DOCUMENT RESUME

ED 220 999 EC 150 021

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TITLE An Early Childhood Intervention Curriculum Matrix.
INSTITUTION George Peabody Coll. for Teachers, Nashville Tenn. John F. Kennedy Center for Research on Education and Human Development.
PUB DATE Aug 81
NOTE 70p.; Prepared through the Family, Infant and Toddler Project.
AVAILABLE FROM George Peabody Coll. of Vanderbilt Univ., John F. Kennedy Center for Research on Education and Human Development, Information Services, Box 40, Nashville, TN 37203 ($3.00).

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS Communication Skills; Concept Formation; *Curriculum Development; *Developmental Disabilities; Early Childhood Education; High Risk Persons; *Intervention; *Learning Activities; *Mental Retardation; Motor Development; Number Concepts; Perceptual Motor Coordination; Skill Development; Spatial Ability; Teaching Methods

ABSTRACT

The paper describes an approach for identifying intervention strategies, techniques, procedures, and activities designed to enhance the developmental competencies of handicapped, mentally retarded, developmentally disabled, and at risk children (birth to 4 years of age). Curriculum procedures are classified according to domains of intervention and whether the intervention strategies are a primary or secondary source of activities for facilitating a given set of competencies. The paper is divided into four major sections. In the first section, the intervention domains included on a curriculum matrix are operationally described and defined. The second section describes the general procedure that can be followed in using the curriculum matrix. The curriculum matrix itself is presented in the third section. Matrixes are provided for developmental age ranges of birth to 1 year, 1 to 2 years, 2 to 3 years, and 3 to 4 years. Curriculum intervention procedures are categorized according to the following areas: gross motor, personal-social, hearing and speech, eye-hand coordination, manipulation, prequantitative reasoning, object permanence, means-ends abilities, vocal imitation, gestural imitation, causality, spatial relationships, schemes for relating to objects, nonverbal/verbal communication, and preoperational concepts. A curricula bibliography makes up the fourth section. (Author/SW)

AN EARLY CHILDHOOD INTERVENTION CURRICULUM MATRIX

Carl J. Dunst, Ph.D.

Family, Infant and Toddler Project
John F. Kennedy Center for Research on Education and Human Development
George Peabody College of Vanderbilt University

The Family, Infant and Toddler Project is a model demonstration project for providing educational services to young mentally retarded children and their families in rural settings. Based in Middle Tennessee, FIT Project staff members work with children age birth through four, their families, and the local professionals and agencies who assist them.

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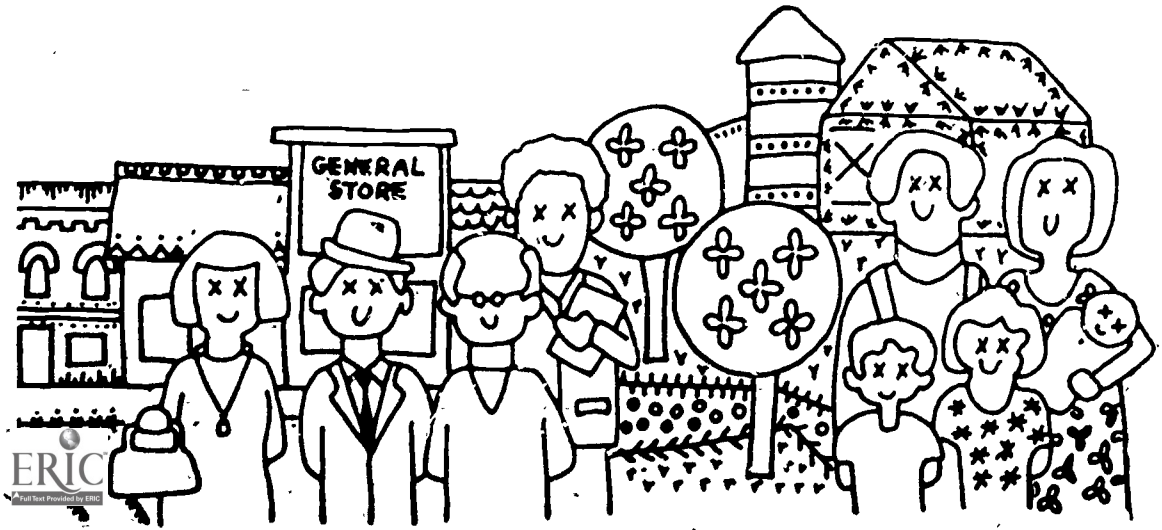

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August, 1981

An Early Childhood Intervention Curriculum Matrix

This monograph describes an approach for identifying intervention strategies, techniques, procedures, activities, etc. designed to enhance the developmental competencies of handicapped, mentally retarded, developmentally disabled, and at-risk children--birth to four years of age. It goes beyond a simple compliation (Cross, Chitty & Goin, 1975; Dunst, 1973a; 1973b, 1976) or description (Harbin & Cross, 1975; Thorum, 1976) of curriculum procedures; the monograph classifies curriculum procedures according to (a) domains of intervention and (b) whether the intervention strategies are a primary or secondary source of activities for facilitating a given set of competencies.

The monograph is divided into four major sections. In the first section, the intervention domains included on the curriculum matrix are operationally described and defined. The second section describes the general procedure that can be followed in using the curriculum matrix. The curriculum matrix itself is presented in the third section of the monograph. The curricula bibliography is included in section four.

SECTION I

Definitions of the Intervention Domains

The curriculum matrix classifies intervention strategies and procedures according to 15 domains of intervention: gross motor, personal-social, hearing and speech, eye-hand coordination, manipulation/performance, pre-quantitative reasoning, object permanence, means-ends abilities, vocal imitation, gestural imitation, causal understanding, spatial relationships, scheme for relating to objects, nonverbal and verbal communication, and preoperational thought. The first 13 of these areas are domains on the Griffiths (1954, 1970) and Uzgiris and Hunt (1975) assessment instruments. The nonverbal and verbal communication domain is based on a communicative development sequence proposed by Dunst (1978a). The preoperational thought domain is based on Piaget's (1962) descriptions of the genesis of cognitive competence.

While perhaps other assessment instruments or other theoretical models could have been used as a means for classifying curriculum procedures, the Dunst (1978a), Griffiths (1954, 1970), an Uzgiris and Hunt (1975) scales have been found to have general utility for identifying a child's particular intervention needs. These assessment procedures include a wide range of both social and nonsocial developmental competencies, assess a child's ability to both initiate and respond to different stimuli, tap progressively more complex behaviors in the genesis of different developmental competencies, and permit a good estimation of a child's developmental capabilities in specific rather less global terms--perhaps the most important criterion for the design of appropriate intervention procedures. Consequently, these scales can be used as criterion measures of performance in determining a child's strengths and weaknesses, and monitoring the progress a child makes.

Moreover, because the intervention strategies and procedures are taken from independent sources of activities--rather than developed from the assessment instruments themselves--test training, a primary flaw in the evaluation of intervention efforts (see Dunst & Rheingrover, in press), is avoided. Still further, progress made in domains for which intervention is provided (e.g., gross motor) can be compared to progress in nonintervention areas (e.g., vocal imitation and personal-social development) to gauge the efficacy of the intervention efforts (see especially Dunst, 1978b; Dunst & Rheingrover, in press). Since one cannot possibly intervene in 15 areas simultaneously, this type of evaluation is built into the intervention model.

As a basis for discerning the specific content of each intervention domain, we next define and describe the nature of the competencies of the separate areas. These descriptions are synopses of the item content of the Dunst (1978a), Griffiths (1954, 1970), and Uzgiris and Hunt (1975) scales.

Gross Motor

The gross motor (locomotor) scale on the Griffiths' tests measure a variety of progressively more complex landmarks in the genesis of independent ambulation. Like most motor scales, the Griffiths tests include items that assess the child's ability to roll over, sit independently, crawl and creep, ascend and descend stairs, walk, run, and jump. Two things, however, make this scale particularly unique. First, the scale measures different levels of the same competency, and thus make detecting minor changes in behavior possible. For example, there are five levels or degrees of crawling behavior included on this scale. Second, most of the items are very pragmatic, and thus are ecologically valid measures of gross motor development. For example, items such as "sits well in a chair," "stoops" to pick up a toy, and "can seat him/herself at a table" are several such pragmatic indices of gross motor development.

Personal-Social

Three general types of personal-social behaviors are measured on this scale: social responsiveness/orientation, self-help skill development, and self-concept. The social responsiveness/orientation items assess a variety of behaviors indexing a child's social-affective and social interactive developmental competencies. The self-help skill items measured the extent to which a child eats and drinks independently, dresses and undresses oneself, and has bowel and bladder control. The self-concept items index both mirror image responsiveness and knowledge of body parts. What makes the personal-social scale particularly appealing in terms of intervention is the diversified type of social-adaptive competencies measured--thus increasing the interventionist's knowledge and awareness of the broad based nature of early personal-social development.

Hearing and Speech

The hearing and speech scale assesses a child's acquisition of progressively more complex prelinguistic vocalizations, vocabulary size, and receptive language abilities. The scale also measures a child's knowledge of colors and his/her use of personal pronouns. Of particular value is the fact that spontaneous as well as elicited vocal and verbal behaviors receive credit in determining a child's repertoire of speech and language competencies. This permits one to assess the extent to which a child's language is stimulus controlled (elicited) or is used spontaneously for communicative purposes in response to the child's individual needs.

Eye-Hand Coordination

This scale measures the genesis of behaviors involving the coordination between the eye and hand. At the earliest levels of development, progressively more complex forms of visually directed reaching behaviors are assessed. Response-contingent manipulative behaviors (reaches for and shakes bell, strikes one object with another, etc.) are included on this scale in the second half of the first year. The second year items include scribbling, building towers of cubes, "constructive" object play, and throwing and dropping objects. Stringing beads, imitating both crayon strokes and the drawing of geometric shapes, and the use of scissors dominate the third and fourth year items. Overall, the eye-hand coordination scale taps heterogeneous types of perceptual-motor behaviors.

Manipulation

The manipulation (performance) scale measures two general types of behaviors: object play and orientation, and spatial-perceptual capabilities. The object play and orientation items include behaviors such as hand-mouth coordination, manipulative play with paper, placing objects into containers, and the transfer of objects hand-to-hand. These are all first year items. The second, third, and fourth year items measure, primarily, the progressively more complex behaviors in the genesis of formboard type actions. The formboard sequence have been found to be of particular value for the appropriate introduction of different types of puzzles designed to enhance the acquisition of a child's perceptual-motor competencies.

Pre-Quantitative

The pre-quantitative (practical reasoning) scale measures the following types of behaviors: repeating digits, recognition of currency, size discrimination, weight discrimination, and number concepts. The scale measures many of the pre-quantitative behaviors emphasized as part of curricula in the majority of preschool programs for both developmentally disabled and developmentally normal children. Unlike the other Griffiths scales already discussed (which measure performances from birth to six years), the pre-quantitative scales begin at the three year level.

Object Permanence

The object permanence scale measures a child's progressive understanding of the independent existence of objects--particularly when objects are not in view of the child. The object permanence concept is considered by many the paramount attainment of the sensorimotor period. If, for example, a child is ever to be able to verbalize about objects, persons, and events that have been experienced previously, the child must be able to retain an image of these entities--a representational

manifestation of object permanence. The sequence of steps in the genesis of object permanence include visually searching for objects moving outside the visual field, anticipating the reappearance of an object, securing objects hidden through both visible and invisible displacements, and the recreation of a sequence of hiding events in order to obtain a desired object.

Means-Ends Abilities

The behaviors in the means-ends abilities sequence tap progressively more complex behaviors in the genesis of problem-solving skills. Obtaining an object held within the visual field, using a support and a string to obtain, respectively, objects placed on and attached to it, using a stick as a tool to obtain an object out-of-reach, and engaging in foresight (preplanned) means-to-ends behaviors are the major types of landmarks on this scale. As Uzgiris (1981) has pointed out, the means-ends abilities scale measures the child's understanding of in order to concepts: in order to obtain an object--grasp it, in order to get a toy out-of-reach--use a stick as an extention of the arm, etc. The genesis of problem-solving skills involves the child learning to engage in anticipatory strategies where the goal is first identified and the appropriate means to obtain the goal is "called into play".

Vocal Imitation

The vocal imitation scale measures a child's ability to reproduce (i.e, imitate) five progressively more complex types of vocal behaviors: cooing, babbling, familiar words, unfamiliar sound patterns, and unfamiliar words. Unfamiliar sounds and words are those which the child neither says on a consistent basis nor hears frequently within the home or other environments in which the child spends his/her time. According to Uzgiris (1976), vocal imitation is one type of psychosocial problem-solving behavior. The child takes the modeled sound as the goal, and attempts to progressively modify his/her vocal behavior to match that of the person producing the modeled behavior. The child's modification of his/her behavior is considered the means toward attaining the desired goal.

Gestural Imitation

The child's ability to imitate four types of gestural behaviors are assessed by the gestural imitation scale. These are: simple, visible gestures (e.g., patting); complex, visible gestures (e.g., pat-a-cake); unfamiliar, visible gestures (e.g., snapping the fingers); and unfamiliar, invisible gestures (e.g., tapping the top of the head). Visible gestures are actions the child can see him/herself perform, whereas invisible gestures are actions that the child cannot see him/herself perform. Like vocal imitation, Uzgiris (1976) considers gestural imitation a psychosocial problem-solving type behavior. This domain measures nine major

steps in the genesis of the child's ability to imitate and repeat behaviors viewed moments, hours, and days before--an indication of the child's ability to retain an image of the modeled action--also a representational behavior.

Causality

This scale measures the child's progressive understanding of cause-effect actions. Seven levels (types) of causal behaviors are assessed: hand watching, repeating an action to produce reinforcing consequences, use of idiosyncratic behaviors (procedures) to reinstate interesting spectacles, touching an object or person as a causal act, use of nonverbal gestures as causal acts, activating a wind-up toy following demonstration, and searches and finds the causal mechanism to activate a toy. The paramount attainments of causal development involves the child being able to infer a cause given an effect, and anticipate an effect given a particular cause. The causality scale is particularly unique because it taps the progressive understanding of psychosocial actions. For the most part, very little attention has been paid to the genesis of psychosocial competencies, and the causality scale helps reverse this trend when it is used as a basis for determining intervention needs.

Spatial Relationships

The spatial relationship scale taps a child's progressive understanding of relationships that do or can exist between different objects, and his/her ability to place objects in different spatial configurations. According to Uzgiris and Hunt (1975), spatial relationship concepts involves the child constructing spatial images of his/her world. While many of the items on this scale are also found on traditional psychometric infant tests, the emphasis is less on fine-motor type behaviors (e.g., building towers of cubes) and more on the understanding of spatial relationship type concepts (in, on, gravity, position, location, etc.).

Schemes for Relating to Objects

This scale assesses the child's acquisition of differentiated social and nonsocial play and interactions with objects and persons. At first, the child applies indiscriminately the same behaviors to nearly all objects (e.g., mouthing). Through repeated experiences and opportunities to engage in play with objects, the child comes to use objects in particular ways (banging blocks, shaking rattles, throwing balls, etc.). Still further, the child learns both the social and nonsocial use of objects. At the highest levels of development in this sequence, the child is both able to spontaneously name objects and engage in symbolic play type behaviors. The schemes for relating to objects scale is quite different than most developmental scales, primarily because no items

are administered, rather a child's level of development is determined based on his/her's spontaneous interaction with persons and objects. Lambert and Saint-Remi (1979) recently reported the results of a study which indicated that the scheme scale proved useful in the assessment of profoundly retarded children where traditional infants tests were found to be inappropriate.

Communication Development

This domain concerns itself with the genesis of nonverbal and verbal communication. Dunst (1978) outlined six major levels (types) of communicative competence: behavior state (e.g., stopping crying when picked up), recognitory (e.g., smiling upon seeing a familiar person), contingency (e.g., repeating arm movements to how an adult repeats a lap game), instrumental (e.g., extending the arms out to be picked up), triadic (e.g., using a ball as a means to initiate a game of "catch"), and linguistic (e.g., using the word "more" to request some juice). In this sequence, progressively more complex types of communicative behaviors are considered to replace or be integrated with lower level communicative acts. In the acquisition of communicative competence, a child is considered to move from the use of idiosyncratic gestures and sounds to the use of socially recognized verbalizations--the paramount attainment of early communicative development.

Pre-Operational

As used here, the term pre-operational is used synonymously with the term symbolic function (Piaget, 1962). Piaget designates the ability to differentiate a signifier (e.g., words) from the signified (objects, persons, events, etc.) as a symbolic function. Besides language, imagination, deferred imitation, representational thought, and symbolic play are characteristic of pre-operational thought. The inclusion of this area as an interven ion domain is intended to ensure that a child's repertoire of symbolic-representational behavior are enhanced as part of intervention efforts.

SECTION II

How to Use the Curriculum Matrix

The curriculum matrix itself is organized along four dimensions: (a) domains of intervention, (b) curricular/intervention procedures, (c) developmental age range of the curricular/intervention procedures, and (d) whether the curricular/intervention procedures are a primary or secondary source of activities/strategies designed to enhance developmental competencies. A primary source of activites/strategies is one which is specifically designed to enhance the type of competencies so indicated. A secondary source of activities/strategies is one which includes related procedures, and may be useful for facilitating or expanding the child's repertoire of the types of behaviors so indicated.

To use the curriculum matrix, one needs to first know at what age range (birth to one year, one to two years, two to three years, or three to four years) the child is functioning in the domain(s) of interest. This can be determined using formal assessment procedures such as the Griffiths or Uzgiris and Hunt Scales, informal developmental checklists, and/or observational procedures. Once the child's developmental status is established or estimated, the interventionist enters the curriculum matrix at the appropriate age range, and identifies which curricula/ intervention procedures include both primary and secondary sources of activities designed to enhance developmental competencies in the domains in which intervention is to be provided. For example, if a child was found to be functioning at a seven month level in vocal imitation, and this area was targeted as an intervention domain, the birth to one year matrix would be examined to determine which curricula/intervention procedure were designed to enhance the acquisition of vocal imitation abilities.

The use of the curriculum matrix in the manner just described allows the interventionist to identify appropriate activities/strategies without having to individually examine all the curriculum/intervention procedures listed in the curriculum bibliography.

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SECTION III

COMPILATION OF INFANT AND PRESCHOOL CURRICULA/INTERVENTION PROCEDURES: BIRTH TO 4 YEARS

DEVELOPMENTAL AGE RANGE: Birth - 1

P: Primary Source of Activities
S: Secondary Source of Activities

Curricula/Intervention procedures	Gross Motor	Personal-Social	Hearing and Speech	Eye-hand Coordination	Manipulation	Pre-quantitative Reasoning	Object Permanence	Means-Ends Abilities	Vocal Imitation	Gestural Imitation	Causality	Spatial Relationships	Schemes for Relating to Objects	Nonverbal/Verbal Communication	Preoperational
Alpiner et al. (nd)			P						S					S	
Badger (1973)		P		P	S		P	P	P	P	P	P	P	S	
Banus (1979)	P	S	P	P	P							P			
Bardwell (nd)	P	P	P	P	P		P	P		S		P	P		
Bell (1973)		P	P	P	S							P			
Bobath (1967)	P														
Bricker et al. (1977)	P	P	P	P	P		P	P	P	S	P	P	P	S	
Bunker (1978)	P			P	P							P	S		
Buttram & Brown (nd)	P			P	S							S			
Campbell (1974)	P			P	S			S			S		S		
Cohen & Gross (1979)	P	P	S	P	P		P	P	P	P	P	P	P		

COMPILATION OF INFANT AND PRESCHOOL CURRICULA/INTERVENTION PROCEDURES: BIRTH TO 4 YEARS

DEVELOPMENTAL AGE RANGE: Birth - 1

P: Primary Source of Activities
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Curricula/Intervention procedures	Gross Motor	Personal-Social	Hearing and Speech	Eye-hand Coordination	Manipulation	Pre-quantitative Reasoning	Object Permanence	Means-Ends Abilities	Vocal Imitation	Gestural Imitation	Causality	Spatial Relationships	Schemes for Relating to Objects	Nonverbal/Verbal Communication	Preoperational
Connor et al. (1978)	P	P	P	S	S		S	S	S	S	S	S	S	P	
Cratty (1969)	P			P	S							S			
DeVore (1977)	P	P	S	P	P							P		S	
Dunst (in press)		P	P	S	S		P	P	P	P	P	P	P	P	
Dunst et al. (1976)	P	P	P	P	S		P	P	P	P	P	P	P	P	
Finnie (1974)	P	P	P												
Folio et al. (1976)	P											P			
Forsberg et al. (1977)	P	P	P	P	P		S	P	S	S	P	P	P	S	
Foster (1974)	P	P	P	P	P		P	P	P	P	S	P	S	S	
Fricthl & Peterson (1970)	P														
Furono (1979)	P	P	P	P	P		P	P	P	P	P	P	P	S	
Gates (1972)	P		P	P	P							P			
20														21	

COMPILATION OF INFANT AND PRESCHOOL CURRICULA/INTERVENTION PROCEDURES: BIRTH TO 4 YEARS

DEVELOPMENTAL AGE RANGE: Birth - 1

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Gordon (1970)							P	P	P	P	P	P			
Griffin and Sanford (1975)	P	P	P	P	S		S	S	S	S	S	S			
Hansen (1977)	P	P	P	P						P		P	S	P	
Johnson & Werner (1975)	P	P	P	P	P					P		P			
Joseph (1973)	P	P	P	P	P		S	S	S	S	S	P	S		
Koch (1976)	P	S	S	P	P		S	P			S	P	P	S	
Koontz (1974)	P	P	P	P	P							P			
Lehane (1976)	S	S	S	P	P		P	P	P	P	P	P	P	P	
Levy (1974)	P														
Linde & Kopp (1973)	P	P	P	S	S							S			
McDiarmid et al. (1975)	P	P	P	P	P		P	P	P	P	S	P	P	S	
McGagin (nd)	P	P	P	P	P							P			
McLain et al. (1978)		S	P						S	P	S			P	

COMPILATION OF INFANT AND PRESCHOOL CURRICULA/INTERVENTION PROCEDURES: BIRTH TO 4 YEARS

DEVELOPMENTAL AGE RANGE: Birth - 1

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S: Secondary Source of Activities

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Meier & Malone (1978a)	P	P	P	P	P		P	P			P	P	S		
Mueller (1972)		P	P											S	
Northcott (1972)	P	P	P												
O'Brien (1976)	P	P	P												
Painter (1970)		P	P	P	P		P	P	S	P	P	P	P	S	
Prudden (1964)	P														
Prudden & Sussman (1972)	P														
PSEP (1972)	P	P	P	P	P			P			S	P			
Quick (1973)	P	P	P	P	P							P			
Quick & Campbell (1976)	P	P	P	P	P				S			P	P		
Robinson & Robinson (1978)							P	P	P	P	P	P	P		
Schafer & Moersch (1977)	P	P	P	P	P		P	P	P	P	P	P	P		
Schearer et al. (1978)	P	P	P	P	P							P			

COMPILATION OF INFANT AND PRESCHOOL CURRICULA/INTERVENTION PROCEDURES: BIRTH TO 4 YEARS

DEVELOPMENTAL AGE RANGE: Birth - 1

P: Primary Source of Activities
S: Secondary Source of Activities

Curricula/Intervention procedures	Gross Motor	Personal-Social	Hearing and Speech	Eye-hand Coordination	Manipulation	Pre-quantitative Reasoning	Object Permanence	Means-Ends Abilities	Vocal Imitation	Gestural Imitation	Causality	Spatial Relationships	Schemes for Relating to Objects	Nonverbal/Verbal Communication	Preoperational
Seger et al. (1970)	P	P	P	P	P							P			
Sitnick et al. (1978)			P											P	
Sparling & Lewis (1979)		P	P	P	S		S	S	S	S	P	S	P	P	
Snell (1978)		P		S									S		
Stephens (1977)							P	P	S	S	P	P	P	P	
Tilton et al. (1972)	P	P	P	P	P		S	S	S	S	S	P	S	S	
Tronick & Greenfield (1973)		P	P	P	P		P	P	S	S	S	P	P	S	

COMPILATION OF INFANT AND PRESCHOOL CURRICULA/INTERVENTION PROCEDURES: BIRTH TO 4 YEARS

DEVELOPMENTAL AGE RANGE: 1 - 2 Years

P: Primary Source of Activities
S: Secondary Source of Activities

Curricula/Intervention procedures	Gross Motor	Personal-Social	Hearing and Speech	Eye-hand Coordination	Manipulation	Pre-quantitative Reasoning	Object Permanence	Means-Ends Abilities	Vocal Imitation	Gestural Imitation	Causality	Spatial Relationships	Schemes for Relating to Objects	Nonverbal/Verbal Communication	Preoperational
Abramo et al. (1975)		P	P						P	P				P	
Adams (1975)	P	P	P	P											
Adler et al. (nd)	P		P	P	S				S	S		S		S	
Alpiner et al. (nd)			P											S	
Anderson & Greer (1976)	P	P	P	P	P		S	S				P	S		
Badger (1973)		P		P	S		P	P	P	P	P	P	P	S	
Baker et al. (nd)		S	P						P	P				S	
Banus (1979)	P		P	P	P							P			
Bardwell (nd)	P	P	P	P	P		P	P		S		P	P		
Bell (1973)		P	P	P	S							P			
Bender & Bender (1979)	P	P	P	P	S							S			
Bobath (1976)	P														
Bricker et al. (1977)	P														
Bricker & Dennison (1978			P						P	P			P		

COMPILATION OF INFANT AND PRESCHOOL CURRICULA/INTERVENTION PROCEDURES: BIRTH TO 4 YEARS

DEVELOPMENTAL AGE RANGE: 1 - 2 Years

P: Primary Source of Activities
S: Secondary Source of Activities

Curricula/Intervention procedures	Gross Motor	Personal-Social	Hearing and Speech	Eye-hand Coordination	Manipulation	Pre-quantitative Reasoning	Object Permanence	Means-Ends Abilities	Vocal Imitation	Gestural Imitation	Causality	Spatial Relationships	Schemes for Relating to Objects	Nonverbal/Verbal Communication	Preoperational
Bricker et al. (1976)			P						P	P			P		
Bricker et al. (1973)			P						P	P			P		
Brown & Donovan (1979)	P	P	P	P	P		P	P	P	S	P	P	P	S	
Bunker (1978)	P			P	P							P	S		
Buttram et al. (nd)	P			P	S							S			
Chalfant (1972)	P	P	P	S	P							S			
Cohen & Gross (1979)	P	P	S	P	P		P	P	P	P	P	P	P		
Connor et al. (1978)	P	P	P				S	S	S	S	S	S	S	P	
Cratty (1969)	P			P	S							S			
DeVore (1977)	P	P	S	P	P							P		S	
Dunst (in press)		P	P	S	S		P	P	P	P	P	P	P	P	
Fallen & McGovern (1978)	P	P	P										P		
Finnie (1974)	P	P	P												
Follo et al. (1976)	P			P	P							P			

COMPILATION OF INFANT AND PRESCHOOL CURRICULA/INTERVENTION PROCEDURES: BIRTH TO 4 YEARS

DEVELOPMENTAL AGE RANGE: 1 - 2 Years

P: Primary Source of Activities
S: Secondary Source of Activities

Curricula/Intervention procedures	Gross Motor	Personal-Social	Hearing and Speech	Eye-hand Coordination	Manipulation	Pre-quantitative Reasoning	Object Permanence	Means-Ends Abilities	Vocal Imitation	Gestural Imitation	Causality	Spatial Relationships	Schemes for Relating to Objects	Nonverbal/Verbal Communication	Preoperational
Forsberg et al. (1977)	P	P	P	P	P		S	P	S	S	P	P	P	S	
Frankel et al. (1975)	P			P	P							P			
Fricthl & Peterson (1970)	P														
Furono et al. (1979)	P	P	P	P	P		P	P	P	P	P	P	P	S	
Gates (1972)	P		P	P	P							P			
Gordon (1970)							P	P	P	P	P	P	P		
Griffin & Sanford (1975)	P	P	P	P	S		S	S	S	S	S	S	S		
Hackett (1970)	P														
Hansen (1977)	P	P	P	P						P				P	
Hare & Hare (1977)	P		P	P	P							P			
Hoffman & Mottala (1971)		P	P	P	P										
Horstmeier et al. (1978)			P						P	P			P		
Johnson & Werner (1975)	P	P	P	P	P					P		P			
Joseph (1973)	P	P	P	P	P		S	S	S	S	S	P	S		

COMPILATION OF INFANT AND PRESCHOOL CURRICULA/INTERVENTION PROCEDURES: BIRTH TO 4 YEARS

DEVELOPMENTAL AGE RANGE: 1 - 2 Years

P: Primary Source of Activities
S: Secondary Source of Activities

Curricula/Intervention procedures	Gross Motor	Personal-Social	Hearing and Speech	Eye-hand Coordination	Manipulation	Pre-quantitative Reasoning	Object Permanence	Means-Ends Abilities	Vocal Imitation	Gestural Imitation	Causality	Spatial Relationships	Schemes for Relating to Objects	Nonverbal/Verbal Communication	Preoperational
Koontz (1974)	P	P	P	P	P							P			
LaCrosse et al. (1974)	P	P	P	P	P							P			
Lehane (1976)	S	S	S	P	P		P	P	P	P	P	P	P	P	
Levy (1974)	P														
Linde & Kopp (1973)	P	P	P												
McDiarmid et al. (1975)	P	P	P	P	P		P	P	P	P	P	P	P	S	
McGagin (nd)	P	P	P	P	P							P			
McLain et al. (1978)		S	P						S	P	S			S	
Meier & Malone (1978a)	P	P	P	P	P		P	P			P	P	S		
Molloy (1972)	P	P	P	P	P							P	S		
Northcott (1972)	P	P	P												
O'Brien (1976)	P	P	P												
Painter (1970)		P	P	P	P		P	P	S	P	P	P	P	S	
Perry (nd)	P	P	P	P	P							P			

COMPILATION OF INFANT AND PRESCHOOL CURRICULA/INTERVENTION PROCEDURES: BIRTH TO 4 YEARS

DEVELOPMENTAL AGE RANGE: 1 - 2 Years

P: Primary Source of Activities
S: Secondary Source of Activities

Curricula/Intervention procedures	Gross Motor	Personal-Social	Hearing and Speech	Eye-hand Coordination	Manipulation	Pre-quantitative Reasoning	Object Permanence	Means-Ends Abilities	Vocal Imitation	Gestural Imitation	Causality	Spatial Relationships	Schemes for Relating to Objects	Nonverbal/Verbal Communication	Preoperational
Popovich (1977)	P	P	P	P	S					P		S			
Prudden (1964)	P														
Prudden & Sussman (1972)	P														
PSEP (1972)	P	P	P	P	P			P			S	P			
Quick (1973)	P	P	P	P	P							P			
Quick & Campbell (1976)	P	P	P	P	P				S			P	P		
Reger (1970)	P			P	P							P	S		
Robinson & Robinson (1978)							P	P	P	P	P	P	P		
Schafer & Moersch (1977)	P	P	P	P	P		P	P	P	P	P	P	P		
Schearer et al. (1973)	P	P	P	P	P							P			
Seger et al. (1970)	P	P	P	P	P							P			
Sitnick et al. (1978)			P											P	
Sparling & Lewis (1979)		P	P	P	S		S	S	S	S	P	S	P	P	
Snell (1978)		P		S									S		

DEVELOPMENTAL AGE RANGE: 1 - 2 Years

P: Primary Source of Activities
S: Secondary Source of Activities

Curricula/Intervention procedures	Gross Motor	Personal-Social	Hearing and Speech	Eye-hand Coordination	Manipulation	Pre-quantitative Reasoning	Object Permanence	Means-Ends Abilities	Vocal Imitation	Gestural Imitation	Causality	Spatial Relationships	Schemes for Relating to Objects	Nonverbal/Verbal Communication	Preoperational
Stephens (1978)							P	P	S	S	P	P	P		
Tilton et al. (1972)	P	P	P	P	P		S	S	S	S	S	P	S		
Tronick & Greenfield (1973)		P	P	P	P		P	P	S	S	S	P	P	S	

COMPILATION OF INFANT AND PRESCHOOL CURRICULA/INTERVENTION PROCEDURES: BIRTH TO 4 YEARS

DEVELOPMENTAL AGE RANGE: 2 - 3 Years

P: Primary Source of Activities
S: Secondary Source of Activities

Curricula/Intervention procedures	Gross Motor	Personal-Social	Hearing and Speech	Eye-hand Coordination	Manipulation	Pre-quantitative Reasoning	Object Permanence	Means-Ends Abilities	Vocal Imitation	Gestural Imitation	Causality	Spatial Relationships	Schemes for Relating to Objects	Nonverbal/Verbal Communication	Preoperational
Abramo et al. (1975)		P	P						P	P				P	
Adams (1975)	P	P	P	P	S	P									
Adler et al. (1976)	P		P	P	S									S	
Alpiner et al. (nd)			P												
Anderson & Greer (1976)	P	P	P	P	P										
Badger (1973)		P		P		S			P					S	S
Baker et al. (nd)		S	P						P	P				S	
Banus (1979)	P		P	P	P										
Bell (1973)		P	P	P	S										
Bender & Bender (1979)	P	P	P	P	S	P									
Bobath (1967)	P														
Bricker & Dennison (1978)			P						P	P			P		
Bricker et al. (1976)			P						P	P			P		
Bricker et at. (1973)			P						P	P			P		

COMPILATION OF INFANT AND PRESCHOOL CURRICULA/INTERVENTION PROCEDURES: BIRTH TO 4 YEARS

DEVELOPMENTAL AGE RANGE: 2 - 3 Years

P: Primary Source of Activities
S: Secondary Source of Activities

Curricula/Intervention procedures	Gross Motor	Personal-Social	Hearing and Speech	Eye-hand Coordination	Manipulation	Pre-quantitative Reasoning	Object Permanence	Means-Ends Abilities	Vocal Imitation	Gestural Imitation	Causality	Spatial Relationships	Schemes for Relating to Objects	Nonverbal/Verbal Communication	Preoperational
Brown & Donovan (1979)	P	P	P	P	P				S			S		S	
Bunker (1978)	P			P	P								S		
Butterfield et al. (1974)			P			P							P		
Cahoon (1974)						P									P
Chalfant et al. (1972)	P	P	P	S	P										
Coffman (1968)						P									P
Cohen & Gross (1979)	P	P	S	P	P	P	P	P	P	P	P	P	P		P
Cohen & Talbort (1970)		S	P	P	P	P									S
Connor et al. (1978)	P	P	P											S	
Cratty (1969)	P			P	S										
DeVore (1977)	P	P	S	P	P									S	
Dunst (in press)		P	P											P	
Engel (1968)				P											
Fallen & McGovern (1978)	P	P	P			P									S

COMPILATION OF INFANT AND PRESCHOOL CURRICULA/INTERVENTION PROCEDURES: BIRTH TO 4 YEARS

DEVELOPMENTAL AGE RANGE: 2 - 3 Years

P: Primary Source of Activities
S: Secondary Source of Activities

Curricula/Intervention procedures	Gross Motor	Personal-Social	Hearing and Speech	Eye-hand Coordination	Manipulation	Pre-quantitative Reasoning	Object Permanence	Means-Ends Abilities	Vocal Imitation	Gestural Imitation	Causality	Spatial Relationships	Schemes for Relating to Objects	Nonverbal/Verbal Communication	Preoperational
Finnie (1974)	P	P	P												
Folio & DuBose (1976)	P			P	P										
Forsberg et al. (1977)	P	P	P	P	P	S		S	S	S	S	P		S	
Frankel et al. (1975)	P			P	P	P									
Furono (1979)	P	P	P	P	P	P								S	P
Gates (1972)	P		P	P	P										
Gordon et al. (1972)	P	P	P	P	P	S							S		S
Griffin et al. (1975)	P	P	P	P	S										
Hackett (1970)	P														
Hansen (1977)	P	P	P	P						P				P	
Hare & Hare (1977)	P		P	P	P	P									
Hoffman & Mottola (1971)		P	P	P	P	P									S
Horstmeier et al. (1978)			P						P	P			P		
Johnson & Werner (1975)	P	P	P	P	P	P				P					S

COMPILATION OF INFANT AND PRESCHOOL CURRICULA/INTERVENTION PROCEDURES: BIRTH TO 4 YEARS

DEVELOPMENTAL AGE RANGE: 2 - 3 Years

P: Primary Source of Activities
S: Secondary Source of Activities

Curricula/Intervention procedures	Gross Motor	Personal-Social	Hearing and Speech	Eye-hand Coordination	Manipulation	Pre-quantitative Reasoning	Object Permanence	Means-Ends Abilities	Vocal Imitation	Gestural Imitation	Causality	Spatial Relationships	Schemes for Relating to Objects	Nonverbal/Verbal Communication	Preoperational
Joseph (1973)	P	P	P	P	P										
Karnes (1968)		S	P												
Koontz (1974)	P	P	P	P	P										
LaCrosse (1974)	P	P	P	P	P	P									
Levy (1974)	P														
Linde & Kopp (1973)	P	P	P												
McDiarmid et al. (o975)	P	P	P	P	P									S	
McGagin (nd)	P	P	P	P	P										
McLean et al. (1978)		S	P						S	P	S			P	
Meier et al. (1978a)	P	P	P	P	P										
Meier & Malone (1978b)	P			P	P	P									P
Lalloy (1972)	P	P	P	P	P	P									
Northcott (1972)	P	P	P												
O'Brien (1976)	P	P	P			P									

COMPILATION OF INFANT AND PRESCHOOL CURRICULA/INTERVENTION PROCEDURES: BIRTH TO 4 YEARS

DEVELOPMENTAL AGE RANGE: 2 - 3 Years

P: Primary Source of Activities
S: Secondary Source of Activities

Curricula/Intervention procedures	Gross Motor	Personal-Social	Hearing and Speech	Eye-hand Coordination	Manipulation	Pre-quantitative Reasoning	Object Permanence	Means-Ends Abilities	Vocal Imitation	Gestural Imitation	Causality	Spatial Relationships	Schemes for Relating to Objects	Nonverbal/Verbal Communication	Preoperational
Osborn & Osborn (1974)						P									
Painter (1970)	P	P	P	P	P										
Perry (nd)	P	P	P	P	P	P									
Perry (1974)	P	P	P												
Popovich (1977)	P	P	P	P	S										
Prudden (1964)	P														
Prudden & Sussman (1972)	P														
PSEP (1972)	P	P	P	P	P	P									
Quick (1973)	P	P	P	P	P										
Quick & Campbell (1978)	P	P	P	P	P	P			S			P			
Reger (1970)	P		S	P	P	S									
Schafer & Moersch (1977)	P	P	P	P	P	S									
Schearer et al. (1973)	P	P	P	P	P										
Sime (1973)	S														

DEVELOPMENTAL AGE RANGE: 2 - 3 Years

P: Primary Source of Activities
S: Secondary Source of Activities

Curricula/Intervention procedures	Gross Motor	Personal-Social	Hearing and Speech	Eye-hand Coordination	Manipulation	Pre-quantitative Reasoning	Object Permanence	Means-Ends Abilities	Vocal Imitation	Gestural Imitation	Causality	Spatial Relationships	Schemes for Relating to Objects	Nonverbal/Verbal Communication	Preoperational
Sitnick et al. (1978)			P											P	
Snell (1978)		P		S											
Sparling & Lewis (1979)		P	P	S	S						P	S	P	P	
Stender-Lavatelli (1970)						P									P
Stephens (1977)						P									P
Stremel & Wargas (1974)		S	P										S	S	
TEECH (1973)	P	P		P		P									
Thomas (1977)		P	P											P	
Tilton et al. (1972)	P	P	P	P	P	P									
Tronick & Greenfield (1973)		P	P	S	S	S			P					P	P
Weikart et al. (1971)			P		P	P									P
Weston et al. (1978)						P									
Whitehurst (1971)			P											P	

COMPILATION OF INFANT AND PRESCHOOL CURRICULA/INTERVENTION PROCEDURES: BIRTH TO 4 YEARS

DEVELOPMENTAL AGE RANGE: 3 - 4 Years

P: Primary Source of Activities
S: Secondary Source of Activities

Curricula/Intervention procedures	Gross Motor	Personal-Social	Hearing and Speech	Eye-hand Coordination	Manipulation	Pre-quantitative Reasoning	Object Permanence	Means-Ends Abilities	Vocal Imitation	Gestural Imitation	Causality	Spatial Relationships	Schemes for Relating to Objects	Nonverbal/Verbal Communication	Preoperational
Abramo et al. (1975)		P	P												
Adams (1975)	P	P	P	P	S	P									
Adler et al. (1976)	P		P	P											
Anderson & Greer (1976)	P	P	P	P	P										
Badger (1973)				P		S								S	S
Baker et al. (nd)		S	P											S	
Banus (1979)	P		P	P	P										
Bell (1973)		P	P	P	S										
Bender & Bender (1979)	P	P	P	P	S	P									S
Biber et al. (1977)		S		S	S	P									P
Bradley et al. (1968)	P		S	P	P										
Bricker & Dennison (1978)			P										P		
Bricker et al. (1976)			P										P		
Bricker et al. (1973)			P										P		

COMPILATION OF INFANT AND PRESCHOOL CURRICULA/INTERVENTION PROCEDURES: BIRTH TO 4 YEARS

DEVELOPMENTAL AGE RANGE: 3 - 4 Years

P: Primary Source of Activities
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Curricula/Intervention procedures	Gross Motor	Personal-Social	Hearing and Speech	Eye-hand Coordination	Manipulation	Pre-quantitative Reasoning	Object Permanence	Means-Ends Abilities	Vocal Imitation	Gestural Imitation	Causality	Spatial Relationships	Schemes for Relating to Objects	Nonverbal/Verbal Communication	Preoperational
Bunker (1978)	P			P	P										
Butterfield et al. (1974)			P			P									S
Cahoon (1974)						P									P
Chalfant et al. (1972)	P	P	P	S	P										
Goffman (1968)						P									P
Cohen & Gross (1979)	P	P	S	P	P	P	P	P	P	P	P	P	P		P
Connor & Talbort (1970)	S	P	P	S	S	P									
Cratty (1969)	P			P											
DeVore (1977)	P	P	S	P	P										
Dunst (in press)		P	P												
Engel (1968)			P												
Fallen & McGovern (1978)	P	P	P			P									S
Folio & DuBose (1976)	P			P	P										
Frankel et al. (1975)	P			P	P	P									

COMPILATION OF INFANT AND PRESCHOOL CURRICULA/INTERVENTION PROCEDURES: BIRTH TO 4 YEARS

DEVELOPMENTAL AGE RANGE: 3 - 4 Years

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Curricula/Intervention procedures	Gross Motor	Personal-Social	Hearing and Speech	Eye-hand Coordination	Manipulation	Pre-quantitative Reasoning	Object Permanence	Means-Ends Abilities	Vocal Imitation	Gestural Imitation	Causality	Spatial Relationships	Schemes for Relating to Objects	Nonverbal/Verbal Communication	Preoperational
Furono (1979)	P	P	P	P	P	S									S
Gates et al. (1972)	P		P	P	P										
Gordon et al. (1972)	P	P	P	P	P										
Hackett (1970)	P														
Hare & Hare (1977)	P		P	P	P	P									P
Hoffman & Mottola (1971)		P	P	P	P	P									S
Horstmeier et al (1978)			P										P		
Johnson & Werner (1975)	P	P	P	P	P	P									S
Karnes (1968)		S	P												
Koontz (1974)	P	P	P	P	P										
LaCrosse et al. (1974)	P	P	P	P	P	P									
Linde & Kopp (1973)	P	P	P												
Meier & Malone (1978b)	P			P	P	P									P
Molloy (1972)	P	P	P	P	P	P									

COMPILATION OF INFANT AND PRESCHOOL CURRICULA/INTERVENTION PROCEDURES: BIRTH TO 4 YEARS

DEVELOPMENTAL AGE RANGE: 3 - 4 Years

P: Primary Source of Activities
S: Secondary Source of Activities

Curricula/Intervention procedures	Gross Motor	Personal-Social	Hearing and Speech	Eye-hand Coordination	Manipulation	Pre-quantitative Reasoning	Object Permanence	Means-Ends Abilities	Vocal Imitation	Gestural Imitation	Causality	Spatial Relationships	Schemes for Relating to Objects	Nonverbal/Verbal Communication	Preoperational
O'Brien (1976)	P	P	P			P									
Osborn & Osborn (1974)						P									P
Perry (1974)	P	P	P												
Popovich (1977)	P	P	P	P	S										
Prudden (1964)	P														
Prudden & Sussman (1972)	P														
PSEP (1972)	P	P	P	P	P	P									S
Quick (1973)	P	P	P	P	P										
Quick & Campbell (1978)	P	P	P	P	P	P							P		
Reger (1970)	P			P	P								P		
Schattner (1971)		P	P			P									S
Schearer et al. (1973)	P	P	P	P	P										
Sime (1973)	S					P									P
Sitnick et al. (1978)			P											S	

COMPILATION OF INFANT AND PRESCHOOL CURRICULA/INTERVENTION PROCEDURES: BIRTH TO 4 YEARS

DEVELOPMENTAL AGE RANGE: 3 - 4 Years

P: Primary Source of Activities
S: Secondary Source of Activities

Curricula/Intervention procedures	Gross Motor	Personal-Social	Hearing and Speech	Eye-hand Coordination	Manipulation	Pre-quantitative Reasoning	Object Permanence	Means-Ends Abilities	Vocal Imitation	Gestural Imitation	Causality	Spatial Relationships	Schemes for Relating to Objects	Nonverbal/Verbal Communication	Preoperational
Snell (1978)		P		S											
Stendler-Lavatelli (1970)						P									P
Stephens (1977)						P									P
Stremel & Wargas (1974)			P											S	
TEECH (1973)	P	P		P	S	P									
Thomas (1977)		P	P												
Tilton et al. (1972)	P	P	P	P	P	P									
Tronick & Greenfield (1973)		P	P			S								P	P
Weikart et al. (1971)			P		P	P									P
Weston et al. (1978)						P									
Whitehurst (1971)			P												

SECTION IV

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The Family, Infant and Toddler Project is a model demonstration project for providing educational services to young mentally retarded children and their families in rural settings. Based in Middle Tennessee, FIT Project staff members work with children age birth through four, their families, and the local professionals and agencies who assist them.

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