# TPVT - A SCREENING PICTURE VOCABULARY TEST IN TAMIL

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TO

may beloved

Amma, Appa and Annas

who mean the world

to me

**CERTIFICATE**

*This is to cetrtify that the dissertation entitled* ***"TPVT-A SCREENING PICTURE VOCABULARY TEST*** **IN TAMIL"** *is the bonafide work on part fulfilment for the Degree of Master of Science (Speech and Hearing) of the student with Register No.M.9102.*

*Mysore*
*1993*

*Director*
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**CERTIFICATE**

*This is to cetrtify that the dissertation entitled "**TPVT-A SCREENING PICTURE VOCABULARY TEST** **IN TAMIL**" has been prepared under my supervision and guidance.*

*Mysore* *Dr. Shyamala, K.C.*
*1993* *GUIDE*

## *DECLARATION*

*I hereby declare that this dissertation entitled* ***"TVPT-A SCREENING PICTURE VOCABULARY TEST IN*** **TAMIL"** *is the result of my own study under the guidance of Dr. Shyamala,K.C., lectuter, Department of Speech Pathology, All India Institute of Speech and Hearing, Mysore, and has not been submitted earlier at any University for any other Diploma or Degree.*

*Mysore*
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# INTRODUCTION

"When I use a word", Humpty Dumpty said in a scornful tone, "it means what I choose it to mean".

Lewis Carrol (Miller,1963).

All species in this world show signs of communication with one another through various means, but only human beings are gifted with the ability to use the organized intricate language system as a tool for communication. This language offers an organised way of communication. The basic use of language is to transmit meaning to some one else.

Hearing is a bridge between the thoughts and experiences of the individual. The symbolization of these thoughts and experiences, is accomplished through the usage of words.

Words are the basic meaningful unit of the language. It assists the child to move on from much easier concrete thoughts to the difficult abstract thoughts. Dale(1980) points out that the words are the names we give to our experiences. He further stated that vocabulary acts as a key for concept development.

Learning of a meaningful word indicates that there is a permanent learning taking place in the child's system. Harris(1961) points out that the words children can use and understand give us a good insight into the development of their concepts and ideas.

Studies on language acquisition in children have showed that children go through various stages in the beginning like babbling, lalling and echolalia and soon he/she utters his/her first meaningful word approximately at one year of age. Later he/she begins to combine those words present in his/her lexical stcck and arrive at newer sentences. These combinations are not random but are rule governed and is specific to a particular language. The successive stages in verbal behaviour are much the same in all children regadless of their parent's language.

The area of child language acquisition is a fascinating area and has attracted wide spread attention from the investigators. For over 50 years now attempts have been made to gain insight into normal development of language as this would aid in understanding the language of the disordered children and also planning treatment strategies. It also provides basis for the development of test protocols.

With the gaining understanding of language development, several qualitative and quantitative procedures like mean length of utterance, mean morphological units, etc. were developed to describe and assess the language sample.

Among these, measurement of vocabulary has gained significant attention in the recent decades. Children's knowledge of words is highly related to their mental maturity. As Berry(1960) points out, the child's ability to discriminate, to categorize, depends upon the vocabulary which inturn will reflect on both comprehension and expressive language abilities.

Hence investigators always have based their judgements concerning progress in language development upon the age at which they started speaking words, their ability to define and use words at various levels of difficulty as against their age.

Psychologists have emphasized that the size of vocabulary of the child would be equivalent with the mental test scores.

All these strongly suggest that the measurement of vocabulary is crucial in language assessment.

One of the problems with measurement of vocabulary is it is difficult to select appropriate procedures to obtain most reliable and useful information about the child's stock of words. Despite this problems attempts have been made to standardize few vocabulary tests like peabody picture vocabulary test, full range picture vocabulary test, etc. Majority of these tests are comprehension tests and assess only the receptive part of vocabulary.

**Need of the Study:**

There are only few standardized tools available to assess vocabulary in Indian languages.

In a multilingual country like India, it is very essential to develop tests in all the languages. With the availability of variety of such tools, the speech and language pathologist can obtain the complete profile of language disordered chidren to make or confirm diagnosis, so that directions for language interventions can be determined early.

**Purpose of the study:**

It was planned to design a screening picture vocabulary test in Tamil, in order to identify children with delayed vocabulary development who require in depth speech and language evaluation.

## REVIEW OF LITERATURE

Language is an organised set of symbols which may be either auditory or visual. The use of language is one of the basically distinguising characteristics of man. The process of language acquisition and language function become fundamental problems in the scientific appraisal of human behaviour. Of all phases of child development the learning of language has traditionally attracted more attention because of the complexity of language and apparent ease of swiftness in learning. There has been much speculation about it too.

Some investigators study the origin and growth of language as a human achievement and the development of these language skills in its various aspects. These studies on language acquisiton seem to be concentrating mainly on two issues: (1) Vocabulary (2) Structure (Truby, Bosma & Kind,1965; Holliday, 1975)

Vocabulary and structure were selected for investigation probably because they contribute heavily to communication and are readily amenable for standardization.

Language researchers have identified various stages involved in language acquisition process and these stage are briefly explained in the following pages.

**LANGUAGE ACQUISITION:**

**First Stage: In** this stage vocalizaiton, crying and cooing and other nondescriptive sounds are observed. This stage is from 0-6 mts. utterances in this period seem to be primarily a reflection of child's increasing ability to control various parts of his vocal mechanism. (Truby & Bosma,1965).

Second Stage: This is from 6-8 mtrs and this stage is termed as "Babbling". During this the production of series of consonant vowel syllables is prominent. It is more phonetically diversified type of random vocalization (Carrol,1960).

The next stage is known as the **Expressive Jargon Stage** which occurs in the period of 8-10 months. In the 8th month the child begins to be alert to all stimuli in the immediate environment. He vocalizes syllables, interjections and recognition.

By 9 months adult like intonation pattern have been noted (Cessel & Thompson,1934). The child produces strings of utterances marked by intonation and stress.

In the 10 month the child produces utterances attempting to name repeated instances of objects. The imitation of intonation pattern continues.

In the 11th month the single word utterances begin to emerge. These words are meaningful and they are considered **as** important in language acquisition (Holliday,1975).

Around 18 months the child starts using two word utterances construction of pivot open class type. His repertoire consists of about 50-75 words out of which 50% are nouns.

After about 2 years of age the child uses 3 or more word utterances. Usually the combination includes agent-action-object or agent-action-location. Of the total response nouns continue to be more in number followed by verbs, pronouns and adverbs.

Between 30-36 months, the comprehension of sentence structure, sentences and prosody develops speedily. The child comprehends the semantic difference in subject-object position of nouns. He acquires different types of sentences. By 5 years the child masters in language and his speech is similar to that of adult. However, language acquisition does not cease at this stage but continues in the form of vocabulary and grammatical complexity.

Of the studies on language development much of the work was devoted to the study of vocabulary development in children.

**Vocabulary development:**

As vocabulary is part of language system and as it contributes heavily to communication, emphasis was placed on the study of lexicon development in children. Number of issues regarding the rate of lexicon development and nature of early words have been reported.

Initially for several years investigators focussed their attention towards the study of comprehension skills.

Golden-Meadow et al(1961) and Benedict(1978) reported from their study that children learn ability to comprehend words more than they produce.

According to Hotten lochers(1974) children as young as 9 months of age may respond apropriately to words and short phrases.

Beckwith & Thompson (1976) conducted a study on vocabulary comprehension in children younger than 2 years and reported that comprehension develops in a manner similar to that of production.

These authors relied mainly on informal techniques because young children are not very cooperative subjects. One of the limitation of such informal procedures is it is very difficult to draw definite conclusion regarding the child's comprehension ability.

To overcome this problem, more recently Oviatt(1980) developed a method for assessing lexical comprehension in young children. It was developed basically as a screening procedure. The child is provided with exposures to previously unknown object and action names. Following this, the child's comprehension of each word is tested. The important feature of this approach is it allows one to compute the consistency of a child's response to the word relative to his response to a control word. This procedure would seem more appropriate when the goal is to

determine language disordered children's readiness for comprehension training.

With the gaining understanding of child's comprehension of words, attempts have been made to study the production of early words.

**Early word production:**

One obstacle faced by investigators in the study of lexicon development is that it is very difficult to determine when the child has begun words. Traditionally it had been believed that words begin to appear after babbling or lalling stage. However one year is generally taken as the approximate age at which children acquire their first words.

It is reported that use of directional words as "no", "bye-bye" etc. begin at this age. At about 18 months vocabulary development will begin its spiral development. Between 2.6 - 3.6 years, a child almost doubles the number of words he uses. It increases from 466-910 words. And by 4 years vocabulary increases by 20 percent. (Berry,1960)

A study on vocabulary size determinations were first made by Smith(1926). He considered comprehension and use of two factors in finding out whether and how a child acquires a particular word. He concluded that children's vocabulary at the age of 1.6 years is approximately 22 words and by the age of 1-9 years it reaches to 118. The number of words taken for the study was 203 words.

Nelson (1973), on the other hand suggests that children aged 1.8 years acquire approximately 50 words.

These studies show that vocabulary size increases with advancing age levels.

**Nature of early words**:

**It** is generally observed tht children acquire nouns first, verbs and adjectives later, relational words still later and pronouns are used by the most advanced children by the end of second year. (Beckwith & Thompson, 1976)

Studies related to lexicon development suggested that children's early words take a variety of forms.

Bloom(1973) has distinguished two types of words that are seen in the studies of early word use. One being relational words which may involve reflexive relations of a single object itself, describing either objects existence or disappearance, concerning action or location. The other type of words are substantive words referring to particular person or classes of persons or objects. A child's early vocabulary contains fewer relational words than substantive words.

Nelson's study (1973) contributed much to the study of child's lexical development. He studied the first 50 words acquired by 18 children and noted that nominals and action words were numerous than words falling into other categories. A further analysis led to the interesting conclusion that children

learn easily the names of the things that they con act on or they act themselves. For eg. keys, shoes, etc.

Attempts have been made to analyse as to why and how the child acquires the words. It is found that when children name objects in the environment, their intention is not to inform the listener of the objects name (Neinlo & Bruner,1978) but rather to gain or direct the attention of the listener (Holliday 1975, Bruner 1975). These authors concluded that chidlren select their lexical items for use which represent that situational element which is least certain from the listeners point of view.

According to Leonard & Fay(1979) young children tend to avoid using certain adult form of words. The child select those items which belong to or rather fit into his production system and reflects the complex word structure. As he grows up he gradually tries to fit in these words to his vocabulary system.

McShane(1980) attempted to study the communicative functions served by children's early words usage. McShane suggested that young children used relatively limited lexicons to convey a variety of communicative intentions.

Among these studies on word production, much of the work was devoted to find the factors that influence a young child's tendency to use a particular word. One such factor is unsolicited imitation.

Bloom, Hood & Light Bown(1974) & Ramer(1976) reported that imitation of particular lexical item decreased while the spontaneous use of the lexical item increased.

Leonard,Schwartz & Folger(1979) attempted to determine whether imitated words were acquired more readily in production than words that were not imitated. They observed that first spontaneous use of non-imitated words required no more stimuus exposures than the first spontaneous use of previously imitated words. However in their follow-up study Leonard et al(1983) observed tht spontaneous usage was more frequent for words that had been both imitated and used spontaneously than for words that had been used spontaneously without being imitated. This shows that imitationplays an important role in lexicon acquisition. And these findings suggest that imitation could serve as a vehicle through which words might be introduced more readily into the lexicon.

The other factor that influences the young child's tendency to use new word is the phonological compositon of a word. Children's selection and avoidance of words depends upon the initial consonant of the words (Shibamoto & Olmsted,1978) and the interaction between initial consonant and syllable shape of the word (Macken,1976).

Schwartz & Leonard (!982) found that expressive lexicons of approximately five words were more likely to use new words that contained consonants they had previously produced than words

containing consonants they had shown me prior evidence of attempting.

These recent findings on early word production and the factors influencing the production and the communicative function served by these words seem to offer new dimensions for clinical management. It specificaly suggests a modification in lexical training procedures.

**Vocabulary testing and related issues:**

Historically in language testing, emphasis was centered around assessing all the areas of language viz. vocabulary, articulation, phonology. But with the recent developments in the field of linguistics, the emphasis in testing shifted from syntax to semantics.

A wide range of formal and informal assessment tools have been developed to gather information regarding the sematnic capabilities of children.

Some of the currently used formal vocabulary tests are full range picture vocbulary test (FRPVT) and Peabody Picture Vocabulary Test (PPVT), Test of Language Developmental Scale, etc. These include broadest age range where as the other tests like the test of auditory comprehension of language (Elizabeth Carrow,1975), Assessment of children's language comprehension (Gidden & Stark,1972), Boehm test of basic concepts, assess wide range of semantic concepts but more restricted in the age groups.

Apart from these, few screening tests namely - The test of early language development (Hresko et al,1981), The compton speech and language evaluation (Compton,1978) have been developed to identify children with language delay. These are norm referenced tests to evaluate the child's performance in relation to some peer group and yield age equivalent score or other scores such as percentile score, standard score or quotients.

In recent times, there has been a shift away from the standard testing of language towards informal assessment (Leonard 1978). Attempts have been made to formulate a vocabulary list (Rescolla 1989, Reznick 1989) in order to identify young children with language delay. Such a list can be used to determine the availability of words in spontaneous speech of the child by parents.

The standard intelligence test also have items on vocabulary, naming, or definition and this can be used to obtain information on vocabulary development of the child.

Other than these tests there are some non-standard procedures such as "basic concept inventory" have been mentioned in the literature.

Various procedures can be used in the assessment of vocabulary. Majority of these tests make use of short single words which are relatively concrete and picturable, as these stimuli elicited maximum number of responses.

Lerea (1958) attempted to develop a standardized procedure which would measure the normal and language retarded child's ability to express and comprehend vocabulary and structure. Picture language inventories were constructed for this purpose.

It was found that among normal children both comprehension and expression appear to be a positive function of age. The language impaired were handicapped in both comprehension and production of language.

Beckwith & Thompson(1976) selected large number of vocabulary items for testing the vocabulary comprehension in children younger than two years. The technique used slides of real objects for testing the receptive vocabulary. Results indicated that comprehension develops similar to that of production in that nouns are the easiest one, verbs are more difficult. Modifiers and locatives are most difficult. No significant effect of sex and social status reported.

Goldin & Meadow (1976) reported that in the course of vocabulary building by around 2 years of age generally comprehension precedes production and this discrepancy is greater for verb elements than nouns.

Benedict (1978) studied the earliest phase of vocabulary growth and found comprehension, production ratio to be around 5:1 with a 5 month gap between comprehension and production at the 50 word level. His study indicated that comprehension precedes production for lexical development.

Dale (1976) carried out a long in depth study "the words we know, A national inventory" - a useful 45,000 word list of student's knowledge of words by grade level. This is a major contribution to the field of vocabulary development.

In the Indian context a study on vocabulary in Kannada was carried out by Gururaj Rao (1969). The investigation was to find out the Kannada vocabulary content of 3 1/2 year old children. Results showed that children whose parents had higher educational qualification and higher socioeconomic status demonstrated higher vocabulary scores, when compared with children whose parents were of middle socio-economic status.

All these studies indicated clearly that comprehension of words precedes expression.

After having gone through several aspects of lexical development including vocabulary development one can look into the larynge assessment and various measures of vocabulary reported in the literature.

According to Hutchinson et al(1979) the language assessment and intervention can be clustered under one or another three different categories which place emphasis on different perspectives. They are:

(1) the grammatical perspective
(2) the developmental perspective
(3) the cognitive and semantic perspective

Investigation on estimation of size of vocabulary has been made by several scholars in the field of vocabulary.

A pioneer investigator in the study of growth of vocabulary in young children was Smith (1926) who constructed a 203 word list to assess vocabulary.

In recent times there is a raising awareness that vocabulary testing is a crucial measure in language assessment. But the construction of vocabulary test is not an easy-task. According to the investigators the builders of vocabulary test must grapple with a number of knotty problems like:

(1) defining what is word.

(2) Deciding the kind of response to be obtained - that is naming or pointing in response to stimulus.
   - Choosing the correct synonym.
   - Using the word in sentence.
   - Provide the meaning of the word.

(3) Selecting the test material which is basis of his sampling.

A thorough search in the literature reveals that the currently available vocabulary tests exist in various forms. Some are standard tests and some exist in the form of checklists and screening tests which are designed to identify children with language delay.

Following are the few vocabulary tests that are widely used:

(1) Peabody Picture Vocabulary Test (Dunn,1965)

(2) Full range Picture Vocabulary Test (Ammons & Ammons,1948).

(3) Michigan Picture Language Inventory (Lerea,1958)

(4) Vocabulary Comprehension Scale (Bangs,1975)

(5) The Seashore-Eckerson English Recognition Vocabulary Test.

(6) Assessment of Children's Language Comprehension Scale (Gidden & Stark,1972).

(7) The expressive one word picture vocabulary Test (Gardner,1979).

(8) Test of Word-Finding (Shipra,1992)

(9) The Boehm Test of Basic Concepts (Boehm,1971)

(10) The McCarthy Scales of Children's Ability (McCarthy,1970).

(11) The Environmental Language Inventory (MacDonald,1978)

(12) Multilevel Informal Language Inventory (Goldsworth & Secord,1983).

Some of the available screening tests are:

(1) The developmental indicators of assessment and learning. (Mardell & Goldernberg,1975)

(2) The screening test for adolescent language. (Prather et al,1980)

(3) The test of early language development. (Hresco et al,1981)

(4) The Compton speech and language evaluation. (Compton, 1978)

Before going into the description about each of this test, a few tests on language that include measures of vocabulary as a part of language assessment are described in brief.

**Illinois Test of Psycholinguitic Abilities:**

This is designed by McCarthy and Kirk(1961). This is one of the most comprehensive and highly standardized tests. The final test battery was standardized on 700 children between the ages of 2-6 and 9 years and standard score norms were calculated. The measure is based upon the three major dimensions of psycholinguistic ability.

(1) Levels of organisation
(2) Psycholinguistic process
(3) Lelvels of communication.

ITPA consists of 9 subtests. They are :

(1) Auditory decoding
(2) visual decoding
(3) Auditory vocal association
(4) Visual motor association
(5) Vocal encoding
(6) Motor encoding
(7) Auditory vocal automatic ability
(8) Auditory vocal sequential ability
(9) Visual motor sequential ability.

In the auditory decoding subtest the examiner assess the understanding of the spoken word, that is vocabulary of the individual.

**UTAH** Test **of** language development:
Designed by Mecham,J. & Jones,J (1964)

This is a very simple measure which provides an objective instrument for measurement of expressive and receptive verbal language skills, on both normal and handicapped children. Age range is 1-15 years. Items like :

(1) Names of common pictures
(2) Repeat 2 digits
(3) Respond to simple commands
(4) Names of colour
(5) Identifies action in pictures are given for 2-3 year age group children.

**The Houston Test for Language Development:**

This test is standardized on 215 children between the age of 6 months to 6 years and normative scores are given.

Test contains two parts. In Part-1 items like melody of speech, gesture accent, articulation, vocabulary. This is used for the age group of 6 months - 3 years.

Part-2 employs children from 3-6 years of age and this includes items like self identity vocabulary, gesture auditory judgement etc.

**The Bankson Language Screening Test (BLST):**

This is designed by Bankson (1977). It consists of a battery of 17 subtests covering semantics, morphology, syntax, auditory and visual perception, thus reflecting an attempt to identify areas of deficit for further assessment. It focuses more on expression than comprehension. The semantics subtests range from concrete vocabulary items to more abstract generalization such as functions and opposites. Items on BLST are scored as right or wrong. Total raw score can be converted to percentile rank. The author recommands further language evaluation for children with scores at or below the thirtieth percentile, with a strong therapy recommendation for those below the 60th percentile.

The BLST was norm referenced on 637 children between the ages of 4 years 1 month and 8 years. It takes approximately 25 minutes to administer.

**The Full Range Picture Vocabulary Test (FRPVT):**

This test was developed by Ammons and Ammons (1948). It is used as an estimate of verbal ability or a measure of auditory comprehension vocabulary. Test is administered individually for 15 minutes. Test materials are composed of 16 picture plates, with each plate containing four cartoon like black and white line drawings. There are two forms A and B provided with each having 85 test words listed according to chronological age. Two additional forms C & D are also available for use in the study of

superior adult levels. A scoring key is provided. Answer sheets contain space for recording of the score obtained on each plate.

Pointing or yes/no responses as the examiner points out, are acceptable responses. Correct and incorrect responses are recorded on a printed answer sheet. The number of correct responses is used as a raw score and these raw scores are converted into mental age equivalents for children (2-16 years) and to percentiles for adults.

The FRPVT does require adequate vision but can be adopted for administration to motorically involved or hearing handicapped persons if they are able to read.

According to authors FRPVT provides a reliable vehicle for estimating receptive vocabulary.

**Peabody Picture Vocabulary Test (PPVT):**

This was developed by Dunn (1965). It provides an estimate of a subjects verbal intelligence through measuring his hearing vocabulary. The age range is 2.3 years to 18.5 years.

Test material consists of a spiral bound booklet which contains 3 example plates and 150 test plates. These plates are arranged in order of increasing difficulty. There are 4 black and white pictures on each plate. Same set of plates are used for A & B forms. The manual provides suggestions about the point on the word list at which the testing must begin for various age levels.

Administration of the test is a simple procedure. A test word is spoken by the examiner. The testee can indicate his response by pointing to the picture, saying the number of the picture or blinking his eye for Yes/No response.

A base and ceiling are established and number of correct and incorrect responses are recorded in the record sheet. Raw score is simply the sum of correct responses. This is converted into mental age, intelligence quotients and percentile equivalent. Administration and scoring requires 10-15 minutes.

The PPVT is a standardized test with a minimum of 11 studies attesting to its reliability. It is a reliable instrument for both handicapped and average children. The PPVT and Standford Binet correlated at 0.71 while the PPVT and the Weshler correlated at 0.61.

Payne et al(1972) reported that the reliability coefficients ranged from 0.48 to 0.58 and validity coefficients ranged from 0.49 to 0.58 comparing the PPVT with the Standford Binet. The ease and speed of administration and scoring have increased its popularity and it is included as a basic item in many test batteries.

**The Peabody Picture Vocabulary Test - Revised (PPVT-R):**

Dunn *&* Dunn (1981) gave a revised form of peabody picture vocabulary test which includes wide age range from 2 years 6 months to 40 years 11 months. Words are chosen based on the frequency of occurance rather than semantic content. Raw scores

can be converted to age equivalents, standard scores, stanines, or percentiles. Two forms L & M are included to provide for retesting scores on forms A & B of the originals. PPVT(1965) cannot be compared directly to scores on the new forms but means of comparing between the two versions is detailed in the revised manual.

The PPVT-R is one of the best standardized language tests available but the limitation of this study is that it can be used only as a measure of receptive vocabulary. The present study has been based on PPVT.

**Vocabulary Comprehension Scale:**

This is designed by Bangs(1975) to assess comprehension of pronouns and words of position, size and quantity and quality. The test was standardized on 80 pre-school children aged two to six years and 10 children in each six months interval.

The test uses toy objects rather than pictured representation and it requires 20 to 45 minutes to administer. There are no standardized administration procedures. Totally 61 items are there and scoring is pass or fail. Items within each category (size, quantity) are sealed according to the percent of children passing the item on standardized sample. This provides a rough index of a developmental performance level.

It is not used as a diagnostic test, but one of the indicates and may be useful in assessing vocabulary in some mentally retarded population.

**Michigan Picture Language Inventory (MPLI):**

This is developed by Lerea(1958) and revised by Wolski (1962). The test is designed to measure two major components of language development in children. They are vocabulary and grammatical structures. Each of these components is tested in both verbal expression and verbal comprehension modes.

The test contains two subtests-vocabulary subtest and structure subtest. Each subtests is evaluated both receptively and expressively. Vocabulary test contains 35 items and language structure consists of 50 stimulus plates.

Administration of vocabulary test begins with picture naming. Child has to name the pictures pointed by the examiner, out of 3 pictures placed in front. Receptive vocabulary testing follows expressive. Items failed on expressive tests are further tested in the receptive mode. Similarly language structure is also tested in both receptive and expressive mode.

MPLI has limited clinical utility as the sentential/ communicative abilities are never assessed directly. It has not kept pace with recent advancements in the field of language. It takes long time to administer.

**The Seashore-Eckerson English Recognition Vocabulary Test:**

This test has been designed for school age children and can be self administered by subjects who have moderate reading skills. The test booklet consists of three sets of words i.e.

173 general terms or basic. Vocabulary a supplementory test, of 40 proper nouns, geographical locations and rare words and 46 derivation terms. Each test word is followed by 4 alternative words or sets of words from which the subject tested is to select the one which is the test word synonym or is related to the test word with the closest meaning.

Bangs(1958) has designed a battery of psychometric tests to delineate the assets and liabilities of children with speech and language problems. The 4 factors explored by the test items are:

(1) Language (ideation comprehension and usage)

(2) Memory, attention (visual, auditory)

(3) Visual motor perceptual skills

(4) Social maturity

Test items which assess the comprehension of oral language are presented with oral instruction but do not require an oral response. The test items are selected from Ammons Full Range Picture Vocabulary Test.

**Assessment of Children's Language Comprehension Scale (ACLC)**:

ACLC developed by Giddan & Stark (1972) is concerned with a child's understanding of grammatical units. Age range is between 3-7 years. The test consists of 50 plates and the clinician tells the child to point the pictures that are named. It provides information about the child's understanding of a core of vocabulary and his ability to process an increasing number of critical elements.

**The Boehm Test of Basic Concepts (Boehm,1971):**

This includes fifty vocabulary items in the categories of space, quantity and time, along with a miscellaneous category that are typically used in work materials for kindergarten children. Comprehension of individual words is tested by having the child choose from a set of pictures with items arranged developmentally. Although the manual identifies the items as useful for population of kindergarten to second grade children, many of the items would be appropriate for use with preschoolars.

**The McCarthy Scales of Children's Ability (McCarthy,1970):**

This has several subtests in its verbal scale that can be useful in assessing children's semantic knowledge.

1. **Word knowledge:** has two parts. In Part-1 children point to five common objects and name four pictured objects. In part-2, they define words.

2. **Verbal Memory:** Children relate the highlights of a paragraph read to them and thus demonstrate awareness of theme as well as semantics.

3. **Verbal fluency:** Children must name words that fall into each of 4 different categories within a time limit.

4. **Opposite analogies:** Children provide opposite in an anology form.

The MSCA is designed for children from 2 and 1 1/2 to eight and one half years of age. It is norm referanced if the entire scale is used. But no norms are available for individual subtests, which is not a problem when used to assess regularities.

**The Environmental** Language **Inventory**(**ELI**):

It is designed by Macdonald (1978) to assess multiword utterances according to the presumed semantic roles. Eight semantic rules such as:

(1) Agent and action
(2) Action & object
(3) Agent & Object
(4) Agent or object + Location
(5) Action + location
(6) Negation + X
(7) Modifier + head
(8) Introducer + X

are assessed.

The childs expression of each semantic relation is sampled three times for a total of 24 items. Each item consists of a nonlinguistic cue, conversational cue and an imitation cue.

For diagnostic purposes the imitation and second conversation cue are included only if the child does not respond to the first conversational cue with an expression of the intended rule. A sample of speech in free play is also recorded and scored for semantic relations expressed as well as several

measures of utterance length and intelligibility. The ELI model of assessment and training focuses entirely on production. It is most appropriate for use with individuals with good receptive skills and expression limited to two and three word utterances.

**Multilevel Informal Language Inventory(MILI)**(Goldsworthy & Secord,1983)

Assesses children's use of synatactic structures and semantic relations and the correspondence between them. There levels of elicitation are provided:

(1) presentation of action pictures for the child to describe so as to elicit a brief spontaneous language sample.

(2) Pictured stories that the child listens to and then retells to elicit more circumscribed structures.

(3) Single pictures to elicit specific structures that are not previously used or are used incorrectly. The other categories such as verbs, nominals, modifiers, adverbs, prepositions, negation, interrogatives, and Conjunctions are also included. This tool is not norm referanced, however and is not intended to give relative rankings of individuals.

**The Expressive One-word Picture Vocabulary Test:** (Gardener, 1979)

This test (Gardner 1979) presents individually a series of 110 pictures to be named with single words.

This test is standardized for children from ages two to 12 years. A version for children from 12 to 16 years is also available. This test is a measure of verbal intelligence and a screening test for speech or learning disorders as well as means of sampling expressive vocabulary. Scores derived include percentiles, mental age equivalents and deviations IQs.

**The Test of Word Finding** (German 1986)

This attempts to distinguish between vocabulary deficits and problems with word retrieval. It samples the child's skill in finding appropriate noun, verbs, category words through picture naming, sentence completion and descriptions and then assesses the childs comprehension of target words that are not used correctly. Standard scores and percentile ranks are computed.

Screening tests:

The following survey tests are also available which are designed for the purpose of selecting children, who need further language evaluation or for identifying the areas of deficit in which further assessment is indicated.

**The Development Indicators of Assessment and Learning** (Mardell & Goldenberg,1975)

**Purpose:** Designed to assess the motor and language abilities of pre-kindergarten children in the areas of gross motor skills, a fine motor skills, concepts and communication.

**Items:** Concepts and communication subtests cover a variety of receptive and expressive skills including articulation. Vocabulary use and recognition, following directions, formulating original response to question and story pictures.

**Age group of children:** 2 years 6 months to 5 years 6 months.

**Time taken for the administration** - 25-30 minutes.

Points are given for each task and the scores are conputed for each of the four areas tested. The child's score is compared with the cut off score specified by chronological age and based on this need for assessment is determined.

**The Screening Test of Adolascent Language** - Designed by Prather, Beucher, Wallace (1980)

**Purpose:** To assess and identify the junior and senior high school students who are in need of further assessment.

Choice of synonyms to assess vocabulary comprehension and sentence imitation to assess syntax and the ability to deal with abstract and nonliteral language is sampled.

Administration of time of test is only 7 minutes.

**The Test of Early Language Development (TELD)** - Designed by Hresko, Reid, & Hammill (1981)

**Purpose:** This is a 38 item screening test designed to determine whether 3-8 year old children have difficulty with receptive and expressive language.

Children are asked questions to elicit responses in the areas of phonology, syntax and semantics.

**The Compton Speech and Language Evaluation** (Compton 1978)

It is a survey test designed to identify 3-6 year old children who need indepth speech and language evaluation. It covers the areas of articulation vocabulary, memory span, morphology, syntax fluency and voice quality.

**Vocabulary** tests **in Indian languages** - **Kannada Screening Picture Vocabulary Test** (Sreedevi 1988):

This is the only test available in Indian languages that evaluates the lexical development of children.

The test is constructed by Sreedevi(1988) for the age group of 3-6 years. Test material consists of 30 picture plates with each plate containing 4 black and white line drawings. These plates are arranged in order of increasing difficulty. The response is through pointing to the correct picture. Raw score is the number of correct responses and this is converted into percentile ranks. A percentile rank of 50 and above is considered as normal. Children who score below 50 are considered as deficient in vocabulary skills and author recommends detailed language evaluation for such children.

It is a quick and an easy measure requiring only 10 minutes for administration. It assesses only the receptive vocabulary.

**A Test of Word-finding Abilities in Children (TWAC-H):**

This test is constructed by Shipra(1992) to assess the word finding abilities in children between the age range of 5-10 years.

This test consists of four subtests which are:

(1) picture naming - nouns
(2) Sentence completion
(3) Description naming and
(4) Picture naming - verbs.

There are totally 100 items. Correct and incorrect responses are noted and the total number of correct responses give the raw score. Depending on the raw score accuracy index and speed index could be determined. Accuracy index is calculated irrespective of the speed of the child. For speed index the scores are dividied into responses which are with in 5 seconds (fast response) and responses which took longer than 5 seconds (slow response). The raw scores can be converted to percentile ranks to detect the performance level of a child with respect to his age group. Norms have been established on 100 normal children who had Hindi as their mother tongue.

This test helps us to identify children with word-finding or word retrieving deficits. It is also used to distinguish between children with word retrieving and naming deficits. Hence it becomes a helpful tool for speech and language pathologists and learning disability professionals.

Studies on vocabulary of language impaired children:

Several studies have been carried out in deaf and C.P. population and few on autism and other language disordered children.

Karlin et al(1952) in their attempt to study the speech and language behaviours in mentally deficient children reported that they used only limited vocabulary. The amount of the vocabulary used was found to be in correlation with degree of mental deficiency.

Grisword and Commings(1974) studied the vocabulary of 19 deaf preschool children and it is reported that the average expressive vocabulary is small compared to that of hearing children of the same age group.

This comparison did not prove that there is a one-to-one relationship between vocabulary and chronological age. There are other factors like length of time spent in preschool training, amount of communication carried out at home which effect vocabulary size.

Ishiswa et al(1978) examined vocabularies in the age group of 2-6 years deaf children. He used 100 picture cards and compared the results with that of 3 year old normal children. The authors noted that with increasing age, vocabulary size increased but then the loss of hearing should be minimum.

The other findings were words which had higher percentage of correct answer in 3 year old normal children, had a higher percentage in deaf children too.

Studies focussed on cerebral palsied children showed that they are delayed in language usage in all dimensions including vocabulary.

McCurry & Irwin(1953) conducted a study concerning the presence of words in the speech of spastics, athetoids and tension athetoid children from 1-12 years of age. It was found that there were no statistical difference between the three groups and chronological age was also an important factor to be considered for interpreting the performance.

Same authors conducted another study on 91 CP children from 5-17 years age group to compare the vocabulary of use and understanding, using PPVT. Sex differences between the means of vocabularies of use and understanding were not present.

The effects of type, extent and degree of CP on the vocabularies of use and understanding was investigated upon.

Results revealed no significant difference between the scores of two vocabularies of spastics and athetoid children and among quadriplegics, hemiplegics/paraplegics,. However difference was seen in terms of vocabulary of understanding.

Bishop(1979) tried to compare language disordered children aged 6.3 years to 13.1 years with control children aged 3.9 years

to 13.2 years using PPVT and TROG (Test for Reception of Grammer). The majority of language disordered children including those classified as having expressive disorders, performed below the age levels on both tests, with girls doing more poorly than boys.

Prior & Halt (1979) attempted to compare autistic children with retarded and control groups. These three group were matched for their mental age. PPVT was used and verbal comprehension was measured. Results proved that normals scored better than MR who in turn scored better than autistic children.

Leonard et al(1983) used a picture naming task to test word finding problems in language impaired children. The subjects were shown 64 pictures of objects and asked to name each as rapidly as possible. The found that

(1) pictures of objects having commonly occuring names were named much faster than the ones with relatively lesser known names.

(2) Language impaired children fared poorer than their chronological age and normal peers but were much better compared to their language age peers.

(3) The effects of frequency of occurance on naming time were comparable for all 3 groups of children.

These studies prove that there is definite difference in the pattern of language development between normals and language impaired children.

Studies on vocabulary development of disordered population in Indian context:

There are very few studies conducted on disordered Indian population. Sharmila(1991) carried out a study to assess the receptive vocabulary level of CP children aged from 3-15 years using the screening Kannada Picture Vocabulary Test (KPVT) developed by Sreedevi in 1988.

45 children were taken for the study out of which 31 were spastics, 10 were athetoid and 4 belonged to mixed category. She found the receptive vocabulary scores of the CP individuals improved with age. Performance of CP children in the age range of 3-4, 4-5 & 5-6 years was found to be similar to that of normals.

Attempt was also made to compare the vocabulary scores with type and degree of cerebral palsy. It was noted that mixed group performed better than spastics which in turn was better than of athetoid type of CP. Mild category of CP scored better than moderate which intrun was better than severe category.

All these above studies support the view that measurement of vocabulary has been a significant part of language assessment in children.

## METHODOLOGY

The aim of the present study was to construct a screening picture vocabulary test in Tamil which would serve as a clinical tool to identify the language delayed/disordered children.

The study was conducted in three stages.

(1) formulation of the word list
(2) construction of the test
(3) standardization of norms

**Formulation of word list:**

As there was no standard vocabulary list available in Tamil, the following attempt was made to formulate a word list.

A pictorial glossary book in Tamil was identified. This book is designed and published by Central Institute of Indian Language, Mysore, for the purpose of teaching vocabulary for kindergarten children (A pictorial glossary book, CIIL Publication). It can be used as a supplimentary aid for teaching vocabulary to adults in literacy promotion programs.

Totally 200 picturable words commonly used in day-to-day life were selected. These words belonged to different semantic domains such as body parts, numerals, colours, animals, etc.

Using this, a preliminary testing was carried out on 3-6 year Tamil speaking children at Neyveli. These children were divided into three age groups of 1 year interval each. 10 subjects were selected in each age group from different schools.

Equal number of male and female children (5 boys + 5 girls) were taken up in each age group.

As the aim of the study was to construct a test of comprehension, only responses like pointing to the picture that was named were elicited from the child.

These responses were noted down and percentage of the responses was determined. Based on this a vocabulary word list was formulated.

**Construction of the Test:**

From the above mentioned vocabulary list, 33 words were selected based on the following criteria.

(1) The words selected should have a frequency of 40-60% in the respective age group considered i.e. 3-4 year, 4-5 year & 5-6 year.

(2) The words should be discriminative enough, picturable and unambiguous.

Later for each target word 3 distractors were chosen on the basis of the following criteria:

(1) The frequency of occurence of each distractor should be equal or fall within 5 of the frequency of occurence of the target word. This is to maintain the same difficulty level as far as possible.

(2) Distractors also should be picturable.

(3) They should not be ambiguous with the target word nor among themselves.

**Description of the test material:**

The test material consists of 33 picture plates with each plate containing 4 black and white line drawings. Among the 4, one is the target picture and the other 3 are distractors. These plates are arranged in the order of increasing difficulty. The test also includes individual test records to note the correct response (Given in the appendix).

**Time requirements:** The test requires only 5-10 minutes for administration.

**Establishment of norms:**

The test was administered on 120 normal children, attending Tamil medium school at Neyveli. The age range considered was 3-6 years and it was further divided into 3 groups with one year interval each. 40 children (20 boys + 20 girls) were selected in each age group.

The subjects selected were normal children:

(1) whose mother tongue was Tamil and who had studied in Tamil medium school,

(2) who did not show any evidence of physical or sensory impairments,

(3) whose speech and language development was appropriate for their age. (as reported by parents and teachers)

Procedure for administration of the test:

The testing was carried out in a quiet room that was away from distractions.

Initially the tester conversed with the child, made the child feel comfortable and built rapport with him/her.

Then the following instructions were given: " I will show you some sets of pictures now. Loot at all the pictures and point to the one which I ask for".

The parents and teachers were informed not to interfere or prompt the child while testing. If the child was not cooperative or if he was very shy, then parents or teachers were approached for help.

After the instructions were given the test was done in the following steps:

(1) Pictures were shown in the same order as it was sequenced and responses were elicited.

(2) Each subject was given reasonable amount of time (one minute) to respond.

(3) If required the stimulus word was repeated again.

(4) When the correct response was obtained, verbal reinforcements like "Good" or "You are doing well" were given to motivate the child.

(5) When an incorrect response was made the subject was given another chance to look at all the pictures carefully and then to point out.

(6) Finally the responses made by the child was recorded on the scoring sheet.

Recording responses:

For each item administered the picture number which the subject indicated was written in the individual test record (Given in the appendix).

Scoring:

Each correct response was given a score of 1 and the total score was the number of correct responses obtained. The maximum score was 33.

Thus the total score obtained was converted into percentile ranks and they were tabulated. This normative data could be used to find out the percentile rank for a particular score and this would indicate whether the child's vocabulary is adequate for his age or not.

A percentile rank of 50 and above is considered as normal. Below 50 is considered as below average and such children must be probed further and evaluated in depth.

## RESULTS AND DISCUSSION

The test material consists of 33 picture plates with each plate containing 4 pictures among which one is the target picture. These plates are arranged in the order of increasing difficulty. And this test was administered to 120 normal school going children in the age range of 3-6 years. Children were divided into 3 goups with one year interval and 40 children (20 boys + 20 girls) were tested in each age group.

Administration of the test took around 10 minutes. Each correct response was given a score of 1 and the maximum score that could be obtained by an individual was 33.

Thus the sample of 120 children was collected and this was subjected to statistical analysis.

The means and standard deviations of the scores of the 3 age groups were computed and this is given in Table-1.

TABLE-1: Mean and Standard deviation scores obtained by 3 age groups.

| Age in years | Mean | Standard Deviation |
|---|---|---|
| 3-4 | 17.5 | 4.96 |
| 4-5 | 28.67 | 3.07 |
| 5-6 | 30.32 | 1.90 |

Mean and Standard deviation was also computed separately for boys and girls in each age group in order to compare their performance. The results are tabulated as follows.

TABLE-2: Mean and Standard deviation scores of boys and girls in each age group.

| AGE | 3-4 years | | 4-5 years | | 5-6 years | |
|---|---|---|---|---|---|---|
| | Boys | Girls | Boys | Girls | Boys | Girls |
| Mean | 17.9 | 16.3 | 24.2 | 25.05 | 30.65 | 29.55 |
| S.D. | 5.17 | 4.8 | 3.2 | 3.1 | 6.9 | 6.3 |

The total raw scores were converted into percentile ranks for all the three age groups and the values are given in Table-3, 4 & 5. This is also graphically represented in Graphs-1,2 & 3 respectively.

TABLE-3: Percentile ranks for 3-4 year age group.

| Scores | Percentile ranks |
|---|---|
| 29 | 98.75 |
| 26 | 93.75 |
| 22 | 85.00 |
| 21 | 76.25 |
| 20 | 65.00 |
| 19 | 53.75 |
| 18 | 48.75 |
| 17 | 43.50 |

| | |
|---|---|
| 16 | 37.50 |
| 15 | 32.50 |
| 14 | 28.75 |
| 13 | 23.75 |
| 12 | 16.25 |
| 11 | 11.25 |
| 10 | 7.50 |
| 9 | 2.50 |

TABLE-4: Percentile ranks for 4-5 years age group.

| Scores | Percentile ranks |
|---|---|
| 32 | 98.75 |
| 30 | 96.25 |
| 29 | 92.50 |
| 28 | 88.75 |
| 27 | 81.25 |
| 26 | 68.75 |
| 25 | 56.25 |
| 24 | 48.75 |
| 23 | 42.50 |
| 22 | 31.25 |
| 21 | 18.75 |
| 20 | 10.00 |
| 19 | 5.00 |

TABLE-5: Percentile ranks for 5-6 years age group.

| Scores | Percentile ranks |
|---|---|
| 33 | 96.25 |
| 32 | 76.25 |
| 31 | 52.50 |
| 30 | 41.25 |
| 29 | 31.25 |
| 28 | 16.25 |
| 27 | 3.75 |

As mentioned, norms in the form of percentile ranks are given in the tables for each age group respectively.

This clearly shows that the total number of correct responses increases with age. For example, to obtain the percentile rank of 98.25 a 3-4 year old child needs to score only 29, but a child between 4-5 years should have higher score of 32.

Thus by using this table, one can compare the child's score with the cut off score specified by chronological age and this indicates whether the child's vocabulary is appropriate for his/her age or not.

A percentile rank of 50 and above is considered as normal. A child who scores 50 is placed at average level and above 50 is at above average level. If the child scores below 50, he is

placed at below average level and such children need to be evaluated in depth.

Thus this test would serve as a screening test in identifying language disordered children who are deficient in vocabulary development.

**Overall performance of the group:**

The present study supports the hypothesis that the vocabulary development increases with age. This is indicated by the maximum score obtained by the 5-6 year age group.

Overall performance of the three groups is also found to be good. The possible reason for the better performance could be that this test mainly assess the receptive skill which has been consistently reported to be better than expression in child language research.

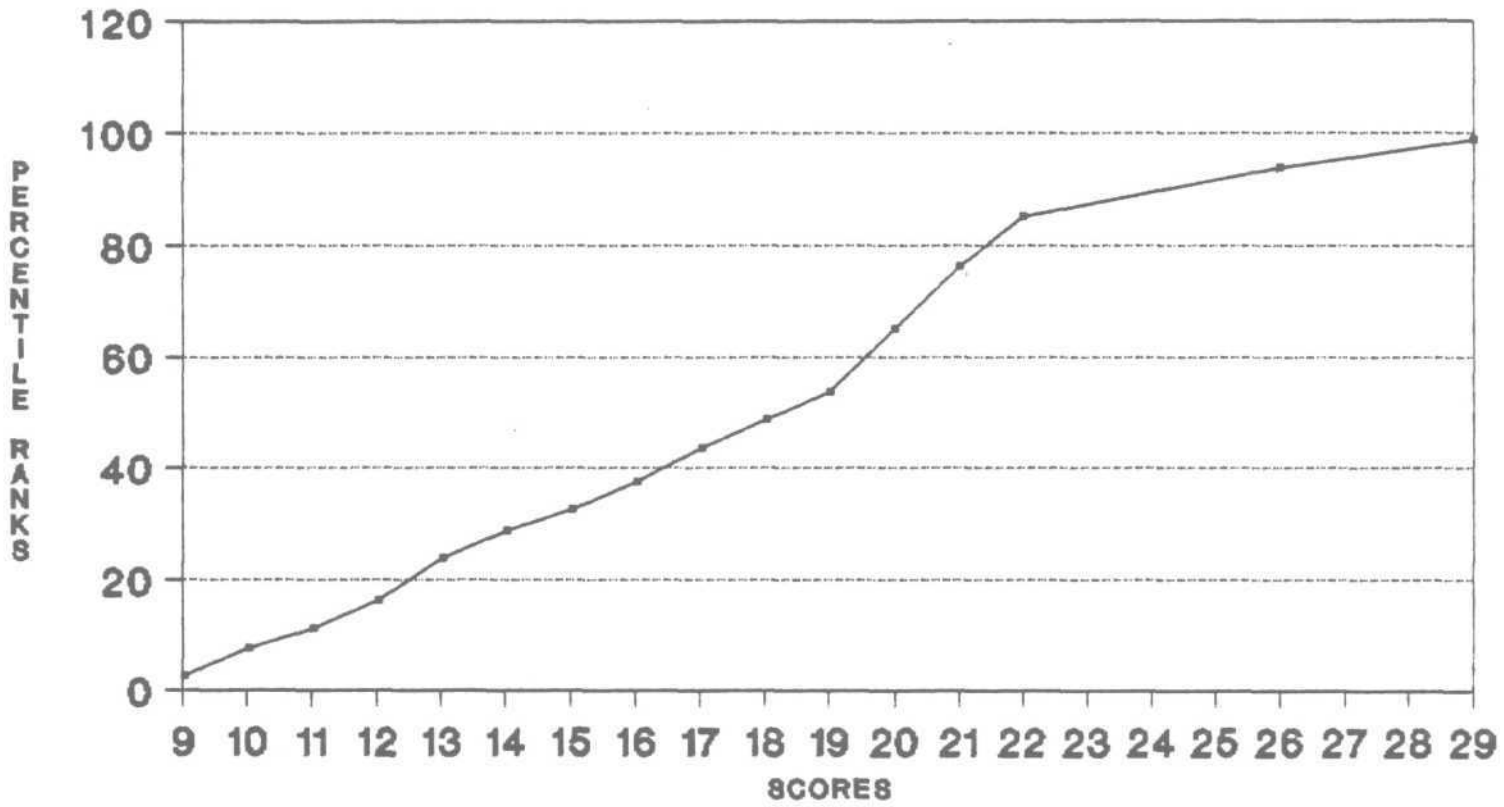
The other reason could be that the subjects are the school going children who already have some amount of exposure to formal language training. This probably made the task easier for them in the present study.

**Performance of males Vs females**:

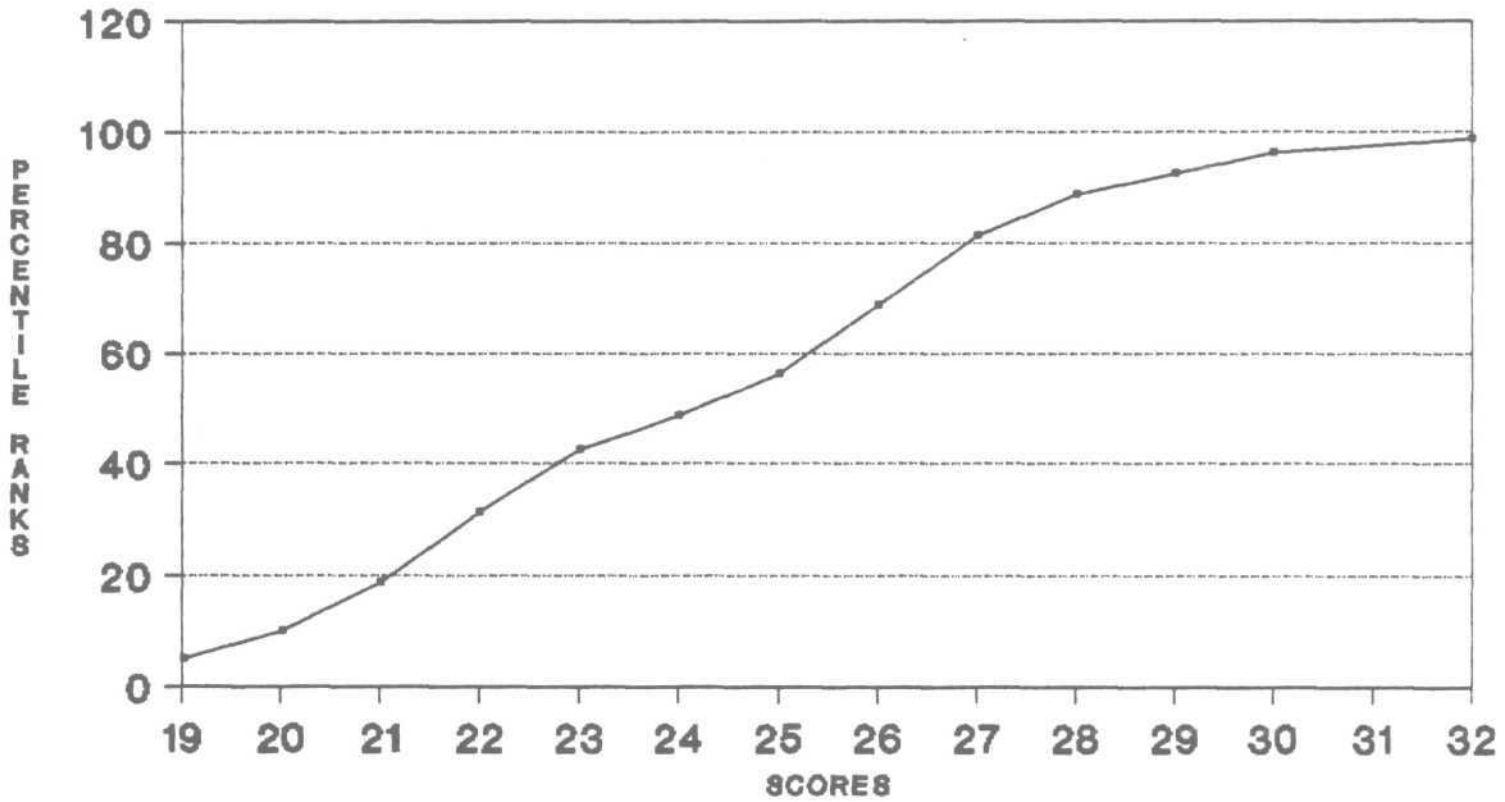
**A** comparison of the performance of male and female children revealed that males have higher mean values than females. This is in correlation with the study carried out by Sreedevi(1989) who constructed a screening picture vocabulary test in Kannada.

But this doesn't support the female superiority indicated with respect to vocabulary development in the literature in that females demonstrate higher number of words than males during any given language acquisition period. The possible explanation for this could be that in Indian families priority is given for male children and female children receive less individual attention in terms of educational aspects. These however need to be further explored.

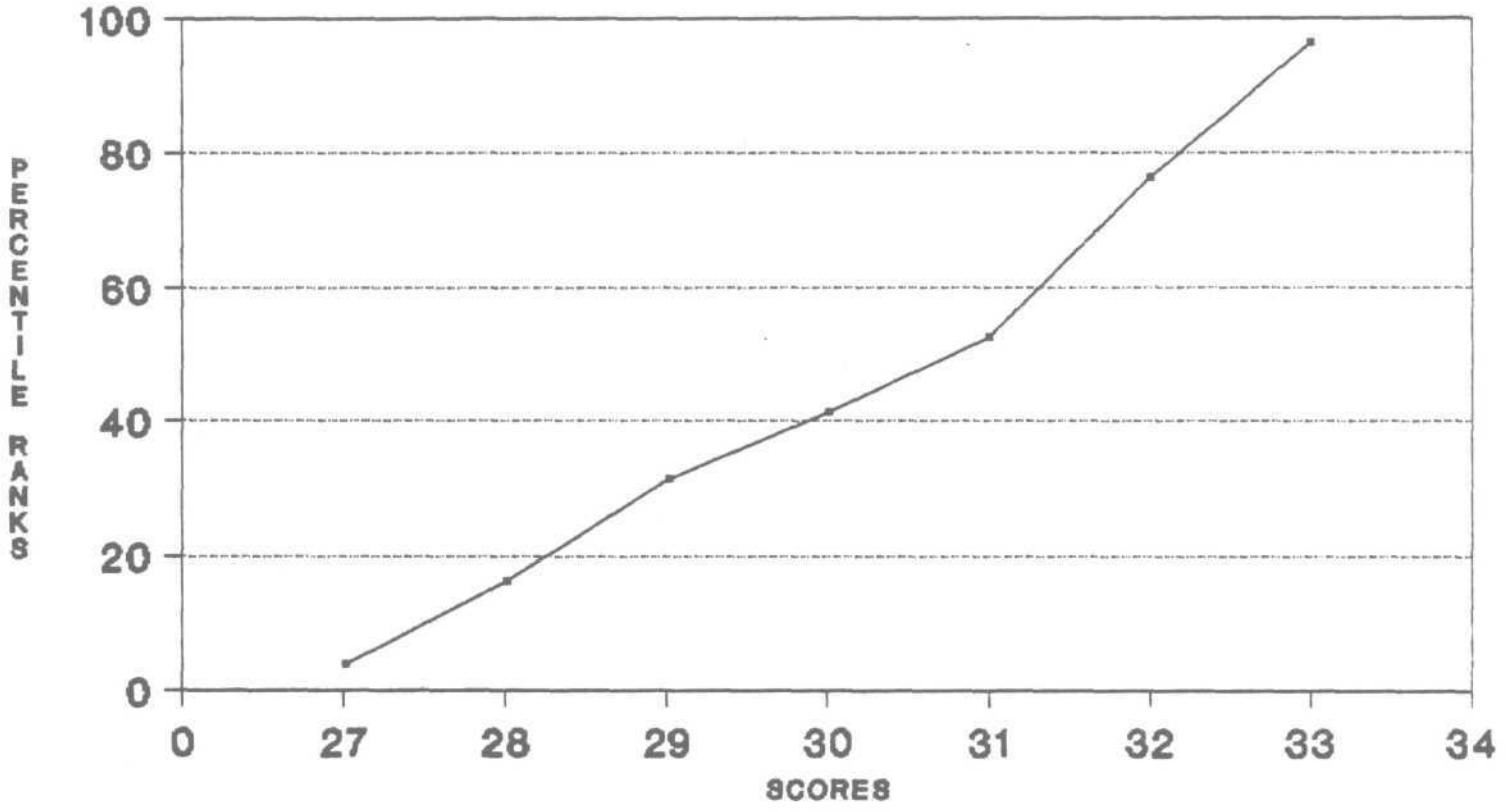
Finally it can be concluded that this test is easy to administer, less time consuming and hence would serve as a effective screening tool to identify children with deficient vocabulary skills in Tamil.




GRAPH-1: SHOWING THE PERFORMANCE OF
3-4 YEAR AGE GROUP




GRAPH-2: SHOWING THE PERFORMANCE OF
4-5 YEARS AGE GROUP




GRAPH-3: SHOWING THE PERFORMANCE OF
5-6 YEARS AGE GROUP

## SUMMARY AND CONCLUSION

The aim of the present study was to construct a screening picture vocabulary test in Tamil. The main purpose of the test is to identify the children who lack adequate vocabulary development and to screen the vocabulary age of the language disordered children.

Initially a pilot study was conducted on 3-6 years Tamil speaking children at Neyveli to determine the number of words that the children could comprehend. For this purpose a pictorial glossary book (CIIL Publications, Mysore) which consists of picturable words from different semantic domains was used. Totally 200 words were selected and based on the percentage of response a vocabulary list was formulated. From this finally 33 words which were picturable, discriminative and unambiguous were selected.

Thus the test material consists of 33 picture plates with each plate containing 4 black and white line drawings. Among the 4 pictures one is target picture and the other 3 are distractors. These 33 plates are arranged in an order of increasing difficulty.

This test was mainly a comprehension test and the response expected was pointing to the pictures requested for.

The test was standardized on 120 normal school going children with medium of instruction Tamil, at Neyveli. The children were between the age group of 3-6 years. Three groups

of 3-4, 4-5 & 5-6 years age range were made and 40 children were tested in each group among which 20 were boys and other 20 were girls.

The responses were recorded and data was subjected to statistical analysis.

Two types of scores were derived:

(1) Mean and Standard deviation were computed.

(2) Raw scores were converted to percentile ranks.

These values were tabulated for each age group respectively. Graphs were also drawn which depicted that vocabulary scores increased as a function of age.

By looking into the normative data one can determine the level of vocabulary development of any child and place him/her in any of the three levels average, below average or above average. It is also possible to compare the performance of one child with the others using this data.

To conclude as only limited number of lexical-semantic tools are available in Tamil language, this test would be an useful screening tool for speech and language pathologist to identify children with language impairment specifically those with auditory comprehension deficits, naming deficits and deficits in vocabulary skills etc.

This test however is not a sole ground for making diagnosis of any language disorders. A Battery of Tests must be used

alongwith this and profile of child's language functions across different areas must be obtained to arrive at a diagnosis.

**Limitations of the study:**

(1) It is only a screening test and does not help in differential diagnosis of different language disorders.

(2) It can be used only on Tamil speaking children.

(3) Age range is limited.

(4) Children only from urban area were taken for the study.

**Recommendations for further research:**

**(1)** Same test can be further continued with age group extended.

(2) This test can be used to develop a comprehensive diagnostic test in Tamil, by including more number of items on comprehension task and including other parts of grammar to assess expressive vocabulary.

(3) A further study can be taken up to standardize this on rural population also.

(4) The efficiency and validity of the test can be confirmed by administering it to large groups of Tamil speaking language impaired children in clinical set ups.

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# APPENDIX

## A. WORD LIST

# TAMIL WORD LIST IN IPA

1. valaijʌl - Bangle.
2. pʌlli - Lizard.
3. veŋgə:jʌm - Onion.
4. tʃʌkkʌrʌm - Wheel.
5. inji - Ginger.
6. ərivə:ḷmʌṇai - Vegetable Cutter.
7. nʌṇḍu - Crab.
8. mi:sai - Moushtache.
9. iḍli - Rice cookies.
10. tuḍʌpʌm - Broom.
11. kokku - Crane.
12. veṭrilai - Pan leaf.
13. sʌŋgi - Conch
14. kombi - Horn.
15. tʌra:su - Balance.
16. sʌlʌŋgai - Anklets.
17. kiḷai - Branch.
18. to:l - Shoulder.



P.T.O

contd.....

19. sutiʃʌl - Hammer.

20. nʌḍṭ - To plant.

21. ve:li - Fence.

22. rʌmbʌm - Saw.

23. meɻuguvʌrti - Candle.

24. nʌṭṭʃʌtirʌm - Star.

25. mudʌlai - Crocodile.

26. pa:mba:ṭi - Snake Charmer.

27. ja:ḍi - Jar.

28. mʌlai - Mountain.

29. ja:keṭ - Blouse.

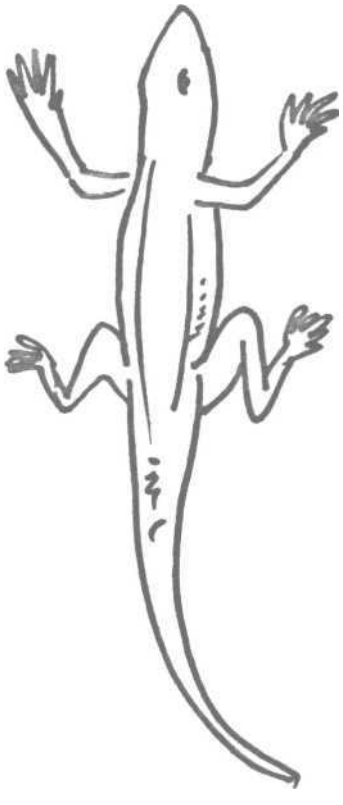
30. koma:ḷi - Bafoon.

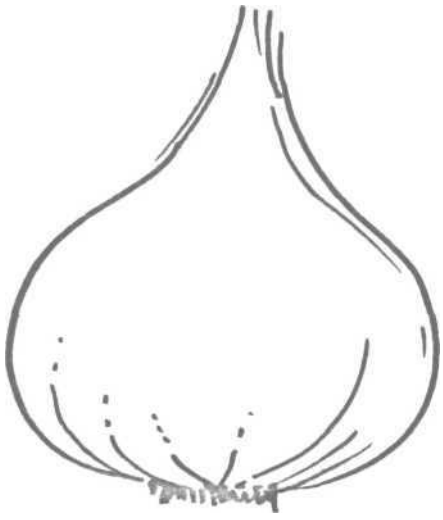
31. vʌṭijidu - Over flowing

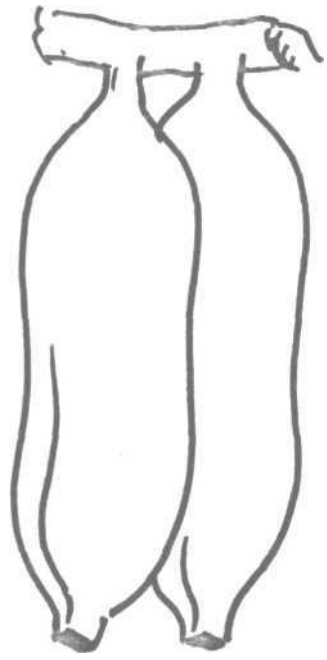
32. puruvʌm - Eye brow.

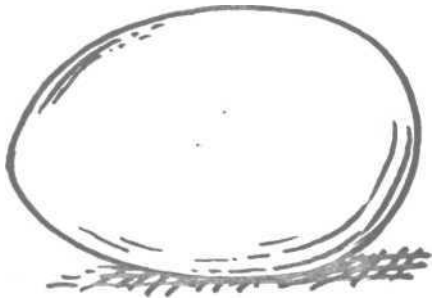
33. irngt - feather.

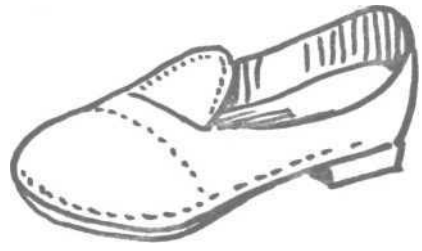
# B. TEST MATERIAL

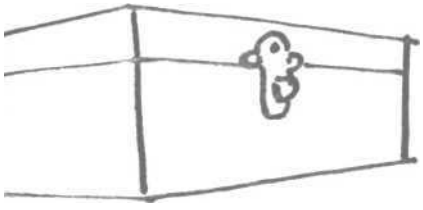


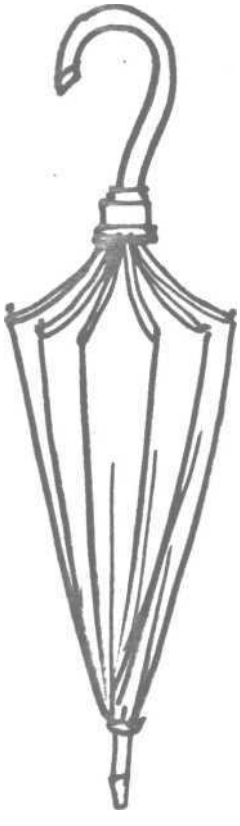


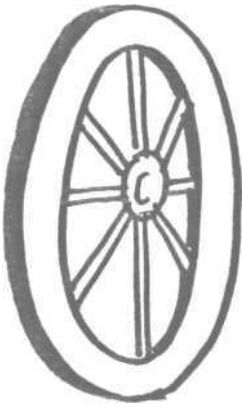


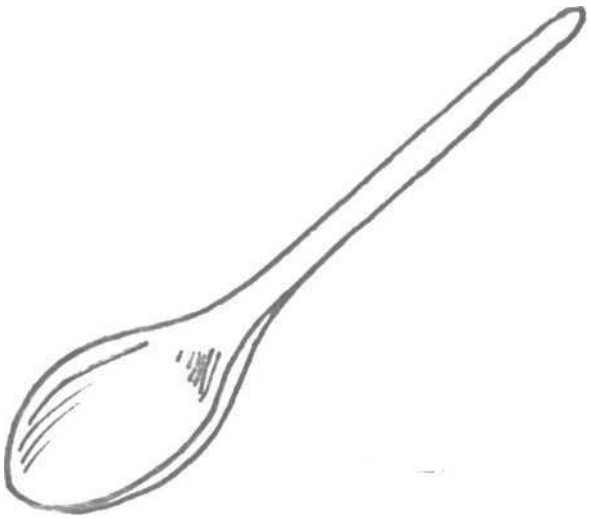


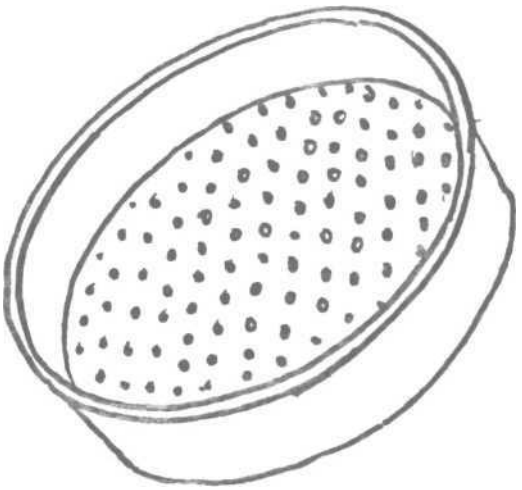


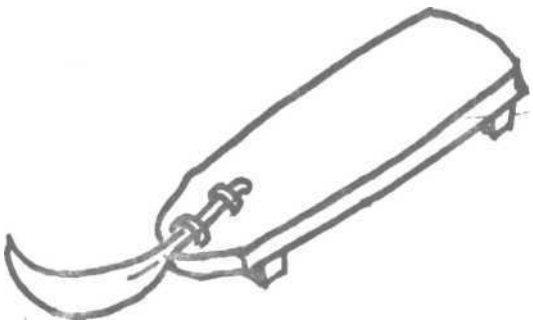


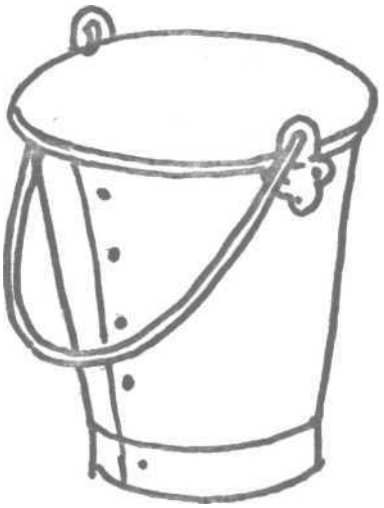


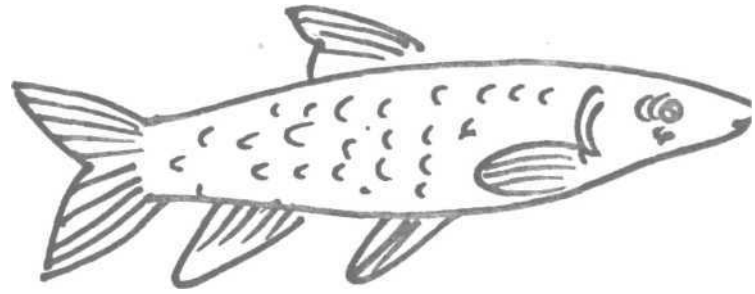












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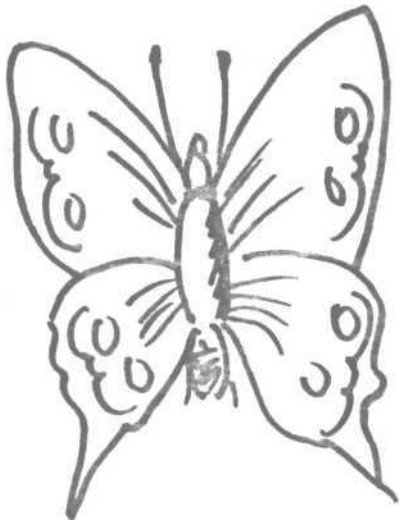

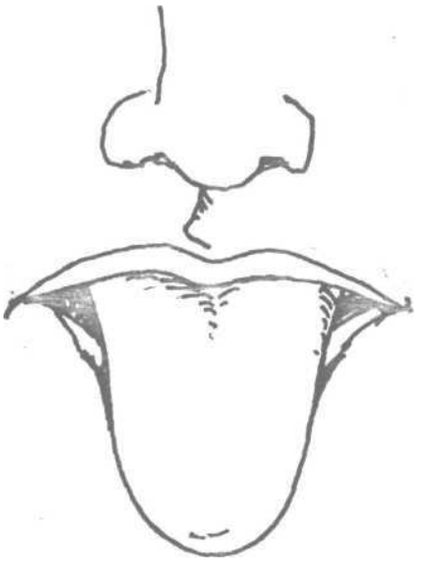

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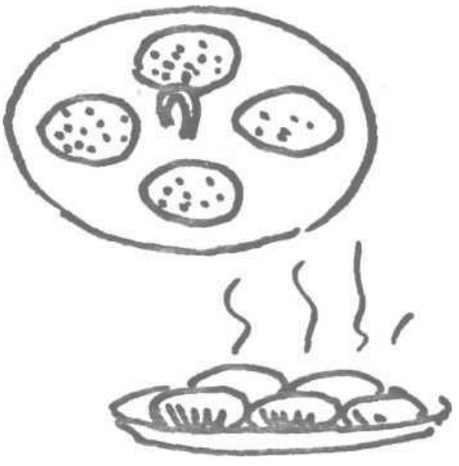

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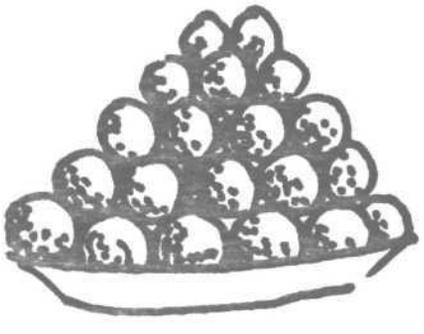

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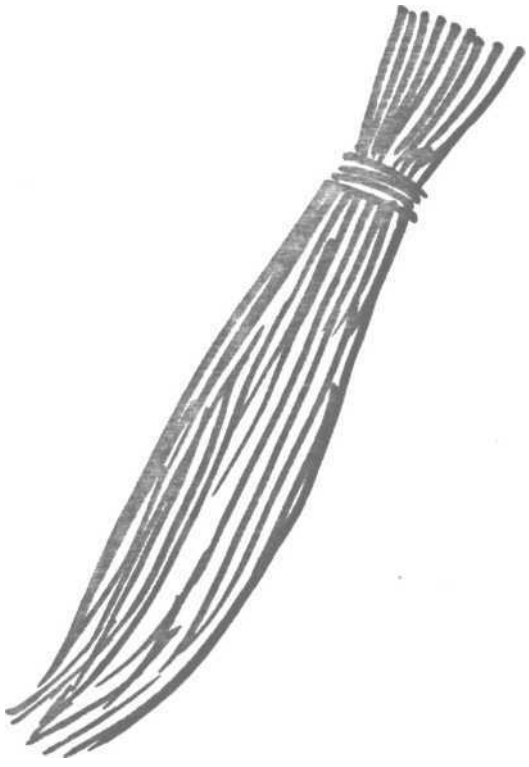

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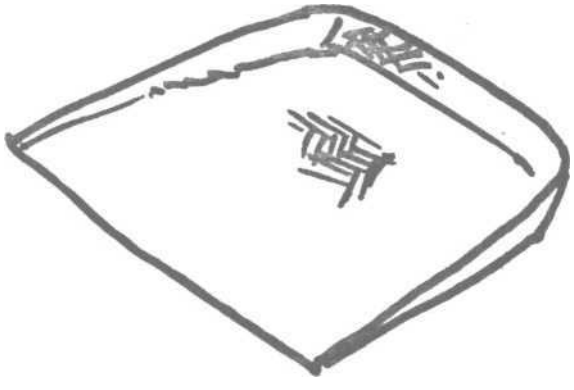

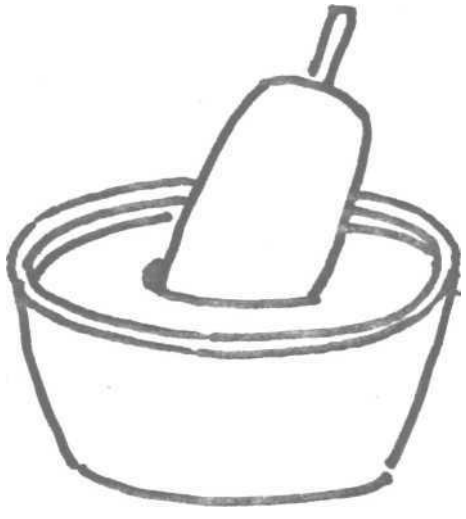

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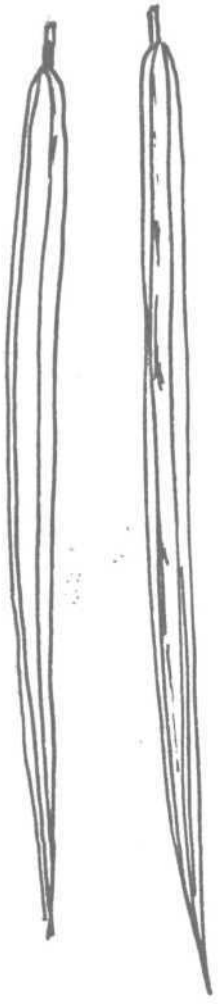

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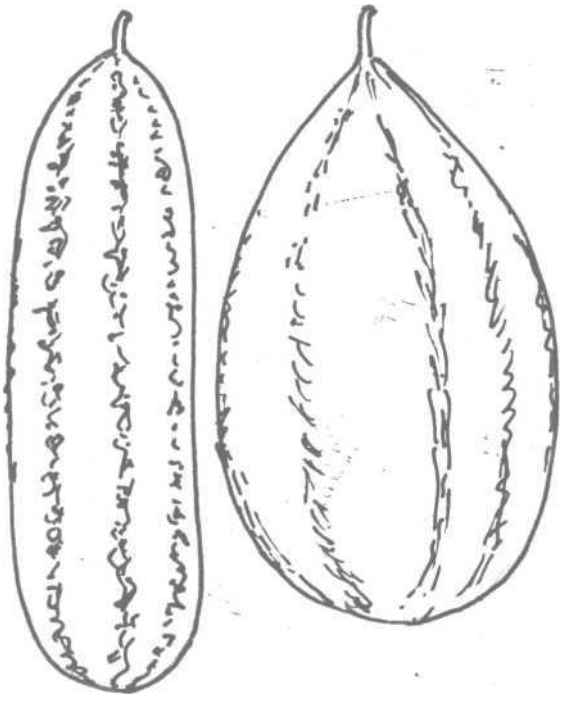

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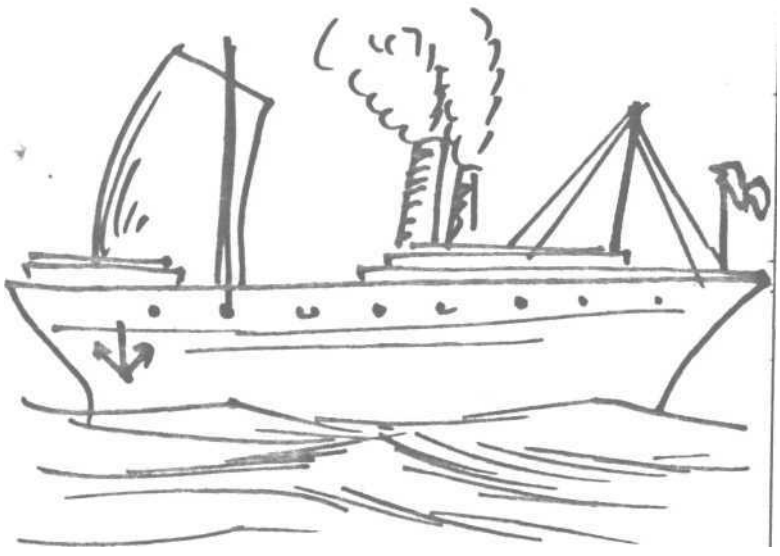

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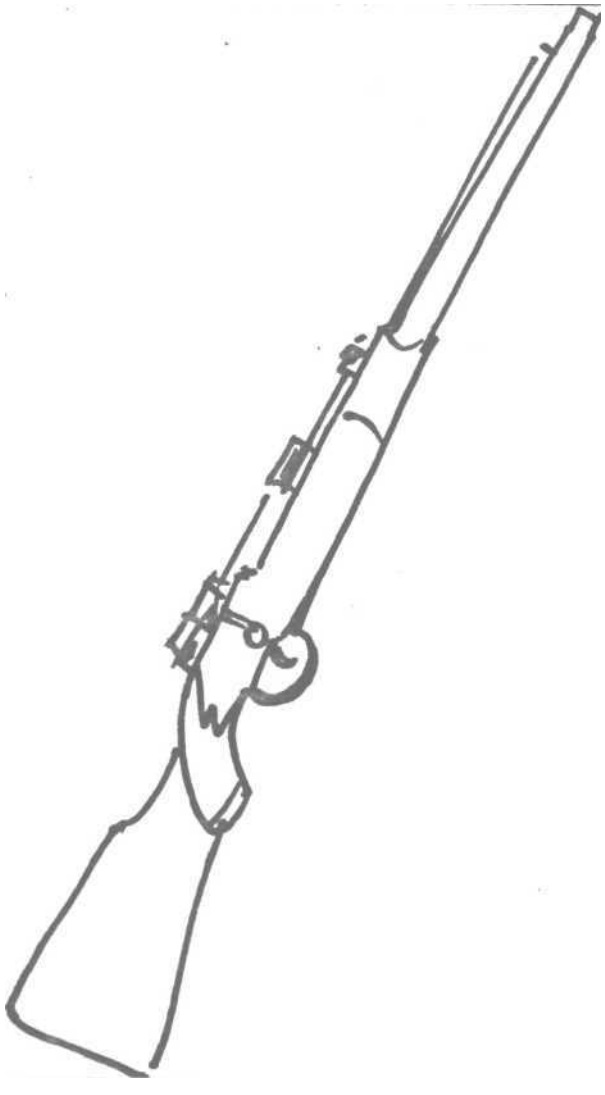

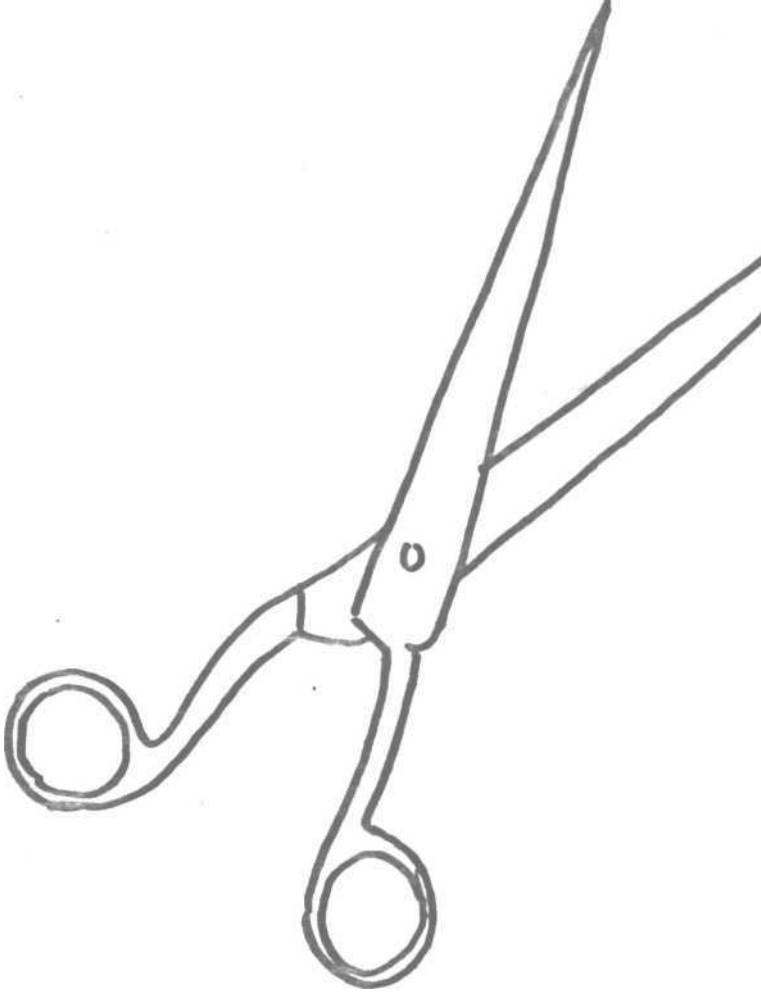

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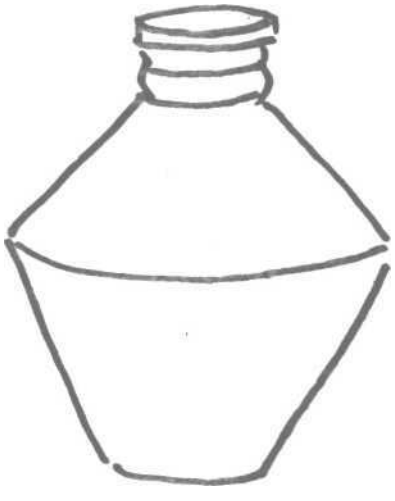

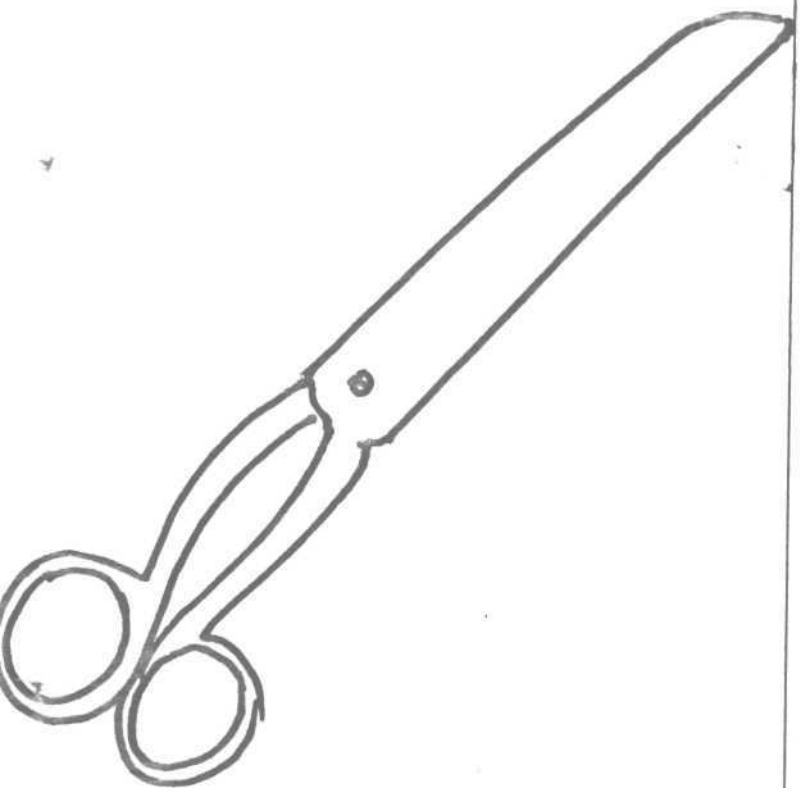

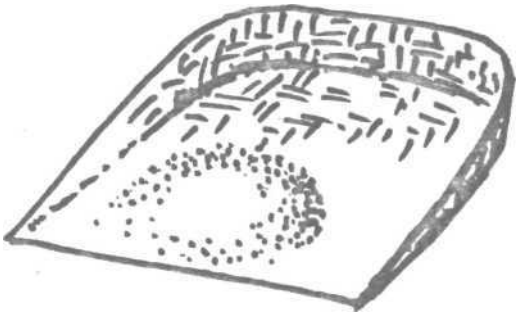

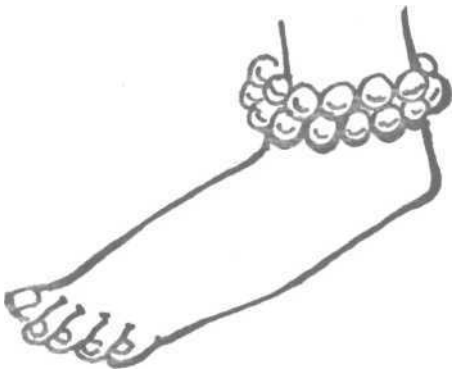

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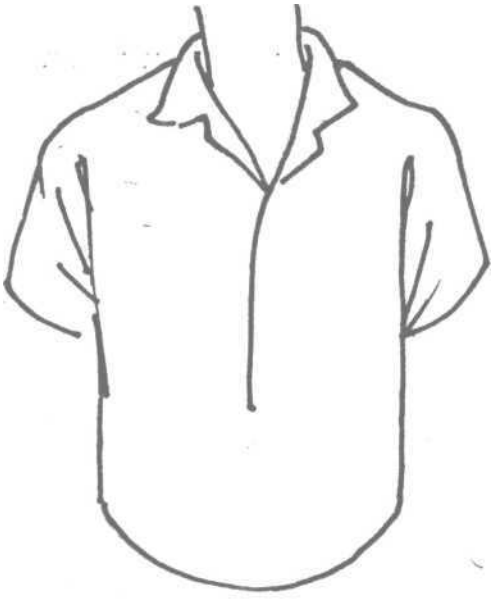

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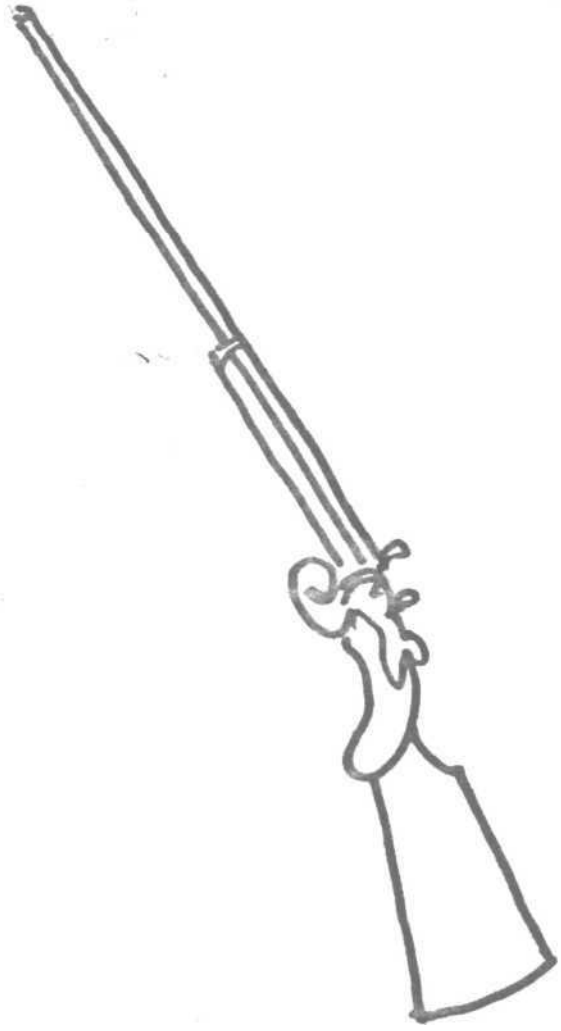

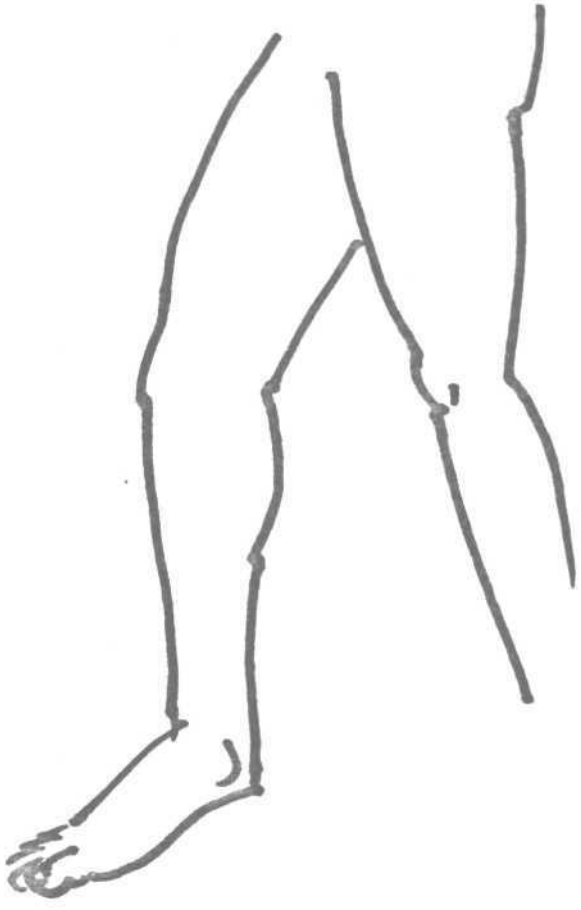

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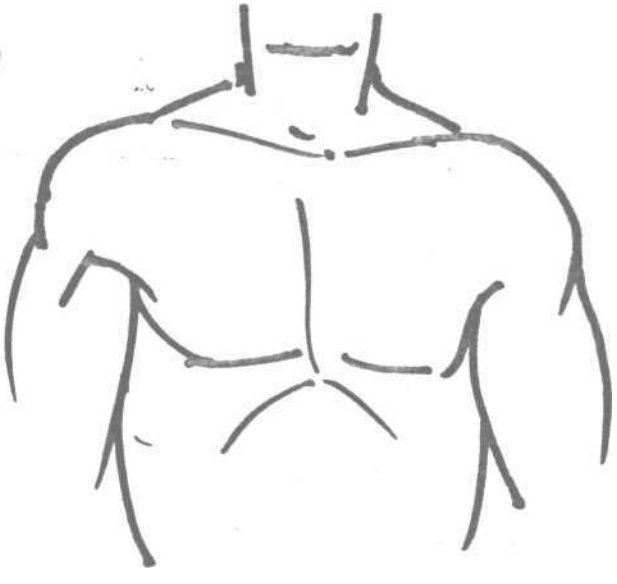

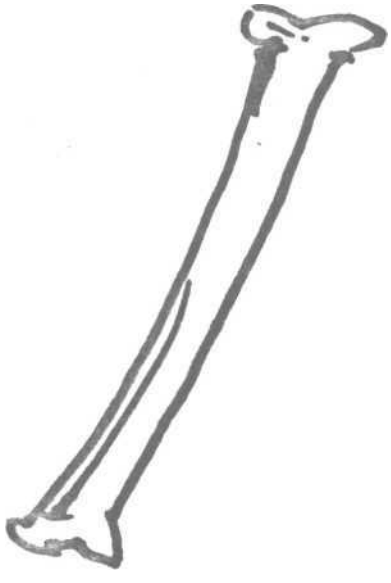



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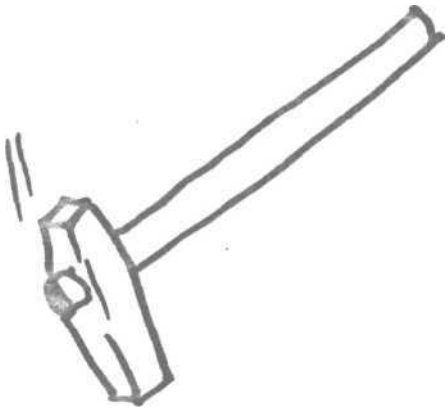

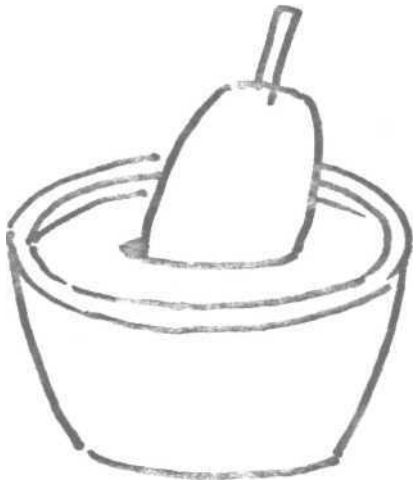

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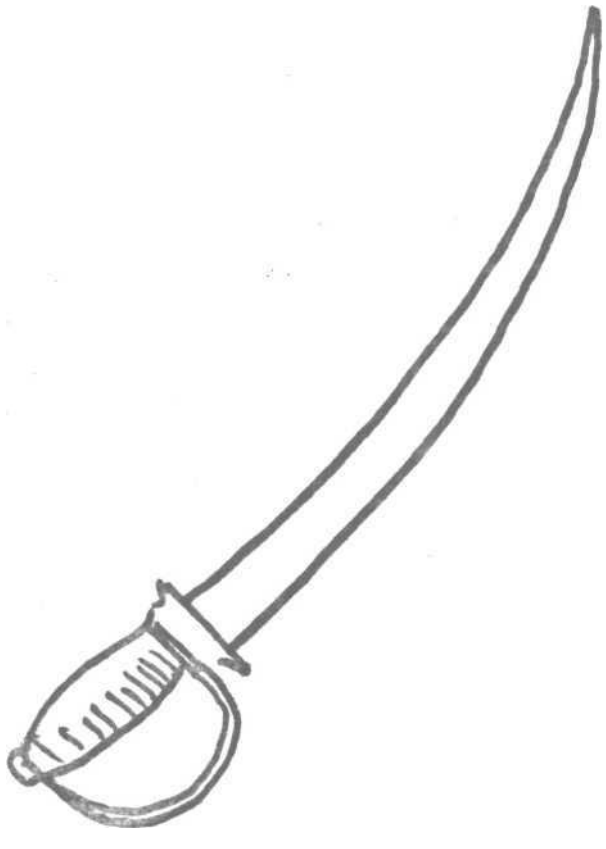

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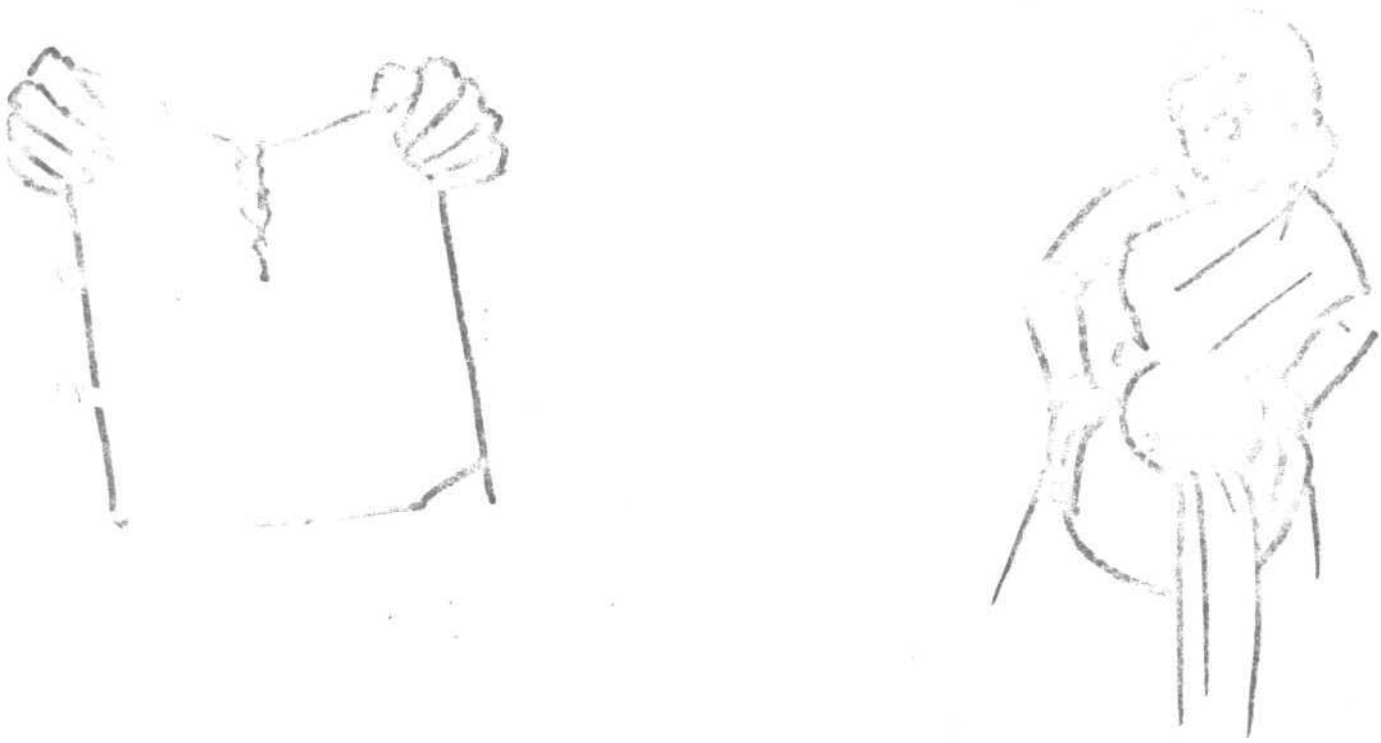

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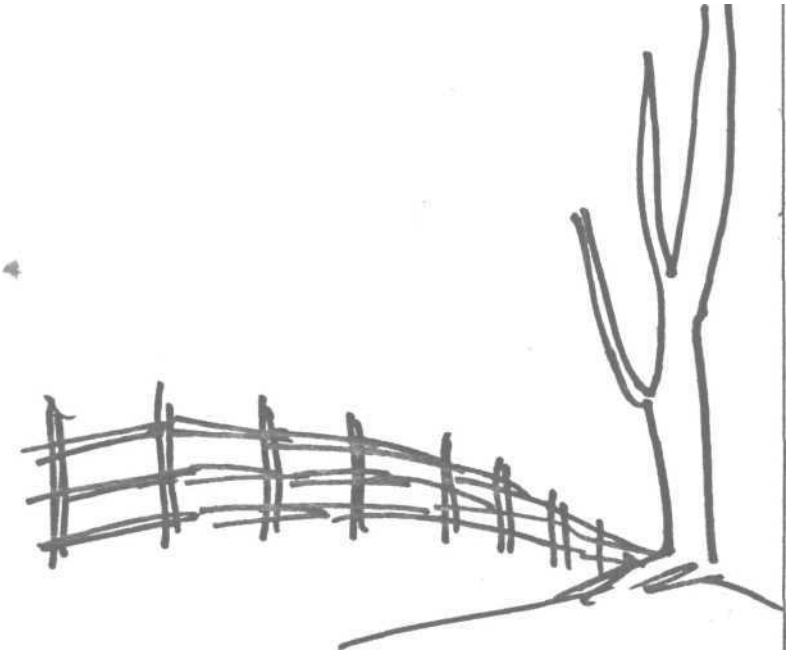

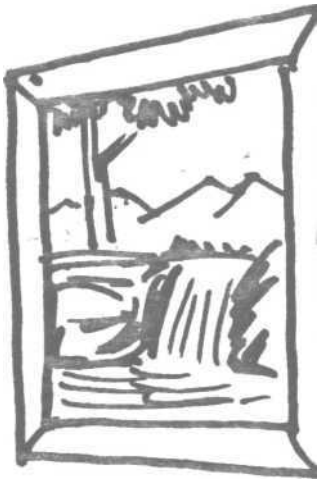

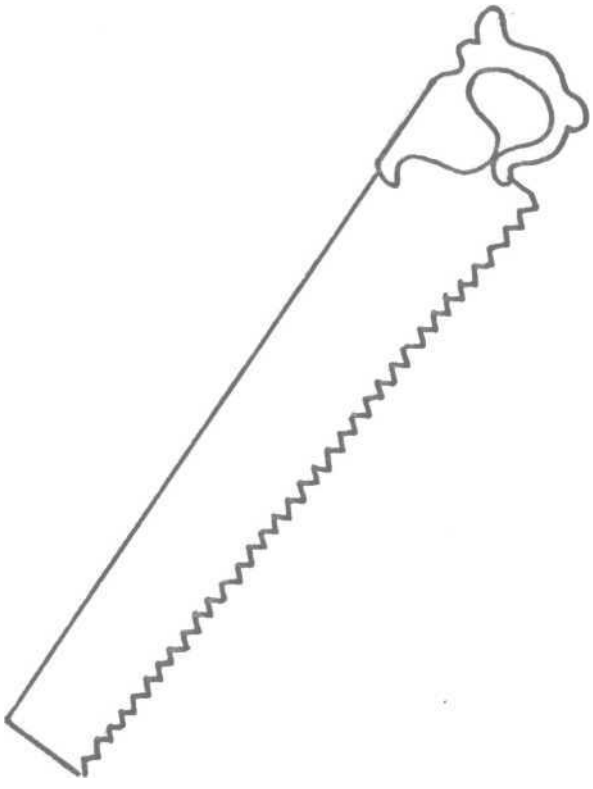

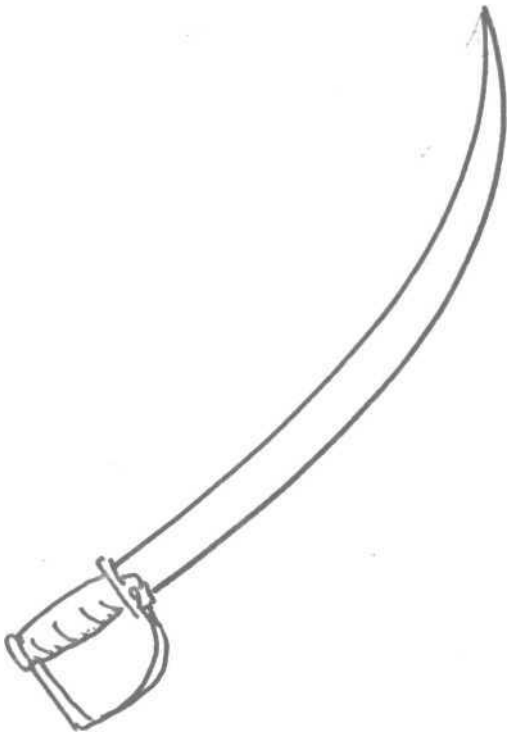

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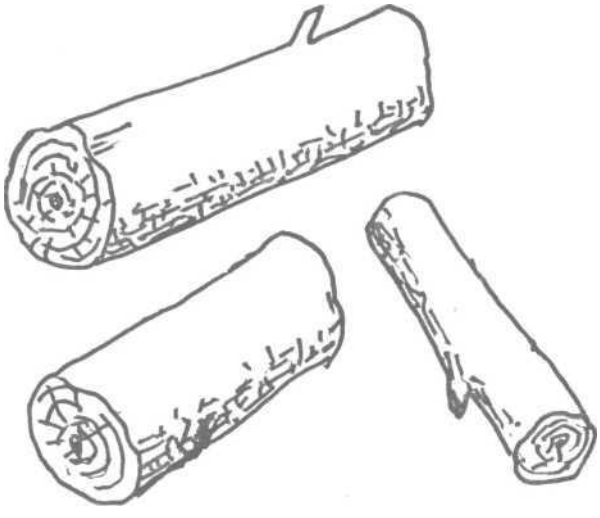

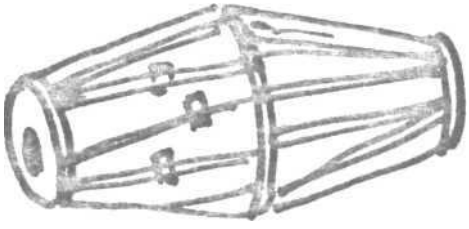

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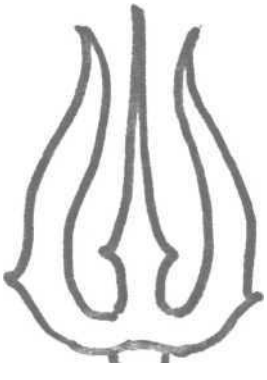

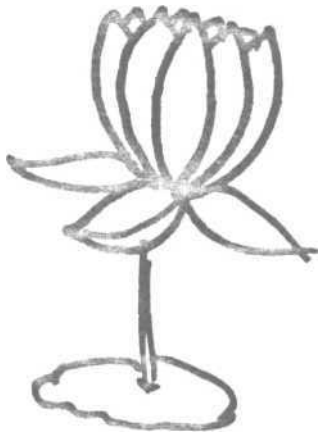

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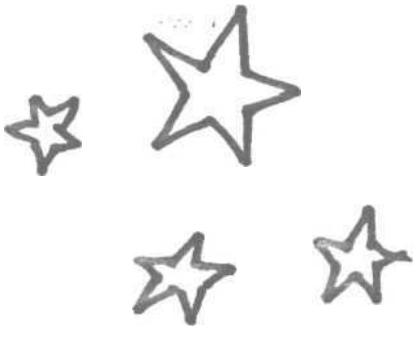

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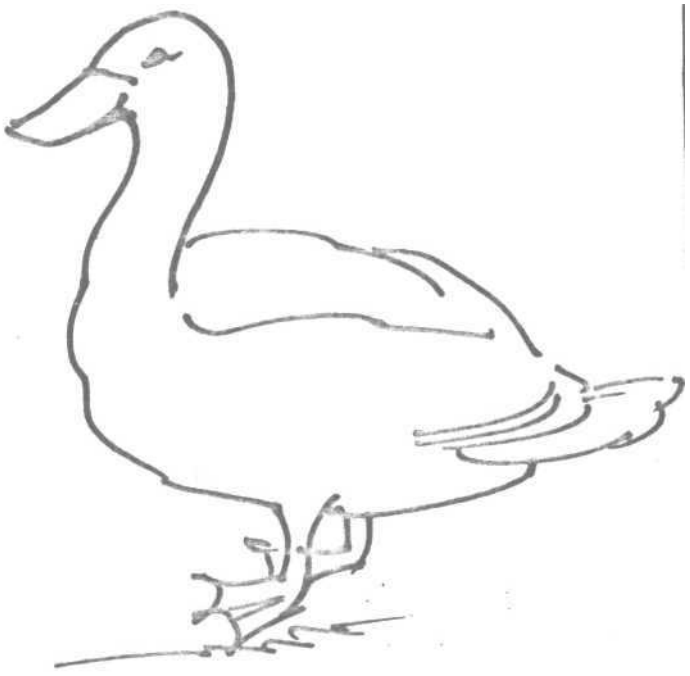

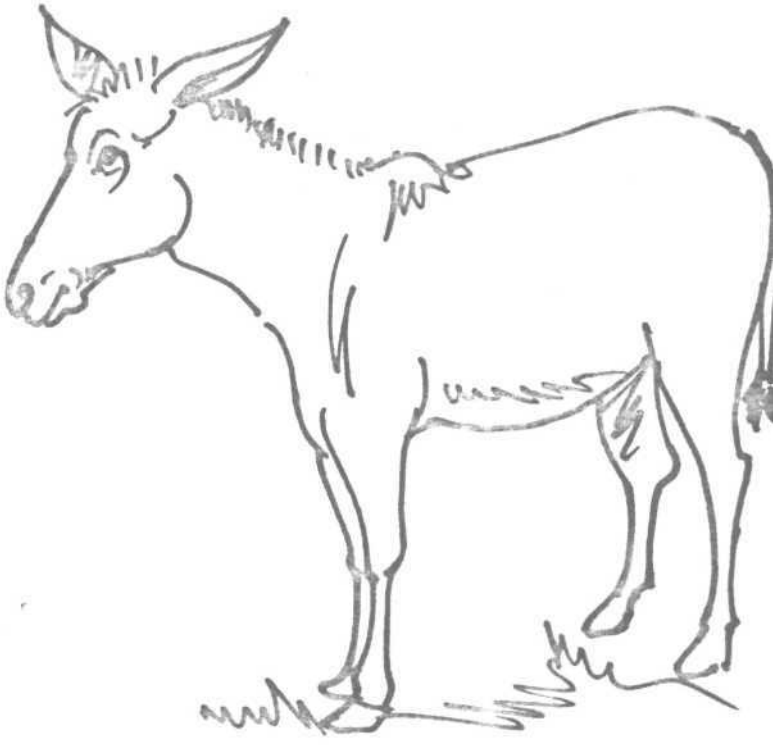

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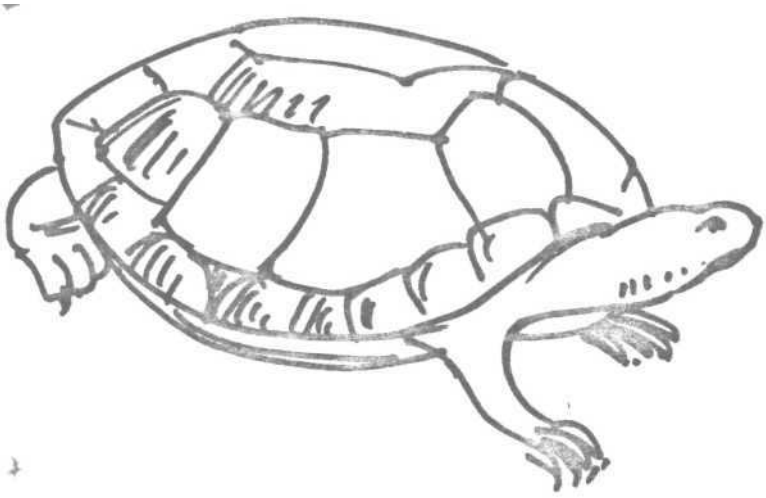

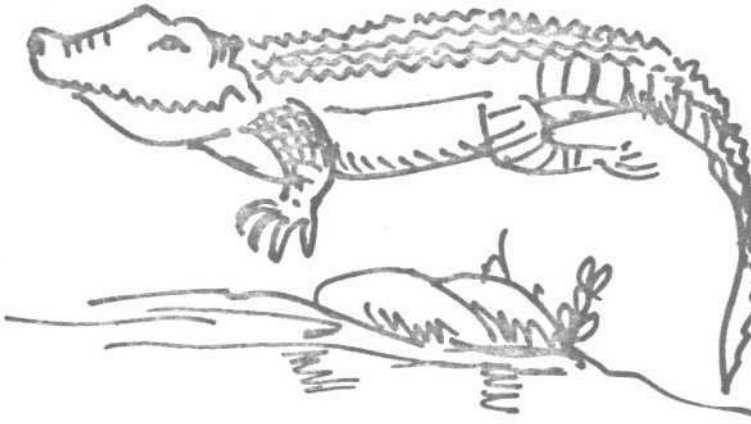

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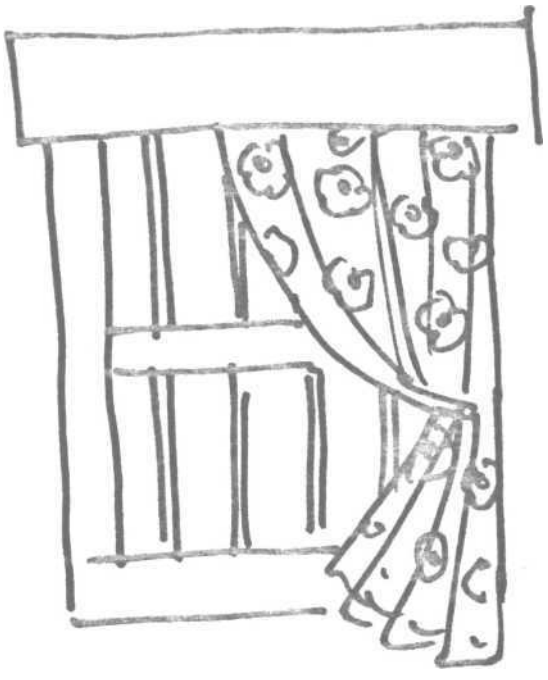

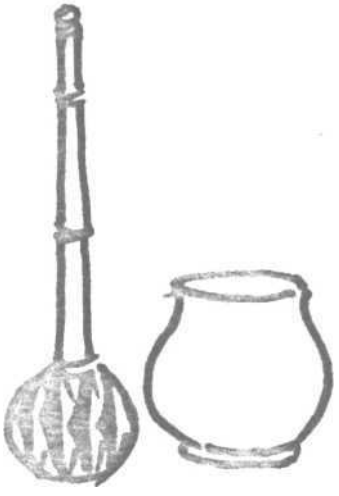

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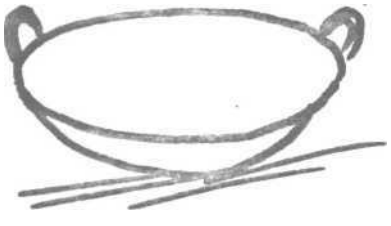

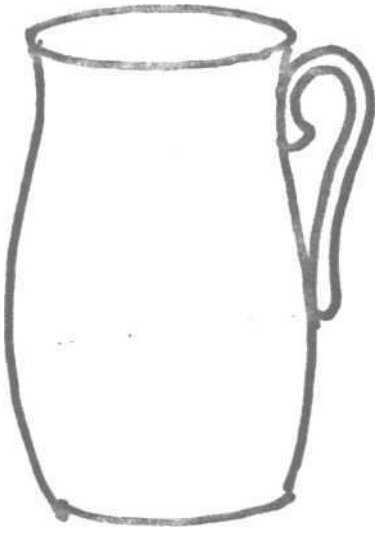

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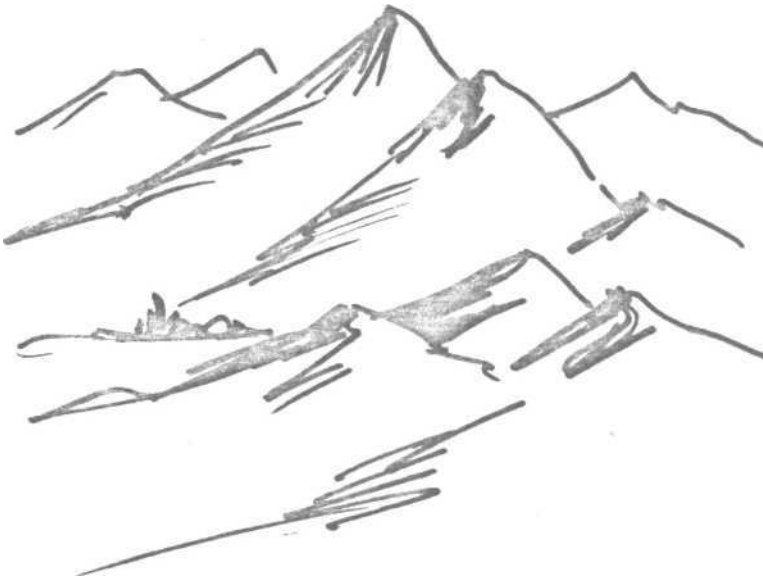

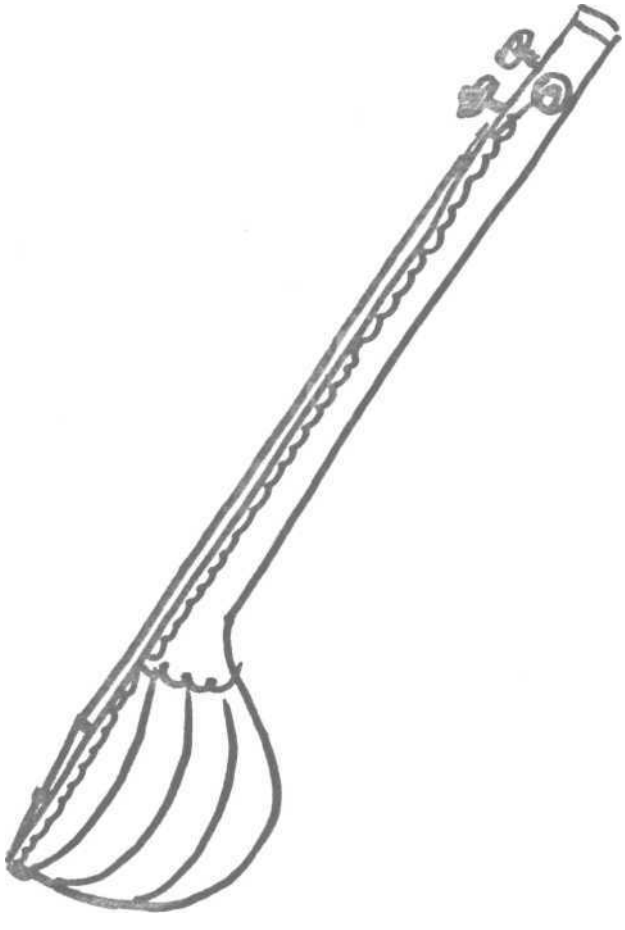

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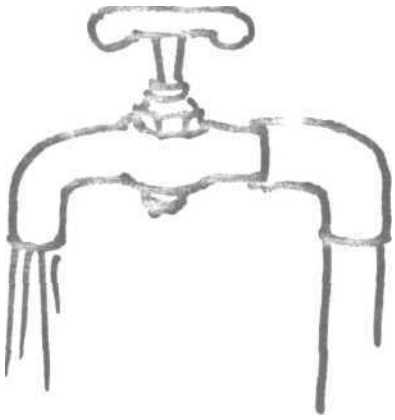

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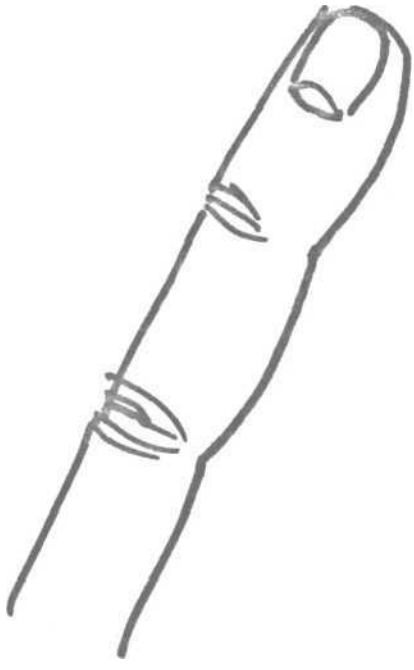

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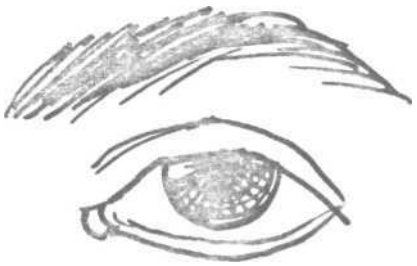

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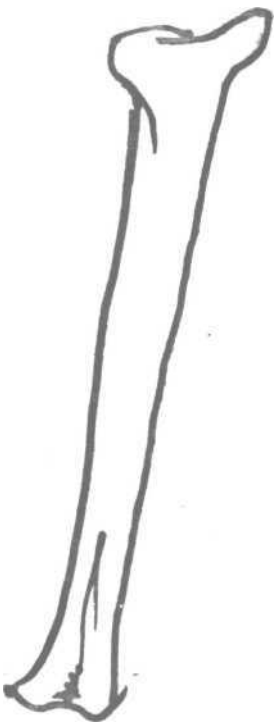

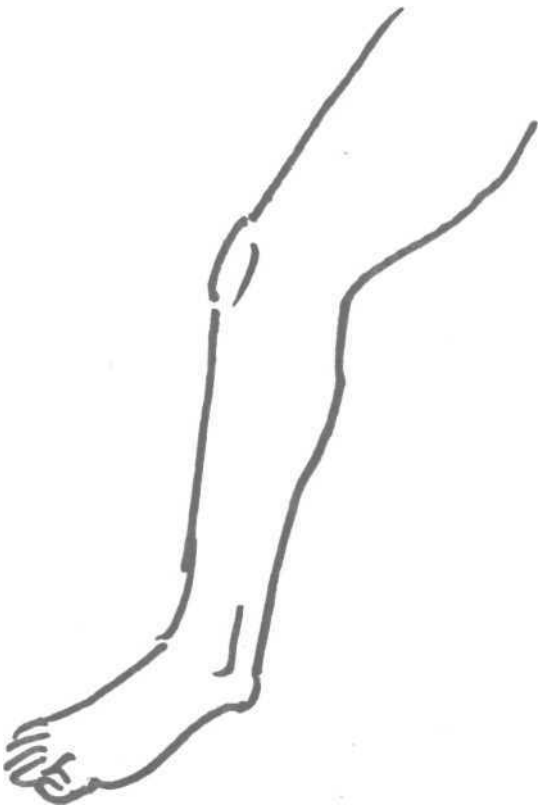

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