Leveraging the Testing Effect using Parametrized Tasks in Learning Management Systems

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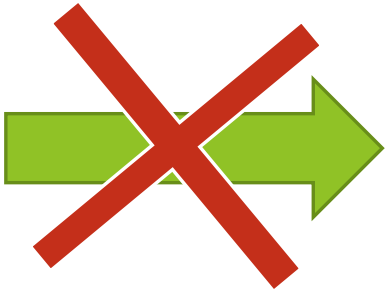
EARLY SIG 6 & 7 Conference 2022 August 22-24

Introduction

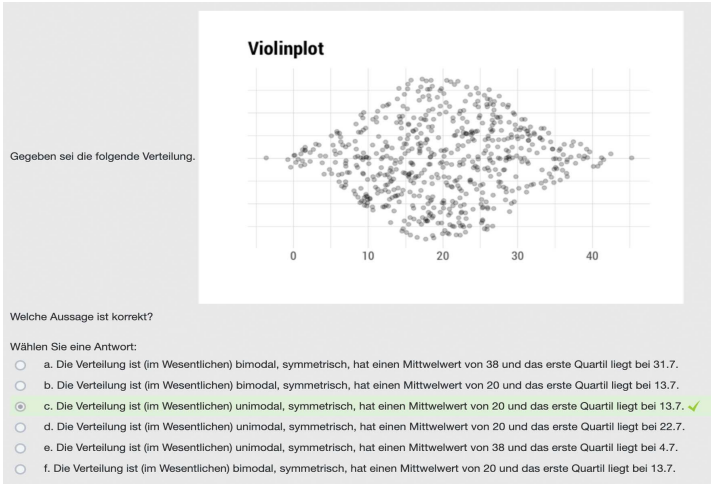
strong evidence for effectiveness of the testing effect



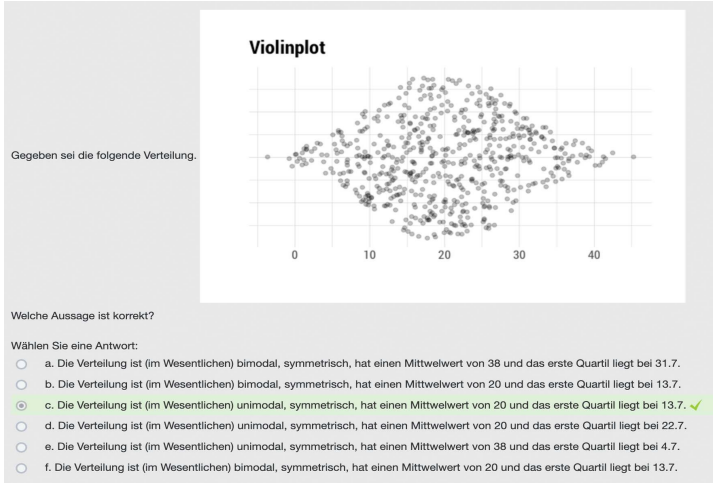
intensive use of tests by students and teachers

Material: Task sets for self-testing

- Example question within parametrized task set



- Example question within fixed task set



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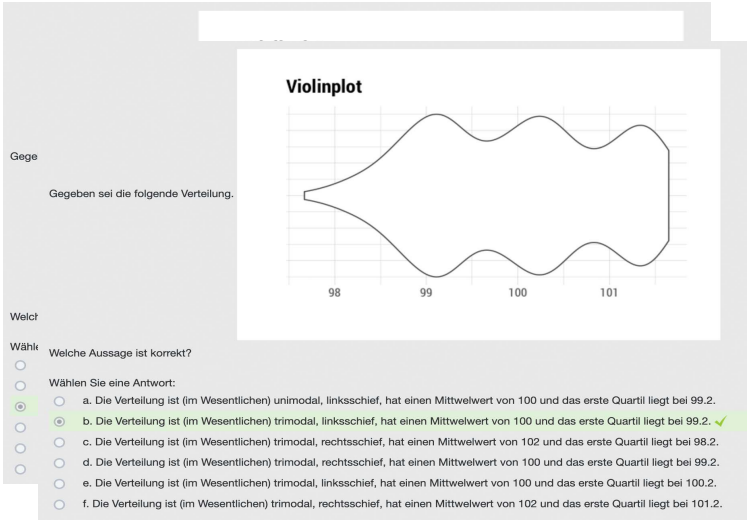

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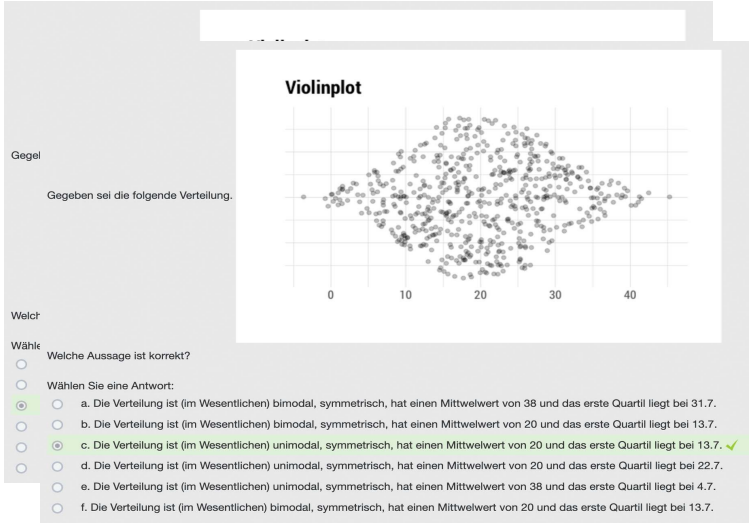

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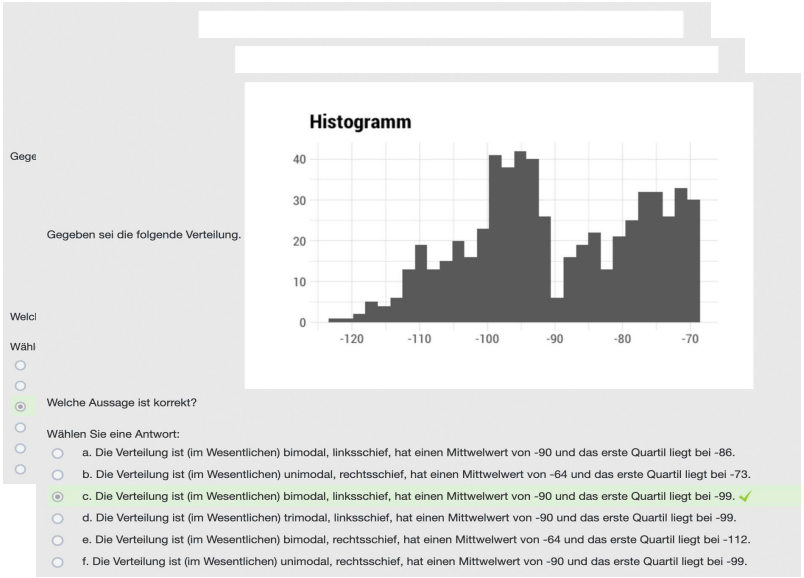

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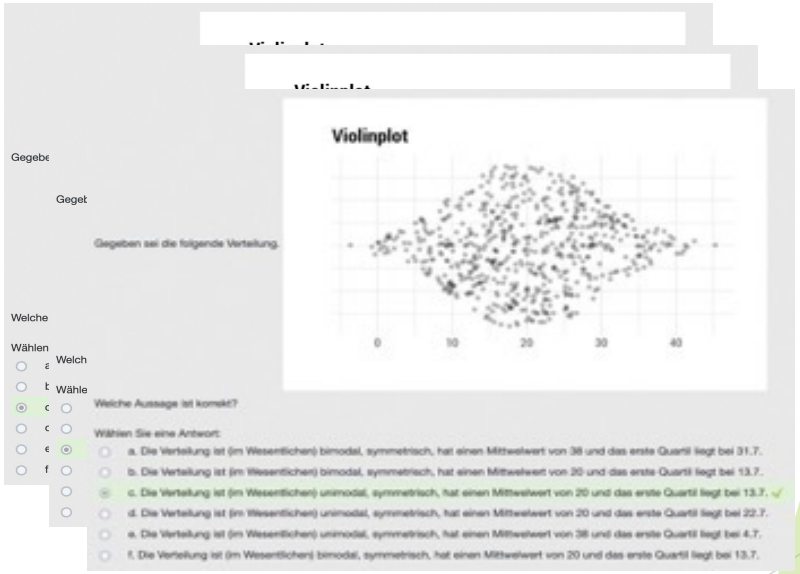
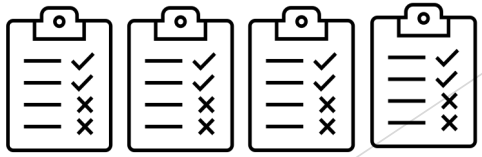


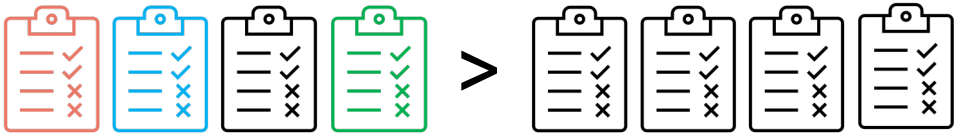


C. Baumann & S. Merk: Leveraging the Testing Effect using Parametrized Tasks (23.08.2022)

Hypotheses

1. The more intensively practice tests are used by students in an online course, the better learning results they achieve.

2. The use of parametrized test tasks leads to higher learning performance than the use of fixed task sets.

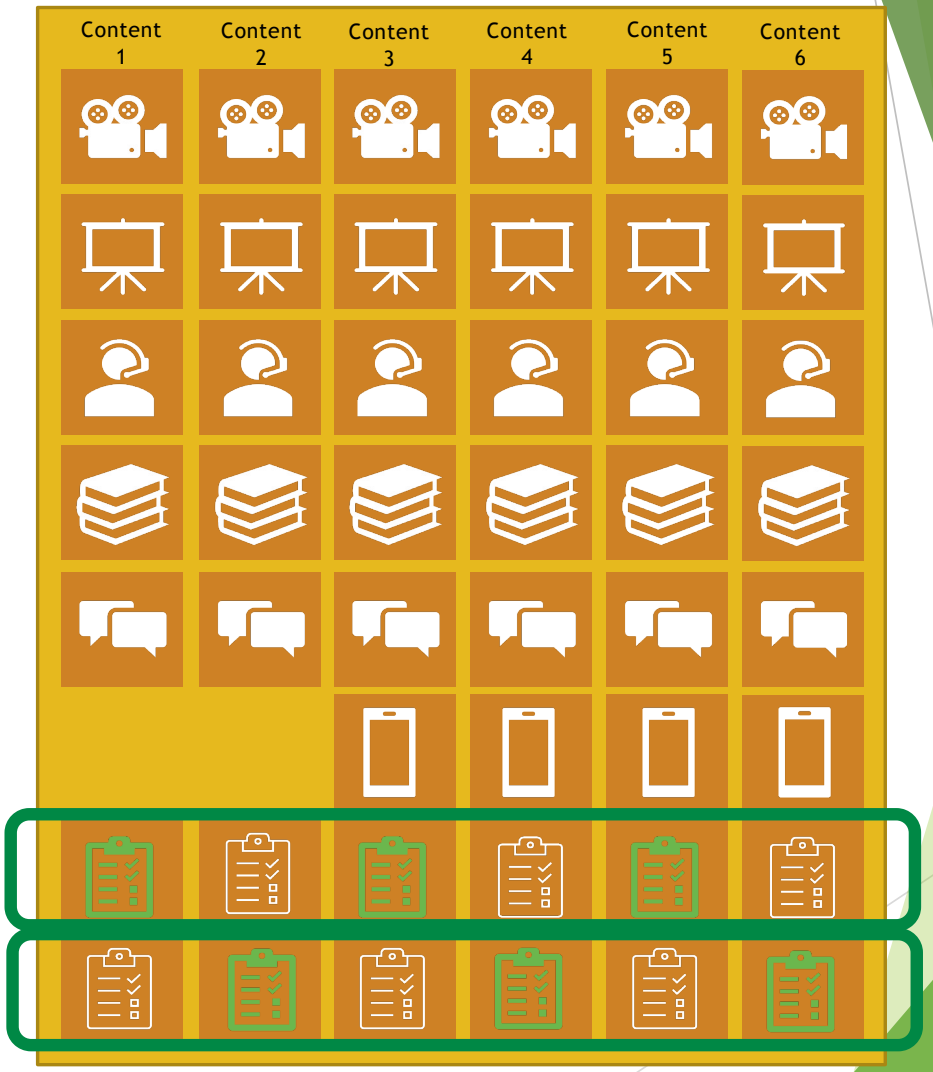


3. Parametrized tasks increase the students‘ situational interest compared to fixed task sets.

Methods

- between-group and within-person experiment
- log data analysis and additional questionnaires

- blended learning setting
- course on research methodology
- student teacher sample
- weekly formative, digital tests (multiple choice test)
- immediate feedback



(Preliminary) Results

- Sample: n=342 student teachers (age 18-43, mean=21.69)

- Kendall's rank correlation tau (number of attempts and result in exam)
- z = 11.771, p-value < 2.2e-16, tau = 0.4454374

(Preliminary) Results

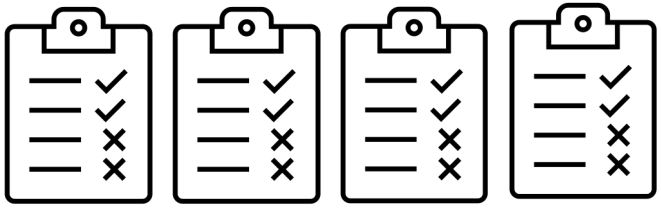
- Sample: n=342 student teachers (age 18-43, mean=21.69)

- Kendall's rank correlation tau (number of attempts and result in exam)
- z = 11.771, p-value < 2.2e-16, tau = 0.44

parametrized task sets

>

fixed task sets

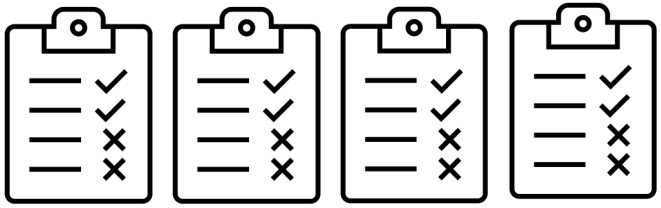


week	tau	p-value
1	-0.03	0.51
2	0.04	0.30
3	-0.05	0.28
4	0.08	0.06
5	-0.04	0.32
6	0.02	0.57

parametrized task sets

?

fixed task sets



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Situational interest

value: useful, unimportant (rev.), unnecessary (rev.)
feeling: exciting, boring (rev.), entertaining

Random intercept model

	value		
Predictors	*Estimates*	*CI*	*p*
(Intercept)	21.71	20.99 – 22.44	**<0.001**
Parametrisierung	-0.34	-0.98 – 0.31	0.304
Random Effects			
σ^2	13.78		
$\tau_{00\ Pseudonym}$	12.93		
ICC	0.48		
$N_{\ Pseudonym}$	167		
Observations	563		
Marginal R^2 / Conditional R^2	0.001 / 0.484		

	feeling		
Predictors	*Estimates*	*CI*	*p*
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Parametrisierung	0.29	-0.38 – 0.97	0.394
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Discussion and next steps

- repetition on task set level vs. single task level

- proportion of correct responses

References

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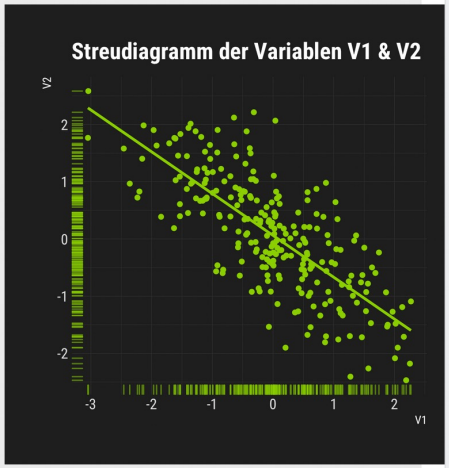
- Yang, C., Luo, L., Vadillo, M. A., Yu, R., & Shanks, D. R. (2021). Testing (quizzing) boosts classroom learning: A systematic and meta-analytic review. *Psychological Bulletin*, *147*(4), 399–435.

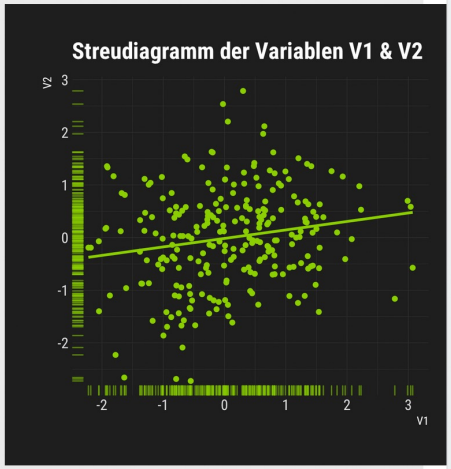
More examples



Obige Abbibldung zeigt die Assoziation der beiden Variablen V1 und V2. Welches Pearsons's r(V1,V2) passt am besten zu dieser Abbildung?

Wählen Sie eine Antwort:

- a. 0.73
- b. 0.07
- c. -0.25
- d. 0.22
- e. -0.74 ✔



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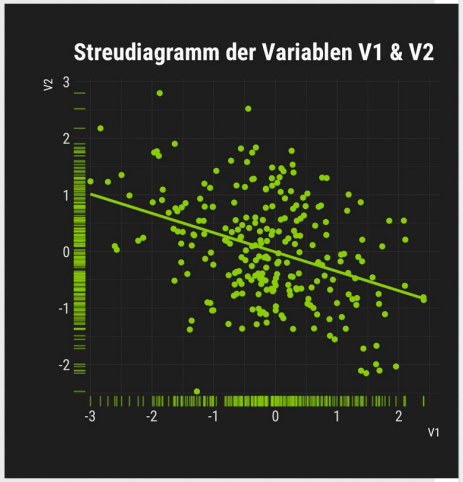
Wählen Sie eine Antwort:

- a. -1.09
- b. -0.16
- c. 0.06
- d. 1.1
- e. 0.13 ✔



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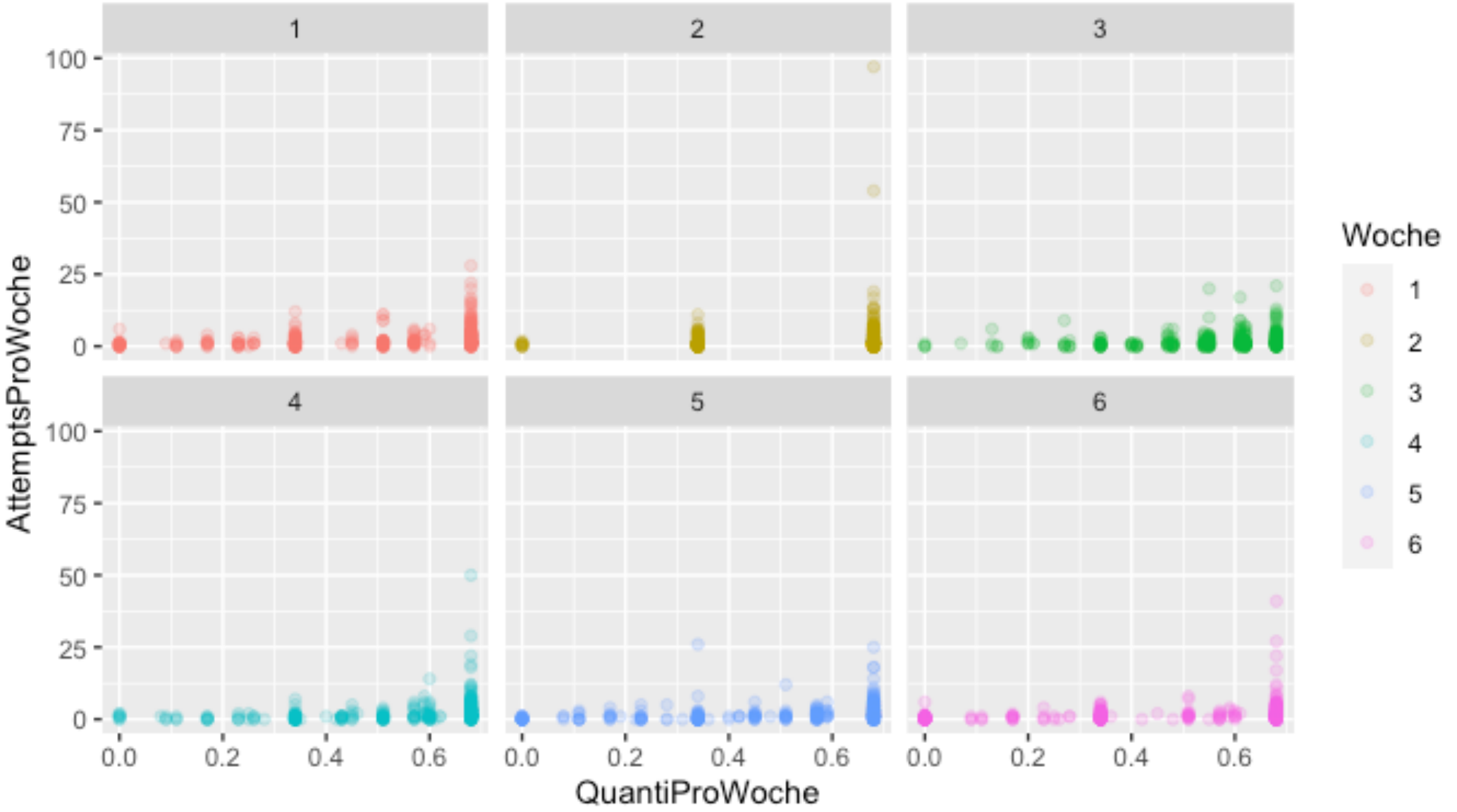
- b. 0.09
- c. 0.24
- d. 0.69
- e. -0.69


1
2
3
4
5
6
AttemptsProWoche
QuantiProWoche
0
25
50
75
100
0.0
0.2
0.4
0.6
Woche
1
2
3
4
5
6