

1975

An Investigation of Receptive and Expressive Pluralization and Tense Inflectional Skills of Three Year Old Children

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AN INVESTIGATION OF RECEPTIVE AND EXPRESSIVE

PLURALIZATION AND TENSE INFLECTIONAL SKILLS

(TITLE)

OF THREE YEAR OLD CHILDREN

BY

JAMES MICHAEL COFFMAN

THESIS

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF

MASTER OF SCIENCE

IN THE GRADUATE SCHOOL, EASTERN ILLINOIS UNIVERSITY
CHARLESTON, ILLINOIS

1975

YEAR

I HEREBY RECOMMEND THIS THESIS BE ACCEPTED AS FULFILLING
THIS PART OF THE GRADUATE DEGREE CITED ABOVE

December 10, 1975

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December 10, 1975

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ACKNOWLEDGMENTS

The completion of this thesis was made possible through the cooperation and support of several persons.

I wish to acknowledge the Directors and Staff of the Busy Bee School and LaPetite Academy of Mattoon, Illinois for their assistance in identifying subjects and in providing testing facilities. I also wish to thank Raymond Lane, Superintendent of Mattoon Community Unit Number Two Schools, for providing additional testing facilities. I extend my appreciation to the parents for allowing their children to participate in the study, and also to the children for their willingness to participate.

A special feeling of appreciation belongs to Dr. James E. Nicely, my thesis adviser. Dr. Nicely's approach to the task provided me with confidence and encouragement. The comments and suggestions of Dr. Wayne L. Thurman and Dr. Mary B. Armstrong, were most helpful and appreciated.

To Mrs. Willa Rice, Mrs. Susan Coffman, my wife, and Mrs. Mary Ellen Coffman, my mother, my thanks for the sacrifices each made in typing the drafts and manuscripts. In addition, Susan drew each of the test plates.

My family deserves my love and gratitude. Susan provided patience, encouragement and love. My children, Michael Scott and Alyson Renee, will now have one of their favorite playmates back.

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CHAPTER I

INTRODUCTION

A linguistic theory of language using a model describing the generative rules of grammar was formulated by Chomsky (1957). This model is viewed as a tripartite structure: phrase structure, transformations and morphology. His model has been used by Menyuk (1963a, 1963b, 1964a, 1964b) and by Carrow (1968) to investigate language development in normal children. Morphology was defined as the application of the inflectional or derived rules of the language. Cooper (1967) defined morphology as "the system of rules by which the smallest meaningful language units, or morphemes, are combined into words."

In recent years, several studies have investigated morphological inflections and derivations in children with varying degrees of intelligence, socio-economic status, hearing acuity, and language development. Although the tests of morphological development have varied in length, item selection, and type of stimulus, most were based on the procedure first used by Berko (1958), for expressively examining morphological competence in children. General trends in the developmental rate and order of morphological skills, and approximations of the ages of acquisition for specific skills

are present in the literature. However, some inconsistencies exist and normative data is not available. Younger children tended to perform better with lexical stimuli than with nonsense stimuli.

Of primary concern in the remediation process of language disorders is early intervention. The passage of Illinois House Bill 323 mandates school districts to provide diagnostic and remedial services for all children aged three years to five years having any physical or educational handicap. The speech pathologist is an integral part of the diagnostic team that examines the children in the identification programs and, therefore, must have available knowledge in speech and language development and methods for evaluating that development in young children. Evaluation of younger children presents problems often not found with older children--such as cooperation of the child, intelligibility of speech, and attention to the tasks.

The proficiency of certain early developing morphological inflections has not previously been investigated in three-year-old children. It also has not been determined if the receptive format for assessment at that age supplies additional information concerning morphological development. This information would be useful to the researcher, diagnostician, and clinician.

Investigators have made similar comments concerning the use of morphology by children of different experimental populations. Berko (1958) investigated knowledge of morphological rules in normal children by using a nonsense test to elicit internalized knowledge of the rule to a novel situation. Her results indicated

a pattern "of consistency, regularity, and simplicity" in using inflectional endings. Menyuk (1963a, 1964c) examined the linguistic structures of pre-school children. She reported that inflections marking tense, pluralization, possession, and comparisons are restricted in children's grammar. The greater the number of selectional restrictions for the application of an inflectional rule, the later it appears in children's speech. She stated that the patterns of normal language structure differ from the patterns of deviant structure. Menyuk (1971) reported trends in the developmental order of morphemes in children and reasons for that order. Cooper (1967) compared deaf children to normal hearing children using a written test modeled after the Berko (1958) test. Both populations exhibited the same order of difficulty on various morphemes and had difficulty on the same type of responses.

Comparisons of children with varying degrees of intelligence have been conducted using expressive tests of morphology. Blake and Williams (1968) investigated three populations of different intelligence: normal, superior, and retarded. They compared the subject's use of inflectional and derivational skills at two levels of generality. The results indicated mental ability and expressive morphological competence correlated highly, and that none of their subjects performed better on nonsense stimuli than on lexical stimuli. Newfield and Schlanger (1968) used the Berko (1958) nonsense test and a lexical word list which paralleled that test to discover that significant quantitative differences existed between normal and retarded children on both types of tests. The retarded children experienced significantly more difficulty in

generalizing morphological inflections to unfamiliar situations (nonsense words) which would indicate knowledge of the morphological rule. Dever and Gardner (1970), employing the Berko (1958) nonsense test, found normal children out-scored mentally retarded children when the two groups were matched on either chronological age or mental age, and that the retarded population scored higher on lexical stimuli than on nonsense stimuli. Dever (1972) tested mentally retarded children ages six to ten years with a revision of Berko's test items and a lexical version to determine if test performance could predict the occurrence or non-occurrence of errors in free speech. His conclusion was that the test paradigm, using either real or nonsense words, was not useful in testing the development of bound morphemes in mentally retarded children. However, several points of this study warrant further discussion later.

Some investigators have attempted to evaluate morphological competence in children using inventories of comprehensional and productive items. Bellamy and Bellamy (1970) investigated five morphological inflections including noun pluralization, possession, and three verb forms in normal children. The 52 item test had two productive and two comprehensive tasks. Shriner and Miner (1968) included ten receptive noun pluralization items on their 30 item test with normal and culturally deprived children. Forest (1973) included 11 receptive items in both the lexical and nonsense subtests of her "deep test" of morphological skills. She tested seven noun pluralization items, four past tense items, and one third-person-singular present tense verb form. Five of the eleven items

involved the backward formation task described in Bellamy and Bellamy (1970). Carrow (1968) included in her battery (designed to evaluate comprehensive linguistic structure skills of normal children) inflectional items for noun pluralization (two), verb tense (four), noun-marker (four), and comparative (four).

Developmental sequencing of language skills has been investigated in normal and retarded children. Fraser, Bellugi, and Brown (1963) developmentally determined that imitation is more advanced than comprehension and comprehension is more advanced than production in normal children. Lovell and Dixon (1967) used the test of Fraser et al. with retarded children and obtained the same developmental order. The test included ten grammatical categories, three of which were inflectional structures.

The literature provides substantial information and trends in morphological development and test construction for children of varying mental capabilities and age. There remain, however, many unanswered questions particularly in relation to children below the chronological age of five.

In the present investigation, use of noun pluralization and verb tense will be examined both expressively and receptively using a lexical test involving black and white sketches.

The following null hypotheses are presented for examination:

- (1) There is no significant difference between the expressive scores and the receptive scores of the noun pluralization inflections for three-year-old children.

- 2) There is no significant difference in the noun pluralization scores as the inflections were varied from /-s/ to /-z/ to /-ɪz/.
- 3) There is no significant difference between the expressive scores and the receptive scores of the verb tense inflections for three-year-old children.
- 4) There is no significant difference in the verb tense scores as the inflections were varied from progressive to third-person-singular to past verb forms.

CHAPTER II
REVIEW OF THE LITERATURE

Many investigations have been undertaken in recent years to study morphological development in children. Berko (1958) used a nonsense test to examine the morphological skills in children. It was assumed that a child able to supply correct inflectional allomorphs to words could generalize the internalized rule to a novel situation and provide correct inflectional allomorphs. Each of the 27 nonsense items were brightly-colored line drawings depicting objects, cartoon-like animals, and men performing tasks. The text omitting the desired form was typed on the cards below the pictures. In eliciting a plural inflection, for example, the child was shown the picture of an object and was told, "Here is a _____ (stimulus word: gutch)." He was then shown a picture containing two of the objects and was told, "Now there is another one; there are two of them; there are two _____." The child received a correct score if he inflected the presented stimulus.

The nonsense test presented stimulus frames for the following number of allomorphs: ten noun pluralizations /-s, -z, -ɪz/; two third-person present tense; eight past tense; one diminutive, and compounded or derived word; three singular possessive; three plural possessive; one each of comparative and superlative adjectives. Fourteen compound words followed. Berko used the

responses of 12 adults to establish the criteria for a correct response for the children. Nineteen children from the Harvard Preschool in Cambridge and 61 from the Driscoll School in Brookline, Massachusetts, were given the test individually. The results indicated that sex of the subject was not a significant factor in the children's ability to generalize internalized rules of morphology. While the children formed plurals with the allomorphs /-s/ and /-z/, they did not generalize to form new words with the /-əz/ allomorph. Stimulus words ending in /s, z, ʃ, ʒ, tʃ, dʒ/ were not inflected by Berko's subjects but reported as if they were already plural. The subjects were significantly more successful in applying the /-əz/ allomorph in the third-person-singular of the verb and possessives than in plural nouns. Third-person-present progressive and the /-t/ and /-d/ past tense allomorphs were used successfully. Derivational inflections and irregular verb forms were not used by these children. Berko stated the following:

"The picture that emerged was one of consistency, regularity, and simplicity. The children did not treat new words according to idiosyncratic pattern. They did not model new words on patterns that appear infrequently. Where they provided inflexional endings, their best performance was with those forms that are the most regular and have the fewest variants. With the morphemes that have several allomorphs they could handle forms calling for the most common of those allomorphs long before they could deal with allomorphs that appear in a limited distribution range."

Natalicio and Natalicio (1969) criticized Berko for lack of controls on the subjects, specifically intelligence, aptitude, and socio-economic status. Menyuk (1964a) examined Berko's population and discovered the mean IQ was 130.3 and that parental occupations

ranked in the upper twenty-fourth percent of a middle class population.

Ainsfeld and Tucker (1967) criticized Berko's study because (1) it failed to provide a full index of morphological development; (2) it failed to test the receptive aspect of morphological development; (3) the technique failed to determine if a subject could give the singular if told the plural; and (4) it failed to test an equal distribution of allomorphs.

A series of three studies was conducted by Ainsfeld and Tucker (1967) to investigate the role of numbers in pluralization, the pluralization by addition rule, and the child's mastery of standard English pluralization rules. In the latter study, three recognition and three production tasks were used. The results indicated that children aged four to six had significantly more difficulty with the /-rɪz/ plural than the /-s/ or /-z/ allomorphs. Their subjects had "greater" success giving the singular when supplied with the plural.

Receptive and expressive use of the morphological inflections in past, present, and progressive tenses of regular verbs and the plurals and possessives of regular nouns was investigated by Bellamy and Bellamy (1970). The 160 children, aged four to ten years, were divided 20 males and 20 females per grades one to four. The kindergarten had 15 males and 15 females. Each child was given the 52 item nonsense test individually, with the order of presentation reversed for each child. The examiner supplied correct answers for errors or no responses by the children. Two types of expressive tasks were performed--forward formation

and backward formation. The forward formation task was the same as the Berko paradigm. The backward formation tasks involved the child deleting the inflection for plurals and substituting one inflection for another for verb forms. The first receptive task involved the child selecting the picture which best fit the supplied inflected nonsense form. The child had to select one of two inflected words which best fit the picture in the second receptive task.

The pictures used were laminated crayon sketches mounted on colored construction paper. Illustrations for plural stimuli were flowers or cartoon-like figures; verb stimuli depicted an animal or person performing an action. An attempt was made to use imaginary acts or actions a child could not describe in one word. The expressive verb form was a single character performing a task. The character was depicted twice--once shown with an object doing an act; and with his hands folded or without the object in the other.

The results indicated that the children did not successfully perform 50 percent of the comprehension tasks until they were in second grade (approximately seven years of age). Backward formations, expressive tasks, were not acquired until age eight years. The mastery of the /-s/ and /-z/ allomorphs occurred in third grade for verb and plural forms. The /-ɪz/ was never mastered by the subjects, as is the case with many adults.

The assertion that understanding precedes production was investigated by Fraser, et al. (1963). Production was examined in two ways: (a) as the correct imitation of contrasting features

in sentences without evidence of understanding, and (b) as correct production of contrasting features in sentences as applied appropriately to pictures. Ten grammatical contrasts were evaluated: mass noun/count noun, singular/plural marked by inflections, singular and plural marked by "is" and "are", present progressive tense/past tense, present progressive tense/future tense, affirmative/negative, singular/plural of third person possessive pronouns, subject/object in active voice, subject/object in passive voice, and indirect object/direct object. In the comprehension task the examiner displayed two pictures and named them without revealing the name of either picture. He then read one of the sentences and the child selected the appropriate picture. The other sentence was then read and the child pointed to his selection. In the imitation task, the two sentences were read by the examiner. The child was asked to repeat them after the examiner read them again, individually. The production procedure did not require the repetition of the sentences, however, the sentences were repeated to equate, across tasks, the subject's exposure to the contrasts. Correct production of the contrast sentence was correct only when matched with the correct picture.

An earlier study indicated children aged four years and older would respond correctly on most imitation, comprehension, and production problems. Therefore, 12 subjects from various Cambridge, Massachusetts, preschools aged from 37 to 43 months, were chosen. Each was presented four warm-up items and then the 60 item test having six pairs for each grammatical contrast in counterbalanced and randomized order. It was necessary to continue each task until

the full set was presented since the pretest had determined that switching from one task to another confused the children. One examiner, familiar to the children, performed the testing while another recorded the entire session on tape.

Analysis of scores and order of task performance showed a trend for subjects taking the production task second in order doing better than those taking that task first, and those taking it last doing better than those doing it second. However, these task order scores were not significant. The total scores obtained showed significant differences between the subtests. Imitation was greater than comprehension which was greater than production.

Lovell and Dixon (1967) used the same test as Fraser et al. (1963) to trace the growth and control of grammar and to determine if the imitation, comprehension, and production tasks rank ordered themselves as Fraser et al. had done through the age ranges. He used normal children aged two years to seven years and educationally mentally handicapped children aged six and seven. Twenty subjects at each of the two, three, four, five, and six years were selected from nursery and infant schools. Forty pupils in EMH classes, ages six and seven, were also studied. The mean IQ for the six and seven-year-olds respectively were 61.1 and 66.5 with standard deviations of 8.1 and 9.4.

No individual child scored higher on comprehension than imitation, nor did any child score higher on production than comprehension. This pattern held for group scores beyond the 0.01 level of significance for both groups. The retarded subjects, while not matched for mental age, performed at the three and four year

level in normals. Although the rank ordering of item difficulty was also significant in both populations, Lovell and Dixon, as did Fraser et al. (1963), suggested that several variables may have influenced this, such as length of the sentence contrasts in the different categories.

An investigation of morphological development in normals and educable mentally retarded children conducted by Newfield and Schlanger (1968) used the Berko (1958) test and a list of lexicon words selected to parallel Berko's items morphologically and phonologically. Their purpose was to determine (1) if differences existed between normal's and educable mentally retarded children's morphological development, (2) if the results from lexicon and nonsense stimuli differed on these populations, and (3) if relationships existed between morphological development and mental and chronological ages. Thirty educable mentally retarded subjects from Columbus State School, Columbus, Ohio, having normal hearing and intelligible speech were selected. Their chronological ages ranged from eight years-ten months to twelve years-one month while their mental ages ranged from four years-ten months to eight years. These subjects were given a picture articulation test for these phonemes in the final position /-s, -z, -t, -d, -ŋ/. Only subjects with normal articulation or consistent substitutions were included. Thirty normal subjects from Columbus public schools with normal speech, hearing, and intellectual ability, as determined by school records and personnel, were selected. Ten were selected from grades K, 1, and 2 with their ages ranging from five years-eight months to eight years-four months. The Peabody Picture Vocabulary Test was administered to all subjects for group comparisons and to assess the relationship of

mental age to morphological development.

The two morphology tests were administered individually using the lexicon items first. A pilot study revealed "that using familiar items first aided the children in understanding the responses desired and no practice trials were needed." Berko's scoring criteria was used except for the irregular past verb form where either a regular or irregular response was scored correct. Neither the Berko test nor the lexical test derived for this study revealed a pattern for the comparative and superlative of the nonsense word "quirk" and the diminutive for "wug" and their matched lexical items "spot" and "pig". These were omitted and only the categories of nouns, verb, and possessives were analyzed.

The results indicated that retarded children appeared "to learn morphology in a manner comparable to normal children." The rate of the retarded children was slower but the differences were quantitative, not qualitative. The acquisition order of the various allomorphs in the two populations is basically the same. The /-ŋ/ appeared to be the first mastered by normals and retarded children on both nonsense and lexical tests. The /-z/ first occurred correctly with noun plurals and then with the possessive singular. The /-əz/ allomorph appeared to be mastered first with verbs, then possessives, and then nouns. It was among the lowest-ranking scores of all allomorphs. The plural possessive scores were not considered to be reliable measures of morphological ability since it was formed by "adding a morphological zero." A significant difference was found between the lexical and nonsense test in both populations in favor of the lexical test. Mental age appeared to be a more significant factor in morphological

development than chronological age.

Blake and Williams (1968) investigated the use of selected inflectional and derivational allomorphs in three populations and two levels of generality. Tested inflections included noun plural with /-z/, singular and plural possessive /-z/, the past tense /-d/, the comparative adjective /-ɜ/. The derivational suffixes and the form classes of the stems were the noun marker (-er) with a verb, the noun marker (-ness) with an adjective, the adjective marker (-less) with a noun and the adjective marker (-able) with a verb. The 96 children were grouped eight per cell in four 23-month age brackets beginning at four years-zero months to eleven years-eleven months and three intelligence ranges, determined by IQ scores of 50 to 80, 90 to 110, and 120+. The IQ was determined by the 1960 revised edition of the Stanford-Binet, Form LM. The three groups were all white and from small to medium urban communities. One level of generality consisted of a Berko-type nonsense test. The other was use of the allomorphs while verbal and pictorial stimuli established the linguistic environment or verbal context. The nonsense words conformed with the lexical response in phonological configuration and number of syllables. The 96 items were presented in three sessions, 32 items per session. Responses were taped and scored spontaneously.

The results showed improvement in mean scores for all groups at both levels of generality as chronological age increased except in instances where all responses were correct or all in error. Performance on morphological rule inflection and derivation was consistent; the retarded children never exceeded the normal and superior children; the normal children never exceeded the superior children. In relation

to the subjects' abilities in the level of generality, Blake and Williams stated that subjects who accurately inflected and derived English words were also accurate in applying the morphological rule. Conversely, those not accurate with English words were also unsuccessful in applying the rule. "Several" exceptions occurred where English skills exceeded the nonsense task. The reverse never occurred. It should also be noted that the percentage of successful responses for the comparative, both noun markers and both adjective markers decreased rapidly in all populations. Statistical analyses of this was not computed in the investigation.

Dever and Gardner (1970) compared educable mentally retarded boys of differing mental age (MA) and chronological age (CA) to normal children using the Berko (1958) test of morphology. Ten boys ranging in IQ from 90 to 110 were randomly drawn and placed in each year level from six to ten. The educable mentally retarded CA groups ranged in IQ from 60 to 84 and were grouped by year levels from seven to ten. (Six-year-old retarded children were not identified or available.) Both groups came from approximately the same schools and living area. The MA mentally retarded group was selected from the upper level special classes and grouped ten subjects per year range from six to ten. Bilinguals were excluded. The 26 item Berko test was reproduced from the originals. Twenty-six teachers were used for correct answer determination. They were told their answers could not be wrong and were asked to give every-day responses. The authors reported "several stimuli gave more than one response...". They concluded any response made by 15 percent (four) of the teachers as a correct response. Since more than one correct answer existed, an extra card (Mook) was added for

noun pluralization.

Each item was analyzed. The normal boys outscored the CA-retarded group and the MA-retarded group. The increase in correct scores occurred later in the mentally retarded groups. The /-s/ and /-z/ pluralization allomorphs were easier for all groups than the /-ɪz/ allomorph. Verb forms were found more difficult for all groups with the /-ɪd/ allomorph more difficult than the /-t/ or /-d/. Less than 50 percent of the normals responded correctly to past tense /-ɪd/ until age eight years. The MA mentally retarded group scored near perfect scores on the progressive verb form at age eight years, while the CA mentally retarded group had a "quickly rising curve." Diminutive and derived adjective items showed chaotic graphs and were not analyzed.

The test paradigm developed by Berko (1958) was tested by Dever (1972) to determine its ability to predict the actual occurrence or non-occurrence of errors in the speech of educable mentally retarded children. The paradigm itself has two forms, lexical and the original nonsense form. This investigation used a modified version of the original Berko format "in accordance with the findings of previous research (Dever and Gardner, 1970)." The morphological forms included: plurals /-s, -z, -ɪz/ and an irregular, possessives /-s, -z, -ɪz, -ɪs/ singular and plural, comparatives /-əɹ/ and "more", superlatives /-əst/ and "most", present tense /-s, -z, -ɪz/, past tense /-t, -d, -ɪd/ and irregular, past tense lexical /-ɪd/ plus two irregulars, derived adjective noun, derived adjective verb, progressive, and adjective. This version of the test, therefore, did have some lexical items. The 30 subjects were randomly selected in groups of six for each MA level six, seven, eight, nine, and ten from public school special education

programs in southeastern Wisconsin. Their IQ range was 60 - 84. Children with articulation disorders severe enough to make tape transcription difficult and non-native speakers of English were excluded. Sex was not controlled as previous research had found it not to be a factor.

Each child was given the morphology test, followed by elicitation of two five-minute free speech samples. The latter was accomplished by having a voice-actuated relay wired to a red light affixed to a doll of Mickey Mouse. A timer actuated by the relay signaled when five minutes of speech had been obtained and the child received a reward. During this elicitation, open-ended questions and prompting were used to stimulate the child to talk. The first free speech sample was obtained immediately after completion of the morphology test. The second one was obtained approximately ten days later. An effort was made during the second session to elicit the plural possessive */-ɪz/*, the derived adjectives, and the agentive by talking with the child about a stimulus word with those morphological forms. All tape recordings were transcribed in traditional orthography. Only unpredictable phonological forms (houses) were transcribed in phonetics by graduate students in linguistics. Three additional reviews of the transcriptions were made by a student of linguistics, the author, and a Ph.D.--level linguist in that order. Typed copies were then scored.

Since each inflection was tested by only two test items and since free speech items could vary from zero items to infinity, raw scores were converted to "percentages of total occurrence" to equate the two scores. Transformed test scores were correlated with transformed speech scores for each inflection.

All resulting correlations were not significant. Dever, therefore, concluded "the test does not predict the occurrence of non-occurrence of errors in the free speech of mentally retarded children." In his discussion, he stated that errors in free speech "tended to be at minimum but the test responses varied from 0 to 100 percent correct." He points out that this experiment has not shown Berko's (1958) original assumption to be false, in that those items inflected correctly probably demonstrate the fact that the child could use the particular morphological rule. Instead, this study demonstrated that failure on a test item does not predict errors in free speech accurately.

This writer has two criticisms of the procedures in the above study. Dever reported that test results varied from "0 to 100 percent." Since each inflection was tested by two items, only three scores were possible: 0 percent if both items were missed, 50 percent if one item was correct, and 100 percent if both items were correct. Secondly, the equating of test scores and speech scores using percentage and then conducting correlations did result in comparison of nominal and numerical data.

Cooper employed a written 48 item test having nonsense receptive and expressive portions to compare deaf and hearing children's abilities in inflection and derivation. Receptively, inflections were cued by a nonsense word and figure. The subject then put an "X" on one of four pictures representing the form desired. For derivational suffixes, the subject chose which word best completed a sentence. Expressively, the subject completed inflectional items by modifying a nonsense word that was cued by a picture. For derivations, he completed a statement within a given context. Cooper noted that, in English, derivational suffixes

could be followed by other suffixes while inflectional suffixes occur at the end of a word. The 26 receptive items included regular and irregular pluralization, progressive, third-person-singular, past participle, and past tense verb forms, comparative and superlative, and eight other derived suffixes. The 22 item expressive subtest consisted of a similar format.

The 140 deaf subjects from the Lexington School of the Deaf, New York, had no additional handicap, had English as a first language of their family, and read at a grade two level or better. Their age range was 7.2 years to 19.9 years. One hundred seventy-six hearing subjects ranging in age from 7.2 years to 18.1 years also spoke English as a first language and could read at a second grade level or better. The hearing subjects scored higher than the deaf subjects. Matching the groups for Mental Age resulted in no difference. The differences between the groups were smaller when they were matched on reading level. Item analysis revealed that inflectional rules were "easier" for both groups than derivational items. Receptive items were also easier than expressive items for both groups. The rules easiest on the receptive test were also easiest on the expressive test.

Four expressive tests of morphology developed in recent years have not previously been cited. Forrest (1973) extensively reviewed their formats (Chapell, 1968, Kirk and McCarthy, 1968, Berry and Talbott, 1967) in addition to the formats of the tests used in Shriner and Miner (1968), Bellamy and Bellamy (1970), Newfield and Schlanger (1968) and Berko (1958). The Illinois Test of Psycholinguistic Abilities, Auditory Vocal Automatic subtest, Kirk and McCarthy (1968), uses lexical items and is standardized. It contains several grammatical

items in addition to the morphological items. Chappell (1968) also used lexical items. From his data he concluded that "children kindergarten age and up have mastered an adult-like usage of regular morphemes." The Berry-Talbott Exploratory Text of Grammar was designed from the research of Berko but it has not been standardized.

Forrest (1973) reviewed each of the above and devised a test of morphology that included nonsense and lexical forms with expressive and receptive items. Each form, lexical and nonsense, had 16 noun pluralizations testing allomorphs /-s, -z, -Iz, -vz/ and irregular change, three singular possessives with allomorphs /-s, -z, -Iz/, seven past tense, three third-person-singular, and three present progressive verb forms with allomorphs /-t, -d, -id, -ŋ/ and irregular change, and three adjective derivational items with allomorphs /-ʒ, -əst/. The receptive portion of her test was much shorter than the expressive and 45 percent of those items used the backward formation task of Bellamy and Bellamy (1970). This failed to give a complete comprehensive evaluation of the subject.

Forrest (1973) then compared the morphological development of language delayed children to normals aged three to five. Her 20 subjects were selected from East Central Illinois. The results indicated that the language delayed group scored better on the lexical portion of the test. The normals did better on the nonsense portion. She, therefore, concluded there was no difference between the type of stimuli used with normals. The expressive nonsense items discriminated significantly between the two populations. Her subjects' scores rank ordered themselves as follows: (1) Normal lexical, (2) normal nonsense, (3) delayed lexical, and (4) delayed nonsense. The normal

children did better on both types of receptive items.

While the previously mentioned studies gave trends in acquisition ages of morphemes in children, some researchers have been more specific. Menyuk (1964b) stated that third-person-singular verb forms, possessives, and pluralization of nouns were present in the speech of normal children at age 2.6 years. Past tense markers occur at age 2.9 years. She stated that from age two years-two months to seven years-one month, a trend of less use of restricted forms found in children's grammar toward more adult forms occurred. Halle (1961) described the rules for pluralization as increasing in specificity. He stated that the developmental order of /-z/, then /-s/ and then /-ɪz/ was constant over ages three years through seven years. Irregular plurals develop later than regular plurals. He stated that the developmental order of verb form acquisition was as follows: present participle /-ɪŋ/, past tense /-t/ and /-d/, past tense /-ɪd/, third-person-singular /-z/, third-person-singular /-s/ and third-person-singular /-ɪz/. Irregular verb forms develop later. Menyuk (1971) stated that the pattern for development of morphology was the same in spontaneous speech and in the test situation. The greater the number of selectional restrictions for the application of a rule, the later it appears in children's speech.

CHAPTER III

PROCEDURES

Subjects

Twenty-five subjects were selected from three-year-old children residing in the communities of Mattoon and Charleston in East Central Illinois. There were 14 boys and 11 girls ranging in chronological age from three-years-zero months to three years-eleven months, with the mean age being 3.55 years. All 25 subjects from East Central Illinois spoke only American English and were of Caucasian heritage. Medical history records, previous hearing test results, and other pertinent information were reviewed when available prior to testing. None of the subjects had noticeable or reported physiologic disorders typically associated with speech development or language delay. All subjects passed an air conduction screening test at 15 decibel (ANSI, 1969) for the frequencies of 1000 Hz, 2000 Hz, and 4000 Hz and at 25 decibel (ANSI, 1969) maximum for 500 Hz. All subjects were given a picture word articulation test to elicit spontaneous utterances. The test was developed by the examiner to determine each child's proficiency in producing the phonemes /-s, -z, -t, -d, -ŋ/ in the post vocalic position of words. Two lexical items were presented for each phoneme. A carrier phrase was used to stimulate the desired response if necessary. Test items included "house" and "bus" for /-s/, "nose" and "cheese" for /-z/, "boat" and "hat" for /-t/, "bread" and "hand" for /-d/, and "swing" and "ring" for /-ŋ/. Test items were selected on the

basis of pictorial representation, ease of recognition by children, and various vowel environments. None of these items depicted actions or inflected words. None of the pictures appeared on the morphology test. Correct productions, phoneme distortions, and sound substitutions, such as /θ/ for /s/ were accepted as meeting criteria for this population. Children whose conversational speech was judged to be unintelligible or extremely difficult to understand were excluded. This study's objective was to obtain descriptive results under optimum testing conditions of the inflectional skills of three-year-old children. Therefore, it was necessary that articulation skills be a controlled variable.

The results of the hearing screening test and the articulation test were entered on the same record sheet. Hearing results were recorded "pass" and the level of 500 Hz noted. Articulation responses were recorded as follows: a check (✓) indicated correct; a dash (-) indicated omission; the notation "dis" indicated a distorted phoneme. Substitutions were recorded in phonetic symbols for later comparison to the tape recorded responses. In addition, the record sheet was provided with spaces appropriate for the child's name, chronological age, and birthdate. Medical history information, previous test data, such as hearing screening, and other information were noted if available. (Appendix A).

A parental permission form was signed by the child's parent or guardian prior to any contact with the child. (Appendix B)

Inflectional Language Measure

Test of Morphology

The 24 item inflection test was divided into receptive and expressive subtests, each having 12 items. The following inflectional skills of morphology were evaluated: noun pluralization /-s, -z, -Iz/, past tense /-t, -d/, present progressive tense /-ɪŋ/, and third-person-singular tense /-s, -z/. Two items were presented for each pluralization inflection and the present progressive inflection. One item for each inflection was presented for past tense and the third-person-singular inflections. The past tense inflection /-id/ was excluded since Dever and Gardner (1970) stated it was not mastered by "normal" children until eight years of age.

The test design required that the expressive items be presented first and the receptive items last. This was done to prevent learning of the responses. Testing receptive items first would have provided each subject with the correct inflected responses to be later tested expressively. Three test forms were constructed. The items on each subtest were randomized to prevent skewed results originating from subject fatigue, initial confusion, and/or learning effect.

Stimulus Selection

The stimuli that were selected were easily pictured and regularly inflected. They were pictures familiar to young children. Phonemes considered to be early-developing were used as much as possible. The test stimulus items were "cup", "can", "witch", "duck", "bed", and "dress" for pluralization; "comb", "pick", "skate", "jump", "paint", and "saw" for verb inflections.

Response Criteria

The response criteria for the inflection test were determined by administering the test to five practicing speech pathologists having an average of seven years of public school therapy experience. The examiner and all five speech pathologists were in 100 percent agreement on the responses for each inflection item. (Appendix C)

Verbal Directives

Each subject was read the following before administration of the test:

"You are going to see pictures of people and things. You will know the names of most of the pictures. I will tell you the names, and you will say them back to me. Sometimes you will tell me the name of a picture. Sometimes you will point to a picture. Do you understand? Now listen..."

Directions were repeated as necessary. Subjects were encouraged verbally to respond audibly and were asked to repeat a response if necessary.

Each plate was eight and one-half inches by eleven inches, having black and white line sketches of real figures or persons depicting actions. (Appendix D) The following is a description of each type of plate on the test with the verbal directive used to elicit the responses: Six items expressively tested the three regular inflections /-s, -z, -Iz/ for noun pluralization. A sample directive was: "Here is a cup. Here is another one. Now there are two ____ (cups)." Six items also receptively tested the noun pluralization inflections. One stimulus was presented to the left of four foils. It was named and covered while the subjects pointed to the plural figure of the stimulus. "Here is a cup. Point to cups."

All verbal directives are listed in Appendix E.

The progressive tense verb form was tested expressively by using a single picture of a figure engaged in an activity. The verbal directive stated: "Here is a man who knows how to paint. He is doing it now. The man is _____ (painting)." Receptively, the child pointed to one of three pictures, one depicting the action, one depicting past action, and the third depicting the action about to occur. Picture arrangement on the page was randomized. This three-picture stimulus item was used for all receptive verb forms with only the directive changed. For the progressive, the directive was: "This is a man who knows how to paint. Point to 'The man is painting'."

The third-person-singular tense verb form was expressively tested using a single picture of a person performing an action. The verbal directive stated: "Here is a man who knows how to pick. He does it every day. Every day he _____ (picks)." Receptively, the child pointed to one picture of the three previously described after hearing: "This man knows how to pick. Point to 'The man picks'."

The past tense verb form was tested for the inflections /-t, -d/. Expressively, the picture was of a person doing an activity and the directive stated. "Here is a man who knows how to comb. He did it yesterday. Yesterday he _____." (combed) Receptively, the child pointed to one of three pictures previously described after hearing: "This man knows how to paint. Point to 'The man painted'."

Procedure

All subjects were tested by the examiner. The order of the testing battery was the hearing screening, the articulation test, and

the morphology test. The subjects received visual and verbal rewards for responding. This included praise for cooperation. Verbal comments by the examiner did not indicate correct or incorrect morphological responses. No other reward or reward systems were employed.

Each subject's responses were scored during the test session. In addition, the articulation and morphology test responses were tape recorded. The microphone was worn as a lavaliere or held approximately six inches from the subject's mouth. The tapes were played later, and the morphology test was re-scored for accuracy.

The ability of the examiner to reliably score the expressive responses of the subjects was checked by having a speech pathologist holding the Certificate of Clinical Competence from the American Speech and Hearing Association score five tape recorded samples of the inflection test which had been selected randomly from the total of 25 samples. There was 98.33 percent agreement between the examiner and the additional judge for the 60 responses. Receptive items were scored during the test administration as the subject pointed to the picture.

Each of the three randomized test forms had individualized answer sheets. (Appendix A) Answer sheets listed the stimulus word, the correct response, and the inflection being tested. Items were scored "+" for correct responses, "0" for incorrect responses, and "NR" for no response. Phonetic transcription was used to record substitutions for the inflection phoneme for later comparison to the articulation test. Included on the form were spaces for the subject's name, birthdate, chronological age, and sex. Space was also provided for date of testing, total score, subtest scores, and inflection scores.

"No response" was defined as a subject's refusal either to verbalize a response or failure to select any receptive answer. Subjects failing to respond to six or more stimuli were excluded from the sample population. For subjects responding "I don't know" or subjects not responding to the first presentation of the stimulus, an effort was made to elicit a response for each of the items immediately following the first stimulus presentation. The procedure involved having the child say the test stimulus word in uninflected form, followed by representation of the test item verbal directive. (Appendix E) Correct and incorrect responses obtained were entered on the score sheet for tabulation.

Equipment

A Beltone 10-D portable audiometer having less than 20 hours use following calibration was used for the hearing screening. A Sony, three head stereo, reel to reel tape recorder, Model TC 353D, number 11846, with Unidine B microphone, model 5155B, was used to tape responses. The microphone was equipped with a "puff ball" to reduce ambivalent environmental noise. A ten item articulation test with pictures cut from magazines and representing only the stimulus word was used. The test plates from the morphology test are reproduced in Appendix D.

Experimental Design

The data for analysis was obtained using a morphology test having a receptive and expressive subtest with noun pluralization and verb tense items. For the purpose of analysis, this experiment used two randomized block factorial designs; one for noun pluralization, the other

for verb tense. The same subjects were used in each design. An analysis of variance (Kirk, 1968) and appropriate follow-up tests were administered to the data of both experimental designs.

CHAPTER IV
RESULTS AND DISCUSSION

The purpose of this investigation was to assess inflectional morphology skills in pluralization and verb tense, both receptively and expressively, in three-year-old children. The inflections studied were /-s/, /-z/, and /-ɪz/ for pluralization and /-ɪŋ/, (progressive), /-t/, /-d/ (past), and /-s/, /-z/ (third-person-singular) for verb tense.

The morphology test used to assess inflectional skills was administered to 25 subjects. The subjects were selected from three-year-old children residing in the communities of Mattoon and Charleston in East Central Illinois. There were 14 boys and 11 girls ranging in chronological age from three years-zero months to three years-eleven months, with the mean age being 3.55 years. All 25 subjects from East Central Illinois spoke only American English and were of Caucasian heritage. None of the subjects had noticeable or reported physiologic disorders typically associated with speech development or language delay. All subjects passed a hearing screening test and had proficiency in articulation skills for the phonemes /-s, -z, -t, -d, -ɪŋ/ in the post-vocalic position. Distortions and consistent sound substitutions for the tested phonemes were acceptable for inclusion in the group. None of the subjects had conversational speech judged by the examiner to be unintelligible or extremely difficult to understand.

The 25 subjects were administered the inflection test with the expressive items presented first and the receptive items last. This was done to prevent learning of the responses. Testing receptive items first would have provided each subject with the correct inflected responses to be later tested expressively. The items on each subtest were randomized to prevent skewed results originating from subject fatigue, initial confusion, and/or learning effect.

The response criteria for the inflection test were determined by administering the test to five practicing speech pathologists having an average of seven years of public school therapy experience. The examiner and all five speech pathologists were in 100 percent agreement on the responses for each inflection item. (Appendix C)

The ability of the examiner to reliably score the expressive responses of the subjects was checked by having a speech pathologist holding the Certificate of Clinical Competence from the American Speech and Hearing Association score five tape-recorded samples of the inflection test which had been selected randomly from the total of 25 samples. There was 98.33 percent agreement between the examiner and the additional judge for the 60 responses. Receptive items were scored during the test administration as the subject pointed to the picture.

This study consisted of two random block factorial experimental designs. The first experiment examined noun pluralization skills, while the second experiment examined verb tense skills. The results of the analyses on each design are reported and followed by a discussion of each of the original hypotheses.

Results on Pluralization

The following null hypotheses were presented for examination for the pluralization inflections:

- 1) There is no significant difference between the expressive scores and the receptive scores of the noun pluralization inflections for three-year-old children.
- 2) There is no significant difference in the noun pluralization scores as the inflections were varied from /-s/ to /-z/, to /-ɪz/.

To determine the significance of the differences in the above treatments, an analysis of variance (Kirk, 1968) was done. (Table 1) Statistically significant differences were present in the experimental design for pluralization. There was a statistical difference significant at the 0.001 level of confidence between the expressive and receptive scores of the noun pluralization inflections. Thus the null hypothesis, "There is no significant difference between the expressive scores and the receptive scores of the noun pluralization inflections for three-year-old children," was rejected. There was no statistically significant difference between the inflections on /-s/, /-z/, and /-ɪz/. Thus the second null hypothesis could not be rejected.

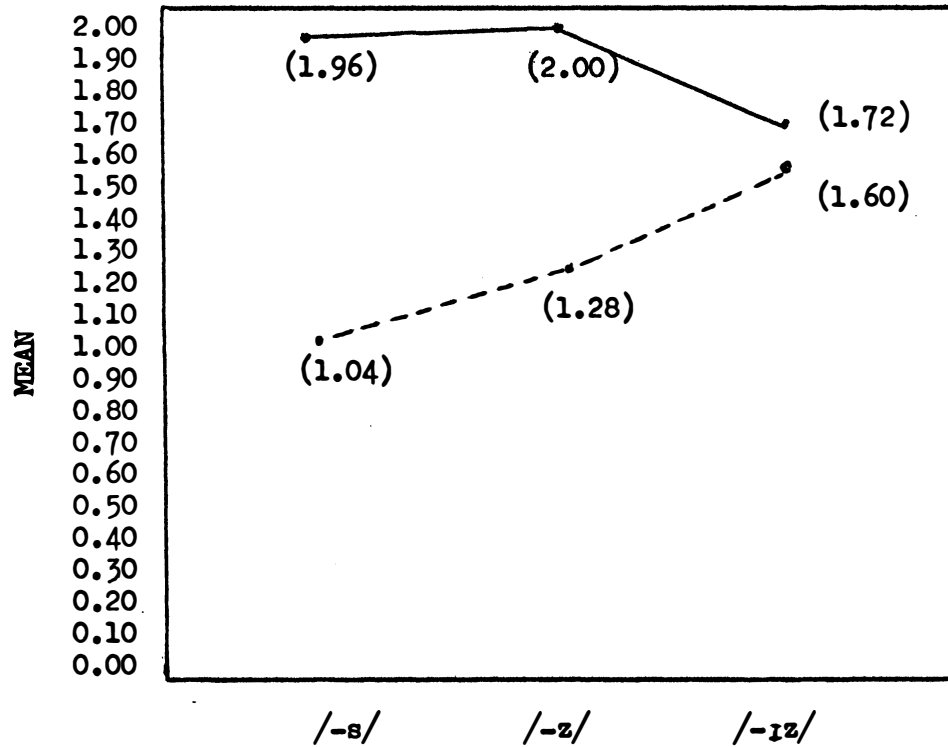
Further analysis revealed a statistical difference significant at the 0.01 level of confidence in the interactions of type of language response and the pluralization inflections. (Table 1) That is, significant differences existed between an inflection pattern receptively and expressively. This difference is illustrated in Figure 1. The children handled each noun pluralization inflection pattern differently on the two subtests. The children were more often correct on a

Table 1. Sources of Variance for Expressive and Receptive Responses on Noun Pluralization Inflections /-s/, /-z/, and /-ɪz/.

Source of Variance	Sum of Squares	df	\overline{MS}	F
Treatments	18.0000	5	3.6000	11.4723*
Expressive/Receptive (A)	12.9066	1	12.9067	41.1302*
Morphological Inflections (/s/, /z/, /ɪz/) (B)	0.7600	2	0.3800	1.2110
A X B Interaction	4.3334	2	2.1667	6.9047**
Subject Variability	12.6667	24	0.5277	
Residual Error Term	37.6667	120	0.3138	

* Significant difference at 0.001 level

** Significant difference at 0.01 level



———— = Expressive scores

----- = Receptive scores

Figure 1. Two Factor Interaction Means of Twenty-Five Subjects on Noun Pluralization Inflections, Expressive and Receptive.

morphological inflection when tested expressively than receptively except for /-ɪz/.

Tests of Simple Main Effect for each treatment of pluralization were done to identify specific sources of significant variance. The results of the type of language response means (Table 2) indicated a statistical difference significant at the 0.001 level of confidence between the expressive and receptive use of pluralization inflections /-s/ and /-z/.

The results of the type of noun pluralization means (Table 3) indicated a statistical difference significant at the 0.001 level of confidence for the pluralization inflections on the receptive subtest. Tukey HSD post hoc pairwise comparison (Kirk, 1968) was used to identify specifically the difference in use of the pluralization inflections (Table 4). There was a statistical difference significant at the 0.01 level of confidence between the /-s/ and the /-ɪz/ inflections receptively.

Discussion

One principle question of this investigation was whether there was a significant difference between the types of language response, expressive or receptive, used to assess noun pluralization in three-year-old children, using the inflections /-s/, /-z/, and /-ɪz/. The three-year-old children in this study scored significantly higher on expressive testing than on receptive testing.

The impact of that difference was greater after re-examination of the format of the test instrument. The inflection test used identical lexical stimuli respectively for each inflection examined

Table 2. Source of Variance for Tests of Simple Main Effects of Type of Language Response Means for Pluralization Inflections /-s/, /-z/, and /-ɪz/.

Source of Variance	Sum of Squares	df	\overline{MS}	F
Type of Language Response for /-s/	10.5800	1	10.5800	33.7157*
Type of Language Response for /-z/	6.4800	1	6.4800	20.6501*
Type of Language Response for /-ɪz/	0.1800	1	0.1800	0.5736
Residual Error Term	37.6667	120	0.3138	

* Significant difference at 0.001 level

Table 3. Source of Variance for Tests of Simple Main Effects of Inflection Means for Pluralization Inflections /-s/, /-z/, and /-ɪz/.

Source of Variance	Sum of Squares	df	\overline{MS}	F
Inflections for Expressive Language	1.1467	2	0.5733	1.8271
Inflections for Receptive Language	3.9467	2	1.9733	6.2886**
Residual Error Term	37.6667	120	0.3138	

** Significant difference at 0.01 level

Table 4. Results of Tukey HSD post hoc Pairwise Comparisons of Number of Correct Means for the Three Morphological Inflections for Pluralization, Receptive Subtest.

	Mean Correct	/-s/	/-z/	/-ɪz/
/-s/	1.0400	—	.2400	.5600*
/-z/	1.2800		—	.3200
/-ɪz/	1.6000			—

* Tukey HSD = 0.3764 at 0.01 level

receptively and expressively. Visual stimuli were varied only as necessary to represent the inflected stimulus with foils receptively. The expressive form was given first to prevent learning by the subject by providing him with the correct inflected response of the expressive form. If learning occurred during the test from either verbal or visual stimulation, it occurred in favor of the receptive subtest. However, the receptive scores were lower than the expressive scores. To prevent further bias via learning effect, three different test formats were used. The inflectional items on each of the six subtests were randomized making each subtest order different and independent. This randomization of items also prevented skewed results originating from subject fatigue or initial item confusion.

To review, expressive pluralization test results were significantly better than receptive test results. This result differs from the results of Fraser et al. (1963) and Lovell and Dixon (1967). Their stimulus material included ten grammatical contrasts, two of which assessed pluralization. Children's imitation, production, and comprehension skills were assessed in both studies. The results in both studies rank ordered, from the easiest to the most difficult, the tasks of imitation, comprehension, and production.

The results in this study also disagree with those of Shriner and Miner (1968). Their study included receptive and expressive noun pluralization using nonsense stimuli. They tested ten items on each subtest using only the /-s/ and /-z/ inflections. Their population ranged from two years-seven months to six years-one month, and were in matched groups classified as normal and "culturally disadvantaged" but matched on mental age. They reported that there were no

statistically significant differences between groups or within groups relative to receptive and expressive noun pluralization.

Bellamy and Bellamy (1970) used essentially the same inflections as this study, but used a different format and older subjects. Their results state that only second grade children (age seven) mastered half of the comprehensive items. Their study, as did this one, kept contextual clues at a minimum, forcing the children to rely on the inflections themselves. The verbal directives were almost identical, but Bellamy and Bellamy used nonsense materials.

There was no specific difference present in the three inflectional allomorphs. The three-year-old children in this study performed equally well on all inflection tasks using pluralization. However, when the type of language response (receptive or expressive) and the inflections (/s/, /z/, /ɪz/) were considered together, there were significant differences noted in the children's responses. The children in this population did better expressively on the /s/ and /z/ pluralization inflections than they did receptively. The receptive scoring criteria for noun pluralization was altered after varying patterns of responding were observed in some of the subjects in the testing situation. For example, some subjects pointed to two pictures and some subjects verbalized while pointing. All of the patterns of responding and their scoring are listed in Appendix D. The alteration resulted in raising receptive scores. Still, the highly significant difference existed with expressive scores exceeding receptive scores.

In this study, it may be surmised that the subjects scored significantly lower on the receptive subtest, because the subjects failed to attend to the inflected stimulus and/or that the subjects failed

to integrate the visual representation of the stimulus into a motor response.

The two factor interaction means (Figure 1) suggested that an order of expressive and receptive inflectional usage may be present. On expressive pluralization, the children in this study scored 100 percent on the /-z/ inflection, 98 percent on the /-s/ inflection, and 81 percent on the /-iz/ inflection.

This substantiated the progression of acquisition of pluralization inflections cited by Halle (1971) in children three to seven years of age. Receptively, this population scored significantly better on the /-iz/ than the /-s/ inflection. This is in contrast to Halle's observations.

Results on Verb Tense

The following null hypotheses were presented for examination for the verb tense inflections.

- 1) There is no significant difference between the expressive scores and the receptive scores of the verb tense inflections for three-year-old children.
- 2) There is no significant difference in the verb tense scores as the inflections were varied from progressive to third-person-singular to past verb forms.

To determine the significance of the differences in the above treatments, an analysis of variance (Kirk, 1968) was done. (Table 5) Statistically significant differences were present in the experimental design for verb tense. There was a statistical difference significant at the 0.001 level of confidence between the expressive and receptive

Table 5. Sources of Variance for Expressive and Receptive Responses on Verb Tenses for Progressive, Third-Person-Singular, and Past.

Source of Variance	Sum of Squares	df	\overline{MS}	F
Treatments	37.6660	5	7.5320	18.8961*
Expressive/Receptive (A)	14.7266	1	14.7266	36.9458*
Morphological Inflections for Progressive/Third-Person- Singular/Past (B)	13.7200	2	6.8600	17.2102*
A X B Interaction	9.2131	2	4.6065	11.5567*
Subject Variability	14.6400	24	0.6100	
Residual Error Term	47.8400	120	0.3986	

* Significant difference at 0.001 level

scores of the verb tense inflections. Thus, the null hypothesis, "There is no significant difference between the expressive scores and the receptive scores of the verb tense inflections for three-year-old children," was rejected. There was a statistical difference significant at the 0.001 level of confidence between the verb tense scores as tense varied from progressive to third-person-singular to past. As a result, the null hypothesis, "There is no significant difference in the verb tense scores as the inflections were varied from progressive to third-person-singular to past verb forms," was rejected.

Further analysis revealed statistical differences significant at the 0.001 level of confidence in the interactions of type of language response and the verb tense (Table 5). That is, significant differences existed between a verb tense pattern receptively and expressively. This difference is illustrated in Figure 2. The children handled each verb tense pattern differently on the two subtests. The children were more often correct on the progressive and past tense when tested expressively than when tested receptively.

Tests of Simple Main Effect for each treatment of tense were done to identify specific sources of significant variance. The results of the type of language response means (Table 6) indicated a statistical difference significant at the 0.01 level of confidence between the expressive and receptive use of the progressive inflection, and at the 0.001 level of confidence for the expressive and receptive use of past tense inflections.

The results of the type of verb tense means (Table 7) indicated a statistical difference significant at the 0.01 level of confidence

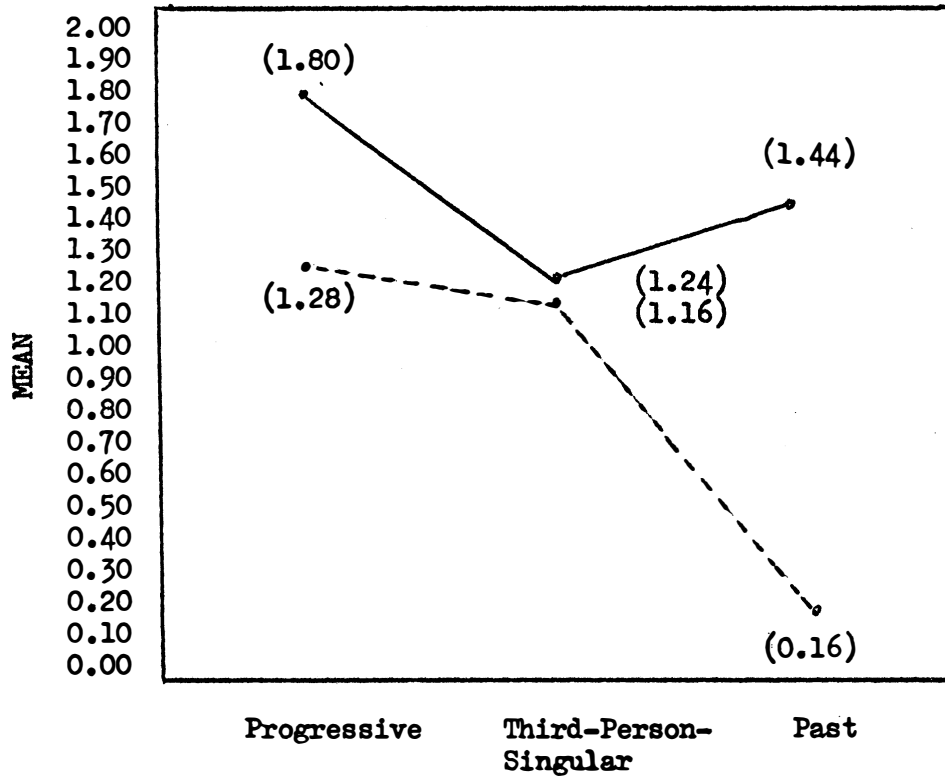


Figure 2. Two Factor Interaction Means of Twenty-Five Subjects on Verb Tense Inflections, Expressive and Receptive.

Table 6. Source of Variance for Tests of Simple Main Effects of Type of Response on Verb Tense Inflections for Progressive, Third-Person-Singular, and Past.

Source of Variance	Sum of Squares	df	\overline{MS}	F
Type of Response for Progressive	3.3800	1	3.3800	8.4797**
Type of Response for Third-Person-Singular	0.0800	1	0.0800	0.2007
Type of Response for Past	20.4800	1	20.4800	51.3798*
Residual Error Term	47.8400	120	0.3986	

* Significant difference at 0.001 level

** Significant difference at 0.01 level

Table 7. Source of Variance for Tests of Simple Main Effects of Inflection Means on Verb Tense Inflections for Progressive, Third-Person-Singular, and Past.

Source of Variance	Sum of Squares	df	\overline{MS}	F
Inflections for Expressive	4.0267	2	2.0133	5.0510**
Inflections for Receptive	18.9067	2	9.4533	23.7164*
Residual Error Term	47.8400	120	0.3986	

* Significant difference at 0.001 level

** Significant difference at 0.01 level

between the verb tense items on the expressive subtest and at the 0.001 level of confidence on the receptive subtest. A Tukey HSD post hoc pairwise comparison (Kirk, 1968) was used to identify specifically, the difference in expressive (Table 8) and receptive (Table 9) use of the verb tenses. There was a statistical difference significant at the 0.01 level of confidence between the progressive tense and third-person-singular tense within the expressive subtest. There was a statistical difference significant at the 0.01 level of confidence between the progressive tense and the past tense, and between the third-person-singular tense and the past tense within the receptive subtest.

Discussion

This part of the experiment sought to determine if a significant difference existed between the type of language response (receptive or expressive) used to assess the various forms of verb tense in three-year-old children. The verb tenses tested and an example of each were: progressive, "skating"; third-person-singular, "saws"; and past, "jumped." It was determined that the three-year-old children in this study responded significantly better to expressive testing for verb tense skills than to receptive testing.

The controls of the test design must also be cited for the verb tense subtest. The stimulus words for the expressive and receptive testing of verb tense were identical. The visual stimuli required adding a representation of future and past tense to the test plate for the receptive subtest. This gave the subject three pictures from which to choose. Expressive items were tested first for the same reasons cited in the noun pluralization discussion.

Table 8. Results of Tukey HSD post hoc Pairwise Comparison of the Number of Correct Means for the Morphological Inflections for Tense, Expressive Subtest.

	Mean Correct	Progressive	Third-Person-Singular	Past
Progressive	1.80	—	0.56*	0.36
Third-Person-Singular	1.24		—	0.20
Past	1.44			—

* Tukey HSD = 0.4243 at 0.01 level

Table 9. Results of Tukey HSD post hoc Pairwise Comparison of Number of Correct Means for the Morphological Inflections for Tense, Receptive Subtest.

	Mean Correct	Progressive	Third-Person-Singular	Past
Progressive	1.28	—	0.32	1.44*
Third-Person-Singular	1.16		—	1.00*
Past	0.16			—

* Tukey HSD = 0.4243 at 0.01 level

The expressive verb tense test results were significantly better than the receptive subtest results. This result differs with the results of Fraser et al. (1963) and Lovell and Dixon (1967). Six of their ten grammatical contrasts used verb tense; three of these six used the tenses examined here. These two studies ranked from easiest to most difficult, imitation, comprehension, and production.

Bellamy and Bellamy (1970) tested the verb tenses used in this study, but using a different format and older subjects. Their subjects, aged four years to eleven years, also scored higher expressively than receptively. They considered the view that children may not comprehend basic aspects of language, including tense. But they felt that, since the test situation minimized contextual clues, their subjects "...probably reflected a lack of sensitivity to morphological inflections rather than an inability to understand spoken language." That statement suggested to the examiner a need for further refinement in assessing linguistic competence in children.

Significant differences were found among the three verb tenses tested in this study as the tenses were varied from progressive to third-person-singular to past. This definitely indicates that the three-year-old children in this study demonstrated varying degrees of skill in their use of verb tense, suggesting development trends. As was noted earlier in the discussion of the test design, the /-id/ inflection for past tense was not included in the morphology test used in this study. A general trend was observed in the literature that the /-id/ inflection was not mastered by pre-schoolers.

When the type of language response (receptive or expressive)

and the verb tense were considered together, there were significant differences noted in the children's responses. The statistical measures revealed significant differences between the expressive and receptive use of the progressive tense and the past tense. The behavior patterns of the children were of interest. A small number of the children pointed to all three pictures on the receptive test plates. In addition, they had confused facial expressions. Most of the children responded with the same speed and confidence displayed for pluralization items. Only three or four of the subjects studied the three pictures before responding.

Of particular interest was the response pattern of the subjects for the receptive past tense items. Only four of a possible 50 responses for the receptive past tense verb form were correct. It must be noted that of the 46 incorrect responses, 36 responses were of the progressive tense foil. That foil indicated action that had begun but was not completed, such as a girl in mid-air jumping over a box. It would appear that three-year-old children may interpret initiated action as a past event. The high incidence of incorrect responses might also be attributed to the fact that the progressive foil was presented in isolation as the defining stimulus on the past tense expressive item. Bellamy and Bellamy (1970) found that their past tense receptive inflections were not mastered until age ten. They cited the visual stimuli as the probable cause of this result. They reported that "...some children and adults seem to feel that any picture of an action automatically suggests past time."

Comparisons within subtests revealed a significant difference between the progressive tense and the third-person-singular tense on

the expressive subtest. This suggested a trend in developmental order of acquisition. Within the receptive subtest, there was a significant difference between the progressive tense and the past tense and between the third-person-singular tense and the past tense. This further substantiated the responses for the receptive past tense items.

Implications for Further Research

Several response behaviors were noted during the administration of the morphological inflections test used in this study. Some children appeared to be more interested in the expressive items than the receptive items. Others seemed confused about the receptive verb tense items, in particular the past tense items. The directive "Point to..." was difficult for a few children to understand on the receptive subtest. Also, some children tended not to scan the entire test plate on receptive items. These observed behaviors suggested a need for revision in test plate design and in verbal directives to the child.

Consideration should be given to the type of visual stimulus used on expressive test items if the same items are to be tested receptively. The test instrument in this study reproduced the original stimulus pictures to test noun pluralizations. To reduce learning effect, perhaps different pictorial representations of the same noun could be used on both types of testing. The test instrument in this study used a pictorial representation of the progressive verb tense for the stimulus on all expressive verb tense items. Receptively, the subjects scored higher on the verb tense items which had the progressive tense picture as the correct response. Two explanations of those results are suggested: (1) There was learning effect from

the expressive test items to the receptive test items, or (2) the subjects had difficulty receptively identifying past tense items. These results should be verified by testing each verb tense receptively and expressively using different pictorial verb tense representations as the expressive stimuli.

The significant differences between receptive and expressive subtest scores on both noun pluralization and verb tense strongly suggested evaluation of receptive and expressive abilities in other areas of language, particularly in the age range two years to five years.

This investigation should be replicated using more response items per inflection for noun pluralization and verb tense. Increasing the number of responses per inflection would verify trends or establish new trends in the response patterns noted in this study. Also, increasing the number of responses per inflections would be appropriate for establishing normative data.

While the literature contains studies citing acquisition ages and trends for morphological inflections, there still exists a need for normative data in this area.

CHAPTER V

SUMMARY

This study was designed to examine the inflectional skills of three-year-old children in noun pluralization and verb tense as tested expressively and receptively. A 24 item lexical test of morphological inflections was used to assess the language skills of 25 subjects. The subjects resided in East Central Illinois, were of Caucasian heritage, and spoke only American English. The inflection test was divided into receptive and expressive subtests, each having six noun pluralization items and six verb tense items.

Three test forms having identical stimuli were used. The order of stimulus presentation to children was randomly determined on each of the six subtests. The children's responses were tape recorded and re-evaluated by the examiner. The inflection test was administered using a standardized procedure which included verbal directives. The subjects were given a hearing screening test and a 12 item post-vocalic position articulation test prior to the morphology test.

The results of the statistical analyses for the noun pluralization inflections indicated a significant difference between the expressive and receptive scores. There was no significant difference between the inflections /-s/, /-z/, and /-ɪz/. Statistically significant differences were recorded in the interactions of type of language response and the noun pluralization inflections. There was

a significant difference between the expressive and receptive use of the pluralization inflections /-s/ and /-z/. Within the receptive subtest, there was a significant difference between the /-s/ and /-iz/ inflections.

The results of the statistical analyses for the verbal tense inflections also indicated a significant difference between the expressive and receptive scores. In addition, there was a statistically significant difference between verb tense scores as the tense varied from progressive to third-person-singular to past. Statistically significant differences were revealed in the interactions of the type of language response and the verb tenses. There was a significant difference between the expressive and receptive use of the progressive inflection and the past tense inflections. Within the expressive subtest on verb tense, there was a statistically significant difference between the progressive and third-person-singular verb tense. Within the receptive subtest, both the progressive tense and the third-person-singular tense differed significantly from the past tense.

The results of this study strongly suggested the need for further investigation into the receptive language skills of young children. The stimuli in this study were identical for both subtests. In addition, administration and scoring procedures were in favor of higher receptive scores. The subjects, however, scored significantly higher on expressive test items than on receptive test items for both noun pluralization and verb tense inflections.

Implications were also present for investigation into modifying the test design. More variety in verbal directives to the children

appeared to be necessary in some instances. The learning effect of visual stimuli on items tested expressively and receptively was not investigated in this study, however, response trends were noted. The learning effect of visual stimuli should be determined before normative data are compiled. The number of items per inflection should be increased in future investigations to examine further the response patterns of the three-year-old children in this study.

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APPENDIX A

TEST FORMS

HEARING AND ARTICULATION RECORDING SHEET

NAME: _____ DATE: _____
 BIRTHDATE: _____
 C.A.: _____

MEDICAL INFORMATION _____

PREVIOUS TEST DATA:

ARTICULATION TEST

house _____ nose _____ hot _____ bread _____ ring _____

bus _____ cheese _____ boat _____ hand _____ swing _____

KEY: + = correct dis = distortion
 - = omission record substitutions

HEARING RESULTS

Pass _____

Fail _____

CRITERIA: 15dB screen at 1000Hz
 2000Hz
 4000Hz
 25dB screen at 500Hz
 500Hz level _____

Morphology Test Record Blank
Test Number 1

NAME: _____ DATE OF TESTING: _____ yr. mo. da.
SEX: _____ BIRTHDATE: _____
C.A.: _____

TOTAL SCORE: _____
Receptive Subtest Score: _____
Expressive Subtest Score: _____

PLURALS	Rec.	Exp.	Key:
/-s/	/2	/2	+ = correct
/-z/	/2	/2	0 = incorrect
/-Iz/	/2	/2	NR = no response

TENSE	Rec.	Exp.
/-ŋ/	/2	/2
/-s/	/1	/1
/-z/	/1	/1
/-t/	/1	/1
/-d/	/1	/1

ITEMS

Expressive

1. cans /-z/ _____
2. beds /-z/ _____
3. witches /-Iz/ _____
4. painting /-ŋ/ _____
5. picks /-s/ _____
6. jumped /-t/ _____
7. skating /-ŋ/ _____
8. combed /-d/ _____
9. dresses /-Iz/ _____
10. ducks /-s/ _____
11. cups /-s/ _____
12. saws /-z/ _____

Receptive

13. beds /-z/ _____
14. witches /-Iz/ _____
15. saws /-z/ _____
16. skating /-ŋ/ _____
17. cans /-z/ _____
18. cups /-s/ _____
19. ducks /-s/ _____
20. painting /-ŋ/ _____
21. combed /-d/ _____
22. picks /-s/ _____
23. jumped /-t/ _____
24. dresses /-Iz/ _____

Morphology Test Record Blank
Test Number 2

NAME: _____ DATE OF TESTING: _____ yr. mo. da.
SEX: _____ BIRTHDATE: _____
C.A.: _____

TOTAL SCORE: _____
Receptive Subtest Score: _____
Expressive Subtest Score: _____

PLURALS

	Exp.	Rec.	
/-s/	_____/2	_____/2	Key: + = correct 0 = incorrect NR = no response
/-z/	_____/2	_____/2	
/-Iz/	_____/2	_____/2	

TENSE

	Exp.	Rec.
/-ŋ/	_____/2	_____/2
/-s/	_____/1	_____/1
/-z/	_____/1	_____/1
/-t/	_____/1	_____/1
/-d/	_____/1	_____/1

ITEMSExpressive

1. skating _____ /-ŋ/
2. picks _____ /-s/
3. cans _____ /-z/
4. dresses _____ /-Iz/
5. combed _____ /-d/
6. jumped _____ /-t/
7. witches _____ /-Iz/
8. beds _____ /-z/
9. ducks _____ /-s/
10. saws _____ /-z/
11. painting _____ /-ŋ/
12. cups _____ /-s/

Receptive

13. picks _____ /-s/
14. jumped _____ /-t/
15. ducks _____ /-s/
16. dresses _____ /-Iz/
17. skating _____ /-ŋ/
18. cans _____ /-z/
19. painting _____ /-ŋ/
20. witches _____ /-Iz/
21. combed _____ /-d/
22. beds _____ /-z/
23. saws _____ /-z/
24. cups _____ /-s/

Morphology Test Record Blank
Test Number 3

NAME: _____ DATE OF TESTING: _____ yr. mo. da.
SEX: _____ BIRTHDATE: _____
C.A.: _____

TOTAL SCORE: _____
Receptive Subtest Score: _____
Expressive Subtest Score: _____

PLURALS	Rec.	Exp.	Key:
/-s/	_____/2	_____/2	+ = correct
/-z/	_____/2	_____/2	0 = incorrect
/-Iz/	_____/2	_____/2	NR = no response

TENSE	Rec.	Exp.
/-ŋ/	_____/2	_____/2
/-s/	_____/1	_____/1
/-z/	_____/1	_____/1
/-t/	_____/1	_____/1
/-d/	_____/1	_____/1

ITEMS

Expressive

1. dresses _____ /-Iz/
2. cans _____ /-z/
3. saws _____ /-z/
4. skating _____ /-ŋ/
5. ducks _____ /-s/
6. jumped _____ /-t/
7. beds _____ /-z/
8. picks _____ /-s/
9. combed _____ /-d/
10. painting _____ /-ŋ/
11. witches _____ /-Iz/
12. cups _____ /-s/

Receptive

13. beds _____ /-z/
14. dresses _____ /-Iz/
15. cups _____ /-s/
16. saws _____ /-z/
17. skating _____ /-ŋ/
18. cans _____ /-z/
19. painting _____ /-ŋ/
20. picks _____ /-s/
21. jumped _____ /-t/
22. witches _____ /-Iz/
23. combed _____ /-d/
24. ducks _____ /-s/

APPENDIX B

PARENTAL PERMISSION FORM

PARENTAL PERMISSION FORM

I hereby give consent for my child to serve as a subject in a research project conducted by Michael Coffman, a Graduate Student in Speech Pathology at Eastern Illinois University, Charleston, Illinois. This study is to investigate the use of certain word endings (plurals and tense) by three-year-old children. I understand that my child will be requested to name some pictures and point to others. His/her responses will be tape recorded for evaluation at a later time. At no time will my child's name be used either in the study, or in later discussions, and no remuneration will accrue to the examiner for this study. I understand that this is not a speech class, a speech diagnostic evaluation, or speech therapy.

I understand Mr. Coffman will contact me to arrange the time and place I will bring my child to participate in this study.

_____ has my consent.
Child's name

Birthdate

Physical Condition

Schooling

Previous Speech Therapy

Date and times my child
can be available

Signature

Relationship to child

Phone

Date

Address

APPENDIX C

RESPONSE CRITERIA

RESPONSE CRITERIA

Expressive

 PLURALIZATION

/-s/	/-z/	/-ɪz/
ducks cups	cans beds	dresses witches

VERB TENSE

Progressive	Third-Person-Singular	Past
skating painting	saws picks	jumped combed

RESPONSE CRITERIA

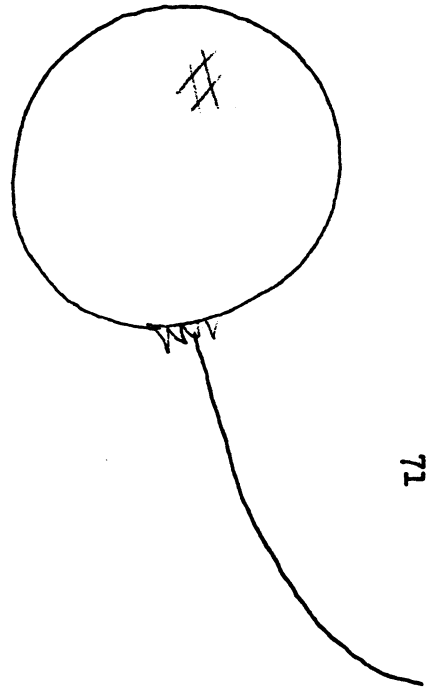
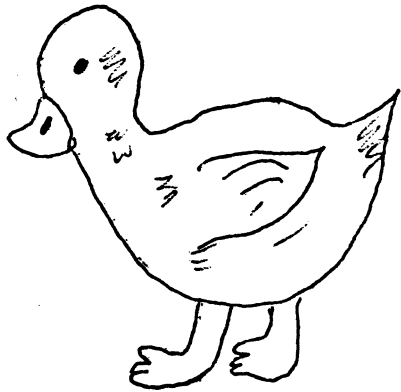
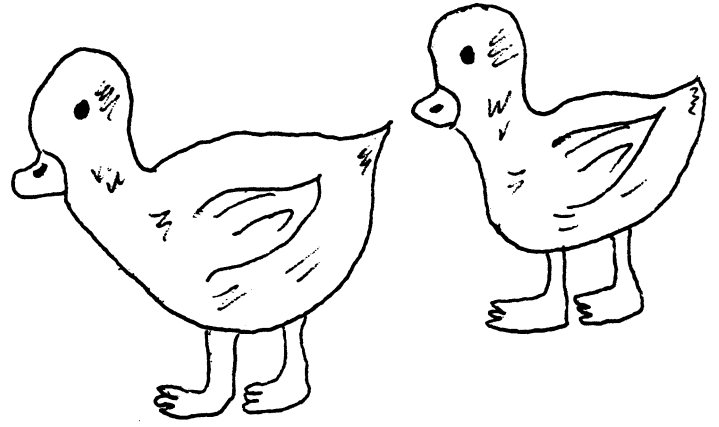
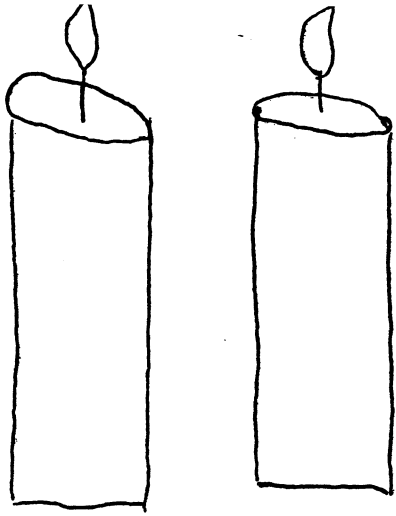
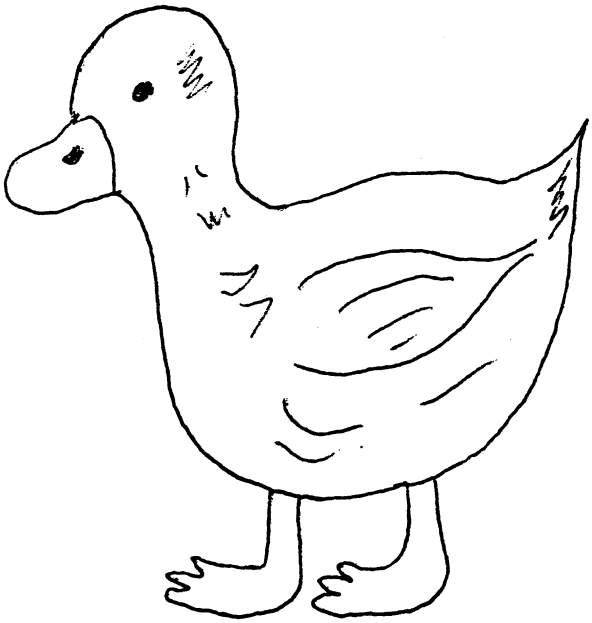
Receptive Pluralization

<u>Response Pattern</u>	<u>Scoring</u>
1. Subject pointed to plural response	correct
2. Subject pointed to singular foil	incorrect
3. Subject pointed to all three figures, plural response figures first	correct
4. Subject pointed to all three figures, singular foil first followed by plural figures without hesitation	correct
5. Subject pointed to all three figures and verbalized singular form	incorrect
6. Subject pointed to plural figures and then singular foil without hesitation	correct
7. Subject pointed to singular foil and then plural figures and verbalized plural form	correct
8. Subject pointed to singular foil and verbalized plural form	incorrect
9. Subject pointed to plural figures and named singular form	correct

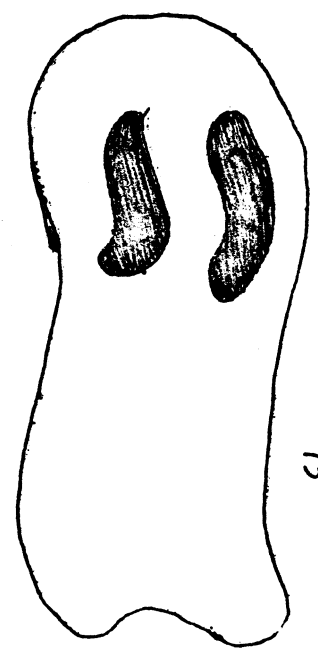
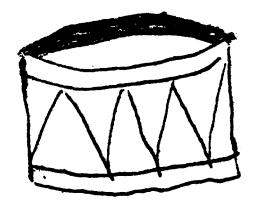
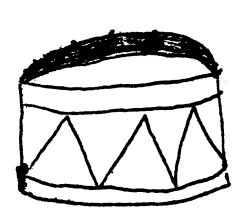
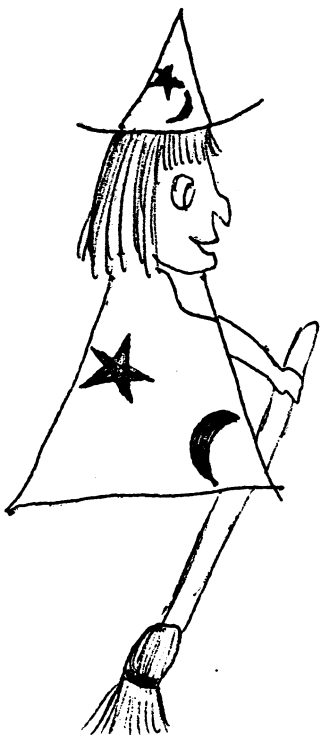
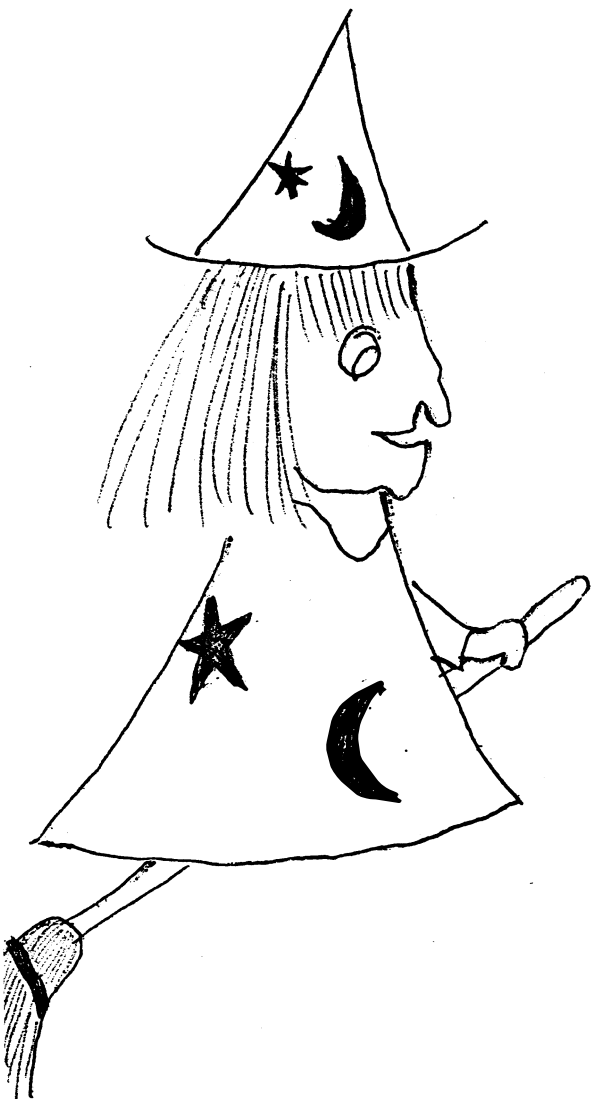
Receptive Verb Tense

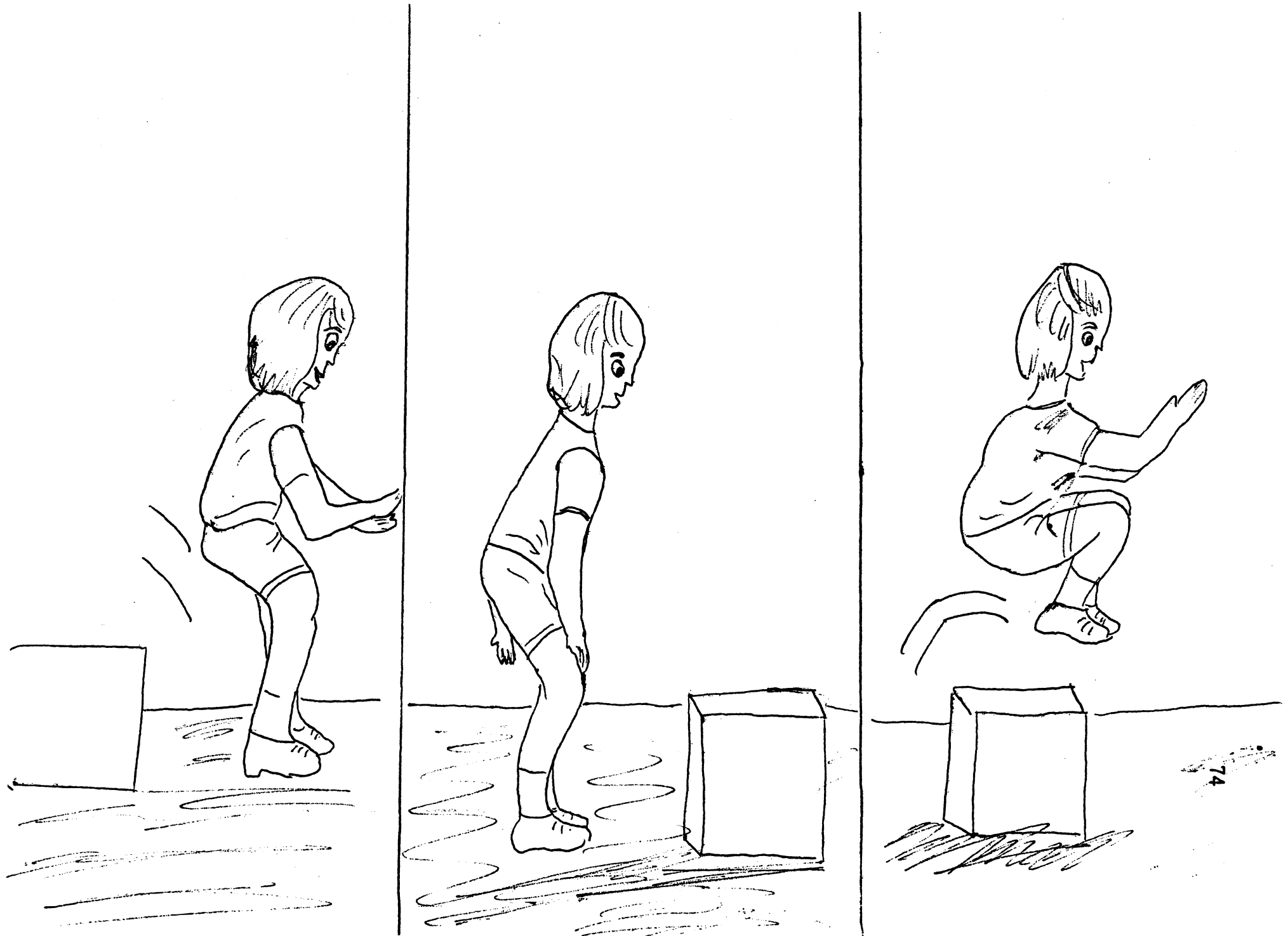
Subjects will point to the appropriate picture depicting each of the verb tense expressive responses listed above.

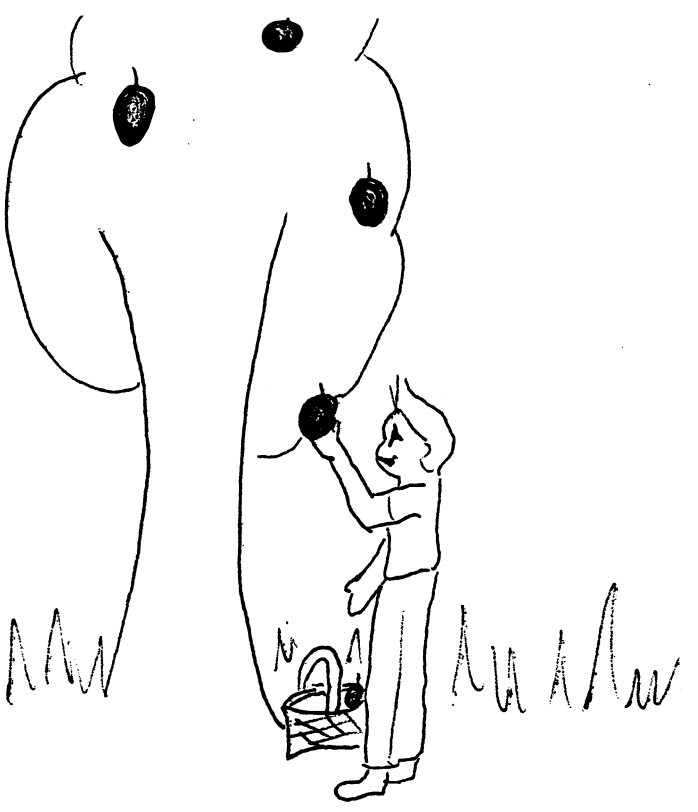
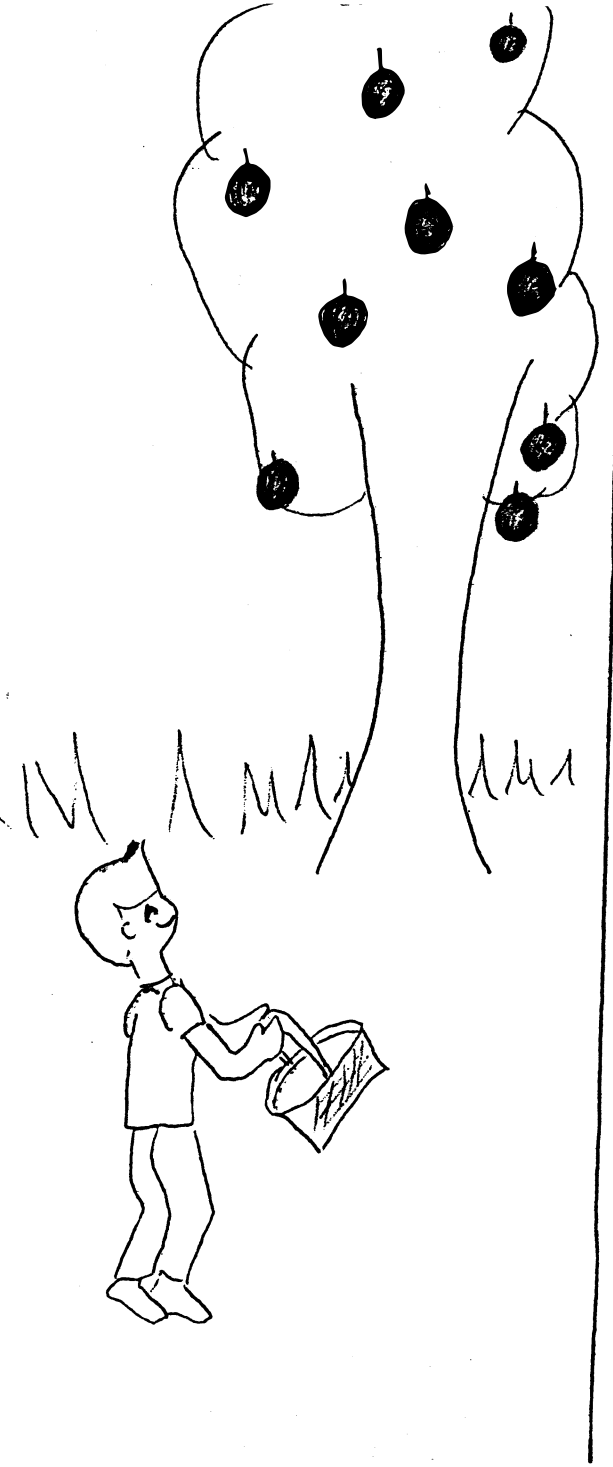
APPENDIX D
TEST PLATES

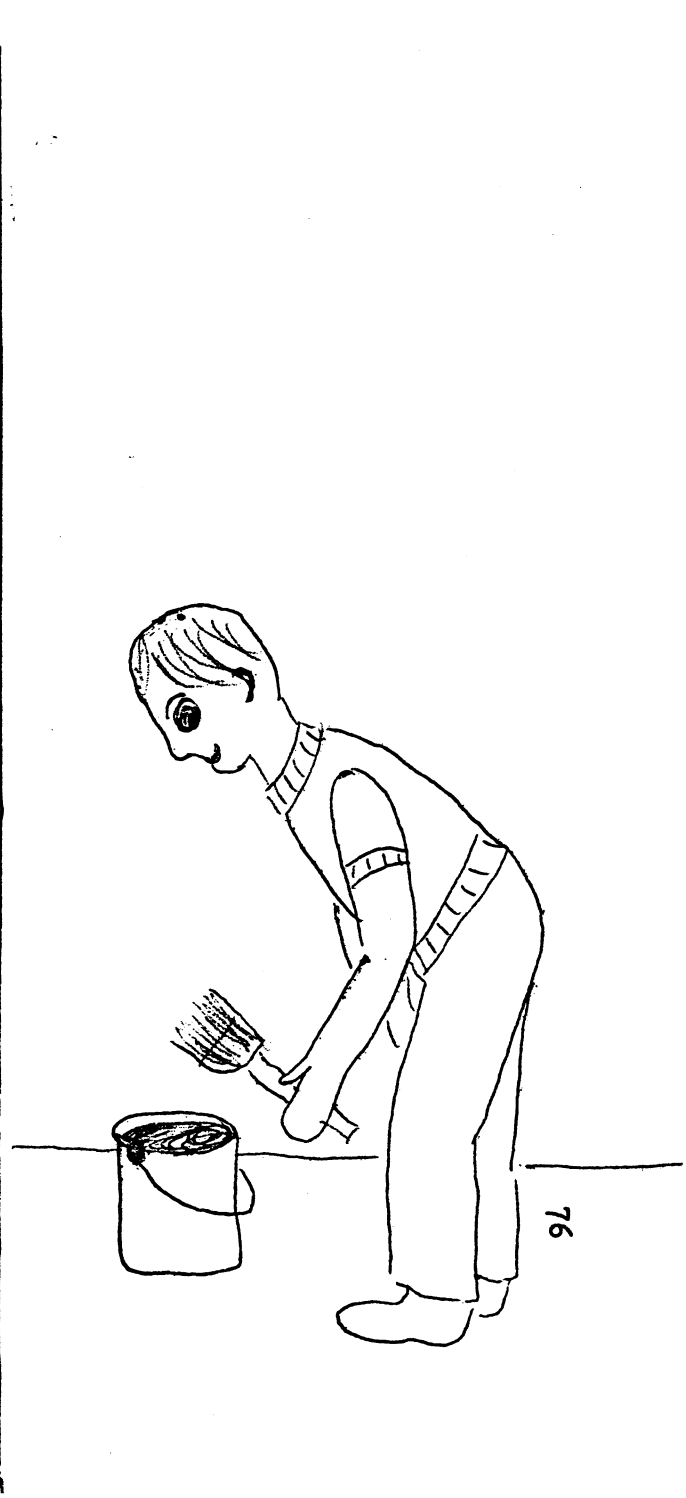
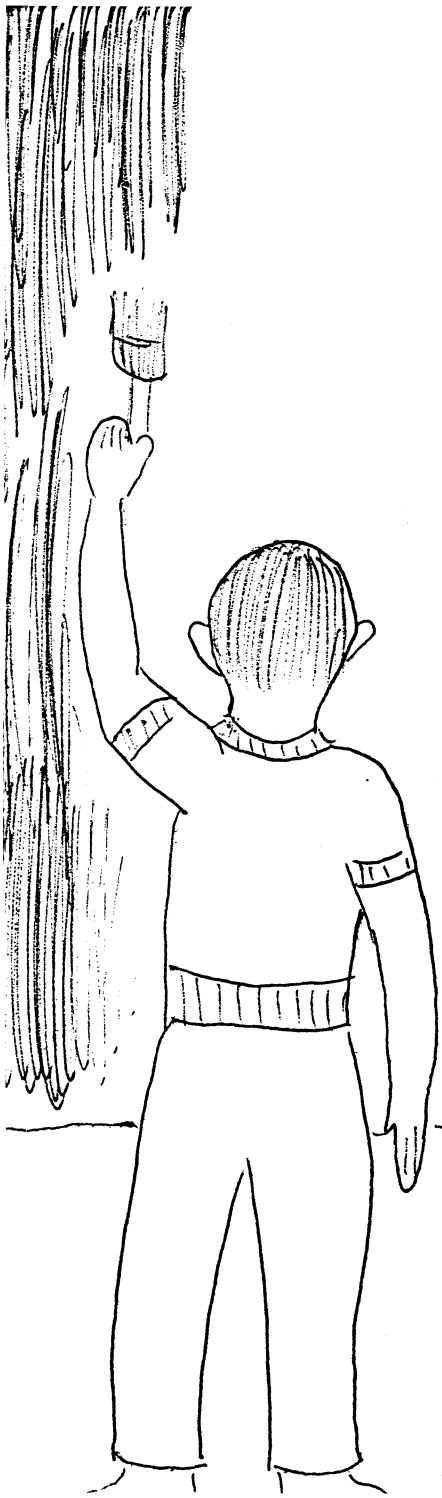


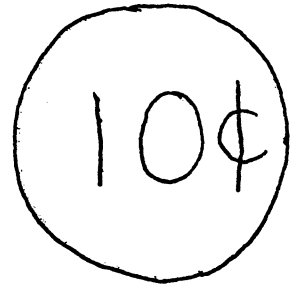
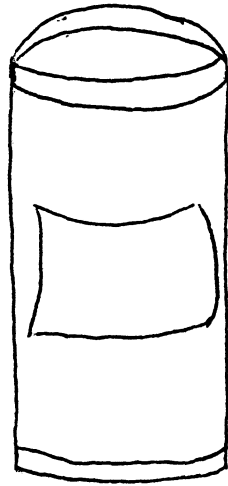
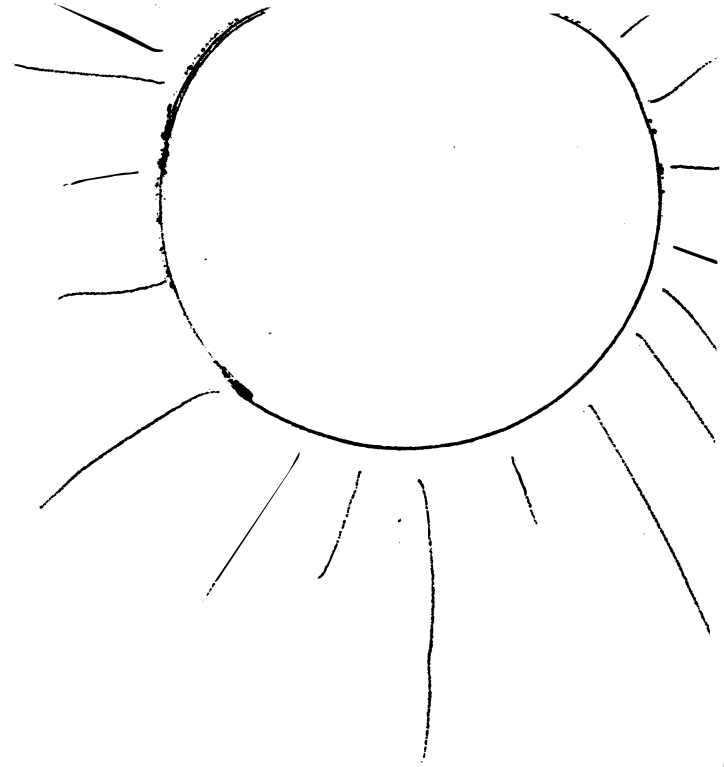
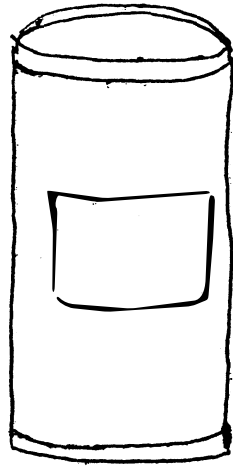
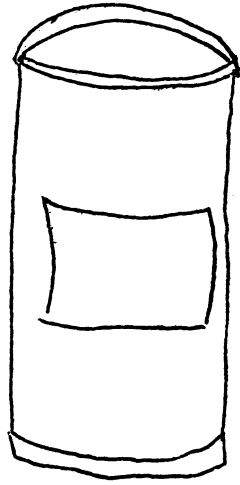
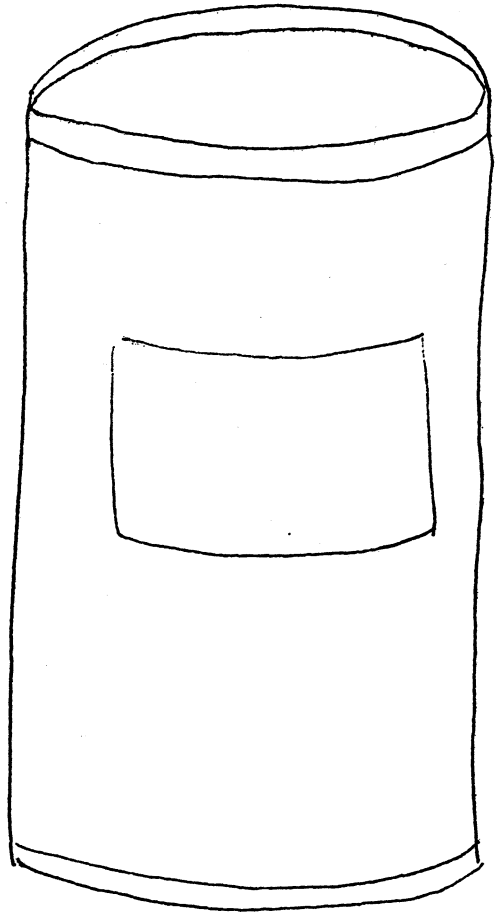


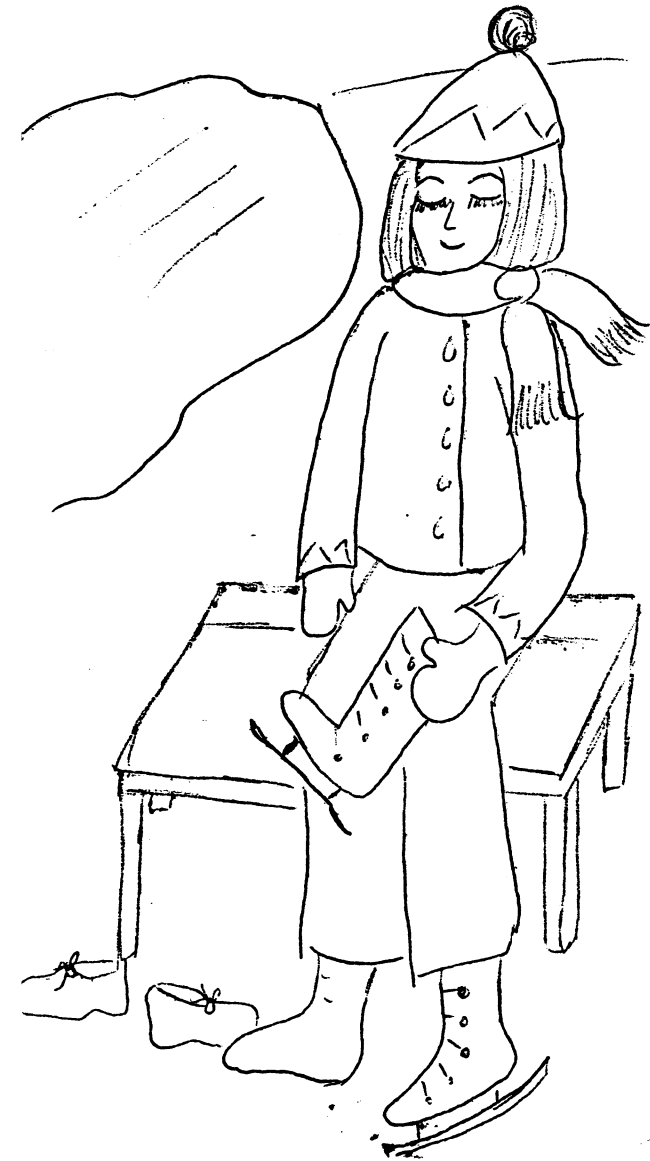


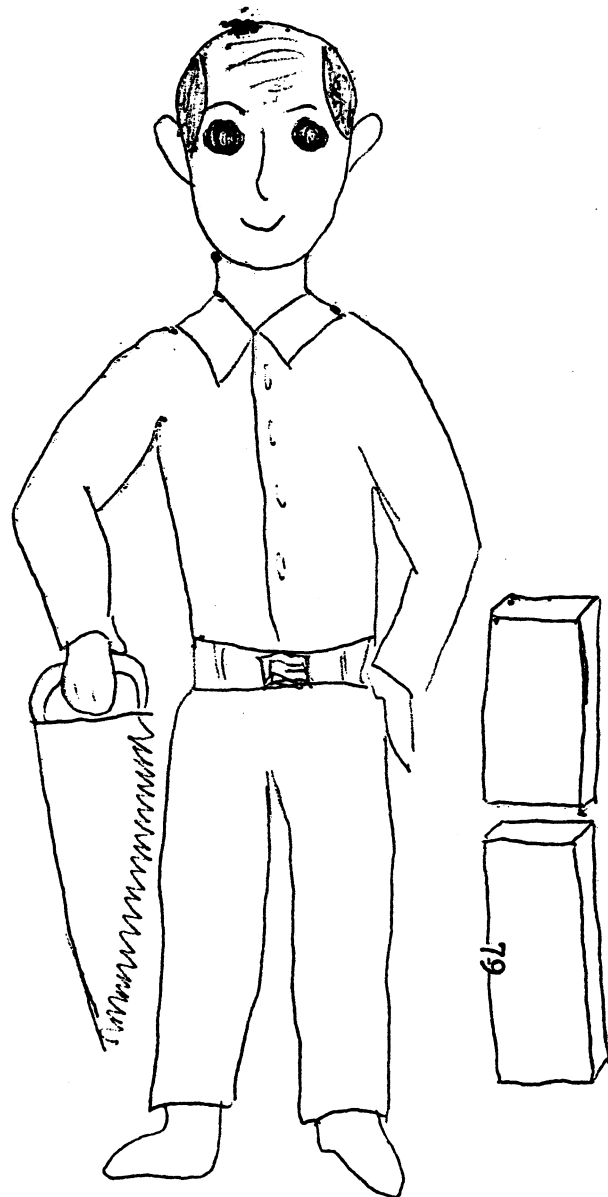
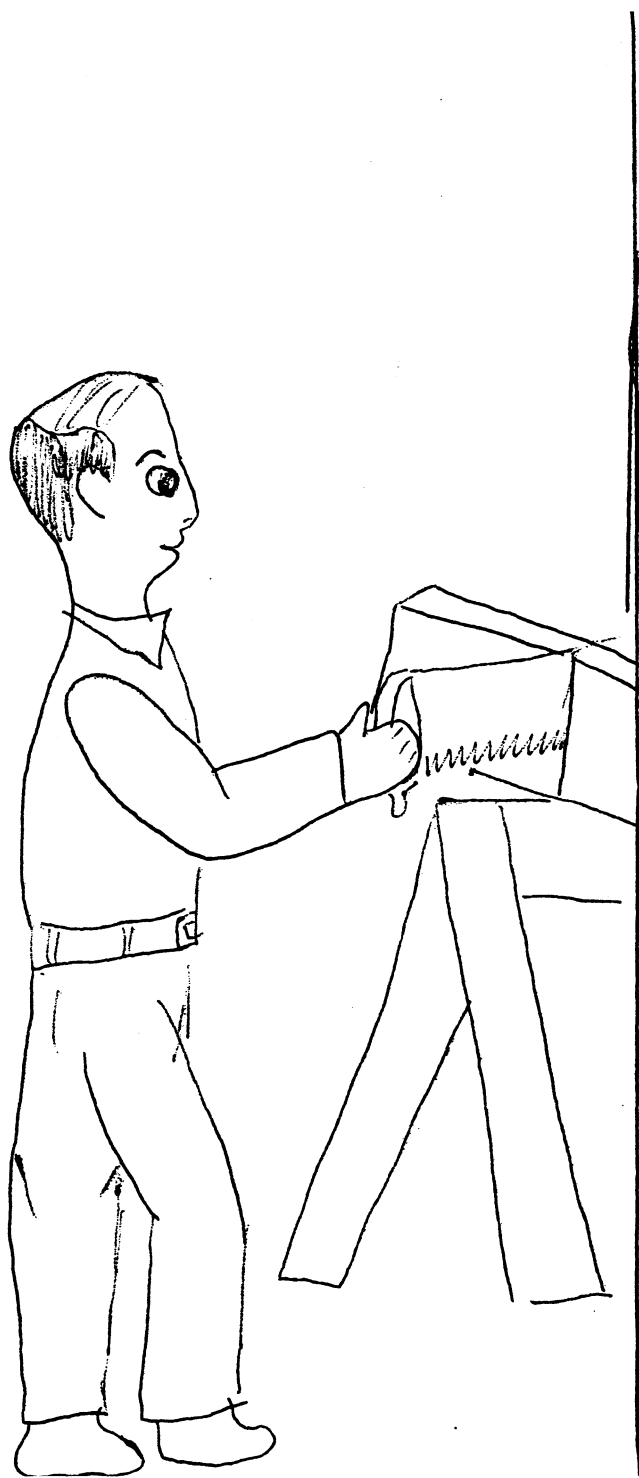
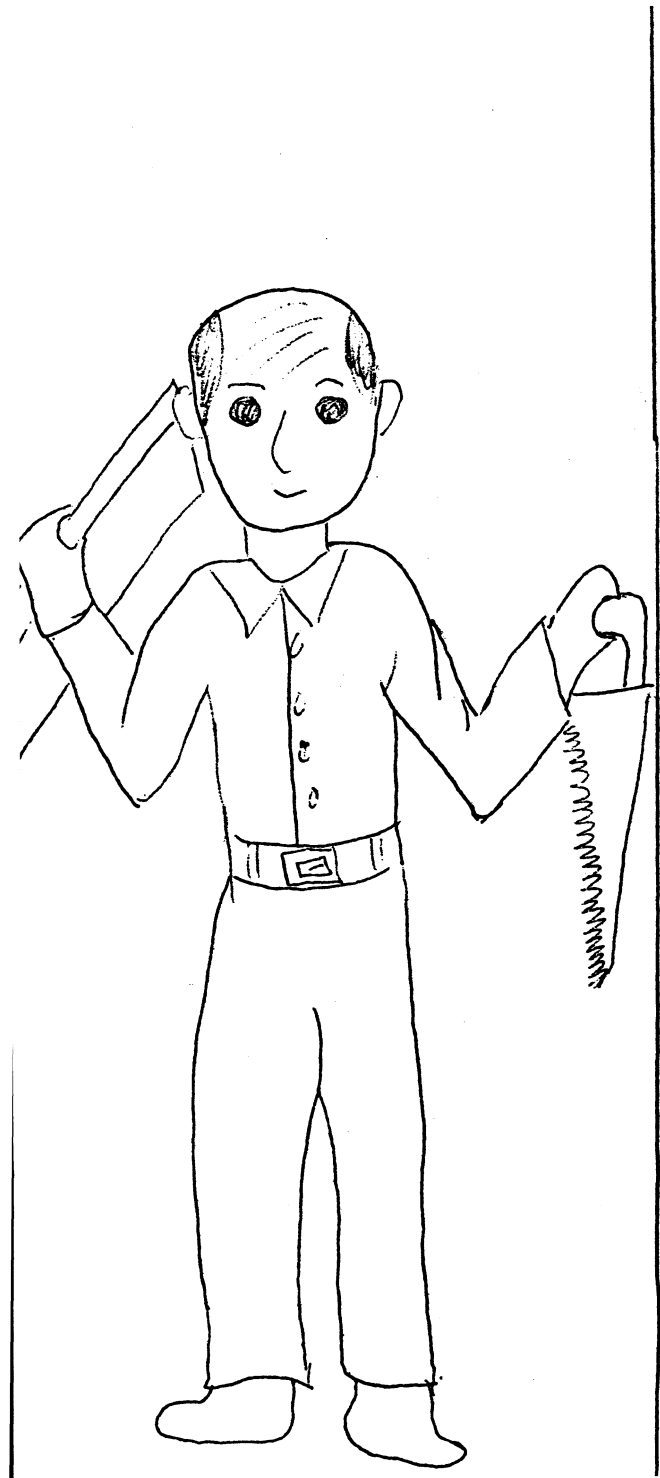


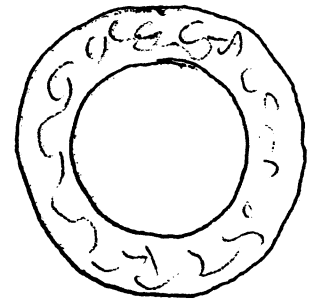
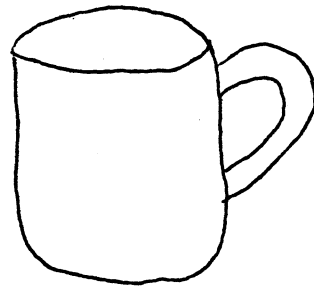
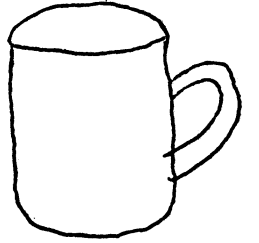
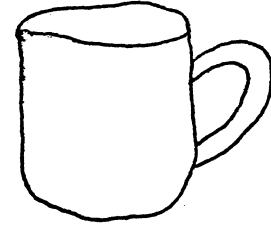
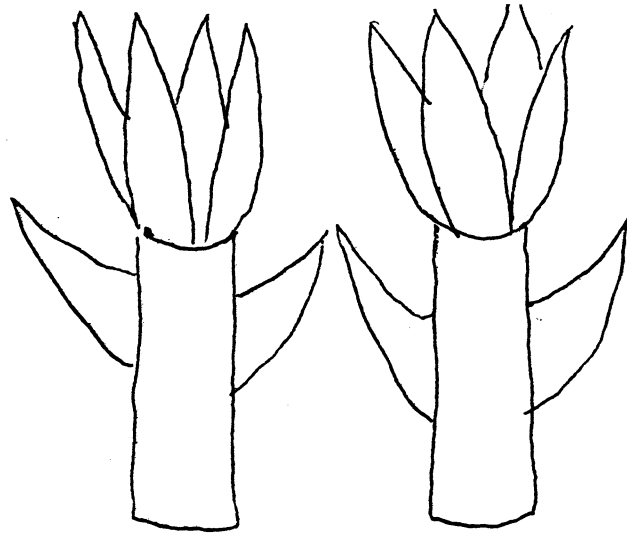
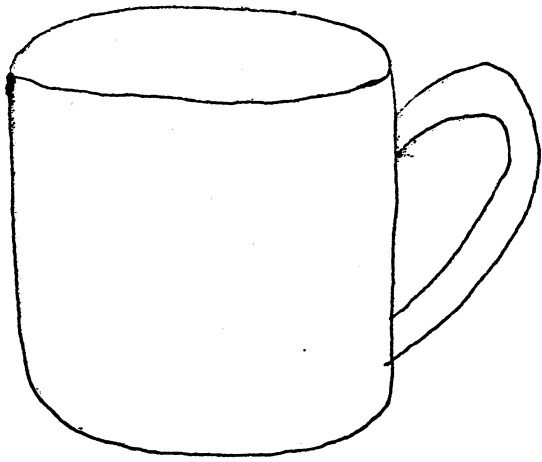


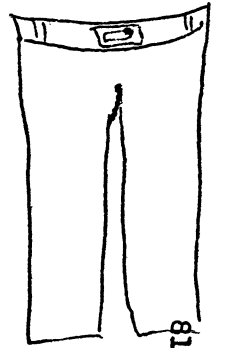
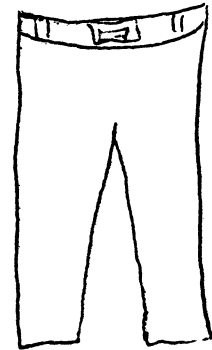
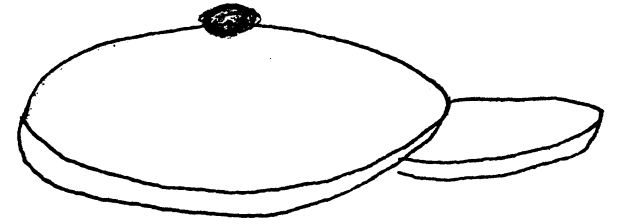
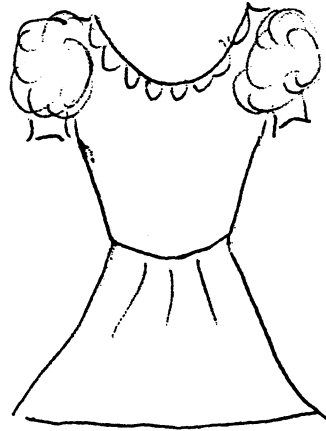
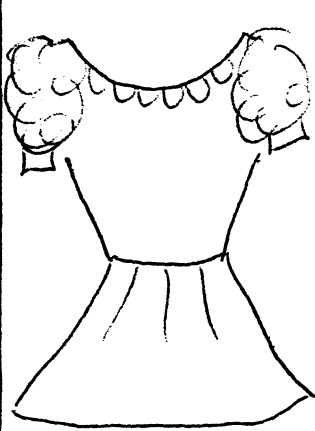
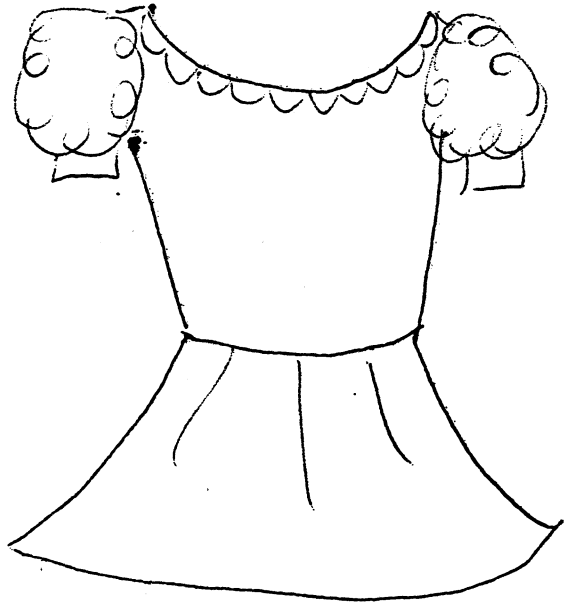


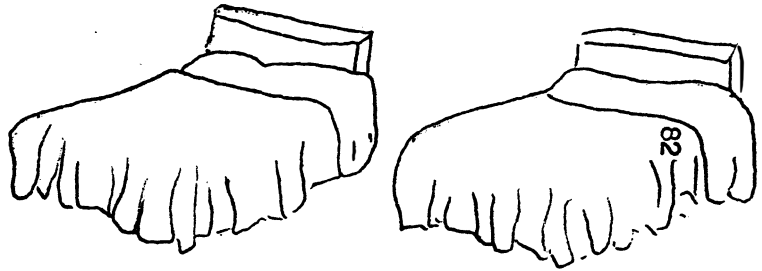
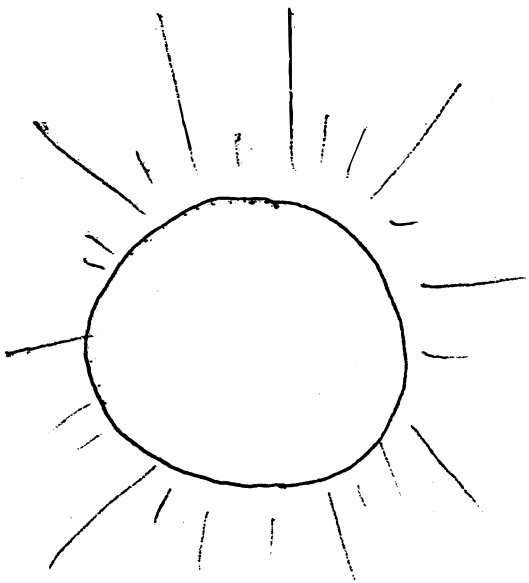
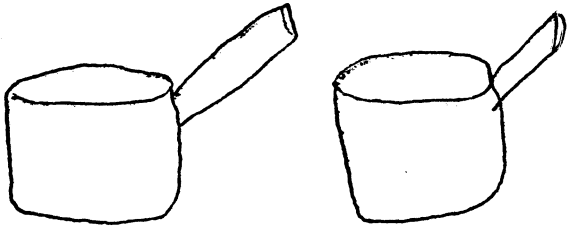
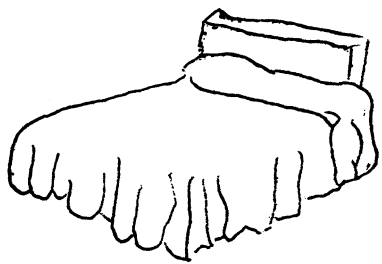
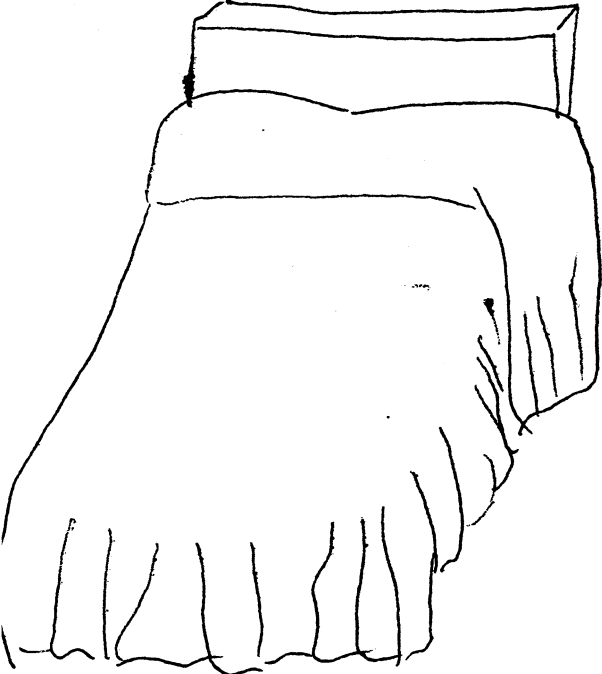




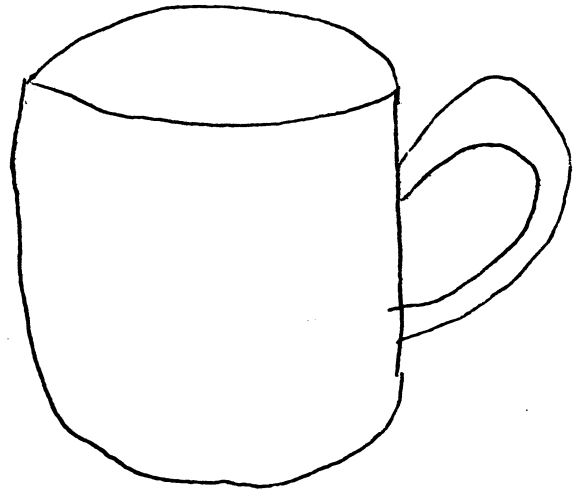
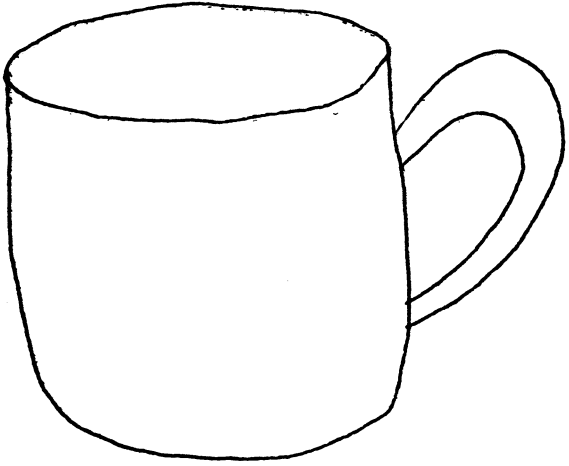


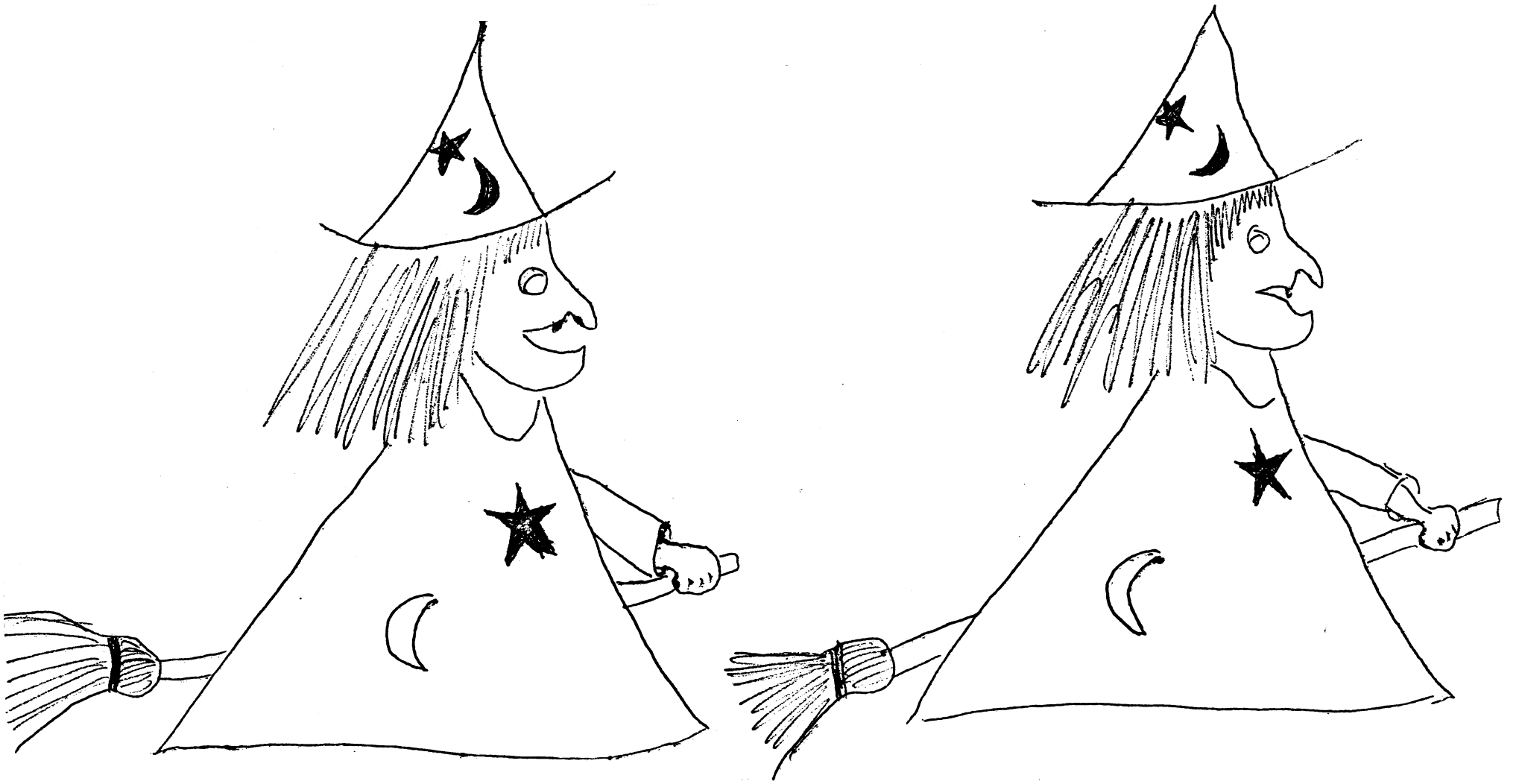


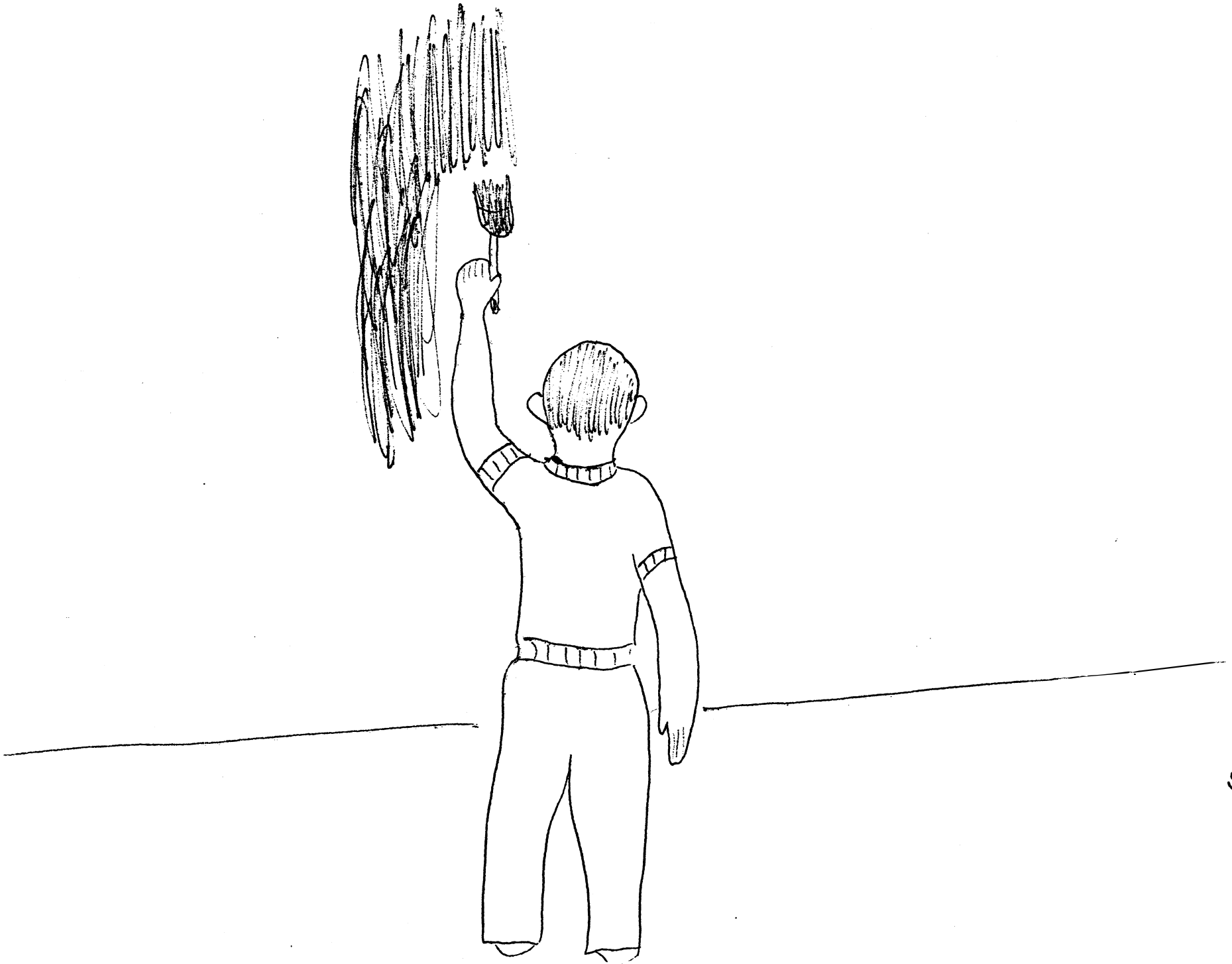




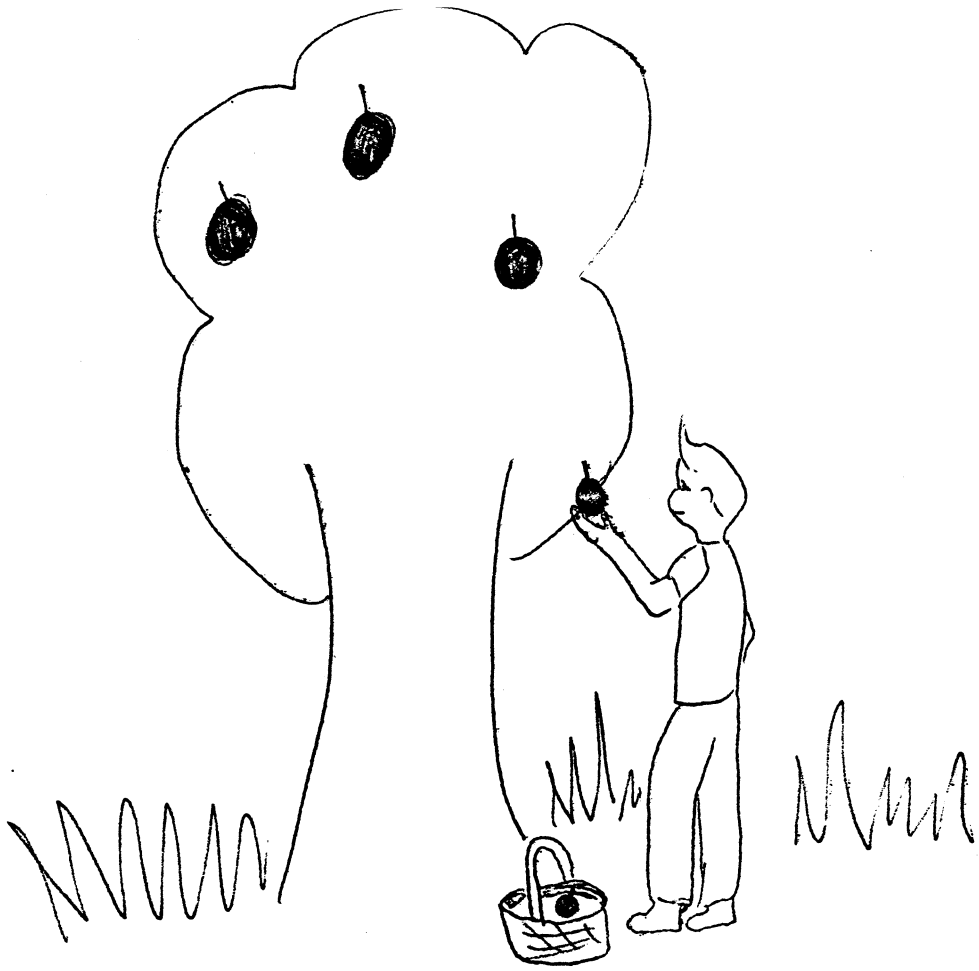
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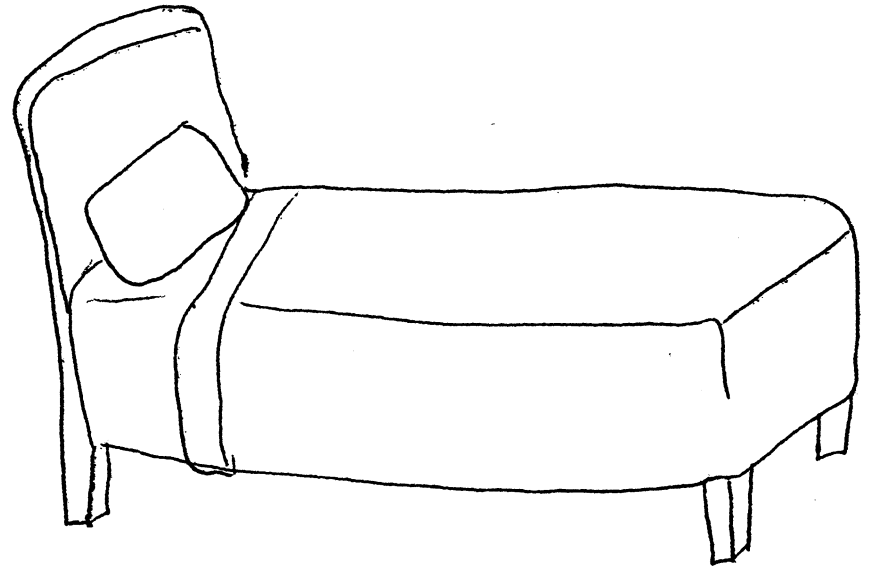
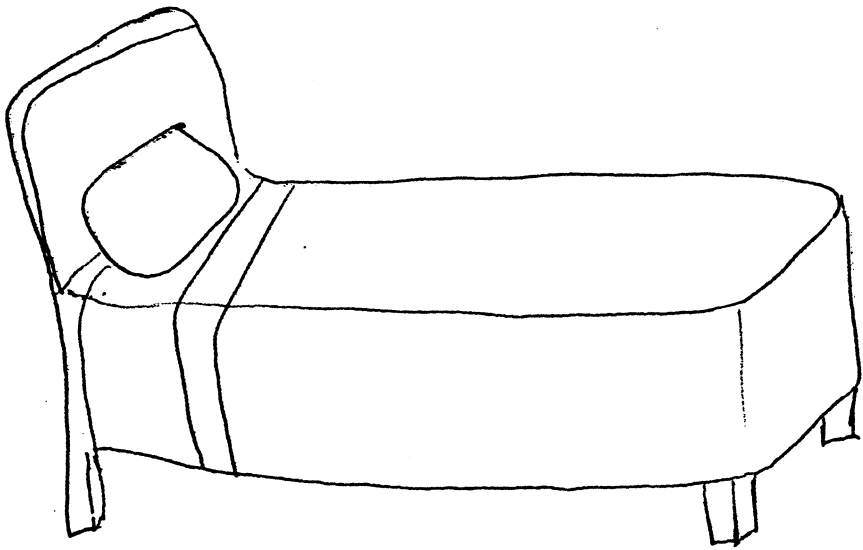


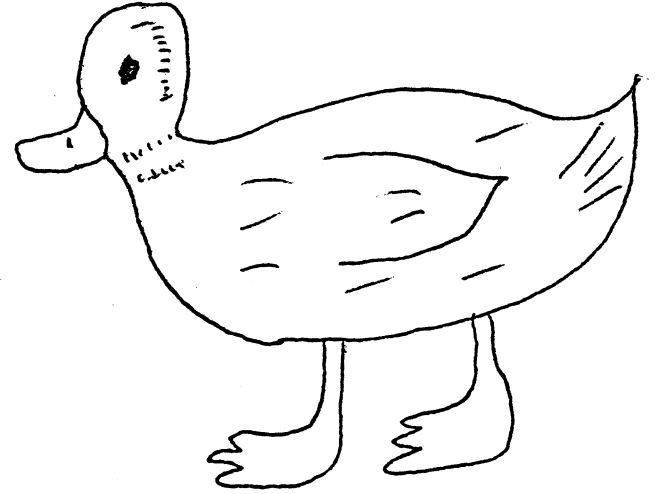
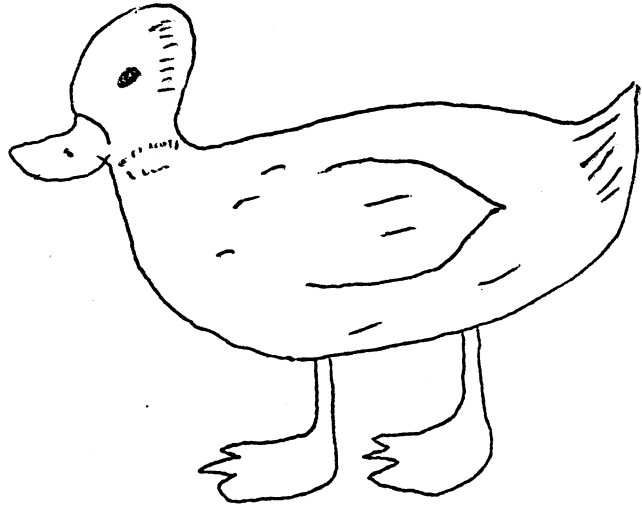


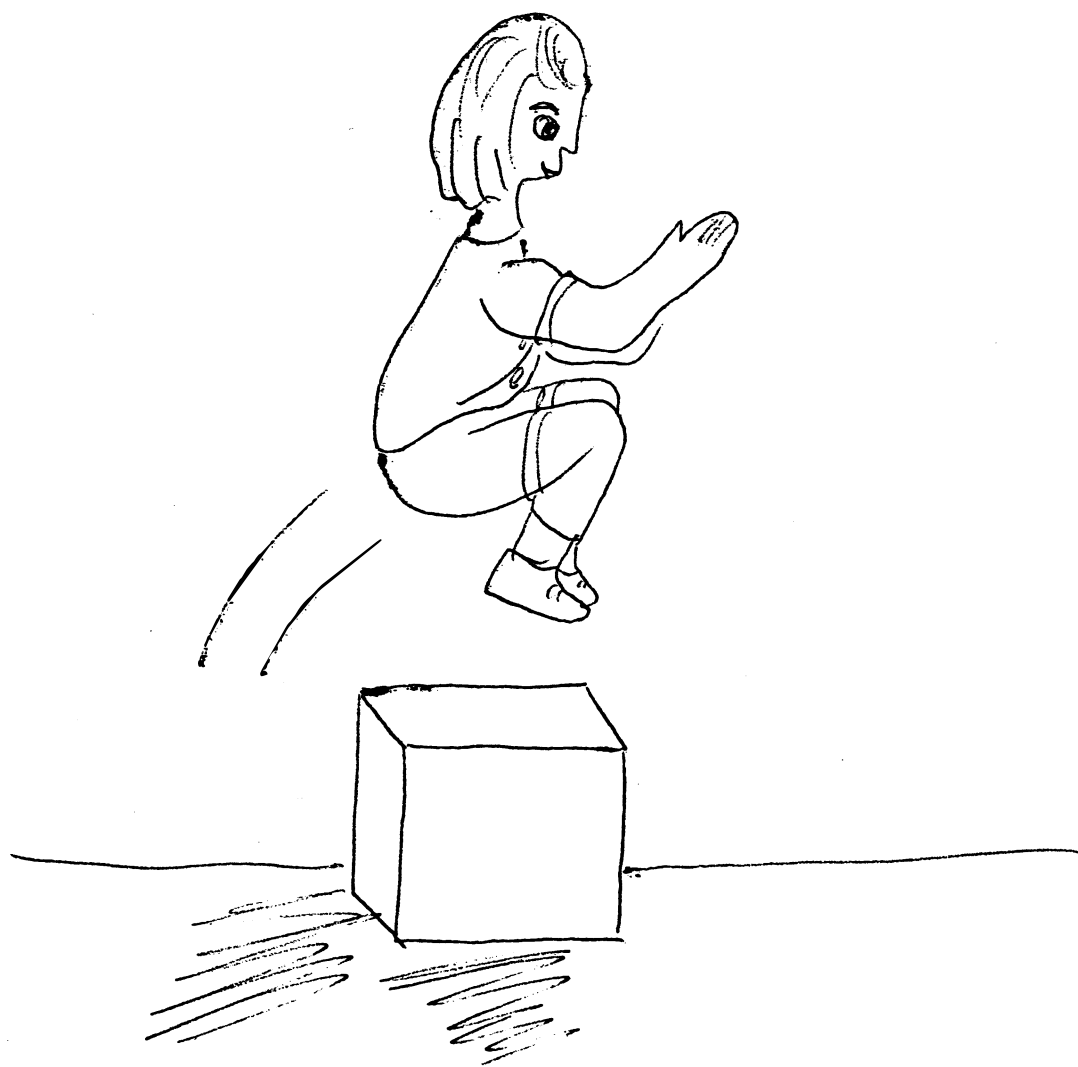


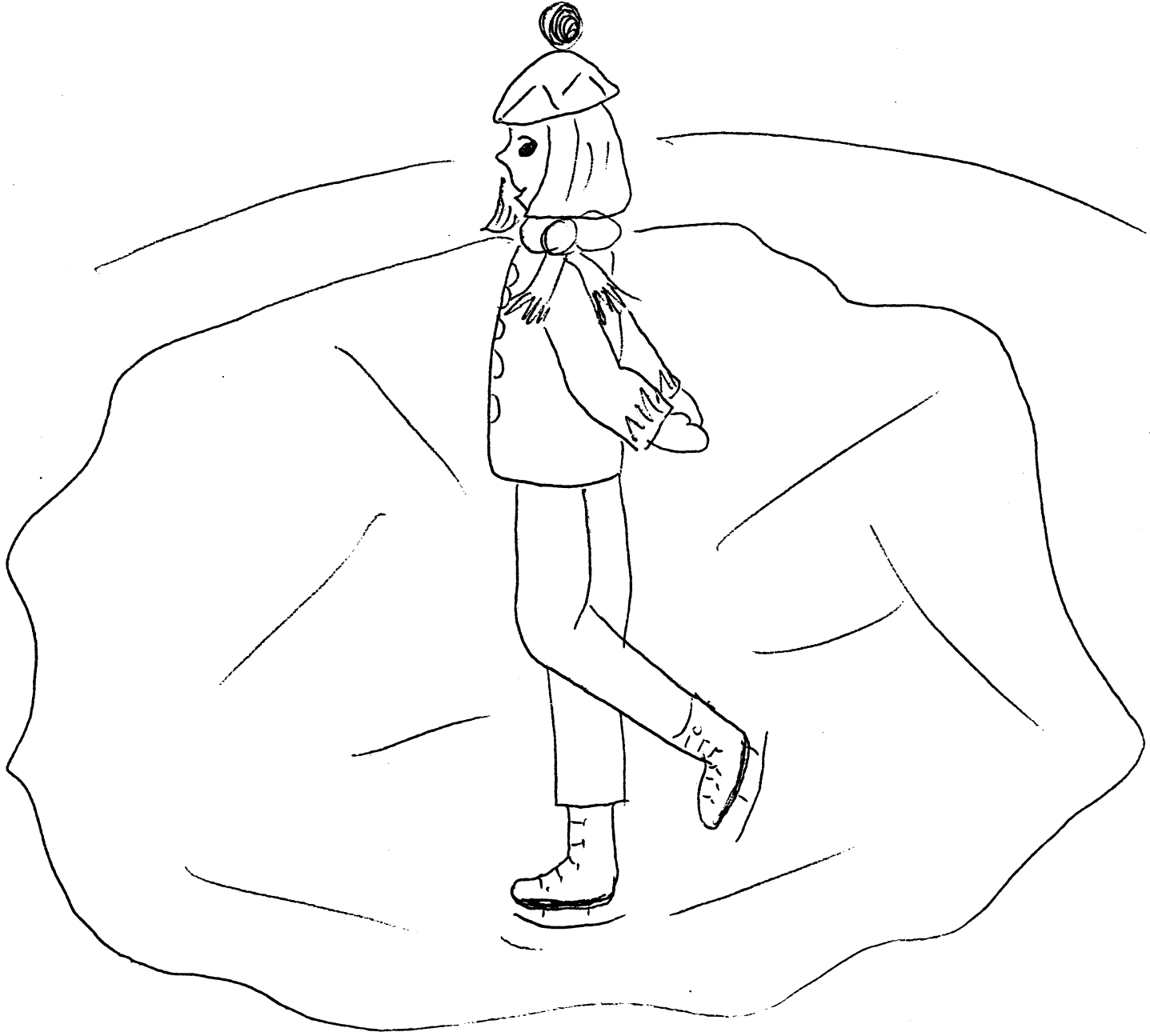


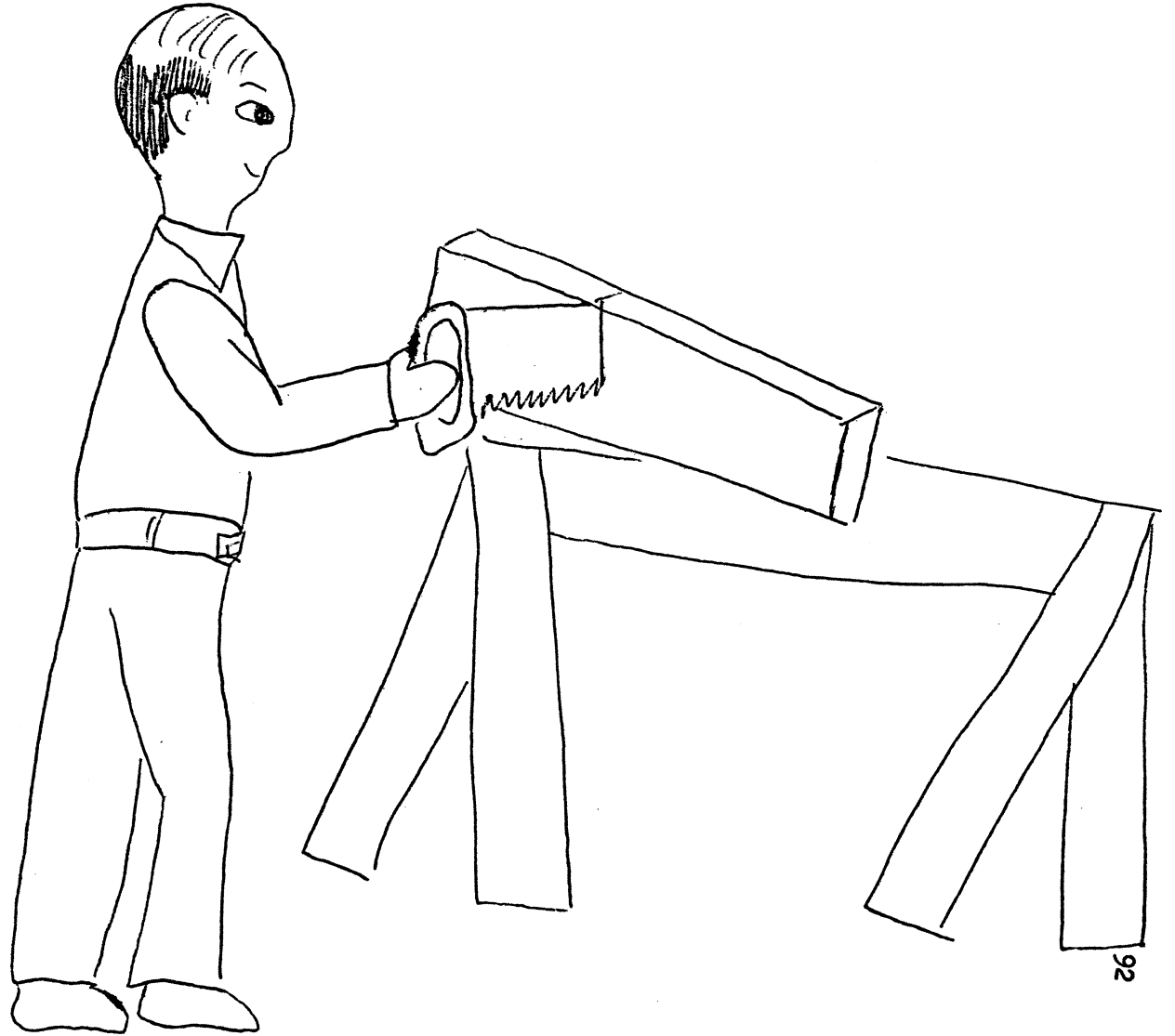


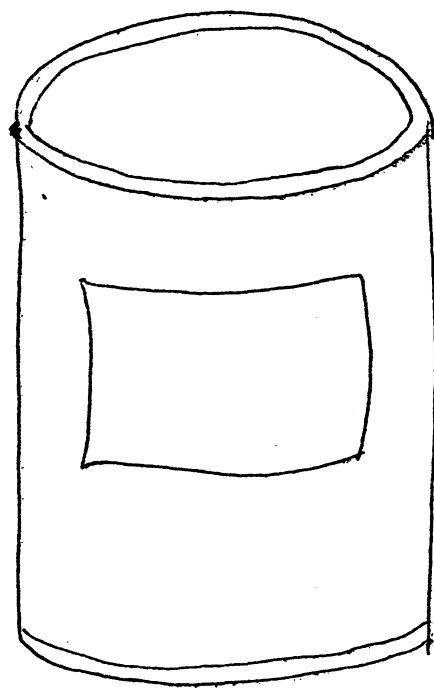
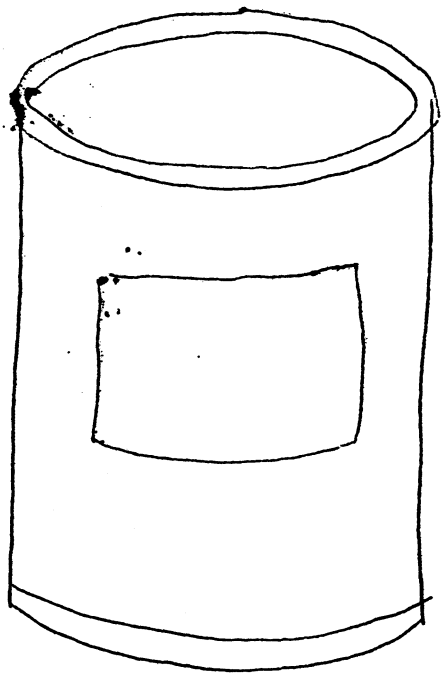


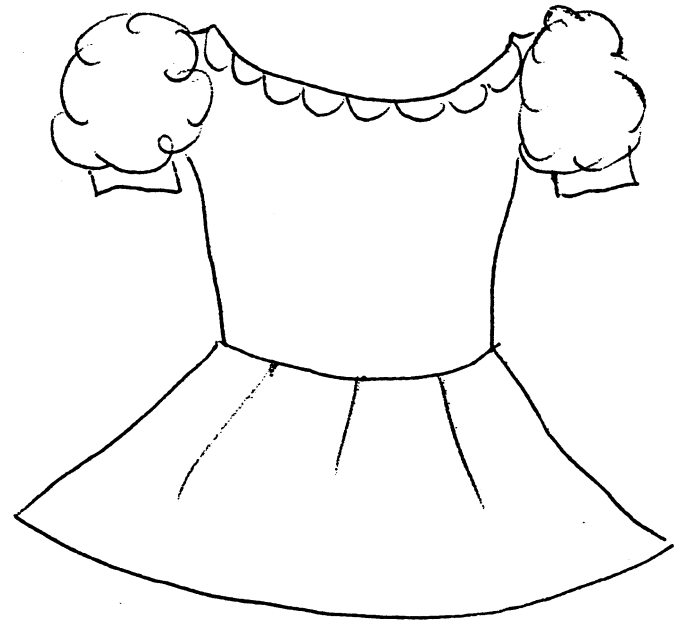
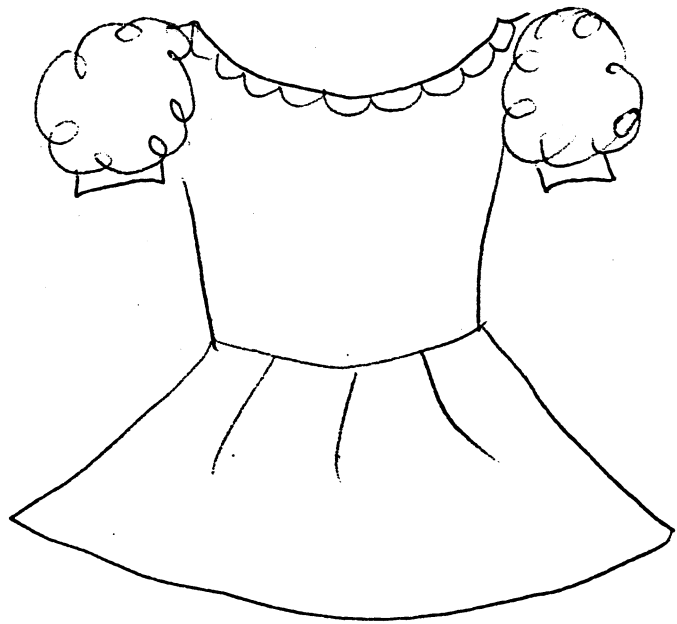












APPENDIX E

VERBAL DIRECTIVES

Verbal Directives for Inflection Morphology Test

INSTRUCTIONS: Read to subject before administering test.

Repeat if necessary.

"You are going to see pictures of people and things. You will know the names of most of the pictures. I will tell you the names, and you will say them back to me. Sometimes you will tell me the name of a picture. Sometimes you will point to a picture. Do you understand? Now listen..."

EXPRESSIVE ITEMS:

1. "Here is a duck. Here is another one. Now there are two _____ (ducks)."
2. "Here is a cup. Here is another one. Now there are two _____ (cups)."
3. "Here is a bed. Here is another one. Now there are two _____ (beds)."
4. "Here is a can. Here is another one. Now there are two _____ (cans)."
5. "Here is a witch. Here is another one. Now there are two _____ (witches)."
6. "Here is a dress. Here is another one. Now there are two _____ (dresses)."
7. "Here is a man who knows how to paint. He is doing it now. The man is _____ (painting)."

8. "Here is a girl who knows how to skate. She is doing it now. The girl is _____ (skating)."
9. "Here is a boy who knows how to pick. He does it every day. Every day he _____ (picks)."
10. "Here is a man who knows how to saw. He does it every day. Every day he _____ (saws)."
11. "Here is a man who knows how to comb. He did it yesterday. Yesterday he _____ (combed)."
12. "Here is a girl who knows how to jump. She did it yesterday. Yesterday she _____ (jumped)."

RECEPTIVE:

1. "Here is a duck. Point to ducks."
2. "Here is a cup. Point to cups."
3. "Here is a bed. Point to beds."
4. "Here is a can. Point to cans."
5. "Here is a witch. Point to witches."
6. "Here is a dress. Point to dresses."
7. "This man knows how to paint. Point to 'The man is painting'."
8. "This girl knows how to skate. Point to the 'The girl is skating'."
9. "This boy knows how to pick. Point to 'The boy picks'."
10. "This man knows how to saw. Point to 'The man saws'."

11. "This man knows how to comb. Point to 'The man combed'."
12. "This girl knows how to jump. Point to 'The girl jumped'."

PROCEDURE FOR REPETITION OF AN EXPRESSIVE ITEM:

Used following "I don't know" responses or if subject was unattentive.

Pluralization example:

Examiner: "(child's name), say 'duck'." (pause) "Good.

Now, here is a duck. Here is another one. Now there are two _____."

Tense example:

Examiner: "(child's name), say 'jump'." (pause) "Good.

Now, this girl knows how to jump. She did it yesterday. Yesterday the girl _____."

APPENDIX F**MEANS AND STANDARD DEVIATION TABLES**

Table F₁. Measures of Distribution for Receptive and Expressive Group Scores on Noun Pluralization Inflections /-s/, /-z/, and /-ɪz/.

Type of Language Response	n	Σ /-s/	Σ /-z/	Σ /- z/	ΣX_1	\bar{X}_1	S
Expressive	25	49	50	43	142	47.3000	15.7367
Receptive	25	26	32	40	98	32.6667	11.0224

Table F₂. Measures of Distribution for Receptive and Expressive Group Scores on Verb Tense Inflections for Progressive, Third-Person-Singular, and Past Tense.

Type of Language Response	n	Σ Progressive	Σ Third-Person-Singular	Σ Past	ΣX_1	\bar{X}_1	S
Expressive	25	45	31	36	112	37.3333	12.5503
Receptive	25	32	29	4	65	21.7333	8.4459