

Principles of Nomenclature And of Classification of Speech And Voice Disorders

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CLASSIFICATION is a logical process which consists in the assemblage under a common name of a number of objects, plants, diseases, etc., which are alike in one or more respects. In any correct classification the definition of any group must hold precisely true of each and every member of that group, and must not hold true of the members of any other group.

Although common to all the special sciences and to knowledge in general, classification is probably most important and most highly developed in botany, in which relationships need to be systematically shown between more than 125,000 different species of plants. Linnaeus (1707-78) put the study of the classification of plants

and animals upon its modern basis. A brief study of his international systematic classification of plants, which has successfully stood the test of two centuries, should give invaluable suggestions for classifying speech and voice disorders.

The plant kingdom is divided into two great fundamental groups called phyla: Cryptogamia (spore-bearing plants) and Phanerogamia (seed-bearing plants). The latter is now called Spermatophyta.

Cryptogamia are divided into three sub-phyla: Thallophyta (algae and fungi), Bryophyta (liverworts and mosses), and Pteridophyta (ferns, horsetails, and club mosses), all of which are spore-bearing plants, but each of which manifests certain characteristics which are not possessed by any other one of these sub-phyla.

The phylum Spermatophyta is divided into two great classes: Gymnospermae (having seeds born naked on the scales of cones) and Angiospermae (having seeds born inclosed in seed cases, pods, or other types of fruit).

Angiospermae are further divided into two large sub-classes: Monocotyledoneae (including grasses, palms, lilies, and orchids) having a single seed leaf, and Dicotyledoneae, most flowering plants having two seed leaves.

Dicotyledoneae are divided into 38 orders, each of which bears seeds with two seed leaves enclosed in pods or other types of fruit, yet each of these orders differs in certain characteristic ways from all the other orders.

* Rewritten from a paper presented to the American Society for the Study of Disorders of Speech (now the A.S.C.A.) about 1929, when the classification of speech and voice disorders, published in 1931 in the first edition of *A Dictionary of Terms Dealing with Disorders of Speech*, was officially adopted by the Society. Professor Robbins is chairman of the Association's Nomenclature Committee. He is Professor of Psychology, Emerson College, Boston, and Speech Correctionist for the Massachusetts Division of Mental Hygiene.

A revised and enlarged edition of the *Dictionary* is scheduled for publication in September 1947. All definitions have been rewritten, lengthened, and clarified, and a few minor revisions in classification have been made in order to make monomial nomenclature adequate for all speech disorders except those which have been named as a result of very elaborate technical studies. Many new terms have been added and the number of pages has been tripled.

Ranunculales, a typical representative of one of these 38 orders, is divided into 16 families which differ in certain characteristic ways from each other, although all manifest the common characteristics of the order Ranunculales.

Ranunculaceae, a typical representative of one of these 16 families, is divided into 35 genera which differ in certain ways from each other, although all manifest the common characteristics of the family Ranunculaceae.

Ranunculus, a typical genus of the family Ranunculaceae, is further divided into between 200 and 250 species, each of which is designated by a two-word name which begins with the name of its genus, *Ranunculus*, and ends with a technical term which describes a major characteristic that is not possessed by any other species in the genus *Ranunculus*. Hence the term, 'binomial nomenclature.' Thus is traced the derivation of the name of *Ranunculus bulbosus*, our common, bulb-rooted buttercup.

The abridged classification of plants

which follows shows in condensed form the relationships described above.

Nomenclature is the system of names used in the classification of any branch of science.

A study of the preceding abridged classification of plants shows that the names of all phyla end with the suffix *gamia*, from the Greek word *gamos*, meaning marriage; that the names of all sub-phyla end with the suffix *phyta*, from the Greek word *phyton*, meaning a plant; that the names of most classes end with *ae*, and of most sub-classes with *eae*; that the names of all orders end with the Latin suffix *ales*, denoting belonging to; that the names of all families end with the suffix *aceae*, from the Latin suffix *aceus*, meaning belonging to; and that the binomial technical name of each species begins with the name of its genus. Many botanical technical terms begin with a descriptive prefix. For example, the different classes of algae begin with a Greek prefix which describes their color.

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- I. Cryptogamia (spore-bearing plants)
 - (I) Thallophyta (algae and fungi)
 - A. Cyanophyceae (blue-green algae)
 - B. Chlorophyceae (green algae)
 - C. Phaeophyceae (brown algae)
 - D. Rhodophyceae (red algae)
 - and five classes of fungi.
 - (II) Bryophyta (liverworts and mosses) containing 2 classes
 - (III) Pteridophyta (ferns, horsetails, club mosses) containing 3 classes
 - II. Phanerogamia (seed-bearing plants)
 - (I) Spermatophyta (seed-bearing plants)
 - A. Gymnospermae (seeds born naked on scales of cones) no classes
 - B. Angiospermae (seeds born enclosed in seed cases, pods, etc.)
 - (A) Monocotyledoneae (having a single seed leaf) containing 11 orders, 36 families, and approximately 20,000 species
 - (B) Dicotyledoneae (having two seed leaves) containing 38 orders, 175 families, and over 100,000 species
 - 1. Ranunculales, a typical order of Dicotyledoneae
 - (1) Ranunculaceae, a typical family of Ranunculales
 - a. *Ranunculus*, a typical genus of Ranunculaceae
 - (a) *Ranunculus bulbosus*, a typical species of *Ranunculus*
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INITIAL PROCEDURES IN CLASSIFYING
SPEECH AND VOICE DISORDERS

Before a systematic international classification of speech and voice disorders is undertaken, three important policies must be adopted: 1. It must be decided whether the classification is to be strictly causal, strictly descriptive, or a combination of both. 2. It must be agreed whether technical terms shall be monomial or binomial. 3. It must be determined whether technical terms shall be derived from the Greek, from the Latin, or from both languages.

The disadvantages of a solely descriptive classification of speech disorders are manifest in Dr. Mardel Ogilvie's *Terminology and Definitions of Speech Defects* (3). On page 95 of that publication such widely different disorders as alalia, aphemia, atonic aphonia, dumbness, lack or loss of speech, and loss of voice are all listed as synonyms of mutism because all manifest loss of speech. Likewise, on pages 182-3, alalia, aphemia, asemasia, asymbolia, dysphrasia, logoplegia, and hearing mutism are listed as synonyms of aphasia. As therapy often depends largely upon the cause of a given speech disorder, the Nomenclature Committee built its system of classification as far as possible upon a causal basis. Each monomial technical term, and the first member of each binomial technical term, is therefore made to end with a root word which states the cause of the speech defect, and the second word of all binomial technical terms is made to state the cause in still greater detail.

As the number of speech and voice disorders is very small compared with the number of plants, as a majority of well established technical terms for speech and voice disorders are monomial, and as an overwhelming majority of speech therapists much prefer short terms, the Committee has used monomial nomenclature whenever possible.

A comparison of such terms as *mutitas physiologica*, *surdo-mutitas*, *mutitas prolongata* and *mutitas idiota*, all derived from the Latin, with the corresponding terms *alalia*, *aneneia*, *atelolalia* and *alogia*, derived from the Greek, shows the value of deriving words from the Greek rather than from the Latin. Moreover, a large majority of well established technical terms for speech and voice disorders are derived from the Greek. Although Latin has proved satisfactory as the basis for botanical nomenclature, Greek unquestionably serves better in speech and voice nomenclature. Good nomenclature never derives a term partly from the Greek and partly from the Latin. As some well established prefixes have different meanings in Latin and in Greek, it avoids confusion to derive all technical speech and voice terms from the single language, Greek.

For these reasons the Nomenclature Committee decided that a systematic international classification of disorders of speech and voice should consist as far as possible of monomial technical terms derived from the Greek, and should be primarily causal rather than descriptive.

The Committee recommends, furthermore, that all technical terms for speech and voice disorders shall begin with a descriptive prefix which depicts the most outstanding symptom of the disorder, and shall end with a root word which states the cause of the disorder. Thus every technical term both describes the speech or voice disorder and states its cause.

Fortunately the Greek language is rich in words which refer to speech and voice. It furnishes nine different words meaning speech and nine different words meaning voice; and this number coincides with nine recognized major causes of speech and voice disorders. Accordingly, under the Greek root word *lalia* have been grouped all speech defects due to functional causes; under the Greek root word

eneia have been grouped all speech disorders caused by impaired hearing; and under the Greek root word *phonia* have been grouped all voice defects due to functional causes. In like manner the Committee has classified all speech and voice disorders, associating each recognized major cause with one Greek root word meaning speech and with one Greek root word meaning voice. The accompanying list shows this classification:

Cause	Speech Disorder Root Word	Voice Disorder Root Word
functional.....	lalia	phonia
anomaly of speech or voice organ.....	glossia	geria*
cortical lesion.....	phasia	iamusia*
deafness.....	eneia*	audia*
disease not included elsewhere.....	phthongia*	laryngopia*
insanity.....	phrasia	boia*
mental deficiency.....	logia	muia*
paralysis.....	arthria	enopia*
psychogenic.....	phemia	omphia*

* Terms marked with an asterisk were coined for the Nomenclature Committee by Dr. G. Oscar Russell (6), not by the writer.

It will be seen that this system obviates the need of a more cumbersome binomial nomenclature, and that it retains well established terms wherever possible.

If a speech therapist desires to state the cause of a speech or voice disorder more precisely than is possible in monomial nomenclature, he may use binomial nomenclature, stating the exact cause in the second word in the form of a Greek adjective, ending uniformly in *-ica*, from the Greek *-ikos*, signifying pertaining to that which the root word denotes. This uniform ending is exactly parallel to the uniform ending, *-ales*, of all orders of plants.

Among other causes of speech and voice disorders which cannot be stated in monomial nomenclature due to lack of Greek words meaning speech and voice are the following, beside which a causal second word suffix is suggested:

imitation, whether conscious or sub- conscious.....	mimetica
lack of unilateral cerebral dominance.....	amphidexica
late maturation of ability to discrim- inate speech sounds.....	phonodiag- nostica
short auditory mem- ory span.....	brachym- nesica
unknown.....	adelica

Beside each of the following structural anomalies which cause dysglossia is listed a corresponding second word suffix, stating the kind of structural anomaly:

absence of teeth.....	anodontica
cleft-palate.....	uranoschismatica
enlargement of tongue.....	macroglottica
hare-lip.....	chiloschismatica
irregular position of teeth.....	ankyodontica
short soft palate.....	brachyuranica
tongue-tie.....	ankyloglottica
under-shot jaw.....	prognathica

Some of the well established Greek descriptive prefixes are as follows:

Enunciation Disorders

a-.....	permanent mutism
asapho-.....	mumbling
atelo-.....	delayed development
brady-.....	abnormally slow
embolo-.....	sound unit additions
idio-.....	invented, individual
leipo-.....	elision
meta-.....	reversals
para-.....	sound substitutions
pedo-.....	infantile, baby-talk
rhino-.....	cleft-palate type
spasmo-.....	spasmodic
tachy-.....	abnormally rapid

Formulation Disorders

cata-.....	repetitious
echo-.....	echo
hyper-.....	too much
hypo-.....	too little
para-.....	word change
poly-.....	too much

Voice Disorders

a-.....	lack of voice
ambly-.....	dull, denasalized
macro-.....	loud
metallo-.....	metallic
micro-.....	weak, soft
oxy-.....	shrill
para-.....	morbid alterations
pneumo-.....	breathy

rhino-.....	nasal
trachy-.....	hoarse
tromo-.....	trembling

These descriptive prefixes of speech and voice disorders correspond exactly with such botanical descriptive prefixes as are found in the four classes of algae:

Cyanophyceae.....	blue green algae
Chlorophyceae.....	light green algae
Phaeophyceae.....	brown algae
Rhodophyceae.....	red algae

To classify speech disorders systematically it is necessary only to designate each class of disorders by placing the Greek prefix *dys-* meaning bad, defective, before each of the nine speech disorder root words listed above as follows:

dyslalia, functional speech defects
dysglossia, disorders due to structural anomalies of speech organs
dysphasia, disorders due to cortical lesions
dyseneia, disorders due to deafness
dysphthongia, disorders due to other illnesses
dysphrasia, disorders due to insanity
dyslogia, disorders due to mental deficiency
dysarthria, disorders due to paralysis
dysphemia, psychogenic disorders

By substituting for the uniform class prefix *dys-*, the following descriptive prefixes which apply to functional speech defects, the following classification of dyslalia results:

atelolalia, delayed speech
asapholalia, mumbled speech
bradylalia, abnormally slow speech
embololalia, addition of speech sounds
idiolalia, invented language
leipolalia, elision
metalalia, reversal of speech sounds
paralalia, substitution or mispronunciation of speech sounds
pedolalia, baby-talk
rhinolalia, functional cleft-palate type of speech
tachylalia, abnormally rapid speech

If a speech therapist wishes to describe functional substitutions of speech sounds more accurately than the term *paralalia* makes possible, he may list the mispronounced sounds in alpha-

betic order at the right of *paralalia*, with or without the substituted sound in parenthesis at the right of the sound for which it is substituted. Thus *paralalia l (w)*, *r (w)*, *s (lateral)*, *z (lateral)* indicates that the patient substitutes *w* for both *l* and *r*, and makes both *s* and *z* laterally. Or the Greek name of the letter mispronounced may be inserted between the prefix, *para-*, and the root word *lalia*; the above example would then read *paralambdalalia*, *pararhotalalia*, and *parasigmatalalia*. As the corresponding older terms *paralambdacism*, *pararhotacism*, and *lateral sigmatism* do not indicate the cause of these substitutions, the speech therapist should state the cause after such terms if he wishes to retain them.

CHANGES SINCE ADOPTION IN 1929

As the classification of speech disorders published in the first edition of *A Dictionary of Terms Dealing with Disorders of Speech* (4) was the same classification which was officially adopted by the Association in 1929, the Nomenclature Committee did not wish to assume the responsibility of making radical revisions in this classification without official sanction by the Association.

However, the Committee did make the following changes in classification in the 1946 revision (5) for the reasons stated below:

In the interests of monomial nomenclature, the old *dyslalia* group was split up into three groups: 1. *dyslalia* was limited to functional speech defects; 2. all speech disorders due to any structural anomaly of any organ concerned with articulation were placed in a new group, *dyglossia*; 3. all speech disorders due to any form of deafness were placed in a new group, *dyseneia*.

Likewise, in the interests of monomial nomenclature, the old *dyslogia* group was split up into two groups: 1. *dyslogia* was limited to speech disorders due to mental deficiency; 2. all

speech disorders due to impaired reasoning in psychoses were placed in a new group, *dysphrasia*, which must not be confused with *dysphasia*.

The *dysphasia* group was reclassified to conform with recent writings of Nielsen (2) and Cobb (1). *Dysphasia* was divided into three major groups, sensory disturbances, formulation disturbances, and motor disturbances. Sensory disturbances were divided into disturbances in primary perception, disturbances in recognition (*agnosia*), disturbances in comprehension (*sensory aphasia*), and disturbances in understanding the full significance of words (*semantic aphasia*). Formulation disturbances were divided into disturbances in the formulation of mental images, difficulty in evoking words as names (*amnesic aphasia*), disturbances in sentence construction (*syntactical aphasia*), and disturbances in the formulation of connected discourse, corresponding to *semantic aphasia*. Motor disturbances were divided into *motor aphasia*, *motor agraphia*, *motor amusia*, and other forms of *apraxia*. The terms *mixed aphasia* and *total aphasia* were retained.

Formulation disturbances are manifest both in speech and in writing, and rightly include those disturbances of expression which are described by many writers under sensory agraphia and sensory aphasia. The language formulation area is so close to both Wernicke's area and the angular gyrus that formulation disturbances are often manifest in patients afflicted with sensory aphasia.

PROCEDURE USED IN COINING NEW TECHNICAL TERMS

The Nomenclature Committee used the following three steps in coining all new technical terms, and recommends that speech therapists take equal care if they have occasion to coin new terms:

1. A list of all Greek words having the same meaning as the English equivalent and several synonyms of this English equivalent was obtained

from two or more English-Greek dictionaries.

2. Each of these Greek words was traced in an unabridged Greek-English lexicon and all terms were discarded which did not have the desired meaning.

3. All Greek words not already discarded were further traced in an unabridged English dictionary to find which words had come through long usage to have taken over a different meaning from that desired; all such words were discarded. Just as many English words have half a dozen entirely different meanings, so many Greek words have several different meanings. After this process of sifting out inappropriate terms, about one term in six remained from which to select the shortest and best known term which has the nearest meaning to that desired.

As the learning of technical terms is difficult at best, writers should not coin unnecessary terms. The Nomenclature Committee is often able to suggest a well established term which has meaning identical with that of a newly proposed term.

REFERENCES

1. COBB, STANLEY. *Borderlands of psychiatry*. Cambridge: Harvard Univ. Press, 1943.
2. NIELSEN, J. M. Epitome of agnosia, apraxia, and aphasia with proposed physiologic-anatomic nomenclature. *J. Speech Disorders*, 1942, 7, 105-141.
3. OGILVIE, MARDEL. *Terminology and definitions of speech defects*. New York: Bur. Publ., Teachers College, Columbia Univ., 1942.
4. ROBBINS, SAMUEL D. and STINCHFIELD, SARA M. *A dictionary of terms dealing with disorders of speech*. Boston: Amer. Soc. Study, Disorders, Speech, 1931.
5. ROBBINS, SAMUEL D., HAWK, SARA STINCHFIELD and RUSSELL, G. OSCAR. *A students' dictionary of terms dealing with disorders of speech*. (1946 Rev. Ed., abridged.) Amer. Speech Corr. Ass'n, 1947.
6. RUSSELL, G. OSCAR. *Encyclopedic dictionary of terms dealing with disorders of speech, voice, and hearing*. (In preparation.)