THEORETICAL PERSPECTIVE OF EARLY STIMULATION PROJECTS: AN APPROACH BASED ON THE META-ANALYTICAL POINT

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Abstract. This research work develops the main theories about early stimulation, as well as the analysis that leads to the structuring of four constructs in order to be able to design project models related to such stimulation. The methodology developed was based on a qualitative and quantitative (mixed) approach, through the bibliographic modality, in which the information search strategies were evaluated, the inclusion and exclusion criteria of the respective information to each construct, the quality of the same and the quantitative analysis of the thirty (30) studies examined. In this way, it was possible to establish the use of articles from a reliable database, sources with an age not older than five years and in Spanish and English. It was possible to conclude the foundation of the constructs related to the study criteria for the model of early stimulation projects, by means of the systematic method of information management called Metanalysis. The defined constructs showed a great binding relationship to the early stimulation projects, since they identified the strategic functions and the guidelines that contribute to the quality of the information. Finally, the Homogeneity and Heterogeneity analysis was carried out through a frequency table, Homogeneity being the fundamental element in the research and the theoretical analysis, since it allows specifying the validity of the information obtained throughout the course of the research.

Keywords: early stimulation, constructs, Metaanalysis, theoretical model

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PERSPECTIVA TEÓRICA DE LOS PROYECTOS DE ESTIMULACIÓN TEMPRANA: UN ACERCAMIENTO A PARTIR DEL PUNTO METAANALÍTICO

Resumen. Este trabajo de investigación desarrolla las principales teorías sobre estimulación temprana, así como también, el análisis que conlleva a la estructuración de cuatro constructos con la finalidad de poder diseñar modelos de proyectos referidos a dicha estimulación. La metodología desarrollada se basó en un enfoque cualitativo y cuantitativo (mixto), a través de la modalidad bibliográfica, en la que se valoraron las estrategias de búsqueda de información, los criterios de inclusión y exclusión de la información respectiva a cada constructo, la calidad de la misma y el análisis cuantitativo de los treinta (30) estudios examinados. De esta manera, se pudo establecer el uso de los artículos de una base de datos confiable, fuentes con una antigüedad no mayor a cinco años y en idioma español e inglés. Se logró concluir la fundamentación de los constructos relacionados a los criterios de estudio para el modelo de proyectos de estimulación temprana, por medio del método sistemático de gestión de información denominado Metaanálisis. Los constructos definidos mostraron una gran relación vinculante a los proyectos de estimulación temprana, ya que identificaron las funciones estratégicas y los elementos directrices que contribuyen a la calidad de la información. Finalmente, se realizó el análisis de Homogeneidad y Heterogeneidad a través de una tabla de frecuencias, siendo la Homogeneidad el elemento fundamental en la investigación y el análisis teórico, ya que permite especificar la validez de la información obtenida en el transcurso de la investigación.

Palabras clave: estimulación temprana, constructos, Metaanálisis, modelo teórico.

Introduction

The issue of child language acquisition is a subject that has been of great interest to specialists in different branches, understanding it from understandably different perspectives (Salguero, Álvarez, Verane and Santelices, 2012). The first serious considerations on the subject of language acquisition are due to Aristotle who, in addition to distinguishing three moments in language acquisition, asserts that the child's linguistic apparatus and his ability to understand language develop independently (Campos, 2010). However, we cannot speak of a true beginning of studies on children's language until the 18th century, where the spirit of observation lays the foundations for research based on facts, even if they are occasional (Cué, Díaz Alonso, Díaz Martínez and Valdés, 2008)

Different authors have pointed out the great importance that these studies on children's language could have for the development of linguistics. In them, we find the need to insist on the idea that the study of children's language is indispensable in the field of general linguistics; and above all in the new principles of phonology in the research of children's language. (Talento and Perdomo-González, 2011)

Thus, at the end of the 18th century, the Diarist approach began with the observation of isolated cases made by the parents themselves. They took notes from the time the child began to say their first words until they were four or five years old. One of the most outstanding contributions was made by Stern in 1907, when he published a series of detailed observations he had made about his children's progress (Down, Darezzo, Nunes and Dupas, 2011).

On the other hand, in terms of evolutionary processes, physical development is found in the first years of life, was well as the basis on which psychological development is instituted, although this is quite independent of physical characteristics.

Thus, motor development occupies an intermediate place between physical and psychological development, depending not only on the development of related muscles and nerves but also on sensory capacities of perception (Martínez-Cruz, García Alonso. Poblano and Madlen, 2010).

Conceptualization of Early Stimulation

Different terms have been used to select the actions that have been addressed to avoid the difficulties of children with clear impairments or simply of groups included as vulnerable. Such is the case with the term early stimulation, as this term seems to evoke a desire to accelerate the normal process for the individual's development. In this way, the aim is to push the physical and intellectual possibilities of the child to the limit, through regulated and continuous stimulation, carried out in all sensory areas, but without forcing the logical process of maturation of the central nervous system in any sense (Cuevas, 2012).

Early stimulation plays a very important role in the first years of life, because at this stage, essential abilities are developed and matured, such as: the area of language, sensory, physical and psychological.

Bolaños (2006) establishes that early stimulation leads to significant learning, trying to awaken, in parents and teachers, the sensitivity of discovering their child's interest and motivation. Likewise, it is based on cerebral flexibility, sensory union and the educational process as presented through games and activities so that children can enjoy the teaching and learning process in a fun way.

On the other hand, Téllez (2003) states that in psychomotor stimulation the child acquires normal muscle tone, correct posture, position and movements, good body balance, stability of behavior and attention, control elements to keep silent, listen, learn and collaborate. Likewise, the learning process is promoted in the organization of space, sharpness of visual and auditory knowledge, visual memory, and related motor coordination, adaptations to time, behavior in their environment and progressive reasoning, since early stimulation seeks to favor and promote the integral environment of the child, guide the maturation process of the child's 4 areas, strengthen the bond between mother and child, attach the father to the family nucleus, and facilitate the child's placement and their family nucleus to the social environment.

On the other hand, Quezada (2013) points out that early stimulation is an important technique in the psychomotor area of children. It expresses that one of the main problems is that many teachers do not know how to face and submit activities due to lack of training and knowledge of the area, so that early stimulation is indispensable in the process of teaching children's learning and a great help since it acts in adequate quantity and quality for each child's moment of maturation.

Based on the above and prior to the metanalysis, a theoretical model was obtained (Figure 1), where constructs were analyzed that facilitated the literature's review, in addition to reviewing the model, according to previous research.
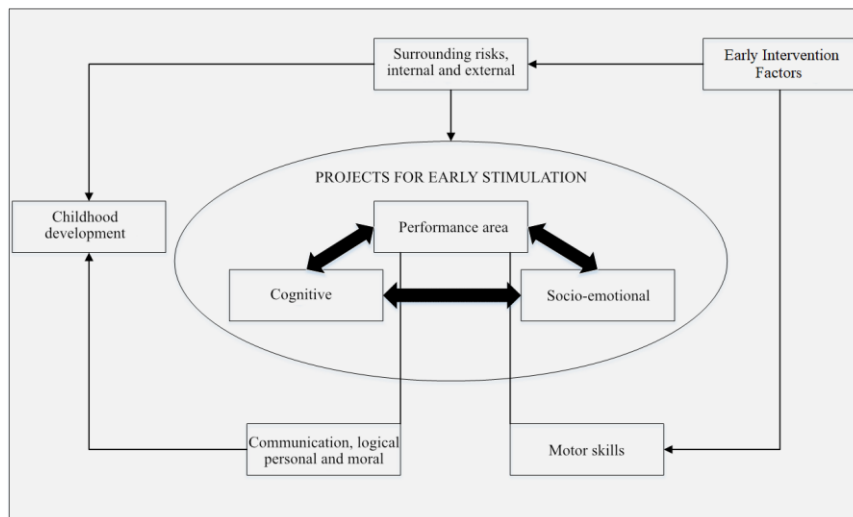
Figure 1. Theoretical Model of Early Stimulation Projects.
Note: Source: Author's creation (2017)

The following is the bibliographic review development for said model

Motor Development of Language and Hearing

The study of human development has become one of the main sources of knowledge, which has enabled the construction of important tools. In the course of childhood, motor and sensory-perceptual capacities are transformed reciprocally, parallel to the very process of maturation of the nervous system, which structures are organized, differentiated and specialized (Navarro, 2005).

Cognitive Development in Language Learning

Cognition is understood as the set of processes from which information is obtained through the senses. This is why memory is analyzed and sent to the appropriate cortical centers for future consultation and used in problem solving. In this way, cognition is interrelated with higher mental processes, in relation to the acquisition of new behavioral processes (Campo, 2011).

The Language and the Socialization Process

The conquest of language originates in socialization, understood as the facilitating process provided by culture for the child to potentially interact with meanings, people, values and practices, which can then be internalized, adapted and executed by the child in his or her usual context (Berger and Luckmann, 1998). This environment in which the child develops (lives, grows and plays) has an essential role in the development and acquisition of communication and oral language. Language is shaped by the exposure of correct linguistic models and by determining situations that favor its consolidation, improvement and generalization (Ibáñez, Mudarra and Alfonso, 2004).

On the other hand, Vicenty (2003) points out that the socialization process basically consists of social learning, that behavior is learned based in the surrounding reality. However, although psychologically, the learning of behaviors has been explained by diverse theories, this author indicates that one of the most significant theories for explaining the phenomenon of socialization is the theory of Bandura, elaborated in 1977. This theory presents two important aspects, since, on the one hand,

it establishes a difference between what the learning of a behavior (set of stimuli) is, and its execution. For example, when observing a behavior, people can store the information in their memory, being able or not to reproduce it later. On the other hand, the next important aspect of the theory is that the realization will depend on the success or failure achieved by the person being observed, rather than on the reinforcement received from the observer.

In this way, the family and the school can be considered as agents of socialization, although there are other agents such as mass media (Frederic, 1982)

Acting Towards Communicative Needs

The feeling of language functions makes sense with the intentional strategy and attitude with which children respond (Ardila, 2013). The basic linguistic functions established by Halliday (1975) include: i) the ideative function, which represents the relationship between the speaker and the real world around them, including their own being as a part of it. This function expresses the speaker's experience, but also the structure and determines the way in which the world is observed; ii) the intrapersonal function, which allows the establishment and maintaining social relationships. It is an interactive function and serves to express the different social roles including the roles that each one assumes in communication; and finally, iii) the textual function, through which language establishes correspondence between itself and the situation in which it is used. This function makes it possible to establish cohesive relationships between the parts of a text and their adaptation to the specific situation in which they are involved.

In particular, the ideative function and the interpersonal function manifest the objectives that people pursue using language: to understand the world and act in it, while the textual function is necessary to make the ideative and interpersonal components work; it is instrumental to them.

Development Areas

In order to organize the activities that will be developed with the families and their children, it is important to have divided areas that must be addressed in relation to the child's need to achieve early stimulation (Quinteros, 2011).

Cognitive Area

This term refers to the child's ability to become aware of himself or herself and his or her environment, to start giving order to the intended reality, through mental structures and associations that allow him or her to explore, compare, choose, ask questions, classify, etc. (Manley et al, 2013). The child in this area begins to analyze and understand their environment through the interaction they have with their environment, having experiences that can be developed in a better way, with their levels of thinking being effectively developed. It is in this way that the areas of development perfect a thought, memory and perception (Gordillo, 2013).

Motor Skills

The word motor refers to the function by which a child moves a part of their body, being that conjugated stimuli from the outside world are in the actions of motor skills, intrinsic factors of each child and a sequence of vital organic processes.

On the one hand, motor development will depend on the maturation of the basic neurophysiological system, as well as the neuroendocrine system, metabolic processes (fundamental for energy intake) and enzymatic processes (synthesis of proteins, vitamins, etc.). While environmental factors such as proper nutrition, restful sleep, warmth, hygiene, etc., will be of vital importance for a healthy and adequate life (Schwartzmann, 2006). In this way, the timely and adequate satisfaction of the aforementioned factors will make a good development and a better relationship within the human environment possible, where interrelations constitute aspects that define and condition the great possibilities of expression of the child's genetic information. Therefore, the way in which the motor response is expressed, and the possibilities of expanding these psychomotor responds, will depend, to a large extent, on the favorable conditions provided by the environment.

Psychomotor development is different for each child. Therefore, it is present in the same order as each of them. Likewise, development is created from the head to the feet, which is why we see that the functional development of head and hands is first and foremost the development of legs and feet (Gordillo, 2013; Rodríguez & Iglesias, 2009).

Fine Motor Skills

Its reference is to the process of refining the gross motor control point, determined after a skill that is the result of the maturation of the neurological system (Marzal, Parra and Colmenero, 2011). The control of fine motor skills in infants is a developmental cycle and is taken as a relevant event to estimate their developmental age. It is in this way, with the passing of time, that it is based on experience and acquired knowledge and requires normal intelligence (creating ease of planning and executing a task), muscular strength, coordination and normal sensibility (Pinango and Vega, 2018).

Gross Motor Skills

Unlike fine motor skills, gross motor skills exert greater energy, but this in turn requires patience (Mulas, 2007). In this way, reference is made to the control of the general muscular movements of the body, which lead the child from absolute dependence to independent movement. From the moment gross motor skills control is obtained, fine motor skills control is developed, thus perfecting small and precise movements (Marzal, Parra, Colmenero, 2011).

Early Intervention Factors

There are a series of factors that influence the development of a child's motor skills, and they are classified as follows: a) endogenous factor, which is related to the maturation and genetics of the child, including disorders and their characteristics that tend to be inherited; b) exogenous factor, which intervenes in the development that is generated from outside; c) physical factor, considered as food, sanitary conditions, among others; d) social factor, which is related to the relational environment and, in turn, is associated with the infant (Grande, 2011).

In this way it is possible to skimp the formation and evolution of the motor progresses, stimulating its evolution (Grande, 2011). The professional in this branch of health sciences must recognize the different behaviors that appear in children, and once their strengths and weaknesses are known, their growth and development can be reinforced and intervene in (Rodríguez, Gomez and Prieto, 2017).

Method

The research has a qualitative and quantitative (mixed) focus with a descriptive range. In this same way, the research modality has great relevance as the contribution made was bibliographic. According to the studies found in databases and documentary sources, the analysis method used for confirming the information's quality was the Metaanalysis. This method identifies a set of processes in which computer tools such as Forest Plot Generator were used. This helps representing information through forest plots. The huge amount of information built by the results was classified in the Excel v.2016, used for representing the results obtained around the world through natural sciences focused journals (psychology, early stimulation and others). For this reason, automatic databases were used as they provided all the available and updated information about early stimulation researches to the researchers.

It is important to mention that the databases used were a secondary source of resource, which helped obtaining information in a homogeneous and heterogeneous way, and that can be retrievable through systematic networks of scientific information. They have complete records or bibliographic references, organized in fields that cover all the information's aspects (title, author, abstract, etc.)

Metanalysis

Sandoya (2008) points out that metanalysis is a technique replacing descriptive review as an evidence analyzing method. He also states the type of review sought by topic-related studies; establishing who guaranteed it and who didn't, with a recommendation based on the author's opinion being formulated. However, as there were no formal rules for its fulfillment, the review was classic and subjective and, therefore, biases or errors were very likely. Disagreement between reviewers went from basic aspects, as the type of studies to be included or the sample size, to specific aspects, as each of the study type's value. As such, metanalysis provided exactitude in the search, selection and analysis process, and the structural evidence integration, granting a more objective outlook for it.

However, there are three main methodological problems with this type of analysis which are i) Heterogeneity of the studies included; ii) The publication's biasness; iii) The selection's biasness. It is highly recommended to implement heterogeneity in the metanalysis, as explained further on.

Regarding the publication's biasness, it is mentioned according to the published scientific articles that do not faithfully reflect the totality of the studies. This is because, in many cases, when the obtained results are positive, they are more likely to be sent to wider impact journals. Whereas those with a non-significant result or contrary to the established hypothesis are simply, most of the time, not published. In this way, results are made conditional on the biographical search and can provide biased results.

On the other hand, the selection's biasness delimits the inclusion and exclusion criteria, which is why they must be clearly defined in the analysis and be as objective as possible. Sometimes, the author them self is in charge of biasing the results based on their own inclusion and exclusion criteria, which can benefit some publications.

In conclusion, regardless of the metanalyses' limitations, they must be planned and organized to reach a more objective analysis. Especially, because they help detecting false negatives and can detect areas that must be explored. However,

metanalyses can produce the wrong results when ignoring the presence of a possible significant Heterogeneity between the studies, when including the biases and also when introducing other biases in the search process for the studies.

Strategy for Obtaining Bibliographic Resources

Once the databases are selected, some constructs, descriptors or key words are established. These constructs are considered the main concepts or variables of the study's problem in the research topic (Day and Gastel, 2008). These main ideas act as key descriptors when beginning the search and, thus, obtain the bibliographical sources needed to carry out this work.

Bibliographical Selection Criteria

The selection criteria were delimited through the review objectives, meaning the main question this work seeks to answer. Other aspects used for defining the relevance of the bibliographical sources are: a) reliability of the results; b) obtained results; c) applicability of the results obtained in the work's study (Vera, 2009).

The Information's Organization

The systematization of the obtained information simplifies a complex topic and makes its objectivity easily achievable through a reasonable reduction. This methodology can be applied to the creation of an information's segmentation process, with Excel v.2016. as the office system program for this activity. This organization system is a cognitive tool that consist of representing knowledge in a graphical and synthetic way, focused on effective and meaningful learning as seen in Table 1. Different indicators for each article were selected. They classify the dimension through diversely reviewed sources at the global level.

Table 1.
Analysis of Theoretical Constructs.

DIMENSIONS	INDICATORS	USA	SPAIN	CHILE	BOLIVIA	COLOMBIA	MEXICO	AUSTRALIA
PERFORMANCE AREA	Cognitive	32	4	17	15	12	66	2
	Socio-emotional	21	117	75	1	12	69	3
	Language and Hearing	58	97	34	5	15	122	59
MOTOR SKILLS	Fine motor skills	3	73	59	3	28	31	9
	Gross motor skills	8	47	110	2	32	41	2
EARLY INTERVENTION FACTORS	Prenatal risks	162	95	76	76	12	14	122
	Perinatal risks	2	10	3	2	1	12	44
	Postnatal risks	9	112	124	10	20	204	2
	Environmental risks	53	35	20	28	17	47	29
CHILD DEVELOPMENT	Communative development	56	35	34	0	3	1	2
	Logical thinking	2	63	78	0	12	14	1
	Personal development	4	6	3	0	21	145	2
	Moral development	23	65	130	34	193	120	22

Note: Authors' creation (2017).

The creation over a previously mentioned precise theoretical model was obtained through the constructs' organization system, by means of an adjustment of the contrast indicators and each article's dimension. For this reason, it was possible to

specify which country has developed more researches related to the research line considered in this study. The system corroborating the organization of the information and the constructs is defined as descriptor's counter. It identifies the origin of the article and, as previously mentioned, can reflect which country has more scientific contributions regarding the study's topic.

Results

Based on the literature's revision, it was possible to obtain the structuring of the constructs in which a research's theoretical model was determined. The descriptors of this constructs analysis helped adjusting and contrasting the literature's revision. This way, four dimensions were established: a) Performance Area, b) Mobility, c) Early Intervention Factors, d) Child Development.

Figure 2 shows the levels of the study according to the corresponding Performance Area of the construct, Cognitive, Socio-emotional, and Language and Hearing. As seen in this figure, the origin of the literature related to the Performance Area dimension shows that the U.S. has a larger analysis in the Cognitivism area. In the same way, Spain shows predominance in the Socio-emotional indicator while, again, the U.S. has a bigger range of studies in the Language and Hearing studies.
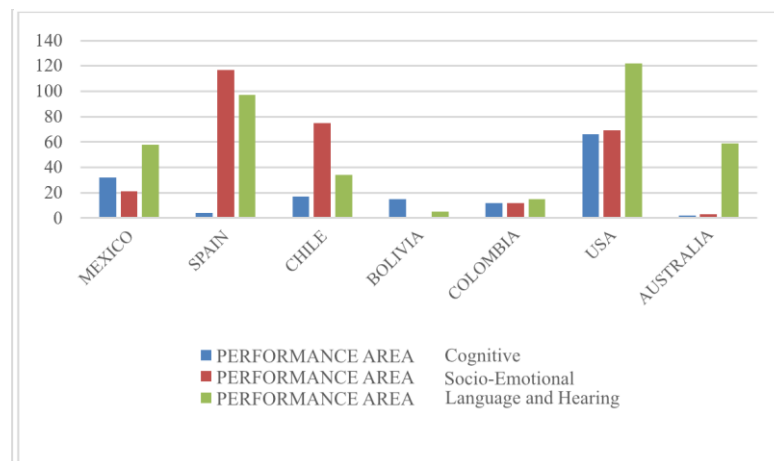

Figure 2. Construct, Performance Area.
Note: Source: Authors' creation (2017).

As shown in the analysis of the Mobility dimension, Figure 3 shows that Spain has made relevant studies according to the Fine motor skill indicator, while Chile equally stands out in the Gross motor skill studies, according to the different context each population faces.
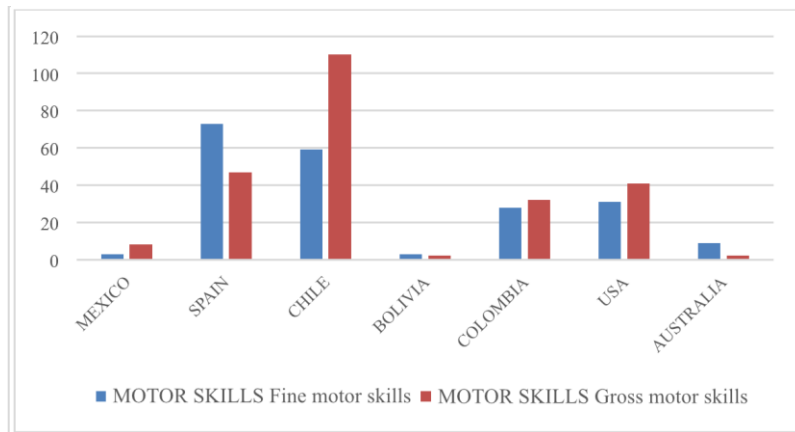
Figure 3. Construct, Mobility
Note: Source: Authors' creation (2017)

Continuing with the results, Figure 4 shows an analysis made according to the Early Intervention Factors dimension, which determines that Mexico has a higher tendency of Prenatal Risks and Perinatal Risks indicator studies. Additionally, it is also noticeable that Australia has studies in the area, however, it highlights that the results for these indicators are weak. Besides that, the U.S. shows a great quantity of studies related to the Postnatal Risks indicator, and Colombia is the country that out stands the least in this dimension. This determines that there are no relevant studies concerning this indicator. Lastly, few studies have been carried out in Mexico regarding the Environmental Risks indicator, which suggests that this indicator has not had relevance in former studies.
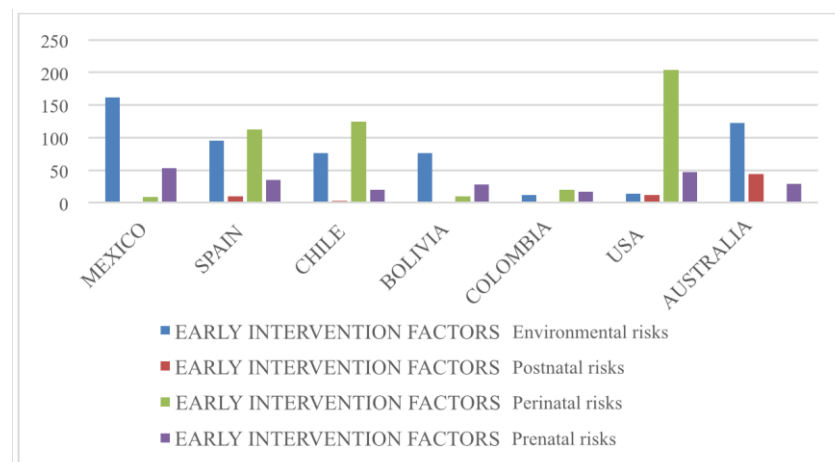

Figure 4. Construct, Early Intervention Factors
Note: Source: Authors' creation (2017)

Figure 5 determines the analysis results of the Child Development dimension. We can observe that Mexico has relevant studies regarding the Communicative Development indicator, as well as Chile showing latent studies regarding Logical Thinking. For said reason, an approach to a bibliographical analysis of the region must be made. With these permanent studies, the US shows a predominance in the Personal Child Development indicator, while Colombia shows that, in recent years, it has been

focused on research related to the features of the Moral Development indicator, making it predominant in these studies for this research line.
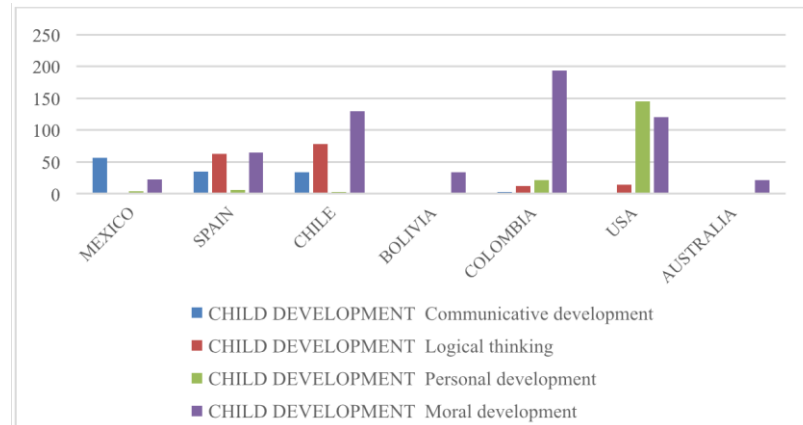

Figure 5. Construct, Child Development
Note: Source: Authors' creation (2017)

Consequently, a Homogeneity and Heterogeneity analysis through a frequency table has been made. In this sense, Homogeneity is considered a basic element in research and in theoretical analysis as it helped specify the obtained information's validity in the research's development. Table 2 describes this analysis, where the four established dimensions can be seen, as well as the Homogeneity and Heterogeneity percentages, and the study's population.

Table 2.
Population frequencies in the study.

	Homogeneity	Homogeneity %	Heterogeneity	Heterogeneity %	Study population	Study total sample %
Performance Area	25	83%	5	17%	30	100%
Motor Skills	26	87%	4	13%	30	100%
Early Intervention Factors	22	73%	8	27%	30	100%
Child Development	13	43%	17	57%	30	100%

Note: Authors' creation (2017).

The values obtained were also represented in the Forest Plots which, as previously mentioned, help connect and contrast the obtained results through the different qualitative assessment scales used in the examined studies.

In Figure 6, Forest Plot, Heterogeneity values are presented from 1 to 2, while Homogeneity values are displayed from 0 or 1 through values in the X axis. Horizontal lines crossing the charts show the size of the trust interval. The longer the lines, the bigger the trust interval, so results from the study are considered less replicable.
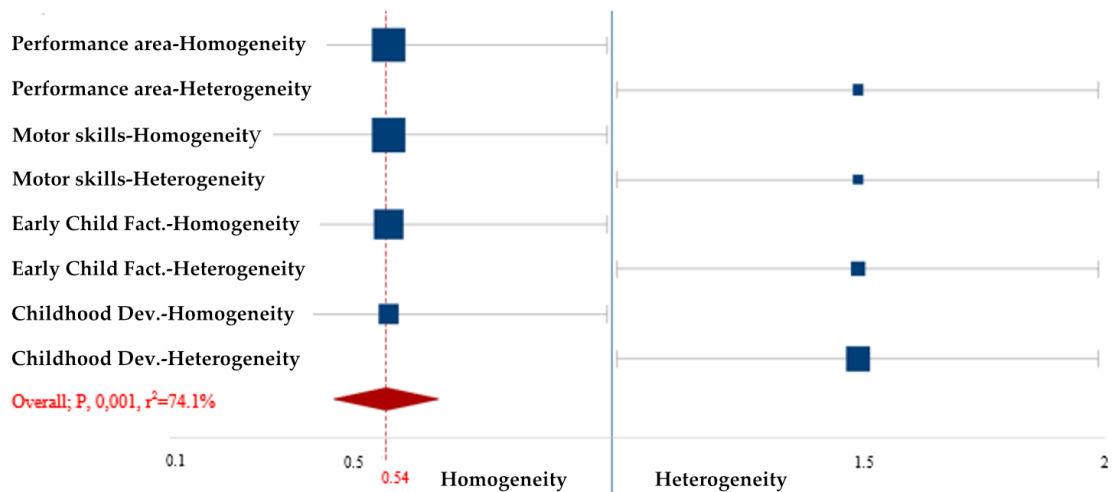
Figure 6. Forest Diagram – Constructs' Validation.
Note: Source: Authors' creation (2017)

Besides that, in the middle of the forest plot, a vertical line symbolizes the void effect of the studies. Which means that it does not represent a significant value so as to determine the information's quality.

The global effect is calculated by the average value of the Homogeneity and Heterogeneity impact for each of the function's studies. The value is 0.54, presented as a red rhombus, which location indicates a bigger Homogeneity in the research, as it is located in the left side of the void effect line (vertical line). It's important to notice that, if the diamond touches the vertical line, the aggregated results establish that the factor does not provide protection nor risk.

Discussion and conclusions

To conclude the research, it managed to establish the grounds for the constructs based on the different study criteria for the project model's early stimulation through a systematic and information management method called Metanalysis. The assessment of the following aspects was also made: information searching strategies; inclusion and exclusion criteria of each construct respective information; the information's quality; the examined studies quantitative analysis. The obtained result proved that mainly trustworthy database articles and sources of less than five years in Spanish and English were used. The Homogeneity of the study was established with a determinant average of 0.54, based on the analytic criteria of the researchers, presenting preeminence over the Heterogeneity.

In this way, constructs show a big relation linking to early stimulation projects as it identifies strategic functions and driving elements that contribute to the information's quality. That is how, through a thirty (30) bibliographical sources study population, a model referred to the projects of society linking the early area stimulation was obtained. This model should be directed by the higher education institutions as it shows the main factors taken into account when stipulating a plan and executing it.

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