

Early Development Standards for Children Aged 2 to 12 Months in a Low-Income Setting

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Abstract

The aim of this study was to develop a screening tool to screen children for development problems in a low-income setting. Childhood development problems are a major health issue faced by low-income countries. A validated screening tool is needed for early identification of developmental delays. This article contains the first phase of a study that established a relatively simple tool to screen children for developmental problems. The aim of the first phase was to define a set of development indicators for the period of 2 to 12 months of life. The study methodology consisted of an extensive literature review, to develop a set of indicators to measure child development in infancy. The indicators were placed within a framework developed and used by experts in other countries. It consists of major domains, subdomains, specific aspects, and standards of development. This was followed by content validation of the indicators. Following review of literature, 171 indicators were compiled under the framework. At the end of content validation, 125 indicators were retained in the framework. These were pretested, and another 26 were removed following pretesting. The study developed a framework of indicators that could be used as a development tool following a reference-based validation. The second phase of the study that included the assessment of psychometric characteristics and reference-based validation would be published in a separate article.

Keywords

child development, development screening, development standards

Introduction

Childhood developmental delays and their sequelae are a major public health concern for low-income countries. Grantham-McGregor and colleagues (2007) state that many children in developing countries are exposed to multiple risks for poor development including poverty, poor health, and nutrition. The conservative estimate is that more than 200 million children below 5 years of age in developing countries are not developing to their full potential.

Developmental problems affect both developed and developing countries. For example, in the United Kingdom, an analysis of a cross-sectional survey of 16,000 children aged 0 to 18 years revealed that 7.3% of children were reported as having a developmental disability (Blackburn, Read, & Spencer, 2010). In a comprehensive review done of studies on disability covering intellectual, hearing, speech, vision, motor, and neurologic impairment in low- and middle-income countries (Maulik & Darmstadt, 2007), a 12% overall disability rate was reported among 2- to 9-year-old children from one community-based study in India ($n = 640$).

Early identification of delays by screening is vital, as interventions could make a big difference to the individual

and family, and place less demand on health expenditure (Grantham-McGregor et al., 2007). Development screening of a child is currently measured by a range of developmental screening tests (Frankenburg et al., 1996). Developing countries face a big obstacle in systematic screening due to three factors:

1. Established development screening tools need to be validated to a country before being used.
2. Trained people are needed to administer them.
3. To identify developmental problems, a large number of apparently normal children have to be examined. These three factors require considerable expertise, money, and time, all rare attributes in a developing setup.

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To overcome these obstacles, middle- and low-income countries need instruments that could be used in the field by a primary health care worker or caregiver. Normative development standards for young children called Early Child Development Standards (ECDS) could serve this purpose. Standards are statements that specify an expectation for achievement of skills or knowledge that may be used as a basis of comparison in measuring or judging capacity, quality, value, or quantity (Kagan & Britto, 2008).

The age at which development skills appear can be given as a range. These ranges can be considered as age percentiles. A percentile of a development indicator is the age a particular skill is achievable by a percentage of children. Based on the percentiles, norms can be defined. These norms can be used to make relative assessment of children in relation to their level or status of development (Fernald, Kariger, Engle, & Raikes, 2009).

Development of ECDS therefore consists of two components:

1. development of a tool where early developmental indicators are initially defined and placed in a development framework, and
2. age validation of the tool to obtain ECDS.

The methods adopted to develop ECDS were recommended in two global workshops held in Shanghai, China, and Kathmandu, Nepal (Kagan & Britto, 2008), in collaboration with the United Nations Children's Educational Fund (UNICEF).

Aim

This report gives the first component of a study where a series of early developmental indicators for children in second to 12th months of life were defined and adapted to ensure their content and cultural appropriateness.

Method

Development tools generally use a three- to four-domain approach in categorizing the items. For example, the Bayley's scale uses a three-domain approach (Motor, Cognitive, and Language) in the main scale (Bayley, 2005). The Denver Developmental Screening Test (Frankenburg et al., 1996) uses a three-domain method as well. These scales do not further subdivide the items. The present study further subdivides the items and uses a hierarchy to place the items (refer to Table 1). This hierarchy has been used by countries that have addressed ECDS (Tennessee Department of Education, 2013). In this, there are four domains of development, their subdomains, specific aspects, standards, and indicators. The four major subdomains were utilized as all major development scales used this categorization. The items under the major domains conformed to the placement of items found in

widely used scales such as the Bayley's and Denver Developmental Tool. The subdomains are broad areas of the domain. The specific aspects are the main components of those subdomains. The standards are the expected skills that depict the specific aspects. Standards are measured by the final indicators. The indicators are very specific statements that can be actually measured.

Once the skills are defined, they are made measurable by converting them to indicators; hence, the final hierarchy of a domain is given in Figure 1.

There are several steps involved in developing and validating an instrument. As the first step, an extensive review of literature is needed to operationalize the construct to be measured (Benson & Clarke, 1982). When the construct is operationalized, the items that can measure the construct as accurately as possible are identified. The team that developed the Denver Developmental Tool identified 336 items initially as the components needed to measure development (Frankenburg et al., 1996). In development of the Canadian Early Development Index (EDI), the items for the EDI were derived from existing instruments, key informant interviews, and focus groups (Janus & Offord, 2007). Content validation is the next step where the items and the table of specifications are given to a panel of experts who are asked to place the items in the suitable grids within the table of specifications. When absolute agreement is not reached, the item is revised until a consensus on its placement is reached. Cronbach and Meehl (1955) state that content validity is established by showing that the test items are a sample of a universe in which the investigator is interested.

Development tools can either use an a priori structure to categorize their indicators or an empirically driven method. An empirically driven structure will decide on the categories where the items will be placed following a mathematical evaluation like factor analysis. Most of the widely used scales like Bayley's scale have not used an empirically driven method but utilized an a priori structure method. The Bayley Scales of Infant Development II (BSID II) has been subjected to factor analysis to explore the factor structure. For example, one such study is the analysis carried out by Thompson and others (Thompson et al., 1994). The authors conclude that at a second-order factor analysis, the mental and motor components emerge as discrete constructs. Countries developing ECDS have all used an a priori structure method. The present study uses this method as well. The authors are of the view that as the hierarchy used in the present study consists of numerous categories, it would render it unfeasible to do a construct validity at all levels. But a factor analysis at the topmost category that has the four domains of development could certainly be attempted.

Thus, the first phase of the study is comprised of two components:

- A. desk review to generate a tentative list of relevant indicators and

Table 1. Framework of Domains, Subdomains, Specific Aspects, Standards, and Indicators.

Domain	Subdomain	Specific aspect	Standard
Cognitive Development	Logical Thinking and Numeracy Skills	Comparison and measurement/spatial awareness	<ul style="list-style-type: none"> Child demonstrates the ability to make comparisons and measure to some extent Child develops spatial sense
		Numbers	<ul style="list-style-type: none"> Child demonstrates awareness of numbers
	Environmental Awareness	Scientific inquiry	<ul style="list-style-type: none"> Child develops an inquiring mind Surroundings (people and objects)
		Awareness of world around	<ul style="list-style-type: none"> Shows interest in surroundings (people and objects)
Social and Emotional Development	Approaches to Learning	Awareness of community	<ul style="list-style-type: none"> Child demonstrates an awareness of the community he lives in
		Problem solving	<ul style="list-style-type: none"> Child demonstrates ability to use different strategies for problem solving
	Social	Creativity and imagination	<ul style="list-style-type: none"> Child demonstrates creativity and imagination
		Curiosity and persistence	<ul style="list-style-type: none"> Child demonstrates curiosity and persistence
Language and Early Literacy skills	Language	Relationship with adults	<ul style="list-style-type: none"> Responds to and interacts with familiar adults Identifies unfamiliar people
		Relationship with peer	<ul style="list-style-type: none"> Infant develops positive relationships with peers
	Early Literacy	Prosocial behavior	<ul style="list-style-type: none"> Develops perception of routines Demonstrates awareness of some responsibilities (acts independently) Develops empathy
		Self-concept	<ul style="list-style-type: none"> Demonstrates the development of a positive self-concept
Motor	Language	Self-control	<ul style="list-style-type: none"> Develops the ability to control impulses and regulate himself
		Self-expression	<ul style="list-style-type: none"> Develops the ability to express emotions appropriately
	Early Literacy	Aesthetic appreciation	<ul style="list-style-type: none"> Shows some ability for aesthetic appreciation
		Receptive language	<ul style="list-style-type: none"> Child demonstrates the ability to understand language to some extent
Motor	Expressive language	Expressive language	<ul style="list-style-type: none"> Child demonstrates the ability to express needs, feelings, and experiences for a variety of purposes
		Participating in experiences that include books; discovering and appreciating books	<ul style="list-style-type: none"> Manifests and interest for the book
	Motor	Prereading	<ul style="list-style-type: none"> Demonstrates prereading skills
		Prewriting	<ul style="list-style-type: none"> Demonstrates prewriting skills
Physical Well-Being	Motor	Gross motor	<ul style="list-style-type: none"> Demonstrates ability for movement and coordination
		Fine motor	<ul style="list-style-type: none"> Demonstrates ability to manipulate things briefly/shows visual coordination
	Physical Well-Being	Taken as not applicable	

B. qualitative study to carry out content and cultural validation of the above.

Component A: Desk Review to Generate a Tentative List of Relevant Indicators

The purpose of the desk review was to gather the generic list of expectations on what children should know and be able to do at a given age during the period of 2 to 12 months of their life and to define indicators to reflect them. Therefore, the data items included a comprehensive list of indicators that reflected a particular child's developmental performance pertaining to each developmental domain

(Motor, Socio-emotional, Cognitive, and Language domains). These indicators were finally organized into the hierarchy. The data for the desk review were gathered after review of several sources. These included review of textbooks on child development, existing developmental standards, and developmental scales.

Textbooks reviewed were *Child Development* by John W. Santrock (2001), *Child Psychology: A Contemporary Viewpoint* by Hetherington and Parke (1999), *The Development of Children* by Cole and Cole (1989), *Child Development Principles and Perspectives* by Cook and Cook (2009) and *Psychology: The Science of Behavior* by Neil R. Carlson (1984).

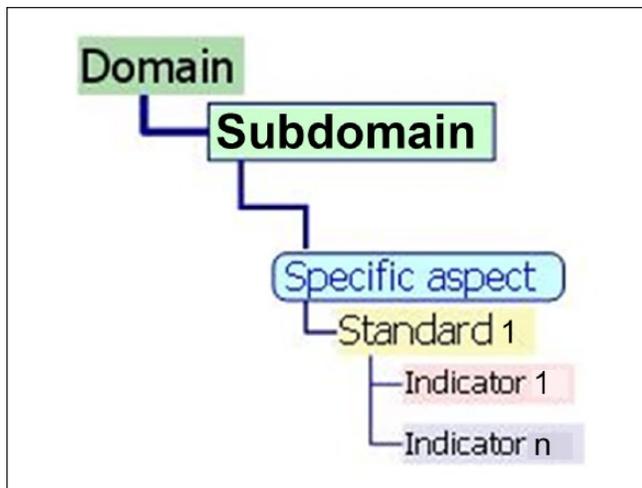


Figure 1. Hierarchy of a domain.

Subsequent to this, a review of articles on ECDS in the form of an electronic search was done to cover the standards and indicators already developed in the world. The articles were the following:

1. "South Africa National Early Learning and Development Standards for children birth to four years. Department of Basic Education, Pretoria, South Africa" (Department of Basic Education, Pretoria, 2009).
2. "Revised Tennessee Early Learning Developmental Standards" (Tennessee Department of Education, 2013)
3. Ohio's infant and toddler guidelines (U.S. Department of Health and Human Services, National Infant & Toddler Child Care Initiative, Child Care Bureau, Office of Family Assistance, Administration for Children and Families, 2006).
4. "Washington state early learning and development guidelines." (Washington State Department of Early Learning, 2011)
5. "Macedonia Early Learning and Development Standards from 0-6 years" (Damovska, Janeva, Palcevaska, Panova, & Shaehu, 2006).

Searches in Medline (1970 to present), PsycINFO (1960 to present), and Embase (1960 to present) did not yield any additional information. The search terms used were "development," "child," and "standards." A keyword search and a title search were done.

Next, scales of development commonly in use were reviewed. These were the Bayley Scales of Infant and Toddler Development (Bayley, 2005), the Denver Developmental Screening Tool (Frankenburg et al., 1996), the Parents' Evaluation of Development Status (Glascoc, 1997), and the Ten Questions Screening Interview (Landers & Kagitcibasi, 1990).

Additional items appearing in these instruments which did not include highly specified test material and items that were not too complex so that it would be understood by the average caregiver were included.

Finally, a comprehensive list of items was obtained, and they were assigned to the domain, subdomain, specific aspect, and standard hierarchy. They were placed in the relevant age groups reflecting the ages of 2 to 3 months, 3 to 6 months, 6 to 9 months, and 9 to 12 months.

The indicators chosen had the following characteristics:

- Reflecting only a single skill or activity
- Being specific for a particular skill
- Having the ability to capture the performance as the skill advances

Qualitative Study to Carry Out Content and Cultural Validation

This was to assess whether the indicators were comprehensive in covering the domains, were actually reflecting the domain under which they were included, and were actually reflecting the specific aspects and standards given. Modified Delphi technique was used for this process. For this, six experts comprising of three local consultant pediatricians (two qualified in developmental pediatrics), two psychologists, and a consultant child psychiatrist were utilized.

They were requested to go through each indicator with regard to the following and give their verdict:

1. Comprehensiveness of the standards and indicators in covering all aspects of the domain.
2. Adequacy in reflecting the scope of the domain.
3. Reflection of the standard, specific aspect, subdomain, and domain under which they were included.
4. Representation of domains in comparatively equal distribution.
5. Observability and measurability.
6. Are a reflection of what children in the age group are expected to know and be able to do.

After the initial round, the comments were analyzed for each item. If four or more out of six agreed on an indicator, it was taken as valid and included in the final instrument. If four or more experts disagreed, they were removed from the list. If three agreed, those indicators were again presented to all six experts. After completion of the second round, if the disagreement still stood at 50% (three disagreeing), the item was removed.

The finalized list of indicators at the end of this phase was transformed into measurable items with the help of a pediatrician involved in development assessment of children. This was brought about by laying out specific instructions to elicit a skill. To maintain uniformity in testing, a testing procedure had to be explained precisely so that the data collectors could

conform to the procedure. The Bayley Scales of Infant and Toddler Development was consulted to decide on the positions, objects, and distance that items should be held when testing was done.

Next, a focus group discussion (FGD) of parents was held to gather information required to fine-tune the indicators to ensure their cultural appropriateness. Four FGDs were held on four different occasions, each consisting of eight parents. The indicators were then pretested. Pretesting was done using 10 children from age category. All the indicators in the age group were administered and assessed whether any difficulty arose to their observability.

Results

Following the first component which was the desk review, 171 indicators were compiled under the framework. They were organized under 25 standards which reflected 23 specific aspects in four main domains of development. Table 1 gives the framework of domains, subdomains, specific aspects, and standards.

Tables 2-5 give the 171 indicators arranged in the framework. Some indicators appeared in more than one age group as the indicators which suited the best age group could be selected once they were age validated.

Out of the 171 indicators, 46 indicators were removed at the end of content validation. Tables 6 and 7 summarize how these indicators were reduced during content validation.

As 46 indicators were removed at the end of content validation, 125 indicators proceeded to the next step of the study which was the FGD with parents to ensure cultural appropriateness. Although removal of 48 indicators is shown, in actuality, only 46 indicators were removed as two were relocated elsewhere. No major modifications were needed following the FGDs.

The development framework with the 125 indicators is given in Tables 8-11

Next, the indicators were pretested. Following pretesting, 26 indicators had to be removed due to issues in measurability. Table 12 gives the indicators removed following pretesting.

Discussion

Due to lack of trained personnel and funds, developing countries are not in a position to hold a regular development screening program. Recognizing this fact, several countries have developed ECDS. The ECDS developed in this study was used as a pilot to develop national standards for child development in Sri Lanka. The first objective of the study was to define a set of tentative indicators to reflect the development in the four domains of development. This took the form of a desk review that generated a tentative list of indicators. The indicators were placed in the development framework described in the methodology. The main issue faced by

the researchers was that most literature on child development gives indicators only under the four main domains. Fitting these indicators into the framework was a complicated task. The dearth of measurable indicators in the social and cognitive domains was another issue.

During content validation, the domain in which the most number of indicators was removed was the socio-emotional domain. Twenty-four were removed as they were not observable, and three were removed as they were too advanced for the given age groups in which the indicator would be tested. The reason for this is that social and emotional skills depict an unquantifiable aspect of a person and therefore are more qualitative than quantitative. Development scales like the Bayley Scales of Infant and Toddler Development therefore do not include socio-emotional skills in their scoring component (Bayley, 2005). Indicators for social development skills taken from Western literature tend to cause issues when used in a non-Western setup. In a preliminary survey done for the Malawi Developmental Assessment Tool, it was found that a significant amount of social indicators taken from Western literature had to be discarded as they did not qualify following a logistic regression analysis to obtain population norms (Gladstone et al., 2010).

The Cognitive domain had altogether 14 indicators removed. Eight of these indicators were initially placed under the two standards: (a) comparison and sorting and (b) spatial awareness which were in the subdomain Logical Thinking and Mathematics in the Cognitive domain. The issue arose as to whether these standards were applicable in infancy. Although it is said that mathematical skills operate even in early infancy, there is a problem in including it in an instrument for two reasons. First, it cannot be accurately said that functions like comparison and sorting operate in very early life. Although research has found that even newborns have rudimentary mathematical knowledge (Cook & Cook, 2009), there is not enough evidence to include these skills in a document such as this.

In the Language domain, four indicators were removed as they overlapped with other indicators in measuring the standard.

In the Motor domain, only one indicator was removed as it was not objectively measurable. This domain shows indicators that are less complicated and have fewer aspects than other domains. This could be the reason that indicators belonging to this domain form the bulk in assessment systems of child development in the first half of the 20th century (Gessel & Amatruda, 1947). Improvements in psychometrics in the latter half of the century have made it possible to measure less straightforward aspects in development like socio-emotional components.

Conclusion

The development indicators in the framework could be used as a tool to screen children for development delays after undergoing a reference-based validation. The second part of

Table 2. Indicators for Age 2 to 3 Months.

Domain: Physical Development	Domain: Social and Emotional Development	Domain: Cognitive Development	Domain: Development of Language and Early Literacy Skills
Subdomain: Motor	Subdomain: Social Development	Subdomain: Logical Thinking and Mathematics	Subdomain: Language
Specific aspect: Gross motor	Specific aspect: Relationship with adults	Specific aspect: Comparison, measurement, and spatial awareness	Specific aspect: Receptive language
Standard 1: Demonstrates ability of movement and coordination	Standard 1: Responds to and interacts with familiar adults	Standard 1: Child demonstrates the development of comparison and measurement concepts	Standard 1: Responds to sights and sounds
1. Turns head from side to side when lying on back	9. Follows the caregiver with eyes	21. Watches actions of others	31. Startles, cries, or wakes when there is a loud sound
2. Raise head and chest when lying on stomach	10. Stops crying when familiar voice is heard	22. Reacts to disappearance of caregiver's face	32. Attentive when spoken to
3. Holds head erect and steady when held on shoulder	11. Cuddles into caregiver's shoulder when being held (trusts)	23. Reacts to caregiver/people/objects	33. Focuses on objects and sound-making toys
4. Extends and flexes legs at will	Specific aspect: Relationship with peers	24. Looks at own hands and observes	34. Recognizes mother's voice and is soothed by it
5. Follows moving person through midline to left and right	Standard 2: Infant develops positive relationships with peers	Standard 2: Child develops spatial sense	Specific aspect: Expressive language
6. Moves arm at sight of toy or object	12. Looks in direction of a child nearby	25. Explores object placed in hands	Standard 2: Uses sounds and body movements to communicate
Specific aspect: Fine motor	13. Smiles/coos in response to older children's attention	Specific aspect: Numbers	35. Produces soft, gurgling sounds
Standard 2: Demonstrates ability to hold things briefly/shows visual coordination	Specific aspect: Prosocial behavior	Standard 2: Child demonstrates awareness of numbers	36. Smiles in response to speaker's attention
7. Eyes follow an object from left to right/top to bottom (cognitive)	Standard 3: Develops perception of routine	Not applicable to this age group	37. Makes sound of comfort and displeasure
8. A small object placed in hand is accepted and brought to the mouth	Subdomain: Emotional Development	Subdomain: Awareness of the Environment	Subdomain: Early Literacy
	Specific aspect: Self-concept	Specific aspect: Scientific inquiry	Specific aspect: Participating in experiences that include books; discovering and appreciating books
	Standard 4: Demonstrates the development of a positive self-concept	Standard 3: Child develops an inquiring mind	Standard 3: Shows an interest in books
	14. Uses crying to signal needs	26. Looks at surroundings in a new place	Specific aspect: Prereading
	15. Conveys desires—Makes vocal protests when not picked up when he wants	27. Waves arms to touch dangling toy overhead	Specific aspect: Prewriting
	Specific aspect: Self-control		

(continued)

Table 2. (continued)

Domain: Physical Development	Domain: Social and Emotional Development	Domain: Cognitive Development	Domain: Development of Language and Early Literacy Skills
<p>Standard 5: Develops the ability to control impulses and regulate himself</p> <p>16. Stops crying on seeing a familiar person</p> <p>17. Calms self—Sucks on hand before going to sleep</p> <p>Specific aspect: Self-expression</p> <p>Standard 6: Develops the ability to express emotions appropriately</p> <p>18. Uses specific kinds of sounds to signal needs</p> <p>19. Is responsive to an adult's attempts to comfort—Relaxes when massaged</p> <p>20. Conveys primary desires such as hunger—Protests when not picked up when he wants</p>	<p>Standard 4: Shows interest in surroundings (people and objects)</p> <p>28. Focuses on objects which are at close range</p> <p>29. Gazes continuously at objects for at least 3 s</p> <p>30. Child freely turns eyes/head in visual exploration of surroundings</p> <p>Specific aspect: Awareness of the community</p> <p>Standard 5: Child demonstrates an awareness of the community he lives in</p> <p>Subdomain: Approaches to learning</p> <p>Specific aspect: Curiosity, initiative, and persistence</p> <p>Specific aspect: Creativity and imagination</p> <p>Standard 6: Child demonstrates creativity and imagination</p> <p>Specific aspect: Problem solving</p> <p>Standard 7: Child demonstrates ability to use different strategies for problem solving</p>	<p>Specific aspect: Awareness of living and nonliving world</p> <p>Standard 4: Shows interest in surroundings (people and objects)</p> <p>28. Focuses on objects which are at close range</p> <p>29. Gazes continuously at objects for at least 3 s</p> <p>30. Child freely turns eyes/head in visual exploration of surroundings</p> <p>Specific aspect: Awareness of the community</p> <p>Standard 5: Child demonstrates an awareness of the community he lives in</p> <p>Subdomain: Approaches to learning</p> <p>Specific aspect: Curiosity, initiative, and persistence</p> <p>Specific aspect: Creativity and imagination</p> <p>Standard 6: Child demonstrates creativity and imagination</p> <p>Specific aspect: Problem solving</p> <p>Standard 7: Child demonstrates ability to use different strategies for problem solving</p>	

Table 3. Indicators for 3 Plus to 6 Months.

Domain: Physical development	Domain: Social and Emotional Development	Domain: Cognitive Development	Domain: Development of Language and Early Literacy Skills
Subdomain: Motor	Subdomain: Social Development	Subdomain: Logical Thinking and Mathematics	Subdomain: Language
Specific aspect: Gross motor Standard 1: Demonstrates ability of movement and coordination	Specific aspect: Relationship with adults Standard 1: Responds to and interacts with familiar adults	Specific aspect: Comparison and sorting/spatial awareness	Specific aspect: Receptive language
1. Supports upper body on arms when lying on stomach	6. Coos or smiles when talked to	Standard 1: Child develops ability to compare and sort	
2. Swipes at dangling objects with hands and feet	7. Kicks legs or reaches with arms when familiar person approaches	18. Sorts out familiar faces from among a group	
3. Rolls both ways (front to back, back to front)—Rolls to prone position	8. Looks at and touches the face of someone familiar who moves in closer to baby	Standard 2: Develops spatial sense	
	9. Smiles or laughs in response to tickling	No indicators for this age group	
Specific aspect: Fine motor Standard 2: Demonstrates ability to hold things briefly/shows visual coordination	Standard 2: Identifies unfamiliar people	Specific aspect: Numbers	Standard 1: Child demonstrates the ability to understand expressions and body language
4. Can follow a circular motion of an object (upper and lower quadrants as well)	10. Reaches to a familiar adult to be picked up when a stranger greets him	Standard 3: Child demonstrates awareness of numbers	30. Begins to turn head toward sounds that are out of sight
5. Rotates wrist from palm up to palm down when manipulating an object	11. Facial expressions change at the sight of an unfamiliar person	No indicators for this age group	31. Responds appropriately to tone of speaker's voice (distressed when harsh, happy when pleasant)
	Specific aspect: Relationship with peers Standard 3: Infant develops positive relationships with peers		32. Identifies familiar sounds and responds
	12. Directs smiles and vocalizations toward other infants/babies		Specific aspect: Expressive language
	13. Looks toward a peer who is interacting with an interesting object		Standard 2: Child demonstrates the ability to express needs, feelings, and experiences for a variety of purposes
	Specific aspect: Prosocial behavior Standard 4: Develops perception of routines		33. Laughs out loud
			34. Imitates short string of vowel sounds (double sounds—Ba . . . Ba)
			35. Makes sounds that go up and down in pitch
			36. Likes to babble
			Specific aspect: Language Comprehension
			Standard 4: Child demonstrates the ability to comprehend gestures and sounds
			37. Responds to mother's/caregiver's gestures—Responds when mother calls him
Subdomain: Emotional Development	Subdomain: Awareness of the Environment	Subdomain: Early Literacy	Subdomain: Early Literacy
Specific aspect: Self-concept	Specific aspect: Scientific inquiry	Specific aspect: Participating in experiences that include books; discovering and appreciating books	

(continued)

Table 3. (continued)

Domain: Physical development	Domain: Social and Emotional Development	Domain: Cognitive Development	Domain: Development of Language and Early Literacy Skills
<p>Standard 5: Demonstrates the development of a positive self-concept</p> <p>14. Responds positively to adults' attempts to comfort</p> <p>15. Conveys desires/needs through sounds</p> <p>Specific aspect: Self-control</p> <p>Standard 6: Develops the ability to control impulses and regulate himself</p> <p>Specific aspect: Self-expression</p> <p>Standard 7: Develops the ability to express emotions appropriately</p> <p>16. Uses sounds/facial expressions or actions to show preferences</p> <p>Specific aspect: Aesthetic appreciation</p> <p>Standard 8: Shows some ability for aesthetic appreciation</p> <p>17. Calms when sung to/falls asleep listening to music/lullabies</p>	<p>Standard 4: Child develops an inquiring mind</p> <p>19. Grabs and probes objects</p> <p>20. Reaches out toward objects</p> <p>21. Visually follows object as it moved out of direct line of vision</p> <p>Specific aspect: Awareness of living and nonliving world</p> <p>Standard 5: Shows interest in surroundings (people and objects)</p> <p>22. A toy is held, touched, and tasted</p> <p>23. Inspects own hands</p> <p>24. Eye moves from one object to another in response to sound</p> <p>25. Prefers novel object</p> <p>Specific aspect: Awareness of the community</p> <p>Standard 6: Child demonstrates an awareness of the community he lives in</p> <p>26. Discriminates family members from others</p> <p>27. Shows awareness of unfamiliar surroundings</p> <p>Subdomain: Approach to Learning</p> <p>Specific aspect: Curiosity, initiative, and persistence</p> <p>Specific aspect: Creativity and imagination</p> <p>Standard 7: Child demonstrates creativity and imagination</p> <p>28. Shows delight in producing sounds—Smacks lips, squeals on purpose</p> <p>Specific aspect: Problem solving</p> <p>Standard 8: Child demonstrates ability to use different strategies for problem solving</p> <p>29. Pulls a cloth with rattle on it to obtain rattle</p>	<p>Standard 3: Shows an interest in books</p> <p>38. Looks intently at pictures for several seconds with thoughtful expression</p> <p>Specific aspect: Prereading</p> <p>Specific aspect: Prewriting</p>	

Table 4. Indicators for 6 Plus to 9 Months.

Domain: Physical development	Domain: Social and Emotional Development	Domain: Cognitive Development	Domain: Development of Language and Early Literacy Skills
Subdomain: Motor	Subdomain: Social Development	Subdomain: Logical Thinking and Mathematics	Subdomain: Language
Specific aspect: Gross motor	Specific aspect: Relationship with adults	Specific aspect: Comparison and sorting and spatial sense	Specific aspect: Receptive language
Standard 1: Demonstrates ability for movement and Coordination	Standard 1: Responds to and interacts with familiar adults	Standard 1: Child develops ability to compare and sort	Standard 1: Child demonstrates the ability to understand expressions and body language
1. Moves from lying down to sitting position	9. Smiles when familiar person smiles or talks	23. Pulls a string attached to a toy making it come closer	37. Temporarily stops action in response to "no"
2. Can sit unsupported	10. Babbles and coos to get attention of someone familiar nearby	Specific aspect: Numbers	Specific aspect: Expressive language
3. Supports whole weight on legs when adult is holding both hands	Standard 2: Identifies unfamiliar people	Standard 3: Child demonstrates awareness of numbers	Standard 2: Child demonstrates the ability to express needs, feelings, and experiences for a variety of purposes
4. Holds railing to move from sitting to standing position	11. Stops activity and stares at a new person entering room	Indicators	38. Vocalizes in response to speaker's attention
	Specific aspect: Relationship with peers	No indicators for this age group	39. Vocalizes at least two different vowel sounds
	Standard 3: Infant develops positive relationships with peers		40. Begins to babble in strings—Ba-ba-ba
	12. Kicks feet in excitement at sight of other child/children		Specific aspect: Language Comprehension
Specific aspect: Fine motor	13. Uses hands to explore face/hair of peer		Standard 3: Child demonstrates the ability to comprehend gestures and sounds
Standard 2: Demonstrates ability to hold things/shows visual coordination	Specific aspect: Prosocial behavior		41. Complies with a request— Examiner shows placement of cube in box and requests baby to do same
5. Grasps and object with thumb and first and second fingers	Standard 4: Develops perception of routines		
6. Bangs two hand-held items together	14. responds positively to when feeding time approaches		
7. Transfers objects from hand to hand	15. Complies with bathing/washing		
8. Moves his head to search for object which has fallen from the table	Standard 5: Develops empathy		
	16. Watches with an expression of distress when another child cries		
	Standard 6: Develops the ability to cooperate		
	17. Begins to watch other children in a group and shows interest in their play		
	Subdomain: Emotional Development	Subdomain: Awareness of the Environment	Subdomain: Early literacy
	Specific aspect: Self-concept	Specific aspect: Scientific inquiry	Specific aspect: Participating in experiences that include books; discovering and appreciating books
	Standard 5: Demonstrates the development of a positive self-concept		

(continued)

Table 4. (continued)

Domain: Physical development	Domain: Social and Emotional Development	Domain: Cognitive Development	Domain: Development of Language and Early Literacy Skills
<p>18. Does not release an object easily</p> <p>19. Tries to grab object from other's hand</p> <p>Specific aspect: Self-control</p> <p>Standard 6: Develops the ability to control impulses and regulate himself</p> <p>20. Seeks reassurance from adult when encountering new experience</p> <p>Specific aspect: Self-expression</p> <p>Standard 7: Develops the ability to express emotions appropriately</p> <p>21. Makes responses to express how he feels about what is happening</p> <p>Specific aspect: Aesthetic appreciation-</p> <p>Standard 8: Shows some ability for aesthetic appreciation</p> <p>22. Enjoys kids songs</p>	<p>Standard 4: Child develops an inquiring mind</p> <p>24. Explores inside and outside surface of objects—for example, cup</p> <p>25. Repeatedly turns and object over</p> <p>26. Explores and inspects the smallest details floor</p> <p>27. Discovers difference between moving and static objects</p> <p>Specific aspect: Awareness of living and nonliving world</p> <p>Standard 5: Shows interest in surroundings (people and objects)</p> <p>28. Searches for fallen object</p> <p>29. Plays with mirror: image by patting, smiling/laughing, reaching playfully</p> <p>30. Holds bell by handle and purposefully bangs it</p> <p>Specific aspect: Awareness of the community</p> <p>Standard 6: Child demonstrates an awareness of the community he lives in</p> <p>31. Knows difference between mother and grandmother</p> <p>32. Recognizes different rooms in the home</p> <p>Subdomain: Approaches to Learning</p> <p>Specific aspect: Curiosity, initiative, and persistence</p> <p>Specific aspect: Creativity and imagination</p> <p>Standard 7: Child demonstrates creativity and imagination</p> <p>33. Child enjoys noises—Bangs objects together over and over again</p> <p>34. Uses body to make sounds—Splashes water, slaps objects</p> <p>Specific aspect: Problem solving</p> <p>Standard 8: Child demonstrates ability to use different strategies for problem solving</p> <p>35. Pulls cloth on table to obtain object</p> <p>36. Searches for item that has been covered completely (covering bangle with cloth)</p>	<p>Standard 4: Shows an interest in books</p> <p>42. Holds book using both hands and manipulates the book to make the pages open</p> <p>Specific aspect: Prereading</p> <p>Specific aspect: Prewriting</p>	

Table 5. Indicators for 9 Plus to 12 months.

Domain: Physical Development	Domain: Social and Emotional Development	Domain: Cognitive Development	Domain: Development of Language and Early Literacy Skills
<p>Subdomain: Motor</p> <p>Specific aspect: Gross motor</p> <p>Standard 1: Demonstrates ability for movement and coordination</p> <ol style="list-style-type: none"> 1. Crawls forward on hands and knees 2. Raises self to standing position using a chair/other aid 3. May walk 2 to 3 steps without support 4. Can pivot in the sitting position <p>Specific aspect: Fine motor</p> <p>Standard 2: Demonstrates ability to manipulate things briefly/shows visual coordination</p> <ol style="list-style-type: none"> 5. Uses thumb and first finger to pick up things 6. Puts objects into a container and takes objects out of a container 7. When given a cube, opens his hand and extends it when requested but does not release it 	<p>Subdomain: Social Development</p> <p>Specific aspect: Relationship with adults</p> <p>Standard 1: Responds to and interacts with familiar adults</p> <ol style="list-style-type: none"> 8. Reaches to the caregiver when hurt or upset 9. Actively clings or cries when familiar person says good bye 10. Tugs on caregiver or makes noises when felt ignored <p>Standard 2: Identifies unfamiliar people</p> <ol style="list-style-type: none"> 11. Needs to be comforted or close to the caregiver on arrival of an unfamiliar person 12. Demonstrates joy when caregiver returns after being away 	<p>Subdomain: Logical Thinking and Mathematics</p> <p>Specific aspect: Comparison and measurement</p> <p>Standard 1: Child demonstrates the ability to make comparisons and measure to some extent</p> <ol style="list-style-type: none"> 23. Uses props as aids—Uses a chair to stand up 24. Begins to enjoy putting items in a container/getting objects out of a container <p>Standard 2: Child develops spatial sense</p> <ol style="list-style-type: none"> 25. Explores inside and outside surface of objects <p>Specific aspect: Numbers</p> <p>Standard 4: Child demonstrates awareness of numbers</p> <p>Indicators</p> <p>No indicators for this age group</p>	<p>Subdomain: Language</p> <p>Specific aspect: Receptive language</p> <p>Standard 1: Child demonstrates the ability to understand language to some extent</p> <ol style="list-style-type: none"> 38. Follows one-step routines when presented with gestures—Clapping hands 39. Knows own name and responds by looking when called 40. Understands the names of familiar objects (leg, cup chain, etc.) by pointing or touching them when they are uttered. <p>Specific aspect: Expressive language</p> <p>Standard 2: Child demonstrates the ability to express needs, feelings, experiences for a variety of purposes</p> <ol style="list-style-type: none"> 41. Vocalizes to get attention 42. Produces at least two different distinct consonant sounds 43. May say a word—“ba” for bottle, “ma” for mother 44. Uses at least one gesture to make wants known 45. Babbles extensively <p>Specific aspect: Language Comprehension</p>
<p>Specific aspect: Relationship with peers</p> <p>Standard 3: Infant develops positive relationships with peers</p> <ol style="list-style-type: none"> 13. Tries to imitate playing with the toy after watching peer play with it 14. Watches intently when older children play 15. Crawls into an adult’s lap if adult is talking with other children <p>Specific aspect: Prosocial behavior</p> <p>Standard 4: Develops perception of routines</p> <ol style="list-style-type: none"> 16. Shows anticipation of meal times 	<p>Subdomain: Awareness of the Environment</p> <p>Specific aspect: Scientific inquiry</p> <p>Standard 5: Child develops an inquiring mind</p> <ol style="list-style-type: none"> 26. Repeatedly turns an object over 27. Explores and inspects the smallest details—for example, bread crumbs fallen on the floor, beads—Also given in previous age group <p>Specific aspect: Awareness of living and nonliving world</p> <p>Standard 6: Shows interest in surroundings (people and objects)</p> <ol style="list-style-type: none"> 28. Regards one or more familiar pictures with interest 	<p>Specific aspect: Expressive language</p> <p>Standard 2: Child demonstrates the ability to express needs, feelings, experiences for a variety of purposes</p> <ol style="list-style-type: none"> 41. Vocalizes to get attention 42. Produces at least two different distinct consonant sounds 43. May say a word—“ba” for bottle, “ma” for mother 44. Uses at least one gesture to make wants known 45. Babbles extensively <p>Specific aspect: Language Comprehension</p>	

(continued)

Table 5. (continued)

Domain: Physical Development	Domain: Social and Emotional Development	Domain: Cognitive Development	Domain: Development of Language and Early Literacy Skills
<p>Standard 5: Demonstrates awareness of some responsibilities (acts independently)</p> <p>17. Tries to feed self without help—Can feed himself a biscuit</p> <p>Standard 6: Develops empathy</p> <p>18. Cries when hearing another child cries</p> <p>Standard 7: Develops the ability to cooperate</p> <p>Subdomain: Emotional Development</p> <p>Specific aspect: Self-concept</p> <p>Standard 5: Demonstrates the development of a positive self-concept</p> <p>19. Pays attention to own reflection in mirror</p> <p>20. Responds to name being called</p> <p>Specific aspect: Self-control</p> <p>Standard 6: Develops the ability to control impulses and regulate himself</p> <p>21. Halts action on reprimand “no” but may cry simultaneously</p> <p>Specific aspect: Self-expression</p> <p>Standard 7: Develops the ability to express emotions appropriately</p> <p>22. Indicates desire for specific items—for example, favorite toy</p> <p>Specific aspect: Aesthetic appreciation</p> <p>Standard 8: Shows some ability for aesthetic appreciation</p>	<p>Standard 5: Demonstrates awareness of some responsibilities (acts independently)</p> <p>17. Tries to feed self without help—Can feed himself a biscuit</p> <p>Standard 6: Develops empathy</p> <p>18. Cries when hearing another child cries</p> <p>Standard 7: Develops the ability to cooperate</p> <p>Subdomain: Emotional Development</p> <p>Specific aspect: Self-concept</p> <p>Standard 5: Demonstrates the development of a positive self-concept</p> <p>19. Pays attention to own reflection in mirror</p> <p>20. Responds to name being called</p> <p>Specific aspect: Self-control</p> <p>Standard 6: Develops the ability to control impulses and regulate himself</p> <p>21. Halts action on reprimand “no” but may cry simultaneously</p> <p>Specific aspect: Self-expression</p> <p>Standard 7: Develops the ability to express emotions appropriately</p> <p>22. Indicates desire for specific items—for example, favorite toy</p> <p>Specific aspect: Aesthetic appreciation</p> <p>Standard 8: Shows some ability for aesthetic appreciation</p>	<p>29. Interested in three blocks and picks up at least two blocks and visually attends to 3rd block</p> <p>30. Begins to imitate familiar motions such as stirring</p> <p>31. Demonstrates what an object can do (understands function—Dolls walk)</p> <p>Specific aspect: Awareness of the community</p> <p>Standard 7: Child demonstrates an awareness of the community he lives in</p> <p>32. Shows awareness of neighbors</p> <p>Subdomain: Approaches to Learning</p> <p>Specific aspect: Curiosity, initiative, and persistence</p> <p>Standard 8: Shows curiosity and persistence</p> <p>33. Pokes fingers into holes, gaps</p> <p>Specific aspect: Creativity and imagination</p> <p>Standard 8: Child demonstrates creativity and imagination</p> <p>34. Claps or bounces up and down on his own</p> <p>35. Experiments with sound—Dumps blocks, pots, and pans on floor and repeats</p> <p>Specific aspect: Problem solving</p> <p>Standard 9: Child demonstrates ability to use different strategies for problem solving</p> <p>36. Pulls things off shelves, baskets</p> <p>37. Begins to put knowledge of inside to use—Stack two to three cups</p>	<p>Standard 3: Shows ability to comprehend information</p> <p>46. Understands a simple gesture— Gives the cube in his hand when mother asks for it</p> <p>Subdomain: Early Literacy</p> <p>Specific aspect: Participating in experiences that include books; discovering And appreciating books</p> <p>Standard 4: Shows an interest in books</p> <p>47. Shows an increase in visual attention to book</p> <p>48. Turns pages, has some difficulty in separating papers but succeeds</p> <p>49. Laughs or smiles to show recognition of pictures</p> <p>50. Makes appropriate noises when he sees familiar animal/object (Booh, booh for dog)</p> <p>51. Points to individual pictures and vocalizes</p> <p>Specific aspect: Prereading</p> <p>Standard 7: Prereading: Child demonstrates interest in interacting with story</p> <p>52. Makes appropriate noises when sees familiar animal or object</p> <p>53. Laughs or smiles to show recognition of pictures</p> <p>54. Points to individual pictures and vocalizes while pointing</p> <p>Specific aspect: Prewriting</p>

Table 6. Indicators Removed in 2 to 3 Months and 3 Plus to 6 Months Age Groups.

Indicator	Postexpert validation
Age 2 to 3 months	
1	Why indicator was removed
11. Cuddles into caregiver's shoulder when being held (trusts)	Not age appropriate
16. Stops crying on seeing a familiar person	Standard itself Removed—Not age appropriate
17. Calms self—Sucks on hand before going to sleep	Not objectively measurable
20. Conveys primary desires such as hunger—Protests when not picked up when he wants	Relocated under standard—Develops an inquiring mind
21. Watches actions of others	Not appropriate for the age
22. Reacts to disappearance of caregiver's face	Not appropriate for the age
23. Reacts to caregiver/people/objects	Was relocated under standard—Shows interest in surroundings
24. Looks at own hands and observes	Not appropriate for the age
25. Explores object placed in hands	Not appropriate for the age
37. Makes sound of comfort and displeasure	Not appropriate for the age
Age 3 plus to 6 months	
8. Looks at and touches the face of someone familiar who moves in closer to baby	Not objectively measurable
10. Reaches to a familiar adult to be picked up when a stranger greets him	
11. Facial expressions change at the sight of an unfamiliar person	
12. Directs smiles and vocalizations toward other infants/babies	
16. Uses sounds/facial expressions or actions to show preferences	
17. Calms when sung to/falls asleep listening to music/lullabies	
18. Sorts out familiar faces from among a group	Not age appropriate
26. Discriminates family members from others	Not age appropriate
30. Begins to turn head toward sounds that are out of sight	Not objectively measurable
35. Makes sounds that go up and down in pitch	Not objectively measurable

Table 7. Indicators Removed in 6 Plus to 9 Months and 9 Plus to 12 Months Age Groups.

		Why indicator was removed		
Age 6 plus to 9 months				
21	14. Responds positively to when feeding time approaches	Not objectively measurable		
22	15. Complies with bathing/washing			
23	16. Watches with an expression of distress when another child cries			
24	17. Begins to watch other children in a group and shows interest in their play			
25	18. Does not release an object easily			
26	19. Tries to grab object from other's hand			
27	20. Seeks reassurance from adult when encountering new experience			
28	21. Makes responses to express how he feels about what is happening			
29	22. Enjoys kids songs			
30	23. Pulls a string attached to a toy making it come closer			
31	24. Explores inside and outside surface of objects—for example, cup			
32	27. Discovers difference between moving and static objects			
33	31. Knows difference between mother and grandmother			
34	32. Recognizes different rooms in the home			
35	37. Temporarily stops action in response to "no"			
36	41. Complies with a request—Examiner shows placement of cube in box and requests baby to do same			
Age 9 plus to 12 months				
37	7. When given a cube, opens his hand and extends it when requested but does not release it		Why indicator was removed	
38	11. Needs to be comforted or close to the caregiver on arrival of an unfamiliar person			
39	12. Demonstrates joy when caregiver returns after being away			
40	15. Crawls into an adult's lap if adult is talking with other children			
41	16. Shows anticipation of meal times			
42	18. Cries when hearing another child cries			
43	21. Halts action on reprimand "no" but may cry simultaneously			
44	22. Indicates desire for specific items—for example, favorite toy			
45	23. Uses props as aids—Uses a chair to stand up			
46	24. Begins to enjoy putting items in a container/getting objects out of a container			
47	25. Explores inside and outside surface of objects—for example, cup			
48	36. Pulls things off shelves, baskets			
				Did not reflect the standard properly— Demonstrates the ability to make comparisons and measurements Better indicator No. 37 present Did not reflect the standard
				Overlapped with other indicator No. 35 Same indicator present in 9- to 12-month group Not objectively measurable
				Overlapped with other indicators—No. 46 of subsequent age group and thus administered in this age group as well
				Not objectively measurable
				Did not reflect the standard properly— Demonstrates the ability to make comparisons and measurements Better indicator No. 37 present Did not reflect the standard

Table 8. Final Indicators for Age 2-3 Months.

Domain: Physical Development	Domain: Social and Emotional Development	Domain: Cognitive Development	Domain: Development of Language and Early Literacy Skills
<p>Subdomain: Motor</p> <p>Specific aspect: Gross motor</p> <p>Standard 1: Demonstrates ability of movement and coordination</p> <ol style="list-style-type: none"> Turns head from side to side when lying on back Raises head and chest when lying on stomach Holds head erect and steady when held on shoulder Extends and flexes legs at will Follows moving person through midline to left and right Moves arm at sight of toy or object <p>Specific aspect: Fine motor</p> <p>Standard 2: Demonstrates ability to hold things briefly/shows visual coordination</p> <ol style="list-style-type: none"> Eyes follows an object from left to right/top to bottom (cognitive) A small object placed in hand is accepted and brought to the mouth 	<p>Subdomain: Social Development</p> <p>Specific aspect: Relationship with adults</p> <p>Standard 1: Responds to and interacts with familiar adults</p> <ol style="list-style-type: none"> Follows the caregiver with eyes Stops crying when familiar voice is heard <p>Specific aspect: Relationship with peers</p> <p>Standard 3: Infant develops positive relationships with peers</p> <ol style="list-style-type: none"> Looks in direction of a child nearby Smiles/coos in response to older children's attention <p>Specific aspect: Prosocial behavior</p> <p>Standard 4: Develops perception of routines</p> <p>Subdomain: Emotional Development</p> <p>Specific aspect: Self-concept</p> <p>Standard 5: Demonstrates the development of a positive self-concept</p> <ol style="list-style-type: none"> Uses crying to signal needs Conveys desires—Makes vocal protests when not picked up when he wants <p>Specific aspect: Self-control</p> <p>Standard 6: Develops the ability to control impulses and regulate himself</p> <p>Specific aspect: Self-expression</p> <p>Standard 7: Develops the ability to express emotions appropriately</p> <ol style="list-style-type: none"> Uses specific kinds of sounds to signal needs Is responsive to an adult's attempts to comfort—Relaxes when massaged 	<p>Subdomain: Logical Thinking and Mathematics</p> <p>Specific aspect: Comparison and spatial awareness</p> <p>Standard 1: Child demonstrates the development of comparison concepts</p> <p>Standard 2: Child develops spatial sense</p> <p>Specific aspect: Numbers</p> <p>Standard 3: Child demonstrates awareness of numbers</p> <p>Subdomain: Awareness of the Environment</p> <p>Specific aspect: Scientific inquiry</p> <p>Standard 4: Child develops an inquiring mind</p> <ol style="list-style-type: none"> Watches actions of others Looks at surroundings in a new place Waves arms to touch dangling toy overhead <p>Specific aspect: Awareness of living and nonliving world</p> <p>Standard 5: Shows interest in surroundings (people and objects)</p> <ol style="list-style-type: none"> Focuses on objects which are at close range Looks at own hands and observes Gazes continuously at objects for at least 3 s Child freely turns eyes/head in visual exploration of surroundings <p>Specific aspect: Awareness of the community</p> <p>Standard 6: Child demonstrates an awareness of the community he lives in</p> <p>Subdomain: Approach to Learning</p> <p>Specific aspect: Curiosity, initiative, and persistence</p> <p>Specific aspect: Creativity and imagination</p> <p>Standard 7: Child demonstrates creativity and imagination</p> <p>Specific aspect: Problem solving</p> <p>Standard 8: Child demonstrates ability to use different strategies for problem solving</p>	<p>Subdomain: Language</p> <p>Specific aspect: Receptive language</p> <p>Standard 1: Responds to sights and sounds</p> <ol style="list-style-type: none"> Startles, cries or wakes when there is a loud sound Attentive when spoken to Focuses on objects and sound-making toys Recognizes mother's voice and is soothed by it <p>Standard 2: Uses sounds and body movements to communicate</p> <ol style="list-style-type: none"> Produces soft, gurgling sounds Smiles in response to speaker's attention <p>Subdomain: Early Literacy</p> <p>Specific aspect: Participating in experiences that include books; discovering and appreciating books</p> <p>Standard 3: Shows an interest in books</p> <p>Specific aspect: Prereading</p> <p>Specific aspect: Prewriting</p> <p>Specific aspect: Expressive language</p>

Table 9. Final Indicators for 3 Plus to 6 Months.

Domain: Physical Development	Domain: Social and Emotional Development	Domain: Cognitive Development	Domain: Development of Language and Early Literacy Skills
<p>Subdomain: Motor</p> <p>Specific aspect: Gross motor</p> <p>Standard 1: Demonstrates ability of movement and coordination</p> <ol style="list-style-type: none"> Supports upper body on arms when lying on stomach Swipes at dangling objects with hands and feet Rolls both ways (front to back, back to front) <p>Specific aspect: Fine motor</p> <p>Standard 2: Demonstrates ability to hold things briefly/shows visual coordination</p> <ol style="list-style-type: none"> Can follow a circular motion of an object (upper and lower quadrants as well) Rotates wrist from palm up to palm down when manipulating an object 	<p>Subdomain: Social Development</p> <p>Specific aspect: Relationship with adults</p> <p>Standard 1: Responds to and interacts with familiar adults</p> <ol style="list-style-type: none"> Coos or smiles when talked to Kicks legs or reaches with arms when familiar person approaches Smiles or laughs in response to tickling <p>Standard 2: Identifies unfamiliar people</p> <p>Specific aspect: Relationship with peers</p> <p>Standard 3: Infant develops positive relationships with peers</p> <ol style="list-style-type: none"> Looks toward a peer who is interacting with an interesting object <p>Specific aspect: Prosocial behavior</p> <p>Standard 4: Develops perception of routines</p> <p>Subdomain: Emotional Development</p> <p>Specific aspect: Self-concept</p> <p>Standard 5: Demonstrates the development of a positive self-concept</p> <ol style="list-style-type: none"> Responds positively to adults' attempts to comfort Conveys desires/needs through sounds <p>Specific aspect: Self-control</p> <p>Standard 6: Develops the ability to control impulses and regulate himself</p> <p>Specific aspect: Self-expression</p> <p>Standard 7: Develops the ability to express emotions appropriately</p> <p>Specific aspect: Aesthetic appreciation</p> <p>Standard 8: Shows some ability for aesthetic appreciation</p>	<p>Subdomain: Logical Thinking and Mathematics</p> <p>Specific aspect: Comparison and sorting</p> <p>Standard 1: Child develops ability to compare and sort</p> <p>Standard 2: Develops spatial sense</p> <p>Specific aspect: Numbers</p> <p>Standard 8: Child demonstrates awareness of numbers</p> <p>Subdomain: Awareness of the Environment</p> <p>Specific aspect: Scientific inquiry</p> <p>Standard: Child develops an inquiring mind</p> <ol style="list-style-type: none"> Grabs and probes objects Reaches out toward objects Visually follows object as it moved out of direct line of vision <p>Specific aspect: Awareness of living and nonliving world objects)</p> <p>Standard 4: Shows interest in surroundings (people and objects)</p> <ol style="list-style-type: none"> A toy is held, touched, and tasted Inspects own hands Eye moves from one object to another in response to sound Prefers novel object <p>Specific aspect: Awareness of the community</p> <p>Standard 12: Child demonstrates an awareness of the community he lives in</p> <p>Standard 19: Shows awareness of unfamiliar surroundings</p> <p>Subdomain: Approaches to Learning</p> <p>Specific aspect: Curiosity, initiative, and persistence</p> <p>Specific aspect: Creativity and imagination</p> <p>Standard 7: Child demonstrates creativity and imagination</p> <ol style="list-style-type: none"> Shows delight in producing sounds—Smacks lips, squeals on purpose <p>Specific aspect: Problem solving</p> <p>Standard 8: Child demonstrates ability to use different strategies for problem solving</p> <ol style="list-style-type: none"> Pulls a cloth with rattle on it to obtain rattle 	<p>Subdomain: Language</p> <p>Specific aspect: Receptive language</p> <p>Standard 1: Child demonstrates the ability to understand sounds/expressions and body language</p> <ol style="list-style-type: none"> Responds appropriately to tone of speaker's voice (distressed when harsh, happy when pleasant) Identifies familiar sounds and responds <p>Specific aspect: Expressive language</p> <p>Standard 2: Child demonstrates the ability to express needs, feelings, experiences for a variety of purposes</p> <ol style="list-style-type: none"> Laughs out loud Imitates short string of vowel sounds (double sounds—Ba . . . Ba) Likes to babble <p>Specific aspect: Language comprehension</p> <p>Standard 3: Child demonstrates the ability to comprehend gestures and sounds</p> <ol style="list-style-type: none"> Responds to mother's/caregiver's gestures—Responds when mother calls him <p>Subdomain: Early Literacy</p> <p>Specific aspect: Participating in experiences that include books; discovering and appreciating books</p> <p>Standard 4: Shows an interest in books</p> <ol style="list-style-type: none"> Looks intently at pictures for several minutes with thoughtful expression <p>Specific aspect: Prereading</p> <p>Specific aspect: Prewriting</p>

Table 10. Final Indicators for 6 Plus to 9 Months.

Domain: Physical Development	Domain: Social and Emotional Development	Domain: Cognitive Development	Domain: Development of Language and Early Literacy Skills
<p>Subdomain: Motor</p> <p>Specific aspect: Gross motor</p> <p>Standard 1: Demonstrates ability for movement and coordination</p> <ol style="list-style-type: none"> Moves from lying down to sitting position Can sit unsupported Supports whole weight on legs when adult is holding both hands Holds railing to move from sitting to standing position <p>Specific aspect: Fine motor</p> <p>Standard 2: Demonstrates ability to hold things/shows visual coordination</p> <ol style="list-style-type: none"> Grasps and object with thumb and first and second fingers Bangs two hand-held items together Transfers objects from hand to hand Moves his head to search for object which has fallen from the table 	<p>Subdomain: Social Development</p> <p>Specific aspect: Relationship with adults</p> <p>Standard 1: Responds to and interacts with familiar adults</p> <ol style="list-style-type: none"> Smiles when familiar person smiles or talks Babbles and coos to get attention of someone familiar nearby <p>Standard 2: Identifies unfamiliar people</p> <ol style="list-style-type: none"> Stops activity and stares at a new person entering room <p>Specific aspect: Relationship with peers</p> <p>Standard 3: Infant develops positive relationships with peers</p> <ol style="list-style-type: none"> Kicks feet in excitement at sight of other child/children Uses hands to explore face/hair of peer <p>Specific aspect: Prosocial behavior</p> <p>Standard 4: Develops perception of routines</p> <p>Standard 5: Develops empathy</p> <p>Standard 6: Develops the ability to cooperate</p> <p>Subdomain: Emotional Development</p> <p>Specific aspect: Self-concept</p> <p>Standard 5: Demonstrates the development of a positive self-concept</p> <p>Specific aspect: Self-control</p> <p>Standard 6: Develops the ability to control impulses and regulate himself</p> <p>Specific aspect: Self-expression</p> <p>Standard 7: Develops the ability to express emotions appropriately</p> <p>Specific aspect: Aesthetic appreciation</p> <p>Standard 8: Shows some ability for aesthetic appreciation</p>	<p>Subdomain: Logical Thinking and Mathematics</p> <p>Specific aspect: Comparison and sorting and spatial sense</p> <p>Standard 1: Child develops ability to compare and sort</p> <p>Standard 2: Child develops spatial sense</p> <p>Specific aspect: Numbers</p> <p>Standard 3: Child demonstrates awareness of numbers</p> <p>Subdomain: Awareness of the Environment</p> <p>Specific aspect: Scientific inquiry</p> <p>Standard 4: Child develops an inquiring mind</p> <ol style="list-style-type: none"> Repeatedly turns and object over Explores and inspects the smallest details—for example, bread crumbs fallen on the floor <p>Specific aspect: Awareness of living and nonliving world</p> <p>Standard 5: Shows interest in surroundings (people and objects)</p> <ol style="list-style-type: none"> Searches for fallen object Plays with mirror image by patting, smiling/laughing, reaching playfully Holds bell by handle and purposefully bangs it <p>Specific aspect: Awareness of the community</p> <p>Standard 6: Child demonstrates awareness of community he lives in</p> <p>Subdomain: Approaches to Learning</p> <p>Specific aspect: Curiosity, initiative, and persistence</p> <p>Specific aspect: Creativity and imagination</p> <p>Standard 7: Child demonstrates creativity and imagination</p> <ol style="list-style-type: none"> Child enjoys noises—Bangs objects together over and over again Uses body to make sounds—Splashes water, slaps objects <p>Specific aspect: Problem solving</p> <p>Standard 7: Child demonstrates ability to use different strategies for problem solving</p> <ol style="list-style-type: none"> Pulls cloth on table to obtain object Searches for item that has been covered completely (covering bangle with cloth) 	<p>Subdomain: Language</p> <p>Specific aspect: Receptive language</p> <p>Standard 1: Child demonstrates the ability to understand expressions and body language</p> <p>Specific aspect: Expressive language</p> <p>Standard 2: Child demonstrates the ability to express needs, feelings, experiences for a variety of purposes</p> <ol style="list-style-type: none"> Vocalizes in response to speaker's attention Vocalizes at least two different vowel sounds Begins to babble in strings—Ba-ba-ba-ba <p>Specific aspect: Language Comprehension</p> <p>Standard 3: Child demonstrates the ability to comprehend gestures and sounds</p> <p>Subdomain: Early Literacy</p> <p>Specific aspect: Participating in experiences that include books; discovering and appreciating books</p> <p>Standard 4: Shows an interest in books</p> <ol style="list-style-type: none"> Holds book using both hands and manipulates the book to make the pages open <p>Specific aspect: Prereading</p> <p>Specific aspect: Prewriting</p>

Table 11. Final Indicators for 9 Plus to 12 Months.

Domain: Physical Development	Domain: Social and Emotional Development	Domain: Cognitive development	Domain: Development of Language and Early Literacy Skills
<p>Subdomain: Motor</p> <p>Specific aspect: Gross motor</p> <p>Standard 1: Demonstrates ability for movement and coordination</p> <ol style="list-style-type: none"> 1. Crawls forward on hands and knees 2. Raises self to standing position using a chair/other aid 3. May walk two to three steps without support 4. Can pivot in the sitting position <p>Specific aspect: Fine motor</p> <p>Standard 2: Demonstrates ability to manipulate things briefly/ shows visual coordination</p> <ol style="list-style-type: none"> 5. Uses thumb and first finger to pick up things 6. Puts objects into a container and takes objects out of a container 	<p>Subdomain: Social Development</p> <p>Specific aspect: Relationship with adults</p> <p>Standard 1: Responds to and interacts with familiar adults</p> <ol style="list-style-type: none"> 7. Reaches to the caregiver when hurt or upset 8. Actively clings or cries when familiar person says good bye 9. Tugs on caregiver or makes noises when felt ignored <p>Standard 2: Identifies unfamiliar people</p> <p>Specific aspect: Relationship with peers</p> <p>Standard 3: Infant develops positive relationships with peers</p> <ol style="list-style-type: none"> 10. Tries to imitate playing with the toy after watching peer play with it 11. Watches intently when older children play (watch children in a group) <p>Specific aspect: Prosocial behavior</p> <p>Standard 4: develops perception of routines</p> <p>Standard 5: Demonstrates awareness of some responsibilities (acts independently)</p> <ol style="list-style-type: none"> 12. Tries to feed self without help—Can feed himself a biscuit 	<p>Subdomain: Logical Thinking and Mathematics</p> <p>Specific aspect: Comparison and measurement</p> <p>Standard 1: Child demonstrates the ability to make comparisons and measure to some extent</p> <p>Standard 2: Child develops spatial sense</p> <p>Specific aspect: Numbers</p> <p>Standard 3: Child demonstrates awareness of numbers</p> <p>Subdomain: Awareness of the Environment</p> <p>Specific aspect: Scientific inquiry</p> <p>Standard 4: Child develops an inquiring mind</p> <ol style="list-style-type: none"> 15. Repeatedly turns an object over 16. Explores and inspects the smallest details—for example, bread crumbs fallen on the floor, beads—Also given in previous age group <p>Specific aspect: Awareness of living and nonliving world</p> <p>Standard 5: Shows interest in surroundings (people and objects)</p>	<p>Subdomain: Language</p> <p>Specific aspect: Receptive language</p> <p>Standard 1: Child demonstrates the ability to understand language to some extent</p> <ol style="list-style-type: none"> 26. Follows one-step routines when presented with gestures—Clapping hands 27. Knows own name and responds by looking when called 28. Understands the names of familiar objects (leg, cup chain, etc.) by pointing or touching them when they are uttered. <p>Specific aspect: Expressive language</p> <p>Standard 2: Child demonstrates the ability to express needs, feelings, experiences for a variety of purposes</p> <ol style="list-style-type: none"> 29. Vocalizes to get attention 30. Produces at least two different distinct consonant sounds 31. May say a word—“bah” for bottle, “ma” for mother 32. Uses at least one gesture to make wants known 33. Babbles extensively <p>Specific aspect: Language Comprehension</p>

(continued)

Table 11. (continued)

Domain: Physical Development	Domain: Social and Emotional Development	Domain: Cognitive development	Domain: Development of Language and Early Literacy Skills
<p>Standard 6: Develops empathy</p> <p>Standard 7: Develops the ability to cooperate</p> <p>Subdomain: Emotional Development</p> <p>Specific aspect: Self-concept</p> <p>Standard 5: Demonstrates the development of a positive self-concept</p> <p>13. Pays attention to own reflection in mirror</p>	<p>17. Regards one or more familiar pictures with interest</p> <p>18. Interested in three blocks and picks up at least two blocks and visually attends to third block</p> <p>19. Begins to imitate familiar motions such as stirring</p> <p>20. Demonstrates what an object can do (understands function—Dolls walk)—Small doll</p> <p>Specific aspect: Awareness of the community</p> <p>Standard 6: Child demonstrates an awareness of the community he lives in</p> <p>21. Shows awareness of neighbors</p>	<p>Standard 3: Shows ability to comprehend information</p> <p>34. Understands a simple gesture—Gives the cube in his hand when mother asks for it</p> <p>Subdomain: Early literacy</p> <p>Specific aspect: Participating in experiences that include books; discovering and appreciating books</p>	<p>Standard 4: Shows an interest in books</p> <p>35. Shows an increase in visual attention to book</p> <p>36. Turns pages, has some difficulty in separating papers but succeeds</p> <p>37. Laughs or smiles to show recognition of pictures</p> <p>38. Makes appropriate noises when he sees familiar animal/object (booh, booh for dog)</p> <p>39. Points to individual pictures and vocalizes</p> <p>Specific aspect: Preading</p> <p>Standard 7: Child demonstrates interest in interacting with story</p> <p>40. Makes appropriate noises when sees familiar animal or object</p> <p>41. Laughs or smiles to show recognition of pictures</p> <p>42. Points to individual pictures and vocalizes while pointing</p> <p>Specific aspect: Prewriting</p>
<p>14. Responds to name being called</p> <p>Specific aspect: Self-control</p> <p>Standard 6: Develops the ability to control impulses and regulate himself</p> <p>Specific aspect: Self-expression</p> <p>Standard 7: Develops the ability to express emotions appropriately</p> <p>Specific aspect: Aesthetic appreciation</p> <p>Standard 8: Shows some ability for aesthetic appreciation</p>	<p>Subdomain: Approaches to Learning</p> <p>Specific aspect: Curiosity, initiative, and persistence</p> <p>Standard 7: Shows curiosity and persistence</p> <p>22. Pokes fingers into holes, gaps</p> <p>Specific aspect: Creativity and imagination</p> <p>Standard 8: Child demonstrates creativity and imagination</p> <p>23. Claps or bounces up and down on his own</p> <p>24. Experiments with sound—Dumps blocks, pots and pans on floor an repeats</p> <p>Specific aspect: Problem solving</p> <p>Standard 8: Child demonstrates ability to use different strategies for problem solving</p> <p>25. Begins to put knowledge of inside to use—Stack two to three cups</p>	<p>Standard 4: Shows an interest in books</p> <p>35. Shows an increase in visual attention to book</p> <p>36. Turns pages, has some difficulty in separating papers but succeeds</p> <p>37. Laughs or smiles to show recognition of pictures</p> <p>38. Makes appropriate noises when he sees familiar animal/object (booh, booh for dog)</p> <p>39. Points to individual pictures and vocalizes</p> <p>Specific aspect: Preading</p> <p>Standard 7: Child demonstrates interest in interacting with story</p> <p>40. Makes appropriate noises when sees familiar animal or object</p> <p>41. Laughs or smiles to show recognition of pictures</p> <p>42. Points to individual pictures and vocalizes while pointing</p> <p>Specific aspect: Prewriting</p>	<p>Standard 4: Shows an interest in books</p> <p>35. Shows an increase in visual attention to book</p> <p>36. Turns pages, has some difficulty in separating papers but succeeds</p> <p>37. Laughs or smiles to show recognition of pictures</p> <p>38. Makes appropriate noises when he sees familiar animal/object (booh, booh for dog)</p> <p>39. Points to individual pictures and vocalizes</p> <p>Specific aspect: Preading</p> <p>Standard 7: Child demonstrates interest in interacting with story</p> <p>40. Makes appropriate noises when sees familiar animal or object</p> <p>41. Laughs or smiles to show recognition of pictures</p> <p>42. Points to individual pictures and vocalizes while pointing</p> <p>Specific aspect: Prewriting</p>

Table 12. List of Indicators Removed Following Pretesting.

Age group	Indicator with number
2 to 3 months	6. Moves arm at sight of toy or object 8. A small object placed in hand is accepted and brought to the mouth 12. Smiles/coos in response to older children's attention 13. Uses crying to signal needs 15. Uses specific kinds of sounds to signal needs 19. Waves arms to touch dangling toy overhead
3 plus to 6 months	23. Child freely turns eyes/head in visual exploration of surroundings 3. Rolls both ways (front to back, back to front) 4. Can follow a circular motion of an object (upper and lower quadrants as well) 5. Rotates wrist from palm up to palm down when manipulating an object 15. A toy is held, touched, and tasted 19. Shows awareness of unfamiliar surroundings
6 plus to 9 months	20. Shows delight in producing sounds—Smacks lips, squeals on purpose 1. Moves from lying down to sitting position 8. Moves his head to search for object which has fallen from the table 18. Holds bell by handle and purposefully bangs it 20. Uses body to make sounds—Splashes water, slaps objects
9 plus to 12 months	4. Can pivot in the sitting position 6. Puts objects into a container and takes objects out of a container 9. Tugs on caregiver or makes noises when felt ignored 10. Tries to imitate playing with the toy after watching peer play with it 17. Regards one or more familiar pictures with interest 21. Shows awareness of neighbors 22. Pokes fingers into holes, gaps 23. Claps or bounces up and down on his own 24. Experiments with sound—Dumps blocks, pots, and pans on floor and repeats

the study (to be included in a separate article) describes the assessment of psychometric properties of the tool along with reference-based validation. The tool utilizes simple equipment and does not need highly specialized training. This allows it to be used in a low-income setting.

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