# Science Anxiety in Times of a Pandemic: Can Mindfulness Training Ease the School Transition Experience?

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## Introduction

- Schools quick to adapt to changes during COVID-19 pandemic but children's learning progress slowed
  - German primary school students' skills in reading and maths declined, with most significant portion of decline directly attributed to pandemic experiences [1, 2]
  - Science as new subject in secondary school relies on these skills in critical delay
- Students ill prepared in core readiness skills for secondary school also have to cope with transition experience
  - Move generally associated with student anxiety [3]
  - Impedes participation in science classes, affecting achievement, performance and knowledge acquisition [4, 5]
- Additional recognition of science anxiety [6]
  - Adapted rating scale for measuring science anxiety establishes it as distinct from test and general anxiety [7]
- Training sessions generally effective in supporting anxious students in exam preparation and knowledge acquisition [5]
  - Mindfulness as particular strategy effective in positively supporting school transition related anxiety [8]
  - But no insight into role it can play in alleviating science anxiety

## Research Questions

- How significant is the issue of science anxiety amongst German 5th-graders?
- Can science anxiety be improved through the implementation of a mindfulness programme?

## Design and Method

- Quasi-experimental approach
  - Three classes of fifth-graders ($N$ = 67) at public regular school in north of Germany who transitioned from primary to secondary school in summer of 2023
- Pretest-intervention-posttest design
  - Pre-test science anxiety rating scale [7] formed baseline measure
  - Groups 1 and 2 received six weeks of mindfulness activity at start of each science lesson
  - Each activity unit consisted of Silent 60 plus one exercise

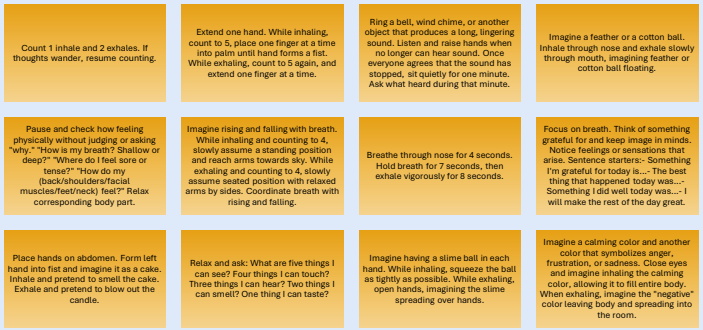


Figure 1: Exercises in the mindfulness training programme

  - Group 3 continued lessons in usual approach (control group)
  - After six weeks all children completed anxiety rating scale
  - Group 1 then continued with mindfulness activities for another six weeks, but not Group 2
  - At end of second six weeks, all three groups again completed scale

## Results

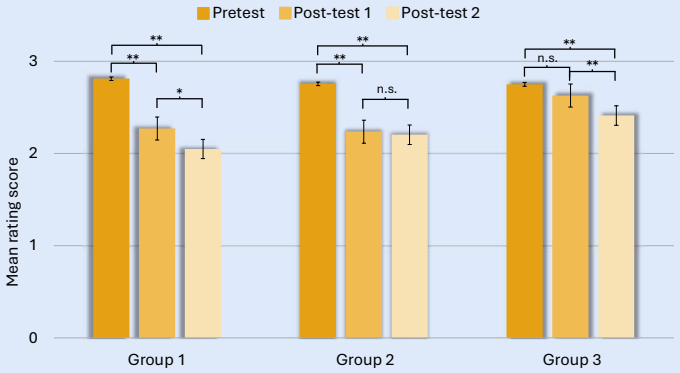


Figure 2: Mean anxiety rating scores across tests by group

- Pretest baseline
  - No significant variation in anxiety ratings across three groups
  - Girls' scores significantly higher than boys' in all three groups, in agreement with other studies showing similar gender effects [7]
- From pretest to post-tests
  - Results from Group 1 indicate continuous significant improvement in ratings
  - Results from Group 2 support effect of intervention but also highlight importance of continued intervention
  - Control Group 3 also significantly improved, with ratings no longer significantly different across three groups in end, but highlights delay in reduction can be pre-empted by earlier intervention
  - Across all three groups gender differences no longer significant by first post-test, but role of intervention in narrowing gap unclear

## Conclusion

- Moderate science anxiety levels present following school transition
- Ratings reduced in all three groups by end of first school term, but intervention groups made quicker progress
  - Support enjoyment of and interest in science, increasing engagement with important topics for global future
  - Could also have effect on other subject related anxieties as well as on overall school transition experience
- Further points to consider in fuller evaluation
  - Teaching styles; immigration and resulting higher efforts to include diverse students; separating science anxiety from how it is affected by transition related anxiety

## References

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