

## Supplementary Materials

### “Effects of COVID-19 Pandemic on Progress Test performance in German Speaking Countries.”

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#### 1. Supplementary Tables

##### Supplementary Table 1

Mixed regression model output for pair PT36-PT41<sup>a</sup>

Predictors	Estimates	CI	p-value	R <sup>2</sup> <sup>b</sup>
(Intercept)	0.59	-3.66 – 4.84		
Test no. [41]	2.53	1.31 – 3.75	<0.01	0.00
Semester	5.7	5.00 – 6.40	<0.01	0.30
Test modality [ePT]	5.04	3.06 – 7.01	<0.01	0.01
Test modality [Paper-Pencil]	3.67	1.70 – 5.63	<0.01	0.01
Test no. [41] * semester	-0.32	-0.50 – -0.13	0.01	0.00
<b>Random Effects</b>				
$\sigma^2$	224.11			
$\tau_{00}$ uni	35.17			
$\tau_{11}$ uni.semester	1.08			
ICC	0.14			
$N_{uni}$	9			
Observations	13,372			
Marginal R <sup>2</sup> / Conditional R <sup>2</sup>	0.49 / 0.56			

*Abbreviations:* CI = confidence interval; Test no. = (Progress) Test number; ePT = electronic Progress Test; uni = University

<sup>a</sup> PT pair (every PT shares a considerable number of questions with the PT that took place five semesters before, i.e., No 36 & 41; PT 36 = summer semester 2017, PT 41 = winter semester 2019/20, N = 13372).

<sup>b</sup> semi partial  $r^2$  for fixed effects

## Supplementary Table 2

### Mixed regression model output for pair PT37-PT42<sup>a</sup>

Predictors	Estimates	CI	p-value	R <sup>2</sup> <sup>b</sup>
(Intercept)	3.57	1.05 – 6.08		
Test no. [42]	3.72	2.57 – 4.88	<0.01	0.00
Semester	4.37	3.72 – 5.02	<0.01	0.27
Test modality [ePT]	5	3.91 – 6.08	<0.01	0.14
Test modality [Paper-Pencil]	1.79	0.62 – 2.96	<0.01	0.00
Test no. [42] * semester	0.04	-0.11 – 0.20	0.59	0
<b>Random Effects</b>				
$\sigma^2$	163.31			
$\tau_{00 \text{ uni}}$	10.9			
$\tau_{11 \text{ uni.semester}}$	0.92			
ICC	0.06			
$N_{\text{uni}}$	9			
Observations	13,121			
Marginal R <sup>2</sup> / Conditional R <sup>2</sup>	0.49 / 0.52			

*Abbreviations:* CI = confidence interval; Test no. = (Progress) Test number; ePT = electronic Progress Test; uni = University

<sup>a</sup> PT pair (every PT shares a considerable number of questions with the PT that took place five semesters before, i.e., No 37 & 42; PT 37= winter semester 2017/18, PT 42 = summer semester 2020, N = 13,121).

<sup>b</sup> semi partial  $r^2$  for fixed effects

### Supplementary Table 3

#### Mixed regression model output for pair PT38-PT43<sup>a</sup>

Predictors	Estimates	CI	p-value	R <sup>2</sup> <sup>b</sup>
(Intercept)	3.93	1.75 – 6.12		
Test no. [43]	5.66	4.63 – 6.69	<0.01	0.01
Semester	4.71	4.09 – 5.34	<0.01	0.28
Test modality [ePT]	4.83	3.55 – 6.11	<0.01	0.02
Test modality [Paper-Pencil]	-0.84	-1.93 – 0.25	0.13	0
Test no. [43] * semester	-0.3	-0.46 – -0.14	<0.01	0.00
<b>Random Effects</b>				
$\sigma^2$	187.51			
$\tau_{00 \text{ uni}}$	8.27			
$\tau_{11 \text{ uni.semester\_unfac}}$	0.88			
ICC	0.04			
$N_{\text{uni}}$	9			
Observations	13,822			
Marginal R <sup>2</sup> / Conditional R <sup>2</sup>	0.48 / 0.51			

*Abbreviations:* CI = confidence interval; Test no. = (Progress) Test number; ePT = electronic Progress Test; uni = University

<sup>a</sup> PT pair (every PT shares a considerable number of questions with the PT that took place five semesters before, i.e., No 38 & 43; PT 38 = summer semester 2018, PT 43 = winter semester 2020/21 N = 13,822).

<sup>b</sup> semi partial r<sup>2</sup> for fixed effects

## Supplementary Table 4

Net changes per subject, defined as the differences in the percentage share of correct answers between the two tests of each PT pair<sup>a</sup>, restricted to the subset of questions related to each subject; data were collected from PT tests administered by nine medical schools in Germany and Austria and analyzed in January 2021.

Subject	PT41-PT36 <sup>b</sup>	PT42-PT37 <sup>c</sup>	PT43-PT38 <sup>d</sup>
General Practice		0.97	1.36
<b>Anesthesiology, Emergency Medicine and Intensive Care</b>	<b>3.48</b>	<b>5.41</b>	<b>10.05</b>
Anatomy, Biology	7.15	0.11	3.18
Occupational and Social Medicine, Healthcare		2.43	0.72
Ophthalmology	3.02		0.40
Biochemistry, Chemistry, Molecular Biology		-2.50	4.19
Surgery	1.90	3.96	5.19
Dermatology	0.87	1.34	-0.56
<b>Epidemiology, Medical Biometrics</b>	<b>2.92</b>	<b>14.76</b>	<b>22.56</b>
Gynecology and Obstetrics	0.77	6.33	7.17
Otorhinolaryngology	-0.93		-0.86
Human Genetics	-5.02	0.52	3.43
Hygiene, Microbiology	0.04	1.71	1.74
Internal Medicine	-0.20	2.07	5.67
Paediatrics	2.54	4.24	2.56
Clinical Chemistry, Clinical Pathology	-2.94		
Med. Psychology/Sociology			5.18
Naturopathy, Physical Medicine			
Neurology	2.80	4.58	4.69
Orthopedics	6.69	2.62	9.65
Pathology	-5.31	4.21	1.59
Pharmacology, Toxicology	-1.09	5.19	0.80
Physiology, Physics	5.14	0.05	7.10
Psychiatry, Psychosomatic Medicine	4.53	9.22	5.75
Radiology, Nuclear Medicine	-1.05	-1.11	0.69
Legal Medicine	5.64		2.09
Urology	-0.24	-2.13	1.00
<b>Average change</b>	<b>1.40</b>	<b>3.05</b>	<b>4.21</b>

Abbreviations: PT = Progress Test Medizin

<sup>a</sup> PT pair (every PT shares a considerable number of questions with the PT that took place five semesters before, i.e., No 36 & 41, No 37 & 42, No 38 & 43)

<sup>b</sup> PT 36 = summer semester 2017, PT 41 = winter semester 2019/20, N = 13,372

<sup>c</sup> PT 37 = winter semester 2017/18, PT 42 = summer semester 2020, N = 13,121

<sup>d</sup> PT 38 = summer semester 2018, PT 43 = winter semester 2020/21 N = 13,822