



## The self-attribution bias and paranormal beliefs



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### ABSTRACT

The present study investigated the relation between paranormal beliefs, illusory control and the self-attribution bias, i.e., the motivated tendency to attribute positive outcomes to oneself while negative outcomes are externalized. Visitors of a psychic fair played a card guessing game and indicated their perceived control over randomly selected cards as a function of the congruency and valence of the card. A stronger self-attribution bias was observed for paranormal believers compared to skeptics and this bias was specifically related to traditional religious beliefs and belief in superstition. No relation between paranormal beliefs and illusory control was found. Self-report measures indicated that paranormal beliefs were associated to being raised in a spiritual family and to anomalous experiences during childhood. Thereby this study suggests that paranormal beliefs are related to specific cognitive biases that in turn are shaped by socio-cultural factors.

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### 1. Introduction

Paranormal beliefs refer to an eclectic range of New Age beliefs and practices, involving belief in Psi, precognition, witchcraft, superstition, as well as telekinesis and channeling (Lindeman & Svedholm, 2012). It has been suggested that individual differences in cognitive and decision-making biases predispose specific persons to believe in paranormal phenomena (Irwin, 2009). For instance, belief in the paranormal has been associated with a stronger tendency to commit type-1 errors in decision making tasks (Krummenacher, Mohr, Haker, & Brugger, 2010; Riekkki, Lindeman, Aleneff, Halme, & Nuortimo, 2013; van Elk, 2013), a bias towards confusing ontological categories (Lindeman & Aarnio, 2007; Lindeman, Svedholm-Häkkinen, & Lipsanen, 2015) and a stronger reliance on intuitive compared to analytical thinking (Pennycook, Cheyne, Seli, Koehler, & Fugelsang, 2012; Stanovich & West, 1998). The view that paranormal believers display cognitive and reasoning biases has been referred to as the ‘cognitive deficit hypothesis’ (Irwin, 2009) – suggesting that paranormal believers lack some of the skills and abilities that are characteristic of ordinary cognition. At the same time, in the social-psychological literature many cognitive and reasoning biases have been described as being adaptive and serving motivational needs (Haselton & Nettle, 2006; Taylor & Brown, 1994). According to the latter view the exaggerated cognitive biases characteristic of paranormal believers may actually foster one’s self-esteem and self-efficacy – in line with the proposed suggestion that supernatural beliefs indeed primarily serve motivational needs related to self-enhancement (Sedikides, 2010; Sedikides & Gebauer, 2010).

The present study focuses on two specific cognitive biases associated with paranormal beliefs, namely: the illusion of control (van Elk, Rutjens, & van der Pligt, 2015) and the self-attribution bias (Mezulis, Abramson, Hyde, & Hankin, 2004).

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Both the illusion of control and the self-attribution bias have been described as positive illusions (Taylor & Brown, 1988), as they serve the fundamental motivational need for maintaining self-esteem and fostering a sense of control over the surrounding world (Landau, Kay, & Whitson, 2015).

The *illusion of control* refers to the tendency to overestimate the amount of control that can be exerted over events that are in fact determined by chance (Langer, 1975; Langer & Roth, 1975). The illusion of control reflects a specific instance of the error management principle ‘nothing ventured, nothing gained’: especially in an environment where the costs of trying are relatively low, the best option would be to use every opportunity to exert control (Haselton & Nettle, 2006). It has been found that the illusion of control decreases with increased age, possibly suggesting that in the case of young children it may be adaptive to have a fundamental motivation to aim to control their environment (Heckhausen & Schulz, 1995; van Elk et al., 2015). In addition, it has been found that the illusion of control is exaggerated in patients suffering from delusional beliefs (Balzan, Delfabbro, Galletly, & Woodward, 2013) and in schizophrenic patients (Hauser et al., 2011), which has been related to an imprecise coding of predictive signals related to one’s actions (Corlett, Taylor, Wang, Fletcher, & Krystal, 2010). Of interest to the present study, it has also been found that people who strongly believed in paranormal phenomena (e.g., superstition, psi and precognition) are characterized by a stronger illusion of control (Blackmore & Troscianko, 1985; Blagrove, French, & Jones, 2006; Blanco, Barberia, & Matute, 2015; Tobacyk & Wilkinson, 1991) – in line with the view that an overestimation of control is at the heart of magical thinking and superstitious practices (Keinan, 1994).

The *self-attribution bias* reflects the tendency to over-attribute positive outcomes to oneself and negative outcomes to external factors (Mezulis et al., 2004). Similar to the illusion of control, the self-attribution bias decreases with increased age (for review, see: Mezulis et al., 2004; van Elk et al., 2015), suggesting that the enhanced self-attribution bias for younger children is related to motivational factors, such as a higher need to maintain self-esteem (Stipek & Mac Iver, 1989). Age-related changes in the self-attribution bias have also been associated to cognitive development that progresses from wishful thinking and an inability to distinguish wishes from reality, to a cognitive processing style that takes into account the actual relation between one’s actions and specific outcomes (Klaczynski & Fauth, 1997; Schuster, Ruble, & Weinert, 1998). The self-attribution bias has been related to mental health and wellbeing; for instance, it has been found that depressive patients show a strongly attenuated self-attribution bias (Mezulis et al., 2004; Taylor & Brown, 1994). On the other hand, an excessive optimism bias may result in illusions of invulnerability and, as such, may actually compromise, rather than enhance, mental health. Although some studies have suggested that schizophrenic patients are characterized by an enhanced self-attribution bias (Hauser et al., 2011; Werner, Trapp, Wustenberg, & Voss, 2014), findings from a meta-analysis did not show a consistent relation between schizotypy and self-enhancement biases (Mezulis et al., 2004).

To date, no study has directly investigated the relation between paranormal beliefs and the self-attribution bias. Following the observed positive relation between paranormal beliefs and illusory control and the notion that supernatural beliefs primarily serve self-enhancement (Sedikides, 2010; Sedikides & Gebauer, 2010), it could be hypothesized that paranormal believers are characterized by an exaggerated self-attribution bias as well. For example, in a field study among practitioners of magic and witchcraft it was found that believers tended to interpret seemingly coincidental events as being related to the rituals they performed (Luhmann, 1991). Similarly, many superstitious behaviors are characterized by a tendency to take credit for successful outcomes, while unsuccessful results are attributed to external factors (Corlett et al., 2010; van Elk, Friston, & Bekkering, 2016).

Thus, in this study I aimed to investigate whether paranormal believers display a stronger illusion of control and a stronger self-attribution bias. To recruit participants showing sufficient variability in paranormal beliefs a field study was conducted at psychic fairs, which typically attract visitors displaying a modest to strong interest and affinity with paranormal phenomena (for similar approach, see: van Elk, 2013, 2015). A computerized card guessing game was used to measure the illusion of control and the self-attribution bias (van Elk et al., 2015). In this task participants were required to select a card of their choice and were subsequently presented with a randomized positive or negative outcome. I measured to what extent the participants believed they could control the outcome and the proportion of positive compared to negative outcomes attributed to oneself was used as a measure of the self-attribution bias. To assess individual differences in paranormal beliefs I used the revised paranormal belief scale (RPBS; Tobacyk, 2004), which consists of different subscales. Furthermore, in order to obtain more insight in the etiology and origins of paranormal beliefs, several open-ended questions were included probing participants to describe what triggered their interest in paranormal phenomena. The hypotheses, experimental procedure and analysis plan of the study were not officially preregistered using the open science framework (OSF), but were submitted and time-stamped prior to the start of the study at the website of the ethics committee of the Department of Psychology at the University of Amsterdam (see [Supplementary Online Material](#)).

## 2. Methods

### 2.1. Participants

This study was conducted as a field-study at two psychic fairs organized in the Netherlands: Paraview Hilversum on February 20th/21st and Paraview Amsterdam on March 5th/6th 2016 ([www.paraview.nl](http://www.paraview.nl)). Visitors of the psychic fair were invited to participate in a short study by the University of Amsterdam on the psychological basis of belief in paranormal phenomena. The initial aim was to test at least 60 participants at these two psychic fairs, but due to a relatively low turnout this

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