

TRUST IN SCIENCE AS A PREDICTOR OF PSYCHOLOGICAL MISCONCEPTIONS AMONG PRE-SERVICE TEACHERS

Dominika Havrillová¹, Monika Magdová¹, Miroslava Bozogáňová^{1,2}, & Katarína Fuchsová¹

¹*Institute of Pedagogy, Andragogy and Psychology, Faculty of Humanities and Natural Sciences, University of Presov (Slovakia)*

²*Institute of Social Sciences of the Centre of Social and Psychological Sciences SAS (Slovakia)*

Abstract

Psychological misconceptions among pre-service teachers represent a persistent problem that can negatively influence pedagogical decision-making, the use of scientific knowledge, and the implementation of evidence-based practices in educational settings. While previous research has focused primarily on knowledge acquisition and critical thinking as factors related to misconception endorsement, the role of trust in science remains underexplored. Trust in science refers to the extent to which individuals perceive scientific knowledge as credible, relevant, and socially beneficial. Lower levels of trust in science may increase susceptibility to simplified or unverified explanations of psychological phenomena among pre-service teachers. This study aimed to examine the relationship between trust in science and psychological misconceptions among pre-service teachers and to verify whether trust in science represents a significant predictor of misconception endorsement after controlling for study-related variables including year of study, number of completed psychology courses, and teaching practice experience. The sample consisted of 183 pre-service teachers (63.4% women) enrolled in bachelor's and master's teacher education programs in Slovakia, with a mean age of 22.10 years ($SD = 1.72$). Data were collected using paper-based questionnaires that included demographic and study-related variables, a modified version of the Psychological Information Questionnaire assessing psychological misconceptions, and the Credibility of Science Scale measuring trust in science. Statistical analyses included Pearson correlation analysis and hierarchical linear regression. Results revealed a significant positive relationship between trust in science and correct identification of psychological myths ($r = .215, p = .003$), indicating that higher trust was associated with fewer misconceptions. Hierarchical regression analysis demonstrated that after controlling for study-related variables in the first model ($R^2 = .113, p < .001$), trust in science significantly predicted lower misconception endorsement ($\beta = .199, p = .005$), explaining an additional 3.9% of variance ($\Delta R^2 = .039$). Active teaching practice also emerged as a significant predictor ($\beta = .208, p = .021$). These findings suggest that trust in science represents an important factor associated with lower psychological misconception endorsement among future teachers, beyond the influence of formal psychological education and practical experience. Teacher education programs should consider fostering trust in scientific methods alongside psychological knowledge to enhance psychological literacy and support evidence-based pedagogical practice.

Keywords: *Psychological misconceptions, trust in science, pre-service teachers, psychological literacy, teacher education.*

1. Introduction

Psychological misconceptions represent persistent and resistant beliefs about human behavior and mental processes that contradict established scientific evidence. Common examples include the belief that "humans use only 10% of their brain capacity" or that "individuals learn more effectively when instruction matches their preferred learning style" (Bensley & Lilienfeld, 2015). Although exposure to formal instruction in psychology may reduce endorsement of such misconceptions, research consistently shows that myths about learning, memory, intelligence, or brain functioning remain widespread even among university students and pre-service teachers (Ferrero et al., 2016; Furnham & Hughes, 2014). The persistence of psychological myths is particularly concerning in teacher education, as inaccurate beliefs may influence pedagogical decision-making, classroom management strategies, and the adoption of evidence-based practices (Chojak et al., 2021; Dekker et al., 2012; Grospietsch & Mayer, 2018).

Within the broader framework of psychological literacy, teachers are expected not only to possess knowledge of psychological principles but also to critically evaluate information and apply scientific understanding to real educational contexts. Psychological literacy refers to the capacity to apply evidence-based psychological knowledge in adaptive and ethical ways, including the ability to distinguish scientific findings from myths or pseudoscientific claims (Cranney & Dunn, 2011; McGovern et al., 2010). This competence is especially important in educational settings, where teachers not only apply psychological knowledge but also transmit it to students and shape their understanding of psychological phenomena (Horn et al., 2021). However, research suggests that exposure to psychological coursework alone does not necessarily eliminate misconceptions, as intuitive beliefs may persist despite formal instruction (Macdonald et al., 2017; Newton & Salvi, 2020).

One potential factor that may influence the persistence of these misconceptions is trust in science. Trust in science refers to the extent to which individuals perceive scientific knowledge and scientific institutions as credible, reliable, and socially beneficial (Rutjens et al., 2018). Lower levels of trust in science have been linked to greater susceptibility to misinformation and rejection of scientific consensus across domains such as health, climate change (van der Linden et al., 2017), and vaccination (Plohl & Musil, 2021). Within the context of teacher education, trust in science may influence whether pre-service teachers rely on evidence-based psychological principles or on simplified and unverified explanations of classroom phenomena. Despite its theoretical relevance, the role of trust in science in shaping endorsement of psychological misconceptions among future teachers has received limited empirical attention. The present study therefore seeks to examine whether trust in science is associated with lower endorsement of psychological myths and whether it predicts misconception levels beyond formal academic preparation and teaching experience.

2. Objectives

The main objective of this study was to examine the relationship between trust in science and psychological misconceptions among pre-service teachers. Specifically, the study investigated whether trust in science is associated with the correct identification of psychological myths and whether it remains a significant predictor of misconception endorsement after controlling for study-related variables, including year of study, number of completed psychology courses, and teaching practice experience. In addition, the relative contribution of trust in science was evaluated in comparison to formal psychological education and practical teaching experience.

3. Methods

3.1. Sample and data collection

The sample consisted of 183 pre-service teachers enrolled in bachelor's and master's degree programs in teacher education at the University of Presov in Slovakia. Of the participants, 63.4% were women, with a mean age of 22.10 years ($SD = 1.72$). Regarding the level of study, 88 participants (48.1%) were enrolled in bachelor's programs and 95 participants (51.9%) in master's programs. With respect to year of study, 6 participants (3.3%) were in their first year, 61 (33.3%) in their second year, 21 (11.5%) in their third year, 79 (43.2%) in their fourth year, and 16 (8.7%) in their fifth year.

Participants varied in the number of completed psychology-related courses and experience with teaching practice. Data were collected using paper-based questionnaires administered during lectures and seminars of psychology courses between November and December 2025. Participants were informed about the purpose of the study, the voluntary nature of participation, and the anonymity of data processing. Completion of the questionnaire was considered to indicate participants' informed consent to participate in the study.

3.2. Measures

Data were collected using a questionnaire designed for the purposes of the present study. The questionnaire included items assessing basic demographic characteristics (gender, age) and selected academic variables, including year of study, field of study, the number of completed psychology courses at the university level, and previous teaching experience. Teaching experience was categorized as either observational or active teaching practice.

Psychological misconceptions were measured using a modified version of the misconceptions items from the Psychological Information Questionnaire (PIQ) (Kowalski & Taylor, 2011), adapted for the population of pre-service teachers. The modified version comprised 25 true-false items designed to identify common psychological misconceptions. The total score represented the number of correctly identified items, with higher scores indicating greater accuracy in identifying misconceptions and, consequently, lower endorsement of inaccurate psychological beliefs. In the present study, psychological misconceptions were operationalized as the accuracy of identifying them using the PIQ. Because the PIQ consists of heterogeneous knowledge-based items representing distinct psychological misconceptions rather than a single latent construct, internal consistency was not considered an appropriate indicator of reliability in this case. Each item assesses a different domain of psychological knowledge; therefore, low inter-item correlations are expected and do not necessarily reflect poor measurement quality.

Trust in science was measured using the Credibility of Science Scale (Hartman et al., 2017). This instrument assesses the extent to which individuals perceive scientific knowledge and scientific institutions as credible, reliable, and socially beneficial. The scale consists of 6 items rated on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree), with higher scores indicating greater trust in science. The internal consistency of the Credibility of Science Scale in the present study was acceptable (Cronbach's $\alpha = .786$).

3.3. Statistical analyses

Statistical analyses were conducted using IBM SPSS Statistics 26. Data were analyzed using Pearson correlation and hierarchical linear regression analyses. Pearson correlations were first computed to examine the association between trust in science and the correct identification of psychological myths. Hierarchical regression was then conducted to test whether trust in science predicted misconception endorsement beyond study-related variables (year of study, number of completed psychology courses, and teaching practice experience).

4. Results

To examine the association between trust in science and psychological misconceptions, Pearson correlation analysis was conducted. Results revealed a significant positive correlation between trust in science and correct identification of psychological myths ($r = .215, p = .003$). Given that higher scores on the misconception measure reflected a greater number of correct responses (fewer misconceptions), this finding indicates that higher trust in science was associated with lower endorsement of psychological myths.

A hierarchical linear regression analysis was conducted to determine whether trust in science predicted psychological misconceptions after controlling for selected study-related variables.

In the first step of the hierarchical regression analysis, year of study, number of completed psychology courses, and teaching practice experience (observational and active) were entered as control variables. The model was statistically significant, $F(4, 178) = 5.68, p < .005$, explaining 11.3% of the variance in psychological misconceptions ($R^2 = .113$). Among the control variables, only active teaching practice emerged as a significant predictor, whereas year of study, number of completed psychology courses, and observational teaching practice were not statistically significant. Detailed results for Model 1 (control variables) are presented in Table 1.

Table 1. Hierarchical Linear Regression Predicting Psychological Misconceptions – Model 1.

Variable	B	SE	β	t	p
Year of study	.679	.698	.271	.972	.332
Number of completed psychology courses	-.104	.299	-.055	-.349	.727
Observational practice	-.275	1.066	-.050	-.258	.797
Active teaching practice	2.017	.869	.208	2.322	.021

In the second step, trust in science was added as the primary predictor, resulting in a significant increase in explained variance ($\Delta R^2 = .039, p = .005$), indicating its incremental predictive validity beyond the control variables. In the final model, trust in science remained a significant predictor of psychological misconceptions, with higher levels of trust associated with a greater number of correct responses and, consequently, lower endorsement of psychological myths. The results of the final hierarchical regression model including trust in science are presented in Table 2.

Table 2. Hierarchical Linear Regression Predicting Psychological Misconceptions – Model 2.

Variable	B	SE	β	t	p
Year of study	.705	.685	.281	1.029	.305
Number of completed psychology courses	-.092	.293	-.048	-.314	.754
Observational practice	-.450	1.047	-.082	-.430	.668
Active teaching practice	1.975	.852	.203	2.319	.022
Trust in science	.130	.045	.199	2.865	.005

5. Conclusions

The results suggest that trust in science is linked to lower endorsement of psychological misconceptions among pre-service teachers. Although the relationship was relatively modest, it was statistically significant, indicating that students who perceive science as credible and socially valuable are more likely to correctly identify psychological myths. This finding implies that beyond factual knowledge, a general confidence in scientific evidence may influence how individuals evaluate psychological claims. Trust in science may therefore help individuals rely more on evidence-based explanations rather than on intuitive or oversimplified interpretations that often sustain persistent educational myths.

Importantly, trust in science remained a significant predictor even after controlling for academic progression and exposure to psychological coursework. The lack of significant effects for year of study and number of completed psychology courses suggests that formal instruction alone may not be sufficient to reduce misconceptions, a finding consistent with prior research highlighting the resilience of intuitive beliefs (Ferrero et al., 2016; Furnham & Hughes, 2014). In contrast, active teaching practice emerged as a significant predictor, indicating that direct pedagogical engagement may promote reflective processing and more accurate evaluation of psychological concepts. The incremental contribution of trust in science, although accounting for a relatively small proportion of additional variance, underscores its relevance as a complementary factor in the development of psychological literacy within teacher education.

The findings should be interpreted in light of several limitations. The sample was drawn from a single Slovak university, limiting generalizability to other institutional and cultural contexts. The adapted version of the Psychological Information Questionnaire was not independently validated for this population and primarily assessed declarative knowledge rather than the practical application of psychological understanding. In addition, the cross-sectional design prevents causal conclusions, and unequal subgroup sizes in teaching practice analyses may have affected the stability of some estimates.

Future research should replicate these findings across multiple institutions and cultural settings and employ longitudinal designs to clarify the developmental and causal relationship between trust in science and psychological misconceptions. Further studies could also examine additional contributing factors, such as scientific reasoning, critical thinking, and misconception detection skills, as well as use qualitative approaches to better understand how pre-service teachers evaluate and apply psychological knowledge in classroom contexts.

Teacher education programs could strengthen trust in science by incorporating structured activities that encourage critical evaluation of psychological and educational claims. For example, courses may include myth-debunking tasks where students analyze common learning myths and compare them with empirical evidence. In addition, training students to interpret research findings, understand basic research methods, and assess the credibility of sources may help future teachers rely more confidently on scientific evidence. Integrating these elements into both theoretical coursework and teaching practice can support the development of psychological literacy and promote more evidence-informed pedagogical decision-making.

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References

- Bensley, D. A., & Lilienfeld, S. O. (2015). What is a psychological misconception? Moving toward an empirical answer. *Teaching of Psychology*, 42(4), 282–292. <https://doi.org/10.1177/0098628315603059>
- Chojak, M., Luria, E., & Shalom, M. (2021). Neuromyths among Polish teachers – Research results and practical implications. *Prima Educatione*, 5, 115–131. <https://doi.org/10.17951/pe.2021.5.115-131>
- Cranney, J., & Dunn, D. S. (2011). *The psychologically literate citizen: Foundations and global perspectives*. Oxford University Press. <https://doi.org/10.1093/acprof:oso/9780199794942.001.0001>
- Dekker, S., Lee, N. C., Howard-Jones, P., & Jolles, J. (2012). Neuromyths in education: Prevalence and predictors of misconceptions among teachers. *Frontiers in Psychology*, 3, 429. <https://doi.org/10.3389/fpsyg.2012.00429>
- Ferrero, M., Garaizar, P., & Vadillo, M. A. (2016). Neuromyths in Education: Prevalence among Spanish teachers and an exploration of cross-cultural variation. *Frontiers in Human Neuroscience*, 10, 496. <https://doi.org/10.3389/fnhum.2016.00496>
- Furnham, A., & Hughes, D. J. (2014). Myths and misconceptions in popular psychology: Comparing psychology students and the general public. *Teaching of Psychology*, 41(3), 256–261. <https://doi.org/10.1177/0098628314537984>
- Grospietsch, F., & Mayer, J. (2018). Professionalizing pre-service biology teachers' misconceptions about learning and the brain through conceptual change. *Education Sciences*, 8(3), 120. <https://doi.org/10.3390/educsci8030120>
- Hartman, R. O., Dieckmann, N. F., Sprenger, A. M., Stastny, B. J., & DeMarree, K. G. (2017). Modeling attitudes toward science: Development and validation of the Credibility of Science Scale. *Basic and Applied Social Psychology*, 39(6), 358–371. <https://doi.org/10.1080/01973533.2017.1372284>
- Horn, D., Grötzbach D., & Drechsel B. (2021). Fostering preservice teachers' psychological literacy by counseling pupils on their self-regulated learning – Didactical concept of a theory–practice learning setting and insights into pre-service teachers' reflections. *Psychology Learning & Teaching*, 20(2), 279–293. <https://doi.org/10.1177/1475725720973517>
- Kowalski, P., & Taylor, A. K. (2011). Effectiveness of refutational teaching for high- and low-achieving students. *Journal of the Scholarship of Teaching and Learning*, 11(1), 79–90.
- Macdonald, K., Germine, L., Anderson, A., Christodoulou, J., & McGrath, L.M. (2017). Dispelling the myth: Training in education or neuroscience decreases but does not eliminate beliefs in neuromyths. *Frontiers in Psychology*, 8, 1314. <https://doi.org/10.3389/fpsyg.2017.01314>
- McGovern, T. V., Corey, L., Cranney, J., Dixon, W. E., Jr., Holmes, J. D., Kuebli, J. E., Ritchey, K. A., Smith, R. A., & Walker, S. J. (2010). Psychologically literate citizens. In D. F. Halpern (Ed.), *Undergraduate education in psychology: A blueprint for the future of the discipline* (pp. 9–27). American Psychological Association. <https://doi.org/10.1037/12063-001>
- Newton, P. M., & Salvi, A. (2020). How common is belief in the learning styles neuromyth, and does it matter? A pragmatic systematic review. *Frontiers in Education*, 5, 602451. <https://doi.org/10.3389/educ.2020.602451>
- Plohl, N., & Musil, B. (2021). Modeling compliance with COVID-19 prevention guidelines: the critical role of trust in science. *Psychology, health & medicine*, 26(1), 1–12. <https://doi.org/10.1080/13548506.2020.1772988>
- Rutjens, B. T., Sutton, R. M., & van der Lee, R. (2018). Not all skepticism is equal: Exploring the ideological antecedents of science acceptance and rejection. *Personality & Social Psychology Bulletin*, 44(3), 384–405. <https://doi.org/10.1177/0146167217741314>
- van der Linden, S., Leiserowitz, A., Rosenthal, S., & Maibach, E. (2017). Inoculating the public against misinformation about climate change. *Global challenges*, 1(2), 1600008. <https://doi.org/10.1002/gch2.201600008>