

# Lesbarkeit von Schriftarten

in Abhängigkeit vom  
Kompressionsgrad

Thomas, Christina, Niklas und Hafidz

- Eve collects  $c$ . She needs  $m$ , for which  $m = c^d$
- she chooses random  $r < n$ , she gets Bob's public key and then computes

$$x = r^e \bmod n \Rightarrow x^d = r^{ed} \bmod n$$

$$\Rightarrow x^d = r \bmod n$$

$$y = xc \bmod n$$

$$t = r^{-1} \bmod n$$

Eve gets Bob to sign  $y$  with his private key. Bob sends Eve

$$u = y^d \bmod n.$$

Now Eve computes

$$tu \bmod n = r^{-1} y^d \bmod n = r^{-1} x^d c^d \bmod n$$

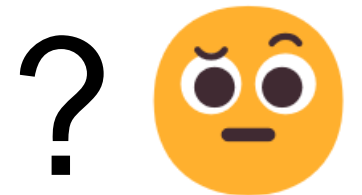
$$= c^d \bmod n = m.$$

# Fragestellung & Hypothese

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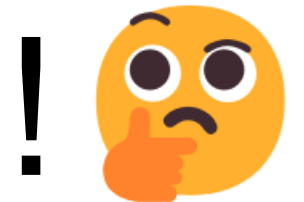
# Fragestellung

Wie stark können Schriftzeichen komprimiert werden, ohne dass die Lesbarkeit beeinträchtigt wird?



# Hypothese

Ab einem bestimmten Kompressionsgrad sind bestimmte Schriftzeichen nicht mehr unterscheidbar.



# Versuchsplan

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# Variablen

## unabhängige

Inhalt?

**ABC**    **123**    **+!@**

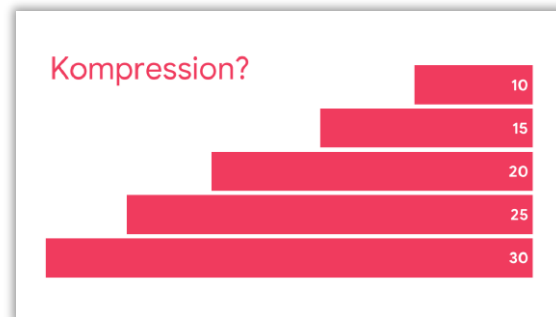
Buchstaben    Zahlen    Sonderzeichen

Schriftarten?

MONOSPACED    Monospaced


SANS SERIF    SERIF    SANS SERIF

SERIF    Aa    Aa



## abhängige

Lesbarkeit?



Korrektheit

ABCD 75%  
APCD korrekt

# Inhalt?

**ABC**

Buchstaben

**123**

Zahlen

**+!@**

Sonderzeichen



# Schriftarten?

MONOSPACED



<https://threerooms.com/wp-content/uploads/2019/06/Monospace-font.jpg>

SANS SERIF

SERIF

SANS SERIF

SERIF



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# Schriftarten?

## MONOSPACED

SourceCodePro

Almost before we kne

## SANS SERIF

Roboto

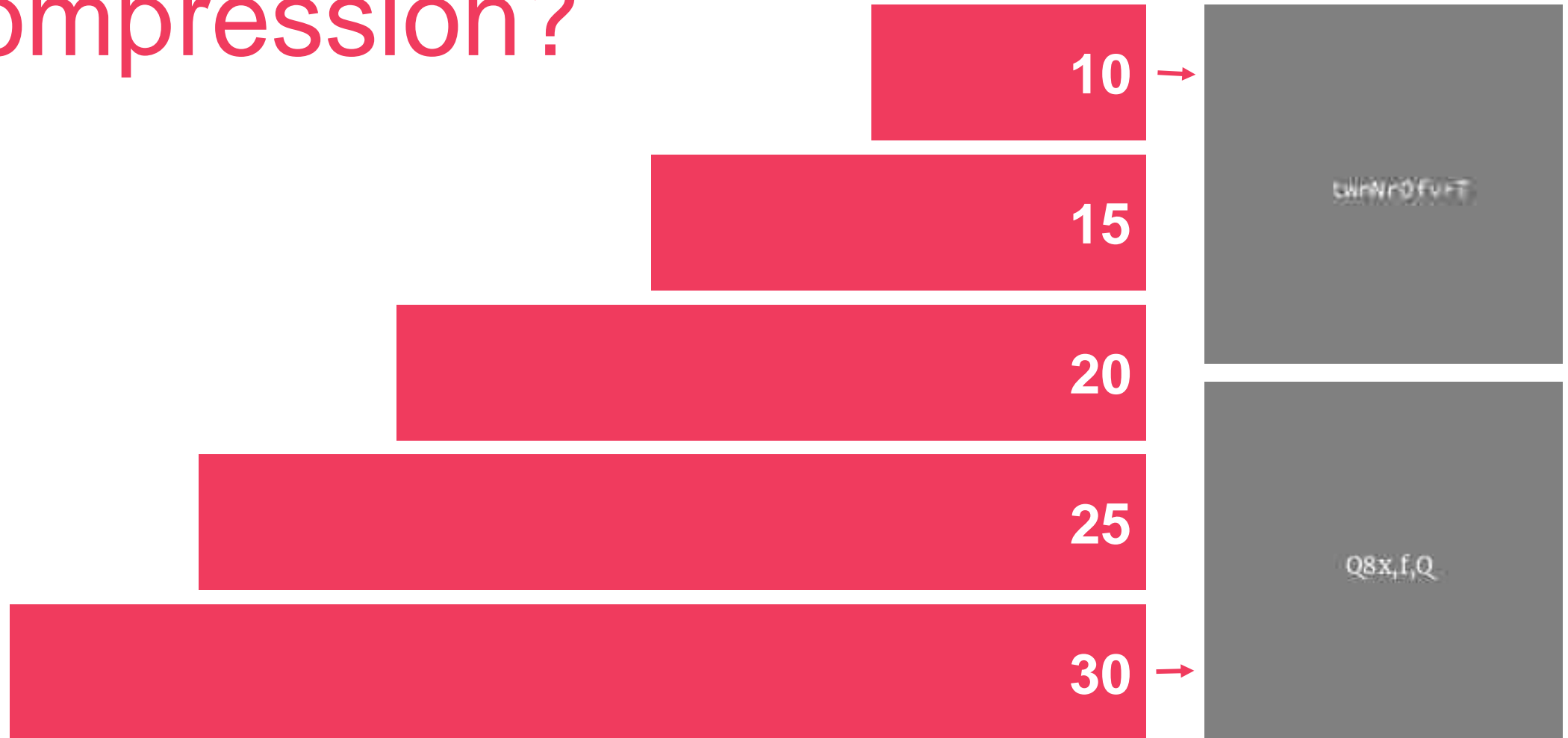
Almost before we knew it, we

## SERIF

Merriweather

Almost before we knew it, v

# Kompression?



# Lesbarkeit?



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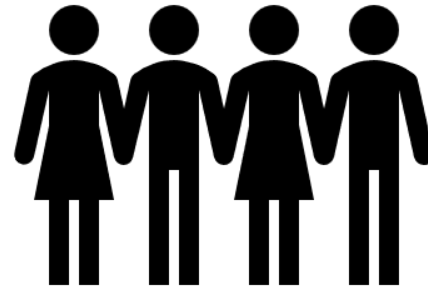
## Korrektheit

A B C D      75%  
A P C D      korrekt

A B C D      75%  
A C D      korrekt

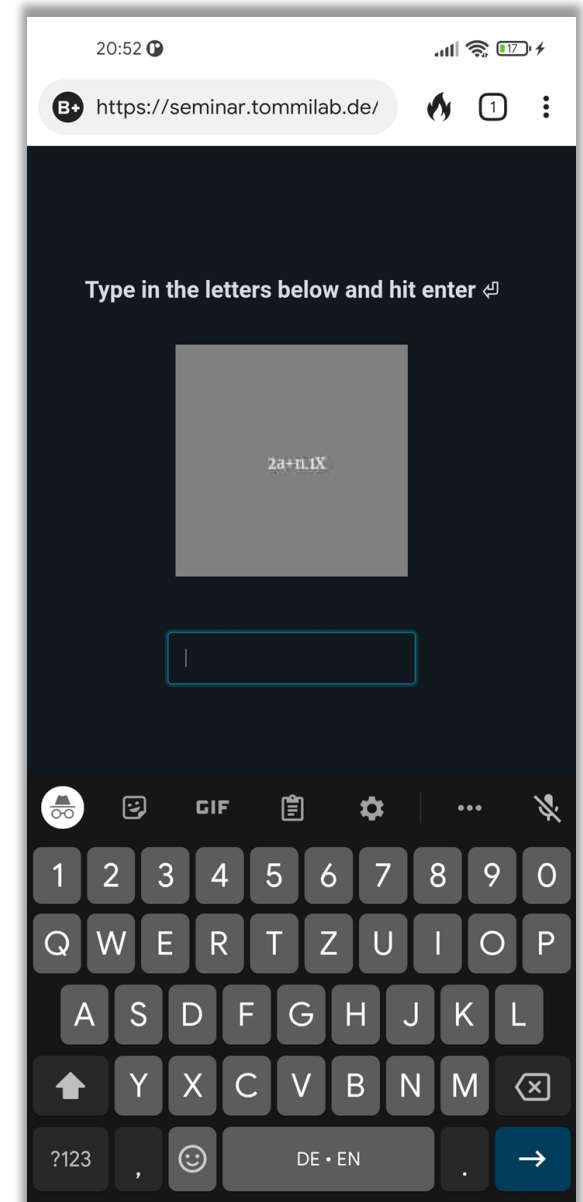
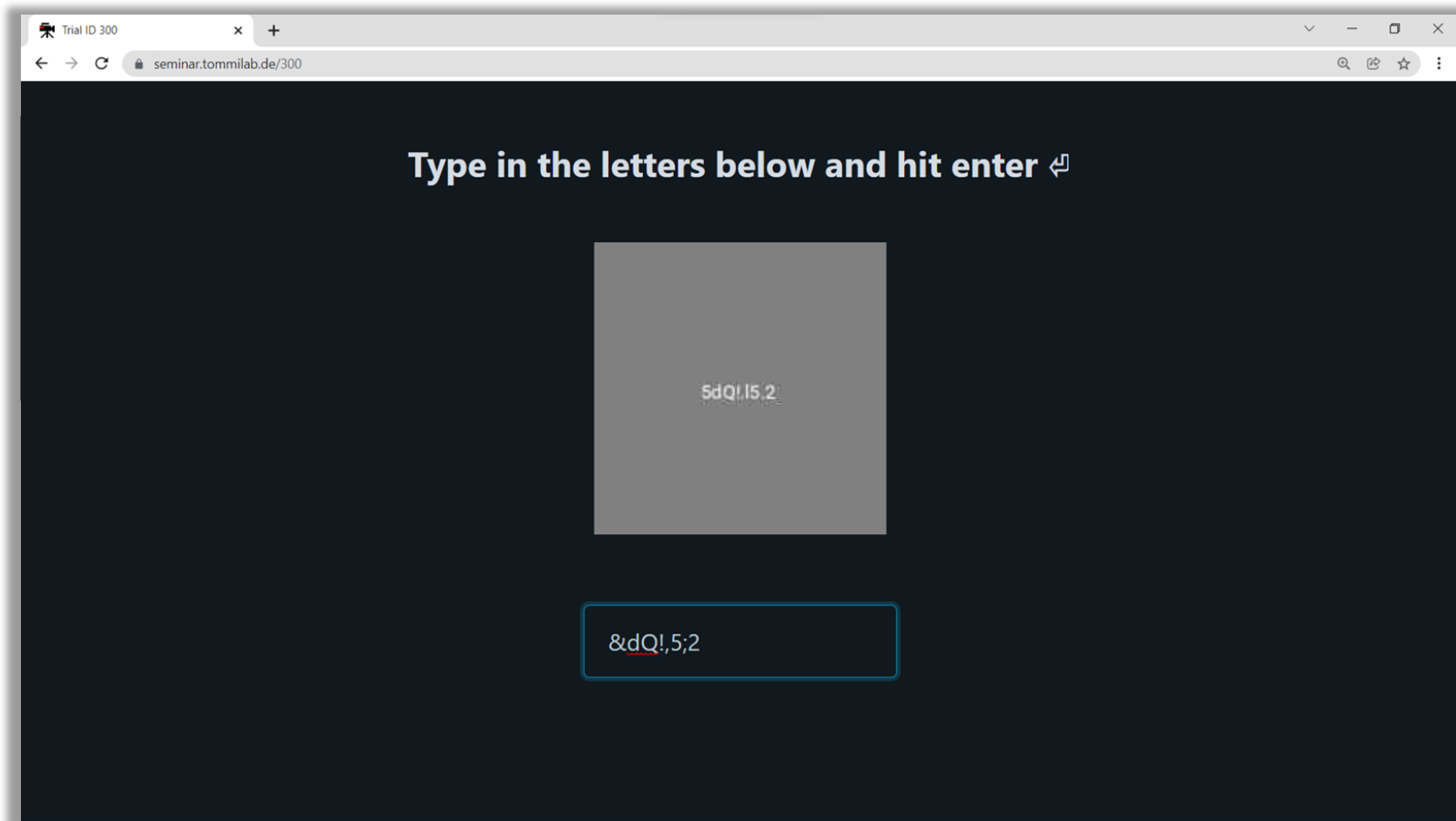
# Methode

- Link
- ID

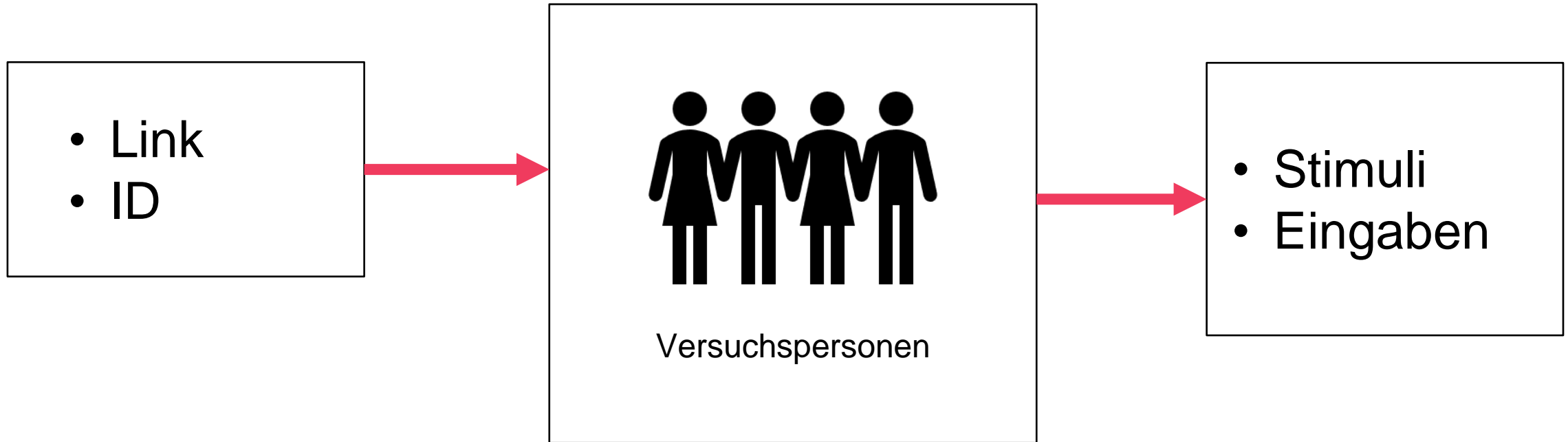


Versuchspersonen

# Methode



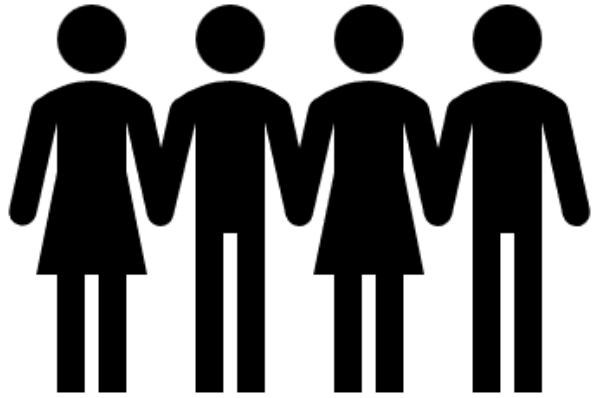
# Methode



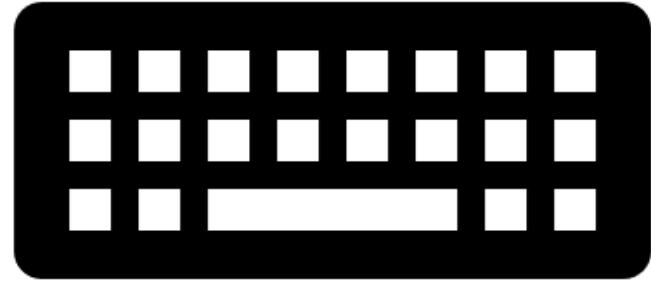
# Ergebnisse

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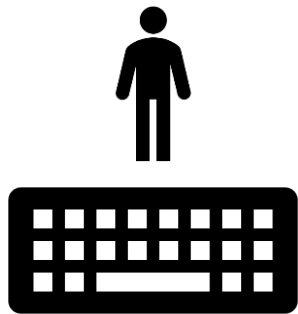


29



1900+

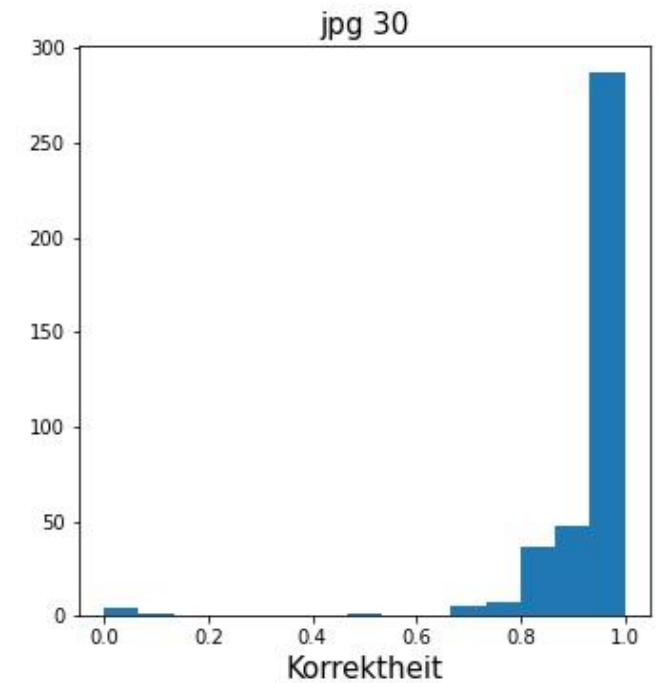
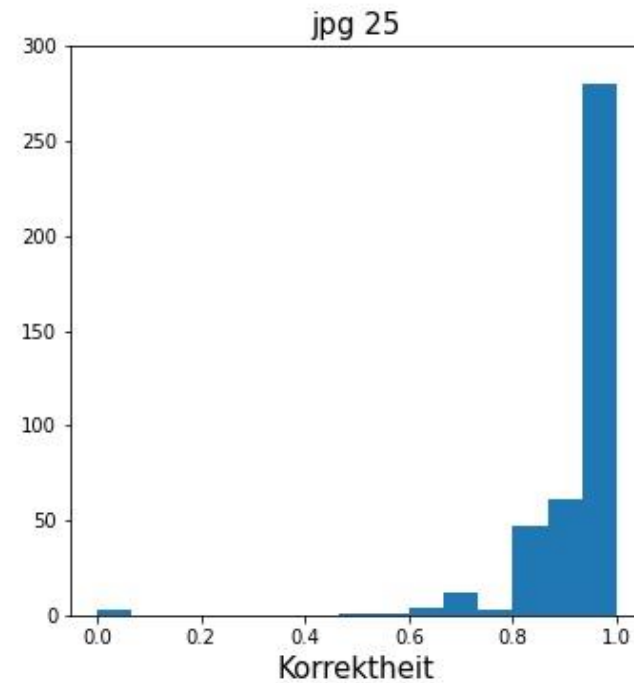
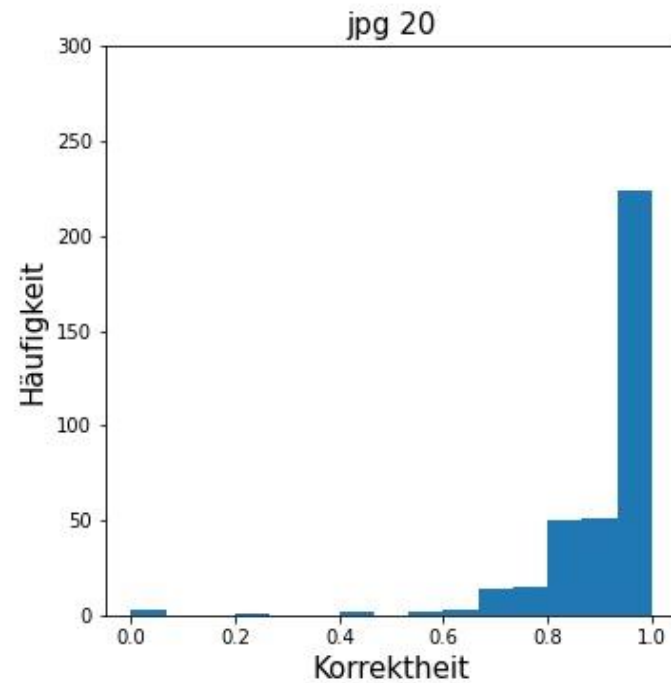
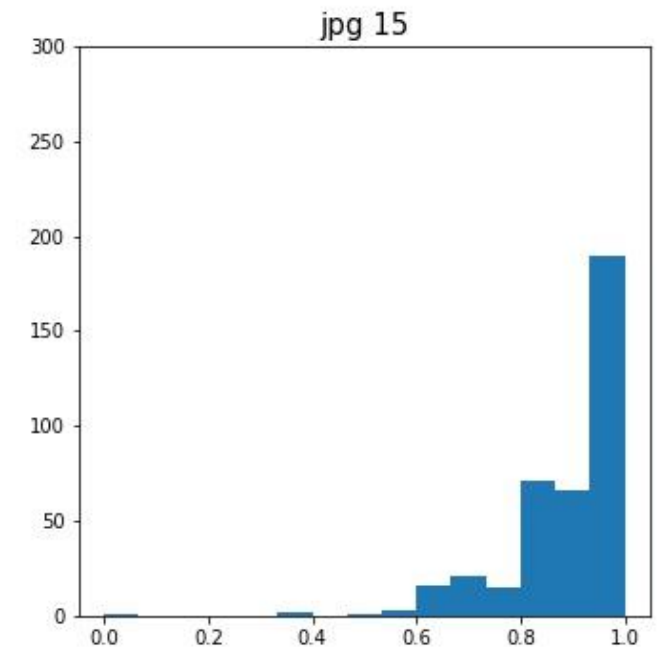
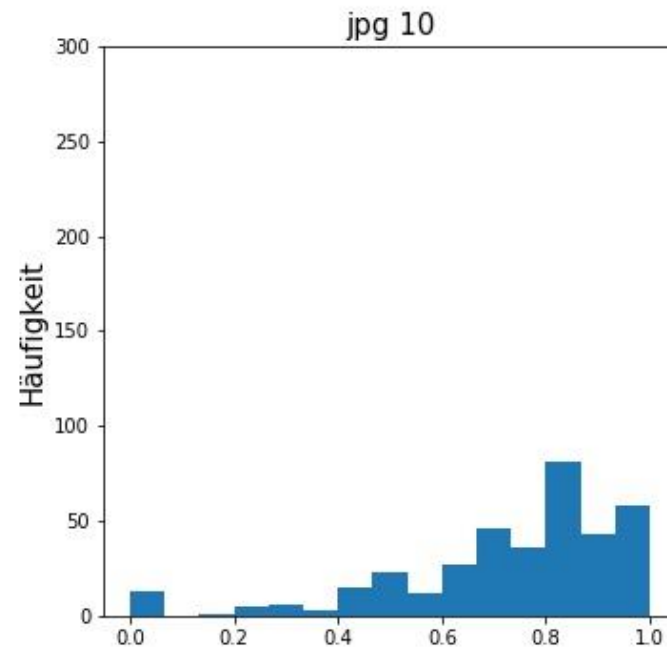
# Versuchsperson A



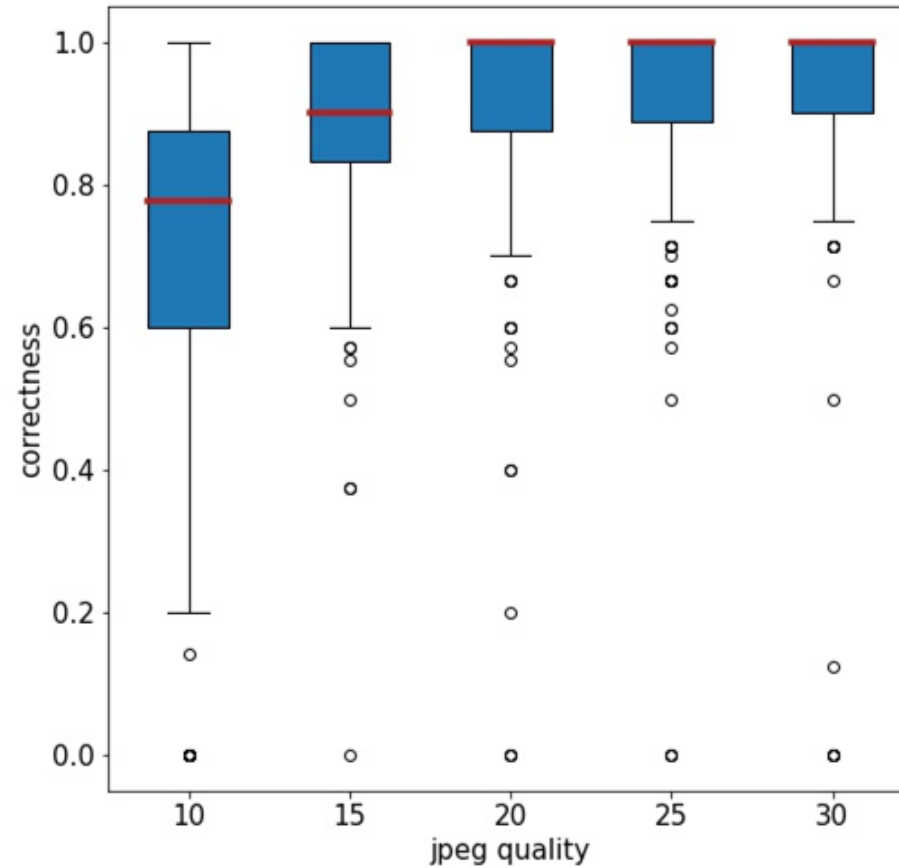
402

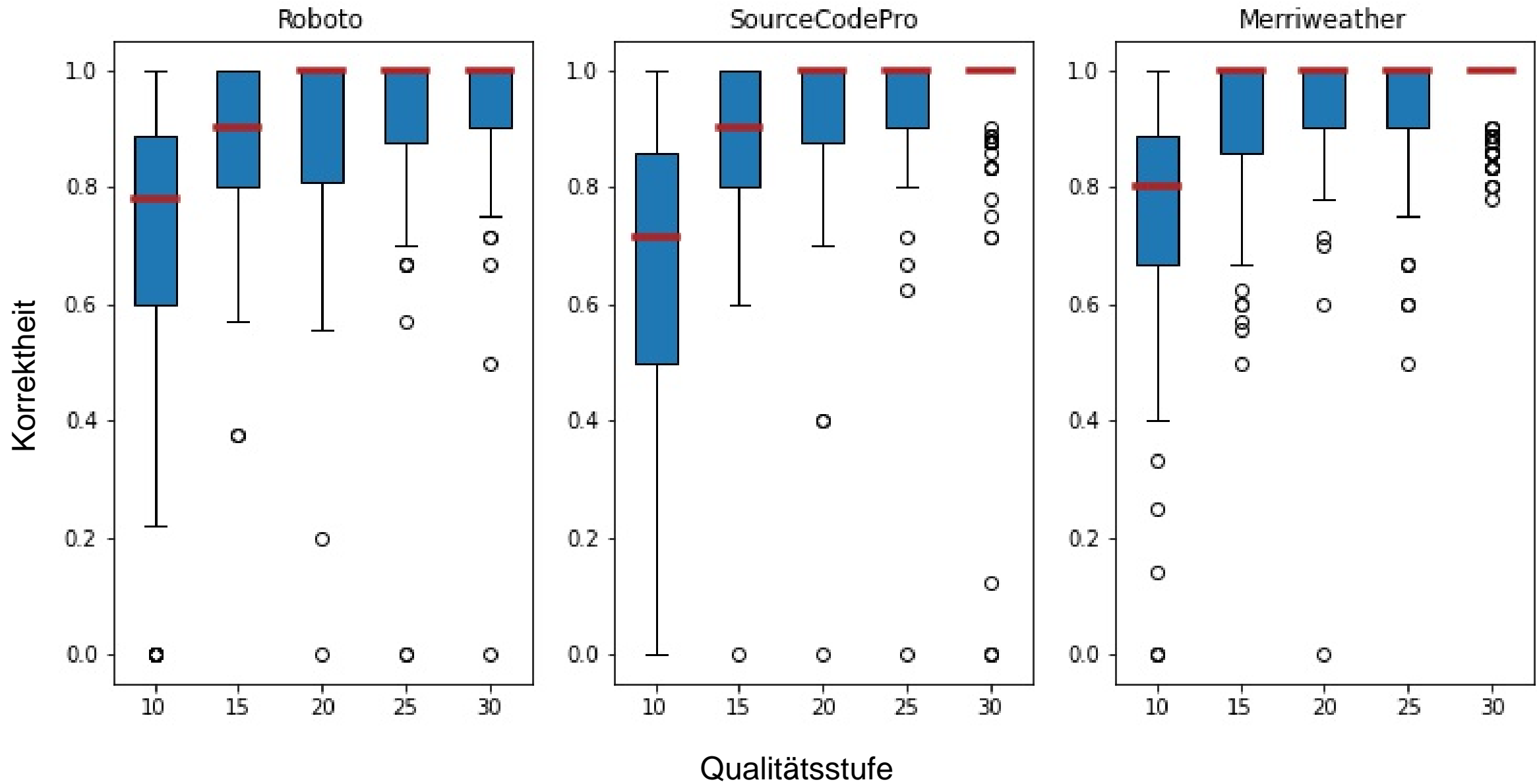
font	jpeg_quality	text_content	user_input	correctness
Roboto-Regular	10	+ !11O	+ _110	0.6667
Roboto-Regular	25	jlnhacB6L	jinhacB6L	0.8889
SourceCodePro-Regular	20	IM-ZuxpNnw	LM-ZuxpNnw	0.9
Roboto-Regular	15	DSEYr	DSEYi	0.8
Merriweather-Regular	10	Eo_26	Eo_26	1
SourceCodePro-Regular	20	o@Hu1P	o@Hu1P	1
Merriweather-Regular	25	AUL!+h'	AUL!+H'	0.8571
Merriweather-Regular	10	-9IB!pS6G	-giH!pS6G	0.6667
Merriweather-Regular	25	N7VVJef	N7VVJef	1
Roboto-Regular	10	_0s-2fLV	_0s2fLV	0.875
Roboto-Regular	20	O4DaH-avT	O4DaH-avT	1
Roboto-Regular	30	bzu1uFNrsF	bzu1uFNrsF	1
Merriweather-Regular	10	U2Kc@	U2Kc@	1
Merriweather-Regular	20	+dNTobRC	+dNTobRC	1
Roboto-Regular	15	3ojqY3	3ojqY3	1
Roboto-Regular	30	mV9UF1we	mV0UF1we	0.875
SourceCodePro-Regular	15	7YcFq	7YcFq	1
SourceCodePro-Regular	20	0EC9w'n	0EC9W'n	0.8571
Roboto-Regular	15	3CD3kgYIU	3CD3kgYIO	0.7778
SourceCodePro-Regular	25	SmmOu	SmmOu	1

# Verteilung der Korrektheit



# Verteilung der Korrektheit





# Korrektheits-Durchschnitt

87%

MONOSPACED

SourceCodePro

87%

SANS SERIF

Roboto

91%

SERIF

Merriweather

SANS SERIF

SERIF



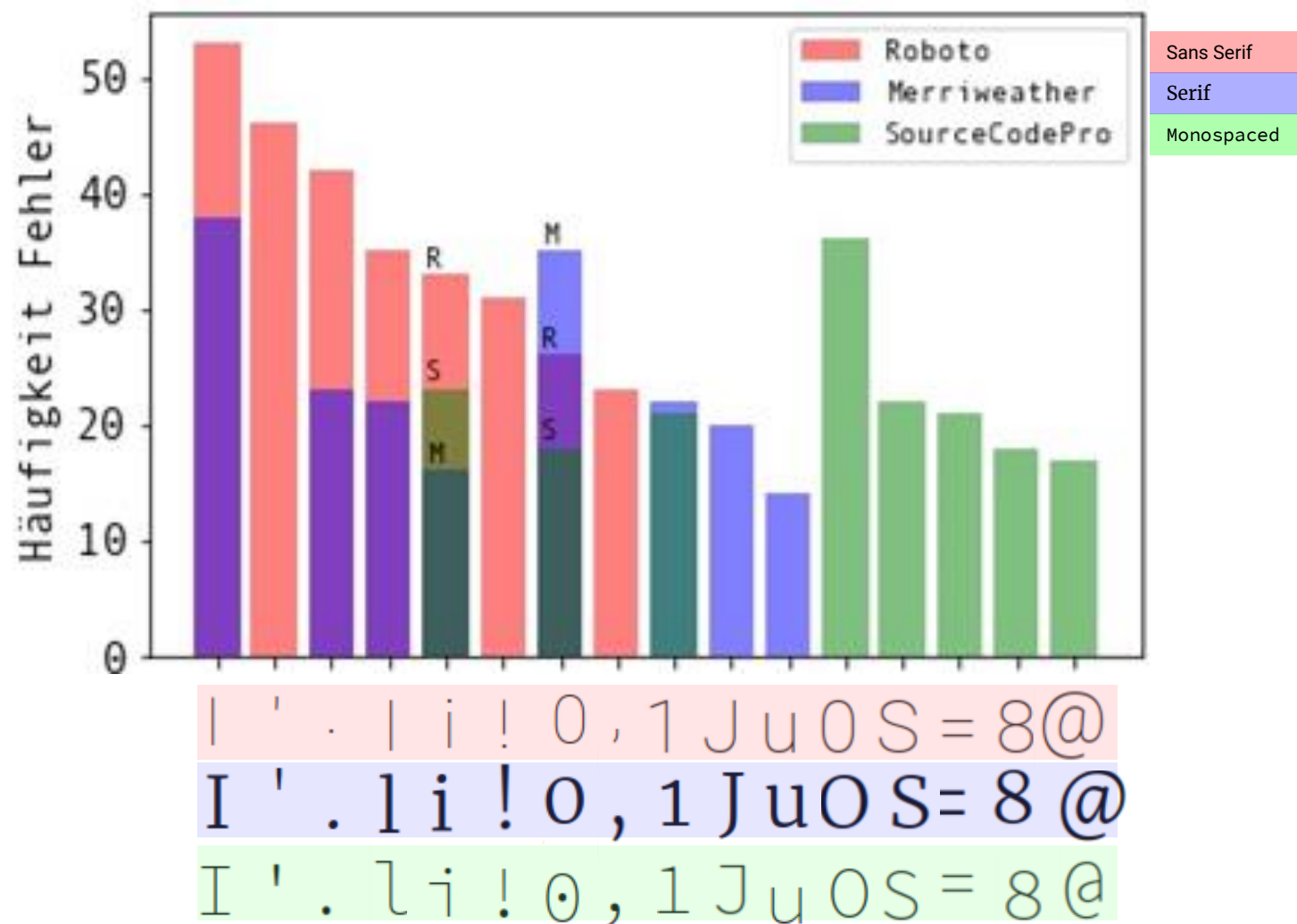
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Aa

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Aa

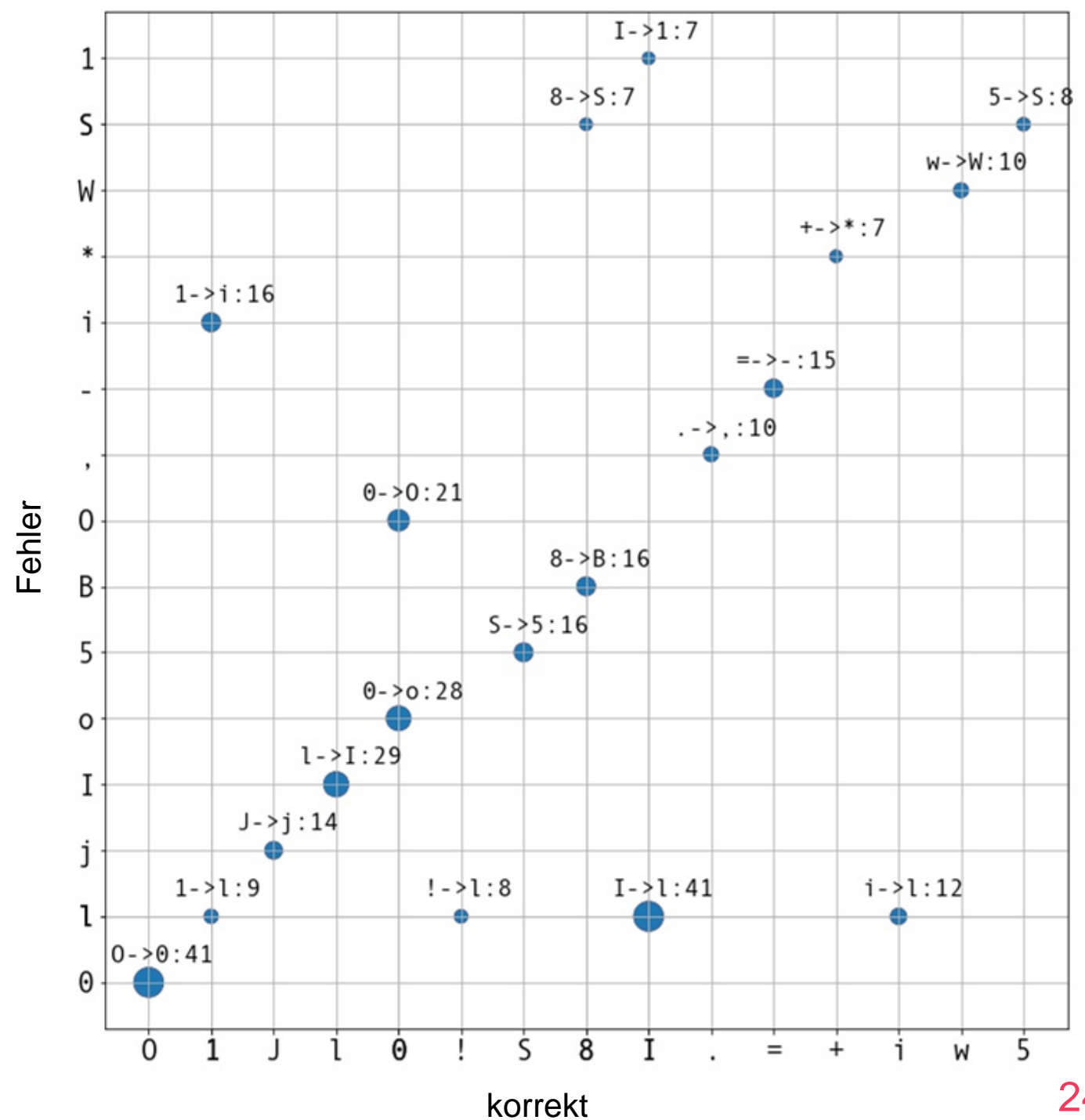
# Nicht erkannte Zeichen bei jeder Schriftart



# Diagramme

Wie oft wurde ein Schriftzeichen mit einem anderen verwechselt?

Vertikale <b>Striche</b>	<b>Punkte</b>
~22%	~10%
<b>Kreise</b>	<b>Rest</b>
~14%	~54%





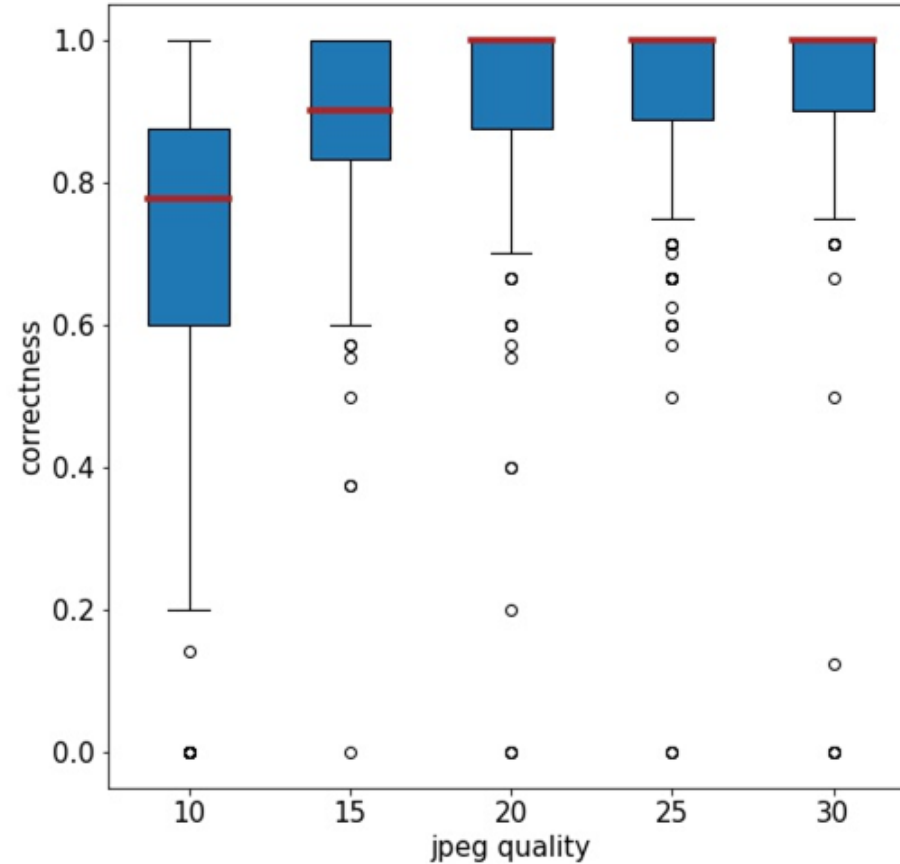
# Interpretation

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## Hypothese

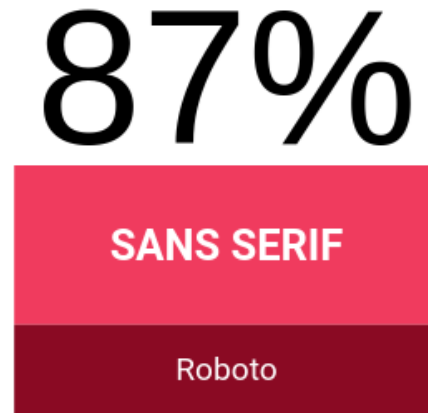
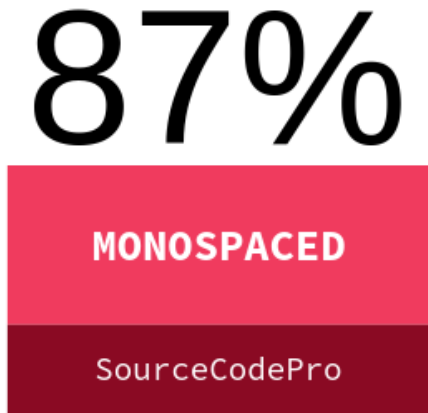
Ab einem bestimmten Kompressionsgrad sind bestimmte Schriftzeichen nicht mehr unterscheidbar.





Für Kompressionsgrad  $\geq 20$  keine Änderung der Lesbarkeit

→ Hypothese bestätigt



Strichstärke, Serifen  
 → beeinflussen Lesbarkeit

### Schriftarten?

MONOSPACED SourceCodePro	Almost before we kne
SANS SERIF Roboto	Almost before we knew it, we
SERIF Merriweather	Almost before we knew it, v

# Reflexion

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# Manöverkritik - Experimentierebene

Fehler im Aufbau:

→ Anzahl und Art der bearbeiteten Stimuli nicht gleich für alle Probanden

Vielen Dank  
für eure Zeit

**Vielen Dank**  
für eure Zeit



# Fragen?

# Abbildungen

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