



# Magical Potential: Why Magic Performances Should be Used to Explore the Psychological Factors Contributing to Human Belief Formation

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## Abstract

Beliefs in supernatural entities are integral parts of both our culturally embedded religions and more individualized magical belief systems (e.g., paranormal beliefs, spirituality). Scholars regularly link the occurrence of beliefs to individuals' cognitive and affective ways of information processing. For magical beliefs in particular, we expect children to endorse them. When reaching adulthood, however, individuals should have abandoned magical beliefs, and become pragmatic, sceptical, critical and rational thinkers. The reality is, a large proportion of the adult population can be described as magical thinkers, or report having had magical experiences, even in the recent past. Moreover, psychological research in adults shows a large range of magical beliefs, which correlate with particular psychological processing biases (e.g., repetition avoidance, seeing signal in noise). Unfortunately, these correlational studies do not tell us whether such psychological processing biases precede magical beliefs or whether they result from these magical beliefs. Knowing the direction of such relationships is key to understand which psychological biases might contribute to adult belief formation (or the persistence of beliefs from childhood). To test such causal relationships, we started to systematically apply an experimental approach in which people are exposed to anomalous events. Such a central event allows before-after comparisons of psychological biases. First empirical results confirmed that the use of magic performances, particularly when of paranormal nature, results in an important amount of paranormal explanations. Pre-existing beliefs enhanced this explanation bias. These results show how easily naïve observers can be “tricked” into unsubstantiated beliefs.

**Keywords** Causality · Paranormal belief · Magical beliefs · Cognition · Biases · Belief formation

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## Introduction

Unlike all other non-human species, our cognitive capacities allow us to think about our past and project ourselves into the future. We can reason about abstract concepts such as morality and love, and use language to convey our thought. Some scholars have argued that such cognitive abilities are central to our widely observable belief tendencies, in particular in entities such as gods and supernatural powers for which no scientific evidence exists.<sup>1</sup> For instance, anthropologists Paul Boyer (Boyer 2003; Boyer and Ramble 2001) and Jesse Bering (2006) as well as developmental psychologist Paul Bloom (2007) suggested that beliefs in supernatural beings are a natural by-product of our cognitive system including faculties such as agency detection, pattern detection and mind-body dualism. As we will reason in our contribution, the cognitive sciences and those looking into individual differences could, indeed, describe a multitude of psychological variables that link to such human beliefs. Yet, these descriptions rarely justify inferences on causality. In the current contribution, we argue for the potential of magic performances in the causal exploration of psychological variables to human belief formation.

### The Phenomenon of Belief or the Belief Phenomena

Today's cognitive psychologists interested in the study of religious beliefs have frequently been inspired by popular science debates and philosophical accounts about the existence of god and religions' impact on society (e.g. Boudry and Coyne 2016; Dawkins 2006; Dennett 2006). Psychologists contribute descriptions and definitions of different types of belief and they have tried to understand their impact on health, social and cognitive functioning (e.g. Purzycki et al. 2018; Różycka-Tran 2017; Shtulman and Lindeman 2016; Wilt et al. 2016; Yonker et al. 2016 for recent examples). Psychological accounts that focus on the belief phenomena (e.g. how beliefs emerge in the first place) suggested that our beliefs result from an innate tendency to detect agency (Barrett 2000; Bloom 2007; Guthrie 1993), create moral communities (Graham and Haidt 2010), and an innate facility to engage in faith rather than in search for evidence that would prove the contrary (Boyer 2008). Also, the notion of a supernatural agent (e.g. god) provides evolutionary advantages in the form of societal control functions (e.g. Bering 2006), psychological functions (Vail et al. 2010), support in handling anxiety and stress (Hui et al. 2017), and other harmful behaviours (e.g. Iles et al. 2016; Schoenthaler et al. 2015). However, the notion of innate belief tendencies remains controversial (Exline et al. 2017; Shook 2017). Still others suggested that people feel attracted to belief systems because they might experience cognitive and emotional states of absorption (Bronkhorst 2017) or transcendence (Keltner and Haidt 2003). In our understanding of the recent literature on religion, we can link the latter two examples to the concept of spirituality (e.g. Skrzypińska 2017).

<sup>1</sup> If not otherwise stated, when referring to belief, we refer to beliefs in supernatural entities such as god(s), but also supernatural / paranormal phenomena (e.g., telepathy, precognition). Moreover, we work on the basis that paranormal, supernatural and magical beliefs can be used interchangeably (Lindeman and Svedholm 2012), and will be called magical beliefs once defined as such together.

Spirituality is a concept that has been, and remains frequently separated from religiosity (e.g., Lindeman and Aarnio 2006; Saucier and Skrzypińska 2006; Willard and Norenzayan 2017). Religiosity can be understood as “cultural heritage” providing cultural meaning (e.g. Bae 2016; Silberman 2005). As Bae (2016, p. 11) noted, belief is a “culturally embodied cognitive phenomenon that turns the focus on the individual self and his/her beliefs that ground, situate, and relate one’s personhood to one’s social contexts and “dividual” relationality. In other words, our beliefs are reflections of an embodied cultural history and ethos that enable our relational connectivity” (but see Apicella 2017). In this context, we would also deal with studies that are interested in traditional religious beliefs such as Christianity, Islam, or Hinduism. Here, the cultural background provides the framework within which one worships in a clearly defined ritual context.

Spirituality, on the other hand, reflects more personal convictions that often result from personal experiences and involve reasoning about otherwise unexplainable events (Galbraith 2014; Singer and Benassi 1981). Katarzyna Skrzypińska formulates the notion of spirituality as follows (2017, p. 1586): spirituality can be “treated as an attitude to life containing cognitive and individual (emotional, experiential and motivational) systems (...) and essentially constructed from an individual view of the world. In particular, it is understood as self-fulfilment in the pursuit of the meaning of life and happiness in the search for the ultimate/sacred, using cognitive, emotional-experiential-motivational and behavioural resources, which is sometimes accompanied by peak experiences”. These descriptions mirror descriptions of the wider category of magical beliefs including supernatural and paranormal beliefs; beliefs that are much more psychological, meaning they are more private, individual, and intimate, such as, the personal search to be connected with a transcendent existence or a bigger form of sacredness (Piedmont 1999). In that sense, personal experience and affective experience thereof shape the experiential (cognitive, affective) framework of magical experiences (see also Corriveau et al. 2015).

When taking into account such studies on religiosity and spirituality (e.g., Lindeman and Aarnio 2006; Saucier and Skrzypińska 2006; Willard and Norenzayan 2017), we have to distinguish between at least these two major belief systems; a culturally-shaped belief system (religiosity) and a personally-shaped belief system (magical beliefs). In terms of belief origins, we likely need to look at different causal pathways. In case of religiosity, upbringing, cultural heritage, or societal rituals are likely contributors to what we believe, and how beliefs are expressed both individually and in groups. For example, Christians engage in certain Christian (cultural) habits regardless of whether they believe in the existence of god or not (e.g. Christmas trees, singing Christmas carols). Simply exercising these habits reinforces the existence and justification of this cultural heritage (being Christian). In the case of magical beliefs, having deep, affectionate, and possibly passionate, spiritual feelings of belief and faith about the existence of a supernatural entity or power can be independent of a person’s upbringing. The person might have had a first-hand experience reminiscent of a magical phenomenon. Else, or in addition, the person might have had a second-hand experience (Ramsey et al. 2011). Such experiences likely shape how these and future feelings and experiences related to magical beliefs are integrated and interpreted.

We suggest that for human belief formation, the affective, personal and intimate experiences are strongly linked to the establishment of magical beliefs (e.g. Good and

Willoughby 2008; Kennedy and Kanthamani 1995). Yet, causality is unclear. Possibly, affective, personal and intimate experiences shape and maintain magical beliefs. Alternatively, affective, personal and intimate experiences result from pre-existing beliefs and cognitive biases. Given the widespread nature of magical beliefs, the lack of causal explanations in belief formation (see also Connors and Halligan 2017; Hui et al. 2017) is worth recognizing.

## On the Search for a Causal Paradigm to Test Magical Belief Formation

### Magical Beliefs in Childhood

Researchers typically assume that magical beliefs are acquired in early childhood (Subbotsky 2004). For example, Piaget's seminal contributions (e.g. 1930) suggested that young children are particularly prone to think magically; they assume that humans have a 'magical' influence over objects and events (by wishing, looking, or gesturing). Children until 6 to 9 years old possess a naïve way of understanding and reasoning about natural phenomena; they use magical reasoning. Traditional developmental perspectives suggest that, with scientific knowledge acquisition and development of abstract reasoning, children stop relying on magical thinking to explain their world – this magical thinking should supposedly dissipate. Phelps and Woolley (1994) reported that children seem able to dissociate "real" from "conjuring" magic, but distinguish them most strongly once they start applying physical explanations to events (by about 6 to 9 years of age). These latter authors concluded that "as children's knowledge of the causal mechanisms underlying specific events increases, their use of magical explanations for those events decreases" (p. 391).

Further studies seem to support this conclusion by Phelps and Woolley (1994). At the ages of 3 to 5 years, children explicitly deny the existence of magic (e.g. object transformations), but implicitly demonstrate that they consider magical processes to be possible (e.g. Harris et al. 1991; Subbotsky 1985). Thus, with increasing age, children might give the impression that they no longer believe in magic, but it does not take much to change their beliefs. In 1985, Subbotsky tested 4-year-old children. They learned about a girl who possesses a magic table that turns animal toys into real animals. When asked if this could happen in real life, only a few agreed. When confronted with a lion figure that started to suddenly move after the instructor had left the room, most reacted in an "irrational" way (running away, using a magic wand). In another series of experiments, Subbotsky used a magic box (2004; see also 2014). Here, the experimenter (i.e. "magician") placed a stamp inside the magic box. Afterwards, the experimenter casted a magic spell ordering the stamp to be burned. When the box was opened, participants found a half-burned stamp. Before seeing this trick, most children claimed that this type of magic could not happen in real life. After seeing the trick, most of the 5 to 6-year-old abandoned their sceptical view and acknowledged that this was proper magic. The 9-year-olds were more sceptical, and only half of them acknowledged that the trick had been created through "real" magic. After the trick was exposed, the 9-year-olds quickly recovered their initial scepticism. At the same time, only half of the 5-year-olds accepted the non-magical conjuring explanation and continued to believe that this has been a true magic event. Subbotsky suggested that when questioned, children show rational and logical thinking because this is what is

expected of them. However, this disbelief in magic seems superficial. His experiments demonstrate that a significant proportion of children can be persuaded that magic is real.

### Magical Beliefs beyond Childhood

Beyond early childhood, empirical research also contradicts the notion that magical beliefs decrease or dissipate. Everyday observations and surveys illustrate that magic beliefs are very common in Western adults (Subbotsky 2014). Only around 10% of the US population are sceptical when it comes to the paranormal (Rice 2003). Three-quarters of the American population endorse at least one paranormal belief (Moore 2005): 31% of respondents believed in telepathy, 32% in ghosts, and 41% in extrasensory perception. In Switzerland, 90% of 1580 individuals reported exceptional experiences such as supernatural appearances and *déjà vue* experiences (Landolt et al. 2014). The German population is similarly open towards exceptional phenomena, with over 50% reporting such experiences (Knittel and Schetsche 2012).

Laboratory experiments using adult participants dovetail findings reported from above surveys. Most prominent, Western adults explicitly deny magical beliefs, but acknowledge implicitly through their behaviour that an anomalous event has occurred (Subbotsky and Quinteros 2002; Subbotsky 2004). In 2001, Subbotsky proposed that in adults, magical beliefs are not simply suppressed, but that they can be reactivated given the appropriate experimental conditions (see also Subbotsky 2014). When performing the magic trick with the magic box, he showed that his adult participants were relatively willing to place their driving license into the box. Also, most were happy for the experimenter to cast the magic spell. However, when the same participants were required to place their hand inside the box, more than half of the participants asked the experimenter to refrain from casting the spell. Subbotsky (2010) suggested that when denial of a magical belief is costly, adults are happy to give up their belief in the almighty power of physical causality and view the world in terms of magical explanations.

In adolescence, the denial of magical belief might also be costly. Good and Willoughby (2008) argued that in order to understand the establishment of beliefs, including belief conversion, we should look at this emotionally sensitive developmental period. These authors did not refer to religiosity and related behaviour (e.g. church attendance), but to experiential, spiritual processes (i.e., thoughts, feelings, experiences), which are likely key to the adherence and conversion to a particular spiritual context (i.e. magical beliefs). These authors highlighted that spiritual experiences link to newly developed cognitive abilities (e.g. abstract and meta-cognitive reasoning) as well as to intense emotional, mainly pleasurable experiences. These experiences can be expected when, for instance, engaging with belief-related impressions of the existence of a higher power, belief-related rituals and individual prayer as well as meditation (see also Newberg and Newberg 2005; Skrzypińska 2017; Spika et al. 2003).

Independent studies also note that adolescence is a time of intense emotions, but is frequently biased towards those of the negative kind (Larson et al. 2002) and is as such subjectively experienced as a period of high levels of stress (Romeo 2010). Engaging in spirituality and converting to an emotionally delivering belief system seems to represent an adapted coping strategy to handle stress and life challenges (see also Zinnbauer

and Pargament 1998). Adolescence might therefore represent a critical period of making a spiritual commitment that may endure over an extended period of time (Good and Willoughby 2008). This notion fits the idea that by adulthood, individuals' magical beliefs have a trait-like character (Drinkwater et al., 2017; Tobacyk and Milford, 1983).

We conjecture that children experience a vivid system of magical beliefs, which is assumed to slowly disappear with the emergence of explanatory models of their natural environment as well as societal demands and expectations. Yet, magical belief experiences regain importance in adolescence due to their emotional and stress-relieving potential. By adulthood, these belief systems, or preferences might be strongly and solidly established, determining subsequent life choices, such as professions and partner preferences (Good and Willoughby 2008). Such causal reasoning on magical belief formation is certainly interesting, if not coherent and understandable. The assumptions might be true or not. Unfortunately, we still lack solid experimental evidence that test the causal contribution of suggested variables on magical belief formation (e.g. development of cognitive functions, emotionality). Empirical studies have been mainly correlational, for instance when assessing relationships between "established" magical beliefs and behavioural variables such as affective variables, personality traits and cognitive performances (e.g. Irwin 2014; Lindeman et al. 2009; Mohr et al. 2001, 2005).

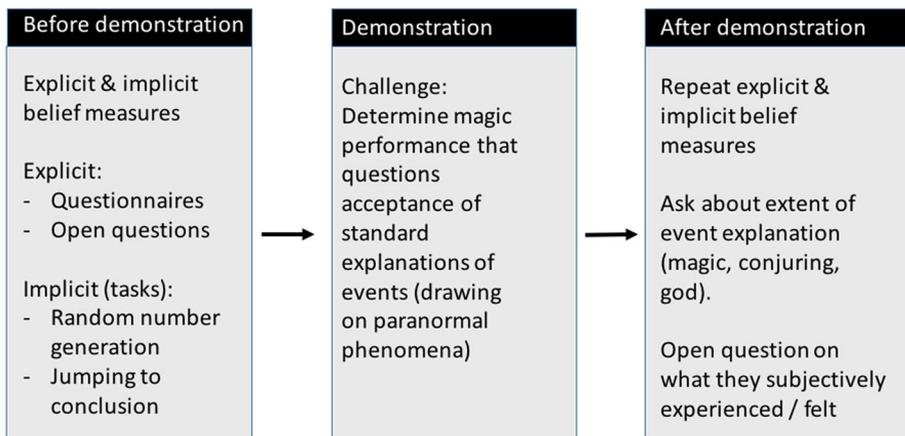
### Magical Beliefs: Quasi- and Fully-Experimental Studies

We are aware of few quasi-experimental or fully-experimental studies indicating that a priori experimental manipulations might change individuals' willingness to believe and accept magical explanations. One example is the study by Corriveau et al. (2015). They presented 5–6 year-old children with the characters in religious narratives. If raised in secular families, the children judged the characters as fictional, but if exposed to religious practice at home, in school, or both, the characters were judged as real. Further examples are those in which verbal suggestions in adults enhanced people's experience of anomalous events during a séance (Wiseman et al. 2003), when seeing a film presenting psychokinetic abilities (Wiseman and Greening 2005), or when having the impression of being observed in a supposedly "haunted" room (Bering et al. 2005). Relevant here are again Subbotsky's studies (2001, 2014) already detailed above. He investigated how causal beliefs of children and adults are influenced by exposure to magic tricks. As a reminder, neither children nor adults easily accepted that a magic spell could cause a magic event. Yet, when a magic event occurred outside a magical setting (an unrelated event was executed during the magic event, e.g. switching a light on and off), individuals linked the unrelated event to the magic event. Thus, children and adults alike might reject the possibility of a magic event on an explicit level, but show through their behaviour that they implicitly consider the possibility that a magic event occurs (Subbotsky 2001, 2014).

Most relevant to our current contribution is the work by Benassi et al. (1980). These authors showed that the general public (incl. scientists) can be fooled into attributing psychic powers to ordinary magic routines. They had a magician performing magic routines in the classroom. Crucially, about half of the participants learned that the performer is a conjuror (conjuror group) and the remaining participants learned that the

performer is a psychic (psychic group). After observing the performance, participants attributed the events more often to psychic abilities in the psychic group as compared to the conjuror group. Importantly, over 50% of the participants in the conjuror group considered psychic explanations. While this experimental manipulation is promising in showing that contextual framing influences how people interpret an anomalous event, the authors did not compare magical beliefs and cognitive biases associated with magical beliefs before and after the demonstration.

More recently, this line of research is being continued in a systematic way (Fig. 1). In a first study, Mohr et al. (2014) investigated whether explicit and implicit measures of magical beliefs change with exposure to magic performances. More concretely, before and after a magic performance, participants provided information on their explicit beliefs (self-report questionnaire) and were tested on a cognitive bias (repetition avoidance in a mental dice task). Repetition avoidance has been linked to enhanced magical beliefs in the past (Brugger et al. 1990). The magic performance involved classical events of stage magic (guessing a card chosen by a volunteer), but also sections alluring to paranormal powers (the magician pretended to be able to contact the dead). The authors expected that both implicit and explicit measures would more strongly increase (before-after comparison) in the conjuror group as compared to the psychic group (see also Benassi et al. 1980). After the magic performance, participants were also asked to what extent they explain the event in psychic, conjuring and religious terms (Fig. 1). The authors found that the psychic group showed stronger repetition avoidance (means less accurate judgment of likelihood of random events) than the conjuror group. In addition, the higher magical belief scores before the magic performance, the higher were psychic explanation ratings. Moreover, participants gave explanations in expectable way; the psychic group gave more psychic explanation, and vice versa, the conjuror group gave more conjuring explanations. However, there were no before-after differences for the explicit (self-reported magical beliefs) and implicit (repetition avoidance) correlates of magical beliefs.



**Fig. 1** General methodology. The experimental approach always involves before-after manipulations assessing at both time points implicit and explicit measures. After the demonstration, we ask participants how they explain and experienced the demonstration (quantitative, qualitative measures)

The outcome of Mohr et al. (2014) was, thus, only partially promising, in particular because no before-after difference had been observed. It was, however, observed that the magic performance resulted in overall low psychic experiences. This observation was supported by anecdotal reports provided by participants during and after the debriefing sessions. Accordingly, the magic performances of subsequent studies were designed such that they included more and stronger routines alluring to paranormal powers. All other aspects of the procedure were kept equal to Mohr et al. (2014, see also Fig. 1). Subsequent to these new magic performances, participants provided substantially higher psychic explanation ratings (Lesaffre et al. 2017, 2018). This was particularly the case for the last experiment. Here, 65% of the studied population provided elevated psychic explanations (Lesaffre et al. 2018). Worth noting, these stronger magic performances triggered pronounced affective reactions, especially of negative quality. Yet, participants also reported positive experiences and confusion (Lesaffre et al. 2017, 2018).

The outcome of studies using magic performances as key element (e.g., Benassi et al. 1980; Lesaffre et al. 2017, 2018; Mohr et al. 2014; Subbotsky 2001) indicate that exposure to a magic event provides a promising experimental paradigm to test causal relationships of adult magic belief formation (see also Ramsey et al. 2011). Most importantly, this approach provides a potential experimental paradigm to investigate which factors contribute to the endorsement and formation of magical beliefs (Fig. 1). In other words, this approach can help shed light on the causal mechanisms between the child perspective of magical beliefs, and the functional properties of magical beliefs in adolescence as well as mechanisms to explain the world and psychological factors in adulthood that were repeatedly found to correlate with (but are not necessarily causal to) individuals' magical beliefs.

## Concluding Remarks

Various scholars argued that our cognitive system is at the origin of the existence of religious beliefs (e.g. Bering 2006; Bloom 2007; Boyer 2003; Boyer and Ramble 2001). Various research domains described and determined psychological variables that are correlated with human belief. While informative, very few of these descriptions targeted causality: whether the respective variables result in belief, or whether beliefs foster the expression of these variables. We argued that magical beliefs (including spirituality) contribute importantly to human belief formation. Thus, those aspects of the belief system that are experiential, frequently private and of affective quality. In order to test whether cognitive, affective and trait variables contribute to adult belief formation, we argued for a causal design in which a magic demonstration is the central event. Thus, we provide the participant with the actual experience of an event that could be explained in magical terms. We can then compare cognitive, affective, and trait variables before and after this magical experience. We can also ask about participants' experiences and interpretations of these events (qualitative data). Initial results indicate that a magic performance, in particular when of supernatural quality, can result in the endorsement of magical beliefs and explanations (e.g. Lesaffre et al. 2017; Mohr et al. 2014) with sometimes strong affective reactions (Lesaffre et al. 2018). We suggest that this experimental paradigm provides a powerful tool to study potential causal factors in human belief formation at various developmental stages.

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## Compliance with Ethical Standards

**Conflict of Interest** The authors declare that they have no conflict of interest.

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