

INPLASY PROTOCOL

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None declared.

A meta-analysis of the relationship between academic achievement emotions and achievement in mathematics

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Review question / Objective: The meta-analysis's aim is to determine the relationship between academic achievement emotions and achievement in mathematics.

Eligibility criteria: The literature was screened as follows: (1) the empirical research in the field of mathematics education discussed in the study reported the correlation coefficient between academic achievement emotion and mathematics achievement; (2) The sample size is reported; (3) There is a clear explanation of the emotional measurement tools and dimension settings of academic achievement, and the source of mathematical achievement; (4) The subjects were primary and secondary school students, excluding pre-school children and college students; (5) The investigation is about students' academic achievement emotion in the traditional teaching environment, excluding the research of online teaching.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 22 July 2022 and was last updated on 22 July 2022 (registration number INPLASY202270100).

Condition being studied: In the process of achieving mathematical academic achievement, in addition to the role of cognitive factors, non-cognitive factors also play an important role. Both academic achievement emotion and mathematical achievement have a great impact on a student's development. However, there is no systematic literature review to discuss

INTRODUCTION

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the relationship between academic achievement emotions, and mathematical achievement.

METHODS

Participant or population: Participants from the research are articles that examine students aged 8-18 years.

Intervention: This is an objective study and no intervention is used. This study aims to assess the correlation between academic achievement emotions and achievement in mathematics and further clarify the relationship between the two.

Comparator: Since most of the included studies are observational, there may be no control group.

Study designs to be included: This review covers all studies on the correlation between academic achievement emotions and achievement in mathematics.

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Information sources: Search the literature with the keywords "emotion", "Academic Emotion", "achievement emotion" and "mathematical achievement" in CNKI, Wan fang, China Science and Technology Journal Database (VIP), web of science, Springer, EBSCO academic source ultimate (ASU). Without language/date/type of

document restrictions. In addition to the electronic databases, we will also search conference papers, dissertations, and reference lists of relevant reviews, to ensure the integrity of the inclusion of the literature.

Main outcome(s): The main purpose of this study is to understand the relationship between academic achievement emotion and mathematical achievement. The effect measurement to be carried out is as follows: after systematic evaluation, if the data is related to quantitative analysis, we will use meta-analysis method. The correlation coefficient and sample size will be used to observe the meta-analysis. Then CMA software is used to analyze the main effect and regulatory effect.

Additional outcome(s): This paper emphasizes the relationship between academic achievement emotion and mathematical achievement, including activating positive emotion, activating negative emotion, and deactivating the relationship between negative emotion and mathematical achievement. We will also summarize and analyze the impact of different types of teaching activities, different cultural backgrounds, and different grades on the relationship between the two.

Quality assessment / Risk of bias analysis: The assessment of publication bias will be conducted by funnel plots and forest plots by CMA V3.

Strategy of data synthesis: A descriptive synthesis of all outcomes will be performed based on the inclusion criteria. Quantitative synthesis will also be used if the included studies are sufficiently homogeneous. We will use the I^2 index to assess the heterogeneity of effect sizes. the I^2 index estimates the percentage of variation between effect sizes attributable to heterogeneity. the I^2 test is used to detect heterogeneity between included studies. Acceptable heterogeneity was defined when $I^2 \leq 50\%$, using a fixed effects model, while a large heterogeneity was considered when $I^2 > 50\%$, using a random effects

model. Results will be assessed using forest sample plots and presented as SMDs for primary and secondary outcomes. Publication bias will be meta-analyzed by funnel plots.

Subgroup analysis: We analyze the effects of type of teaching activity, grade, culture on the correlation between the two, in order to make a supplement for study better.

Sensitivity analysis: In order to check the robustness of the combined results, we conduct a sensitivity analysis to assess the impact of studies with a high risk of deviation.

Country(ies) involved: China.

Keywords: emotion, academic achievement emotions, Mathematics Achievement.

Contributions of each author:

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