Intelligibility of Responsive Webpages: User Perspective

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RESEARCH INTERESTS

- Frontend Development
- User Interface Development

- Usability
- User Experience
- Interaction Concepts

MASTER THESIS

“Scrutable Responsive Web Design”

- State of the Art (e.g., RWD Methods)
- Market Analysis

- Usability Tests
- RWD Guideline

PAPER

“Intelligibility of Responsive Webpages: User Perspective”

- Usability Tests

Agenda

1 MOTIVATION

Explanation of the reasons to examine this topic

2 RELATED WORK

Basis for the following experiments and results

3 EXPERIMENTS

Overview of the conducted usability tests

4 PREFERENCE-TEST

Usability Test in form of an interview

5 FIRST-CLICK-TEST

Usability Test in form of the A/B-test concept

6 DISCUSSION

Discussion of the findings and Results

Motivation

PROBLEM

Responsive Web Design (RWD) seeks to enhance user experience, but may cause, for instance, a **loss of orientation** [1][2]

GOAL

Investigating **users' mental model of responsive behavior** and compile observations into recommendations for web page designers

APPROACH

Conduct a series of experiments **targeting** various aspects of **responsive behavior**

Related Work

MENTAL  MODELS

Human expectations (or behavioral patterns) relate to so-called **“mental models”**, a central concept of human-computer interaction [3]

- Abstract models are build based on **personal experiences** [4]
- Quick interpretation and reaction to **external** and **internal** events is possible [4]

A user's mental model of the **presentation and interaction of a website** can support understanding and operation [5][6]

People have **no access** to their mental model [7]

Experiments

SURVEY

To get a **basic understanding** of users themselves in the context of RWD, a survey conducted via an **online form** was performed

PREFERENCE-TEST

Based on the survey results a preference-test in form of an **interview** was realized [8]

FIRST-CLICK-TEST

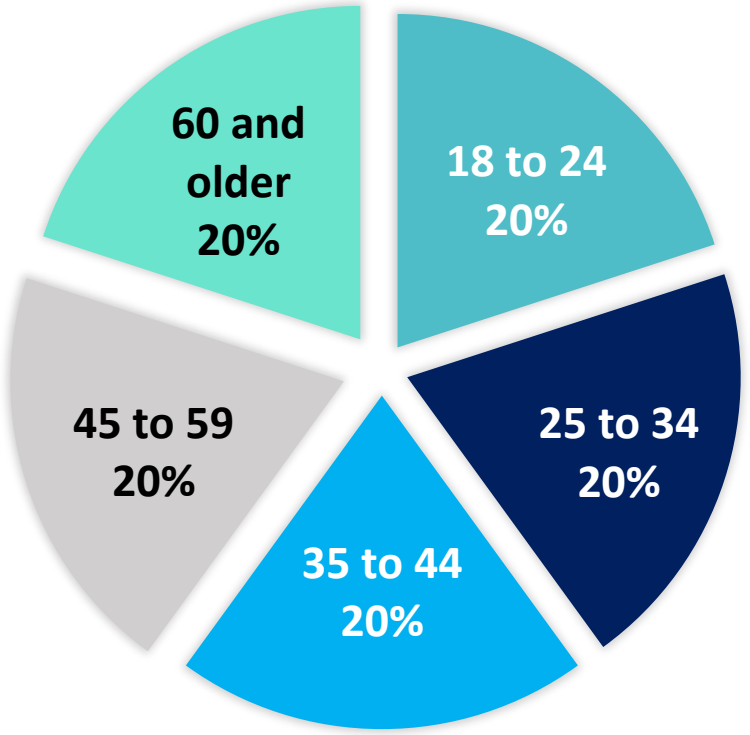
After the Preference-Test the First-Click-test was set up in the form of the **A/B-test** concept [9]

Preference-Test

- Conducted in real form
  - → Small group

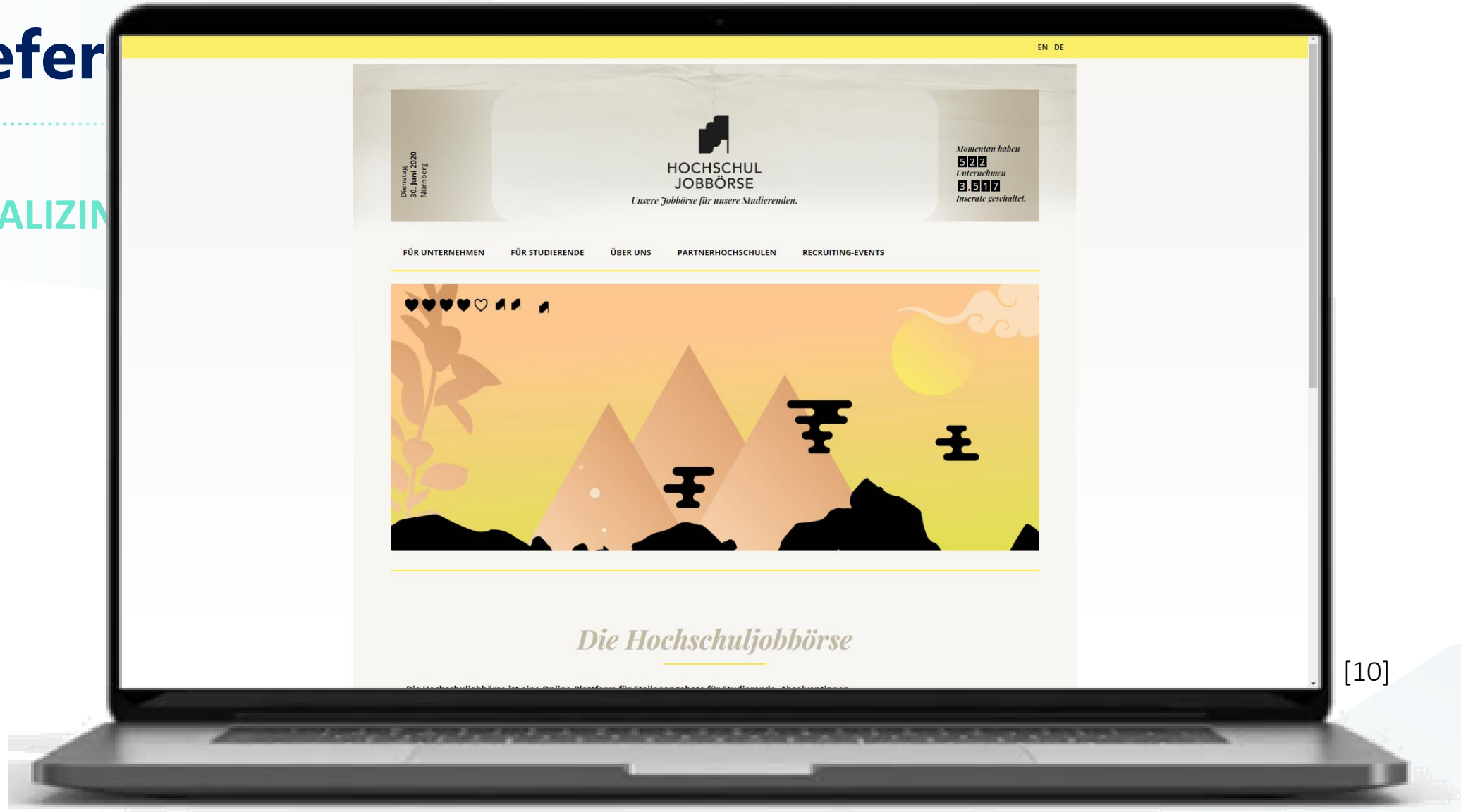
  20 PARTICIPANTS

- Preference questions about operation, menu, content and layout
  - → Supported by illustrations



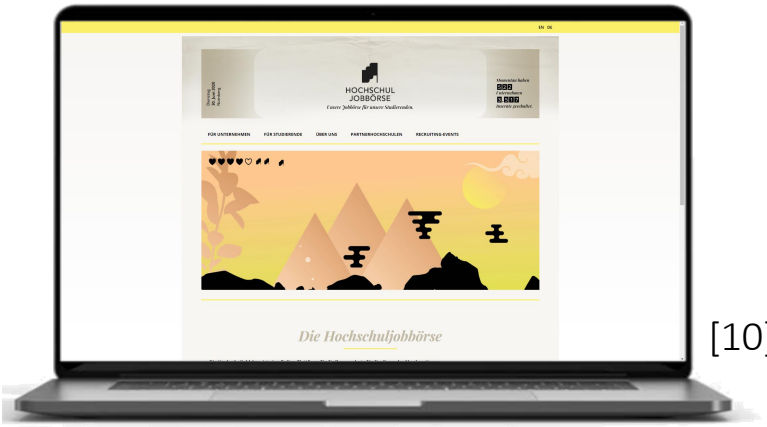
Prefer

VISUALIZIN



[10]

Preference-Test



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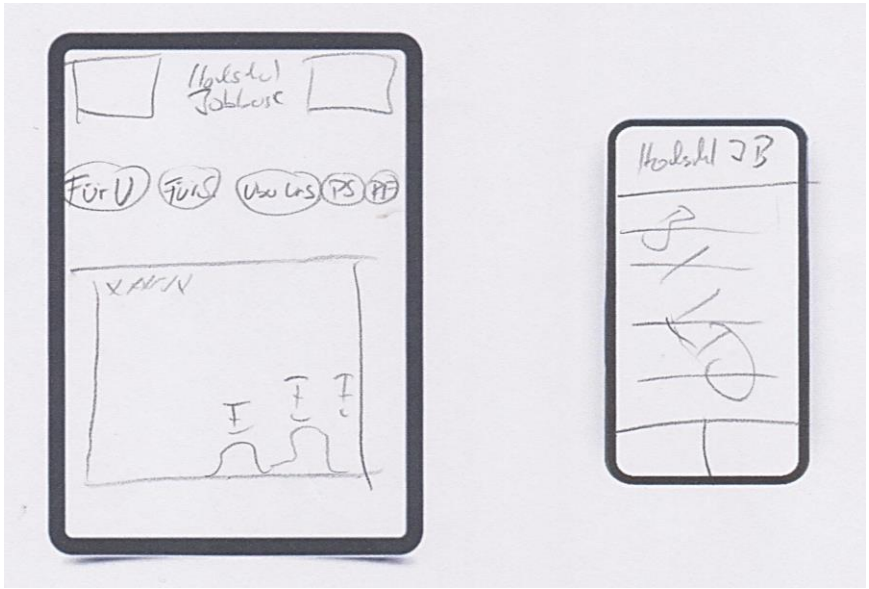
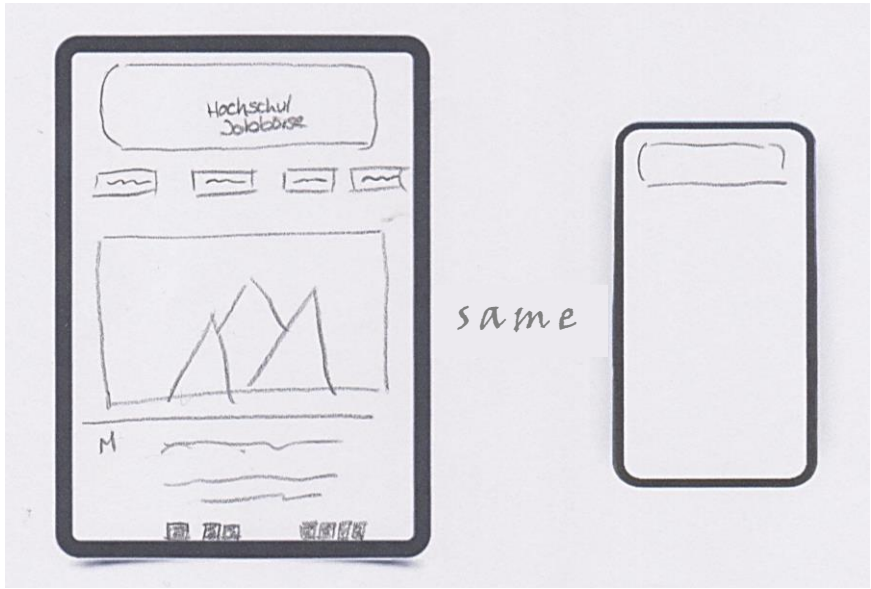
VISUALIZING WEB USERS' MENTAL MODEL

AGE: 28 | **GENDER:** male

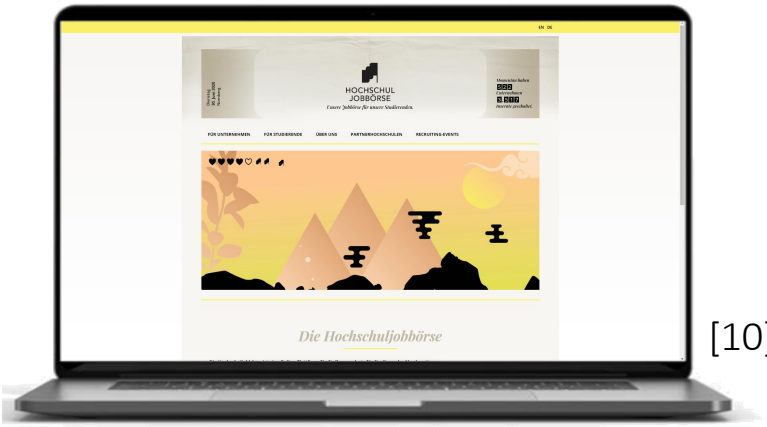


AGE: 26 | **GENDER:** female



Preference-Test

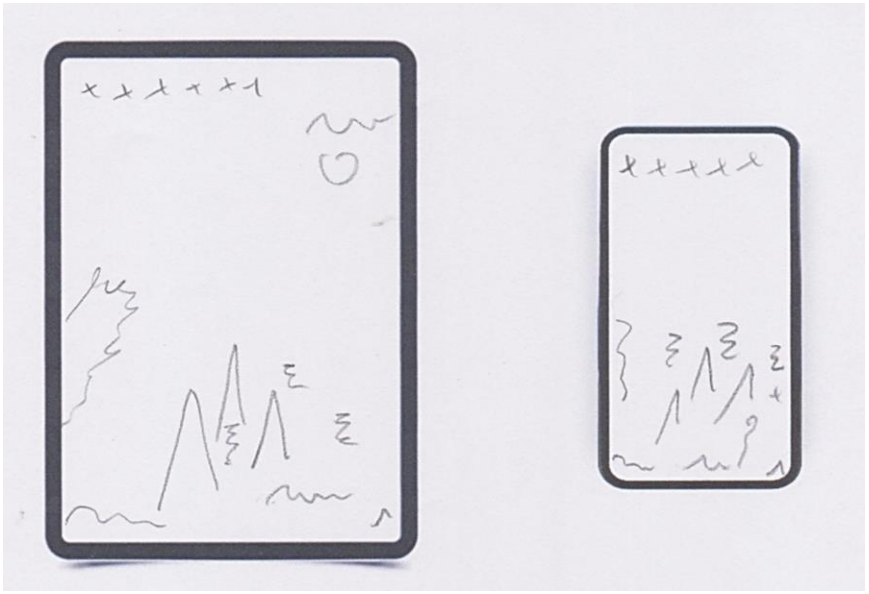
VISUALIZING WEB USERS' MENTAL MODEL



[10]

AGE: 45 | **GENDER:** female

AGE: 57 | **GENDER:** female



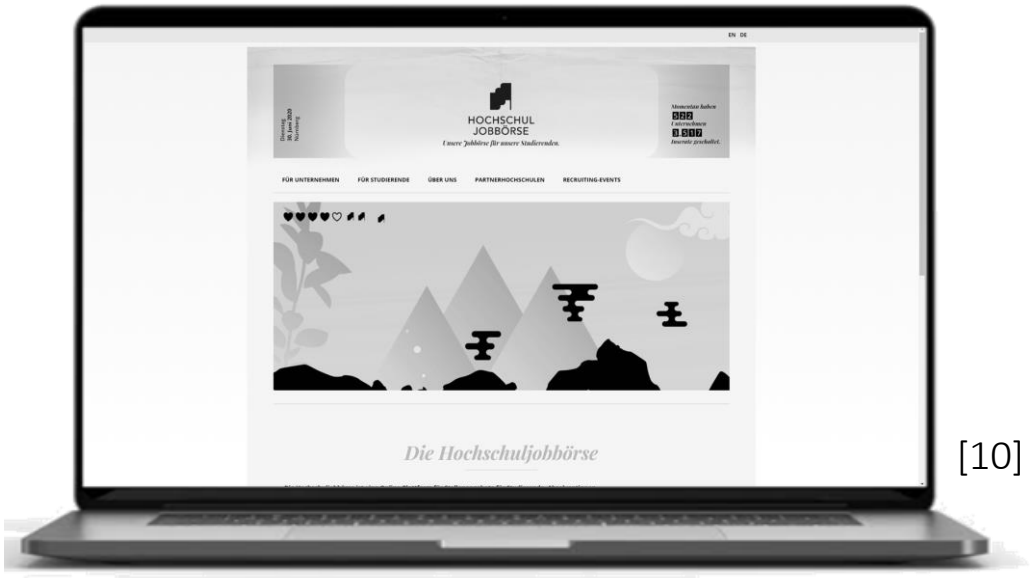
Preference-Test

VISUALIZING WEB USERS' MENTAL MODEL

- In contrast to **older** test subjects, **younger test persons** are aware of the entire webpage

  → may relate to human **brain evolution**:

  - An impact on the executive function can be expected with increasing age [11]
  - Like control of attention = used to perceive external stimuli [11]
  - Some stimuli are noticed instinctively; others require awareness and attention [11]



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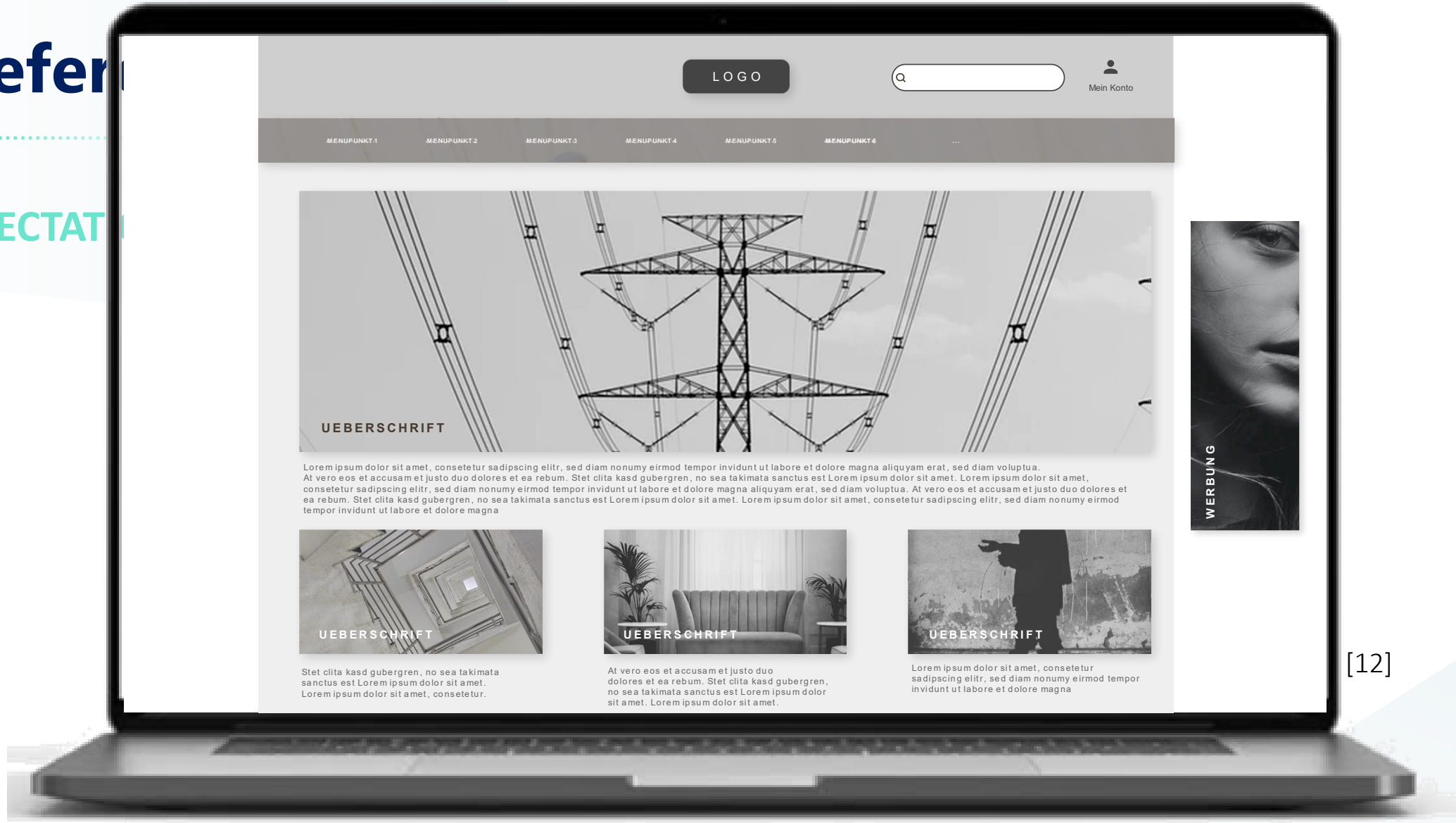
Assumption: triggered stimulus of the image might be too strong for older participants

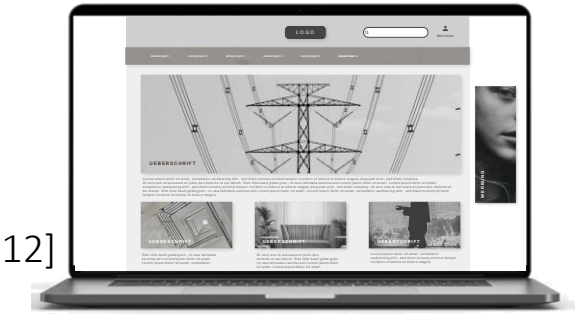
Prefer

EXPECTAT



[12]

Preferenz-Test

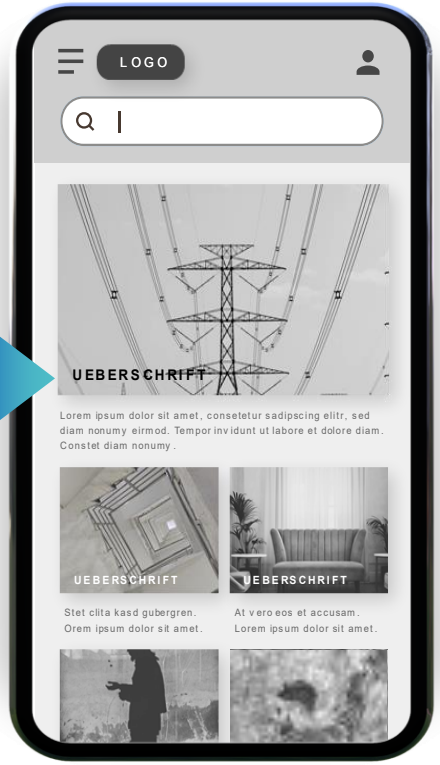

[12]

EXPECTATIONS ON CONTENT AND LAYOUT

- Content not shortened
- Only reduced in size so that it fits on the screen area
- Layout completely unchanged

[12]

65%



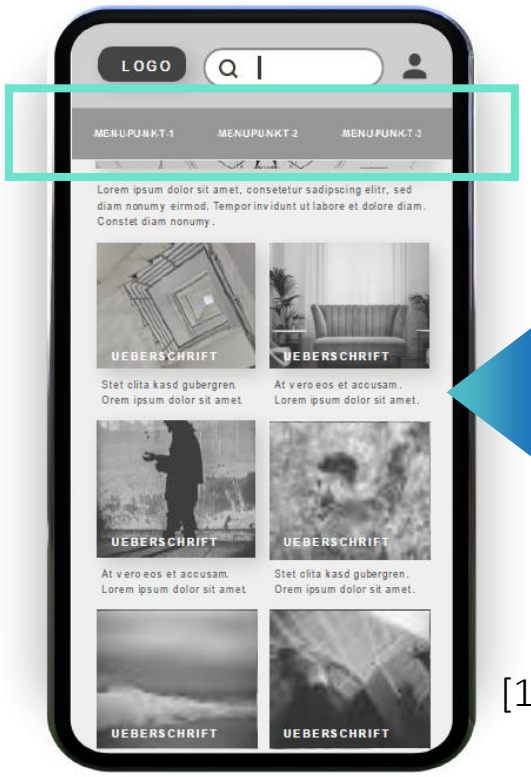
[12]

- Content shortened
- Changed Layout
- Cropped Images
- Customized Menu

Preferenz-Test

EXPECTATIONS ON MENU

Fixed Menu



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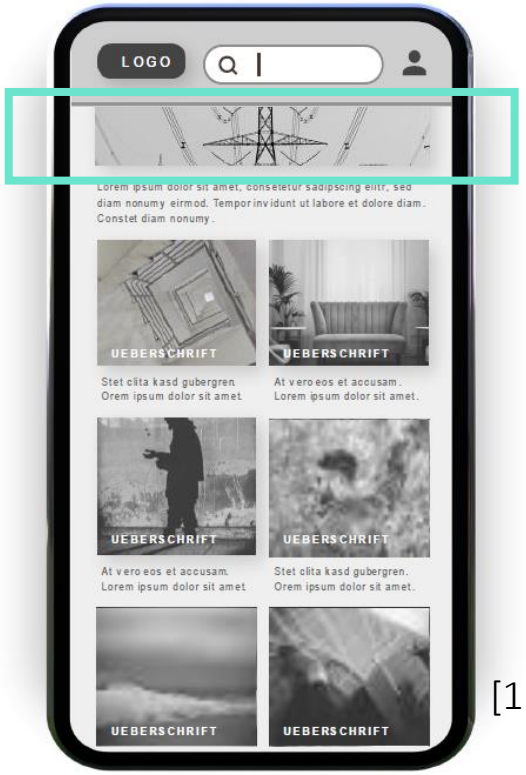


[12]

No fixed Menu

Preferenz-Test

EXPECTATIONS ON MENU

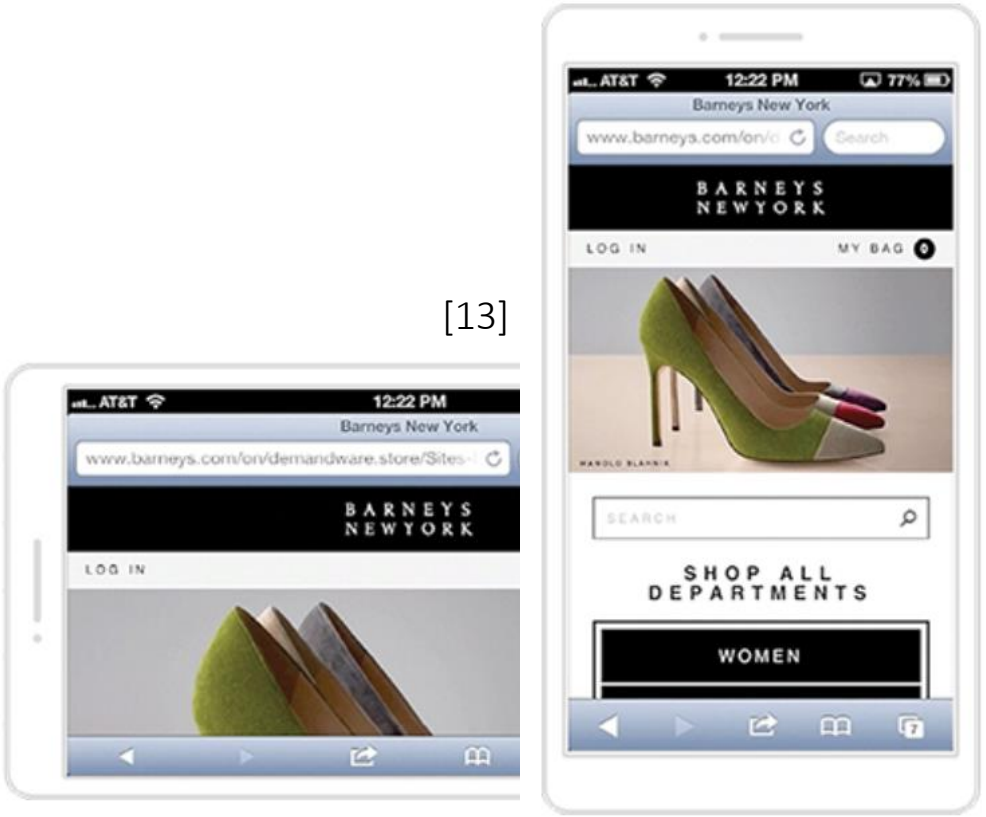
- for **smaller displays**, menu fixation can be **counterproductive**

  → browser buttons require a lot of screen space

  - Reduced area for **displaying** the content [13]
  - **Interactions** may become harder to perform [13] (→ Fat Finger Problem [14])

Recommendation: avoiding fixation of menus on small displays

[13]



tent/
lling area

Preferenz-Test

THUMB ZONE

The **lower part of the screen** can be reached without problems by the user. [13]

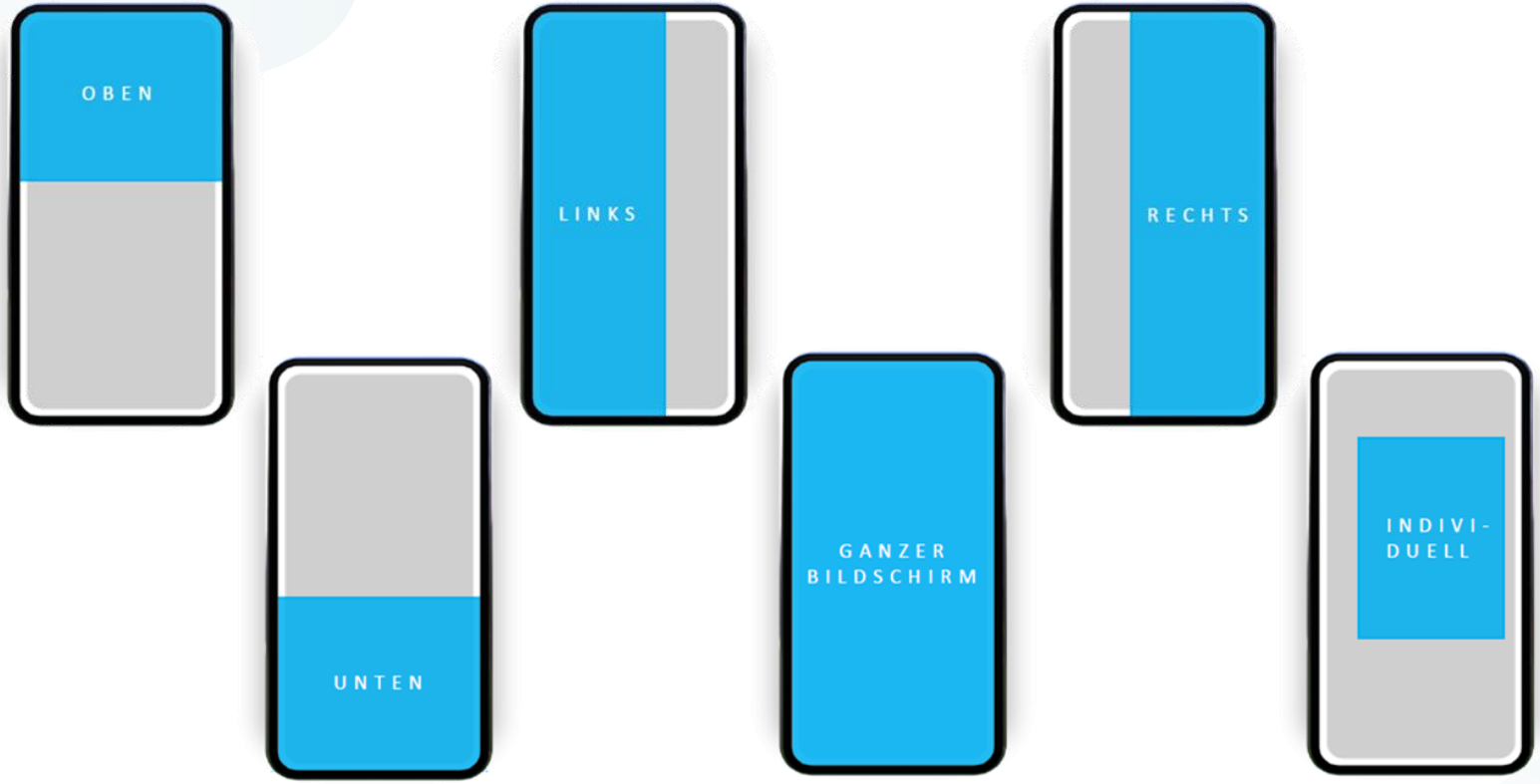
Based on this so called “thumb zone” website should be designed according to the principle “**content over control**”. [13]

Assumption: Place the menu in the thumb zone, i.e. the lower half of the screen.

[15]

Preferenz-Test

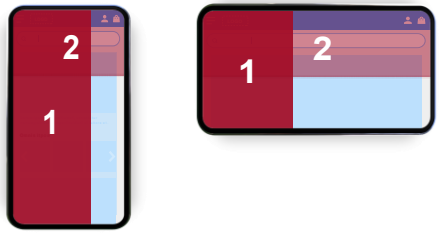
THUMB ZONE



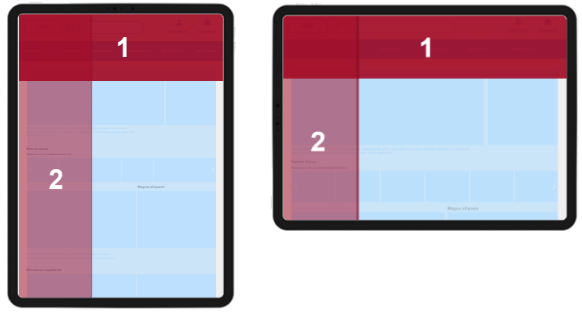
Preferenz-Test

THUMB ZONE

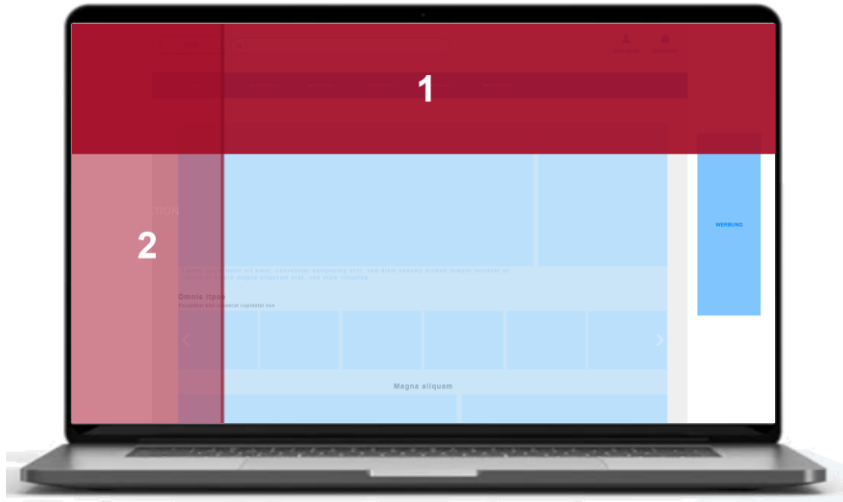
SMARTPHONE



TABLET



DESKTOP



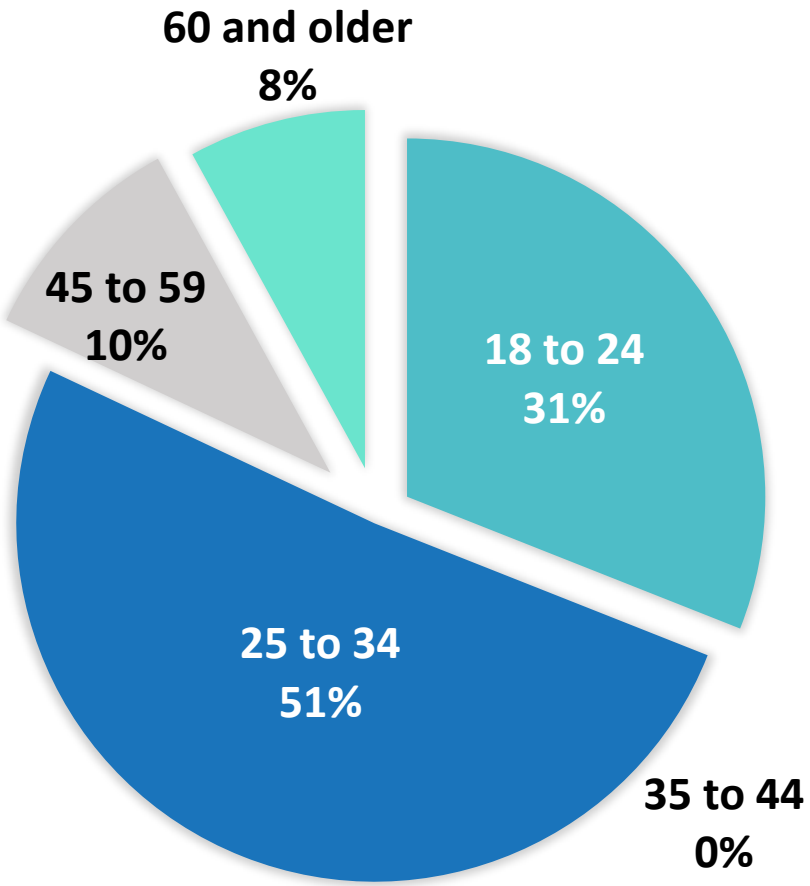
Recommendation: Place the menu on the top or left side

First-Click-Test

- Performed via an online web interface
  - → set up in the form of the A/B-test concept

50 PARTICIPANTS

- Participants should find and click on specific elements on a webpage
  - → Desktop and Smartphone



First-Click-Test

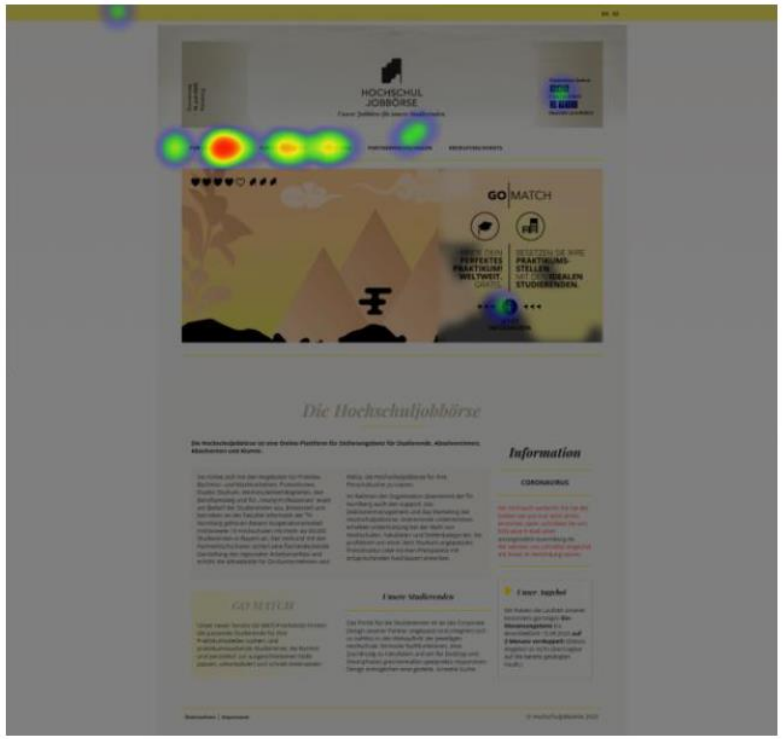
RIGHT AMOUNT OF INFORMATION

Task

Where is the menu?

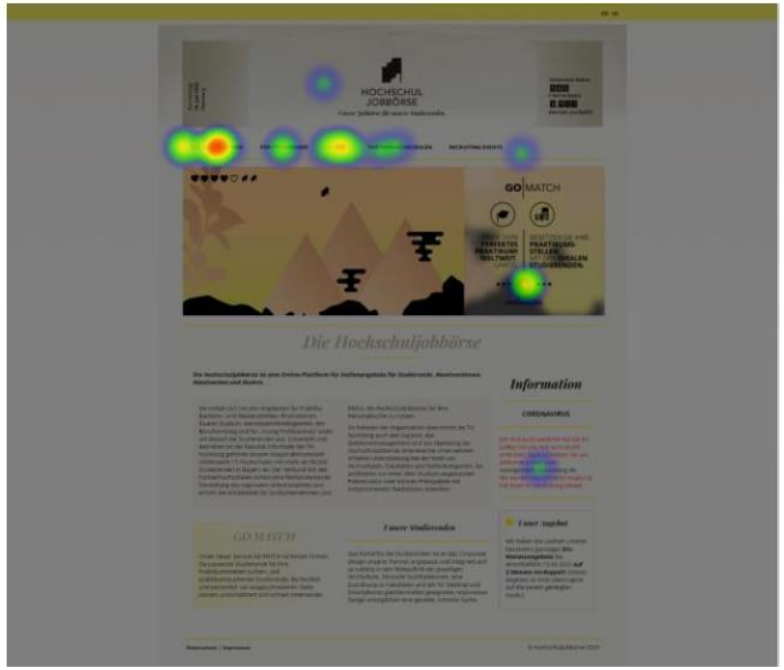
→Respondents in version A found the **menu 5 seconds** faster than the respondents in version B

[10]



Version A

[10]



Version B

First-Click-Test

RIGHT AMOUNT OF INFORMATION

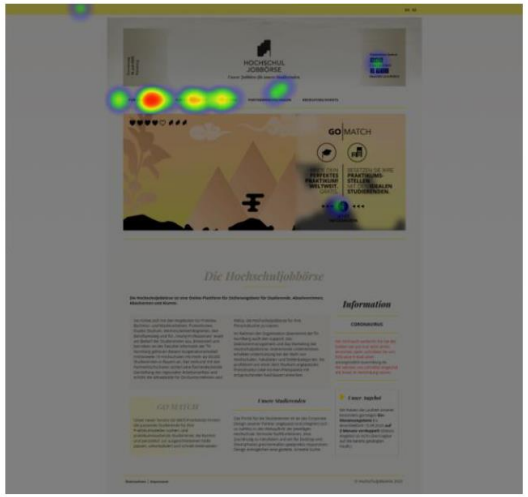
- Due the compression in Version B, more elements are visible on one display area

  →viewer may be flooded with information, which influences the information processing

- With increasing information input, the performance of human information processing increases linearly up to a threshold value [16]

  →Above this threshold, however, performance degrades dramatically [16]

[10]



Version A

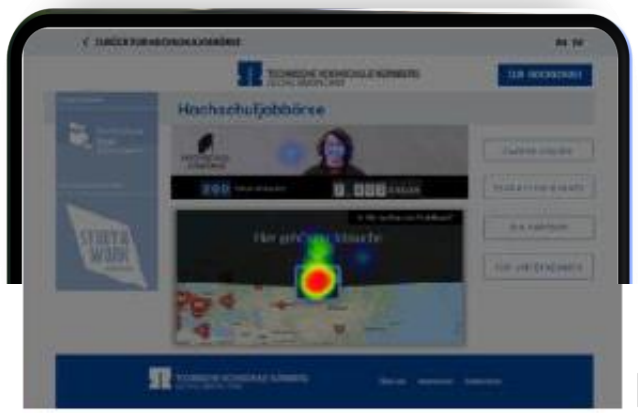
[10]

Version B

Avoiding information overload should **not** result in **too less** displayed **information**

First-Click-Test

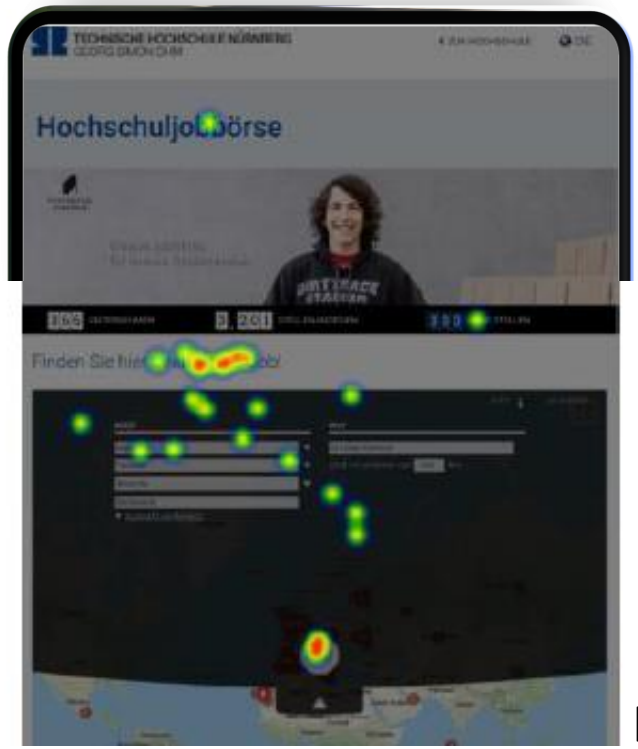
RIGHT AMOUNT OF INFORMATION



[10]

More Information

Faster (on average 3 seconds) and more precise response



[10]

Less Information

Slow (on average 5 seconds) response and dispersed clicks

First-Click-Test

ORIENTATION AND RECOGNITION

- If the user can process the information presented more quickly, he or she will also orientate faster on the website [16]

  → Users found the desired element on the right site 5 times faster and more precise

- Following web design conventions

  → For example, buttons should be designed as rectangles with a three-dimensional appearance [17]

[10]

[10]

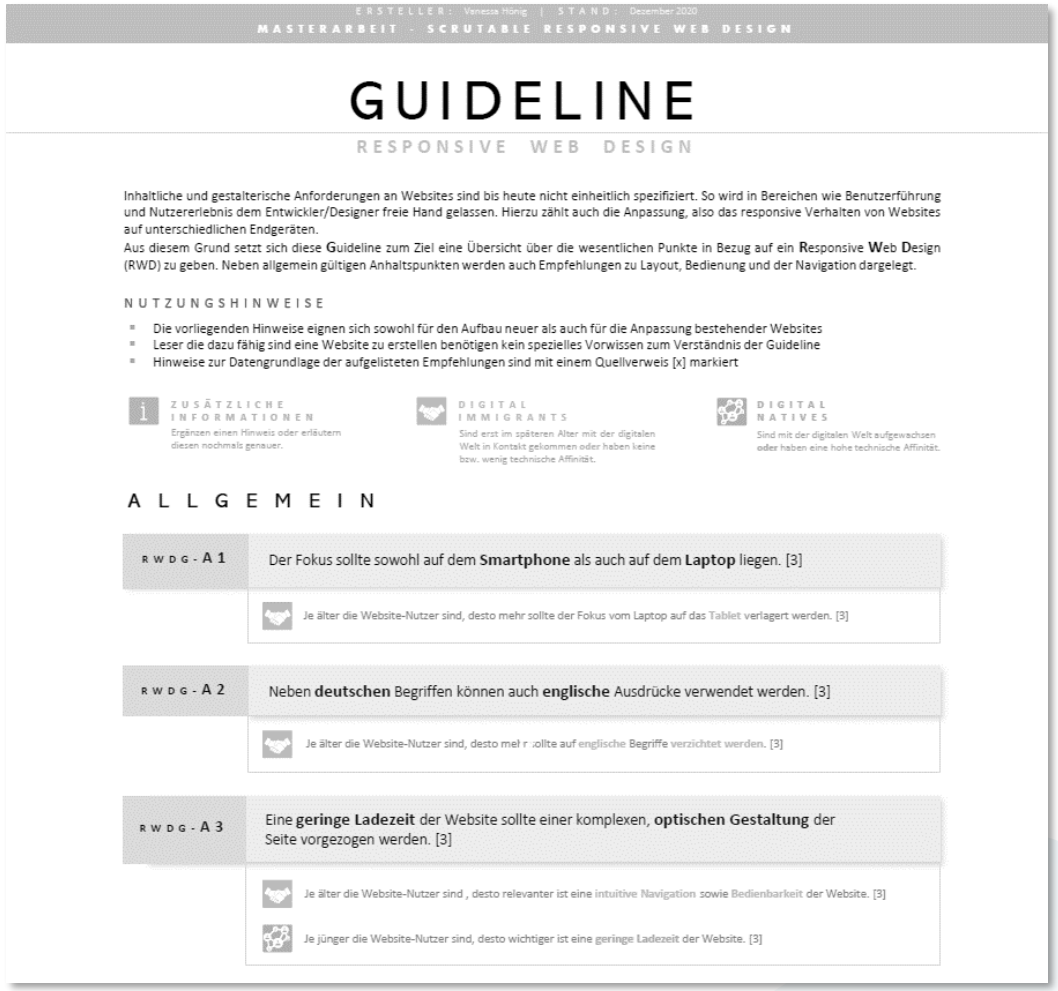
Discussion

[18]

- Results obtained in a series of experiments provide insights to the **relation between adaption of webpages and human cognition**

- Test results usually differed due to **age groups** (respectively digital immigrants and digital natives)

No standard or rules that always stick can be established for RWD



ERSTELLER: Vanessa Hönig | STAND: Dezember 2020

MASTERARBEIT - SCRUTABLE RESPONSIVE WEB DESIGN

GUIDELINE

RESPONSIVE WEB DESIGN

Inhaltliche und gestalterische Anforderungen an Websites sind bis heute nicht einheitlich spezifiziert. So wird in Bereichen wie Benutzerführung und Nutzererlebnis dem Entwickler/Designer freie Hand gelassen. Hierzu zählt auch die Anpassung, also das responsive Verhalten von Websites auf unterschiedlichen Endgeräten.
Aus diesem Grund setzt sich diese **G**uideline zum Ziel eine Übersicht über die wesentlichen Punkte in Bezug auf ein **R**esponsive **W**eb **D**esign (RWD) zu geben. Neben allgemein gültigen Anhaltspunkten werden auch Empfehlungen zu Layout, Bedienung und der Navigation dargelegt.

NUTZUNGSHINWEISE

- Die vorliegenden Hinweise eignen sich sowohl für den Aufbau neuer als auch für die Anpassung bestehender Websites
- Leser die dazu fähig sind eine Website zu erstellen benötigen kein spezielles Vorwissen zum Verständnis der Guideline
- Hinweise zur Datengrundlage der aufgelisteten Empfehlungen sind mit einem Quellverweis [x] markiert

ZUSÄTZLICHE INFORMATIONEN
Ergänzen einen Hinweis oder erläutern diesen nochmals genauer.

DIGITAL IMMIGRANTS
Sind erst im späteren Alter mit der digitalen Welt in Kontakt gekommen oder haben keine bzw. wenig technische Affinität.

DIGITAL NATIVES
Sind mit der digitalen Welt aufgewachsen oder haben eine hohe technische Affinität.

ALLGEMEIN

RWDG-A1 Der Fokus sollte sowohl auf dem **Smartphone** als auch auf dem **Laptop** liegen. [3]

Je älter die Website-Nutzer sind, desto mehr sollte der Fokus vom Laptop auf das Tablet verlagert werden. [3]

RWDG-A2 Neben **deutschen** Begriffen können auch **englische** Ausdrücke verwendet werden. [3]

Je älter die Website-Nutzer sind, desto mehr sollte auf englische Begriffe verzichtet werden. [3]

RWDG-A3 Eine **geringe Ladezeit** der Website sollte einer komplexen, **optischen Gestaltung** der Seite vorgezogen werden. [3]

Je älter die Website-Nutzer sind, desto relevanter ist eine intuitive Navigation sowie Bedienbarkeit der Website. [3]

Je jünger die Website-Nutzer sind, desto wichtiger ist eine geringe Ladezeit der Website. [3]

Discussion

LIMITS

- Only **German participants** have taken part in the test
- The results are based on purely **visual experiments** and **theoretical questions**
- **Responsiveness** should **not** be considered as an **isolated variable** when assessing the general user-friendliness of a website

FUTURE WORK

- Which **functions** are relevant for the web user and which degree of functional scope promotes usability?
- **User studies** should be conducted on a regular basis to keep the hints up to date and thus ensure **continuous** usability

Conclusion - Intelligibility of Responsive Webpages: User Perspective

MOTIVATION

- RWD **lack of usability**, for instance, orientation [1][2]
- Users' **mental model** as recommendations
- Experiments targetting various **aspects of responsive behavior**

APPROUCH

- Execution of various **usability tests**: Survey, Preference-Test and First-Click-Test

  → preference-test in form of an **interview**

  → First-Click-Test set up in form of the **A/B-test** concept

RESULTS

- Differed due to **age groups**
- web site that should **look "the same"** on different devices – users do not notice small adaptations
- All results are summarized in a **RWD-Guidline** (not included in the paper)

Thank you for your attention!

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