

CAN SCHOOL-RELATED MATHEMATICAL PROBLEMS AFFECT THE PERCEIVED DOUBLE DISCONTINUITY?

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There has been a discussion for more than 100 years, that (prospective) secondary mathematics teachers have difficulties to see connections between school mathematics and academic mathematics both at the beginning of their studies as well as at the entry to their career (*double discontinuity*, Klein, 1932). Hence, many universities started to support their prospective teachers in drawing these connections. A popular intervention are school-related mathematical problems (SRMPs) that address connections between school mathematics and academic mathematics (see *school-related content knowledge*, Dreher et al., 2018). Our research project aims to investigate whether SRMPs can lessen students' perceived double discontinuity. We assume that the use of SRMPs reduces the first discontinuity by fostering students' perception of connections between contents of academic mathematics and school mathematics. Furthermore, as most SRMPs address typical teacher tasks requiring academic knowledge, we assume that SRMPs also support students' perceived relevance of academic mathematics for teaching. In the long term, this might influence the second discontinuity.

We conducted our questionnaire-study at one German university with $N = 98$ first year students: an experimental group of 74 prospective teachers who received SRMPs and a control group of 24 students majoring in mathematics or related subjects who visited the same university courses, but did not receive SRMPs. Conducting a t-test and an ANOVA, we found that the perception of both groups did not significantly differ in the pre-test but that the perception in the post-test depended on an interaction of the factors group and time showing a more favorable trend for the experimental group. There were significant but small interaction effects on the perception of connections between academic and school mathematical contents ($F(1, 89) = 6.51, p = .01, \eta^2 = .03$) as well as on the perceived relevance of academic mathematics for the teaching profession ($F(1, 90) = 4.27, p = .04, \eta^2 = .02$). In sum, our results indicate that SRMPs might influence the perceived double discontinuity in a positive way. However, these first results need to be replicated in a larger sample.

References

- Dreher, A., Lindmeier, A., Heinze, A., & Niemand, C. (2018). What kind of content knowledge do secondary mathematics teachers need? *Journal for Didactics of Mathematics*, 39, 319-341.
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