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Specialized and updated training on supporting advanced technologies for early childhood education and care professionals and graduates

MODULE VIII

Early intervention programmes (0-6 years)

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I. Introduction

Module VIII is about the development of early intervention programmes for 0–6-year-olds. Firstly, the structure of programme development will be discussed in two parts: the structure of programme development for 0-3 years and the structure of programme development for 3-6 years. Practical examples of the development of early intervention programmes for different disorders can be found in Laboratory 2: Resolution of 3 case studies on cognitive, social and language pathologies and in Laboratory 2: Resolution of 3 case studies on cognitive, social and language pathologies. Likewise, the use of intelligent resources applied to diagnosis and assessment at early ages can be found in Laboratory 4: Application of intelligent resources to diagnosis and assessment at early ages and the development of an intervention programme with the use of the eEarlyCare application can be found in Laboratory 5: How to develop an intervention programme with the e-EarlyCare-T web application.

II. Objectives

8.1. Understand the structure of programme development for ages 0-3.
8.2. Understand the structure of programme development for ages 3-6,
8.3. Examples of early intervention programmes for different impairments.

III. Content specific to the theme

3.1. Concepts of development 0-3: implications for programme development.

The development of representation refers to the capacity of the human mind to extract, store and manipulate information from the environment, as well as to handle it symbolically by constructing another reality or other possibilities within existing reality. Humans seem to have the ability to develop cognitive functions such as thinking, reasoning, awareness, imitation, understanding causes, and solving certain types of problems (Gómez, 1990, Gómez, 1992, Gómez, 1998, Gómez, 2007). However, these skills do not appear spontaneously at a given developmental moment; they are shaped throughout human development and have precursors in the developmental period prior to their functional acquisition.

3.1.1. Precursors of cognitive abilities.

Below, a series of important precursors are indicated to be considered in observation processes and the development of early intervention programmes for 0-3 year-olds.

a. *The discovery of objects*

As already indicated in Module V, infants seem to have more perceptual capabilities than was assumed from early developmental studies. Infants quickly analyse the world and develop representations that divide objects into figure and background (Rochat, 2001). Attention is progressively directed towards three-dimensional objects and there is a tendency to pay more and more attention to more complex stimuli. This suggests that babies know which objects are familiar and which are new to them. The exploration of objects is also related to interactive safety in the environment. That is, there is a cognitive and motivational basis for why subjects in safe environments will interact more than in unfamiliar environments. Thus, observation and experimentation play an important role in knowledge and representation of objects. Infants acquire the notion of objects first as units of perception and then of action (Fantz, 1964). The infant develops the ability to conjugate schemas in a progressive way that will allow them to create more and more elaborate sequences. This happens when the baby is able to stop something they are doing in order to do a different action that will lead to a better situation and achieve what they want. This is when the development of using **means-ends strategies** begins. Subsequently, using materials or instruments that allow them to achieve something will be one of the most significant achievements of **practical intelligence**. In this, task resolution is fundamental to achieving cognitive development of reasoning. **In this process of problem solving, the development of object permanence is fundamental and is directly linked to the development of representation and resolution on the plane of virtuality**. However, according to the most recent research, the beginning of this capacity occurs earlier than Piagetian theory indicates. The explanation is that Piaget may have confused "action" with "knowledge". Nowadays, technology makes it possible to apply observation indicators more precisely (e.g., habituation-dishabituation processes, gaze tracking, heart rate...) and these seem to indicate that object permanence is acquired at an earlier age. The development of working memory is also involved in this recognition process. Seven-month-old babies may not be able to keep in mind all the variables of a problem

in order to solve it correctly. Therefore, **executive and planning capacity seems to develop around the age of one year** (Diamond, 1990). According to this theory, adequate representations are present in babies from an early age, although they would not yet have developed the executive functions to properly coordinate these representations, which is why they would not be able to solve certain problems correctly. This is why development of executive capacities facilitates development of the ability to control behaviour with increasingly complex representations. Babies from **four to five months** are interested in the effects that actions have on objects and repeat them over and over again, which is what Piaget (1952) called **secondary circular reactions**. These observations and actions also facilitate the development of representations. Circular reactions may be a mechanism for learning about what is already represented and discovering new types of actions, initiating new representations (Parker, 1993). Here, **trial-and-error strategies** are used that will lead infants to increasingly successful resolutions. The subject's **intrinsic motivation** plays an essential role in this whole process. Next comes the development of **tertiary circular reactions**, from **eight to twelve months**. These reactions are a complex combination of objects (pushing one object against another). Babies' ability to repeat their schemes over and over again means that they analyse and study the procedure itself. In other words, they develop **causality and multi-schema complexity** (Karmiloff-Smith, 1992).

b. *Symbolisation in childhood*

The key to the beginning of symbolisation is that babies start to contemplate—and not only perceive—objects and act on them. Already after the two-month revolution, babies are less strict in their cognitive processing of things happening in and around them. **The contemplative attitude allows them to begin reflecting on events and asking questions about what they mean. This transition is the necessary precursor to the symbolic functioning that is an essential condition for the emergence of language**. The first signs become apparent at least around the age of two months, when the baby begins to adopt a contemplative attitude, although the obvious symbolic manifestation will appear at the end of the second year. **All the activities of symbolic functioning appear and manifest themselves together between twelve and eighteen months and mark the line between early childhood and infancy proper.** Symbolic skills depend on the same general capacity, but may be asynchro-

nous in their development, e.g., pretend play may appear before or after graphic symbolism and this may be due to the emotional, motor and expressive limitations of the individual child. From the moment referential activities appear: pointing, joint participation, triadic behaviours, the ability to function symbolically is acquired. The hallmark of childhood is symbolic and make-believe play. **Symbolic play begins in early infancy, from eighteen to thirty-six months.** By eighteen months, children will be able to understand significantly better what is being asked for with a symbolic gesture than with the use of a miniature object referent. However, they will show **confusion between the symbol and the referent**. They will understand the gesture better because it is physically distant from the object. Children will have to overcome the barrier of dual representation (DeLouche, 1995); this representation occurs when one thing (object, image or gesture) can be simultaneously that thing and the symbol of another (a comb, a car, a baby...). The development of symbolic functioning is progressive and depends on circumstances and the demands of the situation. By 36 months, the transgression of conversational use is a minor obstacle to children's symbolic understanding (Tomasello, Striano, and Rochat, 1999). In the development of symbolic play and language, comprehension precedes production. It is only from the age of 36 months that children clearly begin to invent pretend play using objects that represent something else: symbol comprehension develops at 18 months and symbol production at 36 months. The same is true for the reproduction of graphic symbols (Callaghan, 1999). However, this aspect is discussed in more detail in the following section.

c. *Manifestations of the semiotic function at the end of the sensorimotor period*.

As noted above, the **main manifestations of the semiotic function are: deferred imitation, symbolic play, drawing and language** (Delval, 1996). **Deferred imitation** enables the child to imitate in the absence of a model, which implies the development of internal patterns of representation of previously experienced situations. **Symbolic play** allows the child to represent situations they have been involved in. Later, as complexity increases, they will be able to represent other situations that they will not necessarily have to have acted out directly. **Drawing** implies an internalisation of real situations and objects and the possibility of graphically representing them. Although the degree of similarity will depend on the motor skills of reproduction. **Language** is considered to be the most elaborate symbolic skill in terms of complexity

and the one that allows the greatest interpersonal and cognitive development. Vygotsky (1977) understood language as a privileged vehicle of cognition. However, this Module for 0-3 years of age focuses on analysing symbolic play, understood as the basic pillar of representation and which implicitly includes other skills, such as the development of language. By analysing that, it will be possible to deduce data that will help both assessment and intervention. Table 1 analyses the dimensions of symbolic play and the strategies to develop its acquisition from the classification by Marchesi (1987) p.38-42.

Table 1. Relationship between dimensions of symbolic play and possible cognitive strategies to facilitate its development (taken from Sáiz, 2000 p. 120-121).

Dimensions	Content	Cognitive intervention strategies
Decentralisation	*First stage*: Everyday actions referring to one's own body and devoid of any real purpose (e.g.: "drinking from an empty glass"). *Second stage*: Games directed towards other participants: *people* or *dolls*; these are taken as passive agents, receivers of the child's action (12-18 months). *Third stage*: The child gives greater participation to people or dolls. This is an advance in the process of decentration (24-30 months), e.g. the child puts the fork in the doll's hand instead of feeding it directly and also accompanies its actions with its own verbal expressions or by attributing intentions, feelings or emotions to the agents.	- Facilitate the child's interaction with toys (with the adult acting, if necessary, as a *model of the* actions to be carried out). - Enable the child to interact with toys (dolls and toys that help the child to reproduce everyday contextual situations), *modelling* and *shaping of* play situations by the adult. - Let the child initiate interactions; if necessary *model* situational patterns of decentration through overt verbal language as a behaviour regulating agent's actions.
Substitution of objects	*First stage*: The child uses mainly real objects (brush, fork...) or small-scale reproductions for his play. *Second stage*: The child substitutes a real object for an undefined one (makes a stick into a fork...) as long as they have some quality that allows them to perform the same function to a certain extent. *Third stage*: The child replaces an object with a very precise function (fork) with an object with a very different function (comb).	- Facilitate the child's interaction with toys in order to imitate functional actions; if necessary *model* the action by the adult. - Facilitate the child's interaction with toys in order to initiate possible functional substitutions; *model* the action using substitution of objects, which may have some relation to those they substitute. - Enable the child to make non-functional substitutions; *model* the action by using objects in the substitution that are not similar to the objects they are substituting.

Dimensions	Content	Cognitive intervention strategies
Integration	*First stage*: Games are simple, isolated actions. *Second stage*: Elementary production takes place, consisting of applying simple schemas to two or more objects or agents. *Third stage*: Multi-schema combinations involving two or more symbolic actions. There will be an evolution in these: first the actions will be disordered and more or less juxtaposed; then they will be organised in a truly integrated sequence.	- Provide the child with appropriate contexts and situations to initiate the development of play. - Enable more elaborate game situations through *modelling* and *shaping* by progressively increasing the difficulty in organisation and sequencing.
Planning	*First stage*: The child seems to be provoked by the presence of certain toys or objects; they are not directed by a concrete plan or action. *Second stage*: The child looks for the materials needed for a certain game and makes preparations before starting the game, and/or verbally announces that they are going to carry it out (indicating that they have a plan to execute).	- Provide the child with toys and situational frameworks for the action to take place. - *Modelling* and *shaping* situations that facilitate the elicitation of intentionality towards play; using language as a regulator of the actions that are performed.

d. *The forerunners of theory of mind in the sensorimotor period.*

At the end of the sensorimotor period, children begin the development of representation. However, its genesis is many months earlier. From eight to twelve months the **triangular relationships** that are established between **the child, adults and objects** present a series of characteristics:

1.- the baby's actions cannot be effective in the world, they need the interventions of the adults in their immediate environment to be executed (Gómez, 1990; Gómez, 1992; Rivière and Coll, 1985).

2.- communicative actions include **patterns of joint attention**, before, during or after the execution of a gesture, the child seeks eye contact with the adult (Rivière, 1997).

3.- **Gestural communication**. Gestures can be used either to make requests of objects to others (**proto-imperative**) or to show situations (**proto-declarative**). The differ-

ence between the two types of gestures lies in the fact that the latter consider the person as the object of interaction and not only as a means of achievement. That is why prelinguistic intentional communication seems to indicate that there is some kind of understanding of the mental processes of others, these early communicative behaviours would be the initial manifestations of theory of mind (Wellman, 1993). Protodeclarative gestures are understood as more complex communicative behaviours than protoimperative gestures, as they require **metarepresentational capacities**. The behaviours of mentally sharing a situation with another involve being aware that the other has a mind that can share that situation with one's own mind, which involves second-order representations or representations of the mental experiences of others and therefore more complex cognitive understanding (Gómez, Sarriá, & Tamarit, 1993).

Another significant concept for understanding how the development of the precursors of theory of mind begins is **intersubjectivity**. Trevarthen (1982; 1989) differentiated between **primary intersubjectivity**, face-to-face reactions with nurturing figures in which infants would manifest different expressions and would develop from two to four or five months, and **secondary intersubjectivity**, the child's deliberate motivation to share interests and experiences with other people and would manifest itself around the first year of life.

Symbolic play is also considered a precursor to theory of mind, and acquisition begins at the end of the second year, at the same time as the development of other representational skills begins.

Thus, **the link between the development of prodeclaratives, symbolic play and theory of mind is most likely the ability to have meta-representations** (Leslie, 1987; Leslie and Happé, 1989; Gómez, Sarriá and Tamarit, 1993).

3.1.2. Therapeutic Implications in Early Childhood.

So far, the most important acquisitions in the sensorimotor period have been analysed, although an overall developmental picture that would facilitate the creation of intervention programmes is lacking. First of all, it should be **pointed out that there is no single way of intervening, as this will depend on the initial developmental level of**

the child in question. Therefore, before any action is taken, it is necessary to evaluate the real situation of the subject we want to work with, in order to define a baseline for intervention and subsequently analyse both the acquisition processes and the acquisitions themselves.

Table 2 (Sáiz, 2003), presents an analysis of the developmental stages and possible sensorimotor acquisitions that occur at these ages, as well as the cognitive intervention strategies that will help the acquisition process (Rivière and Coll, 1985 and Delval, 1996).

Table 2. Cognitive strategies to support child development during the sensorimotor period (taken from Sáiz, 2000 p. 122-123).

Developmental ages and their relationship to the stages of the sensorimotor period.	**Sensorimotor intelligence**	**Cognitive intervention strategies**
Stage I (0-1 months)	- Development of reflexes. - Signs of accommodation of perceptual selection schemes (attunement to attachment figures). - Beginning of *non-specific linkage*.	- Develop visual tracking of objects. - Facilitate sucking-pausing relationships between mother and baby. - Enable breast-shaking or feeding-pause container relationships. - Implement rocking-pause relationships.
Stage II (1-4 months)	- Primary circular reactions. - First adaptations acquired. - First scheme co-ordinations. - Beginning of the *social smile*. - Emergence of *primary intersubjectivity*. - Start of *proto-conversations*.	- Develop sucking and grasping coordination. - To facilitate vision-hearing coordination. - To develop phonation-audition coordination. - Enabling the elicitation of *social smiles*. - Facilitating the development of *primary intersubjective* behaviours. - Implement the development of contingency awareness. - Develop circular games. - Facilitate the development of *proto-conversational* patterns between infant and nurturing figures.
Stage III (4-8 months)	- Secondary circular reactions. - Full coordination of vision and grasping. - Beginning of the means-ends differentiation. - Anticipatory behaviours.	- Facilitating the development of vision-impairment coordination. - Enable the development of the beginning of means-ends differentiation. - Facilitate the development of the search for partially hidden objects. - Enable the development of anticipatory behaviours.
Stage IV (8-12 months)	- Coordination of secondary schemes. - Pursuit of ends using others as means. - *Reciprocal assimilation of* means-ends. - Progressive differentiation of means-ends. - First acts of *practical intelligence*.	- Facilitating pursuit of ends by using other schemes as a means.

Developmental ages and their relationship to the stages of the sensorimotor period.	**Sensorimotor intelligence**	**Cognitive intervention strategies**
	- Occurrence of intentional behaviours. - Beginning development of *proto-imperative behaviours*.	- Search for completely hidden objects that have just been hidden. - Enable situations in which the child has to communicate and reinforce intentional communication behaviours. - Facilitate the development of *proto-imperative* behaviours.
Stage V (12-15 months)	- Tertiary circular reactions. - New media are discovered by experimentation and known patterns are differentiated.	- Facilitate the search for an object in different places where it can be hidden.
Stage VI (15-18 months)	- Use of new media by mental combination. - Occurrence of *proto-declarative behaviours*. - Object permanence. - Start of performance.	- Present problem situations in which the child has to develop mental combination. - Facilitate situations in which the child has to develop *protodeclarative behaviours.* - Facilitate the search for objects in all locations. - Facilitate the development of representative behaviour.

In the *first stage, attunement-harmonisation patterns* develop. Infants appear oriented to respond to *social stimuli* that facilitate the development of *patterns of interaction* with others. They synchronise muscular responses to the prosodic characteristics of the human voice, as well as orienting their perceptual system towards members of their own species. They also shows emotional expressions imitating others'. All these behavioural responses facilitate *caring* and *protective* behaviours in the adult, both *physiologically* and *emotionally* and *affectively*. This is followed by the *first shared experiences* between adult and baby. From two to 4-5 months, the *primary circular reactions* develop, and the differentiation between *assimilation* and *accommodation* begins, evolving towards the progressive coordination of elementary sensorimotor schemes (vision, hearing, grasping, sucking, vocalisation and the first relational behaviours), although *intentional communication* as such does not exist yet. From two to three months of age, the recognition of the *expressive significance* of others' gestures begin to appear, initiating the progressive development of the *social smile*. Trevarthen (1982) speaks of a *primary intersubjectivity* or *interpersonal motivation* system, which is a kind of *primary regulator* of *mental development*. From that, the baby initiates the recognition of familiar and unfamiliar people. From six to eight weeks there are exchanges of complex expressions of interaction between the baby and the mother or attachment figure. Although there is still no *communicative intention* as

such, the adult will attribute it to the baby and this is an essential step in the baby's *cognitive, social and communication development.* Another aspect to consider is the emergence of *contingency perception* (Watson and Ramey, 1972). The development of *circular play* facilitates the emergence of expressive behaviour on the part of the child and the perception of contingency relationships. Repeated and contingent situations help lay the foundations for *predictability* and *anticipation*, which are the building blocks for the development of later *intentional behaviour* (Atance and Meltzoff, 2005). From four to eight or nine months, *recognition, anticipation* and *attachment* develop. The infant becomes increasingly active in interactive exchanges. There is the beginning of *differentiation* between the baby's own *expressive behaviours*, understood as a *means of* obtaining *social stimulation* contingent on these behaviours. There is an improvement in the development of *anticipatory* and *memory behaviours*. An indicator of this is the *ability to recognise*; the first *recognition schemes* are established in the *here and now*, in the immediacy of the present, so it is not yet recognition that lasts over time. At around five months of age, *visual recognition* of the mother or the parent figure begins, which is the beginning of attachment, establishing the development of the *specific attachment*. This progressive differentiation of the attachment figure means in turn the differentiation of the "self", of the "I", from the environment and therefore the beginning of *categorical differentiation* in the social world (Olson, 1981).

The *anticipation of contingencies* from *shared interaction patterns* is part of the basis for the development of communication (Rivière and Coll, 1985 and Rivière, 1997). By the end of Stage III, *anticipatory signals* are increasingly restricted and the mere presence of the attachment figure is sufficient to initiate patterns of interaction and anticipation. It is therefore important to facilitate *relational* situations for *cognitive development* as well as for *affective and social development*. The child not only learns immediate contingencies in *interaction situations*, but also learns the *scripts* of interaction and communication. By the fifth *month, the* child's relationships with others are increasingly realised through objects (Schaffer, 1984; Deval, 1996). All this occurs at the same time as a progressive increase in hand-eye coordination skills and fine manipulative coordination. As noted above, the development of *triangulation relationships* between adult, child and objects begins. However, the relationship patterns

in the interaction of the baby towards objects and towards adults are different and consequently *means-ends differentiation* appears (Rivière and Coll, 1985).

The schemes of interaction and intentional communication begin at around eight months, and the first *communicative behaviours* proper appear (Bates, 1976; Bates, Benigni, Bretherton, Camaloni, and Volterra, 1979) along with manifestation of *co-ordination of schemes of action* directed at objects. This co-ordination involves intentional co-ordinations to achieve an end, so that there is a progressive differentiation of means-ends, indicating *intentionality*, the first manifestation of *intelligent behaviour*.

The development of *intentional communication* is important not only from the point of view of communication initiation but also from the perspective of *protomental* development. It begins, as already noted, with the emergence of *proto-imperative* gestures towards the end of the first year and continues with *proto-declarative* gestures which emerge approximately towards the end of the second year (Rivière and Coll, 1985). The highest point of the process is marked by the development of *secondary intersubjectivity*, which is nothing other than the expressed motivation to share interests and situations with others (Trevarthen, 1982).

Thus, in the *sensorimotor period*, basic aspects of cognitive, social and communication development are developed, which could be summarised as follows (Delval, 1996):

"Object recognition: This occurs when the child can use *schemas* that they have already applied previously and obtain the same results. The *reciprocal coordination* of these *schemas* allows them to see that the same object can *be explored* from different spheres and therefore *be known* from different dimensions and yet it is still the same object. Object recognition appears when they can use the same *schema* in *new situations* and obtain the same results as in a previous event, and also when different events take place in the same order and they can therefore *anticipate* what is going to happen next. The application of the same *schemas* is what enables them to *identify objects* and establish *categorical relations* between them.

Object permanence: Its acquisition is fundamental in the development process; it allows the child to discover that an object exists beyond the *here and now*. At the end of the *sensorimotor period*, the acquisition of object permanence begins, a representation which enables the child to play mentally with objects and situations.

3.- *Problem solving*: Cognitive growth generates the *acquisition of problem-solving skills* and *strategies*, a fundamental aspect for the development of *cognition*. *Stage III* is when the acquisition of *means-ends differentiation* and the development of *secondary circular reactions* begins. In the *fourth stage*, the child begins to set a priori goals, the child carries out actions different from the end in itself, while in the *fifth stage they begin* to use *new means* to achieve their ends, thus using strategies that allow them to reach the goals they desire. Throughout the sixth *stage, the* development of *representation* begins and therefore the possibility of solving problems on the symbolic plane and not only in present situations. This achievement takes

place around the age of two and is one of the fundamental acquisitions in cognitive and language development.
Intentional communication patterns: The onset of intentional communication develops with the acquisition of *proto-imperatives* (at the end of the first year) and *proto-declaratives* (at the end of the second year).
5.- Development of the precursors of the *Theory of Mind*.
6.- Beginning of the *development of self-awareness*, the progressive evolution of language and *symbolisation capacities* allow the subject to develop a *reflective conscience*" (Sáiz, 2003 p. 124-125).

Table 3 shows a summary of the acquisitions seen, as well as possible strategies to facilitate their development (Sáiz, 2003).

Table 3. Relationships between interaction subjects, representational acquisitions and cognitive strategies that can encourage development (adapted from Sáiz, 2003 p. 125-126).

OBJECTS OF KNOWLEDGE AND INTERACTION	REPRESENTATIONAL ACQUISITIONS	COGNITIVE INTERVENTION STRATEGIES
OBJECTS	- Knowledge of the properties of objects. - Object permanence. - Problem solving with objects.	- Facilitate the development of strategies for approaching and observing objects. - To know the same object according to its characteristics. - Facilitate the development of hide-and-seek games (e.g. peek-a-boo). - Enable the development of the resolution of simple tasks to involve the use of means-ends strategies.
PERSONS	- Attachments to attachment figures. - Petitioning behaviour. - Interactions with others: establishing gestures of greeting, farewell, etc.	- To increase the development of interaction situations with the parenting figures and their close environment. - Develop "give and take" games. - Enable the use of gestures in social situations.

By way of summary, during the **sensorimotor period** (approximately 0-18 months), the child gradually establishes regularities in everyday interaction situations, which facilitates the ability to develop **anticipatory behaviour.** At the end of this period, the possibility of using **symbolic means** to solve everyday problems appears. Capacity for **representation** increases in complexity with regard to the use of signifiers. First, indexes or signs are used, then symbols and finally language signifiers.

3.2. Structure for creating programmes for 0-3 years of age.

We suggest using the script of a stimulation programme developed by Sáiz, M.C. and Román, J.M. (2011). *Mentalistic Stimulation in Early Childhood*. Madrid: CEPE, as it presents a practical adaptation of all the aforementioned current trends in development to the world of stimulation. The programme includes the following intervention

units that refer to the stimulation of all the mental precursors corresponding to the evolutionary milestones of the sensorimotor period.

Unit 1: Ability to develop object tracking skills.
Unit 2: Ability to perform pause-suction actions I.
Unit 3: Ability to perform pause-suction actions II.
Unit 4: Ability to perform rocking-pause actions.
Unit 5: Suction pressure coordination skills.
Unit 6: Vision-hearing coordination skills.
Unit 7: Speech-listening coordination skills.
Unit 8: Ability to develop social smile.
Unit 9: Ability to develop primary intersubjective behaviours.
Unit 10: Ability to develop contingency awareness.
Unit 11: Ability to develop conversational patterns.
Unit 12: Ability to develop vision-awareness coordination.
Unit 13: Ability to develop means-ends differentiation.
Unit 14: Ability to develop object finding skills.
Unit 15: Ability to develop anticipatory behaviours.
Unit 16: Ability to develop means-ends schemes.
Unit 17: Intentional communication skills.
Unit 18: Ability to develop proto-imperative behaviours.
Unit 19: Ability to develop proto-declarative behaviours.
Unit 20: Ability to develop secondary intersubjectivity skills.
Unit 21: Representational Skills I.
Unit 22: Representational Skills II.

These units are based on a common structure, which includes the following sections:

1. Specification of the intervention unit.
2. Structure of the Intervention Unit:
    - Objective of the intervention.
    - Indicators for the evaluation of the intervention unit.
    - Task (activities).
    - Materials needed for the intervention.

- Generalisation activities (i.e., activities that are similar to those in the task but involve a different context or are more challenging).

3.2.1. Examples of 0-3 year programmes.

The following is an example of an intervention unit taken from the Sáiz-Manzanares and Román (2011) programme.

Unit: Ability to develop pause-suction actions II.

Objectives

1.- To develop visual tracking of objects.

Evaluation indicators

- The baby follows objects presented in its field of vision.
- The baby follows objects presented in its field of vision from right to left.
- The baby follows objects presented in its field of vision from left to right.
- The baby follows objects that are presented in its up-down field of vision.
- The baby follows objects presented in its field of vision from bottom to top.

Task

Present objects that are attractive (brightly coloured, and that produce no loud noises) to the baby. Place them in the baby's field of vision from left to right or right to left. From top to bottom and from bottom to top.

Materials

Brightly coloured rattles.

Brightly coloured objects (roundels that can be grasped).

Generalisation activities

Present the baby with various different-sized objects. Place shiny objects that are not too large in the baby's field of vision (about 15-20 cm from the baby's eyes) and draw the baby's attention to them. When the baby is looking at the object, move it from one side of the baby's face to the other, passing through the centre. Move the object up and down from chest height to forehead. Repeat the exercise in a field 30 cm in diameter.

Sáiz-Manzanares and Román (2011) p. 47-48.

3.3. Concepts of development in ages 3-6: implications for programme development.

During the preoperational period the child consolidates many of the acquisitions they began in the sensorimotor period while acquiring new ones. By the end of the sensorimotor period, the child has acquired the ability to represent, although with incomplete development, since consolidating it needs the development of other systems of representation, such as language. Piaget (1952) called this period pre-operational, from his perspective the child has not yet developed operations—sets of actions organised in systems that are dependent on each other. One of the achievements during this pre-operational period is the construction of invariants. Invariants means that the child learns that an object remains the same, even if it undergoes various transformations, and therefore it maintains its identity (acquisition of the identity of objects) (Delval, 1996). There is also important language development during this period, particularly inserting it into the subject's own actions and those of others. From the Vygotskian perspective, language is a privileged vehicle of cognition that allows the subject to use words to represent concepts, inter-conceptual relations and interactive sequences with both objects and people. This acquisition facilitates the child's transi-

tion from the world of experimentation to the world of deduction. This is a key milestone in the development of problem-solving processes. Another important acquisition in this period is theory of mind, which is the ability to think about what others think, to put oneself in their place and to act accordingly in order to achieve things or induce situations.

3.4. Programme development structure for ages 3-6.

3.4.1. Lines for cognitive intervention in the preoperative period.

The following programs offer lines for interventions to facilignitive and social development:

Sáiz-Manzanares, M.C., and Román, J.M. (1996). Programa de intervención cognitiva para niños pequeños. Madrid: CEPE.

Sáiz-Manzanares, M.C., and Román, J.M. (2010). Programme for the development of mental skills in young children. Madrid: CEPE.

The first programme works on the basic prerequisites for learning, the skills to develop: planning thinking (means-ends strategies); self-evaluative thinking; consequential thinking; alternative thinking and identifying emotions. The second works on the skills to: solve interpersonal problems; identify causes and effects of actions; identify the mental states of others; generate consequences; and to evaluate. It also works on the acquisition of using mental verbs: knowing, teaching, wondering, solving, supposing, understanding, explaining, learning, remembering, believing and the resolution of first-order and second-order false belief tasks. Table 4 summarises the most representative acquisitions in the pre-operational period, as well as some of their limitations (Delval, 1996) and possible intervention strategies (Sáiz and Román, 1996).

Table 4. Acquisitions and limitations of pre-operational thinking (reference Delval, 1996) and the cognitive strategies that can favour its development (reference Sáiz and Román, 1996) (adapted from Sáiz, 2003, p. 128-129).

PREOPERATIVE ACQUISITIONS	COGNITIVE INTERVENTION STRATEGIES
- Ability to *represent* by means of *differentiated signifiers*. The child develops the ability to represent that began in the *sensorimotor period*.	- Facilitate the development of representational skills (through the use of language, drawing, deferred imitation, improvement of symbolic play, in general of all representational skills. The adult will act *by modelling* (acting as a model) and *shaping* (guiding the child's actions verbally and/or manually). The adult will also

- Ability to communicate through language: * *informative function*: transmitting/receiving information through language. * *self-regulation* of one's own behaviour through language. * *function of regulating* the behaviour of others through language. - Ability to use language to explain the events of everyday life. - Understanding of *entities* and *functions* (acquisition of invariants and regularities of a qualitative nature). * *Identities*. An object remains the same even if it undergoes some transformations (as long as the transformations are qualitative). * *Functions*: Functional dependence is developed (a change in one situation produces a change in the second and so on, deals with qualitative transformations). - Differentiation between appearance and reality. - Elaboration of the *theory of mind*.	reinforce the child's attempts (however small they may be). - To promote the child's use of language both to ask for and to transmit information. - The adult *will model* their own actions by regulating their own behaviour through their own language (Meichenbaum and Goodman's (1969) strategies of *self-instructional training*). - The adult *will* first *shape* the child's actions through their own language and then seek to make the child regulate their own actions with their own language (see *Cognitive Training Programme*, Sáiz and Román, 1996). - Work from the tangible, providing the child with multiple experiences that help them better understand: * The variations that occur in objects and fundamentally the *process* of transformation both in the *formation of identities* and in the development of *functional dependence.* - Work on the development of resolution *processes.* - Facilitating the development of *theory of mind*, enabling *fictional* and *dramatized situations* that help the child to break out of centring processes, to put them self in the place of the other and to take different perspectives or points of view into consideration.
BEGINNING OF ACQUISITIONS AND LEARNING THAT MUST BE PERFECTED IN THE PRE-OPERATIVE PERIOD.	**COGNITIVE INTERVENTION STRATEGIES**
- Begins to develop *problem-solving strategies*, but has difficulty in considering several aspects of the same situation simultaneously. - Still has difficulties in understanding that an object can belong simultaneously to two classes. - Has difficulty understanding *processes* and tends to see elements in isolation. - Has difficulty in developing *generalisation* processes.	- To facilitate the development of *problem-solving processes** by enabling the child to tangibly deal with several aspects of the same situation simultaneously. - Using *problem-solving strategies** the adult will play games in which the child can see that an object can belong to two or more categories at the same time (categorisation processes). - Place special emphasis on the child observing and understanding the *process* and not just the outcome of a problem or situation. - Facilitate the development of *generalisation processes** of learning. * See *Cognitive training programme for young children (*Sáiz and Román, 1996).

Work on current lines of metarepresentational development in the pre-operational period has been explained above. However, they can be expanded with the bibliography below.

Sáiz-Manzanares, M.C. (2003). Cognitive intervention in young children. In A. Gómez, P. Viguer and M.J Cantero (Eds.), *Intervención Temprana: Desarrollo óptimo*

de 0 a 6 años (pp.117-133). Madrid: Pirámide.

Sáiz-Manzanares, M.C. and Román, J.M. (2010). *Mentalistic skills development programme*. Madrid: CEPE.

Sáiz-Manzanares, M.C., & Payo, R.J. (2012). *Psychology of Early Childhood Development: A Teaching Project adapted to the European Higher Education Area*. Burgos: Servicio de Publicaciones de la Universidad de Burgos.

Sáiz-Manzanares, M.C. (2018). *E-project based learning in Occupational Therapy: an application in the subject "Early Stimulation"*. Burgos: Servicio de Publicaciones de la Universidad de Burgos.

3.4.2. Lines of language intervention in the pre-operative period

Following the Vygostkian perspective, language development—although it cannot be reduced to cognitive development—is directly involved with the development of pragmatic function. Recent research highlights the relationship between the development of metarepresentational skills, mental skills and the development of comprehension and expressive language in terms of phonological, morphosyntactic, semantic and especially pragmatic development. The following is a summary of the most significant current theoretical contributions. Although they are more exhaustively described in:

Sáiz-Manzanares, M.C. (2003). Cognitive intervention in young children. In A. Gómez, P. Viguer and M.J Cantero (Eds.), *Intervención Temprana: Desarrollo óptimo de 0 a 6* años (pp.117-133). Madrid: Pirámide.

Sáiz-Manzanares, M.C. and Román, J.M. (2010). *Mentalistic skills development programme*. Madrid: CEPE.

Sáiz-Manzanares, M.C., & Payo, R.J. (2012). *Psychology of Early Childhood Development: A Teaching Project adapted to the European Higher Education Area*. Burgos: Servicio de Publicaciones de la Universidad de Burgos.

Sáiz-Manzanares, M.C. (2018). *E-project based learning in Occupational Therapy: an application in the subject "Early Stimulation"*. Burgos: Servicio de Publicaciones de la Universidad de Burgos.

The most representative milestones in this context are discussed below.

Development of "mental verbs".

Mental verbs have been considered metarepresentational expressions. Human beings can make their own mental states—and inferences about the mental states of others—explicit through language. Antonietti, Liverta-Sempio, Marchetti, and Astington

(2006) analysed the most representative studies on the acquisition of theory of mind and its possible relationship with the "linguistic skills" associated with the acquisition and use of mental verbs. It appears that there are relationships between children's semantic and syntactic competences and their competences in solving mental tasks. However, the acquisition of syntactic skills alone cannot explain mental development (Astington, 2000; Charman & Shmueli-Goetz, 1998; Ruffman, Slade, Rowlandson, Rumsey, & Garnham, 2003; Perner, Sprung, Zauner, & Haider, 2003). Looking at the relationship between the development of mental skills and semantic development, Antonietti et al. (2006) found strong correlations between the acquisition of mental verbs and the acquisition of first-order tasks and low correlations between these and the development of second-order tasks. In *first-order* tasks the questions represent *mental states* produced by *mental acts*; in *second-order* tasks the questions represent *mental activities*. The verbs that these authors include in the "metacognitive vocabulary test" (Antonietti et al., 2006) coincide more with mental states than with mental acts. According to these authors, second-order tasks include a high level of recursive thinking "I think he thinks he thinks she thinks", in which linguistic and metalinguistic components play a minor role. Another important factor in understanding mental development is the age variable. Papafragou, Cassidy, and Gleitman (2007) studied the development of mental verbs such as *think* or *know* and their relationship with age. These verbs do not appear until children are three years old and are not differentiated from each other until they are at least four years old. For these authors, the difficulties in acquiring mental verbs can be explained by the difficulty children have in observing and experiencing them. Such verbs require contextual situational frameworks that favour experimentation and testing the causality of propositions of semantic and syntactic relations. Comprehension of mental states increases significantly with age (Gopnik & Astington, 1988; Perner & Wimmer, 1985; Wellman, 1995; Wimmer & Perner, 1983). Comprehension of the second-order theory of mind task is difficult to a high degree at all ages. This complexity has been explained by several hypotheses: the syntactic complexity of the task, the age of the subjects and the development of representational levels (Astington, 2001; Olson and Astignton, 1993). It seems that metacognitive skills in mental verbs and in the development of meta-representation are important for the proper creation of belief specifically in first-order tasks but not in second-order tasks due to the problematic recursion involved. It should be understood that in the former the child can represent situations, but in the latter they have

to represent mental states, i.e., the mental content of a mental act (Antonietti et al., 2006). Mental verbs express mental states, involving propositions that mark a relationship between the subject, the context (propositions), the attitude (mental state), and the part of the real world being evaluated (Doherty, 2009). If the propositional content of the subject's belief corresponds to the state of situations in the real world, the subject's belief is true and if not it is false (Astington, 1998 p. 91-92). In this framework it is important to relate the *thoughts* (the mental states: beliefs, desires, intentions and emotions) that a subject has to the *words* (the verbal expression of the mental states) that they use and to the *facts* (the behaviours). We can only observe actions and behaviours and listen to the words that others use. Mental states are inferred from language and behaviours (Astington, 1998 p.97).

According to Scholnick (1987, quoted by Sotillo and Rivière, 2000a p. 207) the following aspects should be considered in children's understanding of mental language:

1.- *Definition of the semantic space of the language of mental reference*. This refers to the understanding of representational and meta-representational aspects.

Definition of the processes by which the child acquires understanding. This refers to the metacognitive capacity in the processes of semantic comprehension.

Definition of the context in which the language is used. This refers to the contextual situation in relation to the language.

Another important variable for the understanding of belief states (especially of the second order) is introduced here, namely *metacognitive capacity* in the development of the understanding process. In mental verbs such as "to know" [referring to *metacognitive mental processes*, the difference between what a subject knows and the process of knowing will be marked. That is, the difference between "knowing something" and "knowing how to arrive at that knowledge" (procedure)]. It is important to keep in mind that behind every mental verb there is a cognitive and sometimes a metacognitive process that goes beyond the semantic content. Mental verbs have three important properties: *factivity*, *intentionality* and *recursivity*. *Factivity* refers to the property of a verb by which the truth of its predicate is assumed (Kiparsky and Kiparsky, 1970 cited by Rivière and Sotillo, 2000 p.171; Sotillo and Rivière, 2000a p. 208). Sotillo and Rivière (2000), in their review of research on mental verbs, point out that the acquisition of factivity in children begins around the age of 4 years and continues

until adolescence. It is important to differentiate between factive verbs (knowing, forgetting, remembering) and non-factive verbs (thinking, believing and dreaming), since with age the acquisition of one improves over the other. Factuality is in some cases related to *intentionality*. The intentionality of a mental verb implies an absence of commitment to the truth of the predicate of that verb (Searle, 1983 cited by Rivière and Sotillo, 1998 p.173). *Intentional mental verbs* refer to mental or cognitive functions that the subject cannot see directly and *non-intentional mental verbs* refer to mental functions or processes that the subject, although not able to see, can objectify from the execution itself. Intentional verbs: 1.- Do not ensure the veracity of an utterance; 2.- Do not ensure the existence of the predicate element and 3.- It is not possible to substitute that utterance with another that has the same reference, this is what has been called *referential opacity* (Rivière, Sotillo, Sarriá, and Nuñez, 2000 p.129). Riviére et al. (2000) studied the relationships of the verbs: *remember*, *believe* and *know* in children aged 4.5 to 5.5 years. They found that the relationships between prediction and non-intentional verbs such as *remember* and *know* are fulfilled but this is not the case for the intentional verb *believe*. The difficulty in the acquisition of verbs ranges from the simplest, to *remember*, then to *know* and the most complex to *believe*. The truth is that there are a series of linguistic statements that are difficult to measure and quantify, as they have a subjective reference. Thus, Theory of Mind relates to the development of *mental states*, the development of language, especially in its pragmatic components, cognitive and metacognitive processes (Rivière and Nuñez, 1996).

3.4.3. Lines of intervention in entities and functions of transformations in the pre-operative period

In recent decades, research on Piagetian theory has led to changes in the understanding of developmental acquisitions related to the world of interactions with objects and the reasoning used in understanding them. The most significant contributions to the knowledge of the world of transformations and to the understanding of physical phenomena are presented below. The following summary is based on the book by Goswami, U. (2008). Cognitive Development: The Learning Brain. Hove and New Cork: Psychology Press.

a. Causal reasoning and the world of transformations.

Causal reasoning is a general domain of skills and a core of cognitive development. Children around the age of three begin to analyse different physical causes and their effects on objects (cutting, melting, breaking etc.). Causal reasoning requires children to think in a spatio-temporal causal sequence. Gelman, Bullock, and Meck (1980) suggest that children at age three understand some of the cause-effect relationships of relationships that occur over reversible events. However, Gupta and Bryant (1989) criticised the methodology used in Piagetian studies. For them it is possible to solve sequences of causal reversibility before developing causal reasoning correctly. Sometimes children at this age may choose the most salient answer which does not necessarily have to be the correct one from the point of view of a causal reasoning sequence, but in their answer they have not taken into account all the possibilities given from sequentially reasoned thinking. For these authors, true causal thinking implies the representation of the transformation sequence from its initial state to its final state. Three-year-olds are likely to be distracted by the most salient or important of the possible options, this type of response is non-canonical in the beginning of the development of early causal thinking. Understanding sequences requires causal inference based on the difference between the initial state of an object and its final state. Thus, representational causal reasoning begins around the age of three years and is acquired, depending on the type of problem, around the age of four years, although the understanding of causal reasoning in real and non-representational situations begins as early as the age of two years. However, it will not be fully acquired until the subject has a causal understanding of the physical world.

b. Reasoning and causal principles

Causal reasoning has been studied from the causal parameters proposed by Hume (1748).

Principle of priority

Causes precede effects. Particular mechanisms of causal transmission may develop before those of spatial or temporal transmission and may determine causal attributions. This is why the context in which they develop is important. Shultz (1978) demonstrated the importance of children's development of "conscious self", i.e., meta-knowledge about causal agents in developing their own causal reasoning.

2. Covariation principle

Causes and their effects should covary systematically. Shultz and Mendelson (1975) showed that children between the ages of three and four can use this type of inference about covariation to determine causality, mostly choosing the correct answers. Siegler and Liebert (1974) concluded that the ability to make inferences about causal covariation simply depends on the physical phenomena.

3. Principle of temporal contiguity

Causes and their effects must be contiguous in space and time. This principle is closely related to the principle of covariation, as it implies temporal covariation and also temporal contiguity. The latter is related to the principle of priority whereby causes precede their effects. Thus, if physical rationality is delayed in time between cause and effect, the principle of temporal contiguity may take time to occur. Shultz and Mendelson (1975) concluded that the absence of time-contingent cause-effect indicates its importance for the development of the principle of covariation and in the comprehensive development of causal reasoning.

4. Principle of similarity of causes and effects

Shultz and Ravinsky (1977) noted the importance of cause-effect similarity. Recent studies explain similarity reasoning from the use of Bayes' Theorem A $\longrightarrow$ B $\longrightarrow$ C or A $\longleftarrow$ B $\longrightarrow$ C or A $\longleftarrow$ B $\longleftarrow$ C (Gopnik, Gymour, Sobel, Shultz, Kushnir, and Danks, 2004). Gopnik, Sobel, Schulz, and Glamour (2001) examined whether two- to four-year-olds could discriminate which objects have causal power over others. They concluded that children's causal inferences are consistent with the relationships between causality and probability of occurrence proposed by Bayes' theory. In addition, these authors indicated that children have the capacity for causal representation through the use of relationship maps between events.

c. Understanding causal changes

Understanding causal structure is crucial in making causal inferences (Shultz, Pardo, and Altmann, 1982). If the causes of A on B produce C (A $\longrightarrow$ B $\longrightarrow$ C), it implies that there is no direct relation between A and C.

d. Therapeutic implications

In summary, it seems that the beginnings of causal thinking about physical objects are present in children from the age of two, and this coincides with the onset of their representational capacity. However, the development of rational causal thinking is directly related to the ability to develop meta-representation, i.e., to mentally imagine trajectories of objects and representations of them from a mental continuum, even if that is not a visible time-based sequence. Of particular importance in this process is the way in which transformation tasks are presented. If the tasks are presented in a real and experimental way, children will be able to tangibly verify the possible transformations of an object. This will later enable the ability to make meta-representations of them and mentally produce a transformation sequence, even if it is not spatially contingent in the here and now. Causal reasoning is fundamental to cognitive development, it is particularly important in learning about empirical relations in the world, and in learning what the world is like.

Current lines of development and their relation to cognition in the pre-operational period have been summarised above. However, they can be expanded with the following bibliography, which can be taken as explanatory manuals:

Goswami, U. (2008). *Cognitive Development: The Learning Brain: The Learning Brain.*

Sáiz, M.C. (2003). Cognitive intervention in young children. In A. Gómez, P. Viguer and M.J Cantero (Eds.), *Intervención Temprana: Desarrollo óptimo de 0 a 6* años (pp.117-133). Madrid: Pirámide.

Sáiz, M.C., & Payo, R.J. (2012). *Psychology of Early Childhood Development: A Teaching Project adapted to the European Higher Education Area*. Burgos: Servicio de Publicaciones de la Universidad de Burgos.

3.4.4. Examples of programs for children aged 3-6.

The developmental increase in problem-solving ability is one of the enigmas of human developmental psychology. This increase seems to be related to the cognitive increase that in humans is linked to their ability to use increasingly sophisticated strategies in problem-solving processes. The difficulties lie in evaluating the type and use of these strategies, as they cannot be observed directly and have to be inferred from the analysis of the problem-solving process. A number of general skills incorporated in the solving process can be identified in any problem-solving task:

1.- Recognise that there is a problem.

2.- Identify a goal.

3.- Plan a strategy to solve the problem.

4.- Observe whether the strategy is effective.

Research in problem solving has shown that children can succeed in solving Piagetian problems where they have not traditionally done so. Success depends on how the problem is formulated and how familiar the subject is with the type of problems posed (Gelman, 1978). Another variable that seems to be involved in problem solving is language development (Donaldson, 1993). The process of problem solving can be supported by applying the following tools:

1.- Stimulation and guidance through language.

2.- Help in the choice of material.

3.- Help in the preparation of the assembly.

4.- Modelling and shaping actions.

It should also be borne in mind that not all problems can be taught in the same way; those that are more familiar are easier and those that involve different levels of abstraction are more complex. The work on current lines of problem solving in the pre-operational period was summarised above. More information is available in the bibliography listed below.

Sáiz, M.C. (2003). Cognitive intervention in young children. In A. Gómez, P. Viguer and M.J Cantero, *Intervención Temprana: Desarrollo óptimo de 0 a 6* años (pp.117-133). Madrid: Pirámide.

Sáiz, M.C. and Román, J.M. (1996). *Cognitive training programme for young children.* Madrid: CEPE.

Sáiz, M.C. & Román, J.M. (2010). *Mentalistic skills development programme*. Madrid: CEPE.

Sáiz, M.C., & Payo, R.J. (2012). *Psychology of Early Childhood Development: A Teaching Project adapted to the European Higher Education Area*. Burgos: Servicio de Publicaciones de la Universidad de Burgos.

Below, an outline is proposed for creating intervention programmes based on the book by Sáiz-Manzanares, M.C. and Román, J.M. (1996). *Programa de entrenamiento cognitivo para niños pequeños.* Madrid: CEPE. Sáiz, M.C. & Román, J. M. (2010). This programme is structured in intervention units using the following scheme:

1.- Objectives.

2.- Assessment indicators per unit.

3.- Tasks.

4.- Materials.

5.- Generalisation activities.

The Cognitive Training Programme for young children is aimed at children aged four to seven years or older with developmental difficulties. Both the programme and the assessment instruments allow for an individual analysis of each child. The programme addresses the following units of therapeutic intervention:

Unit 1: Attentional skills. Works on the development of the basic prerequisites for learning: attention, imitation, following instructions.
Unit 2: Relaxation skills. Work on relaxation practice by segmentation.
Unit 3: Discrimination skills of the different weather conditions. This is a regular activity in the Infant Education curriculum and is the starting point for the modelling technique.
Unit 4: Thinking aloud skills (I). This is the key unit in the whole programme. Through the figure of a pet, children are helped in the acquisition of general strategies in problem solving processes:

1.- Focusing attention. Through the question "What is my problem?
2.- Planning: Through the question: "How am I going to do it?
3.- Continuous evaluation of the process: "How am I doing?
4.- General self-evaluation of the whole process: "How did I do it?

Unit 5: Thinking aloud skills (II). Using the solving process from unit 4, we work on the task of discriminating geometric figures.
Unit 6: Skills to develop alternative plans. Using the solving process from unit 4 applied to a puzzle solving task.
Unit 7: Verbal labelling skills I. Using the solving process from Unit 4 applied to a solving task of finding items equal to.
Unit 8: Verbal labelling skills II. Using the solving process from unit 4 applied to a solving task of looking for distinct items that.
Unit 9: Phonetic and semantic discrimination skills. Using the resolution process from unit 4, we work on phonetic and verbal discrimination tasks, which are common in the second cycle of the infant education curriculum.
Unit 10: Auditory inhibition skills. Using the resolution process from unit 4, listening tasks are worked on in which children must develop inhibition processes when they hear the key word.
Unit 11: Interpersonal problem solving skills (I). Using the resolution process from unit 4, the development of interpersonal problem solving begins. We work on situations of happiness, anger, sadness, reinforcing positive feelings as opposed to negative ones.
Unit 12: Categorisation skills. Using the solving process from unit 4, the children are introduced to the importance of categorisation in decision making before solving a problem.

Unit 13: Ability to identify causes. Using the resolution process from unit 4, consequential thinking is worked on.
Unit 14: Thinking aloud skills (III). Using the resolution process from unit 4. Role-talking is worked on in the solving process. Also, the maze solving task.
Unit 15: Interpersonal problem solving skills (II). Using the solving process from unit 4, the child is encouraged to start thinking of more than one solution to a problem.
Unit 16: Ability to identify meaningful sentences. Using the resolution process from unit 4, we work on the analysis of meaningful sentences using consequential thinking.
Unit 18: Ability to generate consequences (I). Using the resolution process from unit 4, we work on consequential thinking.
Unit 19: Ability to generate consequences (II). Using the resolution process from unit 4, we work on consequential thinking.
Unit 20: Auditory inhibition skill (II). using the resolution process from unit 4, we work from consequential thinking.
Unit 21: Ability to generate consequences (III). Using the solving process from unit 4, subjects are asked to find more than one consequence to the solutions given.
Unit 22: Ability to evaluate (I). Using the resolution process from unit 4, we work from the categorisation of: security-insecurity.
Unit 23: Inductive thinking skills. Using the solving process from unit 4, inductive thinking is worked on.
Unit 24: Ability to evaluate (II). Using the resolution process from unit 4, we work from the categorisation of: "fair-unfair".
Unit 25: Ability to evaluate (III). Using the resolution process from unit 4, we work from the categorisation of: "good-bad feelings".
Unit 26: Ability to evaluate (IV). Using the resolution process from unit 4, we work from the categorisation of: "effectiveness-non-effectiveness".
Unit 27: Ability to evaluate (V). Using the resolution process from unit 4, we work on the resolution of an interpersonal problem using all of the previously seen categorisation criteria.
Unit 28: Ability to evaluate (VI). Using the resolution process from unit 4, the resolution of an interpersonal problem is worked on using all the previously seen categorisation criteria.
Unit 29: Ability to evaluate (VII). Using the resolution process from unit 4, we work on the resolution of an interpersonal problem using all the previously seen categorisation criteria.

The programme from Sáiz-Manzanares, M.C. , and Román, J.M. (2010) is also provided as an example. *Mentalistic skills development programme*. Madrid: CEPE. This programme is structured in intervention units that follow the same scheme as the previous programme:

1.- Objectives.

2.- Assessment indicators per unit.

3.- Tasks.

4.- Materials.

5.- Generalisation activities.

The Mental Skills Development Programme for young children is aimed primarily at children between 4 and 7 years of age, although it can be applied at other ages to establish or reinforce the development of the mental skills described, as well as in the

framework of special education with respect to pathologies associated with deficits in the acquisition or development of task resolution and/or in the acquisition or development of mental skills. This programme provides a series of assessment instruments that allow the teacher to study individual children through the analysis of tasks during problem-solving processes, facilitating the assessment of competences related to cognitive and metacognitive content in mental tasks. The units covered by the programme are described below.

Unit 1: Interpersonal problem-solving skills (I). This unit begins the work on interpersonal problem solving. Problem-solving strategies applied from the four steps of metacognitive resolution are proposed (Meichenbaum and Goodman, 1969; Camp and Bash, 1985): "What is my problem?", "How can I solve it properly?", "Am I following the strategies I thought of?", "How did I do?". The self-instructional training is based on the identification of feelings of joy, sadness and anger, reinforcing positive feelings as opposed to negative ones. The intervention structure is as follows:

1.- Focusing attention, through the first image and the question: "What is my problem?" or "What is my task?", we will try to make the child aware of what they have to do, what they have to solve.

Planning: in order to satisfactorily solve a task or problem of any kind, it is necessary to think about the strategies to be used. There needs to be a process of analysis between the possible answers and their consequences. This is a complex step in the processing and analysis of information that will require the subject to make a precise study of both the task and the appropriate strategies to solve it. The teacher or therapist models the process through the second figure by asking "How can I do it" or "What do I have to do to solve it? Here the development of planning thinking is worked on.

3.- Continuous evaluation of the process: The solver has to reflect on whether the solving process they are following agrees with what they planned. Systematic feedback of the process is essential in order to be able to modify it if necessary. We work with the third image by asking: "How am I doing?", thus developing self-evaluative thinking.

4.- General self-evaluation of the whole process. It is very important that the solver develops self-evaluative thinking, so that they learn to self-reinforce when they have resolved a task or situation well and to manage tolerance to frustration when they have not done so and can in this case begin to resolve the task again. To do this, the therapist uses the fourth slide with the question: "How did I do?"

Unit 2: Ability to identify causes and effects of actions (I).

Work begins on the development of causal and consequential thinking. It is important to initiate children in analysis before making decisions. All behaviour has causes (antecedents) and also consequences (consequents). In other words, a series of consequences will follow from the answers they give to a problem. Children are taught to analyse the factors for and against, so that the consequences do not come as a surprise later on.

Unit 3: Ability to identify causes and effects of actions (II).

This unit continues the work started in unit 2 on the development of causal and consequential thinking.

Unit 4: Ability to identify the mental states of others (I).

Role-taking (putting oneself in the other person's place) is worked on to solve a task or a problem. It starts by considering the mental states of the other person and giving a solution to a problem by thinking from the mental state of another person and not from one's own.

Unit 5: Ability to identify the mental states of others (II).

The work described in unit 4 is followed up in a variety of situations.

Unit 6: Ability to identify the mental states of others (III).

The work described in unit 4 is followed up in a variety of situations.

Unit 7: Ability to generate consequences (I).

In this unit we try to increase the difficulty and ask the children to indicate more than one consequence to a problem, and in turn to analyse the possible situational effectiveness of these consequences.

Unit 8: Evaluation skills (I).

This unit aims to increase the difficulty of analysing the processes of solving an interpersonal task, from the evaluation of the mental states of others and the hypothesis of possible answers to a situation taking into account the mental states of the characters and not one's own.

Unit 9: Evaluation skills (II).

Reinforces the objectives seen in Unit 8.

Unit 10: Evaluation skills (III).
Reinforces the objectives seen in Unit 8.
Unit 11: Ability to use the verb to forget.
This unit aims to introduce children to the conceptualisation of mental verbs such as forgetting. The aim is for the child to analyse the given stories taking into account the mental states of the characters and to use the verb to forget in common, everyday situations.
Unit 12: Ability to use the verb understand.
This unit aims to introduce children to the conceptualisation of mental verbs such as understand. The aim is for the child to analyse the given stories taking into account the mental states of the characters and to use the verb understand in common, everyday situations.
Unit 13: Ability to use the verb to teach.
This unit aims to introduce children to the conceptualisation of mental verbs such as teach. The aim is for the child to analyse the given stories taking into account the mental states of the characters and to use the verb teach in common, everyday situations.
Unit 14: Ability to use the verb wonder.
This unit aims to introduce children to the conceptualisation of mental verbs such as wonder. The aim is for the child to analyse the given stories taking into account the mental states of the characters and to use the verb wonder in common, everyday situations.
Unit 15: Ability to use the verb decide.
This unit aims to introduce children to the conceptualisation of mental verbs such as decide. The aim is for the child to analyse the given stories taking into account the mental states of the characters and to use the verb decide in common, everyday situations.
Unit 16: Ability to use the verb suppose.
This unit aims to introduce children to the conceptualisation of mental verbs such as suppose. The aim is for the child to analyse the given stories taking into account the mental states of the characters and to use the verb suppose in common, everyday situations.
Unit 17: Ability to use the verb comprehend.
This unit aims to introduce children to the conceptualisation of mental verbs such as comprehend. The aim is for the child to analyse the given stories taking into account the mental states of the characters and to use the verb comprehend in common, everyday situations.
Unit 18: Ability to use the verb explain.
This unit tries to introduce children to the conceptualisation of mental verbs such as explain. The aim is for the child to understand the given stories taking into account the mental states of the characters and to use the verb explain in common, everyday situations.
Unit 19: Ability to use the verb learn.
This unit aims to introduce children to the conceptualisation of mental verbs such as learn. The aim is for the child to analyse the given stories taking into account the mental states of the characters and to use the verb learn in common, everyday situations.
Unit 20: Ability to use the verb remember.
This unit aims to introduce children to the conceptualisation of mental verbs such as remember. The aim is for the child to analyse the given stories taking into account the mental states of the characters and to use the verb remember in common, everyday situations.
Unit 21: Ability to use the verb believe.
This unit aims to introduce children to the conceptualisation of mental verbs such as believe. The aim is for the child to analyse the given stories taking into account the mental states of the characters and to use the verb believe in common, everyday situations.
Unit 22: Ability to solve first-order false belief tasks (I).
This unit works on the resolution of first-order false belief tasks. It tries to implement the work done in other units, from the analysis of the mental states of the characters who in this case have a false belief.
Unit 23: Ability to solve first-order false belief tasks (II).
This unit works on the resolution of first-order false belief tasks. It tries to implement the work done in other units, from the analysis of the mental states of the characters who in this case have a false belief. This unit aims to reinforce the work in the previous unit (22).
Unit 24: Ability to solve first-order false belief tasks (III).
This unit works on the resolution of first-order false belief tasks. It tries to implement the work done in other units, from the analysis of the mental states of the characters who in this case have a false belief. It aims to reinforce the work of units 22 and 23.

3.5. Steps to initiate the development of an early intervention programme

The steps to start the development of a therapeutic intervention programme for 0-6 year-olds are outlined below.

1. Study the user's medical history.

2. Assess their current age of development in the different areas (psychomotor, cognitive, communication and language, socialisation and personal autonomy).

3. Establish the difference between the developmental age and the chronological age of the user.

4. Establish priorities of the most affected development area(s).

5. Depending on the professional profile of the therapist, choose the corresponding area and start drawing up the intervention programme, always based on collaborative and interdisciplinary work.

6. The programme should include objectives, evaluation indicators, activities, materials, spaces, start date, follow-up date and results. A record template is recommended, such as the example attached.

Objectives	Evaluation indicators	Activities	Materials	Spaces	Start date	Follow-up date	Results

Summary

This module dealt with the development of early care programmes aimed at children aged 0-6 years, split into two periods, 0-3 and 3-6. We reviewed the evolutionary milestones of the two developmental periods, sensorimotor and pre-operational. We looked at examples of pre-existing programmes for both periods, as well as a general outline for creating therapeutic intervention programmes.

Glossary

This topic does not have a specific glossary as the concepts have been explained throughout the module.

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