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# Paranormal beliefs, education, and thinking styles

Kia Aarnio \*, Marjaana Lindeman

*Department of Psychology, University of Helsinki, P.O. Box 9 (Siltavuorenpenger 20 D),  
00014 University of Helsinki, Finland*

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## Abstract

This study examined connections between paranormal beliefs and educational level, discipline, length of education, gender, and analytical and intuitive thinking. Finnish students ( $N = 3141$ ) from 14 university and six vocational school disciplines filled in an Internet-based questionnaire. The results showed that university students had less paranormal beliefs than vocational school students, which was partially due to university students' stronger preference for analytical thinking. Of the university students, those majoring in medicine and psychology held the least beliefs and the students of education and theology held the most beliefs. Length of university education was, however, only slightly negatively associated with paranormal beliefs. Intuitive thinking was positively connected with paranormal beliefs. Women's higher intuitiveness and lower analytical thinking partially explained their higher amount of beliefs compared to men.

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## 1. Introduction

Paranormal beliefs are widespread among Western people: in North America, more than half of adults believe in psychic powers and extrasensory perception (Orenstein, 2002; Rice, 2003). Some studies indicate that education decreases paranormal beliefs but the empirical evidence is

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\* Corresponding author. Tel.: +358 9 19129537; fax: +358 9 19129443.

E-mail address: [kia.aarnio@helsinki.fi](mailto:kia.aarnio@helsinki.fi) (K. Aarnio).

sparse and contradictory (a review: Vyse, 1997). Moreover, the underlying mechanisms of the relationship between paranormal beliefs and education have not been empirically analyzed.

In most studies that have included participants from a wide variety of educational levels, paranormal beliefs have been less prevalent among the more educated (Orenstein, 2002; Otis & Alcock, 1982; Za'rour, 1972). Besides amount of education, the kind of majors people have seems to matter: University students of natural and social sciences, and psychology and medicine students in particular, tend to have less paranormal beliefs than students of art and humanities (Gray & Mill, 1990; Grimmer & White, 1992; Pasachoff, Cohen, & Pasachoff, 1970; Za'rour, 1972). Many studies have also shown contradictory findings: In comparison with students of social science, students of natural science have either held more (Jahoda, 1968), less (Pasachoff et al., 1970), or equal amount of (Salter & Routledge, 1971) beliefs.

Several methodological issues are relevant when considering the results regarding disciplinary differences in paranormal beliefs. First, many of the above mentioned studies date back to four decades, and may not reflect the effect of current education. Second, the methods and results of the earliest studies are not reported in much detail, which hampers their comparison with more recent findings. Third, the sample sizes have typically been small, restricting the reliability of results concerning the frequency of paranormal beliefs in different disciplines. Fourth, the range of studied disciplines has been highly restricted.

Why students of different educational levels and university disciplines show different levels of paranormal belief is yet poorly understood. The few researchers who have brought up the issue have proposed that university students have less paranormal beliefs than students of lower educational levels because their education provides them with critical thinking abilities (Otis & Alcock, 1982; Za'rour, 1972). Likewise, these researchers have proposed that students of art and humanities have more paranormal beliefs than other students because they lack the need to evaluate arguments critically. Critical and analytical thinking is thus assumed to be the generative mechanism through which education influences paranormal beliefs. This is possible because some studies suggest that belief in the paranormal is related to poor critical thinking and low rationality (Gray & Mill, 1990; Musch & Ehrenberg, 2002). Other studies have, however, failed to find such a connection (Roe, 1999). One study even showed a positive relationship between analytical thinking and paranormal beliefs (Wolfradt, Oubaid, Straube, Bischoff, & Mischo, 1999). The contradiction is further deepened by results of some early studies showing relative stability of paranormal beliefs during the years of higher education (Jahoda, 1968; Parida, 1962; Pasachoff et al., 1970; Salter & Routledge, 1971). To untangle the discrepancies between the previous studies, we examined whether analytical thinking and length of education are negatively related to paranormal beliefs, how level and field of education are related to paranormal beliefs, and whether analytical thinking mediates these relationships.

Besides analytical thinking, intuitive thinking may influence the relationship between paranormal beliefs and disciplines. We hypothesized that intuitive thinking is positively related to paranormal beliefs because in thinking intuitively and in justifying paranormal beliefs assessment of information is based on personal experiences and in neither case justification with objective evidence is required; Intuitions and beliefs are rather self-evidently valid (Epstein, Pacini, Denes-Raj, & Heier, 1996; Stanovich & West, 2000). Positive connection between intuitive thinking and paranormal beliefs has been reported in earlier work (Epstein et al., 1996; Wolfradt et al.,

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