Short-form versions of the MacArthur Communicative Development Inventories

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ABSTRACT
The MacArthur Communicative Development Inventories (CDIs) are a pair of widely used parent-report instruments for assessing communicative skills in infants and toddlers. This report describes short-form versions of the CDIs and their development, summarizes newly available normative data and psychometric properties of the instruments, and discusses research and clinical applications. The infant short form (Level I, for 8- to 18-month-olds) contains an 89-word checklist for vocabulary comprehension and production. The two parallel versions of the toddler short form (Level II, Forms A and B, for 16- to 30-month-olds) each contain a 100-word vocabulary production checklist and a question about word combinations. The forms may also be useful with developmentally delayed children beyond the specified age ranges. Copies of the short forms and the normative tables appear in the appendices.

The MacArthur Communicative Development Inventories (CDIs) were developed to fill a need for effective, cost-efficient instruments for assessing a range of communicative skills in infants and toddlers. The other major methods for assessing early language and language-related skills – language sampling and structured testing – each have significant limitations when carried out with children under 2½ years of age. Situational and temperamental factors ranging from disinterest in the tasks to illness and anxiety can introduce unwanted variation in performance or preclude testing altogether. Moreover, each method requires highly trained examiners and/or coders and therefore is labor intensive. The CDIs were developed to supplement these traditional methods by systematically

utilizing the extensive experience of parents – experience that is far more representative of the children's language than that provided by a relatively brief laboratory or clinic interaction. The CDIs are cost-effective as well as reliable and valid (Fenson et al., 1993) and therefore permit the collection of very large samples for addressing a variety of issues.

Despite the advantages and the demonstrated statistical integrity of the MacArthur CDIs, the time required to complete the form and the requirement that the parent be literate restrict their applicability in many research, clinical, and educational settings when a rapid assessment of a child's language level is needed. The time required to complete the full MacArthur CDIs may not be available in busy clinic settings or in research projects when many other procedures must be carried out. Low literacy levels may also limit the ability of some parents to complete the forms.

The short forms were developed to capitalize on the demonstrated effectiveness of parent input in a briefer format. This report describes the short-form versions of the CDIs and their development,[1] summarizes normative data and the psychometric properties of the instruments, and discusses research and clinical applications.

DESCRIPTION OF THE INSTRUMENTS

Infant form (Level I)

This form, designed for children between 8 and 18 months, contains an 89-word vocabulary checklist with separate columns for comprehension and production. The first column is labeled "Understands." The second column is labeled "Understands and Says." The directions specify that the first column should be checked if the child understands but does not yet say the word and that the second column should be checked if the child not only understands but also says the word.

Toddler form (Level II, Forms A and B)

There are two equivalent forms, both designed for children between 16 and 30 months. Either form may be used for a single administration. For longitudinal studies, users have the option of alternating between the two versions on repeated administrations. Each form contains 100 vocabulary items. An item appearing at the bottom of each of these forms asks the parent if their child has begun to combine words; the three response options are "Not Yet," "Sometimes," and "Often."

Copies of the short forms appear in Appendix 1. For children in the 16- to 18-month age range, investigators have the option of using either the infant version or the toddler version. If receptive vocabulary is of interest, the infant form may be used. For maximum comparability across repeated testings that extend beyond 18 months, the toddler form may be the better choice. These forms may also be used for older children with language delay (but see Fenson et al., 1993, for cautions in this regard).

Table 1. *Correlations of the final 89-word infant short form with the full infant CDI vocabulary comprehension and production scales*

% Rank	Comprehension			Production		
	8–10 mos.	11–13 mos.	14–16 mos.	8–10 mos.	11–13 mos.	14–16 mos.
0–33	.88	.87	.89	not valid	.70	.83
34–67	.80	.81	.85	not valid	.75	.78
68–99	.97	.97	.96	.88	.94	.98

Note: $p < .01$ for all values. The "not valid" designation applies to regions of the distribution where low scores precluded meaningful interpretation.

DEVELOPMENT OF THE SHORT FORMS

General procedures

Items for the short forms were drawn from the CDI long forms, which contain 396 and 680 words on the infant and toddler forms, respectively. Prototype 50-word infant and toddler short forms were assembled using the following guidelines. First, words should vary in age of acquisition. We tried to select an approximately equal number of words reaching the 50% reporting level at each month represented on the forms. Word selection by age of acquisition was made possible by using the month-by-month CDI frequency data for individual words reported in Dale and Fenson (1996). Second, in selecting words, we attempted to achieve a balance among the various semantic and structural linguistic categories represented on the full CDI inventories. Third, words with strong regional or ethnic biases were avoided, as were words with ambiguous parts of speech in common use (e.g., *water* can be a noun or a verb; *on* can be a preposition referring to a location or an adjective referring to a state of functioning).

Children's simulated short-form scores were extracted from the long forms collected in the CDI norming study (Fenson et al., 1993). Correlations were then obtained between these scores and the children's original vocabulary scores on the full CDI. That is, each child's set of responses on the full CDI was used to generate a score for the subset of items designated for use on the short form. Because it was essential that the short forms be valid at all ages and at high, medium, and low levels of language development at each age, these correlations were calculated separately for nine subsamples of children (3 levels of age × 3 levels of language) (see Table 1 for an example). The prototype forms were then modified by adding, subtracting, and replacing words to increase the short form/long form correlations in cells as necessary. A target of 100 words was established as a practical upper limit for the infant and toddler short forms. Early-appearing words were added to eliminate floor effects at the lower end of each age range. Later-appearing words were added to eliminate ceiling effects for high-scoring children at the upper end of the age range for each form.

Table 2. *Correlations of the final 100-word toddler short forms*
(A and B) with the full toddler CDI vocabulary production scale

% Rank	16–18 mos.	19–21 mos.	22–24 mos.	25–27 mos.	28–30 mos.
Form A					
0–33	.92	.93	.95	.95	.97
34–67	.83	.91	.86	.88	.84
68–99	.97	.95	.95	.94	.90
Form B					
0–33	.91	.94	.96	.96	.98
34–67	.87	.90	.87	.84	.90
68–99	.96	.96	.95	.92	.93

Note: p < .01 for all values.

Infant form

Table 1 shows the correlations for vocabulary comprehension and production for the final 89-word set. The overall correlation for comprehension between the final short form and long form was $r = .98$ ($r = .97$ after age was partialed out). The overall correlation for production was $r = .97$; this coefficient was not reduced by partialing out age.

Of the 89 words in the final list, 62% were nouns, 15% were verbs, 12% were adjectives and adverbs, and 11% were pronouns, sound effects, and other parts of speech.

A parallel procedure was carried out to determine whether a subset of the actions and gestures section could be identified that would correlate highly with the full set of 63 actions and gestures appearing in the long form. Our analyses indicated that actions and gestures could not be reliably sampled in a very brief format in that a minimum of 40 items would be required. Therefore, an action and gesture scale was not included on the infant short form.

Toddler forms

Selecting items for an initial toddler short form (A) proceeded in the same fashion as outlined for the infant short form (Pethick, 1994). This process was continued until no further increases occurred in the correlations for the individual cells (within the framework of a 100-word ceiling). The availability of individual word frequencies (Dale & Fenson, 1996) allowed us to make these successive modifications with considerable precision, resulting in the high correlations between the short form and the long form shown in the upper portion of Table 2. The overall correlation for the sample as a whole was $r = .99$ ($r = .98$ with age partialed out).

A second 100-word toddler short form (B) was then produced using the same procedures. In order to include an adequate number of words that reached the 50% reporting criterion in the 16- to 18-month period, 10 words appearing on

Form A were also included on Form B; the other 90 words on Form B did not appear on Form A. The lower portion of Table 2 shows the short form/long form correlations for this second subset of words. The correlations for Form B were comparable to those obtained for Form A. The overall correlation for the sample as a whole was $r = .99$ ($r = .98$ after age was partialed out).

When derived from the full CDI for the same children, the two short forms correlated with each other at $r = .99$ ($r = .98$ with age partialed out). Moreover, the simulated mean scores at each month were quite comparable for the two forms, as were the overall mean scores (48.36 and 48.96 for Forms A and B, respectively). Based on the similarity of these simulated means, as well as the very high correlations between the two subsets, these two short forms were judged to be equivalent measures.

For Form A, 52% of the items were nouns, 18% were verbs, 15% were adjectives and adverbs, and 15% were pronouns, prepositions, and other parts of speech. For Form B, 53% of the items were nouns, 17% were verbs, 17% were adjectives and adverbs, and 13% were pronouns, prepositions, and other parts of speech.

The original toddler CDI scale included several components to evaluate grammatical development, the most important of which was a set of 37 pairs of sentences that differed on specific grammatical features. Parents were asked to choose the sentence that sounded most like their child's present level of speech. The correlation obtained in the CDI norming study (Fenson et al., 1994) between vocabulary and grammatical development assessed in this way was $r = .85$ ($r = .73$ after age was partialed out). A variety of additional analyses and datasets have confirmed the very close relation of vocabulary and early grammatical development in typically developing, language-delayed, and early-talking children (Bates, Dale, & Thal, 1995). Because simulated short-form vocabulary scores were highly correlated with vocabulary on the full CDI and the latter was highly correlated with grammatical development, it is not surprising that the simulated short-form vocabulary scores were highly correlated with grammatical development ($r = .80$ and $.79$ for Forms A and B, respectively). Thus, it appears that the short-form vocabulary scale can serve as a reasonable estimate of grammatical level; in the interests of brevity, no grammar scale was included other than a single question about whether the child had begun combining words. (See Dale, Dionne, Eley, & Plomin, in press, for a short-form grammar scale derived from the full CDI.) The ability to combine words has been noted as a developmentally significant milestone that sets the stage for a wide array of syntactic and semantic developments as well as general vocabulary development (Bates, Bretherton, & Snyder, 1988).

THE NORMING STUDY

Despite the high correlations between the simulated short-form scores and the original full CDI scores, a norming study using the new short forms was essential for two reasons. First, it could not be assumed that the probability of a word being checked by a parent was independent of the length of the list on which the word occurs. Second, it appeared that the comprehension measure on the

Table 3. *Demographic characteristics of the general population and the CDI sample*

Demographic characteristics	United States (%)[a]	Infant sample (%)	Toddler sample (%)
Ethnicity			
White	77.7	88.7	92.5
Black	13.0	3.4	1.1
Asian	3.3	2.9	1.8
All others	6.0	4.5	4.6
Parent education			
Some high school or less	23.2	2.4	1.5
High school diploma	42.0	16.6	15.2
Some college	16.9	23.0	23.8
College diploma	17.9	52.6	54.3

[a]Demographic profile for persons aged 18 to 34 years, 1990 U.S. Bureau of the Census data.

infant form might be useful past the original cutoff age of 16 months. Therefore, a new norming study was conducted to obtain data on the infant short form (Level I) at ages 8 through 18 months and on the toddler short form (Level II, Forms A and B) at ages 16 through 30 months.

Sample

Data were collected by mail at three locations in the United States: New Haven, CT; Seattle, WA; and San Diego, CA. In New Haven and Seattle, the parents who were sent questionnaires had agreed shortly after the birth of their child to have their names placed in infant studies subject pools at Yale University or the University of Washington. In San Diego, the participants were recruited via a subject pool composed of individuals who had previously indicated their willingness to participate in research studies at San Diego State University or the University of California, San Diego. Forms were completed for 483 infants and 911 toddlers. Of these 1,394 forms, 15 (2 infant and 13 toddler) were excluded from the final sample on the basis of medical information supplied by the parent. These included cases of 6 or more weeks preterm delivery, serious hearing loss, and other major medical problems. Cases with repeated ear infections were retained in the sample. The median cell size for the norming sample (for each combination of age, gender, and form) was 15, with a range of 8 to 34.

Table 3 summarizes the ethnic and educational characteristics for the CDI short form infant and toddler samples in relation to the 1990 U.S. Bureau of the Census figures. The educational and occupational levels of the parents who completed the inventories were clearly well above the national average – a reflection of the sampling sites and procedures used to gather participants. The highest percentage of parents in the sample held a college diploma, whereas the highest percentage of parents in the census data held a high school diploma.

The infant sample was slightly more diverse than the toddler group, with about 5% fewer whites in the former group.

The normative sample was limited to children for whom English was their primary language. However, forms were accepted for children exposed to more than one language because bilingual language environments are common for a considerable portion of the nation's children. In the infant sample, 14.3% of the parents reported that their child was exposed to a second language. In the toddler sample, the percentages were 13.4% for Form A and 14.5% for Form B.

DEVELOPMENTAL TRENDS

Curve fitting

The growth curves shown here are based on fitted rather than observed scores. In essence, fitted or "smoothed" curves compensate for the random variation inherent in samples, using sample values to project expected population values. Growth curve modeling is a technique that uses all the data simultaneously to predict scores to show overall patterns of development (Burchinal & Appelbaum, 1991). The logistic function was used because logistic functions typically begin with a gradual increment, leading to a more rapid surge and then a leveling off. This is the type of pattern frequently seen in the acquisition of language skills as well as other cognitive growth processes (VanGeert, 1991). The analyses reported in conjunction with each measures were based on the raw scores.

Infant form

Figure 1 summarizes developmental trends and individual variability for vocabulary comprehension on the infant form at each month. The median scores increased approximately sixfold across the 11-month age span. The range of scores within each month was very large: in the first five months, the lowest level of the distribution was 0 words, and in the last five months, at least one child scored at the ceiling level of 89 words. Variability at each month was substantial throughout. A factorial analysis of variance (ANOVA) performed on the receptive vocabulary scale yielded significant effects of age, $F(10, 450) = 31.99$, $p < .001$, and gender $F(1, 450) = 7.07$, $p < .01$. Mean scores were higher for girls at most months, but Bonferroni pairwise comparisons were statistically reliable only at 18 months.

Figure 2 summarizes developmental trends and individual variability for vocabulary production on the infant CDI short form. As would be expected, the scores were very low up to 12 months and increased slowly throughout the subsequent months. The range of scores within each month underscores the wide variability in children's word production at these early ages. A two-way ANOVA yielded significant effects of age, $F(10, 450) = 30.47$, $p < .001$, and gender, $F(1, 450) = 8.19$, $p < .01$. Bonferroni pairwise comparisons (favoring girls) were statistically reliable only at 11 and 18 months.

The correlation between the receptive and expressive vocabulary scales was
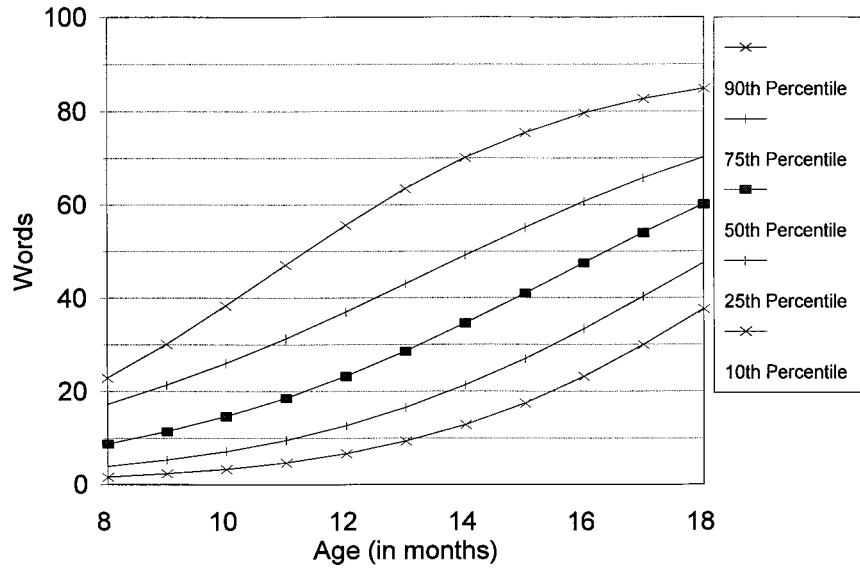
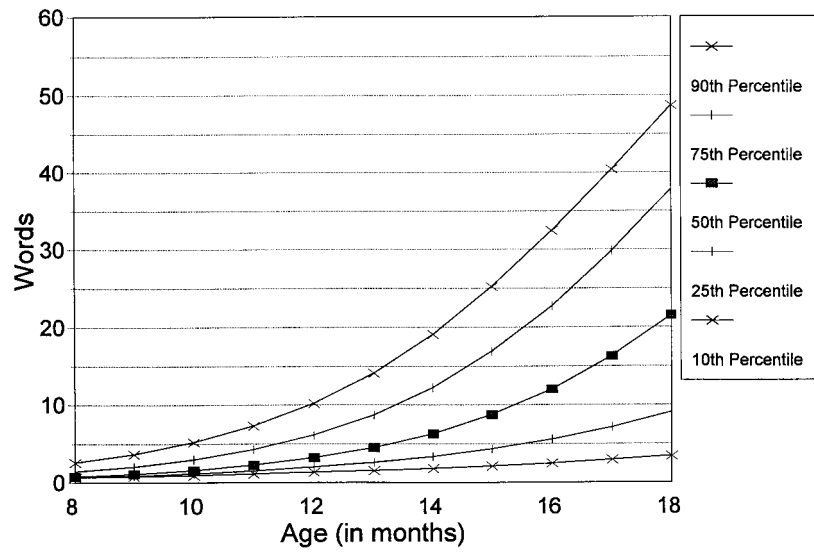Figure 1. Infant short-form vocabulary comprehension scores (fitted).

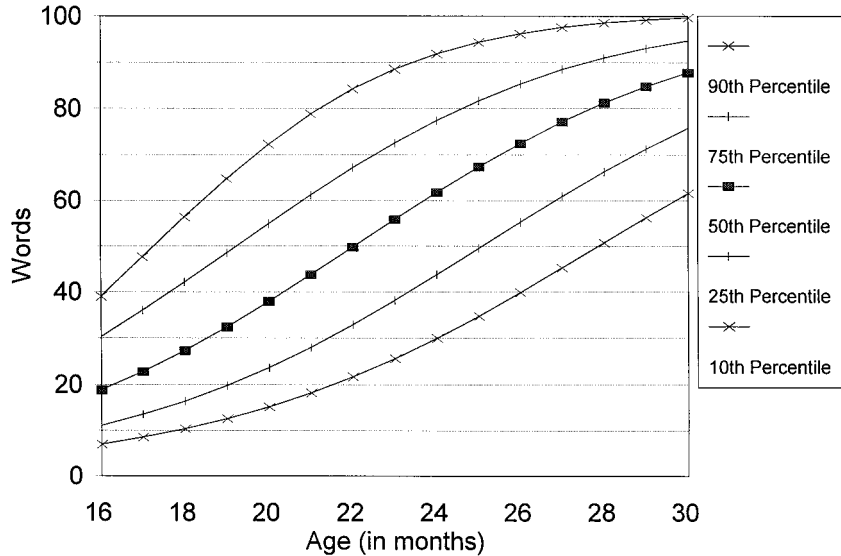Figure 2. Infant short-form vocabulary production scores (fitted).

Figure 3. Toddler Form A vocabulary production scores (fitted).

.69, dropping to .51 after age was removed. These correlation are comparable to the values of .65 and .53 reported between these two scales for the full CDI (Fenson et al., 1993).

Toddler forms

The toddler CDI short forms measured vocabulary production only. There were 100 words on the checklists to which the parent responded only if the child was judged to say the word. Figures 3 and 4 summarize developmental trends and individual variability on Forms A and B, respectively. A ceiling effect was indicated for children in the upper 25% of the distributions on both forms after 26 or 27 months.

A factorial ANOVA produced significant effects of age, $F(14, 871) = 63.84$, $p < .001$, and gender, $F(1, 871) = 44.15$, $p < .001$. Bonferroni pairwise comparisons (favoring girls) were statistically reliable at 8 of the 17 monthly intervals.

The general comparability of Forms A and B can be seen by comparing Figures 3 and 4. Both developmental trends and individual variability were highly similar, indicating that the percentile scores for the forms may be used interchangeably.

Developmental trends for combining words

At the bottom of each of the toddler short forms there was a single question that asked if the child had begun to combine words yet (e.g., "nother cookie" or "doggie bite"). Three response options were given: "Not Yet," "Sometimes,"
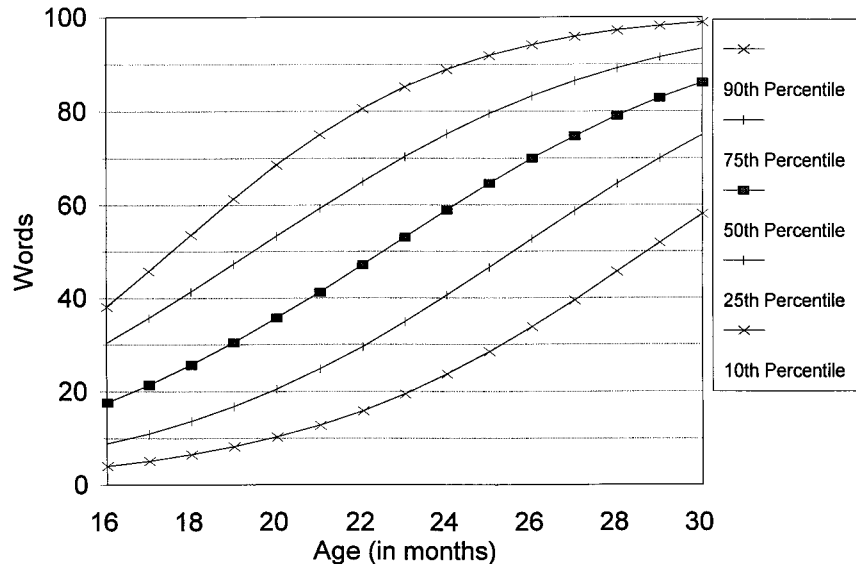
Figure 4. Toddler Form B vocabulary production scores (fitted).

or "Often." For Form A, the correlation between combining words and vocabulary score was $r = .76$ ($p < .01$), and for Form B, it was $r = .79$ ($p < .01$).

Figure 5 illustrates the month-by-month trends for combining words. The percentage of children reported to be combining rose steadily from relatively low levels at 16 months to 100% by 30 months. By 22 months, almost all children were combining words at least some of the time. This result is consistent with previous research regarding the age at which two-word speech emerges; a range from about 18 to 24 months is reported, depending on the particular study (Crystal, 1976; Singleton, 1989). Previous research has also noted that correlations between word combinations and vocabulary size are stronger than correlations between word combinations and age (Bates, Thal, & Janowsky, 1992). In the present sample, a similar finding of lower correlations with age was obtained. The correlation between word combinations and age for Form A was $r = .59$, and for Form B it was $r = .60$.

Demographic analyses

The norming sample was skewed away from the lower end of the sociometric distribution in the same manner as occurred for the full CDI norming study. Hence, our ability to test for demographic effects was very limited. For both the infant and toddler samples, the scores of children whose mothers reported education beyond the 12th grade (about 86% of each sample) were compared with those of children whose mothers' education stopped at or before the 12th grade
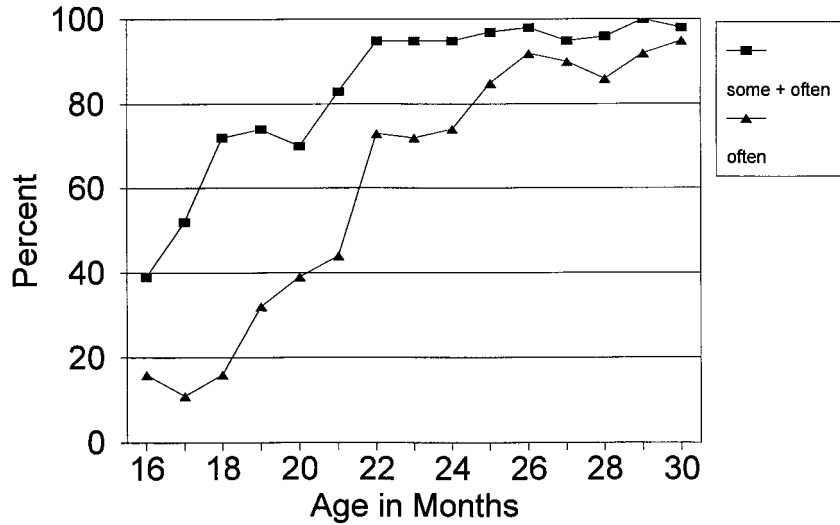
Figure 5. Proportion of children combining words (Forms A and B combined).

(about 14% for the infant and toddler data sets). The *t* tests indicated that the mean scores did not differ for the infant comprehension and production scales nor for the toddler production scale.

PSYCHOMETRIC PROPERTIES OF THE SHORT FORMS

Individual variability

Individual variability in the growth trends for the skills assessed by the infant and toddler short forms can be seen clearly in Figures 1 through 5. These figures indicate that the infant and toddler short forms effectively encompass the range of linguistic abilities shown by the 8- to 18-month-olds and the 16- to 30-month-olds, respectively. The minimal separation between percentile subgroups for vocabulary production in the 8- to 12-month age group reflects the fact that productive speech is just beginning to emerge during this time – but only for a minority of the sample. After these early months, the separation continues to increase between subgroups to the 18-month termination point for the infant form. In contrast to the production data, the comprehension scores on the infant form show substantial separation among the five percentile subgroups from the earliest months, and the separation generally persists throughout the age span covered by the infant form. Like the infant form, the two versions of the toddler form show the capacity to accommodate the range of expressive skills of toddlers across the major portion of the age range.

Reliability

Reliability for the three CDI short forms was evaluated by computing Cronbach's coefficient alpha, which is an estimate of the average split-half correlation across all possible item splits. A coefficient of .80 or higher is generally considered acceptable (Sattler, 1992). Because the words on each of these short-form lists constitute a subset of the child's total vocabulary, all of them can be hypothesized to share a comparable resemblence to total vocabulary. As expected, Cronbach's alpha approached 1.0: .97, .99, and .99 for the infant form, toddler Form A, and toddler Form B, respectively.

Validity

Content validity, defined as the extent to which the content of the scale maps onto what the investigator hopes to assess, is tested by examining the features of an instrument. Both the infant and toddler forms sample a wide range of vocabulary items known to be represented across the 8- to 30-month age range. The items were drawn from the full CDI, which derived words directly from developmental literature, and from suggestions made by parents in response to earlier versions of the instruments.

Concurrent validity is determined by assessing the relation between the measure under evaluation and the scores on other measures designed to assess similar abilities. Hanson (1994) had parents complete short and long forms two weeks apart, counterbalanced so that each form was completed first by half of the sample. He obtained Pearson correlations between the two forms as follows: for the infant form ($N = 50$), .88 for vocabulary comprehension and .90 for vocabulary production; for the toddler forms for vocabulary production, .74 for Form A ($N = 28$) and .93 for Form B ($N = 40$). These results offer further assurance that the short forms provide an effective alternative to the long forms when a briefer assessment instrument is needed.

NORMATIVE TABLES

Appendix 2 contains separate normative percentile tables for girls and boys, furnishing raw score values for every 5th percentile level from the 5th to the 99th rank. These tables allow the assessment of a child's standing relative to other children of the same age and gender. For example, as shown in the table for CDI Toddler Form B (Vocabulary Production), a raw score of 87 words for a 26-month-old girl would place her at the 75th percentile for her age and gender. The tabled values are "smoothed" scores, derived by determining the best-fitting logistic functions. This procedure compensates for irregularities in the raw score means produced by random variation.

RESEARCH AND CLINICAL APPLICATIONS

The CDI short forms provide reliable indices of vocabulary development that are highly correlated with vocabulary scores on the full CDI. The infant version yields measures of vocabulary comprehension and vocabulary production. The

toddler version yields a measure of vocabulary production. These forms will be useful to researchers and clinicians who are seeking a quick assessment of early language. The forms will be particularly valuable when time or parental literacy is limited. In the latter case, parents with limited reading skills may find a 1-page form less burdensome than an 8-page questionnaire. The shorter form also makes it more feasible for an examiner to assist with any specific words the parent does not recognize. The forms are brief enough to be administered verbally, although there is, at present, no comparative data on the effects of verbal versus written presentation of these instruments. The short forms may also prove useful in longitudinal studies, where repeated administration of the full inventory would be impractical. For children in the 16- to 30-month age range, investigators have the option of alternating between the two equivalent toddler forms to reduce effects accruing from repeated administration of the same items.

The CDI manual (Fenson et al., 1993) cautions that the upwardly skewed socioeconomic distribution of the normative study limits the applicability of the norms to children from low education/low income families. A study by Arriaga, Fenson, Cronan, and Pethick (1998) validated that warning; they found that the scores of very low income children on the full CDI toddler form were dramatically lower than those from middle-class homes. However, their study did not allow a determination of whether the depressed scores reflected underreporting by parents, deficient skills of the children, or some combination of these factors. Information relevant to this question has been published by Roberts, Burchinal, and Durham (1999). A preliminary, abbreviated 50-item version of the toddler CDI short form was completed by the parents of 87 African American toddlers from low income homes. A comparison of these data with other language measures indicated that a significant number of these parents significantly underestimated the expressive vocabulary skills of their children in completing this "mini" version of the CDI short form. While the brevity of the form may have exacerbated the underreporting effect, the findings further underscore the importance of exercising caution in administering and interpreting the MacArthur instruments with low socioeconomic samples.
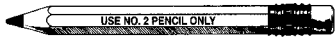
The CDI short form may be used for many of the same research and clinical purposes as the full CDIs (Fenson et al., 1993). Clinical uses include corroboration of professionally administered measures, evaluation of treatment effects, and possibly screening for language delay, although empirical studies are needed to determine the sensitivity of the forms for identifying delay. Research uses include screening and preselecting children at different levels of language development, matching children on language skills prior to some experimental treatment, and examining the influence of other variables on language development. Because the short forms include only vocabulary measures – and a briefer list at that – they are not likely to be as precise as the full CDI. For example, the word list is too brief to be useful for studies of vocabulary composition (Bates et al., 1994). The brevity of the list also contributes to a possible ceiling effect after 27 to 28 months, especially for high-ability children. Finally, the toddler forms do not include any measure of grammatical development following the

emergence of word combinations. Researchers and clinicians should carefully consider their language assessment goals prior to selecting one of the CDI instruments.

APPENDIX 1

MacArthur Short Form
Vocabulary Checklist: Level I

Make no stray marks. Improper Marks Proper Mark USE NO. 2 PENCIL ONLY
Erase any changes cleanly.

Child's Name _____ Sex _____

Birthdate _____ Today's Date _____

VOCABULARY CHECKLIST

For words your child understands but does not yet say, mark the first column (understands). For words that your child not only understands but also says, mark the second column (understands and says). If your child uses a different pronunciation of a word, mark it anyway.

	UNDERSTANDS	UNDERSTANDS AND SAYS		UNDERSTANDS	UNDERSTANDS AND SAYS		UNDERSTANDS	UNDERSTANDS AND SAYS
choo choo	O	O	chair	O	O	wait	O	O
meow	O	O	couch	O	O	break	O	O
ouch	O	O	kitchen	O	O	feed	O	O
uh oh	O	O	table	O	O	finish	O	O
bird	O	O	television	O	O	help	O	O
dog	O	O	blanket	O	O	jump	O	O
duck	O	O	bottle	O	O	kick	O	O
kitty	O	O	cup	O	O	kiss	O	O
lion	O	O	dish	O	O	push	O	O
mouse	O	O	lamp	O	O	sing	O	O
car	O	O	radio	O	O	smile	O	O
stroller	O	O	spoon	O	O	night	O	O
ball	O	O	flower	O	O	today	O	O
book	O	O	home	O	O	all gone	O	O
doll	O	O	moon	O	O	big	O	O
bread	O	O	outside	O	O	broken	O	O
candy	O	O	plant	O	O	dark	O	O
cereal	O	O	rain	O	O	fast	O	O
cookie	O	O	rock	O	O	hurt	O	O
juice	O	O	water	O	O	pretty	O	O
toast	O	O	babysitter	O	O	soft	O	O
hat	O	O	girl	O	O	I	O	O
pants	O	O	grandma	O	O	me	O	O
shoe	O	O	mommy	O	O	how	O	O
sock	O	O	bath	O	O	who	O	O
eye	O	O	don't	O	O	away	O	O
head	O	O	hi	O	O	out	O	O
leg	O	O	night night	O	O	other	O	O
nose	O	O	patty cake	O	O	some	O	O
tooth	O	O	please	O	O			

MacArthur Short Form
Vocabulary Checklist: Level II (Form A)

Make no stray marks. **Erase any changes cleanly.**	**Improper Marks** ⊘⊗⊖⊙	**Proper Mark** ●	USE NO. 2 PENCIL ONLY

Child's Name _____		**Sex** _____	
Birthdate _____	**Today's Date** _____		

VOCABULARY CHECKLIST

Children understand many more words than they say. We are particularly interested in the words your child SAYS. Please mark the words you have heard your child use. If your child uses a different pronunciation of a word, mark it anyway.

baa baa	○	hat	○	sky	○	all gone	○
meow	○	necklace	○	party	○	cold	○
ouch	○	shoe	○	friend	○	fast	○
uh oh	○	sock	○	mommy	○	happy	○
woof woof	○	chin	○	person	○	hot	○
bear	○	ear	○	bye	○	last	○
bird	○	hand	○	hi	○	tiny	○
cat	○	leg	○	no	○	wet	○
dog	○	broom	○	shopping	○	after	○
duck	○	comb	○	thank you	○	day	○
horse	○	mop	○	carry	○	tonight	○
airplane	○	plate	○	chase	○	our	○
boat	○	trash	○	dump	○	them	○
car	○	tray	○	finish	○	this	○
ball	○	towel	○	fit	○	us	○
book	○	bed	○	hug	○	where	○
game	○	bedroom	○	listen	○	beside	○
applesauce	○	bench	○	like	○	down	○
candy	○	oven	○	pretend	○	under	○
coke	○	stairs	○	rip	○	all	○
cracker	○	flag	○	shake	○	much	○
juice	○	rain	○	taste	○	could	○
meat	○	star	○	gentle	○	need	○
milk	○	swing	○	think	○	would	○
peas	○	school	○	wish	○	if	○

Has your child begun to combine words yet, such as "nother cookie" or "doggie bite?"
○ Not Yet   ○ Sometimes   ○ Often

MacArthur Short Form
Vocabulary Checklist: Level II (Form B)

Make no stray marks. Erase any changes cleanly.	Improper Marks ⊘⊗☺☺	Proper Mark ●	USE NO. 2 PENCIL ONLY

Child's Name _____ Sex _____

Birthdate _____ Today's Date _____

VOCABULARY CHECKLIST

Children understand many more words than they say. We are particularly interested in the words your child SAYS. Please mark the words you have heard your child use. If your child uses a different pronunciation of a word, mark it anyway.

baa baa	○	beads	○	store	○	big	○
moo	○	hat	○	zoo	○	black	○
ouch	○	jeans	○	baby	○	then	○
yum yum	○	shoe	○	mommy	○	careful	○
quack quack	○	feet	○	child	○	dirty	○
bird	○	nose	○	mailman	○	fine	○
duck	○	tongue	○	bath	○	mad	○
fish	○	bottle	○	bye	○	noisy	○
kitty	○	bowl	○	lunch	○	slow	○
moose	○	clock	○	night night	○	before	○
penguin	○	glass	○	no	○	today	○
boat	○	jar	○	bite	○	tomorrow	○
truck	○	keys	○	build	○	she	○
balloon	○	light	○	catch	○	their	○
present	○	telephone	○	drink	○	they	○
puzzle	○	bathtub	○	drop	○	yourself	○
cheese	○	chair	○	find	○	why	○
chicken	○	crib	○	go	○	above	○
cookie	○	porch	○	hide	○	away	○
juice	○	sofa	○	jump	○	up	○
pretzel	○	cloud	○	kick	○	none	○
salt	○	hose	○	look	○	some	○
sauce	○	sidewalk	○	pick	○	does	○
vanilla	○	sun	○	run	○	don't	○
cup	○	house	○	sit	○	were	○

Has your child begun to combine words yet, such as "nother cookie" or "doggie bite?"
○ Not Yet   ○ Sometimes   ○ Often

MacArthur CDI Infant Form
Percentile Scores for Vocabulary Comprehension (Fitted)
Boys
Age in Months

% Rank	8	9	10	11	12	13	14	15	16	17	18
99	52	62	70	76	81	84	86	88	88	89	89
95	32	40	47	55	62	68	73	77	81	83	85
90	30	33	40	45	50	55	60	65	69	72	75
85	21	25	30	36	42	48	53	59	64	69	73
80	18	21	28	33	39	45	51	57	62	67	72
75	16	20	25	30	36	42	48	54	60	65	70
70	12	15	19	24	30	36	42	49	55	62	67
65	10	13	16	21	26	32	39	46	53	59	65
60	9	12	15	19	24	30	36	43	50	56	63
55	8	10	13	17	22	27	33	39	46	53	59
50	7	10	12	16	20	25	30	36	43	49	56
45	6	8	10	14	18	23	29	35	42	49	58
40	5	7	9	12	16	20	26	32	39	46	53
35	4	6	8	10	14	18	23	29	36	44	51
30	3	4	6	8	12	16	21	28	35	43	51
25	3	4	5	7	10	14	19	25	32	40	48
20	2	2	3	5	8	11	16	22	29	38	47
15	2	1	3	5	8	10	14	19	25	32	40
10	1	2	3	4	6	9	12	17	22	29	37
05	1	1	1	2	3	5	8	11	16	23	31

MacArthur CDI Infant Form
Percentile Scores for Vocabulary Comprehension (Fitted)
Girls
Age in Months

% Rank	8	9	10	11	12	13	14	15	16	17	18
99	54	62	68	74	78	82	84	86	87	88	89
95	47	55	62	68	73	78	81	83	85	87	88
90	24	31	39	47	55	63	68	74	79	82	84
85	21	27	35	42	50	58	65	71	76	79	82
80	20	25	33	37	45	50	56	62	68	72	76
75	18	22	28	34	40	47	53	58	65	70	74
70	16	20	25	30	36	43	49	55	61	66	71
65	14	19	24	29	35	41	47	53	59	64	69
60	13	16	21	26	32	38	45	51	58	64	67
55	12	15	19	24	30	36	42	49	55	61	67
50	10	13	16	21	26	32	39	45	52	59	65
45	8	11	14	19	24	30	37	44	51	58	64
40	8	10	13	17	22	28	34	41	48	55	62
35	7	10	13	16	21	26	32	38	45	52	58
30	7	9	11	15	19	23	29	35	41	48	54
25	5	7	9	12	16	21	26	32	39	46	53
20	4	6	8	10	13	18	23	29	35	43	50
15	3	5	7	9	12	16	21	26	33	40	48
10	2	3	4	6	9	13	16	23	29	36	45
05	2	2	3	5	6	9	12	16	21	27	34

MacArthur CDI Infant Form
Percentile Scores for Vocabulary Production (Fitted)
Boys
Age in Months

% Rank	8	9	10	11	12	13	14	15	16	17	18
99	5	7	10	13	18	24	31	40	48	56	64
95	3	4	6	8	12	17	23	30	39	48	57
90	2	3	4	6	9	12	17	23	31	40	48
85	2	2	3	5	7	10	14	19	26	34	42
80	2	2	3	4	6	9	12	16	22	29	37
75	1	2	3	4	5	8	11	15	20	26	33
70	1	2	2	3	4	6	9	13	17	23	31
65	1	1	2	3	4	5	7	10	14	19	25
60	1	1	2	3	4	5	7	9	13	17	23
55	1	1	2	2	3	4	6	8	12	16	21
50	1	1	1	2	3	4	5	7	10	13	18
45	1	1	1	2	2	3	5	6	8	11	14
40	1	1	1	2	2	3	4	6	8	10	14
35	1	1	1	2	2	3	4	5	7	8	11
30	1	1	1	2	2	2	3	4	5	6	8
25	1	1	1	1	2	2	3	3	4	5	6
20	1	1	1	1	2	2	2	3	3	4	5
15	1	1	1	1	1	2	2	2	3	3	4
10	1	1	1	1	1	2	2	2	2	3	3
05	1	1	1	1	1	1	1	2	2	2	2

MacArthur CDI Infant Form
Percentile Scores for Vocabulary Production (Fitted)
Girls
Age in Months

% Rank	8	9	10	11	12	13	14	15	16	17	18
99	4	6	8	12	17	23	31	38	48	57	65
95	3	5	7	10	14	20	27	36	45	54	63
90	3	4	5	8	11	15	21	27	35	44	52
85	2	3	5	7	9	13	17	23	30	38	46
80	2	3	4	6	8	11	15	21	28	36	44
75	2	3	4	5	7	10	14	19	26	33	41
70	1	2	3	4	6	9	13	18	24	31	39
65	1	2	3	4	6	8	12	17	22	29	38
60	1	2	3	3	5	7	10	14	19	26	33
55	1	2	2	3	5	7	9	13	17	23	30
50	1	1	2	3	4	6	8	11	15	20	27
45	1	1	2	3	4	5	7	10	14	19	26
40	1	1	2	2	3	4	7	9	13	17	23
35	1	1	1	2	3	4	5	8	10	14	18
30	1	1	1	2	2	3	5	6	9	12	16
25	1	1	1	2	3	3	4	6	8	10	13
20	1	1	1	2	2	3	4	5	7	9	11
15	1	1	1	1	2	2	3	4	6	7	9
10	1	1	1	1	2	2	2	3	3	4	5
05	1	1	1	1	1	1	1	1	1	2	2

MacArthur CDI Toddler Form A
Percentile Scores for Vocabulary Production (Fitted)
Girls
Age in Months

% Rank	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
99	51	66	74	80	85	89	92	94	96	98	98	99	99	100	100
95	58	66	74	80	85	89	92	94	96	98	98	99	100	100	100
90	39	48	57	66	74	80	86	90	93	95	97	98	99	100	100
85	37	43	54	62	70	77	82	87	91	93	95	97	98	99	100
80	29	36	43	51	59	66	73	79	84	88	91	93	95	97	98
75	29	36	43	51	59	66	73	79	84	88	91	95	95	97	98
70	29	36	43	50	57	65	71	77	82	86	89	92	94	96	97
65	28	34	40	46	52	59	65	70	75	80	84	87	90	92	94
60	27	32	38	44	50	56	62	67	73	77	81	85	88	90	93
55	26	31	36	42	48	54	60	66	71	76	80	84	87	89	92
50	23	28	33	39	45	51	57	63	68	73	78	82	85	88	91
45	21	25	30	35	41	47	53	59	65	71	75	80	84	87	90
40	20	24	28	34	40	46	52	58	64	69	74	79	83	86	89
35	18	22	26	31	37	43	49	55	61	67	73	77	82	85	88
30	16	20	24	29	34	40	46	52	58	64	70	74	79	83	88
25	16	20	23	27	33	38	43	49	55	61	66	71	76	80	83
20	14	17	20	24	28	33	38	44	49	55	61	66	71	75	79
15	14	16	19	22	26	30	34	39	44	49	53	58	63	68	72
10	12	15	17	20	23	27	31	35	39	44	48	53	58	62	67
05	9	11	13	15	17	20	23	27	30	34	38	43	47	51	56

MacArthur CDI Toddler Form A
Percentile Scores for Vocabulary Production (Fitted)
Boys
Age in Months

% Rank	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
99	61	68	77	83	87	91	94	96	97	98	99	100	100	100	100
95	58	66	74	81	86	90	93	96	97	98	99	100	100	100	100
90	37	45	53	61	69	73	81	86	90	92	95	96	98	98	99
85	33	39	46	52	65	71	77	81	85	88	91	93	96	95	96
80	30	35	41	47	59	64	70	74	79	83	86	88	89	91	93
75	26	31	37	43	55	61	66	70	72	76	81	84	87	90	92
70	24	29	34	39	50	56	62	67	67	72	76	80	84	87	88
65	22	26	30	35	46	51	56	62	62	67	71	76	80	83	86
60	20	24	28	33	43	48	53	59	59	64	69	73	77	81	84
55	17	20	24	29	39	44	50	55	55	61	66	71	76	80	83
50	14	17	23	25	35	40	46	52	58	58	64	68	74	79	83
45	12	15	18	22	32	37	43	49	55	61	67	72	70	77	81
40	11	14	17	20	30	35	41	47	53	59	59	68	70	75	79
35	11	13	16	19	28	33	39	44	50	56	56	62	68	73	77
30	10	12	15	18	26	31	36	41	47	53	53	59	64	70	74
25	10	11	14	17	24	29	34	40	45	51	57	63	62	68	73
20	8	9	12	15	22	26	31	37	43	49	49	55	62	67	73
15	6	8	10	12	17	21	26	32	38	43	39	44	50	55	61
10	6	7	9	11	16	19	22	28	34	31	36	41	47	52	58
05	2	3	4	5	7	9	11	14	20	17	20	25	29	34	40

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MacArthur CDI Toddler Form B
Percentile Scores for Vocabulary Production (Fitted)
Boys
Age in Months

% Rank	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
99	77	81	84	87	90	92	93	95	96	97	98	98	99	99	100
95	48	57	65	72	79	84	89	92	94	96	98	99	99	100	100
90	30	37	46	54	62	70	77	82	87	90	93	95	97	98	99
85	26	32	39	46	54	62	69	75	80	85	89	92	94	96	97
80	23	29	36	43	51	58	66	72	78	83	87	90	93	95	96
75	25	30	36	42	48	55	61	67	73	78	82	86	89	91	93
70	21	26	31	37	43	50	56	62	68	74	79	82	86	89	92
65	18	23	28	33	39	46	52	59	65	71	76	81	85	88	90
60	16	19	24	29	35	41	47	54	60	66	72	77	81	85	88
55	15	18	23	27	33	39	45	51	58	64	70	75	80	84	87
50	14	17	21	26	31	36	42	48	55	60	66	71	76	81	84
45	11	14	18	22	26	31	37	43	49	56	62	68	73	78	82
40	10	13	16	19	23	28	34	40	46	52	58	65	70	75	80
35	9	11	14	17	21	25	30	35	41	47	54	60	66	71	76
30	8	9	12	15	18	23	27	33	39	45	51	57	63	69	75
25	6	8	10	12	15	19	23	28	34	40	46	53	59	65	70
20	5	7	8	10	13	16	20	24	29	35	40	46	53	59	65
15	4	5	8	8	11	13	16	20	24	29	35	41	47	53	59
10	2	3	4	5	8	10	13	16	20	24	29	35	41	47	48
05	1	2	3	3	4	6	8	10	13	16	20	25	30	36	26

MacArthur CDI Toddler Form B
Percentile Scores for Vocabulary Production (Fitted)
Girls
Age in Months

% Rank	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
99	63	66	73	80	84	87	90	93	95	96	97	98	98	99	100
95	60	67	73	78	83	87	90	92	94	96	97	98	99	99	100
90	46	52	59	63	71	76	81	85	88	91	93	95	96	97	98
85	43	49	55	61	66	72	76	80	84	87	90	93	94	95	96
80	40	46	52	58	64	70	74	79	83	86	89	91	93	95	96
75	35	41	47	53	60	66	71	76	80	84	87	89	92	94	94
70	33	38	44	50	56	62	68	73	77	81	83	88	90	92	94
65	29	34	40	46	52	58	64	70	75	79	83	87	89	89	91
60	27	32	37	43	49	55	60	66	73	73	79	83	86	87	89
55	27	32	37	42	48	53	58	64	69	73	77	81	84	87	88
50	24	28	33	38	44	49	55	60	63	70	75	79	82	86	88
45	21	24	29	34	39	45	50	56	62	67	72	76	80	84	87
40	20	24	28	33	38	43	46	54	59	64	69	74	78	82	85
35	17	20	24	28	33	38	43	49	54	60	65	70	74	78	82
30	15	18	22	26	31	36	41	46	52	58	63	67	73	76	82
25	14	17	20	24	29	33	39	44	50	55	61	61	71	76	80
20	12	14	17	21	24	28	33	38	43	48	54	59	64	68	74
15	10	12	14	17	21	25	29	34	39	44	50	55	61	66	71
10	8	10	12	14	17	20	24	28	33	37	43	48	53	59	64
05	4	5	6	8	9	12	14	17	21	24	29	34	39	44	50

NOTE

1. Work by Reznick and Goldsmith (1989) on a preliminary MacArthur short form established a framework for the current project. Five parallel short forms were developed for the predecessor of the CDI Words and Sentences Form for toddlers – the Early Language Inventory (ELI) (see Dale, Bates, Reznick, & Morisett, 1989; Fenson et al., 1993). These five forms correlated with each other at r values greater than .97 ($p < .01$) and with the full ELI score at r values greater than .98 ($p < .01$).

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