	The default text editor for Linux. Very lightweight and can be extended with many plugins
Emacs	The editor of choice for many programmers. Very hard to learn but very useful in the end. Is an IDE for many programming languages. Some consider it to be an operating system
Vim	Another editor of choice of many programmers

Even if you don't use it for LaTeX, you want a good plain text editor!

LaTeX editors

Other editors are specialized for LaTeX:

Rstudio	If you did not use this IDE yet for R then do so. Has especially good support for `Sweave` and `knitr`
TeXniccenter	Has a menu very similar to WYSIWYG editors with shortcuts for common pieces of codes
TeXmaker	Similar to TeXniccenter with less functionality but cross platform
TeXworks	A very basic LaTeX editor which does what you want it to do and not much else. Comes default with most distributions
ShareLaTeX	Online LaTeX editor, doesn't require a local distribution and allows collaboration on LaTeX documents

More: `http://tex.stackexchange.com/questions/339/latex-editors-ides`

Which editor to use?

Depends on your needs, writing style and preferences

Need to write?	Use:
Short note, abstract, outline, any text that does not need formatting	Don't use LaTeX, use a good lightweight plain text editor (notepad++, Gedit, etcetera.)
A lot of text while New to LaTeX and used to WYSIWYG editors	Use TeXnicCenter or TeXmaker
Text in which `R` code is included or run in the background	Use RStudio or Emacs (with `knitr` package)
LaTeX texts often and programming in multiple languages	Learn a powerful editor such as Emacs
LaTeX documents together with collaborators	Use ShareLaTeX

TEXworks

- In this workshop we will be using TEXworks because it is very basic, comes default with MiKTEX and is available for Mac and Linux as well.
- Download TEXworks from `http://www.tug.org/texworks/`
- Important to note is that TEXworks is *not* the only choice. Indeed it is not even mentioned on the previous slide.

LaTeX distributions

- LaTeX is distributed through distributions
- A good distribution has a package manager that allows you go install and update packages with relative ease
- In this workshop we will be using:

  Windows: MikTeX
  Mac: MacTeX
  Linux: TeXlive

Detailed instructions to install these distributions can be found on the workshop website.

PATH variable

- The instruction guide will ask you to set something called a PATH variable
- This is a small list of paths to directories that tells your computer where it can find programs
- This enables you to run pdfLaTeX from command line
- In some editors, this is the only way to make a shortcut to LaTeX
- Might not be needed now but useful to have set right later on

A first LaTeX document

Open TeXworks, make a file with the following code:

```
\documentclass{article}
\begin{document}
Hello World!
\end{document}
```

Save this file in an empty folder. Then select “pdfLaTeX” from the drop down menu and press the play button.

Templates

- Often it can be hard to start from scratch
- Many templates exist to help you get started, find them on Google!
- Often in these comments are used to say what you need to do
  - A comment is preceded by a % sign

Contact Details

Course website:

- `http://sachaepskamp.com/latex2015`

E-mail:

- `sacha.epskamp@gmail.com`