Digitaler Stress: Forschungsbefunde und Praxisimplikationen

Prof. Dr. René Riedl

47. Congress der Controller
München, 16.05.2023

UNIVERSITY OF APPLIED SCIENCES UPPER AUSTRIA

DIGITALISIERUNGS ZENTRUM Campus Steyr Wirtschaft und Management

DIGITAL BUSINESS INSTITUT

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NeuroIS SOCIETY

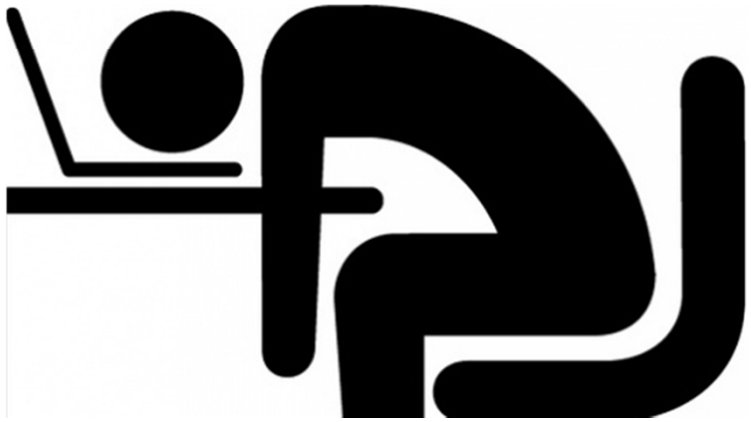
www.digital-stress.info

Positive Effekte von digitalen Technologien

- verbesserter Zugang zu Informationen
- rasche Kommunikation
- erhöhte Produktivität

Allgegenwärtigkeit und Nutzung von digitalen Technologien …

Nebenwirkungen



Digitaler Stress

Stress, der durch die Nutzung und Allgegenwärtigkeit von Informations- und Kommunikationstechnologien verursacht wird.

Konsequenzen

- *Aktivierung autonomes Nervensystems (Sympathikus)*
- *Anstieg Stresshormone (Adrenalin, Noradrenalin, Kortisol, …)*

Gesundheits-probleme

- *Erhöhte Fehlzeiten*
- *Niedrigere Arbeitsmotivation*
- *Geringeres Bekenntnis zur Organisation*
- *Reduzierte Leistungsfähigkeit*
- *Geringere Produktivität*

Ökonomische Probleme

Befunde wissenschaftlicher Forschung

Einfluss von Computerarbeit auf Ermüdung

Laborstudie auf der Basis verschiedener Aufgaben mit Messung von Gehirnströmen (EEG)

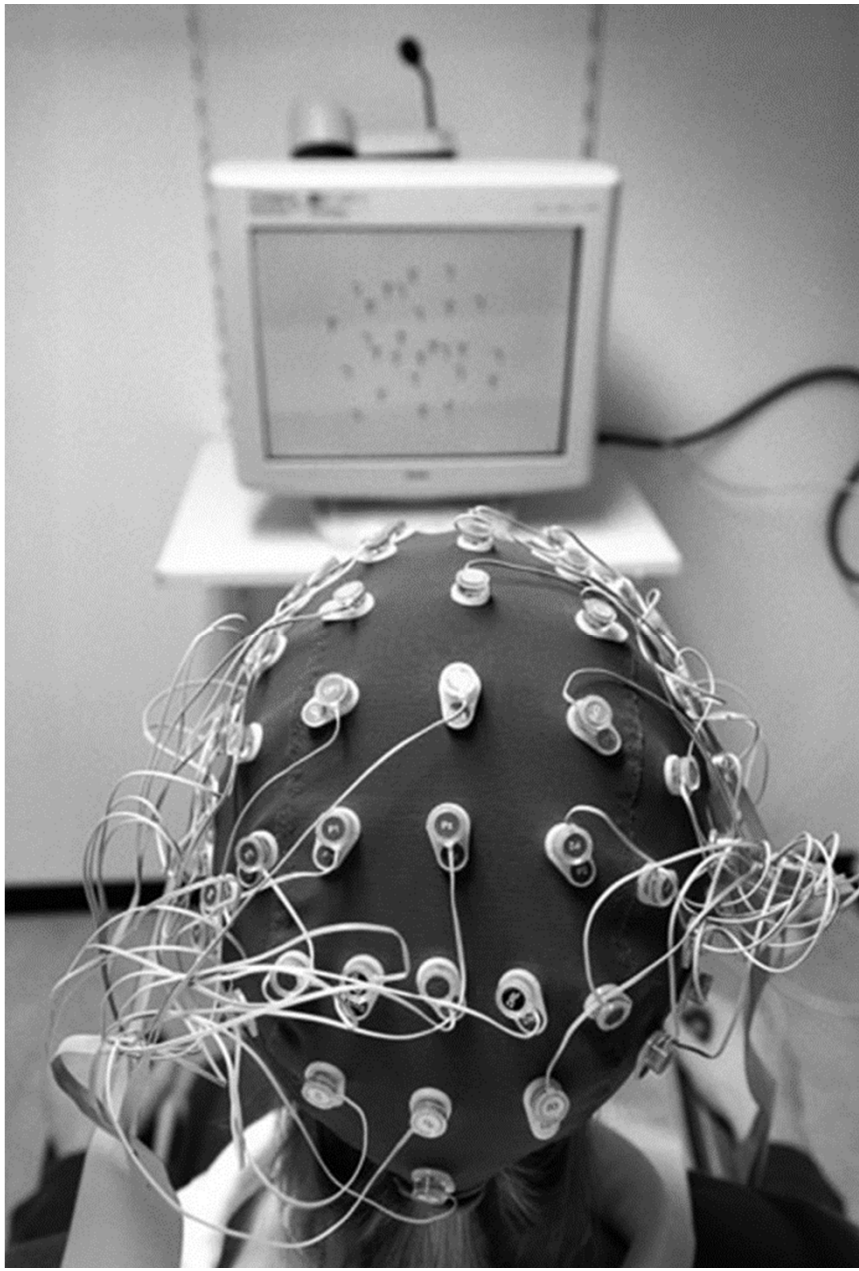
Papier/Bleistift-Aufgaben vs. Aufgaben am Computer

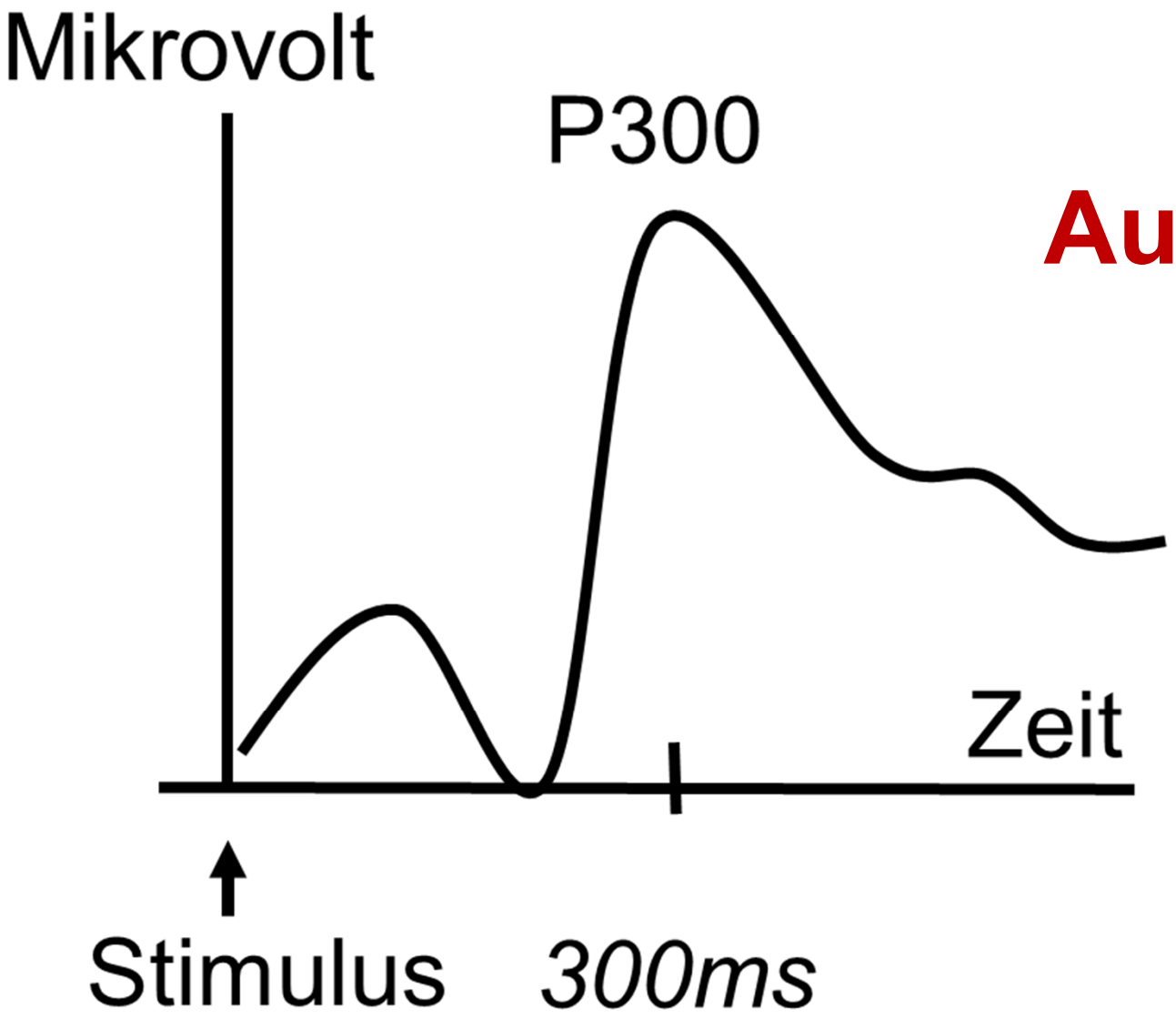
z. B. Ausbessern von Fehlern in einem Text

- jede Aufgabe dauerte 7 Minuten

  (3 Aufgabenbereiche)

- danach wurden mittels EEG Gehirnströme gemessen (auf Basis einer Aufgabe, bei der die Wahrnehmung und Unterscheidung von 2 akustischen Signalen eine Rolle spielt)



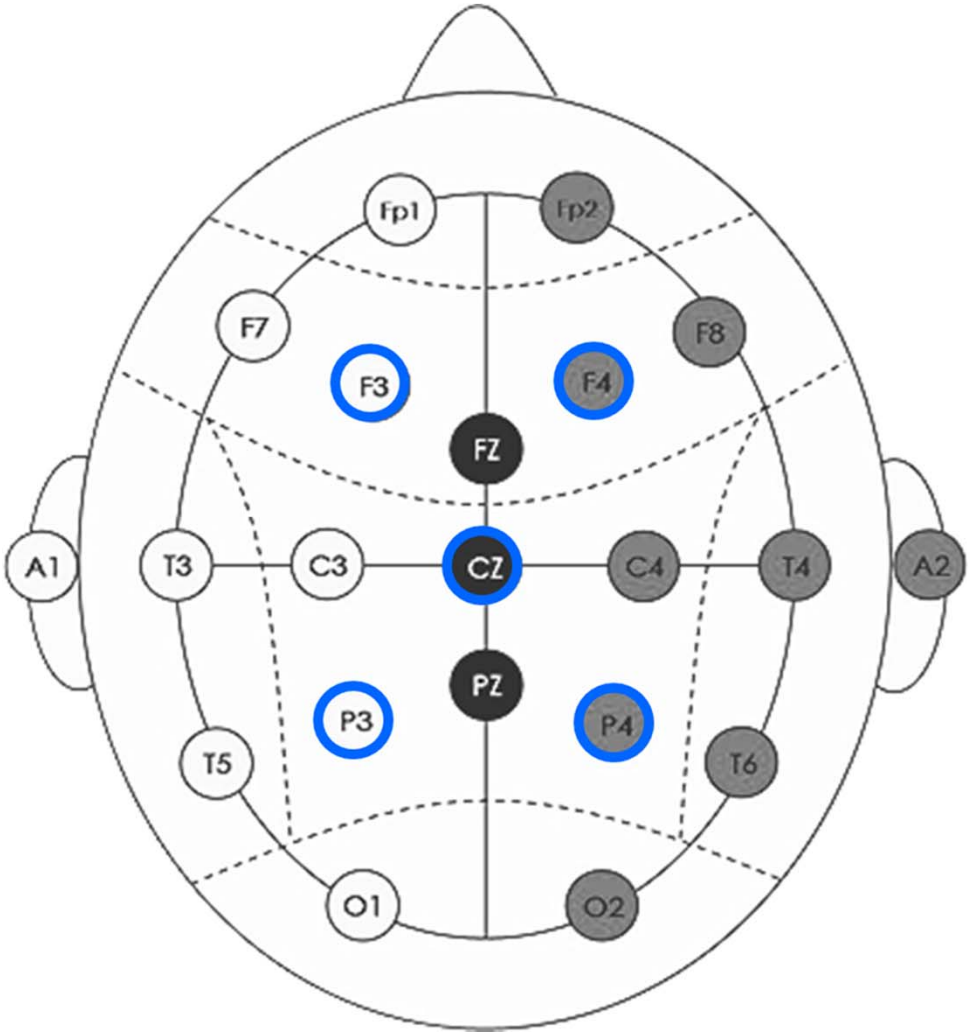


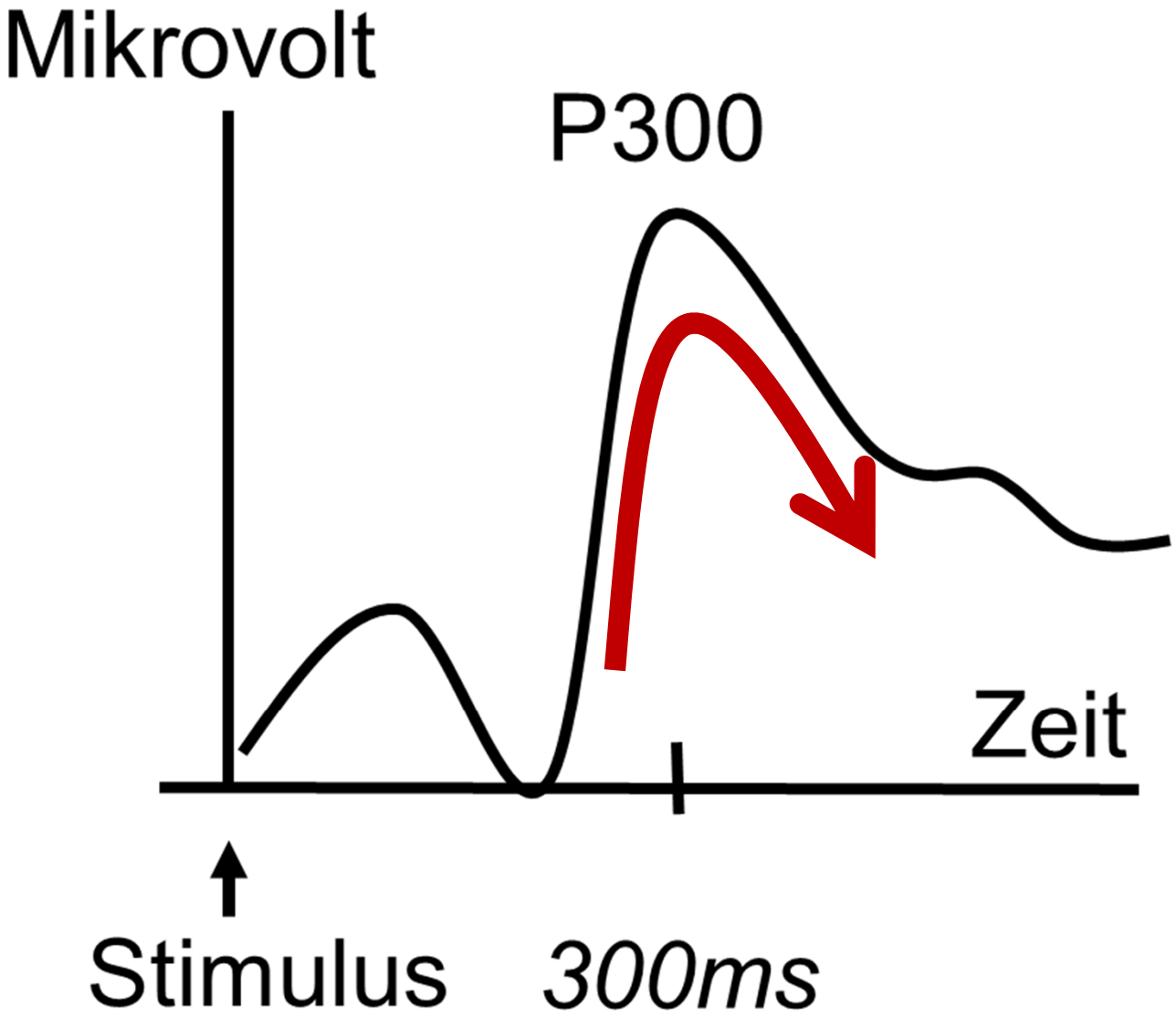
Aufmerksamkeit

KEY:

- RIGHT Hemisphere
- LEFT Hemisphere
- Mid Line

F : Frontal Lobe
T : Temporal Lobe
C : Central Lobe
P : Parietal Lobe
O : Occipital Lobe
Z : Mid Line





Erschöpfung

Reduzierte P300-Amplitude

Video-Conference Fatigue

Quelle: columbiaspectator.com

Videoconference Fatigue

Befragungsstudie

Contents lists available at ScienceDirect

Journal of Affective Disorders Reports

journal homepage: www.sciencedirect.com/journal/journal-of-affective-disorders-reports

Research Paper

On the associations between videoconference fatigue, burnout and depression including personality associations

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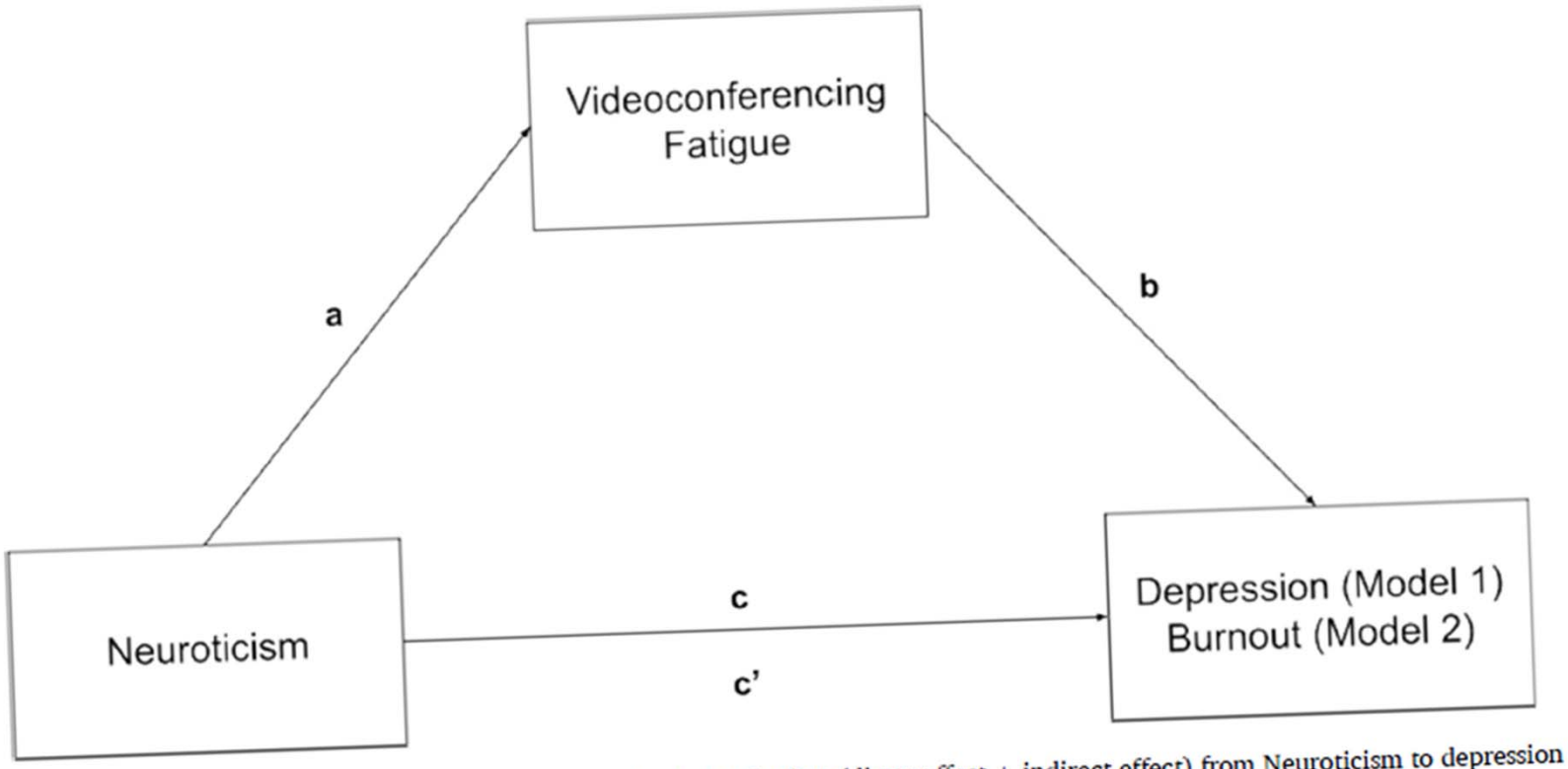
ARTICLE INFO

Keywords:
Videoconference fatigue
ZOOM fatigue
Personality
Depression
Burnout
Neuroticism

ABSTRACT

Videoconference fatigue (hereafter VC fatigue) presents a new psychological construct, which gained momentum in course of the COVID-19 pandemic with the rise of videoconferences taking place in everyday (work-)life. In order to better characterize VC fatigue, it is of importance not only to investigate associations with age, gender and personality (as has been done earlier and will be revisited). Besides, it is crucial to shed light on relevant psychopathological constructs co-occurring with VC fatigue. In the present survey study, based on data from $N = 311$ participants recruited via the Internet we investigated the associations between VC fatigue, burnout and depression, and we specifically took the personality trait neuroticism as potential predisposing variable into account. These four constructs were robustly positively associated with each other. Moreover, mediation analyses revealed that the positive associations between neuroticism and burnout/depression might in parts be mediated by VC fatigue. However, future studies are needed to disentangle cause and effect between the aforementioned variables. The present study, to our knowledge, is among the first to reveal associations between VC fatigue and psychopathologies. Moreover, in this paper we present a German version of the Zoom & Exhaustion Fatigue scale (ZEF) by Fauville and colleagues.



he mediation model. a, b, and c' are direct effects, whereas c is the total effect (direct effect + indirect effect) from Neuroticism to depression (Model 1) or Model 2). Fear of COVID-19, gender, student status, and age are included as covariates.

Table 1
Descriptive statistics and correlation analysis results ($N = 311$).

	Descriptive Statistics				Correlations	
	M	SD	Min	Max	1	2
1. Neuroticism (IPIP-20)	10.84	3.37	4	20	-	
2. ZEF (Videoconference Fatigue)	36.65	11.61	15	75	.395***	-
3. FCV-19S (Fear of COVID-19)	12.15	4.11	7	28	.350***	.262***
4. PHQ-8, (Depression)	7.71	4.89	0	24	.512***	.588***
5. MBI-GS (Burnout)	53.57	16.07	17	97	.431***	.511***
6. Age	29.40	11.22	18	74	-.149**	-.155**

Notes. IPIP-20: International Personality Item Pool-20 Inventory, ZEF: Zoom Exhaustion & Fatigue Scale, FCV-19S: Fe
Health Questionnaire 8, MBI-GS: Maslach Burnout Inventory – General Survey. Pearson correlation coefficients are prese
Sum scores are presented for the questionnaires. * $p < .05$, ** $p < .01$, *** $p < .001$. M = Mean, SD = Standard Deviat
Maximum.

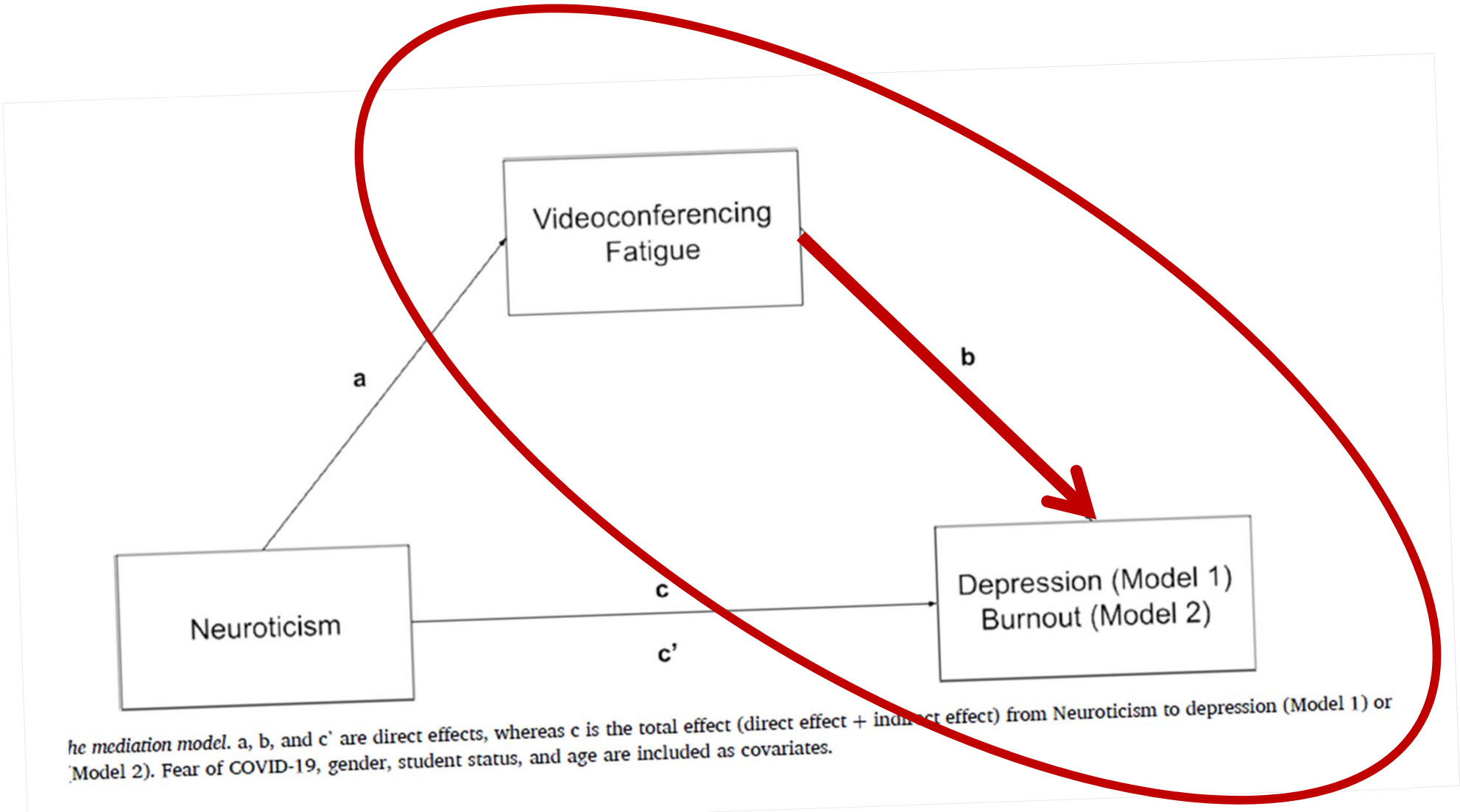


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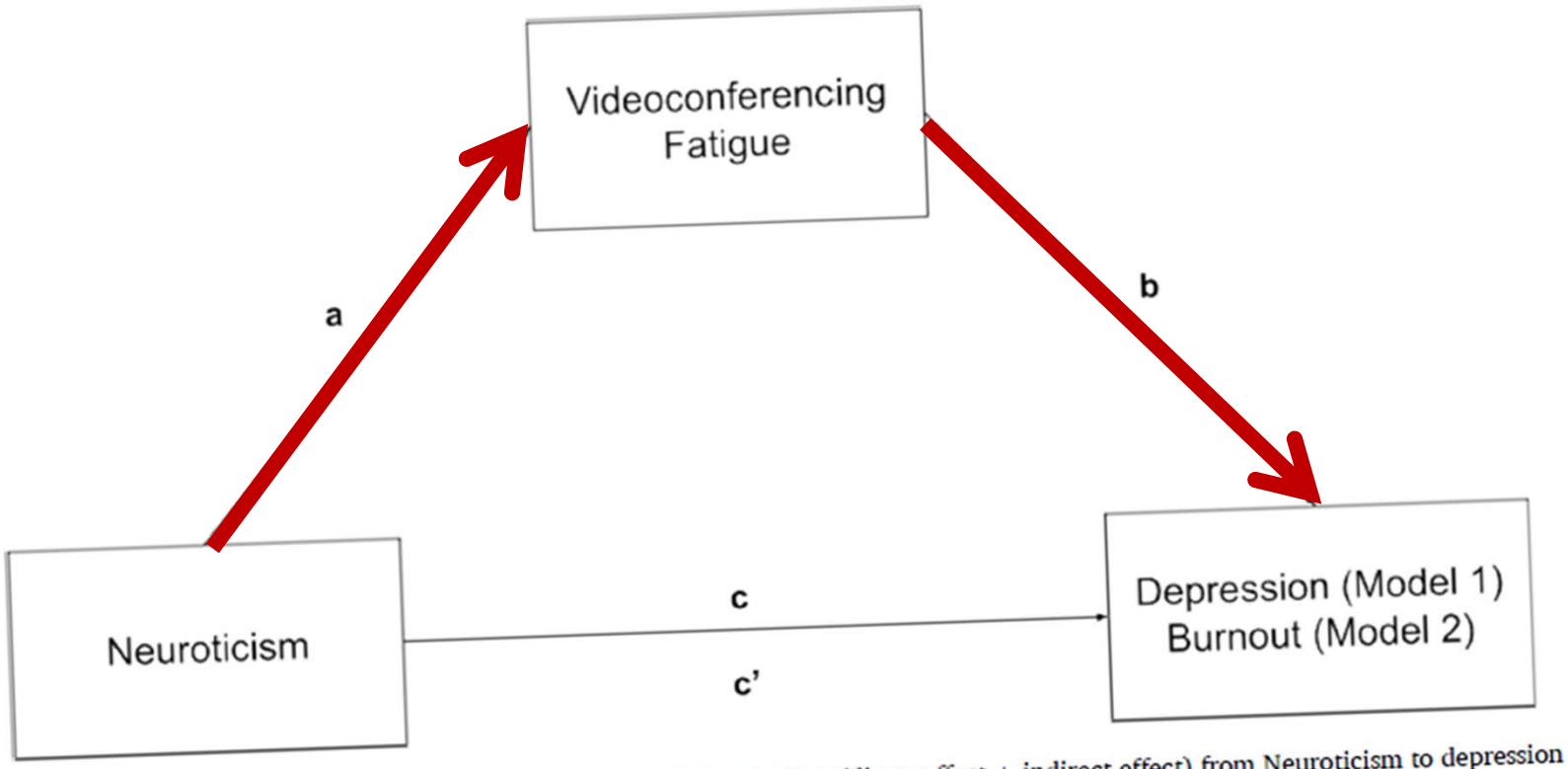
Table 2

Results of mediation analyses.

	Mediation model statistics			
	Outcome: Depression			
	β	SE	t (df)	95% CI for ab
Direct effect (a)	.311	.057	5.417*** (305)	-
Direct effect (b)	.425	.046	9.230*** (304)	-
Direct effect (c')	.292	.050	5.821*** (304)	-
Total effect (c)	.425	.052	8.143*** (305)	-
Indirect effect (ab)	.130	.025	-	[.083; .180]
Model statistics	R	R-squared	F	df
	.60	.36	84.90***	2; 304
	Outcome: Burnout			
	β	SE	t (df)	95% CI for ab
Direct effect (a)	.311	.057	5.417*** (305)	-
Direct effect (b)	.393	.050	7.816*** (304)	-
Direct effect (c')	.288	.055	5.253*** (304)	
Total effect (c)	.410	.055	7.441*** (305)	-
Indirect effect (ab)	.116	.025	-	[.070; .167]
Model statistics	R	R-squared	F	df
	.54	.30	63.68***	2; 304

Notes. Standardized coefficients are displayed. Standard errors of indirect effects are bootstrapped over 5,000 samples. Averaged bootstrapped indirect effects (ab) are displayed. *** $p < .001$.



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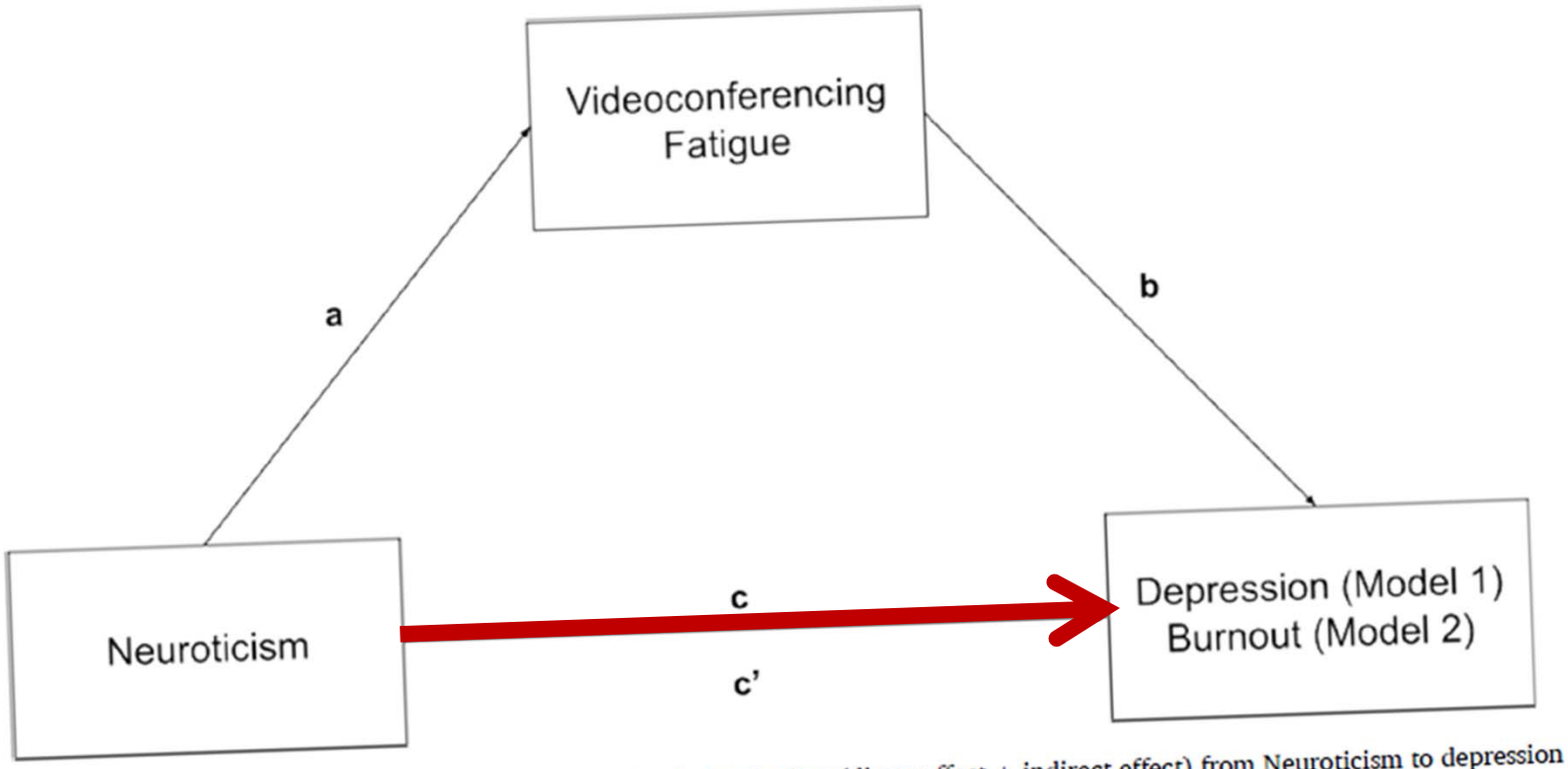

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Neurotizismus

Spektrum von emotionaler Labilität
zu emotionaler Stabilität

Wichtige Dimensionen:

- Verletzlichkeit
- Ängstlichkeit
- Innere Unruhe
- Übermaß


zoom
skype

Electronic Markets (2022) 32:153–177
https://doi.org/10.1007/s12525-021-00501-3

RESEARCH PAPER

On the stress potential of videoconferencing: definition and root causes of Zoom fatigue

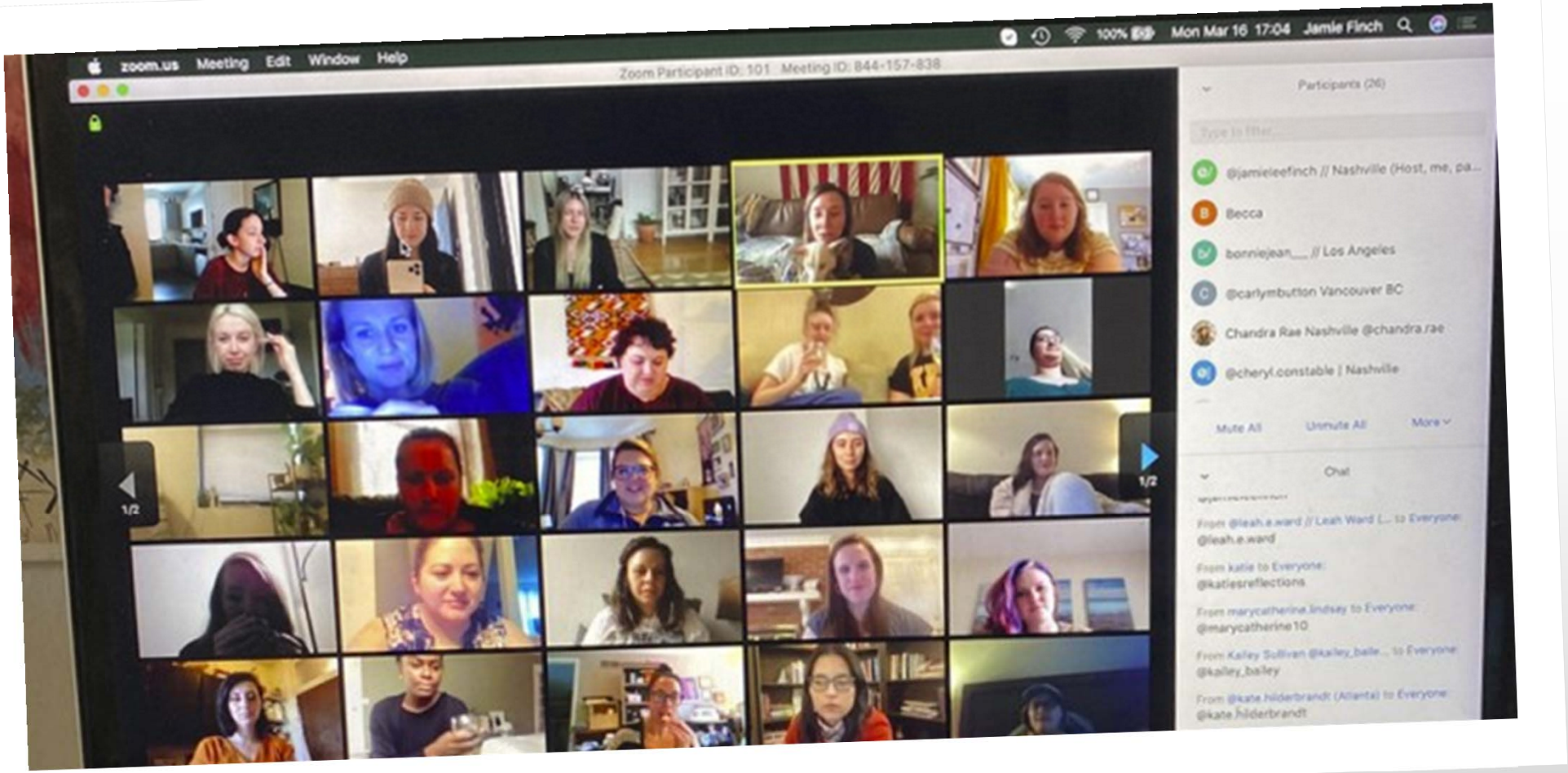
René Riedl[1,2]

Received: 6 May 2021 / Accepted: 15 September 2021 / Published online: 6 December 2021

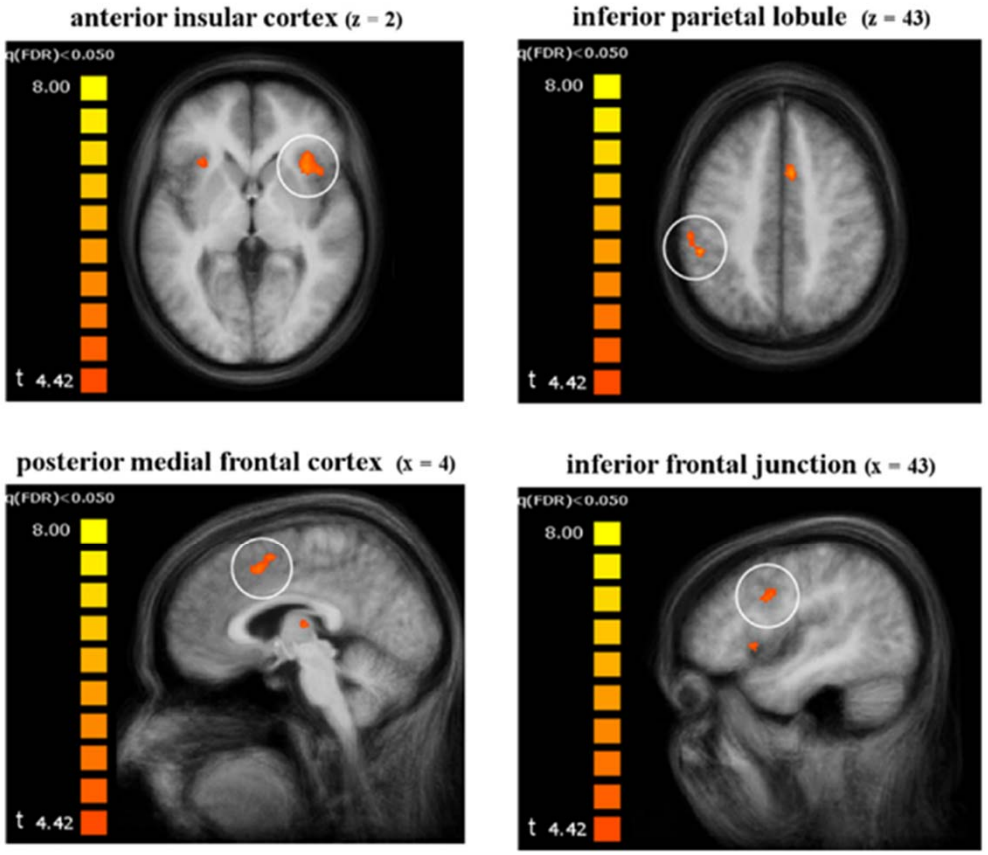
Abstract

As a consequence of lockdowns due to the coronavirus disease (COVID-19) and the resulting restricted social mobility, several billion people worldwide have recently had to replace physical face-to-face communication with computer-mediated interaction. Notably, the adoption rates of videoconferencing increased significantly in 2020, predominantly because videoconferencing resembles face-to-face interaction. Tools such as Zoom, Microsoft Teams, and Cisco Webex are used by hundreds of millions of people today. Videoconferencing may bring benefits (e.g., saving of travel costs, preservation of environment). However, prolonged and inappropriate use of videoconferencing may also have an enormous stress potential. A new phenomenon and term emerged, *Zoom fatigue*, a synonym for videoconference fatigue. This paper develops a definition for Zoom fatigue and presents a conceptual framework that explores the major root causes of videoconferencing fatigue and stress. The development of the framework draws upon media naturalness theory and its underlying theorizing is based on research published across various scientific fields, including the disciplines of both behavioral science and neuroscience. Based on this theoretical foundation, hypotheses are outlined. Moreover, implications for research and practice are discussed.

Keywords Zoom fatigue · Videoconference stress · Videoconference fatigue · Technostress · Media naturalness theory · NeuroIS · Home office


zoom.us Meeting Edit Window Help
Zoom Participant ID: 101 Meeting ID: 844-157-838
Mon Mar 16 17:04 Jamie Finch
Participants (26)
@jamieleefinch // Nashville (Host, me, pa...
Becca
bonniejean___ // Los Angeles
@carlymbutton Vancouver BC
Chandra Rae Nashville @chandra.rae
@cheryl.constable | Nashville
Mute All
Unmute All
More
Chat
1/2
1/2

Asynchronität der Kommunikation



Contrast: Immediate vs. 0.5 sec (average), max: 0.7 sec

Kohrs et al. (2012, 2016)

K e i n e Körpersprache

K e i n
Augenkontakt

Selbst-wahrnehmung

Automatische mentale Prozesse werden unterbrochen – **erhöhter kognitiver Aufwand**

- Was denken die anderen User über mich?
- Wie werde ich von anderen Usern wahrgenommen?

"Imagine in the physical workplace, for the entirety of an 8-hr workday, an assistant followed you around with a handheld mirror, and for every single task you did and every conversation you had, they made sure you could see your own face in that mirror. This sounds ridiculous, but in essence this is what happens on Zoom calls"

Bailenson (2021)

Mirror Anxiety

Frauen haben mehr Video-conference Fatigue als Männer

Fauville et al. (2021)

Multitasking
während
Videoconferencing

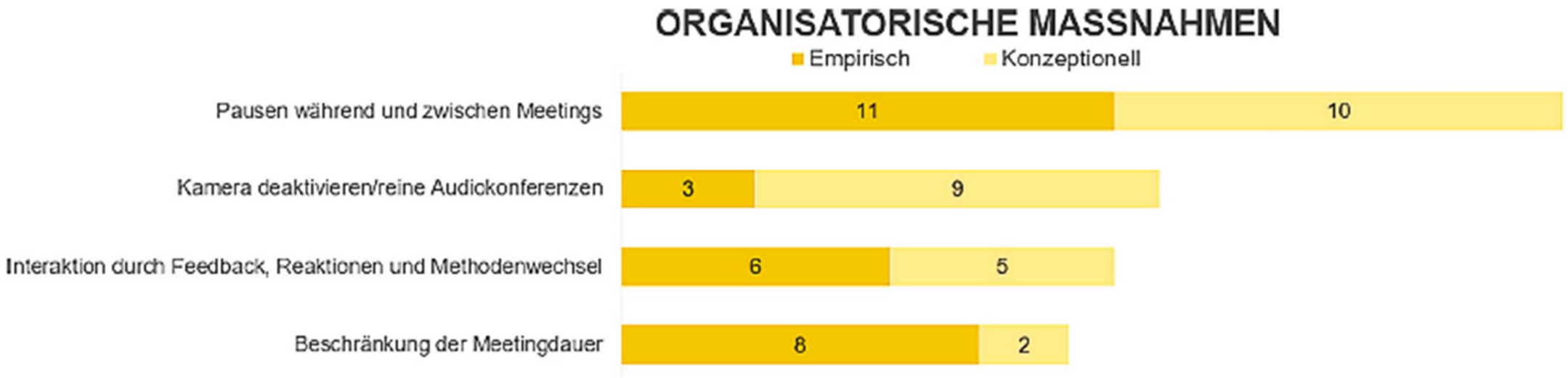
HMD Praxis der Wirtschaftsinformatik
https://doi.org/10.1365/s40702-023-00963-3

SPEKTRUM

Bewältigungsstrategien von Videoconference Fatigue

Victoria Bauer · René Riedl

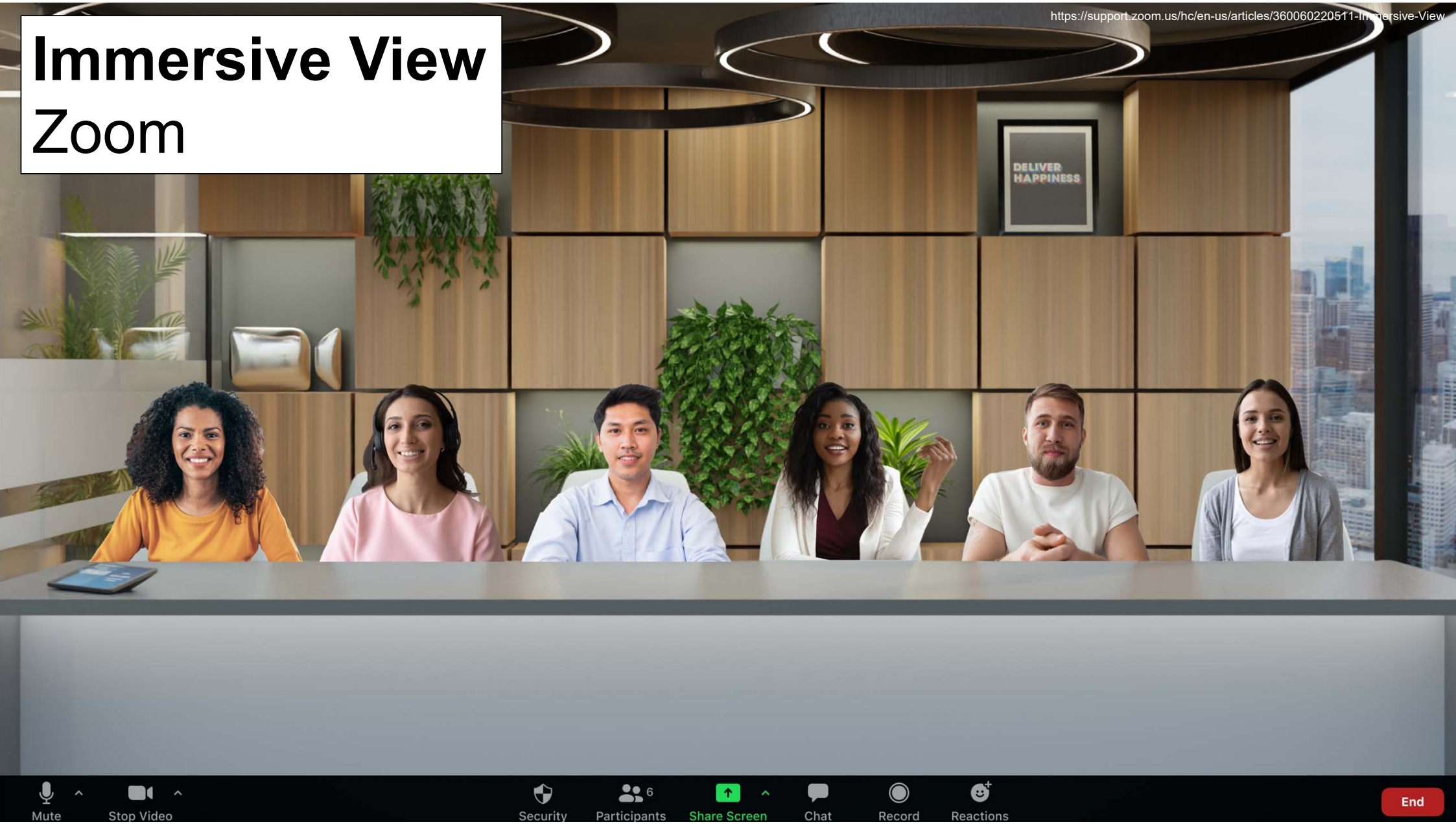
Eingegangen: 15. November 2022 / Angenommen: 17. Februar 2023


ORGANISATORISCHE MASSNAHMEN
Empirisch
Konzeptionell
Pausen während und zwischen Meetings
11
10
Kamera deaktivieren/reine Audickonferenzen
3
9
Interaktion durch Feedback, Reaktionen und Methodenwechsel
6
5
Beschränkung der Meetingdauer
8
2

Together Mode
Microsoft Teams

https://news.microsoft.com/de-de/gekommen-um-zu-bleiben-neue-funktionen-fuer-microsoft-teams/

Immersive View
Zoom



Smartphone, Social Media und Unterbrechnungen

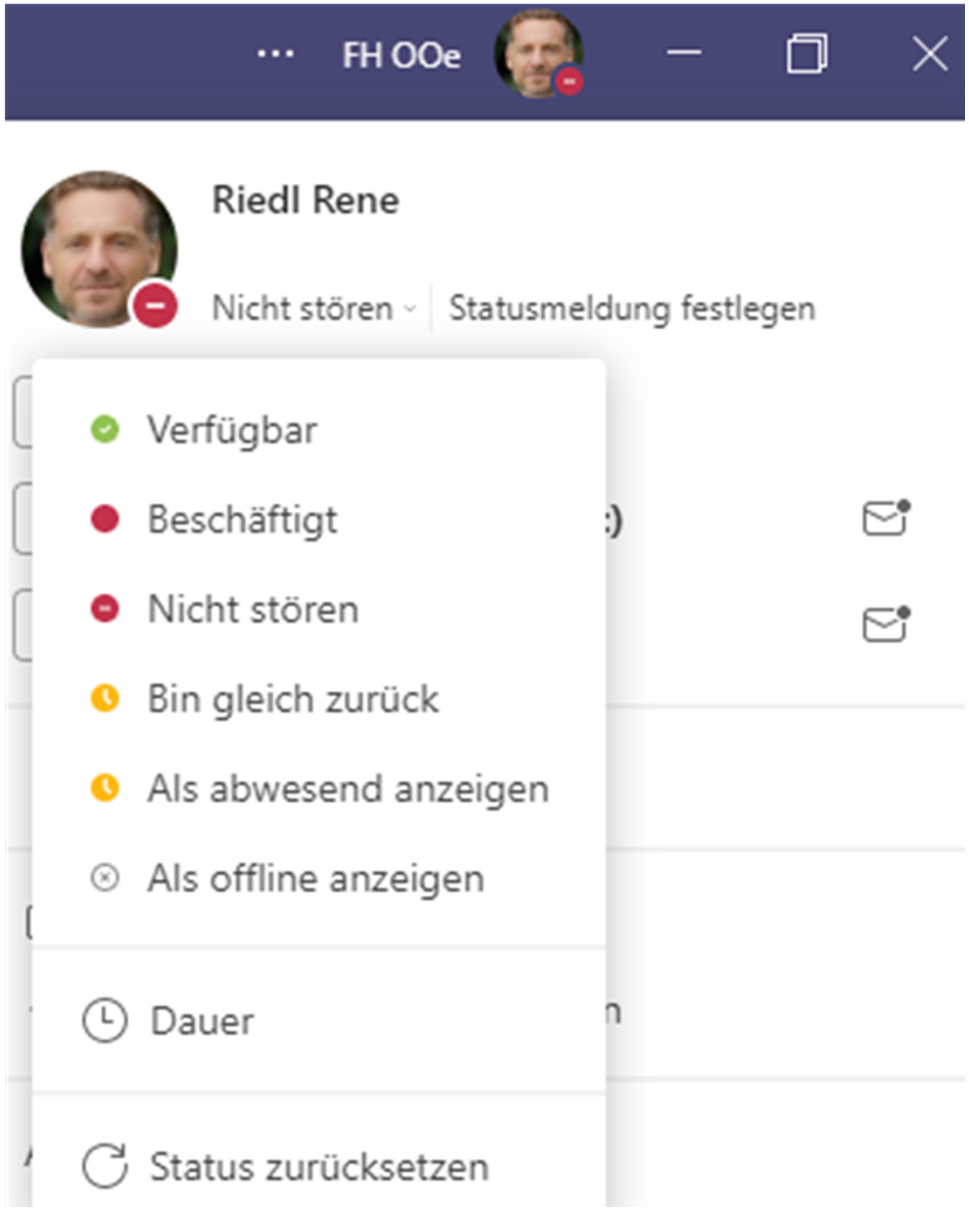
Informations- und Kommunikationsmisere

- 88 Unterbrechungen mit dem eigenen Smartphone pro Tag
- alle 11 Minuten unterbrechen wir uns selbst (bei 16 Stunden Wachphase)
- bis zu 24 Minuten, um die ursprüngliche Aufgabe wieder aufzunehmen
- ¼ der ursprünglichen Aufgaben werden gar nicht mehr aufgenommen

Mehr Multitasking → kein Flow

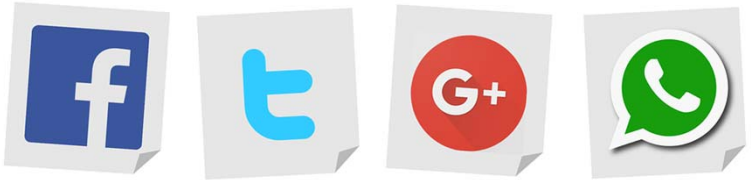
kein Flow → weniger Zufriedenheit & Produktivität

Microsoft Teams



Beispiel: Smartphone, Social Media

- größeres soziales Netzwerk auf Social Media → mehr Infektionen der oberen Atemwege
- Facebook-Abstinenz für wenige Tage → Rückgang des Stresshormons Kortisol
- Facebook-Nutzung → verzögerte Erholung nach Stresserlebnissen (Kortisol)
- Überblicksartikel: 16 Einzelstudien, 15 belegen den positiven Zusammenhang von Smartphone-Nutzung und Stress



E-Mail-Stress

Beispiel: E-Mail

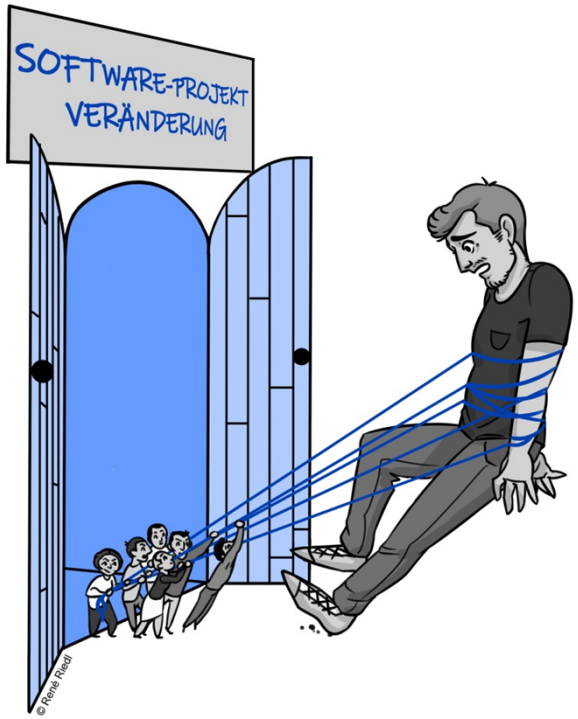
- 75 E-Mails pro User/Tag
- alle 15 Minuten werden E-Mails gelesen
- 2 Stunden E-Mail-Zeit pro Tag
- E-Mails laufend zu checken verändert das eigentliche Merkmal der Technologie als asynchrones Medium → kein Flow
- Multitasking → erhöhter Blutdruck

- **3 x täglich E-Mails checken (= Optimum) → weniger Stress**

Ständiger Wandel

Ständiger Wandel

- digitale Transformation → Veränderungen der Organisation und der IT-Landschaft
- die meisten Menschen streben nach Stabilität und Kontinuität → Veränderung geht mit Unsicherheit einher, das führt zu Stress
- Einführung von Anwendungssystemen geht mit Stress und Burnout einher

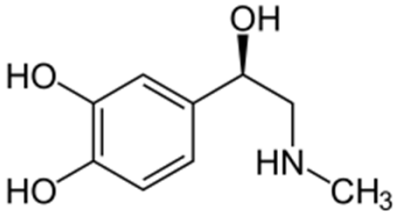


Einfluss von System-einführungen auf Stresshormone

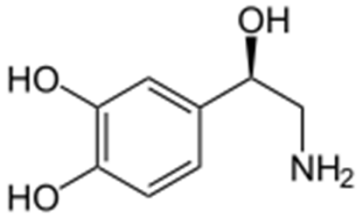
Feldstudie
in fünf Unternehmen verschiedener Branchen

3 Messzeitpunkte

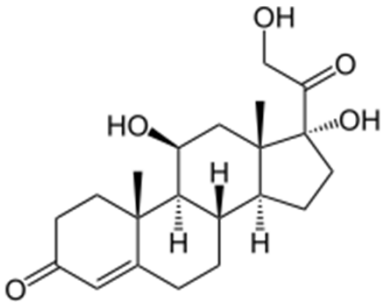
Adrenalin



Noradrenalin



Kortisol



- Phase 1: 2 Monate vor der Einführung
- Phase 2: 2-6 Monate nach Start der Einführung
- Phase 3: 12 Monate nach Abschluss der Einführung

- Phase 1 auf 2:

  Adrenalin ↑ | Noradrenalin ↑ | Kortisol ~

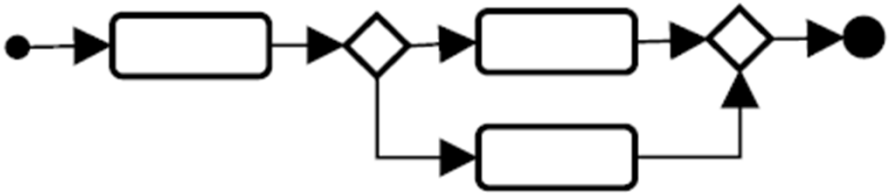
  Einführung von neuen Systemen führt zu Stress.

- Phase 2 auf 3:

  Adrenalin ↑ | Noradrenalin ↑ | Kortisol ↑

  Veränderte Abläufe und Beschleunigung führen zu Stress.

1. Einführung digitaler Technologien



2. Veränderte Arbeitsabläufe

3. Stress

Bewältigungsstrategie gegen digitalen Stress

— Beispiel —

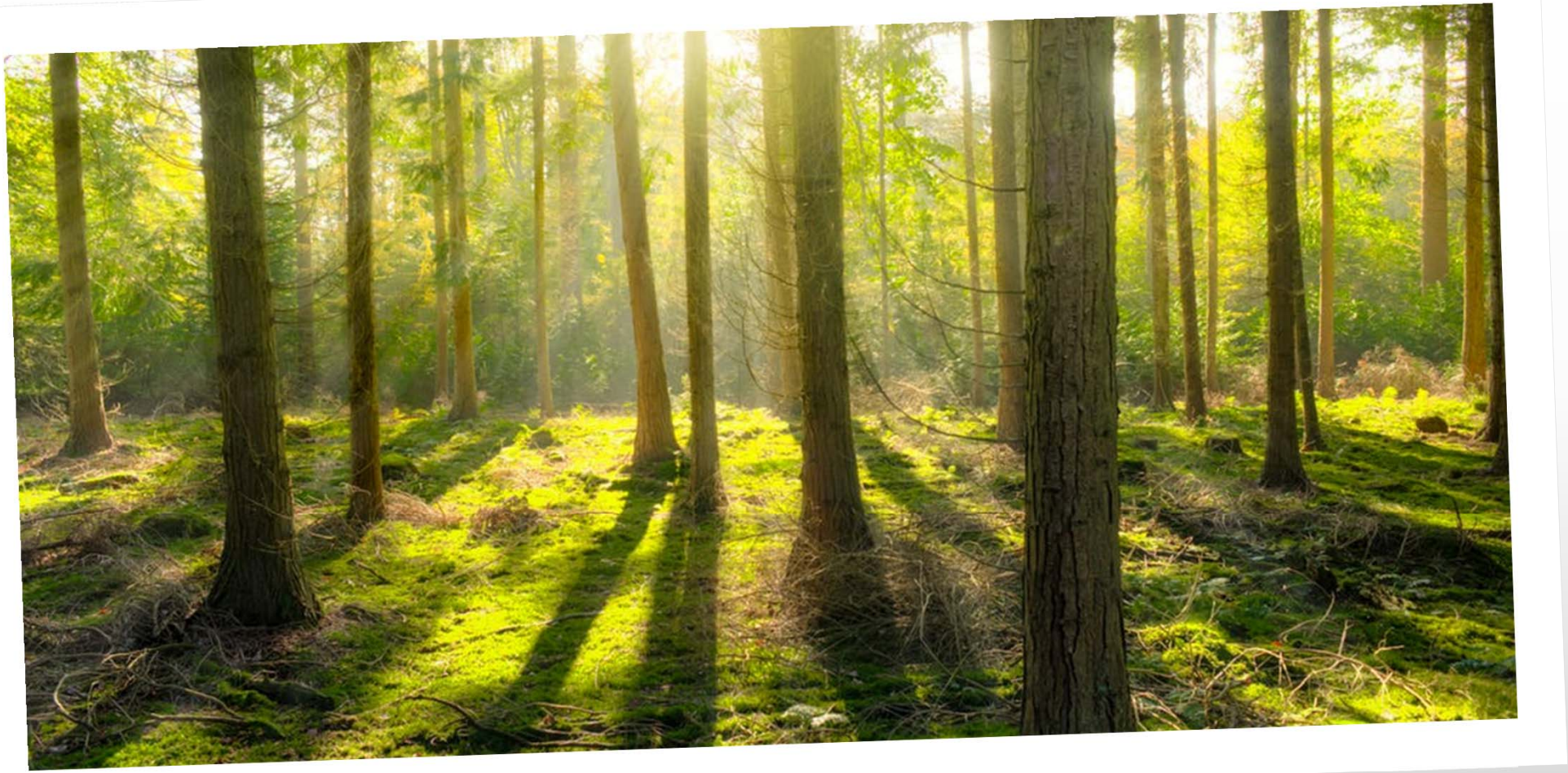

PAUSE
© René Riedl

Normalisierung des Blutdrucks (ca. 10-minütige Pausen)

Baseline:
119,6 mmHg (SYS)
73,7 mmHg (DIA)

User unter Stress:
157,5 mmHg (SYS)
85,8 mmHg (DIA)

Hjortskov, N. et al. (2004)



Wer hat mehr digitalen Stress: ältere oder jüngere Menschen?


Jüngere haben
meist mehr
digitalen
Stress

Alter → Digitaler Stress

Alter → **Nutzungs-dauer und -häufigkeit von digitalen Technologien** → Digitaler Stress

Was ist eine der allerwirksamsten Strategien gegen digitalen Stress?

Nutzungsdauer
und Nutzungshäufigkeit
von digitalen Technologien

R E D U Z I E R E N

Digitaler Stress: Forschungsbefunde und Praxisimplikationen

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