PROGRAMA DE PÓS-GRADUAÇÃO EM EDUCAÇÃO
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Crenças infantis de gravidez e desenvolvimento intrauterino e fatores associados

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Resumo

Esta investigação pretendeu conhecer o processo evolutivo e as caraterísticas específicas das crenças infantis (3 a 10 anos) acerca da gravidez e desenvolvimento intrauterino e fatores associados. É um estudo correlacional quase experimental. A nossa amostra é incidental, constituída por 566 crianças portuguesas. Neste estudo, comprovamos a existência de processos evolutivos ou de diferenciação nas crenças infantis acerca de gravidez e desenvolvimento intrauterino, associados à idade, nível socioeconômico e o nível de desenvolvimento cognitivo. Salientamos a importância das características da personalidade infantil (por exemplo, curiosidade e extroversão) na construção das crenças analisadas, fator chave e explicativo das diferenças observadas durante as entrevistas realizadas às crianças. Sublinhamos a matriz de fatores biológicos, sociais, cognitivos, motivacionais e educacionais em que se alicerça a construção destas crenças nos infantes.

Palavras-chave: Crenças infantis. Gravidez e desenvolvimento intrauterino. Processos evolutivos. Variáveis sociodemográficas.

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Children's beliefs on pregnancy and intrauterine development and related factors

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Abstract

This research aims to know the evolutionary process and specific characteristics of children's beliefs (3 to 10 years) about pregnancy and intrauterine development and related factors. It is a correlational study, almost experimental. Our sample is incidental, with 566 Portuguese children. We have proved the existence of evolutionary or differential processes in children's beliefs about pregnancy and intrauterine development, related to age, socioeconomic level and cognitive development. The importance of the child´s personality characteristics (for example, curiosity and extroversion) in the construction of the analyzed beliefs is highlighted a key and explanatory factor for the observed differences during the interviews carried out with the children. We underline the matrix of biologic, social, cognitive, motivational and educational factors on which the construction of these beliefs in children is based.

Keywords*:* Children's beliefs. Pregnancy and intrauterine development. Evolutionary processes. Sociodemographic variables.

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Creencias infantiles de embarazo y desarrollo intrauterino y factores asociados

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Resumen

Esta investigación ha pretendido conocer el proceso evolutivo y las características específicas de las creencias infantiles (de los 3 a los 10 años) acerca del embarazo y desarrollo intrauterino y factores asociados. Es un estudio correlacional cuasi experimental. Nuestra muestra es incidental, constituida por 566 niños portugueses. En este estudio comprobamos la existencia de procesos evolutivos o de diferenciación en las creencias infantiles acerca del embarazo y desarrollo intrauterino, asociados a la edad, al nivel socioeconômico y al nivel de desarrollo cognitivo. Se realza la importancia de las características de la personalidad infantil (por ejemplo, curiosidade y extroversión) en la construcción de las creencias analizadas como factor clave y explicativo de las diferencias observadas, durante las entrevistas realizadas a los niños. Subrayamos la matriz de factores biológicos, sociales, cognitivos, motivacionales y educacionales sobre los que se sustenta la construcción de estas creencias en los ninõs.

Palabras clave: Creencias infantiles. Embarazo y desarollo intrauterino. Procesos evolutivos. Variables sociodemográficas.

Introduction

Teaching in higher education for approximately twenty years and training courses for Early Childhood Educators and Elementary School Teachers, with their respective realities and pedagogical practices, have made us aware of the importance of early childhood as a formative period in personality development. The supervision of internships allows us to observe firsthand the curiosity of preschool children who, in their eagerness to understand the world around them, ask questions about what they do not yet know. Naturally inquisitive, these children ask questions about everything and comment on their surroundings. It is common in preschool for children to reenact scenes of weddings, births, and baptisms, as well as familial scenes where they imitate dialogues and behaviors they observe in their parents and other adults. We are interested in understanding the mechanism behind the acquisition and evolution of children's beliefs (ages 3 to 10) regarding pregnancy and intrauterine development, as well as the associated factors.

The domains we considered emerged from observing spontaneous situations in the daily lives of preschool children ("teacher…I'm going to have a little brother…my cousin was just born…my cat had kittens…"), as well as from observing their activities, games, and play, especially in role-play scenarios, notably in the dollhouse, where interactions often begin with phrases like "…now I'm the mom…," with the child, doll, or friend playing the role of the child, followed by dialogues that are reproduced, transferred, or invented.

Extending the age range to 10 years arose from the need to analyze the evolution of these beliefs, as Portuguese preschool children are generally between 3 and 5-6 years old, during which time significant conceptual changes occur from ages 4 to 10 (Carey, 1985).

The motivation for this research also emerged when initial bibliographic research on this subject revealed that existing studies were quite dated (Conn, 1947; Nagy, 1953; Kreitler & Kreitler, 1966; Moore & Kendall, 1971; Bernstein & Cowan, 1975; Bernstein, 1994; Cohen & Parker, 1977; Goldman & Goldman, 1982, 1988; Gordon et al., 1990; Jagstaidt, 1984; Barragan, 1988; Volbert, 1996; Brilleslijper-Kater & Baartman, 2000; Pereira 2004; Zoldosova & Prokop, 2007). Given recent changes in family education, with greater openness in parent-child education and the role of preschool, we were curious to see whether children's beliefs had remained as described in these studies or if they had evolved.

This article is structured into two parts. In the first, we present the theoretical framework of our theme, discussing the theories formulated by children in the considered domains as they seek knowledge and understanding of the world around them. We describe the objectives of our research, followed by the second part, which presents our empirical study on the selected beliefs (pregnancy

and intrauterine development) and associated factors, analyzing their relationship with sociodemographic (age, gender, family structure) and developmental aspects. Although there are few studies in this field, existing ones show a close relationship between the development of children's sexual knowledge and cognitive development, considering both processes to be interlinked (Kreitler & Kreitler, 1966; Barragan, 1988; Bernstein & Cowan, 1975; Goldman & Goldman, 1982). To facilitate result comparison, while not aiming for a comprehensive approach, we included a cognitive development variable in our study, measured using Piagetian criteria. The study addresses methodological aspects related to sample characterization, procedures, variable definition and operationalization, and the statistical analysis performed. This is followed by the presentation of results, followed by their systematization and discussion, concluding with some final observations.

Theoretical Conceptualization

Broadly speaking, studies conducted on children's knowledge concerning pregnancy and intrauterine development (Conn, 1947; Nagy, 1953; Kreitler & Kreitler, 1966; Moore & Kendall, 1971; Bernstein & Cowan, 1975; Bernstein, 1994; Cohen & Parker, 1977; Goldman & Goldman, 1982, 1988; Gordon et al., 1990; Jagstaidt, 1984; Barragan, 1988; Volbert, 1996; Brilleslijper-Kater & Baartman, 2000; Pereira, 2004; Zoldosova & Prokop, 2007) demonstrate that knowledge in these areas is interconnected, exhibiting progressive levels influenced by various factors and understood from diverse conceptual perspectives.

Conn's study (1943) found that children only began to understand the increase in their mother's abdominal size during pregnancy around the ages of 7 to 8. Later studies (Gebhard, 1977) suggested that children acquire facts about pregnancy before age 7. In Barragan's study (1988), few responses included variables in a partial or complete explanation. As age increased, children demonstrated a greater capacity to partially or fully integrate various factors. According to Goldman and Goldman (1982), while young children know that the baby is in the mother's belly, they do not understand how long it remains there. Over time, they become more accurate in estimating the length of pregnancy, with girls appearing to have a more realistic understanding than boys. In the study by Zoldosova and Prokop (2007), older children had a clear idea of the pregnancy duration (9 to 10 months). However, younger children showed significant variation in their estimates (e.g., 5 weeks; 2 or 4 months; 1 or 2 years).

In Pereira's Study (2004), according to intellectual maturation processes, vague temporal notions gradually diminish, and more precise temporal concepts about gestation duration generally prevail after formal schooling for nearly all children.

Regarding intrauterine development, Zoldosova and Prokop (2007) found that while children are capable of imagining what is inside the mother's belly, it is challenging for them to conceptualize what might be inside a baby who is, in turn, inside the mother's belly. Volbert (1996) notes that children between ages 4 and 7 have only a vague understanding of intrauterine development. For Goldman and Goldman (1982), the gestation process is difficult for young children to grasp because their thinking is concrete, and what happens within the mother's belly is internal and invisible. Concepts of growth and evolution gradually develop with age, but complete understanding often remains elusive until adolescence. Almost all children questioned by Volbert (1996) exhibited at least a vague knowledge of fetal growth, though they were unable to describe the process in detail.

Jagdstaitd's study (1984) explains the progression in children's understanding of intrauterine development in parallel with the stages of knowledge regarding the origin of life, moving through progressive stages (from pre-existence to mythological artificialism and immanent artificialism). Pereira's studies (2004) confirm that children aged 5 to 8, before formal schooling, lacked awareness of the need for embryonic or blood-related attachments in this process. Among children aged 8 to 11, following formal education, representations of the fetus and embryonic attachments showed significant conceptual evolution, with more complex notions emerging, such as the existence of the placenta and umbilical cord, either separately or in the same drawing.

Giordan and De Vecchi (1999) argue that understanding the processes of nutrition and respiration is difficult for children. Often, the umbilical cord is seen as a solution to all essential needs, as if its mere presence resolves vital issues. The research by Zoldosova and Prokop (2007) found that while some children mentioned fetal growth, they did not refer to its development.

Research Problems and Objectives

The research problems (RP) of our investigation were: (RP1) What is the process of acquisition of children's beliefs about pregnancy and intrauterine development, and what factors are associated with it? (RP2) Are there relationships between the evolutionary process and the characteristics of each stage of these beliefs, and sociodemographic and developmental variables?

Accordingly, the objectives of this research were established as follows: to understand the types of children's beliefs about pregnancy and intrauterine development; to explore the process of

acquisition of these beliefs; and to analyze the relationships between the evolutionary process, the characteristics of each stage of these beliefs, and sociodemographic and developmental variables

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Methodology

Methodological Design

According to Fortin (2003), the decision to use a qualitative or quantitative method depends on the research question, as it may suggest exploring human experience or examining and verifying relationship.

As our research focuses on understanding children's beliefs in the specified domains and aims to examine their relationship with various factors, we employed both qualitative and quantitative methodologies. The primary data collection method was interviews to gather information on the identified beliefs, followed by statistical analysis to determine the relationships and associations between these beliefs and the factors considered.

Our study is a quasi-experimental correlational study, aiming to establish relationships between various variables based on an incidental or convenience sample. Correlational studies aim to examine relationships between variables. In such studies, descriptive data on two or more variables are collected simultaneously, and specific correlations are analyzed to verify the strength of association or co-occurrence (Witter, 2005).

Quasi-experimental designs are characterized by the control of independent variables, although groups are not created based on random distribution (Sprinthall & Sprinthall, 1990). In these studies, researchers manipulate collected data to form groups based on specific variables. Some authors view this design as a more sophisticated and reliable level of correlational research; others consider it quasi-experimental, as pós *factum* manipulation allows for more sophisticated statistical analyses than correlational studies, enhancing generalizability and inferential quality (Witter, 2005). In terms of timing, this is a cross-sectional study by age, as data on participants were collected at a single point in time for comparison.

For statistical data processing, we conducted frequency and percentage analyses and Chi-square tests. To test for differences or associations between nominal and ordinal variables in our study, we used Chi-square tests, analyzing Pearson’s Chi-square results for significance. When over one-fifth of cells had an expected frequency below 5 (with a maximum allowable value of 20), we applied the Monte Carlo simulation. This simulation generates random samples when there are small class sizes, addressing issues with categories containing few or no observations. We used a 5% significance level

(a reference value commonly accepted in Social Sciences for hypothesis testing by most researchers in educational psychology), implying an inference with a probability of error below 5%, or only 5 in 100 chances that the result is due to randomness. The statistical software used for data processing was the Statistical Package for the Social Sciences (SPSS version 15.0).

Sample

Our sample is incidental, consisting of 566 Portuguese children aged 3 to 9. We selected the children based on pre-established classification criteria of age, gender, socioeconomic level, and family structure. Given the age range defined for this study, the selection was conducted in public preschools and primary schools within the district and municipality of Guarda, Portugal. The children's ages are uniformly distributed across the ages studied, from 3 to 9 years. The gender distribution is also balanced, with male children (N=284; 50.2%) and female children (N=282; 49.8%) nearly equally represented. Regarding socioeconomic level, the lower level accounts for twice the proportion (N=275; 48.6%) compared to the middle (N=145; 25.6%) and upper levels (N=146; 25.8%). This distribution reflects the challenge of finding middle- and upper-level socioeconomic families in rural areas; consequently, in these areas, only children from low socioeconomic backgrounds were interviewed. In terms of family structure, conventional families—those consisting of married parents or parents in a common-law union—are predominant (N=485; 85.7%), compared to non-conventional structures, including divorced, separated, single, or widowed parents (N=81; 14.3%).

Variables

The variables, as summarized in Table 1, are divided into two general groups: independent variables (sociodemographic and developmental) and dependent variables (children's beliefs in the analyzed domains: pregnancy and intrauterine development).

Table 1: Study Variables

	Independent	**Dependent**
Variables	Sociodemographic: age, gender, socioeconomic level, family structure	Children's beliefs about pregnancy: pregnancy symptoms and gestation period.
	Developmental: cognitive development level, understood in Piagetian terms.	Children's beliefs about intrauterine development.

Source: Own elaboration

We defined four sociodemographic variables: age, gender, socioeconomic level, and family structure. Regarding age, gender, place of residence, occupation, academic level, and family structure, we included open-ended questions in the questionnaires distributed to parents, allowing them to fill in the requested information.

The age variable is measured on a rational scale and consists of 7 categories: 3, 4, 5, 6, 7, 8, and 9 years. The gender variable is nominal and dichotomous, with two categories: male or female. The socioeconomic level variable is ordinal, with three categories: high, medium, and low. The family structure variable is categorical with two categories: traditional family (married and/or common-law) and single-parent family (single, separated, divorced, or widowed).

Although we did not intend to analyze cognitive development in depth, we felt it necessary to include a variable relating to children's classification in terms of cognitive conservation, understood in Piagetian terms. This decision was based on the fact that many of the reviewed studies (Kreitler & Kreitler, 1966; Barragan, 1988; Bernstein & Cowan, 1975; Goldman & Goldman, 1982) rely on Piagetian assumptions to study children's knowledge of affective and sexual topics, with some authors establishing a causal relationship between the two. Thus, we considered this variable as categorical, measured in three categories: non-conserving, intermediate, and conserving. To operationalize this, we administered Piaget's classic conservation tasks of continuous and discontinuous quantities (Piaget, 1967, 1978, 1981; Piaget & Inhelder, 1969; Sprinthall & Sprinthall, 1990) to all interviewed children. No counter-arguments were used; the child's first response to each task was recorded. Each task's result determined the child's cognitive conservation level as: 1. Non-conserving (a change in the shape of clay or water implies inequality); 2. Intermediate (sometimes acknowledges equality, sometimes does not); and 3. Conserving (acknowledges equality with logical arguments in all situations).

We defined children's beliefs about pregnancy (pregnancy symptoms and gestation period) and intrauterine development as dependent variables. All beliefs are categorical variables, measured in the categories indicated below. These were operationalized through a semi-structured interview, based on the works of Goldman (1982) and Barragan (1988).

To categorize the responses, we generally relied on the framework proposed by the cited authors, with specific adaptations to accommodate the particular age range of our sample and particular aspects to be explored, according to the objectives of our investigation. For all categories considered, we took into account the level of knowledge demonstrated, the degree of detail and coherence of the responses, as well as the integration of various explanatory factors. Below, we

describe the categorization applied to the dependent variables (pregnancy symptoms, gestation period, and intrauterine development) and illustrate some of the categories considered with excerpts from the children's beliefs as expressed in interviews.

a) Pregnancy Symptoms

We identified five categories based on the children's perception of pregnancy symptoms: 1. Does not know or does not respond; 2. Perception of physical symptoms; 3. Perception of social variables; 4. Coherent integration of some factors: partial explanation; 5. Correct explanation.

We included responses focused mainly on the growing belly in the category of physical symptoms perception: "When the baby starts to grow, the belly gets big" (3 years old, girl) / "She starts to get fat, and it's not because of sweets, but because of the baby" (4 years old, girl).

In the perception of social variables category, we included arguments such as going to the doctor, having ultrasounds, and doing tests: "When parents get married, the mother's belly grows, and then the mother and father go to the hospital to see if they have a baby; the doctor has a television and sees if there's a baby in the belly" (6 years old, girl) / "The mother starts vomiting and then goes to the health center to the doctor, and he checks if she's pregnant" (8 years old, girl).

We considered partial explanation when there was a correct and coherent integration of some factors: "Mothers start feeling nauseous and think they're pregnant; they go to the doctor, get tests done, then start feeling the baby and seeing the belly grow" (7 years old, boy) / "The mother sometimes feels nauseous and dizzy and notices right away that she's getting bigger, then goes to the doctor" (8 years old, girl).

b) Gestation Period

The responses were classified into four categories: 1. Does not know or does not respond; 2. Random response, when there was no approximation to the gestation period (e.g., days, years, a long time, a short time): "It was a long time, but I don't remember" (3 years old, boy) / "I was there a short time because I wanted to get out" (4 years old, girl); 3. Approximate response, when the answer was around 7 to 8 months of gestation: "Eight months" (5 years old, boy) / "Maybe around seven months…I think so…seven months…it was…it really was" (7 years old, girl); and 4.

Precise response, when the correct gestation period was mentioned: "7 months (I was premature) or 9 months" (9 years old, girl) / "9 months; I was born 15 days early and was in the incubator for 1 day" (9 years old, boy).

c) Intrauterine Development

The four categories of responses considered correspond to children's conceptions of what the baby does in the mother's belly: 1. Does not know or does not respond; 2. Lacks understanding of intrauterine development; 3. Mentions intrauterine development; 4. Explains intrauterine development.

In category level 2, we included responses where the child gave artificial explanations about what happens to the baby during pregnancy: "Babies in the mother's belly cry because they're cramped and want to get out" (6 years old, boy) / "The baby in the mother's belly punches to get out; he doesn't eat or drink, he only eats when he's outside the belly" (3 years old, boy).

In category level 3, we included responses mentioning some knowledge (at least two correct factors of intrauterine development) but with a basic explanation: "Babies feed through a tube that brings mashed-up food from what the mother eats; inside the mother's belly there's water with a sponge that protects the baby if someone tries to punch the mother's belly" (7 years old, boy).

In level 4, we considered responses with coherent articulation of factors, referencing growth or development and providing a more elaborate explanation: "He has to grow to be born; if he doesn't grow, he might die and won't be born; his body gradually forms until it's complete; the mother gives him everything he needs to develop through the cord that connects them…he breathes, eats, and grows through the mother's organs" (9 years old, girl) / "In the mother's belly, the seed turns into a baby; bones and organs form; he feeds through a tube that connects the mother to the baby; only the good food goes through it; the rest goes to the feces, and extra water goes to the mother's urine" (8 years old, girl).

Instruments

We developed a questionnaire through which we surveyed the parents of the children selected for our sample. The first part consisted of requests for sociodemographic data: age and gender of the child participating in the study. We also asked about the parents' occupations, academic levels, marital status, place of residence, and family structure details.

To assign a socioeconomic level, it was necessary to define socioeconomic groups based on the parents of the children in our sample. This criterion was applied simultaneously to both the mother and the father. By cross-referencing this data, we determined the socioeconomic level for each child's parents.

In the semi-structured interview, we used a method similar to Piaget's clinical method, carefully phrasing questions in language familiar to the participants (Piaget, 1982). The interview covered the children's beliefs regarding pregnancy and intrauterine development.

All interviews began with Piaget's classic tasks for conservation of solids and liquids (Piaget, 1967, 1978, 1981; Piaget & Inhelder, 1969; Sprinthall & Sprinthall, 1990). For the conservation of solids, we presented the child with two identical balls of clay. Once the child confirmed they were equal, we introduced three transformations: flattening the clay, forming it into a sausage shape, and dividing each ball into five smaller balls. After each transformation, we asked the child about the amount of clay in each form.

For the liquid conservation task, we used two identical glasses with the same amount of water. After the child confirmed their equality, we poured the liquid from one glass into two different-sized glasses, transferring liquid only from one of the original glasses. After each transfer, we asked the child about the amount of water in each glass. The child was asked to justify each response. Responses were recorded at three levels: does not respond; incorrect (does not recognize equality); and correct (recognizes equality).

The conservation arguments used by children in the solid and liquid quantity conservation tasks were classified into four levels: 1. Does not argue; 2. Uses visual/perceptual arguments; 3. Sometimes acknowledges equality with logical arguments and sometimes does not; 4. Uses logical arguments of identity, inversion, or compensation.

The children were classified into three levels of conservation: 1. Absent, when the change in the shape of the clay or water implied inequality; 2. Intermediate, when the child sometimes acknowledged equality using arguments of identity, inversion, or compensation, and sometimes did not; 3. Conserving, when the child acknowledged equality in each task and used at least one logical argument (identity, inversion, or compensation) in each transformation situation.

As previously mentioned, to understand the beliefs about pregnancy and intrauterine development among the interviewed children, as well as their evolutionary process, we developed a measurement instrument adapted for children of this age, based on those used by Goldman (1982) and Barraga (1988).

Pregnancy symptoms: *How does the mother know she is going to have a baby? Gestation period: How long does it take for the baby to grow/develop before being born? Intrauterine development: What does the baby do while inside the mother's belly?*

For all questions, we recorded the responses and justification arguments, assigning a specific level of differentiation and/or evolution according to the categorization already described.

Procedure

We began by formally requesting official authorization from the School Clusters in the Educational Area (Urban and Rural) of Guarda to conduct the study with children aged 3 to 9 in primary schools and preschools in the city and rural areas where we intended to carry out our research. In response, and after approval by the Pedagogical Council of each Cluster, we received the requested authorization, provided that each child participating in the study had written consent signed by their parents. We distributed 1,000 questionnaires, structured as previously described, to parents of children aged 3 to 9 attending the selected preschools and schools based on their characteristics and location. Along with the questionnaire, we included a letter explaining the objectives of our study and a request for parental consent to interview their child. Parents who agreed were asked to return the signed consent along with the completed questionnaire. A deadline was set for submission, after which we proceeded to collect the questionnaires. We received 600 completed questionnaires with parental consent to interview the children. We numbered the parents' questionnaires and assigned the same number to the child to be interviewed.

The interviews took place during school hours, in private spaces provided by each school or preschool. To examine the relationship between children's beliefs in the specified domains and the independent variables, we conducted Chi-square tests. When more than one-fifth of the cells had an expected frequency below 5, we applied the Monte Carlo simulation.

Results and Discussion

For a comprehensive overview, we present a summary table (Table 2) of the statistically significant relationships found between the dependent variables (analyzed beliefs) and the independent variables. The test values will be provided as we present the results.

Table 2: Summary of Results – Proven Significant Relationships(x).

	Age	Gender	Socioeconomic Level	Family Structure	Cognitive Development
Pregnancy Symptoms	x	x	x		x
Gestation Period	x	x	x		x
Intrauterine Development	x		x		x

Source: Own elaboration

We confirmed that the factors associated with all the analyzed beliefs are: the child's age by group, socioeconomic level, and cognitive development level. The gender of the children is significantly related only to beliefs about pregnancy (symptoms and gestation period).

General Characterization of Response Categories

To explain *pregnancy symptoms*, the most common response was "perception of physical symptoms" (53.9%), followed by "perception of social symptoms" (29.7%). Responses with "coherent integration of some factors" accounted for 6%, and "correct explanations" for 4.4%. Regarding the *gestation period*, the most frequent response was "does not know or does not respond" (51.9%), followed by "precise response" (26.3%). Less frequent were "random responses" (19.8%) and "approximate responses" (1.9%). For *intrauterine development*, the most cited response was "mentions intrauterine development" (54.8%), followed by "does not know or does not respond" (30.6%), "lacks understanding of intrauterine development" (13.4%), and "explains intrauterine development" (1.2%).

Evolutionary Processes and Differentiation of Children's Beliefs and Associated Factors

Through the analysis of frequencies and percentages of the various response categories, as well as the statistical analysis conducted, we confirmed the existence of evolutionary or differentiation pathways in the various beliefs analyzed, associated with several factors. We illustrate some results of the statistically significant relationships with tables, where the absolute values and corresponding percentages of responses can be observed, along with charts that display relative frequencies.

Age

As expected, age is a determining factor in the process of constructing and elaborating the children's beliefs under consideration. Significant differences were observed in the relationship between age groups and the evolutionary categories of beliefs. For all beliefs analyzed, we confirmed that age progression aligns with the evolution of beliefs. The absence of responses or justification arguments is primarily found in the 3-4 age group, with a significant decrease in percentage as age increases.

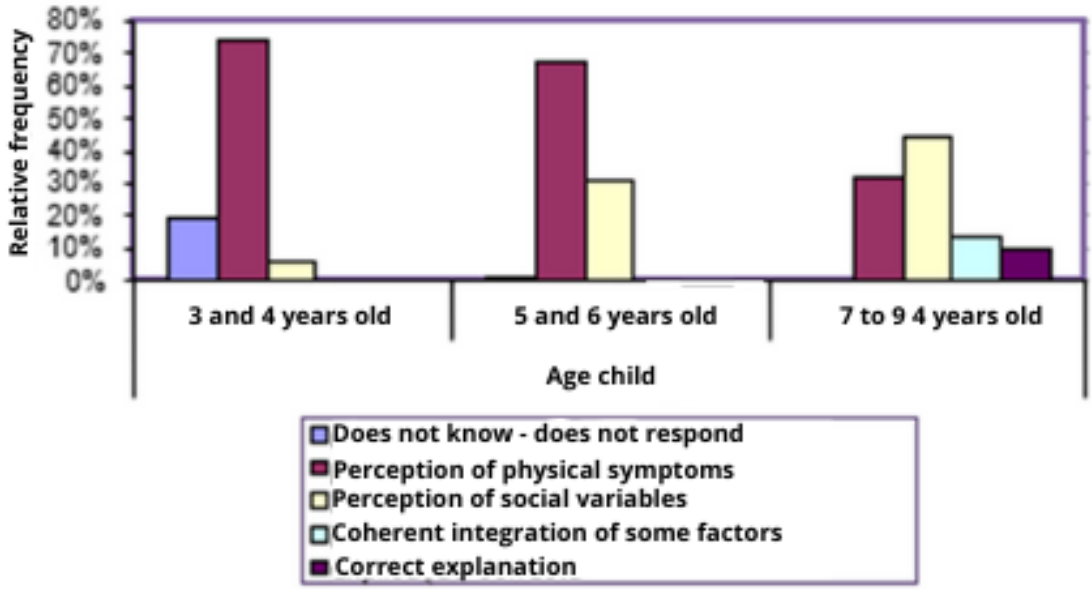
Regarding pregnancy symptoms, our study shows statistically significant differences associated with age ($\chi^2_8 = 236.320$; $p = .000$) (Table 3, Figure).

Pregnancy Symptoms: Observed and Expected Frequencies (in parentheses), by Age

	3 and 4 years old		5 and 6 years old		7 - 9 years old		Total	
Does not know - does not respond	32 (9.7)	19.9%	2 (9.7)	1.2%	0 (14.7)	. 0%	34	6.0%
Perception of physical symptoms	120 (86.8)	74.5%	108 (86.8)	67.1%	77 (131.5)	31.6%	305	53.9%
Perception of social variables	9 (47.8)	5.6%	50 (47.8)	31.1%	109 (72.4)	44.7%	168	29.7%
Coherent integration of some factors	0 (9.7)	. 0%	0 (9.7)	. 0%	34 (14.7)	13.9%	34	6.0%
Correct explanation	0 (7.1)	. 05	1 (7.1)	. 6%	24 (10.8)	9.8%	25	4.4%
Total	161	100%	161	100%	244	100%	566	100%

Own source

Table 3. Pregnancy Symptoms by Age



Own source

he category of responses related to “perception of physical symptoms” decreases with age. Initially, children’s explanations refer to what is visible: the growth of the belly. For example, “Mom knows she's pregnant because her belly gets big, and her shirt doesn’t fit anymore” (8 years old, girl) / “The belly grows, and she immediately sees that her clothes don’t fit” (9 years old, boy).

Progressively, their explanations shift to an understanding of more social and less visible variables, such as going to the doctor.

The category "perception of social variables" increases with age: "Mom feels nauseous and sometimes has a little bit of bleeding; then she goes to the doctor, takes tests, and the doctor is the one who says if she's pregnant or not" (7 years old, girl) / "First, mom feels nauseous and suspicious, then goes to the doctor; if she's pregnant, her belly starts to grow" (8 years old, girl). The categories "coherent integration of some factors" and "correct explanation" appear only between ages 7 and 9.

After passing through a phase of coherent integration of certain factors - leading to a partial explanation (need for tests, ultrasounds, dizziness, nausea, etc.) - they progress further: "When moms are pregnant, they lose their appetite and feel nauseous; then the belly starts to grow" (7 years old, boy) / "Mom starts feeling strange; nauseous… with more sleep and hunger… and she has to go for tests to see if she's pregnant" (9 years old, girl). Finally, children become capable of connecting the absence of menstruation to pregnancy as a definitive symptom. "First, she stops having her period, and her belly hurts; she feels unwell and sometimes vomits; she goes to the doctor to see what's wrong, and he says if she's pregnant" (7 years old, boy) / "Mom stops having her period and starts feeling nauseous… she suspects and goes to the doctor; he does tests and an ultrasound and says if she's pregnant" (9 years old, girl).

This progression reflects an orderly differentiation from the perception of physical symptoms to the perception of social variables, partial explanation (integration of some factors), and complete explanation.

The fact that all children know they were in their mother's belly before birth contradicts the trend of older studies. Conn (1947) noted that the first responses indicating this knowledge only appeared after ages 7 or 8. Gebhard (1977) observed that many children under 7 already have some knowledge about pregnancy. However, more recent studies confirm that most children after age 4 demonstrate some understanding of pregnancy (GOLDMAN, 1982; GORDON, SCHROEDER E ABRAMS, 1990; VOLBERT, 1996 ZOLDOSOVA E PROKOP, 2007).

Overall, we confirmed that it is challenging for young and middle-aged children to understand pregnancy as a process that occurs within the mother's body, which is inaccessible to them beyond noticing the growing belly or feeling fetal movements when placing their hand on a pregnant woman's belly in the later stages of pregnancy.

We found that, regarding pregnancy symptoms, children up to age 6 mainly perceive physical symptoms, followed by the idea of visiting a doctor. The coherent integration of various factors and a correct explanation only occur from ages 7 to 9, meaning that even in this group, very few children mention the absence of menstruation as a symptom.

This observation is also highlighted by Barragan (1988), who associates the lack of understanding of the relationship between menstruation and pregnancy with the difficulty in comprehending fertilization, which goes beyond the fusion of sperm and egg and requires bio-physiological concepts.

Regarding the gestation period, the test values confirm that the differences found are statistically significant ($\chi^2 = 175.819$; $p = .000$, by Monte Carlo simulation). The results are presented in Table 4.

Table 4. Gestation Period: Observed and Expected Frequencies (in parentheses), by Age

	3 - 4 Years Old		5 - 6 Years Old		7 - 9 Years Old		Total	
Does not know - does not respond	114 (83.6)	70.8%	96 (83.6)	59.6%	84 (126.7)	34.4%	294	51.9%
Random response	47 (31.9)	29.2%	42 (31.9)	26.1%	23 (48.3)	9.4%	112	19.8%
Approximate response	0 (3.1)	. 0%	3 (3.1)	1.9%	8 (4.7)	3.3%	11	1.9%
Precise response	0 (42.4)	. 0%	20 (42.4)	12.4%	129 (64.2)	52.9%	149	26.3%
Total	161	100%	161	100%	244	100%	566	100%

Own source

The percentage of "random responses" decreases with age, while "approximate responses" appear between ages 5 and 9, as does the "precise response," which also increases in percentage from ages 5 to 9.

This confirms the existence of an evolutionary differentiation process, beginning with random responses: "I think…I was in my mother's belly for 6 days" (5 years old, girl) / "A long time… many days" (8 years old, girl). This process gradually progresses toward a more accurate understanding of gestation time: "I think about seven months" (7 years old, girl) / "7 or 8 months" (7 years old, boy), with some children even able to mention the gestation period in weeks and add details such as when babies can be born: "9 months normally, but from 7 months, they can be born; I was born at 7 months; I was premature" (9 years old, girl) / "The time is counted in weeks; it's about 36 weeks" (8 years old, boy).

We found that, especially up to age 6, there is a lack of knowledge reflected in the absence of responses and random responses. Approximate and precise knowledge of the gestation period only emerges progressively in the 5-6 and 7-9 age groups. We believe this is related to the difficulty

younger children, especially those aged 3-4, have with conceptualizing time, which at this age primarily represents the present.

Similar results were observed in studies by Goldman (1982), Pereira (2004), and Zoldosova & Prokop (2007). Goldman (1982) noted a pattern of evolution in responses about pregnancy duration, with age incrementally leading to realistic answers. The author explains the unrealistic responses of younger children as being due to their developmental stage, where the concept of time is not yet fully formed.

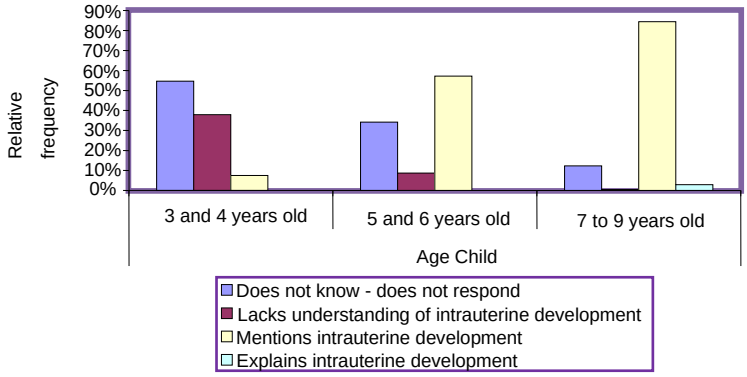
In terms of intrauterine development, we also found statistically significant differences associated with age ($\chi^2 = 227.520$; $p = .000$, by Monte Carlo simulation) (Table 5; Figure 2). The percentage of "does not know or does not respond" decreases with age; the category "lacks understanding of intrauterine development" is higher among 3- to 4-year-olds and decreases with age; the category "mentions intrauterine development" appears between ages 3 and 9 and increases with age; and "explains intrauterine development" only occurs in the 7 to 9 age group.

Table 5. Intrauterine Development: Observed and Expected Frequencies (in parentheses), by Age.

	3 - 4 Years Old		5 - 6 Years Old		7 - 9 Years Old		Total	
Does not know - does not respond	88 (49.2)	54.7%	55 (49.2)	34.2%	30 (74.6)	12.3%	173	30.6%
Lacks understanding of intrauterine development	61 (21.6)	37.9%	14 (21.6)	8.7%	1 (32.8)	.4%	76	13.4%
Mentions intrauterine development	12 (88.2)	7.5%	92 (88.2)	57.1%	206 (133.6)	84.4%	310	54.8%
Explains intrauterine development	0 (2.0)	.0%	0 (2.0)	.0%	7 (3.0)	2.9%	7	1.2%
Total	161	100%	161	100%	244	100%	566	100%

Own source

Figura 2. Intrauterine Development, by Age



Source: Own elaboration

The first explanations children give about what the baby does in the mother's belly typically reflect a lack of understanding of intrauterine development, often with highly imaginative descriptions (the mother's belly contains everything from baby bottles to toilets, and even toys at times!). Similar explanations arise when describing what the baby does inside the belly ("cries because it wants to come out; cries because it wants to see the mother; cries because it's dark"). Examples include: "It drinks water that the mother gives it with a bottle; eats porridge and plays with the mother" (3 years old, girl) / "The baby eats when it's hungry and drinks because there are small plates and cups inside, and it also swims because there's a pool there" (4 years old, boy).

Gradually, children start mentioning basic knowledge of intrauterine development, referring to feeding through the "tube" that "connects" the baby to the mother: "Mothers eat, and the children eat the same; the food goes through the mother's belly button via a type of tube to the baby's belly button; what isn't good, the mother expels as waste, and what is good goes into the blood to nourish the whole body and then to the baby who is inside a bag" (9 years old, boy) / "The baby feeds, develops, and forms organs; the mother eats healthy food to nourish it through a cord; there's also water in the mother's belly and a sponge-like thing to protect the baby if the mother falls" (9 years old, girl).

Following this, children's explanations become increasingly elaborate, incorporating knowledge about what passes through the "tube" (mentioning good things for the baby and bad things going to the mother's waste). They also refer to the importance of vitamins in the mother's diet, the need for rest and sleep, the aquatic environment (like the water in which the baby swims inside the belly), and the placenta, which they describe as a sponge that protects the baby from injury.

Responses categorized as "explains intrauterine development" (providing an explanation with coherent factors and reasonable knowledge) are rare and appear only among children aged 7 to 9: "The baby in the mother's belly is in a sac that has water, oxygen, and food; it stays there for 9 months because it has to form organs, bones…everything until it can be born; it's connected to the mother by the umbilical cord, through which it receives good nutrients and vitamins" (9 years old, girl) / "When the baby is forming, it's in a sac with water that bursts when it's born; the baby needs 9 months to form; it develops through the umbilical cord, which connects it to the mother and gives it what it needs to grow and protect itself" (9 years old, girl).

Thus, the observed differences point to an evolutionary progression from levels of complete unawareness to gradual knowledge levels, starting with a simple mention of one or two developmental factors and progressing to more elaborate explanations, though these remain incomplete.

Regarding beliefs about intrauterine development, while we confirmed a high percentage of non-responses and lack of knowledge on this topic, particularly within the 3-4 age group, most children in the sample demonstrated increasing knowledge about it across all age groups. The percentage of responses and the level of detail varied by age group, with coherent explanations involving multiple factors appearing, though in small numbers, only in the 7-9 age group.

These findings generally align with those of other studies (Goldman, 1982; Pereira, 2004; Zoldosova & Prokop, 2007; Volbert, 1996). In terms of the challenges children face with this topic, we emphasize, as the cited authors do, the invisible nature of pregnancy, which poses a difficulty for children's concrete thinking, even when the process is explained to them in detail.

In this context, Goldman (1982) demonstrated in his study that age progression is associated with the development of children's thought processes, moving from artificial explanations to transitional responses and then to concrete responses with physical explanations. Pereira (2005) highlighted conceptual changes on this topic between ages 8 and 11. The study by Zoldosova and Prokop (2007) on prenatal development is extensive, with the authors detailing children's challenges in conceptualizing functional systems and internal organs. Children often tend to perceive these without a holistic understanding, and they struggle to associate the growth and development of the fetus.

Socioeconomic Level

The children's beliefs analyzed are related to socioeconomic level across all domains considered, with more advanced beliefs corresponding to higher socioeconomic levels. For all beliefs

analyzed, the absence of responses or reasoning is predominantly found in the low or medium socioeconomic levels, decreasing significantly as socioeconomic status increases.

Regarding pregnancy symptoms ($\chi^2_8 = 39.822$; $p = .000$), the percentage of responses in the "perception of physical symptoms" category decreases with higher socioeconomic status; the "perception of social variables" category shows a higher percentage for the medium and high levels, and the categories "coherent integration of some variables" and "correct explanation" increase with socioeconomic level.

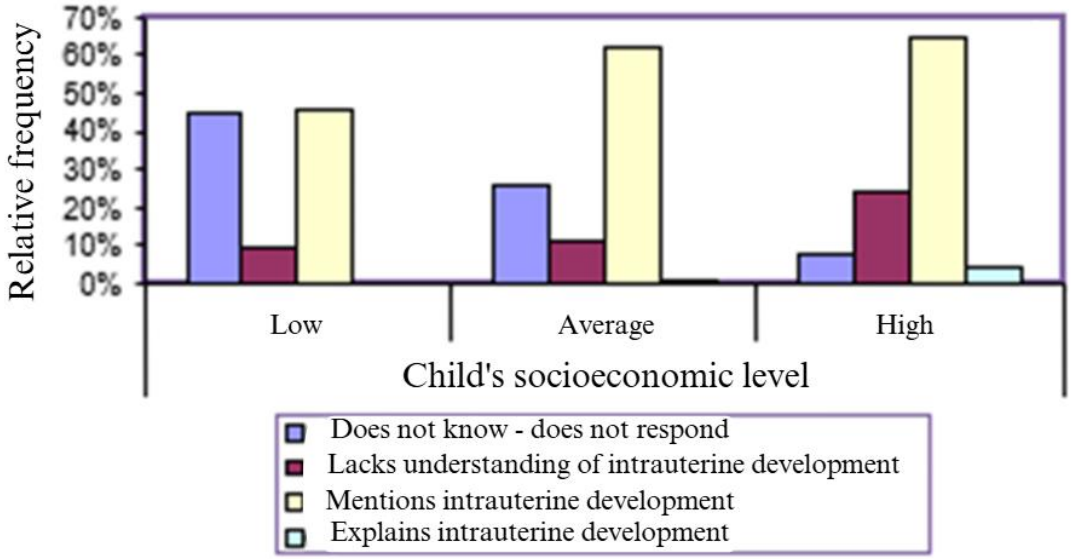
For gestation period ($\chi^2_6 = 34.935$; $p = .000$), the percentage of "precise response" increases with socioeconomic status. Regarding intrauterine development, the test value ($\chi^2_6 = 83.175$; $p = .000$, by Monte Carlo simulation) confirms a statistically significant relationship with socioeconomic level (Table 6, Figure 3).

Table 6. Intrauterine Development: Observed and Expected Frequencies (in parentheses), by Socioeconomic Level

	Low		Average		High		Total	
Does not know - does not respond	124 (84.1)	45.1%	38 (44.3)	26.2%	11 (44.6)	7.5%	173	30.6%
Lacks understanding of intrauterine development	25 (36.9)	9.1%	16 (19.5)	11.0%	35 (19.6)	24.0%	76	13.4%
Mentions intrauterine development	126 (150.6)	45.8%	90 (79.4)	62.1%	94 (80.0)	64.4%	310	54,8%
Explains intrauterine development	0 (3.4)	. 0%	1 (1.8)	. 7%	6 (1.8)	4.1%	7	1.2%
Total	275	100%	145	100%	146	100%	566	100%

Own source

Figure 3: Intrauterine Development by Socioeconomic Level



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The percentage of responses in the "does not know - does not respond" category decreases with higher socioeconomic status; the percentage of responses in the "lacks understanding of intrauterine development" category also decreases, while the percentage of responses in the "mentions intrauterine development" category increases with socioeconomic status. Notably, the "explains intrauterine development" category appears only at the high socioeconomic level.

Thus, across all beliefs, we confirmed an association with socioeconomic level, observing that higher socioeconomic status correlates with more elaborate child beliefs in the domains considered. These results align with those of Gordon, Schroeder, and Abrams (1990), who demonstrated that children from lower socioeconomic backgrounds tend to have lower knowledge levels, possibly influenced by their mothers' more restrictive attitudes toward sexuality, resulting in less sexual education compared to children from middle- and upper-class families.

Our findings diverge from those of Barragan (1988), whose study did not find a significant relationship between socioeconomic level and children's sexual knowledge. We believe this may be due to cultural or procedural differences, possibly stemming from variations in the instruments used to assess and categorize the socioeconomic level of children participating in the study. When we mention possible cultural differences throughout the discussion, we refer to the idea that children's sexual knowledge varies across cultures (Goldman, 1982), meaning that many existing studies may only be applicable in cultural contexts similar to those in which they were conducted.

Family Structure

The children's beliefs considered are not related to family structure.

Cognitive Development Level in Piagetian Terms

In general, children who demonstrate conservation skills with continuous and discontinuous quantities in terms of cognitive development have more advanced beliefs than non-conserving children. Non-conserving children show a higher absence of responses.

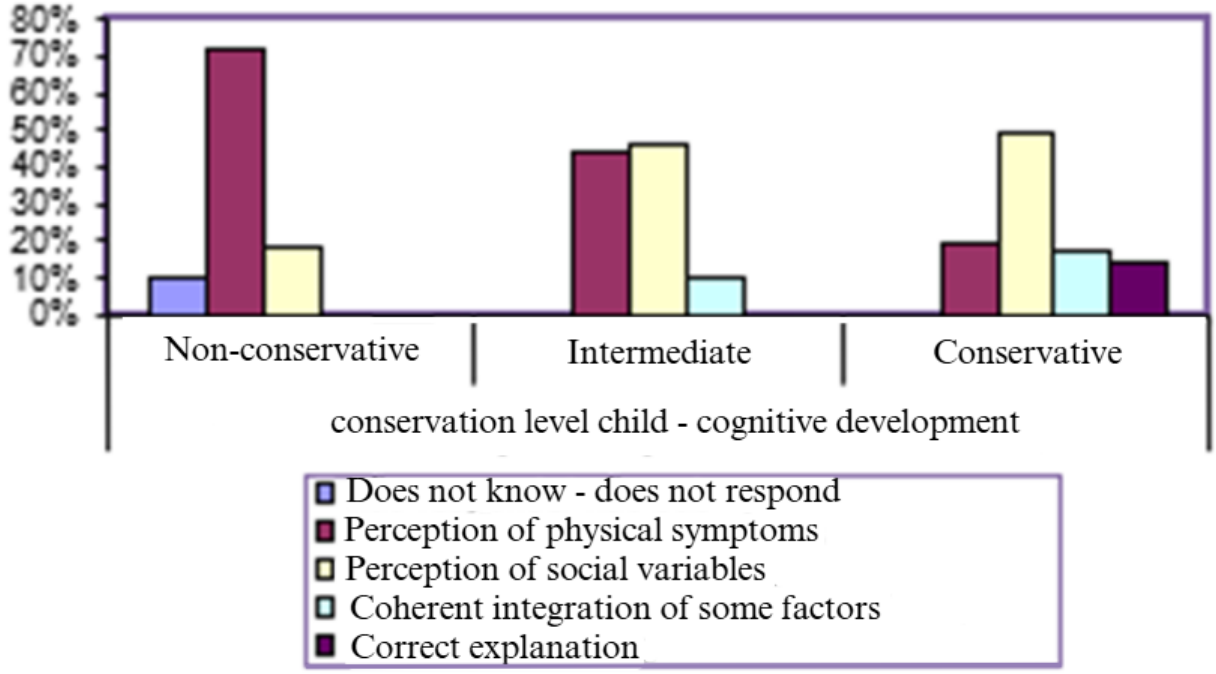
Regarding knowledge of *pregnancy symptoms*, the test value (χ^2_{8}= 231.502; p = .000) (Table 7, Figure 4) indicates statistically significant differences, confirming that the percentage of "perception of physical symptoms" responses is higher for non-conserving children (71.9%); while the percentage of responses in "perception of social variables" (49.1%), "integration" (17.2%), and "correct explanation" (14.2%) is higher for conserving children.

Table 7. Pregnancy Symptoms: Observed and Expected Frequencies (in parentheses), by Cognitive Development Level

	Non-conservative		Intermediate		Conservative		Total	
Does not know - does not respond	34 (21.0)	9.7%	0 (2.9)	. 0%	0 (10.2)	. 0%	34	6.0%
Perception of physical symptoms	251 (188.1)	71.9%	21 (25.9)	43.8%	33 (91.1)	19.5%	305	53.9%
Perception of social variables ;	63 (103.6)	18.1%	22 (14.2)	45.8%	83 (50.2)	49.1%	168	29.7%
Coherent integration of some factors	0 (21.0)	. 0%	5 (2.9)	10.4%	29 (10.2)	17.2%	34	6.0%
Correct explanation ;	1 (15.4)	. 3%	0 (2.1)	. 0%	24 (7.5)	14.2%	25	4.4%
Total	349	100%	48	100%	169	100%	566	100%

Own source

Figure 4. Pregnancy Symptoms, by Cognitive Development Level



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The test value for *gestation period* (χ^2_6=212.793; p =.000), confirms statistically significant differences with this variable. The percentage of random responses is higher among non-conserving and intermediate children, while approximate responses appear only among intermediate and conserving children, with the percentage of precise responses being highest among conserving children. Random responses regarding the gestation period are predominant among non-conserving and intermediate children, while approximate responses occur mainly among intermediate and conserving children, with precise responses being most frequent among conserving children.

For *intrauterine development*, the obtained test value (χ^2_6=164.253; p=.000) shows statistically significant differences in the relationship between variables. The percentage of lack of knowledge about *intrauterine development* is higher among non-conserving children, the percentage of responses mentioning intrauterine development is higher among intermediate and conserving children, and only conserving children provide explanations for intrauterine development.

We confirmed that beliefs regarding pregnancy and intrauterine development are highly associated with cognitive development levels, understood in Piagetian terms, and are crucial in determining their evolutionary and/or differentiation processes.

In terms of intrauterine development knowledge, non-conserving children predominantly show a lack of response, followed by a general lack of knowledge. Responses mentioning intrauterine development are common among intermediate and conserving children, with only conserving children providing detailed explanations.

Thus, children's beliefs about pregnancy and intrauterine development in the preoperational stage (non-conserving) reflect an absence of the notion of reversibility and conservation of quantity invariance. This stage implies that children do not yet understand the complementary roles of the father and mother in conception and face significant challenges in comprehending pregnancy, intrauterine development, or birth, as their thinking remains concrete, and these phenomena require some level of abstraction. Their theories also exhibit a strong egocentric perspective, preventing them from considering other viewpoints or interpretations.

It is within these cognitive limitations that children construct their theories. Theories developed by conserving children are more advanced, as acquiring the notion of reversibility and conservation of quantity invariance enables them to understand the complementarity of both parents in conception as well as fetal transformation and nutrition. This stage, where social development (inseparable from cognitive development) is facilitated by interindividual and individual coordination, supports the acquisition of objectivity (Jagstaidt, 1984).

Considering the significant relationship between cognitive development level and the acquisition of sexual constancy (as shown in previous studies), we can establish associative relationships between the implications of this acquisition and beliefs about pregnancy and intrauterine development. We previously noted that non-conserving children mostly lack verbalized sexual identity conservation, with its acquisition becoming more prevalent in intermediate cognitive groups and fully present in conserving cognitive groups. Additionally, we observed that the ability for sexual constancy with true resistance to contradictions increases substantially from non-conserving to intermediate cognitive groups, continuing to increase, though less markedly, in conserving groups).

In this context, the variation in response categories characteristic or dominant concerning pregnancy and intrauterine development in the intermediate and conserving cognitive groups is linked to the acquisition and mastery of sexual constancy. Relevant categories include: coherent integration of certain variables or correct explanation to describe pregnancy symptoms; a decrease in random responses, paired with an increase in approximate and precise responses regarding gestation time; and the mention and explanation of intrauterine development. These categories imply the acquisition

of sexual constancy, which, in turn, is related to cognitive conservation as understood in Piagetian terms.

This relationship is present in Bernstein and Cowan's (1975) theory on the importance of cognitive concepts and the developmental sequence within a matrix of cognitive structure variables. The authors suggest that it is only when children begin to understand that events and phenomena have causes that they can start investigating what those causes are. Only when a child recognizes that both they and others maintain identity despite changes due to growth can they begin to think about their origins and the origins of their siblings. As children learn to conserve identity, they also develop the concept of causality. It is only when they realize their identity is permanent and that phenomena have causes that they can begin to explore or try to understand those causes. Later, they come to see the world as a place organized by people and for people. Children explain the origin of the world and its elements using psychological and moral language (e.g., "night falls because we need to sleep"). The different levels of children's thinking about the analyzed beliefs illustrate how their concept of causality evolves from a rudimentary beginning to a more harmonious understanding (Bernstein, 1994).

Thus, we confirm studies showing that the level of cognitive development is directly associated with children's sexual knowledge (BARRAGAN, 1988; BERNSTEIN E COWAN, 1975; BRILLESLIJPER-KATER E BAARTMAN, 2000; GOLDMAN E GOLDMAN, 1982; KREITLER E KREITLER, 1966; MOORE E KENDALL, 1971; ZOLDOSOVA E PROKOP, 2007).

Gender

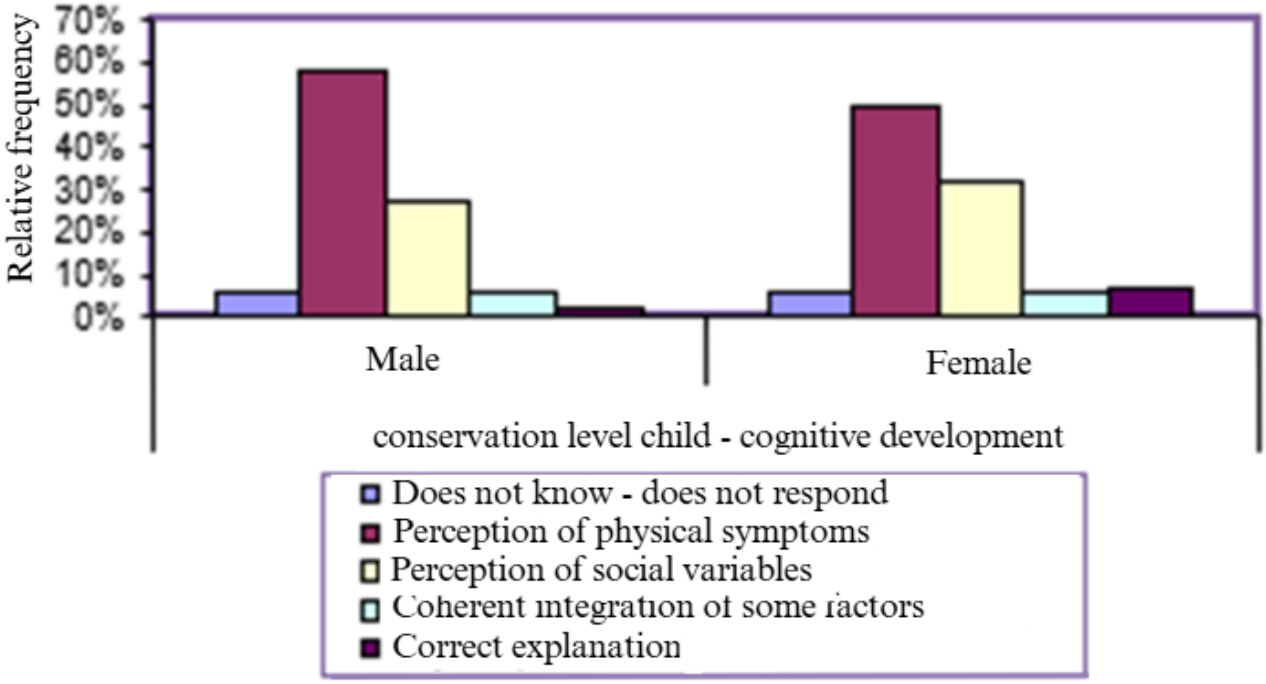
Only the beliefs related to pregnancy symptoms (χ^2_4=10.428; p=.034) (table 8, figure 5) and gestation period (χ^2_3=13.024; p =. 005), are significantly related to the gender of the children, with girls' beliefs being more advanced than boys'. Regarding pregnancy symptoms, the percentage of responses in the "physical symptoms" category is higher among boys, while the percentage of responses in the "correct explanation" category is higher among girl.

Table 8. Pregnancy Symptoms: Observed and Expected Frequencies (in parentheses), by gender

	Male		Female		Total	
Does not know - does not respond	18 (17.1)	6.3%	16 (16.9)	5.7%	34	6.0%
Perception of physical symptoms	166 (153.0)	58.5%	139 (152.0)	49.3%	305	53.9%
Perception of social variables	77 (84.3)	27.1%	91 (83.7)	32.3%	168	29.7%
Coherent integration of some factors	17 (17.1)	6.0%	17 (16.9)	6.0%	34	6.0%
Correct explanation	6 (12.5)	2.1%	19 (12.5)	6.7%	25	4.4%
Total	284	100%	282	100%	566	100%

Own source

Figure 5. Pregnancy Symptoms, by Gender



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Regarding beliefs about gestation period, the percentage of "does not know or does not respond" answers is higher for boys, while the percentage of "precise responses" is higher for girls.

This confirms that, in gender-related beliefs, the absence of responses is more common among boys, while girls tend to be at more advanced levels. We observed a similar trend in Barragan's (1988) study on children's sexual theories.

We also confirmed that girls are more informed about pregnancy symptoms and have a better understanding of gestation period than boys. In Goldman's (1982) study, girls provided realistic answers earlier than boys, which the author attributes to their greater motivation to learn in this area due both to biological self-interest and to their closeness and identification with their mothers, especially among younger girls.

In this way, we somewhat corroborate previous studies on children's knowledge processes regarding pregnancy and intrauterine development, showing that young and middle-aged children (3 to 6 years) have incomplete and imprecise knowledge, with knowledge levels in these areas increasing among children aged 7 to (BARRAGAN, 1988; BERNSTEIN E COWAN, 1975; BRILLESLIJPER-KATER E BAARTMAN, 2000; COHEN E PARKER, 1977; GOLDMAN E GOLDMAN, 1982; GORDON, SCHROEDER E ABRAMS, 1990; JAGSTAIDT 1984; KREITLER E KREITLER, 1966; MOORE E KENDALL, 1971; PEREIRA, 2004; VOLBERT, 1996; ZOLDOSOVA E PROKOP, 2007).

Our study aligns with Carey's theory (1985), as we confirmed that children in the 3-4 and 5-6 age groups, while possessing vague knowledge of the topics, explain pregnancy and intrauterine development not from a biological perspective but rather in terms of desires, beliefs, and social conventions (being married, going to the hospital, liking each other, etc.). These explanations are characteristic of what Carey describes as "intuitive" or "naive psychology," a period during which understanding of various aspects of a phenomenon is reduced to a small number of essential explanatory principles. Only around ages 9-10 does intuitive behavioral theory give way to biological understanding. From Volbert's perspective (1996), studies on reproductive processes involving older children support this theory as well.

After this discussion, we conclude that substantial changes have occurred in children's beliefs, not so much in the construction process but in the specific characteristics of beliefs within each described stage. In our opinion, these changes are partly due to some parents' attitudes, who display greater knowledge and more positive attitudes, expressing higher levels of comfort with topics related to childhood sexuality.

We share Lamers-Winkelman's (1995) view that transforming aspects observed in one's own experiences requires cognitive operations beyond the capacities of young children.

We consider that children actively construct their beliefs, which, in the domains analyzed, depend generally on their developmental age and specifically on the quality of information available to them about this process, as well as on personality trait.

Conclusion

Firstly, we confirmed the existence of evolutionary or differentiation processes in the analyzed children's beliefs, associated with the factors of age, socioeconomic level, and cognitive development level.

Secondly, we verified that, in addition to age, socioeconomic level and cognitive development level (understood in Piagetian terms) are significantly associated with specific characteristics relating to the degree of elaboration in children's beliefs. Thus, children with a high socioeconomic level and advanced cognitive development have more elaborated beliefs compared to other children.

Thirdly, we observed that there are significantly similar evolutionary patterns in the beliefs of children of both genders, although there is a tendency for girls' beliefs to be more advanced than those of boys.

Lastly, we would like to highlight the importance of children's personality traits (such as curiosity and extroversion) in the construction (understood as the grasping and elaboration) of affective and sexual knowledge, which is a key explanatory factor for differences observed among children in the same age group. Finally, we emphasize the matrix of biological, social, cognitive, motivational, and educational factors that underpins the construction of their affective and sexual knowledge.

Study Limitations

This study was conducted with an incidental sample, so its findings cannot be generalized. We attempted to conduct it on a broader geographic level, extending it to other districts, but encountered regional difficulties, which would likely be insurmountable on a national level. Bureaucratic processes are time-consuming, and travel requirements would be incompatible with teaching duties. However, we believe it would be enriching to continue the study, particularly by expanding the sample to include a wider range of location.

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