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Development of Conceptual Reasoning versus Understanding of Children's Theory of Mind and Extraordinary (Supernatural) Minds during Middle Childhood

Elżbieta Rydz [1], Arkadiusz Gut [2], Anna Pietryga [3,*] and Zbigniew Wróblewski [3]

[1] Institute of Psychology, The John Paul II Catholic University of Lublin, 20-950 Lublin, Poland; elzbieta.rydz@kul.pl
[2] Department of Cognitive Science, Nicolaus Copernicus University in Toruń, 87-100 Toruń, Poland; arkadiusz.gut@umk.pl
[3] Institute of Philosophy, The John Paul II Catholic University of Lublin, 20-950 Lublin, Poland; zbigniew.wroblewski@kul.pl
* Correspondence: anna.pietryga@kul.pl

Abstract: It is still not known how a person acquires the ability to think about extraordinary minds. This study examined the point at which a significant distinction appears, the conceptual differentiation of the ordinary mind from the extraordinary mind. Additionally, it examined whether this distance is related to a certain type of conceptual knowledge and understanding of religious concepts. The study involved 117 children from Poland within the age range of 3 to 7 years old (56% girls; 44% boys). The following methods were used: The Deceptive Box Task, The Conceptual reasoning scale from the IDS-P, and the Short test of understanding religious concepts. The obtained results are closer to one of the hypotheses discussed in this area—the anthropomorphism hypothesis, which assumes that after gaining competence in understanding ordinary minds, children begin to build and understand the competencies of extraordinary minds.

Keywords: extraordinary minds; children's theory of mind; conceptual reasoning; middle childhood; false-belief tasks

Citation: Rydz, Elżbieta, Arkadiusz Gut, Anna Pietryga, and Zbigniew Wróblewski. 2023. Development of Conceptual Reasoning versus Understanding of Children's Theory of Mind and Extraordinary (Supernatural) Minds during Middle Childhood. *Religions* 14: 694. https://doi.org/10.3390/rel14060694

Academic Editors: Hans Zollner and Brendan Hyde

Received: 6 March 2023
Revised: 13 May 2023
Accepted: 17 May 2023
Published: 24 May 2023

1. Introduction

It is widely accepted in the scientific literature that religion is universal because it is a natural product of normal cognitive processes. According to this position, religious beliefs arise early and spontaneously, without explicit instructions, and are also easy to acquire. They can also be practiced naturally as a result of cultural input (e.g., education of children by parents) (Viertel et al. 2022; White et al. 2021). These properties prove that religion is something natural and intuitive for man. Maturationally, natural in this context means properties of human cognition that arise at an early stage of development, such as, for example, speaking in the mother tongue, which do not require material support (use of artifacts), as we engage in them spontaneously and relate to everyday matters (McCauley 2000). Religious beliefs are also intuitive due to their quick and easy formulation. They do not require deliberation or conscious reflection. In this context of the nature of religious cognition, the problem of acquiring religious concepts relating to divine attributes, e.g., omniscience, omnipotence, uniqueness, etc., is posed. Therefore, we ask whether these concepts are natural and intuitive or what cognitive resources and mechanisms we can use when formulating these concepts. For example, the concept of omniscience refers to the concept of mind, which is formulated in the early stages of a child's development and evolves into a mature form of intuitive psychology. Developmental research attempts to capture the cognitive mechanisms behind the evolution of representing omniscient agents (god, hero, superman) and limited agents (ordinary people) in the minds of children (Kiessling and Perner 2014; Bartczuk et al. 2012; Lane et al. 2010, 2012; Makris

and Pnevmatikos 2007; Gimenez-Dasi et al. 2005; Knight et al. 2004; Barrett et al. 2001; Petrovich 1997). This leads us to a detailed examination of children's theories of mind in which normal (ordinary) and supernatural minds are represented. The term omniscience in conducted development studies refers to assigning infallibility to agents. It is not tested whether children accept that supernatural minds really have unlimited knowledge of everything (Gimenez-Dasi et al. 2005; Knight et al. 2004).

Children's theory of mind (ToM) is an issue raising interest among scientists from many fields (Ilgaz and Allen 2020; Mirski and Gut 2018; Fiebich and Coltheart 2015; Apperly and Butterfill 2009; Call and Tomasello 2008). The research conducted on this subject demonstrates that preschool children explicitly and reflectively assign beliefs, desires, and intentions to other people (Wellman 2014; Wellman et al. 2001).

The standard task used to check ToM competence—the so-called false-belief task (FBT)—is devised to require from the child the ability to understand the difference between true and false beliefs. The original task consisted of a story told to the child, but later, it took on other forms, i.e., it was administered as a puppet show (Baron-Cohen et al. 1985) or as a scene acted out by human (Leslie and Frith 1988). Furthermore, various specific alterations to the test were also applied, such as the use of unexpected-contents (Gopnik and Astington 1988) or unexpected-identity (Perner et al. 1987). The results were reliably robust in all of these implementations and showed that children start passing the FBT only around age 4. Generally, all different paradigms give comparable results (Gut et al. 2020; Liu et al. 2008; Wellman et al. 2001).

Children's ability to think about extraordinary minds, distinguishing them from human minds, is a developing research area (Kiessling and Perner 2014; Bartczuk et al. 2012; Lane et al. 2010, 2012; Makris and Pnevmatikos 2007; Gimenez-Dasi et al. 2005; Barrett et al. 2001; Petrovich 1997). Extraordinary minds appear in the daily life of a small child. The religious practices of the parents and their environment, as well as their involvement in them, make children familiar with the figure of God at an early stage of development (Saide and Richert 2020; Richert et al. 2016, 2017; Heiphetz et al. 2016). Mass media provide children with information about figures with exceptional perceptual or mental capabilities, such as superheroes. The results of the research conducted so far show that the concept of extraordinary minds is formulated in middle childhood (Kiessling and Perner 2014; Bartczuk et al. 2012; Lane et al. 2010, 2012; Makris and Pnevmatikos 2007; Gimenez-Dasi et al. 2005; Barrett et al. 2001; Petrovich 1997). However, it is still unknown how a person acquires the ability to think about extraordinary minds.

The results of research conducted in the area of acquiring the ability to think about extraordinary minds have allowed for the identification of two alternative hypotheses—the anthropomorphism hypothesis (Shaman et al. 2018; Kiessling and Perner 2014; Lane et al. 2010, 2012, 2016; Makris and Pnevmatikos 2007) and the preparedness hypothesis (Barrett et al. 2001; Bartczuk et al. 2012; Gimenez-Dasi et al. 2005; Petrovich 1997). The anthropomorphism hypothesis is based on Piaget's (1969) theory on the cognitive development of children. It assumes that children attribute equal abilities to all beings, including humans, God, and other extraordinary minds, until they reach the Preoperational Stage. At the turn of the fourth and fifth years of life, they assign limited abilities to humans but extend supernatural abilities to extraordinary minds.

The preparedness hypothesis is a competitive proposition to the anthropomorphism hypothesis. Preparedness theory draws its strength from the finding that children who understand the epistemic limitations of the human mind do not attribute those same limitations to God's mind (Richert and Barrett 2005; Barrett et al. 2001; Evans 2001; Petrovich 1997). These findings have been taken to support the preparedness idea, which holds that children may easily form representations of God because the relevant underlying conceptual structures used for representing God are more default (i.e., closer to the foundational concepts) than the ones that the child needs to form to understand human minds. Consequently, the preparedness hypothesis is "that early-developing conceptual structures in children used to reason about God are not specifically for representing humans, and,

in fact, actually facilitate the acquisition and use of many features of God concepts of the Abrahamic monotheisms" (Barrett and Richert 2003, p. 300). Children show *'preparedness'* to represent extraordinary minds, and it is essential that these intuitive ideas are preserved until adulthood (Barrett and Richert 2003; Richert and Barrett 2005). The ambiguity of the results supporting the anthropomorphism hypothesis and the preparedness hypothesis provides a field for further analysis of the proposed theoretical assumptions regarding the ability to differentiate minds. It also seems interesting to study what cognitive processes underlie the ability in question.

Today's research is more subtle, and we realize that the predictions made by the preparedness and anthropomorphism hypotheses are not transparently resolved. Rather, it is sought, on the one hand, to what extent the default understanding of extraordinary minds coincides with the understanding of natural minds, and on the other hand, how environmental factors related to children's religious backgrounds influence the attribution of infallibility to God (Shaman et al. 2018; Richert et al. 2016).

In the research conducted in this area so far, attempts have been made to link children's theory of mind with selected areas of cognitive development, and the role of language and speech, in particular, was emphasized (de Villiers and de Villiers 2014; Milligan et al. 2007; Astington and Baird 2005; Hale and Tager-Flusberg 2003; Astington 2001; Astington and Jenkins 1999; Dunn and Cutting 1999; Watson et al. 1999; Jenkins and Astington 1996). Still, it is valuable to specify the link between the development of children's theory of mind and the more advanced faculty of children's conceptual reasoning. There are theoretical foundations linking middle childhood with the development of both conceptual reasoning and children's theory of mind (Schaffer and Kipp 2015; Piaget 2006; Premack and Woodruff 1978). The connection of middle childhood with formulating the concept of extraordinary minds allowed for the start of reflection on the cognitive abilities influencing the development of this skill.

Recognizing a research area for further exploration, we decided to conduct empirical research on the ability of children to differentiate minds. In this text, we wished to examine, in the research group of children from Poland, when a significant distinction appears regarding the conceptual differentiation of the ordinary mind from the extraordinary mind. Additionally, assessing whether this distance is related to a certain type of conceptual knowledge and an understanding of religious concepts was another interesting aspect for us to analyze. We also wanted to verify whether the crucial point is that children distinguish the construct of an extraordinary mind on the basis of increasing religious knowledge or whether, despite the fact that this knowledge increases, there is a distinction between ordinary and extraordinary minds based on knowledge about the ordinary mind. We, therefore, attempted to answer the question: Is general conceptual development the key to reasoning about the extraordinary mind, or is it rather the development of knowledge about the mind, the ordinary mind? As a result, we have demonstrated that general conceptual knowledge and an increase in religious knowledge do not explain to us the variance of distinguishing the extraordinary mind in relation to the ordinary mind. It is essential to possess knowledge of the ordinary mind, and it is on this basis that the knowledge of the extraordinary mind is built.

- The development of children's conceptual reasoning in the period of middle childhood

In developmental psychology, conceptual reasoning is also sometimes referred to as conceptual thinking. This ability develops in children in middle childhood, at the developmental stage referred to by Piaget as the Preoperational Stage. Conceptual reasoning is defined as a higher form of thinking based on verbal skills. The development of speech is defined as constitutive for the development of this ability. Thanks to conceptual reasoning, children are capable of processing verbal information and can perform mental operations on the material in this area. Conceptual thinking allows one to search for similarities and differences between objects, and the analyses performed lead to their segregation into classes. This skill from the domain of cognitive abilities allows for developing declarative knowledge and efficient processing of new information obtained from oral transmission

(Fecenec et al. 2015). The direction of the development of children's thinking in terms of concepts has been defined in the literature (Wygotski 1989). This process proceeds from syncretic thinking, through thinking in complexes until it reaches conceptual thinking. It specifies that children in the period of middle childhood are at the stage of thinking in complexes. The perceptual features of an object are of major importance to them, and they combine concepts into groups on this basis. However, this way of thinking undergoes transformations; the child goes through the following complexes: association complexes, collection complexes, chain complexes, and diffuse complexes until they reach the complexes of pseudo-concepts. Each of them is characterized by reference to various criteria for the grouping of concepts. In the development of conceptual reasoning, pseudo-concepts play an important role when the child performs classification on the basis of objective constants and makes reference to an example of a given concept (Kielar-Turska 2011).

- The development of children's religious concepts in the period of middle childhood

The majority of the contemporary concepts of the development of children's religiosity were created in the field of cognitive and developmental psychology, mainly based on Piaget's theory of cognitive development. Piaget (1922, 1928) defines the religiosity of preschool children as heteronomous religiosity based upon the capabilities of preoperative intelligence. In his concept of the development of religious language, Goldman (1964) defined periods within the development of religious thinking and named the preschool age as the stage of intuitive religious thinking. Elkind (1970) describes this period of a child's religiosity as a stage built on the cognitive striving to create images. In his concept of the development of faith, Fowler (1981) defines the preschool age as the stage of intuitive-projective faith. Walesa (2005) describes this period as a stage of magical religiosity. The preschool child is characterized by infantile religiosity and egocentrism but can exceed these limitations and become capable of all kinds of transcendence. At this stage, the child realizes religiosity through activities in distinguished parameters, i.e., (1) religious awareness, (2) religious feelings, (3) religious decisions, (4) bonding with a community of believers, (5) religious practices, (6) religious morality, (7) religious experiences, and (8) forms of professing faith (Walesa 1994). A child's religious awareness includes constantly expanding religious knowledge and targeted behaviors, e.g., forms of play that sensitize them to religious symbols. Religious feelings can have a complex structure, ranging from compassion to fear or suffering. Religious decisions are concerned with the near future, manifested in plans and resolutions. The bond with the community is realized by the child inside and outside the family—during liturgy and catechesis at school, through religious practices (mainly prayer), and through imitating adults. Religious morality at this stage of development involves acting as God would have it; the child begins to understand that some of their actions are sins. In the face of illness or the death of loved ones, the child has religious experiences, e.g., experiences of God's greatness, gratitude for lives saved, etc. The child professes their faith mainly through a willingness to pray and sacrifice (Walesa 1994). Researchers generally agree that this period is dominated by cognitive egocentrism, the ability to create images of religious content, and the acquisition of religious knowledge by participating in the religious life of significant people. In the approaches to the development of religiosity which are not stage-based, researchers focus on the processes of merging intuitive ontology (the intuitive understanding of the logic of perceived events), which takes up the majority of everyday thinking and acquiring of knowledge about the world, with counterintuitive ontology (knowledge contradicting empirical logic), which is used on the occasion of a child's contact with the products of culture and religion (Richert et al. 2017; Willard and Norenzayan 2013; Woolley et al. 2011; Johnson and Boyatzis 2005; Boyer and Walker 2000; Harris 2000). In the period of middle childhood, children can engage in a lively relationship with God (Walesa 1994), and it is the child's connections with the closest people in their lives that are the basis of this relationship (Rydz 2003; Kuczkowski 1998). There are factors such as the implementation of religious practices in a child's life or the willingness to participate in the religious life of the family members or other believers, which make religiousness a part of a child's human development.

2. Materials and Methods

The specifics of the study group were taken into account when adjusting appropriate research methods. The feature of this research requiring particular attention is the fact that it was conducted on a group of subjects in their middle childhood. Therefore, the start of the research was only possible following the preparation of an official document containing a request to allow the study to be carried out, addressed to the principals of the kindergartens and the children's parents. It was also necessary to select methods that would raise the interest of children and would be appropriately adapted to their level of development. For this reason, the experimental test aids were made in primary colors so that preschoolers could name them. It was also ensured that the selected methods had high psychometric values and properly measured the indicators defined in the study.

2.1. Study Subjects

The study involved 117 children (N = 117) within the age range of 3 to 7 years old. Girls constituted 56% of the group, while boys constituted 44%. The child's age was the criterion of selection for the study group. The participants came from preschools and primary schools in eastern Poland and from families with an average socioeconomic status. In order to obtain information on the degree of the children's familiarity with religious issues, parents were asked about their professed faith and the extent of its importance. When declaring their faith, 99% of parents stated they were Roman Catholic, while 1% of the respondents declared no religion of any kind. Parents also stated that their faith was important to them (67%).

2.2. Procedure

The research employed test methods and experimental methods that have a verbal character and was conducted in classrooms allocated by the management of the preschools. No other activities took place in the allocated rooms at that time; thus, there was peace and quiet. Some of the toys were removed from the rooms, and distractors were limited to the minimum so as not to disturb the child. Tables and chairs were adapted to the children's height and physical condition, and the research was carried out individually. The person conducting the study and the child stayed in the same room, with the average duration being around 20 min. The research procedure began by establishing contact with the child in order to overcome the fear of a stranger, encouraging them, and calming the emotions caused by the unusual situation. The researcher asked the child about their name, the name of their preschool group, their favorite toys, and their favorite colors. The child was then informed about the task they were supposed to execute and that their participation was voluntary; the child knew that they could quit completing their tasks at any time. The study began as soon as the child confirmed verbally their willingness to participate in the procedure. In order to measure false belief understanding with regard to ordinary and extraordinary minds, the Deceptive Box Task was used, a method employed by Lane et al. (2010). The researchers also used the Knowledge-Ignorance Task, but in their research, like in many others, connections between both methods were shown. Additionally, as even younger children deal well with the Knowledge-Ignorance Task, it is easier than the Deceptive Box Task. In order to verify whether Polish children produced results at a similar level in both of the above-mentioned tasks, we also used the Knowledge-Ignorance Task supplemented with the figure of God in the pilot research. We obtained convergent results, so we decided to only use the Deceptive Box Task in our research.

The 'Conceptual Reasoning' scale from the IDS-P (Intelligence and Development Scales for Pre-School Children) for children aged 3 to 5 and the 'Conceptual Reasoning' scale from the IDS for children aged 6 to 7 were used to measure the degree of 'Conceptual Reasoning'. In addition, in order to learn the children's level of knowledge of religious concepts, a test of understanding religious concepts was also used (Rydz 2018).

2.3. Measures

2.3.1. False Belief Understanding

In order to measure this ability, an experimental task that refers to children's theory of mind was conducted—the Deceptive Box Task. Four figures were introduced in the task: (1) A girl (a peer to whom the child attributes knowledge similar to their own), (2) Mum (an adult, a parent to whom the child attributes knowledge greater than their own), maybe also up to a certain point (up to approx. the age of 4 years, i.e., the formation of children's theory of mind) they attribute omniscience to her, (3) Superman (a fictional character with extraordinary qualities (a fairy-tale character with capabilities exceeding human ones, but with the awareness that it is a fantasy, fairy-tale character)), and (4) the figure of God (who has the attribute of omnipotence (omniscience/almightiness) in the religious transmission received by the child from their closest relatives). The study began with an introduction consisting of giving the children a presentation with pictures of the figures to which the experiment would refer. The researcher showed the figure in question and introduced it with the words: "Let's talk about X." In the case of the figure of Mum, it was added that this was not really an actual photo of the child's mother, but it should be recognized that it was. Introducing Superman, the researcher talked about his extraordinary attributes, including superpowers, rapid flight, and eyes that can see through walls. For the child to visualize Superman's abilities, an experiment was conducted by showing the child a pen in and out of their sight. Each time the child was asked if they could see the pen, summing up that Superman could see the pen in each case. When depicting God, as in the case of Mom, the information was added that it was not a real picture of God, but it should be acknowledged that it was. After becoming acquainted with the figures, the child was presented with a crayon box and a brown paper bag and was asked what was inside. Then the experimenter opened the crayon box, showing the child the pieces of cardboard inside and the paper bag which contained crayons. After this part, both aids were closed, and the investigator made sure that the child knew the true contents of the box and the bag, giving them prompts if the child needed it. After presenting the pictures and aids, the experimenter moved on to questions relating to all the figures that the child had learned about previously. Each time, they presented a pictorial figure X approaching the box and asked, "X has never been in a room with these items before. If we show X this box, closed, what will X think is inside it?"; "Why will X think the cardboard pieces/crayons are inside?" The child received 1 point for attributing false beliefs to the figures. When assigning a false belief to a figure, the child had to acknowledge that the figure did not know the actual contents of the box and thought there were crayons in the box. If the child referred to their own beliefs and state of knowledge in their reply, they did not get a point. Justifications for the children's responses were not included in the calculations. They only complemented the child's answer to the first question and served to better understand the children's reasoning.

2.3.2. Conceptual Reasoning Level

The 'Conceptual Reasoning' scale from the IDS-P (Intelligence and Development Scales for Pre-School Children) for children aged 3 to 5 and the 'Conceptual Reasoning' scale from the IDS for children aged 6 to 7 were used to measure the degree of 'Conceptual Reasoning'. The authors of the method are Alexander Grob, Giselle Reimann, Janine Gut, and Marie-Claire Frichknecht. In Poland, the adaptation of IDS-P was performed in 2015 by Diana Fecenec, Aleksandra Jaworowska, and Anna Matczak (Fecenec et al. 2015). This method examines six spheres of a preschool child's development: cognitive abilities, socio-emotional competencies, mathematics, language, and motivation. The 'Conceptual Reasoning' scale falls within the area of cognitive abilities and consists of 11 items. IDS-P is a method with high reliability. The 'Conceptual Reasoning' scale is included in the domain of the Fluid Intelligence Scale, whose reliability for individual normalization groups ranges from 0.90 to 0.96. The accuracy of the method was tested by a confirmatory factor analysis, which demonstrated the parallelism between the original version and the Polish adaptation. Additionally, IDS-P was shown to be correlated with other tests specializing in the study

of children's cognitive abilities, such as the 'Leiter International Performance Scale' or the 'TSD Vocabulary Test for Children'. The individual investigative tests demonstrate associations with teachers' and parents' assessments (Fecenec et al. 2015). The research procedure followed the rules described in detail in the instructions for using the method (Fecenec et al. 2015). Children were presented with a board with five places, three of which were occupied by pictures, and two of which were left blank. Five other pictures were arranged in the set next to them. The children's task was to generate a common concept for three pictures from the board and to match two pictures from the set arranged next to it with this concept. When displaying the board, the person conducting the research told the child: "Here are three pictures that go together." (three pictures on the board were indicated). The child was then asked: "Which two of these pictures (the pictures from the set arranged next to the board were pointed at) still match here?" (two empty places on the board were indicated).

2.3.3. The Level of Understanding of Religious Concepts

Considering the latest research directions, the present research takes into account the level of understanding of religious concepts in children. In order to measure this, a short test was used that was constructed by Elżbieta Rydz in 2018, based on Piaget's exploratory-critical interview method. The substrate for the content construction of the questions was Czesław Walesa's theory of the development of religiousness in children (Walesa 2005; Piaget 1928; Fowler 1981; Goldman 1964). A child was asked the question: "Do you know who God is?"Alternatively: "Have you heard of God? Who is this? Why do you think so?" A procedure for answer scoring was established as follows: children's responses showing that they had no knowledge of God, responses with random religious and non-religious associations, and responses with fragmentary knowledge of the general religious field without describing God scored 0 points. Responses containing an anthropomorphic representation of God and those that assigned moral attributes to the figure of God were awarded 1 point.

3. Results

3.1. Conceptual Reasoning and the Age of a Child

Conceptual reasoning was tested with age-adjusted tests. Therefore, the results obtained by the subjects were standardized. This allowed for comparison between the results of people from different age groups. Calculations showed a clear relationship between the child's age and the level of conceptual reasoning (Spearman's $Rho = 0.26$, $p < 0.004$). One-way ANOVA analysis of variance showed that there was a statistically significant difference between certain age groups ($F(4.112) = 2.86$, $p < 0.027$). Bonferroni's post hoc test demonstrated that there were statistically significant differences in conceptual reasoning only between children aged 3 and 5. The children scored higher in the IDS-P Conceptual Reasoning Test as they grew older. However, there are no significant differences between the other age groups.

3.2. Understanding of Religious Concepts and the Age of a Child

It was examined if the child's age was related to the understanding of religious concepts. The obtained results indicated that a dependence occurs, which explains 9% of the variance of the variable called understanding of religious concepts ($eta^2 = 0.09$). Bonferroni's post hoc test indicated that only the group of children aged 3 differed with statistical significance from other groups.

3.3. Conceptual Reasoning and Understanding of Religious Concepts

The existence of a correlation between the child's level of conceptual reasoning and the understanding of religious concepts was verified. The results obtained indicated that there is a correlation that explains 22% of the variance of the variable ($eta^2 = 0.22$).

3.4. The Deceptive Box Task in Relation to the Child's Age

In order to thoroughly analyze the results of the Deceptive Box Task, the answers were divided into those pertaining to the ordinary minds—Girl and Mum, and those pertaining to the extraordinary minds—Superman and God.

As regards the ordinary minds, it was verified whether a correlation occurred between the age of the child and the results obtained in the Deceptive Box Task concerning the Mum and the Girl figures. There is a correlation between the child's age and the results concerning the Girl figure, which explains 48% of the variance of the variable ($eta^2 = 0.48$). A correlation occurs between the child's age and the results concerning the Mum figure, which explains 35% of the variance of the variable ($eta^2 = 0.35$). Moreover, it was verified whether there existed any statistically significant differences between the age groups in the answers pertaining to the minds of the Mum and the Girl. Bonferroni's post hoc test indicated that in terms of the answers pertaining to the mind of the Girl, groups of children aged 3 and 7 are statistically significantly different from other groups. With regard to the answers pertaining to the Mum's mind, Bonferroni's post hoc test also indicated that the groups of children aged 3 and 7 are statistically significantly different from other groups.

With regard to the extraordinary minds, it was investigated whether there was a correlation between the age of the child and the results obtained in the Deceptive Box Task concerning the figures of Superman and God. There occurs a correlation between a child's age and the results concerning the Superman figure, which explains 10% of the variance of the variable ($eta^2 = 0.10$). There is also a correlation between a child's age and the results concerning the God figure, which explains 10% of the variance of the variable ($eta^2 = 0.10$). As with ordinary minds, it was examined whether there were significant differences between the age groups with regard to the answers pertaining to Superman and God's minds. The obtained results showed no significant differences between the age groups with regard to the answers pertaining to the minds of Superman and God.

3.5. Attributing False Beliefs to the Figures

The percentage of the attribution of false beliefs to individual figures is illustrated in a chart (Figure 1). The chart shows several trends; the youngest children (3- and 4-year-old ones) attribute a similar level of knowledge to all figures, regardless of the mind type. At the age of 5, a process of change begins, which allows one to observe significant differences in the attribution of knowledge to minds at the age of 6. The oldest age groups (6- and 7-year-olds) attribute false beliefs to ordinary minds and omniscience to extraordinary minds (scoring 0 in the Deceptive Box Task). This difference is especially apparent in the context of the mind of God and the mother.

3.6. The Deceptive Box Task versus Conceptual Reasoning

The Deceptive Box Task also measured the correlation between conceptual reasoning and the answers pertaining to ordinary and extraordinary minds. As far as ordinary minds are concerned, it turned out that there was a correlation between the level of conceptual reasoning and the answers pertaining to the Mum ($eta^2 = 0.31$) and the Girl ($eta^2 = 0.31$). Taking into consideration both ordinary minds, this correlation explains 31% of the variance of the variable. In terms of extraordinary minds, the results indicate a correlation between a child's level of conceptual reasoning and the results obtained in the test in relation to the figures of God and Superman. There exists a correlation between the level of conceptual reasoning and the answers pertaining to the figure of God, which explains 23% of the variance of the variable ($eta^2 = 0.23$). In turn, the correlation between the level of conceptual reasoning and the answers pertaining to the figure of Superman explains 29% of the variance of the variable ($eta^2 = 0.29$).

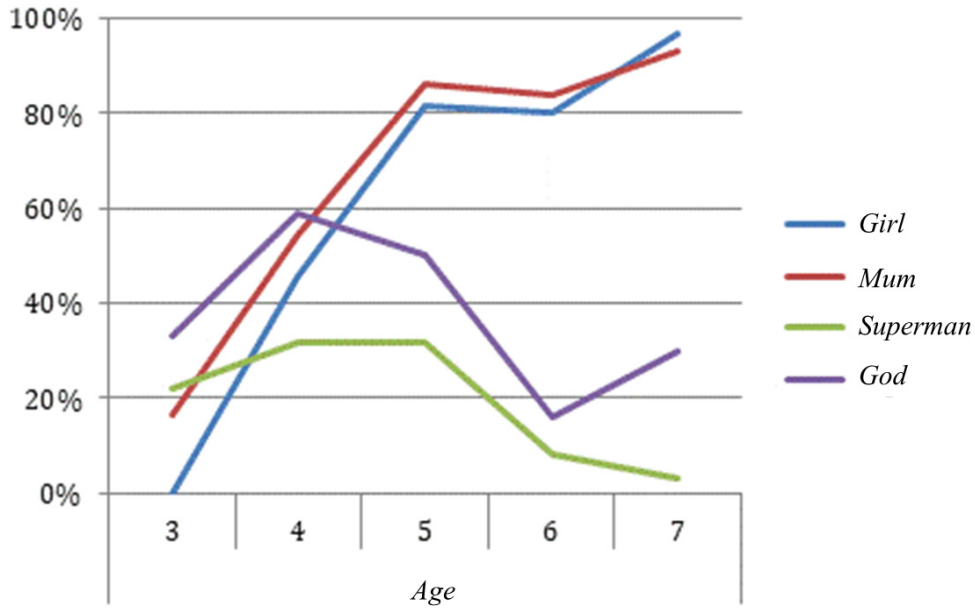

Figure 1. Percentage of children who attributed a false belief to entities, with division by age group.

The study also examined the correlation between a child's level of understanding of religious concepts and the results obtained in the test in relation to the figures of Mum, Girl, Superman, and God. There exists a correlation between the level of understanding of religious concepts and the result obtained in the test in relation to the figure of Mum ($\phi = 0.281$, $p < 0.002$). There also exists a correlation between a child's level of understanding of religious concepts and the result obtained in the test in relation to the figure of the Girl ($\phi = 0.316$, $p < 0.001$). Furthermore, the results indicated a correlation between a child's level of understanding of religious concepts and the results obtained in the test in relation to the figure of God ($\phi = -0.121$, $p < 0.189$). However, there exists no correlation between the level of understanding of religious concepts and the result achieved in the test relating to the figure of Superman.

In order to gain a more in-depth insight into the most visible differences in attributing false beliefs to the [four] figures, it was investigated whether there were significant differences in children's answers pertaining to the extraordinary mind—God—and the ordinary mind—Mum—in individual age groups. Cochran's Q test (Table 1) was used for the calculations. The results demonstrated that at the ages of 5, 6, and 7, answers pertaining to the attribution of knowledge of Mum and God differed with statistical significance.

Table 1. Results of the Cochran's Q test for the attribution of knowledge to the figures of Mum and God ($N = 117$).

Age	Frequency ($N = 117$)	Cochran's Q	df	Significance (p)
3 years	18	1.8	1	0.18
4 years	22	0.111	1	0.739
5 years	22	8	1	0.005
6 years	25	15.211	1	<0.0001
7 years	30	19	1	<0.0001

An important element of the analysis of children's answers was the verification of which variables had an impact on the results obtained by children in terms of attributing knowledge to an extraordinary mind. For this purpose, logistic regression analysis was used (Table 2). Due to the noticeable correlations between the answers regarding the attribution of knowledge to extraordinary minds—Superman and God, and the lack of significant

differences between the age groups, the God extraordinary mind was incorporated into the model as an example of an extraordinary mind. In order to simplify the model, the analysis included the answers pertaining to the attribution of knowledge to an ordinary mind—Mum. The variables that turned out to be important for the attribution of knowledge to God are a child's age and the correct attribution of knowledge to an ordinary mind—Mum. It appeared that neither conceptual nor religious knowledge significantly explains the variance in the answers pertaining to God.

Table 2. The logistic regression analysis model of the attribution of knowledge to an extraordinary mind—God.

Variables in the Model	B	Significance (*p*)	Exp(B)
Child's age	−0.446	0.013	0.64
Conceptual reasoning	−0.021	0.919	0.979
Understanding religious concepts	−0.604	0.188	0.547
Attribution of knowledge to Mum's mind	1.441	0.014	4.226
Constant	1.138	0.151	3.12

4. Discussion

The results described in this article have, on the one hand, confirmed the already-known developmental regularities, but they have also allowed for the discovery of new ones and determined further directions as well as research gaps. The contemporary literature does not mention a developmental leap in conceptual reasoning with regard to the attribution of knowledge to minds. In this work, owing to the analysis of the results, the expected period of intensive development of this ability has been identified. The development of conceptual reasoning skills has also been linked to the development of the attribution of false beliefs. Little research has been undertaken so far in the search for correlations between preschool children's level of conceptual knowledge and their understanding of supernatural minds and knowledge of God. The research we conducted allowed for the analysis of the connections between a child's age and the understanding of religious concepts, as well as the examination of the influence of this ability to reason about the concept of God's mind. By analyzing the mechanism underlying this attribution, we can say that achieving the appropriate competence in conceptual reasoning is crucial for distinguishing between human and nonhuman minds. In this aspect, seeing a strong relationship between conceptual reasoning and the development of ToM, it can be assumed that children's strategy for anthropomorphizing is somehow built on these conceptual abilities. Due to these conceptual resources of the child, the process of differentiation between the limited capacities of ordinary humans and extraordinary agents' less limited capacities can develop. However, the patterns of differentiating the two types of mind—i.e., ordinary and extraordinary—are not spontaneous and self-regulating but always shaped and facilitated by the many environmental factors (e.g., religious backgrounds and parental narratives) to which children are exposed. (Richert et al. 2017; Kiessling and Perner 2014; Lane et al. 2010, 2012; Makris and Pnevmatikos 2007).

Thanks to the research conducted here, it was possible to observe regularities concerning the child's age and the development of conceptual reasoning. The differences between the group of youngest children—the 3-year-olds, and the group of 5-year-old children may indicate that the developmental leap in conceptual reasoning skills occurs at the age of 4. When a child enters the fourth year of their life, they improve their conceptual reasoning skills, and at the age of 5, they achieve such a level that there are visible differences in relation to children aged 3. At the age of 6 and 7, this skill also develops, but the level of progress is not as spectacular. Another novelty in the field of research on the capacity of conceptual reasoning was its connection with the attribution of false beliefs. The analysis of the results discerned the relationship between the described type of reasoning and the children's responses to both types of minds; it was found that along with an increase of conceptual knowledge, the knowledge about minds also grows. This does not mean,

however, that the competence of conceptual knowledge translates into the knowledge of ordinary and extraordinary minds. Observation of simultaneous growth may suggest that these abilities develop at the same time.

The results also showed an interesting correlation between the child's age and understanding of religious concepts. The difference between children at the age of 3 and older children may manifest itself due to the child's increasingly conscious contact with religious content—children's attendance of religion classes at preschool, conversations with family members, and participation in religious practices. Perhaps up to the age of 3, children have a lower religious awareness, which begins to develop after the start of preschool activities and the overall development of the child towards a more aware person. It is also consistent with the description of the religious development of a child who proceeds to increasingly higher forms of religious reasoning and operates and understands religious concepts increasingly well (Walesa 2005; Goldman 1964). Understanding religious concepts turned out to be essential for a child's understanding of how God's mind functions.

The analysis of the results of the surveyed children confirms the previously described developmental regularities concerning children's theory of mind. In the scope of the attribution of knowledge to ordinary minds, the occurrence of statistically significant differences in extreme age groups may indicate the development of children in terms of the theory of mind and knowledge attributed to ordinary minds. Three-year-old children are at an age when the theory of mind has not yet been developed; the age of 4 is identified as its development point. In the following years of life, this skill is further developed, and children at the age of 7 are able to use it at a high level. The obtained results in the field of ordinary minds should also be related to the attribution of knowledge to extraordinary minds. Their analysis showed no significant differences between the age groups in the answers given about the mind of Superman and God. The lack of differences between age groups in terms of responses to these figures indicates a different treatment of ordinary and extraordinary minds. The knowledge of extraordinary minds is more difficult to master. Mental operations concerning extraordinary minds are more complex (Johnson and Boyatzis 2005; Boyer and Walker 2000; Harris 2000).

Thanks to the conducted research, it was also possible to observe the process of change in knowledge attribution. The chart (Figure 1) shows that at the age of 3 and 4, all minds, both ordinary and extraordinary, are treated in a very similar manner in some respects. It can be concluded that children place these minds into one category. At the age of 5, the process of change begins, and at the age of 6, we observe significant differences in the attribution of knowledge to minds. With progressing age, children differentiate between ordinary and extraordinary minds. They attribute omniscience (scoring 0 in the Deceptive Box Task) to extraordinary minds and false beliefs to ordinary minds. This difference is especially apparent in the context of the mind of God and Mother. The responses of children aged 5, 6, and 7 given with regard to the attribution of knowledge to Mother and God differ with statistical significance. This means that as early as the age of 5, the attributions of knowledge to Mother as an ordinary mind and God as an extraordinary mind are substantially separated. These minds are treated differently. So, a question arises about what can influence the development of knowledge about God, assigning omniscience to this figure. What is the mechanism of attributing knowledge to extraordinary minds? The performed logistic regression analysis demonstrates that only two variables have an impact on assigning knowledge to the figure of God. These are the age of the child and the knowledge of the ordinary mind (assigning mental abilities to Mum). The ability of children to attribute omniscience to God is significantly linked to their age and competence in the attribution of the ordinary mind. However, we did not perform a logistic regression analysis in which this attribution of limitations to the mother's mind is the dependent variable, so we have no data on whether knowledge of the mind of God is essential to a better understanding of the mind of the mother. Further studies should be extended to include such an analysis. Considering our research group (which is primarily Christian children), it can be said that our research is consistent with previous findings that in the

first developmental phase, children do not make distinctions between minds and think of all minds, both natural and supernatural, in the same way (Richert et al. 2017; Kiessling and Perner 2014; Lane et al. 2010, 2012; Makris and Pnevmatikos 2007). Perhaps the youngest children acted in accordance with reality bias, not understanding the differences between mental states and the surrounding reality (Lane et al. 2010, 2012). By learning about the limitations of some minds, they extended those limitations to all minds—both ordinary and extraordinary. It is worth emphasizing that many data show "that much like children from secular schools, religiously schooled children who are beginning to appreciate certain limitations of human minds (ignorance and false beliefs) typically also attribute those constraints to agents whom they are raised to believe "know everything"—in this case, the Judeo-Christian God" (Lane et al. 2012, p. 1018). A significant difference between the attribution of mental states appears at the age of 5. But more importantly, our research, as well as earlier research by Lane et al. (2010, 2012) clearly indicates that when children begin to understand the cognitive limitations of humans, they are also likely to believe that the same limitations apply to God. It is only after this period of shared attribution of limitations to mom and God that children begin to differentiate between humans' fallible mental abilities and the full knowledge attributed to God. When trying to understand why children treat Superman in such a specific way or why they linearly attribute omniscience to this character, one must remember that children in the study are instructed, and it is also part of common knowledge that Superman possesses specific perceptual mechanisms to access information, and that is why, as Lane et al. (2010) also says, this character is seen as a "superhero." This status is held in the minds of children, and it promotes the implicit attribution of exceptional cognitive abilities to Superman. The research has shown that conceptual knowledge is important to ordinary and extraordinary minds. We do not know the exact direction of the causal relationship between the results on the false belief test and the results of conceptual reasoning. The study does not exclude the possibility that developed social intelligence influences the ability to conceptual thinking. It may also be that conceptual knowledge helps to better understand the task. However, we know that children do not need more conceptual knowledge to understand the extraordinary mind. For such understanding, knowledge about the ordinary mind is needed, and it is on this basis that reasoning about extraordinary minds is built. It is also worth mentioning that perhaps a measure of children's religiosity, which has not been elaborated on in this study, might turn out to be of significance for the attribution of knowledge about God. Perhaps it is the case that knowledge of the ordinary mind arose through conceptual knowledge, and an appropriate level of religiosity is required to understand the extraordinary mind. In further research, it is worth measuring the level of a child's religiosity to obtain a complete picture of the mechanism of attributing knowledge to extraordinary minds. Our limitations are also related to the lack of consideration of potential cross-cultural differences. We know from research (Richert et al. 2016, 2017) that children with different religious backgrounds show different differentiation between God's mind and human minds. And what is important here is, as the research of Richert et al. (2017) also shows, that it is predicted by variation in the degree of anthropomorphism in parents' concepts of God.

Author Contributions: Conceptualization, A.G. and E.R.; methodology E.R., A.G., A.P. and Z.W..; validation A.G., E.R. and Z.W.; formal analysis A.P. and Z.W.; investigation, E.R., A.G., A.P. and Z.W.; resources, A.G., E.R., Z.W. and A.P.; data curation, E.R.; writing—original draft preparation, A.G, and A.P.; writing—review and editing, A.G., A.P. and Z.W.; supervision, E.R. and A.G.; project administration, A.G., E.R. and Z.W.; funding acquisition A.P. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by the Minister of Science and Higher Education within the program under the name "Regional Initiative of Excellence" in 2019–2022, project number: 028/RID/2018/19, the amount of funding: 11 742 500 PLN.

Institutional Review Board Statement: The study was conducted in accordance with the Declaration of Helsinki, and approved by the Research Ethics Committee of the Faculty of Philosophy of The John Paul II Catholic University of Lublin (protocol number 1/2021).

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The data and research materials are available at Institutional Repository of the John Paul II Catholic University of Lublin, in the section: Faculty of Philosophy, Reports and Scientific Reports. The database is available online, see https://repozytorium.kul.pl/handle/20.500.12153/2036, accessed on 5 March 2023.

Acknowledgments: We would like to thank Sylwia Aniśkiewicz, Małgorzata Golec, Maria Kierepka, Monika Kmieciak, Emilia Nowakowska, Agnieszka Pielaszkiewicz, and Monika Pietrzak for their assistance in conducting the research.

Conflicts of Interest: The authors declare no conflict of interest.

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