

EMPIRICAL ARTICLE

Psychological Features of Magical Thinking in Adolescence

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Abstract. *Background and Problem.* Magical thinking is one of the earliest forms of comprehending reality, and it persists in the modern adult mind. Its connection with cognitive, emotional, regulatory, and moral characteristics has been documented, but the evidence remains fragmentary, and adolescence is severely underrepresented in the literature. *Objective.* This study provides a comprehensive examination of magical thinking in adolescence, testing whether it is associated with psychological characteristics across multiple domains and whether significant predictors can be identified. *Methods.* The study involved 300 adolescents aged 14–17 years (148 boys, 152 girls). Eight standardized self-report instruments measured paranormal belief, cognitive styles, creativity, emotional intelligence, behavioral control, emotion regulation, moral disengagement, and moral identity. Spearman's rank correlations (full sample and by sex) and Bayesian Model Averaging (BMA) regression were employed. *Results.* Magical thinking was positively associated with intuitive thinking ($\rho = 0.234, p < .001$) and negatively with rational thinking ($\rho = -0.248, p < .001$), creativity ($\rho = -0.230, p < .01$), emotional intelligence ($\rho = -0.223, p < .01$), cognitive reappraisal ($\rho = -0.193, p < .01$), and moral self ($\rho = -0.223, p < .01$), while showing positive associations with moral disengagement ($\rho = 0.303, p < .001$). BMA regression ($R^2 = .32$) identified Experiential Engagement, Advantageous Comparison, and Displacement of Responsibility as the predictors with the strongest evidence for inclusion (PIP = 1.00); Volitional Control emerged as an additional predictor (PIP = .62). Sex differences revealed 201 significant correlations in boys versus 93 in girls. *Conclusion.* Magical thinking in adolescence reflects not a cognitive deficit but an affect-driven processing preference, evolutionarily shaped for coping with unpredictability. Findings have implications for educational interventions targeting critical thinking and moral reasoning in adolescents.

Keywords: Magical Thinking, Paranormal Belief, Adolescence, Cognitive Styles, Emotional Intelligence, Moral Disengagement

1. Introduction

Magical thinking represents one of humanity's earliest modes of comprehending reality. Frazer (2009) provided the first systematic account of this phenomenon, identifying two laws of sympathetic magic. According to the law of similarity, outwardly similar phenomena can produce one another. According to the law of contagion, objects that have once been in contact retain mutual influence. In both cases, association by similarity or contiguity is erroneously taken for causal connection. These laws persist in the everyday thinking of educated adults as cognitive heuristics to which the psyche resorts automatically (Rozin & Nemeroff, 2002). Shermer (2015) proposed an evolutionary explanation for this persistence and introduced the concept of *patternicity*, which is the tendency to perceive order and connections

between events regardless of whether they exist in reality.

Two main definitional directions can be distinguished in the literature on magical thinking. The first focuses on belief in the capacity of thought to directly influence reality (Bayramova & Enikolopov, 2016; Zhmurov, 2012). The second interprets the phenomenon more broadly, encompassing the entire spectrum of beliefs in the supernatural (Farkhutdinova, 2023). Vyse (2014) drew a functional distinction between superstition and paranormal belief: paranormal belief admits the existence of phenomena that do not fit the scientific picture of the world, whereas superstition implies the intention to influence the course of events. Irwin (2009) systematized explanations of paranormal beliefs through four hypotheses, namely the social marginality hypothesis, the worldview hypothesis, the

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cognitive deficits hypothesis, and the psychodynamic functions hypothesis. The diversity of definitions reflects the complexity of the phenomenon itself, which involves both the cognitive and the emotional spheres and is not reducible to either. In the present study, magical thinking is understood as the combination of beliefs in the supernatural and the use of magical strategies to influence events. Paranormal belief is defined as the general willingness to admit the existence of phenomena falling outside scientifically established regularities.

Magical thinking emerged phylogenetically as an adaptive mechanism to cope with environmental uncertainty and uncontrollability through rituals, animism, and totemism (Farkhutdinova, 2023). Piaget (2024) described forms of prelogical thinking characteristic of children aged 4 to 7 years, such as animism and egocentrism. In these forms, the child attributes intentions and feelings to inanimate objects and perceives what is desired as achievable by the power of one's own wanting. Subbotsky (2013) demonstrated that magical thinking in childhood has independent significance for mental development and carries substantial potential for learning by stimulating creativity, perception, and memory. Van Elk et al. (2015) regarded children's magical overestimation of their own control over events as an adaptive mechanism. With maturation, magical thinking does not disappear but is transformed. Its elements are preserved in the everyday life of adults as a means of emotional release, coping, and self-regulation (Trubitsyna, 2020), and these patterns have been systematized in a meta-analytic review covering research findings across four decades (Dean et al., 2022). In adulthood, however, magical thinking is increasingly found to be associated with unfavorable psychological characteristics. Superstitious beliefs may impede the adequate perception of health-related information and the making of well-grounded decisions (Taher et al., 2020). Pronounced magical thinking in young adults is associated with reduced self-esteem, impairment of the capacity for close relationships, and distortion of the value-meaning sphere of the personality (Karunin et al., 2024). In adolescence, the picture changes. Early adolescence has been identified as a probable turning point in the formation of metaphysical ideas, with conceptions of the world based on scientific principles being shaped precisely during this period (Rosengren et al., 2000). A number of studies have recorded a wave-like dynamic in which the intensity of magical beliefs decreases by early adolescence and then rises again at the

ages of 14 to 17 (Bolton et al., 2002; Peltzer, 2003; Sagone & De Caroli, 2014). At the same time, adolescence remains almost entirely underrepresented in studies of magical thinking.

The connection between magical thinking and various spheres of the psyche has been traced in studies covering the cognitive, emotional, regulatory, and moral domains. In the cognitive sphere, the substantive basis of this connection is provided by the dual-system model of thinking. Within the cognitive-experiential self-theory of personality, Epstein (2003) distinguished two parallel systems of information processing: the rational system, which relies on logical inference and operates consciously, and the experiential (intuitive) system, which functions automatically and associatively and is governed by affect. Kahneman (2024) designated the fast intuitive system as System 1 and the slow analytical system as System 2, demonstrating that analytical thinking more often endorses the intuitive answer than rechecks it, especially under conditions of reduced motivation. Aarnio and Lindeman (2005) found that paranormal and pseudoscientific beliefs follow the dual-process logic of thinking, with the intensity of magico-religious convictions being determined by the place that intuitive thinking occupies in a person's life. Williams et al. (2022) established that individuals prone to emotional reasoning and jumping to conclusions are more likely to accept paranormal explanations. Van Mulukom et al. (2024) showed that thinking styles are more closely associated with paranormal beliefs than with religious ones, and this association is mediated by metacognitive trust in one's own intuition. Russian data complement this picture: Abitov, Gorodetskaya, and Dvoinin (2022) demonstrated that what underlies personally superstitious thinking is not so much a deficit of intelligence as a particular emotional profile that includes pessimism, anxiety, and fear of novelty. These are precisely the states in which the analytical system is least likely to be mobilized. Creativity, understood as the combination of personality traits that ensure the readiness to notice contradictions, to find original solutions, and to sustain the productive tension of the unknown, is joined with magical thinking by the willingness to operate with what lies beyond habitual experience. Boden (2004) distinguished transformational creativity as the type in which the conceptual space itself is altered such that what was previously unthinkable becomes possible. Within this logic, magical thinking proves to be its natural ground. Bunce and Woolley (2021) confirmed this

connection on a sample of children aged 4 to 7 years: the deeper a child was immersed in the domain of the impossible, the higher were the scores on verbal and physical creativity.

In the emotional sphere, emotional intelligence, understood as the ability to recognize, understand, and manage one's own and others' emotions (Salovey & Mayer, 1990), exhibits several points of intersection with magical thinking. Eddy and Hansen (2021) established that an individual prone to magical thinking responds intensely to others' emotional states yet poorly recognizes their own experiences, while the cognitive side of empathy remains intact. Canli, Ozdemir, and Kocak (2015) showed that in adolescents with a pronounced tendency toward magical ideation, the accuracy of recognizing negative emotions from facial expressions is reduced. Gregory and Mustata (2012) described magical thinking in adolescents as a manifestation of a presymbolic state in which anxious experiences are ordered through bodily rather than mental schemes. Bayramova and Enikolopov (2021) noted that magical thinking is activated predominantly in emotionally significant situations and functions in the psyche as a means of adapting to them.

In the regulatory sphere, magical thinking is embedded in the system of self-regulation that integrates the cognitive, emotional, and volitional resources of the personality (Sergienko et al., 2023). Stoyanova (2007) examined prelogical formations such as beliefs, superstitions, omens, and rituals as a multifunctional psychological phenomenon, introducing the concept of prelogical defense, which is defined as a special system of personality stabilization that shields consciousness from traumatic experiences. Bayramova and Enikolopov (2021) showed that magical thinking gives rise to "productive illusions" that help in coping with difficult life situations, while belief in magic can perform the functions of both emotion-focused and problem-focused coping within Lazarus's classification. Rudski and Edwards (2007) established that the performance of rituals generates an illusion of control over the outcome of an event, even when no objective connection between the ritual and the result exists. Abitov and Akbirova (2020) found that superstitiousness can act as an imaginary control mechanism that protects against uncertainty and stress factors.

In the moral sphere, moral identity reflects the place of morality in the structure of the personality's self-awareness and encompasses both the formation of moral standards and the mechanisms through which these standards are

realized or disengaged in behavior. Bandura et al. (1996) described eight cognitive mechanisms of moral disengagement, operating at four points of the self-regulatory system and enabling a person to inflict harm without experiencing internal discomfort. Blasi (1984) showed that moral identity, which describes the degree to which moral qualities define a person's conception of themselves, acts as the principal motivator of moral behavior. Au and Savani (2019) demonstrated that fatalism places the source of events beyond human will, turning one's own actions into something incapable of affecting the course of things. Vygotsky (2008) considered myth as one of the mediators of the internalization of moral attitudes, and Cassirer (2010) showed that mythical thinking forms a unified symbolic space in which the values and norms of culture exist in undifferentiated form. Purzycki et al. (2016) found that conceptions of supernatural beings endowed with the capacity to observe people and to punish wrongdoing reinforce fair treatment of strangers who share the same beliefs. Hoffman (2000) developed a theory of moral development based on empathy, tracing its course from the infant's early response to mature compassion capable of guiding prosocial behavior and sustaining a sense of justice.

Although magical thinking has been linked with each of these spheres, the available data are predominantly fragmentary. Adolescence remains almost entirely underrepresented in studies of magical thinking, and the existing studies on adolescent samples do not provide a coherent picture. In light of this, the aim of the present study is to provide a comprehensive examination of the features of magical thinking in adolescence. The first hypothesis posits that magical thinking in adolescence is associated with characteristics of the cognitive, emotional, regulatory, and moral spheres of the personality. The second hypothesis posits that significant predictors of magical thinking exist among the psychological characteristics of adolescents.

2. Method

2.1. Participants

The study involved 300 adolescents aged 14 to 17 years (mean age 15.75 years, $SD = 1.10$), including 148 boys (49.3%) and 152 girls (50.7%). In terms of age distribution, 14-year-olds accounted for 52 participants (17.3%), 15-year-olds for 71 (23.7%), 16-year-olds for 77 (25.7%), and 17-year-olds for 100 (33.3%). Participants were recruited through convenience sampling and resided in various regions of the Russian Federation. A sensitivity analysis indicated that with $n = 300$ and $\alpha = .05$ (two-

tailed), the study had 80% power to detect Spearman correlations of $|\rho| \geq .16$

2.2. Measures

All instruments demonstrated acceptable internal consistency (Cronbach's $\alpha > .70$) in the present sample.

The Revised Paranormal Belief Scale (RPBS; Russian adaptation by Grigoryev, 2015) comprises the total score and seven subscales: Traditional Religious Belief (TRB), Psi-abilities (PSI), Witchcraft (WIT), Superstition (SUP), Spiritualism (SPI), Extraordinary Life Forms (ELF), and Precognition (PRE). $\alpha = .89$.

The Rational-Experiential Inventory (REI; Russian adaptation by Kornilova & Razvalyaeva, 2017) comprises four scales: Rational Engagement (RE), Rational Ability (RA), Experiential Engagement (EE), and Experiential Ability (EA). $\alpha = .78-.85$.

The Test of Divergent Feeling from the Creativity Assessment Packet (CAP; Russian adaptation by Tunik, 2003) comprises the Total Creativity score and four scales: Curiosity, Imagination, Complexity, and Risk-taking. $\alpha = .82$.

The EmIn Emotional Intelligence Questionnaire (Lyusin, 2006) comprises two pairs of main scales (Interpersonal EI and Intrapersonal EI, Emotion Understanding and Emotion Regulation) as well as five subscales (Understanding Others' Emotions, Managing Others' Emotions, Understanding Own Emotions, Managing Own Emotions, and Expressive Control). $\alpha = .76-.88$.

The Behavioral Control Questionnaire (Sergienko et al., 2023) comprises the overall Behavioral Control score and three scales: Cognitive Control, Emotional Control, and Volitional Control. $\alpha = .80$.

The Emotion Regulation Questionnaire (ERQ; Russian adaptation by Pankratova & Kornienko, 2017) comprises two scales: Cognitive Reappraisal (CR) and Expressive Suppression (ES). $\alpha = .79$.

The Moral Disengagement Scale (MD-24; Russian adaptation by Ledovaya et al., 2016) comprises the total score and eight subscales: Moral Justification (MJ), Euphemistic Labeling (EL), Advantageous Comparison (AC), Displacement of Responsibility (DR), Diffusion of Responsibility (DfR), Distortion of

Consequences (DC), Dehumanization (DH), and Attribution of Blame (AB). $\alpha = .87$.

The Moral Identity Questionnaire (MIQ; Russian adaptation by Sychev & Protasova, 2023) comprises two scales: Moral Self (MS) and Moral Integrity (MI). $\alpha = .84$.

2.3. Procedure and Statistical Analysis

Data were collected from May to October 2025 remotely through the Yandex.Forms platform. All participants were informed about the goals of the study and gave consent to anonymous participation; parental consent was obtained for minors.

Associations between magical thinking and the psychological characteristics of adolescents were assessed using Spearman's rank correlation coefficient. The analysis was performed on the full sample and separately for boys and girls. Significant predictors of magical thinking were identified through regression analysis using Bayesian Model Averaging (BMA). The regression analysis was performed for the total paranormal belief score and for each subscale. A $PIP \geq .50$ was treated as substantial evidence for predictor inclusion, $\geq .75$ as strong, and $\geq .90$ as very strong. Data processing was carried out using Microsoft Excel and the R statistical programming environment (RStudio).

3. Results

3.1. Correlations in the Cognitive Sphere

For cognitive styles measured by the REI, the total RPBS score was positively correlated with Experiential Engagement ($\rho = 0.234, p < .001$) and negatively correlated with Rational Engagement ($\rho = -0.181, p < .01$) and Rational Ability ($\rho = -0.248, p < .001$). Experiential Ability showed no significant correlations with either the total score or the subscales and was excluded from further presentation. At the subscale level, Experiential Engagement was correlated with all seven subscales, with the strongest correlations observed for Spiritualism, Witchcraft, and Precognition. Rational Ability was negatively correlated with six of the seven subscales, most strongly with Superstition and Precognition. Rational Engagement was negatively correlated with five subscales, most strongly with Psi-abilities. The values are presented in Table 1a.

Table 1a. Significant Correlations of Cognitive Styles (REI) with Paranormal Belief and Its Subscales ($n = 300$)

Paranormal belief scale	EE	RE	RA
Total (RPBS)	0.234***	-0.181**	-0.248***

Paranormal belief scale	EE	RE	RA
TRB	0.200***	–	–
PSI	0.145***	–0.248**	–0.187*
WIT	0.218***	–0.191**	–0.250***
SUP	0.132*	–0.206***	–0.288***
SPI	0.266***	–0.161*	–0.255***
ELF	0.202***	–	–0.212**
PRE	0.217***	–0.192**	–0.265***

Note. Spearman's rank correlation coefficient. * $p < .05$; ** $p < .01$; *** $p < .001$.

For creativity measured by the CAP, the total RPBS score was negatively correlated with three of the five creativity scales: Total Creativity ($\rho = -0.230, p < .01$), Complexity ($\rho = -0.224, p < .001$), and Risk-taking ($\rho = -0.221, p < .01$). No significant correlations with the total score were found for Curiosity or Imagination, although the direction of the associations was preserved. At the subscale level, all significant correlations were negative.

Superstition was the only subscale correlated with all five creativity scales, with the strongest correlation observed with Risk-taking. Precognition and Psi-abilities were significantly correlated with four of the five scales, most strongly with Complexity and Risk-taking, respectively. Witchcraft and Spiritualism were each correlated with three creativity scales. The values are presented in Table 1b.

Table 1b. Significant Correlations of Creativity Scales (CAP) with Paranormal Belief and Its Subscales ($n = 300$)

Paranormal belief scale	Risk-taking	Curiosity	Complexity	Imagination	Total Creativity
Total (RPBS)	–0.221**	–	–0.224***	–	–0.230**
PSI	–0.253***	–0.198**	–0.162*	–	–0.229**
WIT	–0.184**	–	–0.193**	–	–0.185**
SUP	–0.330***	–0.176**	–0.254***	–0.210***	–0.309***
SPI	–0.152*	–	–0.182**	–	–0.187**
ELF	–	–	–0.191**	–	–0.160*
PRE	–0.257***	–0.168**	–0.290***	–	–0.264***

Note. Spearman's rank correlation coefficient. * $p < .05$; ** $p < .01$; *** $p < .001$.

3.2. Correlations in the Emotional Sphere

For emotional intelligence measured by the EmIn questionnaire, the total RPBS score was negatively correlated with Emotion Understanding ($\rho = -0.223, p < .01$) and Intrapersonal EI ($\rho = -0.197, p < .05$). At the subscale level, all significant correlations were

negative. Emotion Understanding, Intrapersonal EI, and Emotion Regulation were correlated with six, five, and four subscales respectively, most strongly with Superstition and Precognition. Interpersonal EI was correlated with three subscales, most strongly with Superstition. The values are presented in Table 2a.

Table 2a. Significant Correlations of Emotional Intelligence (EmIn) Scales with Paranormal Belief and Its Subscales ($n = 300$)

Paranormal belief scale	IEI	IAEI	EU	ER
Total (RPBS)	–	–0.197*	–0.223**	–
TRB	–	–	–	–
PSI	–	–	–0.165*	–
WIT	–0.176**	–0.189**	–0.214***	–0.172**
SUP	–0.275***	–0.253***	–0.332***	–0.241***
SPI	–	–0.198**	–0.187**	–0.173*
ELF	–	–0.162*	–0.170*	–
PRE	–0.185**	–0.239***	–0.258***	–0.207**

Note. Spearman's rank correlation coefficient. * $p < .05$; ** $p < .01$; *** $p < .001$.

At the subscale level of the EmIn, the total RPBS score was negatively correlated with Understanding Others' Emotions ($\rho = -0.171, p < .05$) and Understanding Own Emotions ($\rho = -0.198, p < .01$). All significant correlations at this level were negative. Understanding Others' Emotions was correlated with four subscales, most strongly with Superstition and Witchcraft. Managing Others'

Emotions and Managing Own Emotions were each correlated with three subscales, most strongly with Superstition. Understanding Own Emotions was correlated with five subscales, most strongly with Superstition and Precognition. Expressive Control was correlated with Superstition and Spiritualism. The values are presented in Table 2b.

Table 2b. Significant Correlations of Emotional Intelligence (EmIn) Subscales with Paranormal Belief and Its Subscales ($n = 300$)

Paranormal belief scale	UOE	MOE	UOE-self	MOE-self	EC
Total (RPBS)	–0.171*	–	–0.198**	–	–
TRB	–	–	–	–	–
PSI	–0.171*	–	–	–	–
WIT	–0.182**	–0.138*	–0.177**	–0.151*	–
SUP	–0.283***	–0.213***	–0.243***	–0.222***	–0.149*
SPI	–	–	–0.179*	–	–0.161*
ELF	–	–	–0.167*	–	–
PRE	–0.185**	–0.159*	–0.227***	–0.203**	–

Note. Spearman's rank correlation coefficient. * $p < .05$; ** $p < .01$; *** $p < .001$.

3.3. Correlations in the Regulatory Sphere

For behavioral control, the total RPBS score was negatively correlated with Emotional Control ($\rho = -0.180, p < .05$). Cognitive Control showed no significant correlations with either

the total score or the subscales and was excluded from further presentation. At the subscale level, all significant correlations were negative. Emotional Control was correlated with five subscales, most strongly with Superstition and Precognition. Volitional Control and Total Behavioral Control were correlated only with Superstition. The values are presented in Table 3a.

Table 3a. Significant Correlations of Behavioral Control Scales with Paranormal Belief and Its Subscales ($n = 300$)

Paranormal belief scale	Emotional Control	Volitional Control	Total (Behavioral Control)
Total (RPBS)	-0.180*	—	—
TRB	—	—	—
PSI	-0.196*	—	—
WIT	-0.198**	—	—
SUP	-0.260***	-0.139*	-0.179**
SPI	-0.147*	—	—
ELF	—	—	—
PRE	-0.237***	—	—

Note. Spearman's rank correlation coefficient. * $p < .05$; ** $p < .01$; *** $p < .001$.

For emotion regulation measured by the ERQ, the total RPBS score was negatively correlated with Cognitive Reappraisal ($\rho = -0.193, p < .01$) and Expressive Suppression ($\rho = -0.184, p < .05$). At the subscale level, all significant correlations were negative. Cognitive Reappraisal was correlated

with five subscales, most strongly with Superstition and Precognition. Expressive Suppression was correlated with five subscales, most strongly with Spiritualism and Extraordinary Life Forms. The values are presented in Table 3b.

Table 3b. Significant Correlations of Emotion Regulation Scales (ERQ) with Paranormal Belief and Its Subscales ($n = 300$)

Paranormal belief scale	CR	ES
Total (RPBS)	-0.193**	-0.184*
TRB	—	—
PSI	-0.212**	—
WIT	-0.195**	-0.174**
SUP	-0.261***	-0.152*
SPI	-0.177**	-0.234***

Paranormal belief scale	CR	ES
ELF	–	–0.215**
PRE	–0.235***	–0.184**

Note. Spearman's rank correlation coefficient. * $p < .05$; ** $p < .01$; *** $p < .001$.

3.4. Correlations in the Moral Sphere

For moral disengagement measured by the MD-24, the total RPBS score was positively correlated with the total Moral Disengagement score ($\rho = 0.303$, $p < .001$) and with six of the eight subscales. Moral Justification and Dehumanization showed no significant correlations and were excluded from further

presentation. At the subscale level, all significant correlations were positive. Five of the displayed subscales and the total Moral Disengagement score were correlated with all seven subscales of paranormal belief. The strongest correlations were observed with Superstition and Precognition, particularly for Displacement of Responsibility and Advantageous Comparison. The values are presented in Table 4a.

Table 4a. Significant Correlations of Moral Disengagement Scales (MD-24) with Paranormal Belief and Its Subscales ($n = 300$)

Paranormal belief scale	EL	AC	DR	DfR	DC	AB	Total (MD-24)
Total (RPBS)	0.205***	0.427***	0.447***	0.318***	0.334***	0.167***	0.303***
TRB	–	0.237***	0.262***	0.166***	0.151**	0.116**	0.160***
PSI	0.201***	0.400***	0.351***	0.239***	0.293***	0.108**	0.237***
WTT	0.176***	0.371***	0.366***	0.280***	0.297***	0.119*	0.245***
SUP	0.216***	0.462***	0.516***	0.325***	0.404***	0.229***	0.330***
SPI	0.184***	0.362***	0.352***	0.271***	0.278***	0.105*	0.243***
ELF	0.213***	0.418***	0.421***	0.358***	0.332***	0.195***	0.334***
PRE	0.231***	0.398***	0.447***	0.324***	0.335***	0.155**	0.306***

Note. Spearman's rank correlation coefficient. * $p < .05$; ** $p < .01$; *** $p < .001$.

For moral identity measured by the MIQ, the total RPBS score was negatively correlated with Moral Self ($\rho = -0.223$, $p < .01$) and positively correlated with Moral Integrity ($\rho = 0.139$, $p < .01$). At the subscale level, Moral Self was negatively correlated with six subscales,

most strongly with Superstition and Psi-abilities. Moral Integrity was positively correlated with six subscales, most strongly with Psi-abilities and Superstition. The values are presented in Table 4b.

Table 4b. Significant Correlations of Moral Identity Scales (MIQ) with Paranormal Belief and Its Subscales ($n = 300$)

Paranormal belief scale	MS	MI
Total (RPBS)	–0.223**	0.139**
TRB	0.092*	–

Paranormal belief scale	MS	MI
PSI	-0.303***	0.204***
WIT	-0.230***	0.119*
SUP	-0.343***	0.196***
SPI	-0.196**	0.100*
ELF	-0.194**	0.142**
PRE	-0.285***	0.175***

Note. Spearman's rank correlation coefficient. * $p < .05$; ** $p < .01$; *** $p < .001$.

3.5. Correlations by Sex

In boys, 201 significant correlations were identified; in girls, 93. Superstition, as in the full sample, displayed the strongest correlations in both subsamples. For cognitive styles, Experiential Engagement was most strongly positively correlated with the total paranormal belief score in girls ($\rho = 0.299$), whereas in boys it showed no significant correlation with the total score. For creativity, negative correlations were observed across most subscales in boys, whereas in girls correlations with the total score were retained only for Complexity and Total Creativity. For emotional intelligence, negative correlations were observed across nearly all scales in boys, whereas in girls no correlations with the total score were found, and the remaining significant correlations primarily involved Superstition. For behavioral control, negative correlations were observed across nearly all scales in boys, and Volitional Control,

which had been correlated only with Superstition in the full sample, was correlated with four subscales in boys. In girls, only the correlation between Emotional Control and Superstition was retained. For emotion regulation, negative correlations were observed for both scales of the questionnaire in boys, whereas in girls only two significant correlations were retained. For moral disengagement, positive correlations were broader and stronger in boys, with the strongest correlation observed between Advantageous Comparison and the total score ($\rho = 0.608$); in girls, correlations with the total score were retained at weaker magnitudes. For moral identity, the negative correlation of Moral Self with the total paranormal belief score was stronger in boys, whereas in girls no correlation between Moral Self and the total score was found. The numbers of significant correlations in the subsamples are presented in Table 5.

Table 5. Number of Significant Correlations Between Psychological Characteristics and Paranormal Belief, in the Full Sample and by Sex ($n = 300$)

Measure	Full sample ($n = 300$)	Boys ($n = 148$)			Girls ($n = 152$)		
		Total	New	Lost	Total	New	Lost
Cognitive styles (REI)	21	18	6	9	21	3	3
Creativity (CAP)	24	30	9	3	17	0	7
Emotional intelligence (EmIn)	39	59	21	1	7	1	33
Behavioral control	8	16	8	0	1	0	7
Emotion regulation (ERQ)	12	15	3	0	2	1	11

Moral disengagement (MD-24)	55	55	1	1	35	3	23
Moral identity (MIQ)	15	8	0	7	10	0	5
Total	174	201	48	21	93	8	89

Note. Counts of statistically significant Spearman rank correlations ($*p < .05$) of psychological scales with the total paranormal belief score and its seven subscales. New = correlations significant in the subsample but not in the full sample. Lost = correlations significant in the full sample but not in the subsample.

3.6. Regression Analysis

Bayesian Model Averaging (BMA) regression was used to identify predictors of the paranormal belief scales. The model R^2 for the total score was .32. The cumulative posterior probability of the five most plausible models was approximately 12%. Four substantial predictors of the total paranormal belief score were

identified, all positive in direction. Advantageous Comparison, Displacement of Responsibility, and Experiential Engagement showed the strongest evidence for inclusion, each at $PIP = 1.00$. Volitional Control exceeded the threshold for substantial evidence with a notable margin ($PIP = .62$). Posterior inclusion probabilities are presented in Figure 1.

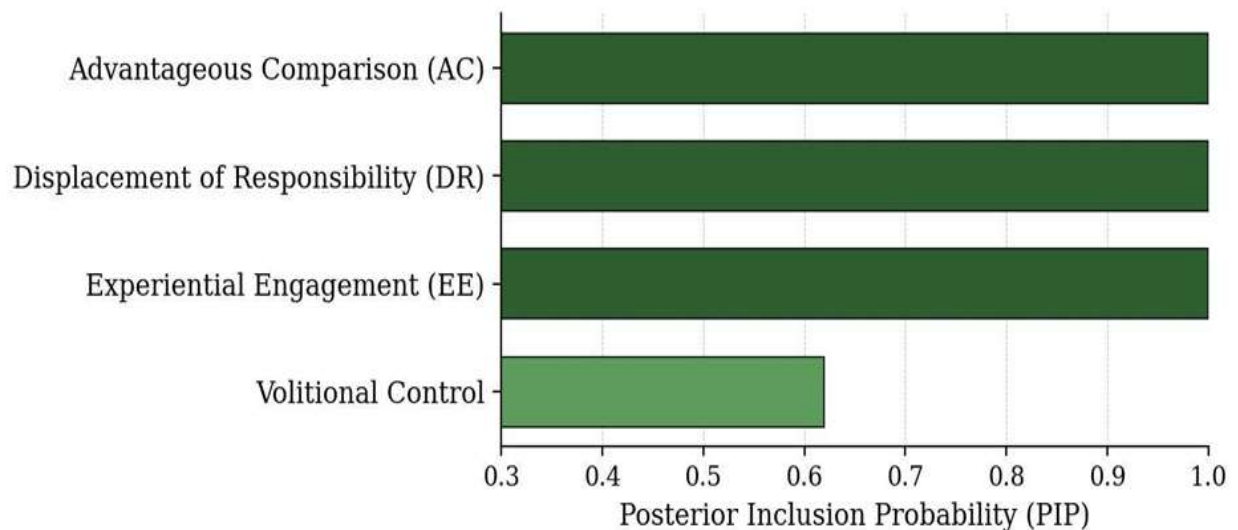


Figure 1. Posterior Inclusion Probabilities (PIP) of Substantial Predictors of the Total Paranormal Belief Score

The three predictors with $PIP = 1.00$ for the total score replicated across most subscales. Experiential Engagement and Advantageous Comparison showed substantial evidence for inclusion in all seven subscales, and Displacement of Responsibility in five of seven. Beyond these three, six additional variables crossed the substantial-evidence threshold selectively in individual subscale models. In Psi-abilities, Rational Engagement and Cognitive Reappraisal additionally crossed the threshold. In Superstition, Risk-taking and Moral Justification additionally crossed the threshold. In Precognition, Cognitive

Reappraisal and Risk-taking additionally crossed the threshold. In Spiritualism and Extraordinary Life Forms, Expressive Suppression additionally crossed the threshold. In Traditional Religious Belief, Moral Self additionally crossed the threshold and was the only positive predictor among all subscale-specific additions. In Witchcraft, only Advantageous Comparison and Experiential Engagement crossed the threshold; no subscale-specific additional predictors were identified. Posterior inclusion probabilities are presented in Figure 2.

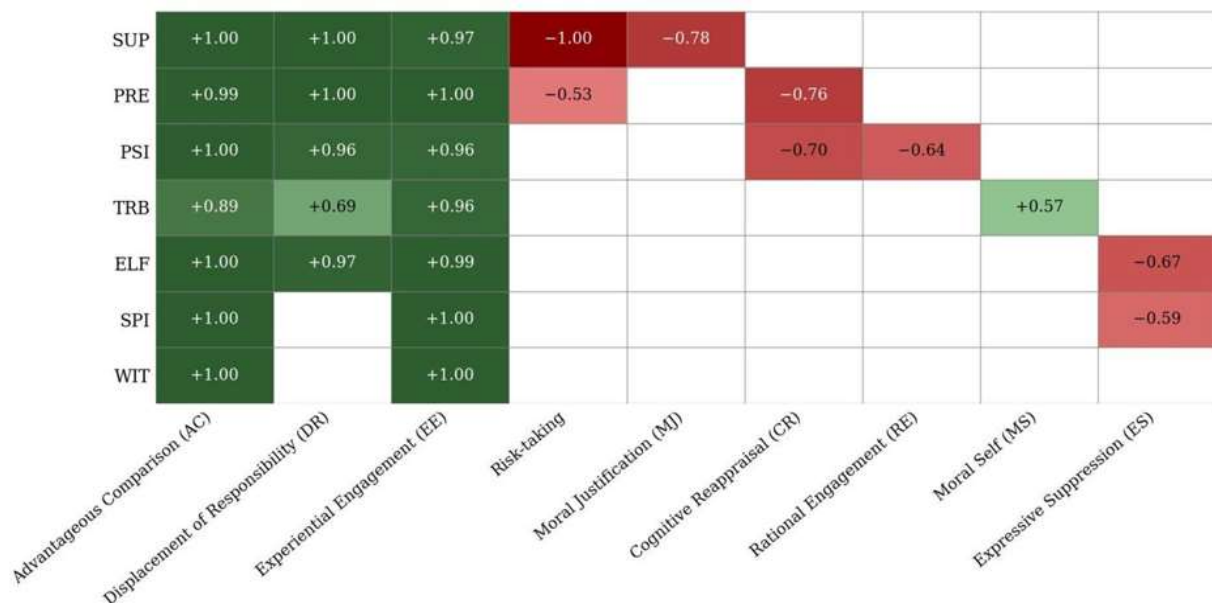


Figure 2. Posterior Inclusion Probabilities (PIP) of Substantial Predictors Across the Seven Paranormal Belief Subscales. Cell color indicates direction (green = positive, red = negative); empty cells indicate PIP < .50.

4. Discussion

4.1. Correlation Analysis

Since Experiential Engagement represents a low-effort strategy of rapid, automatic, affect-driven judgments, whereas Experiential Ability reflects an adaptive cognitive resource grounded in accumulated experience and implicit knowledge, magical thinking was associated only with the former. This distinction is consistent with the separation between the experiential and rational systems in Epstein's cognitive-experiential self-theory (Epstein et al., 1996). Paranormal belief is thus tied not to cognitive resources as such, but to a preference for a particular mode of information processing. The rationality scales demonstrated the inseparability of engagement and ability, since the use of rational strategies rests directly on the corresponding cognitive skill. Rational analysis counteracts the cognitive heuristics that generate magical explanations and that continue to operate in the everyday thinking of educated adults (Rozin & Nemeroff, 2002). The negative associations of both rationality scales with paranormal belief indicate that adolescents with pronounced magical thinking tend to prefer an associative path of information processing. Analytical thinking, moreover, more often endorses an intuitive answer than rechecks it, particularly under reduced motivation (Kahneman, 2024). The differential behavior of Traditional Religious Belief, which was associated with Experiential Engagement but not with rationality or creativity scales, is

consistent with the findings of Van Mulukom et al. (2024), who showed that paranormal beliefs are more closely linked to thinking styles than religious beliefs, and this link is mediated by metacognitive trust in one's own intuition.

The negative association between magical thinking and creativity was not self-evident from the theoretical analysis, since prior data suggested a shared willingness to operate with what lies beyond the possible. The personality component of creativity, including Curiosity and Risk-taking, reflects an adolescent's readiness to continue searching beyond the first explanation that magical thinking supplies in the form of a ready symbolic answer requiring no verification. The cognitive component, represented by Complexity, presupposes analytical immersion in a task and the holding of contradictions, whereas magical thinking removes the need for such immersion by replacing a complex picture of the world with a coherent but simplified one. The pronounced negative association between Risk-taking and Precognition further clarifies this logic: precognition as a mechanism for "looking ahead" represents a strategy of replacing uncertainty with a comforting picture of the world, opposite to a readiness to accept the unknown. This pattern is consistent with Vyse's (2014) view of openness to the "realm of the possible" as being linked both to divergent thinking and to the acceptance of paranormal explanations. At the same time, creativity has also been conceptualized in the literature as a transformational process operating beyond the boundaries of the habitual conceptual order, to

which immersion in the realm of the impossible may contribute (Boden, 2004; Subbotsky, 2012).

Intrapersonal emotional intelligence was more strongly affected than the interpersonal one. The understanding of own emotions requires internal cognitive analysis that allows an experience to be recognized, differentiated, and traced to its cause. When this analysis is poorly developed, emotional experience remains undifferentiated and anxious states are organized through bodily rather than mental schemas, in line with the findings of Gregory and Mustata (2012) on the presymbolic state of adolescents with pronounced magical thinking. More archaic mechanisms are recruited for their processing, magical thinking among them. The understanding of others' emotions was also associated with magical thinking, but this process draws not only on internal cognitive resources but also on external perception, which functions as a compensatory mechanism and attenuates the association overall. This is consistent with the conclusions of Eddy and Hansen (2021) on the selective character of difficulties affecting the perceptual component of emotional intelligence while cognitive empathy remains intact, and with the findings of Canli et al. (2015) on reduced accuracy of facial-expression emotion recognition in adolescents with magical ideation. Within intrapersonal emotional intelligence, the most pronounced associations involved Understanding Own Emotions, the component most directly tied to internal cognitive analysis of affective states.

Magical thinking and behavioral control operate within a shared field of emotional-tension management. Whereas behavioral control integrates emotional tension into a system of conscious self-regulation, magical thinking addresses affect through the sense of influencing the outcome of events, of reducing anxiety, and of restoring the intelligibility of the surrounding world by means of omens, rituals, and appeals to fate. This is consistent with Bayramova and Enikolopov's (2021) notion of "productive illusions" that render the world commensurate with the person, and with Stoyanova's (2007) conception of prelogical defense as a system that stabilizes personality and shields it from anxiety. Emotional Control, which reflects the capacity to cope with affective tension, displayed the most pronounced association with magical thinking among all components of behavioral control. Cognitive Control reflects the capacity to analyze the environment and construct mental schemas that may be filled with either magical or rational content, but the process itself is neutral with

respect to magical thinking. Volitional Control showed only a single, weak association with magical thinking, involving Superstition, since it is tied to drawing upon psychic resources rather than to choosing strategies of engagement with emotional experience. This pattern is paralleled by Vetrova's (2009) findings on the uneven development of behavioral-control subsystems, in which volitional control remains relatively stable across adolescence. Total Behavioral Control similarly correlated only with Superstition, indicating that the general regulatory system is responsive only to the most behaviorally loaded component of paranormal belief.

The two emotion-regulation scales operate at different points of the emotional process and therefore affect different types of paranormal belief. Cognitive Reappraisal intervenes at the stage of construing the situation by offering an alternative interpretation of the event, whereas Expressive Suppression acts later, at the stage of expression of an already-arisen emotion, and, when used consistently, restricts access to affective-bodily signals themselves. Spiritualism and Extraordinary Life Forms describe the admission of a hidden reality that includes spirits of the dead, beings unknown to science, and other forms of life, as well as the possibility of contact with them. The strongest channel for perceiving the otherworldly is open access to affective-bodily and imagistic impressions. Expressive Suppression, as a habitual strategy of holding emotions in, gradually narrows this channel, and the ground for such impressions diminishes. This is consistent with the findings of King et al. (2007), according to which belief in ghosts and extraordinary beings is particularly closely associated with reliance on the experiential system of thinking. The intersection between emotional intelligence and behavioral control is Emotion Regulation, since it represents the step at which understanding is converted into regulation. The association of magical thinking with this scale shows that both spheres are involved and demonstrates their inseparable proximity. An association of magical thinking with one of them spreads naturally to the other, and its influence must therefore be considered jointly. Cognitive mechanisms displayed differential sensitivity to magical thinking depending on whether they operated autonomously or were embedded in the service of emotional processing. The emotional-regulatory system thus emerges as the area of adolescent psychic life in which magical thinking is most consistently present.

Moral disengagement, which rests on cognitive devices that loosen moral constraints,

and magical thinking share the same causal error. Both substitute the attribution of responsibility through an associative replacement of causal links, reproducing the logic of the laws of similarity and contagion described by Frazer (2009). Rational justification, by contrast, requires the matching of true premises with true conclusions and is constructed only after the moral judgment has been delivered, which makes it difficult to displace the authorship of an action outside the agent. A rational view of one's own moral transgressions is painful for self-awareness, as it can undermine the internal self-image, and the psyche defends itself by shifting causal authorship onto higher powers and resorting to prelogical defenses (Stoyanova, 2007). Moral judgments are largely generated intuitively, as shown by Haidt (2012), who described the hundreds of rapid moral judgments that a person makes daily without rational justification. Magical thinking, which belongs to the same mode of processing, is readily incorporated into moral evaluation. Displacement of Responsibility finds direct support in a fatalistic worldview that locates the source of events beyond human will, which is consistent with the data of Au and Savani (2019) on belief in fate as a way of dealing with constraints, turning one's own actions into something incapable of affecting the course of things. The opacity of dominating circumstances heightens the need for protection, and the responsibility for what occurs is transferred onto these unintelligible, uncontrollable forces. Advantageous Comparison, in turn, evaluates not the act itself but the act set against a heavier one, introducing into the moral evaluation a variable that replaces direct analysis. Both devices admit a wide repertoire of properly magical means, from entrusting the outcome to providence to ritual "cleansing" of guilt, and cover the moral situation from two poles. This corresponds to the four points of the self-regulatory system described by Bandura et al. (1996), at which the mechanisms of moral disengagement operate, since Displacement of Responsibility relocates the question of the agent of the action, whereas Advantageous Comparison relocates the question of its gravity.

Moral Justification was not associated with magical thinking. This device requires the reformulation of a harmful action as serving a higher aim, a cognitively costly operation that presupposes the construction of a coherent argument, and the goal-directed character of such reasoning hinders the incorporation of paranormal beliefs. Dehumanization showed no associations with any subscale of paranormal

belief. Paranormal beliefs, despite cultural influence, rest substantially on individual-psychological and biological foundations, whereas Dehumanization belongs primarily to the sociocultural domain, as emphasized by researchers stressing the need to take sociohistorical factors into account in the study of dehumanization (Haslam, 2006; Kronfeldner, 2021). These processes belong to different levels of psychic organization and did not intersect in the present study.

Moral Self, which reflects the place of moral content in self-awareness, was negatively associated with magical thinking. Pronounced paranormal beliefs are accompanied by active use of moral-disengagement devices, and the divergence between judgment and action thereby created is incompatible with retaining moral qualities at the core of identity, which Blasi (1984) regarded as the principal motivator of moral behavior. Moreover, magical views locate causality outside, whereas Moral Self requires internal agency, the sense that it is one's own decisions that determine who one is. Moral Integrity, which reflects adherence to moral principles in actual behavior, was, on the contrary, positively associated with magical thinking. An adolescent with pronounced paranormal beliefs may follow rules at the conventional level described by Kohlberg et al. (1983) as the grounding of moral judgments in the expectations of close others and in the maintenance of social order, reproducing the norms of the immediate environment without their deep internalization. This is not a contradiction with the negative association involving Moral Self but rather reflects two levels of norm-following alongside weak inner endorsement.

Traditional Religious Belief showed a twofold pattern of relations with the moral domain. On the one hand, religious systems are tied to moral prescriptions, set a moral framework, and strengthen moral behavior through representations of a supernatural observer capable of punishing and rewarding, a position supported by the data of Purzycki et al. (2016) on the influence of moralizing-god representations on prosocial behavior. On the other hand, religion employs devices similar to those of moral disengagement, since responsibility is shifted from the person onto an authority figure that defines what is good and what is bad and provides pathways for the remission of guilt (Stoyanova, 2007). A positive contribution is also made by belonging to a religious community, in which moral norms are transmitted through shared practices and a system of values. This position is supported by

data on the link between religiosity and prosocial behavior in adolescents (Hardy & Carlo, 2005) and by the concept of moral communities, according to which religious groups constitute a space that sets and maintains shared moral rules (Graham & Haidt, 2010). The positive association of Traditional Religious Belief with Moral Self differs from that of all other paranormal-belief subscales. Unlike Superstition, Witchcraft, or Precognition, religious affiliation contains a ready-made moral system that enters an adolescent's identity not as the result of inner work but as a part of an adopted tradition. This corresponds to the movement, described by Vygotsky (2008), from externally given moral patterns to internal personal forms, which proceeds through myth and symbol. The literature also contains data according to which belief in the supernatural is associated with greater adherence to moral norms (Atkinson & Bourrat, 2011).

Magical thinking, across all spheres, was associated not so much with psychic resources as such, as with the preference for a particular mode of engaging with experience. Where mature, conscious, and cognitively costly modes of engagement with information, emotions, or moral situations are insufficiently formed or not in demand, magical thinking takes their place. The replacement of causal links by associative ones affects primarily the processes directed inward and systematically relocates causality outward. These two vectors constitute a unified process in which magical thinking is found precisely where the adolescent is turned to the self and offers to shift the point of support beyond it. This is consistent with the findings on the tendency of paranormal belief to bypass the testing of one's beliefs as a moral requirement (Irwin et al., 2022). Two paranormal-belief subscales displayed features warranting separate consideration. Superstition consistently leads in the number and strength of associations across all three domains, since it represents the point at which magical thinking ceases to be a belief and becomes a behavior aimed at influencing the course of events. This pattern corresponds to the functional distinction made by Vyse (2014), who defined superstition as the intention to influence the course of events, as opposed to paranormal belief, which merely admits the existence of unexplained phenomena. It is through action that Superstition comes into contact with cognitive strategies, emotional regulation, and moral decisions. Traditional Religious Belief, in the structure of the instrument, shows the properties not of an individual psychological characteristic but of belonging to an institutional system whose

immediate domain of operation is the moral sphere. This finding is consistent with the view of Rosengren et al. (2000) of magical, scientific, and religious thinking as coexisting systems, each with its own logic and its own domain of application.

The picture obtained can be understood in the context of the gradual maturation of voluntary, conscious, and cognitively costly modes of experience processing during adolescence. Rational thinking, the readiness for cognitive complexity, the voluntary regulation of emotions, and explicit moral justification develop dynamically in adolescence. Frydenberg (2019) noted the gradual acquisition by adolescents of access to cognitive coping strategies such as reappraisal and internal distraction. Vetrova (2009) demonstrated the uneven maturation of behavioral-control subsystems. During the period when these modes are not yet fully formed, magical thinking retains substantial presence in the adolescent's psyche. At the same time, it is not eliminated with age but continues to operate as an automatic system of experience processing that coexists with the rational one. Development consists not in the elimination of magical thinking but in the growing ability to differentiate the two planes.

The observed differences between boys and girls lay in the character of the relations of the rational and intuitive scales with magical thinking and, possibly, in differing degrees of trust in one's own intuition. Boys appear to separate paranormal beliefs from rational analysis and from logical intuition, not incorporating them into the associative processing of implicit experience. Girls, by contrast, appear to weave paranormal beliefs into the intuitive mode of thinking, including its holistic form, in which disparate signals merge into an integral experience of belonging, for example, through Spiritualism and Traditional Religious Belief. This is consistent with Epstein's (2003) notion of the experiential system as an automatic, associative, affect-driven mode of experience processing that serves as a source not only of adaptive decisions but also of superstitions and prejudices. In boys, magical content presumably provides a ready-made answer to uncertainty, and the readiness to continue searching is opposed to it in all forms of paranormal belief. This pattern is consistent with the investment theory of creativity by Sternberg and Lubart (2002), in which tolerance for uncertainty and the readiness to develop an idea despite environmental resistance are central creative resources. In girls, the association emerged selectively, only with those

subscales that involve action or a stated stance, and was absent for subscales defined through admitting the existence of phenomena.

The divergence in correlation patterns between boys and girls in emotional intelligence is likely related to different modes of processing emotional information. In boys, the emotional sphere appears to rely on cognitive recognition of experiences, where magical thinking is recruited only when internal analysis is insufficient. In girls, the emotional sphere appears to operate more often in a prereflective mode that does not require cognitive analysis of experience and therefore coexists with magical thinking without mutual pressure. The assumption of different modes of interaction between cognition and emotion is consistent with Brushlinsky's (2003) principle of the non-disjunctivity of mental processes, according to which the emotional and the cognitive do not exist separately and can be distinguished only in abstraction. The observed sex difference is consistent with Vetrova's (2012) data showing that the gender specificity of emotional intelligence in adolescents is manifested not in level but in the manner in which emotional capacities are integrated into the system of adaptation. In boys, volition is more often directed outward, toward overcoming and goal attainment, and magical thinking may function for them as an alternative way of acting upon the world through appeal to unseen forces that does not require one's own effort. This opposition is also reflected at the cultural level in the symbolism of the warrior and the magician as two non-overlapping male roles. In girls, self-regulation and paranormal belief appear to occupy different planes of the psyche: the former pertains to the management of oneself and one's relationships, the latter to representations of the world and its hidden forces.

The positive association of Expressive Suppression with Psi-abilities in girls is likely to arise at the intersection of two features of female emotional life at this age. Restrained personal experience combined with the urge to read the experience of the other generates a need for a nonverbal mode of mutual understanding, for which real social perception does not always provide sufficient grounds. Belief in Psi-abilities, which admits the possibility of telepathy, mind reading, and the transmission of states without words, becomes a symbolic resolution of this need. This pattern is consistent with the data of Williams et al. (2022) on the central role of emotional reasoning among the cognitive biases predicting paranormal beliefs, where experience serves as an argument for the truth of a judgment. In adolescent boys, socialization

tolerates a wider range of behavioral expressions that come into conflict with the self-image of being a good person. Magical thinking and moral disengagement appear to operate in the service of preserving an integral positive self-image, and the overall dynamic of these mechanisms combines the externalization of causality of actions with their justification from within. This pattern is consistent with Moore's (2015) characterization of moral disengagement as a stable individual propensity that determines how readily a person justifies morally ambiguous acts for oneself. Advantageous Comparison allows for the construction of an abstract image of a substantially heavier act that requires no empirical verification. The creation of an unverifiable mental entity and its use as if it were real belong to the same cognitive errors that underlie magical thinking. This parallel is consistent with the mechanism described by Shweder (1977), in which conceptual similarity between objects is taken as an indicator of their actual relatedness, and correlation is replaced by association. The intersection of these errors likely produces the strongest association in the entire study. In girls, paranormal beliefs in Psi-abilities, Witchcraft, and Superstition, which endow the other with hidden inner content, appear to restrain the adolescent from Dehumanization, which strips the other of inner personal qualities. This pattern is consistent with Hoffman's (2000) theory of empathy as the foundation of moral behavior, tracing its path from the early infant response to mature compassion capable of guiding prosocial behavior and supporting a sense of justice. Religious belief within an institutional framework contains a ready-made moral code whose internalization rests on the adolescent's turning to inner content, a turning more pronounced in girls than in boys, so that religious attitudes become more fully a part of moral self-perception. The quantitative difference in correlations between boys and girls is likely determined by differences in the modes in which magical thinking is integrated into psychic structure. In most domains, comparable levels of psychological characteristics produced fundamentally different correlation pictures. The causes of the differences may include factors of gender-related cultural socialization and the predominant orientation of boys toward action in the external world and of girls toward internal processes. The greater integration of paranormal beliefs into personality in boys is consistent with the data on the positive association of the masculine gender role both with belief in the paranormal and with paranormal experience (Spinelli et al., 2002).

4.2. Regression Analysis

The three predictors with the strongest evidence for inclusion differ in the source to which the subject turns. Experiential Engagement, as reliance on a rapid associative response, is oriented toward one's own inner sensation. Displacement of Responsibility, which relocates the cause of an action to circumstances, and Advantageous Comparison, which evaluates an act through contrast with a heavier one, are oriented outward. What these three scales have in common is an epistemic style of accepting information without verification. In Experiential Engagement the cognitive evaluation of a sensation is bypassed, in Displacement of Responsibility the analysis of personal contribution, and in Advantageous Comparison the moral analysis of the act. The mechanisms of moral disengagement in Bandura's conception represent cognitive operations of constructing justification (Bandura et al., 1996). In the present study, however, they are treated as a stable disposition to accept the result of these operations as true without verification, a treatment consistent with Haidt's (2012) view of the intuitive nature of moral judgments. Magical thinking shapes such an approach to information into an integral worldview, in line with the conception of metacognitive trust in intuition proposed by Van Mulukom et al. (2024). This substantive correspondence makes these three predictors a natural foundation for the prediction of paranormal belief. Volitional Control became a stable positive predictor only when the remaining variables of the model were taken into account, at which point a specific contribution emerged within it that was not overlapped by the other self-regulation scales. The unique component of Volitional Control, as the capacity for the goal-directed maintenance of action, is necessary for the realization of magical practices such as observing omens, performing rituals, and following astrological recommendations. With equal values on the three strongest predictors, an adolescent with higher Volitional Control possesses the resource to translate the magical mode of engaging with the world into stable behavior. This is consistent with the view of magical thinking as a coping strategy that is not reducible to belief and requires active reproduction (Bayramova & Enikolopov, 2021), as well as with the view of rituals as practices that demand and train self-control (Hobson et al., 2018). The behavioral enactment of belief through omens, rituals, and charms makes it most dependent on volitional resources. Direct empirical confirmation of a positive association between Volitional Control and paranormal

belief was not found in the literature. In contrast, in a college-student sample, lower self-control was shown to be a significant predictor of greater endorsement of such beliefs (Mowen et al., 2022). The pattern obtained in the present study may reflect the specificity of adolescence or of the particular component of self-regulation on which the instrument places emphasis, and requires further verification.

For Psi-abilities, additional stable contributions were observed for Rational Engagement, which constitutes a disposition toward analysis and counteracts belief at the level of its very possibility, and for Cognitive Reappraisal, which intercepts the mystical experience at the stage of forming an emotional response. This is consistent with the data of Stanovich and West (2002), according to whom the classical errors of intuitive judgment are attenuated by the work of analytical thinking as an actualizable resource that includes the disposition to reflection. For Superstition, additional stable contributions were observed for Risk-taking, as the readiness to accept uncertainty without ritual guarantees, and for Moral Justification, as an active search for meaning that is incompatible with the passive application of a ready external form. This is consistent with the data of Rudski and Edwards (2007), according to whom ritual practices create an illusion of control and reduce subjective uncertainty regarding the outcome, as well as with Bandura et al.'s (1996) characterization of moral justification as a cognitive reconstruction of an action that requires the construction of a coherent argument. For Precognition, additional stable contributions were observed for Cognitive Reappraisal and Risk-taking, reflecting the epistemic and behavioral aspects already identified in the previous subscales. The posterior inclusion probabilities of both additions are lower than in the source subscales, which is consistent with the hybrid nature of Precognition, in which neither logic is represented in pure form. For Spiritualism and Extraordinary Life Forms, an additional stable contribution was observed for Expressive Suppression. The regression reproduces the correlation pattern in which Expressive Suppression narrows the channel of formation of belief in a hidden reality. The stability of this predictor across both subscales confirms the non-random character of the association. For Traditional Religious Belief, an additional stable contribution was observed for Moral Self, the only positive direction among all subscale-specific additions. This is consistent with the previously established line according to

which Traditional Religious Belief displays the properties of belonging to an institutional system that contains a ready-made moral code, which enters an adolescent's self-awareness as a part of an adopted tradition. For Witchcraft, stable contributions were observed only for two of the three strongest predictors, Advantageous Comparison and Experiential Engagement. No subscale-specific additional predictors were identified, and its structure is fully accounted for by the general mechanisms operating at the level of the strongest predictors. Magical thinking thus emerges as a stable architecture in which a common foundation remains constant, while additional predictors are differentiated according to the content of belief, reflecting the vulnerability of each of its forms to alternative psychological resources.

4.3. Limitations and Future Directions

The cross-sectional design does not allow age-related changes to be separated from cohort effects and provides no access to the individual dynamics of magical-thinking development. The predominance of self-report instruments limits access to content that is poorly reflected upon or lacks verbal form in adolescence. Regression analysis was conducted only on the full sample. The correlation analysis carried out separately for boys and girls revealed fundamentally different patterns of integration of magical thinking into the psyche of adolescents of the two sexes, which renders the conclusions of the full-sample correlation and regression models potentially imprecise at a more localized level of analysis. Magical thinking represents a basic, evolutionarily early mode of making sense of reality and one of the initial forms of cognition, which makes its study a substantive part of psychological science. The findings on the associations and predictors of magical thinking in adolescents open the way for moving from the description of the phenomenon to the study of its mechanisms and for clarifying why precisely these characteristics prove to be relevant and what role they play in the transformation of magical thinking across ontogenesis. Further steps in this direction include a longitudinal study, which would make it possible to trace the individual dynamics of magical thinking in the same adolescents and to separate age-related changes from cohort effects. An extension of the age range to childhood and early adolescence would clarify how magical thinking is transformed from a predominantly adaptive mechanism of childhood into a phenomenon of ambiguous functions in adulthood. Separate regression analyses for boys and girls would allow distinct predictive models to be

constructed and would test the extent to which the predictors with the strongest evidence for inclusion are preserved in each subgroup. A separate direction is constituted by a typological analysis of the sample by the character of paranormal belief, which would make it possible to identify stable subgroups and to test the extent to which the general patterns apply to each of them.

5. Conclusion

Empirical support was obtained for both research hypotheses. Magical thinking in adolescence was found to be associated with characteristics of the cognitive, emotional, regulatory, and moral spheres of the personality, and stable predictors of paranormal belief were identified among the psychological characteristics of adolescents. The correlation analysis indicated that magical thinking in adolescence is accompanied by reliance on the intuitive mode of information processing, by reduced engagement with rational strategies, and by lower levels of creativity. In the emotional and regulatory domain, it is associated with less developed understanding of one's own emotions, with less pronounced emotional control of behavior, and with less active recourse to strategies of emotion regulation. In the moral sphere, magical thinking is associated with greater readiness to draw on mechanisms of moral disengagement. The associations described above are not intended to characterize the individual profile of any particular adolescent and instead allow the listed characteristics to be regarded as interrelated elements of a single picture in which magical thinking occupies a regular place. Regression analysis identified Experiential Engagement, Advantageous Comparison, and Displacement of Responsibility as the predictors with the strongest evidence for inclusion, united by a shared epistemic basis in which a judgment is accepted without subsequent verification, whether of an immediate impression, of a causal connection, or of a moral evaluation. Volitional Control was additionally identified as a resource that allows magical thinking to be carried over into stable behavior in situations requiring active engagement.

Magical thinking in adolescence is thus revealed not as a deficit of psychic resources but as a preference for a particular mode of information processing, one bound to immediate affect and evolutionarily shaped as a way of coping with the unpredictability and uncontrollability of the surrounding world. During the period in which voluntary, conscious, and cognitively costly modes of experience

processing are only being formed, this mode of processing occupies a broad place in the adolescent's psyche and is manifested simultaneously in cognitive, emotional, regulatory, and moral characteristics. These findings have implications for educational interventions: fostering analytical thinking, emotional regulation, and moral reasoning may help adolescents navigate the balance between intuitive and rational processing, reducing reliance on magical thinking when it is maladaptive.

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Highlights:

- Adolescent magical thinking is associated with intuitive over rational processing, lower creativity, and reduced emotional regulation.
- Experiential Engagement, Advantageous Comparison, Displacement of Responsibility are the strongest predictors of paranormal belief, with Volitional Control as an additional predictor.
- Sex differences reveal broader integration of magical thinking in boys (201 correlations) than in girls (93), with distinct patterns across psychological domains.
- Magical thinking in adolescence functions as an affect-driven, evolutionarily shaped coping strategy, not a cognitive deficit.

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Психологические особенности магического мышления в подростковом возрасте

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Резюме. *Актуальность и проблема.* Магическое мышление представляет собой одну из ранних форм осмысления реальности, сохраняющуюся в психике современного взрослого человека. Связь магического мышления с когнитивными, эмоциональными, регуляторными и моральными характеристиками личности зафиксирована в отдельных исследованиях, однако имеющиеся данные носят фрагментарный характер, а подростковый возраст остаётся практически не представленным в научной литературе. *Цель.* Настоящее исследование направлено на комплексное изучение особенностей магического мышления в подростковом возрасте. Проверяется предположение о том, что магическое мышление связано с психологическими характеристиками из разных сфер психики, а также о наличии значимых предикторов среди психологических особенностей подростков. *Методы.* В исследовании приняли участие 300 подростков в возрасте 14–17 лет (148 юношей, 152 девушки). Применялись восемь стандартизированных методик самоотчёта, измеряющих веру в паранормальное, когнитивные стили, креативность, эмоциональный интеллект, контроль поведения, эмоциональную регуляцию, моральное отчуждение и моральную идентичность. Статистическая обработка включала ранговые корреляции Спирмена (на полной выборке и отдельно по полу), а также регрессионный анализ методом усреднения байесовских моделей (ВМА). *Результаты.* Магическое мышление положительно коррелировало с интуитивным стилем мышления ($\rho = 0,234, p < ,001$) и отрицательно — с рациональным стилем ($\rho = -0,248, p < ,001$), креативностью ($\rho = -0,230, p < ,01$), эмоциональным интеллектом ($\rho = -0,223, p < ,01$), когнитивной переоценкой ($\rho = -0,193, p < ,01$) и моральной самостью ($\rho = -0,223, p < ,01$), обнаруживая при этом положительные связи с механизмами морального отчуждения ($\rho = 0,303, p < ,001$).

Регрессионный анализ методом ВМА ($R^2 = ,32$) выделил использование интуиции, выгодное сравнение и смещение ответственности как предикторы с наиболее сильными свидетельствами в пользу включения ($PIP = 1,00$); волевой контроль выступил дополнительным предиктором ($PIP = ,62$). Половые различия проявились в том, что у юношей была выявлена 201 значимая корреляция против 93 у девушек. *Заключение.* Магическое мышление в подростковом возрасте представляет собой не когнитивный дефицит, а предпочтение аффективно-ориентированного способа обработки информации, эволюционно сформировавшегося как механизм совладания с непредсказуемостью. Полученные результаты имеют практические импликации для разработки образовательных интервенций, направленных на развитие критического мышления и морального суждения у подростков.

Ключевые слова: магическое мышление, вера в паранормальное, подростковый возраст, когнитивные стили, эмоциональный интеллект, моральное отчуждение

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