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NON-NEUROGENIC LANGUAGE DISORDERS: A Preliminary Classification

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Abstract

Background—Few publications deal with non-neurogenic language disorders (NNLDs), distinct from psychogenic speech disorders such as psychogenic dysphonia or stuttering. NNLDs are alterations in language due to psychosomatic preoccupations, conversion disorder, psychiatric disorders, or other psychological reasons.

Objective—To identify and classify the range of NNLDs and their characteristics.

Methods—This review summarizes the literature on disturbances in language, broadly defined as the use of symbols for communication, which may have a psychogenic or psychiatric etiology.

Results—The literature suggests a classification for NNLDs that includes psychogenic aphasia with dysgrammatism; psychogenic “lalias” including oxylalia and agitotalia, palilalia and echolalia, xenolalia, glossolalia, and coprolalia; psychologically-mediated word usage; psychotic language; and psychogenic forms of the foreign accent syndrome.

Conclusions—Clinicians and researchers have insufficiently emphasized the presence of NNLDs, their characteristics, and their identification. Yet, these disorders may be the first or predominant manifestation of a psychologically-mediated illness. There are two steps to recognition. The first is to know how to distinguish NNLDs from the manifestations of neurogenic language impairments after a neurological evaluation. The second step is awareness of specific associated and examination features that suggest the presence of a NNLD.

Keywords

language; aphasia; foreign accent syndrome

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OVERVIEW

Non-neurogenic language disorders (NNLDs) may be common psychogenic and psychosomatic manifestations, but there are surprisingly few studies on these conditions. There are significant publications on psychogenic speech, or vocal communication, but not on non-neurogenic language, or the use of symbols for communication. Moreover, classifying language disorders as distinct from thought disturbances can be difficult as language and thought greatly overlap. Although a young to middle-aged female predominance is suggested in the literature (1), there is no information on the incidence or prevalence of NNLDs, nor a classification system for them. The relative vacuum in the literature motivates a preliminary evaluation of the types of non-neurogenic language conditions, ranging from psychogenic aphasia to variants of the foreign accent syndrome (See Table 1).

Before characterizing the specific NNLDs, it is important to distinguish them from the psychogenic speech disorders. Speech is limited to the vocal expression of language, whereas language may involve other modalities, such as auditory comprehension and writing. Psychogenic speech disorders manifest as dysphonia, dysarthria or articulation deficits, acquired stuttering, apraxia of speech, and abnormalities in prosody including prosodic aspects of the “foreign accent syndrome” (FAS) (1). Functional dysphonia refers to the non-neurogenic loss or alteration in voice (pitch, loudness, quality) (2). Dysarthria manifests as deficits in speech articulation, and, when psychogenic, often involves labial consonants (“l”, “r”) or relatively isolated hypernasality (1). Psychogenic stuttering, as opposed to neurogenic stuttering, occurs in the absence of associated features of speech, such as dysarthria or apraxia of speech (1). Apraxia of speech affects the motor planning of speech with decreased initiation and distorted articulation. Finally, FAS is primarily a disorder of prosody, or the rhythm and timing of speech; however, some patients with FAS have alterations in grammar (3), hence FAS can be a NNLD and is further discussed in this review.

In addition to distinguishing NNLDs from speech disorders such as dysphonia and stuttering, the first step in recognizing NNLDs is distinguishing them from neurogenic causes of language impairments. This requires a systematized examination of language fluency and overall intelligibility, comprehension, naming, and alterations in word usage. Normal fluency includes normal quantity (words per minute, phrase length), flow (no word-finding hesitance or effort), and grammar (syntax and presence of grammatical words or parts of words) (See Table 2). After listening for fluency and altered word usage, the examiner tests comprehension with simple and complex commands, confrontational naming of presented items, and the repetition of complex sentences. The examiner may suspect an NNLD when this language examination, and the rest of the neurological evaluation, does not fit the typical pattern of a neurogenic aphasia or language disturbance.

PSYCHOGENIC APHASIA

When abnormal language is suddenly or gradually acquired, it usually suggests brain injury, but it may also be of psychogenic origin. Investigators have described “hysterical” aphasia

as a conversion reaction to placebo (4), and early reports of these psychogenic aphasia are primarily descriptions of abnormalities in conversational fluency and grammar (4–6). In general, psychogenic aphasia are “nonfluent” indicating abnormal quantity and flow of language, agrammatism, or both, and relatively preserved comprehension, naming, and repetition.

Before concluding a psychogenic aphasia, clinicians must recognize and exclude the neurogenic aphasia and sociocultural language conditions (7). In neurogenic nonfluent aphasia such as Broca’s aphasia, the dysgrammatism is “agrammatic” with simplified “telegraphic” sentences lacking grammatical words or parts of words as well as errors of subject-verb agreement and word order. In neurogenic fluent aphasia such as Wernicke’s aphasia, there is normal conversational fluency, often devoid of content words or meaning, but containing paragrammatisms, or substitutions and misuse of grammatical elements such as articles, prepositions, or conjunctions. The primary progressive aphasia are neurodegenerative language disorders which may be “nonfluent” similar to Broca’s aphasia, “logopenic” with word-finding difficulty with poor repetition, or “semantic” with impaired naming due to loss of the meaning of words. Finally, the dysgrammatism of psychogenic aphasia is not the “broken English” (or any other language) attributed to someone who habitually violates traditional rules of grammar from a lack of education or from a subcultural or group preference, from the mixing of languages in “bilingual mode” (e.g., Spanglish), or from the simplified words and grammar when two languages are used in certain sociocultural contexts (e.g., pidgin language).

After excluding neurogenic aphasia, psychogenic aphasia is further suspected when the language features are inconsistent. Patients with psychogenic aphasia have inconsistencies or variability in errors and improbable or implausible grammatical formations. Some psychogenic patients have an excessively simplified grammar that sounds like the “broken English” of presumed “baby talk” but with altered syntax (e.g., “me hungry”). These patients may have improvement when distracted or fatigued and a relative absence of frustrations or concern for their language errors. Strong clues that language symptoms are non-neurogenic are the presence of other unexplained symptoms and the ease of reversibility of the language symptoms with a few therapy sessions (See Table 3) (5). In addition, psychogenic aphasia may be present when the characteristics do not conform to the suspected neurological disorder and its localization. For example, severe dysfluency after a single mild traumatic head injury (TBI) suggests a psychogenic etiology (8).

THE “LALIAS”

There are a number of relatively rare “lalias”, or disorders of talking, that reflect disturbed language production and that can be psychogenic. They include oxylalia and agitotalia, palilalia and echolalia, xenolalia, glossolalia, and coprolalia. Oxylalia and agitotalia are two rarely used terms that accurately reflect variations in abnormally rapid speech. Oxylalia is simply the abnormal rapidity of speech, whereas agitotalia adds that the rapid speech has imperfectly spoken or omitted words. These disorders are most commonly associated with mania, hypomania, catatonic schizophrenia, or excessive anxiety. Palilalia and echolalia are two additional “lalia” terms that reflect repetitive speech manifestations. Palilalia is when

patients excessively repeat their own words, and echolalia is when they repeat the interlocutors' words. Palilalia is often associated with frontal-striatal brain disorders and echolalia with transcortical sensory aphasia; however, both palilalia and echolalia, like coprolalia, can occur in Tourette's syndrome, obsessive-compulsive disorder, and schizophrenia or psychosis (9). Palilalia can also occur as a consequence of a conversion reaction (10).

Xenolalia (also "xenoglossia") refers to the sudden acquisition of a foreign language that the person did not speak before. The new facility with a foreign language is quite dramatic and the subject of a number of reports in the lay press of individuals awakening from an altered mental status or after a TBI and speaking in a previously unfamiliar tongue. On close examination, there is no support for a pure xenolalia as most of these individuals have had a prior exposure to the foreign language and were not really conversationally fluent in it. Their knowledge of the new language appeared to derive from prior overt as well as unconscious learning of that language. Nevertheless, there are case reports of xenolalia-like manifestations. One report describes speaking in a relatively unfamiliar, but previously partially known, alternate language as part of a secondary personality (11). Another report describes long-standing reversion to a previously studied, but imperfectly known, foreign language after hydrocephalus treated with a shunt and "brainstem vascular encephalopathy" (12). The authors describe this person as speaking the language compulsively in the context of other compulsive behaviors. The authors suggest that previous knowledge of a long forgotten second language can be switched on by a brain insult if it leads to compulsive behavior (12). These two cases indicate that xenolalia-like phenomena can occur as a dissociative identity disorder, where there are two or more distinct identities each speaking a different language, or as a compulsive disorder fixated on speaking another language.

Glossolalia or speaking in tongues is similar to xenolalia except that the persons appear to speak in an unknown or incomprehensible language over which they have no control (13). The speech in glossolalia sounds rhythmic and meaningless without recognizable words except some religious ones (14). Although speaking in tongues is mentioned in the New Testament, it has a more recent resurrection in January 1, 1901 when Agnes Ozman requested receipt of the gift of the Holy Ghost and began speaking a language that "sounded Chinese". Glossolalia still occurs in the context of Pentecostal or other Christian or religious practice where it is perceived as a divine language with personal meaning for the speaker. There may be a public and more demonstrative form of glossolalia, with singing and ecstatic body postures, and a quieter and more private form (14). Rarely, glossolalia has occurred in neurogenic conditions, such as glossolalic jargon in Wernicke's and from abnormal right temporal epileptiform discharges (14, 15). In general, most individuals with glossolalia do not have an underlying neuropsychiatric disorder, but it has occurred in psychotic patients and those with a dissociative identity disorder (13, 14).

Coprolalia describes outbursts of obscenities or curse words not readily under the control of the speaker. Although it can occur as a manifestation of left frontal seizures or left frontal strokes with Broca's aphasia, coprolalia occurs most commonly as vocalizations in 10–33% of patients with Gilles de la Tourette syndrome (16). In Tourette's syndrome, coprolalic urges are associated with socially inappropriate symptoms and coprolalic acts are associated with

tic severity (16). In an important study (16), anxiety and depression are unrelated to the presence of coprolalia; however this behavior can emerge during periods of high anxiety, as well as with anger and frustration, in non-Tourette's individuals.

ABNORMAL WORD USAGE

Psychologically-mediated abnormal word usage includes selective anomia, neologisms and paraphasias, malapropisms and confused word usage, clanging and rhyming, and word approximations. Selective anomia is a condition where the individual cannot find or produce a name for specific items or those within a category or group of items. These patients may have repressed these words because of their association with prior psychological traumas. The selective nature of the anomia is evident in contrast to normal word production or verbal fluency lists in unrelated areas.

Neologisms and paraphasias are well known word substitution errors. Neologisms are new or made-up non-English words that have meaning only to the individual. Paraphasias are unintended phonemic ("literal") or word ("verbal") substitutions that occur commonly in neurogenic aphasia, especially Wernicke's aphasia, and, when excessively frequent, lead to "jargonaphasia", an unintelligible mixture of words that sound meaningless to the listener. Patients with psychosis or those with a conversion disorder may have neologisms and paraphasias used in a private, thematic way, having meaning only for the individual.

Malapropisms and clanging are word usage errors related to the sound of the words. Malapropisms are similar to verbal paraphasias, but the word substitution involves mistaking the semantic or meaning of similarly sounding words and using the incorrect one, e.g. "medieval" condition instead of "medical" condition (17). This can obviously result in nonsensical and humorous errors. Malapropisms can represent deliberate misuse of words as part of a psychotic or a psychosomatic disorder and may also be part of a more generalized confused word usage. Clanging, on the other hand, involves repeating words and their associations based upon the word sounds without any consideration of their content or meaning. There may be punning, or the humorous use of words based on their sound or homophone similarities, as well as using a word to suggest two or more of its meanings (18). Clanging is a well-known language symptom among schizophrenics (19).

Word approximations involve nonsensical or wrong answers to questions. Often, word approximations occur as reactions to psychological stress, resulting in approximate answers to even simple questions. It is associated with Ganser syndrome, a rare dissociative disorder, but can represent a conversion disorder or a factitious disorder. The presence of prominent word approximations can also signal other mental disorders such as extreme anxiety, schizophrenia, bipolar disease, depression, and alcohol and drug abuse.

PSYCHOTIC LANGUAGE

Among schizophrenics or those with mania, there are a range of disturbances reflected in language; however, many of them are direct manifestations of their thought disorder, such as disorganized speech, incoherence, illogicality, poverty of speech content, and the related tendencies to go off-track in their conversation or responses, such as tangentiality,

circumstantiality, and frank derailment (19, 20). These are not primary disorders of language; they reflect disturbances in the content of language. Psychotic patients may additionally have alterations in word usage, as previously discussed, including palilalia and echolalia, neologisms and paraphasias, word approximations, and clanging and rhyming. These can be so frequent that they contribute to an unintelligible schizophrenic “word salad” or “schizophasia”, similar to “jargonaphasia” in Wernicke’s aphasia. All of these “language” characteristics are ultimately a reflection of the disturbed thought processes in these individuals, illustrating the difficulty in separating language from thought as these cognitive processes are heavily intertwined and mutually dependent. Nevertheless, distinguishing psychotic speech from other NNLDs is often part of the differential diagnosis.

FOREIGN ACCENT SYNDROMES

Patients with FAS dramatically acquire accents that sound foreign and different from their premorbid accent or from any of their previously spoken languages or dialects (21). For over 110 years, neurologists and psychiatrists have grappled with FAS, ever since Pierre Marie observed the emergence of an Alsatian accent in a Parisian recovering from a left subcortical stroke (22). The most famous case of FAS occurred in a Norwegian woman who appeared to develop a German accent after a left frontal injury from a bomb splinter during World War II, and was consequently shunned by her wartime compatriots (23, 24). Although there are neurological causes of FAS, many cases have failed to show a clear neurological etiology. Furthermore, FAS has occurred as part of schizophrenia, bipolar disease, conversion disorder, anxiety disorders, and non-psychogenic causes such as malingering (25–28), and clinicians are faced with distinguishing neurogenic FAS from psychogenic FAS.

The patients with FAS do not really acquire a genuine accent of another language; rather, the listener’s perception of distorted speech that sounds “foreign” leads to the conclusion of a foreign accent (29). FAS, whether neurogenic or psychogenic, is primarily a disorder of linguistic prosody, or timing and rhythm affecting intonation and word stress, with relatively preserved emotional prosody (30–35). There are also alterations in the pronunciation of spoken vowels and consonants (33, 35, 36), with vowels much more affected than consonants (31, 37). Yet, FAS is not a form of dysarthria or a mild form of apraxia of speech (34, 38, 39). Unlike apraxia of speech, FAS patients do not have difficulties with speech initiation or distorted articulation with articulatory groping (37).

In order to recognize psychogenic FAS, one must first exclude with as much certainty as possible the presence of a neurogenic FAS. About half of neurogenic FAS patients have an additional nonfluent aphasia, and others may have dysarthria or apraxia of speech (32, 40, 41). Neurogenic FAS can result from small focal lesions resulting from left hemisphere strokes and tumors, TBI, migraine, multiple sclerosis, primary progressive aphasia (42), post-excision of a left posterior fronto-opercular arteriovenous malformation (43), some posterior fossa lesions (44), and other acquired CNS lesions (1, 31). Most lesions involve the left inferior frontal gyri (Broca’s area; adjacent premotor cortex), left frontal operculum, left anterior insula, associated basal ganglia regions, and sometimes the cerebellar systems (may be cerebellum or in brainstem), and the white matter pathways linking these regions (30, 31, 33, 35). In neurogenic FAD, various studies suggest disrupted neural networks for motor

control of speech (32, 45, 46), specifically the left deep frontal operculum-anterior insula connectivity involved in fine-tuning of motor programming for optimal articulation (30, 34, 36), and, less frequently, the cerebro-cerebellar circuitry (37, 38, 44).

On the basis of perceived accent alone, clinicians may not be able to reliably distinguish psychogenic FAS from neurogenic FAS; however, there are a number of important differentiating features (See Table 4). First, patients with psychogenic FAS tend to have the absence of aphasia and speech disorders such as dysarthria or apraxia or speech, but may have other functional neurological symptoms, such as psychogenic nonepileptic seizures or multiple unexplained somatic symptoms (28, 47, 48). Second, there are dysgrammatisms without paucity of words, word finding difficulty or hesitancy, or an effortful struggle to speak. Although some patients with neurogenic FAS have agrammatism and some patients with psychogenic FAS have general dysfluency (3, 27), the presence of substantial or preponderant grammatical deficits in otherwise fluent conversation and normal language comprehension suggests a psychogenic cause (26, 47, 49). Third, psychogenic FAS may have variable and inconsistent dysgrammatisms with irregularly affected articles, word order, misused grammatical words, plural-singular verb correspondence, erroneous verb tenses, and drop-out of articles (26). Their dysgrammatisms suggest paragrammatism with mistakes in grammatical use and occasional child-like constructions rather than the agrammatic omissions or telegraphic speech of Broca's aphasia (50). Fourth, there are overall inconsistencies in the expression of the "accent". These patients can reasonably imitate a true foreign accent when asked to do so, and, during singing, the accent may disappear, yet they do not improve with automatic speech or speaking or singing in unison. Finally, similar to the other NNLDs, these individuals usually display indifference and lack of frustration toward their language disorder (21).

CONCLUSIONS

NNLDs are varied and distinct psychogenic disorders that are probably much more common than realized. They include psychogenic aphasia with dysgrammatism, the "lalias", word usage abnormalities, psychotic language, and some patients labeled as having the FAS. There is a two-step process in recognizing NNLDs that involves distinguishing neurogenic language disorders after a neurological evaluation and looking for the specific features of NNLDs (See Tables 3 and 4). Characteristics that distinguish these disorders include the fact that they do not fit the typical neurogenic pattern, have marked variability, lack commensurate concern or distress, and often readily respond to intervention or therapy. This article presents a preliminary classification and is, undoubtedly, only a beginning. This preliminary classification and discussion may stimulate further research and consideration of language as a psychosomatic symptom itself.

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TABLE 1**Potential Manifestations of Non-Neurogenic Language Disorders**

A.	Psychogenic Aphasia and Dysgrammatism
B.	Lalias
a.	Oxylalia and agitolalia
b.	Palilalia and echolalia
c.	Xenolalia
d.	Glossolalia
e.	Coprolalia
C.	Altered Word Usage
a.	Selective Anomia
b.	Neologisms and paraphasias
c.	Malapropisms and confused word usage
d.	Clanging, punning, and rhyming
e.	Word approximations
D.	Psychotic Language
E.	Foreign Accent Syndromes

TABLE 2

Glossary of Pertinent Speech and Language Terms

Agitolalia – abnormally rapid speech in which words are imperfectly spoken or omitted
Agrammatism – loss of grammatical words/word parts with abnormal sentence structure
Anomia – inability to produce names for objects or events
Aphasia – disorder of language (as opposed to speech)
Apraxia of Speech – motor speech planning deficit with labored initiation and production
Articulation – formation of clear and distinct and well pronounced speech sounds
Broca's aphasia – nonfluent language with relatively intact basic comprehension
Clanging – word association based on sound
Coprolalia – involuntary and repetitive use of expletives or obscene language
Dysarthria – difficult or unclear articulation of speech
Dysgrammatism – refers to both nonfluent agrammatism and fluent paragrammatism
Dysphonia – voice problems in volume or pitch
Echolalia – meaningless repetition of another's words or speech
Fluency – the ability to speech easily and fluidly, vs. sparse, halting, or agrammatic
Foreign Accent Syndromes native speaker is perceived as developing a foreign accent
Glossolalia – speaking in an unknown language
Language – complex system of communication primarily based on cognitive symbols
Malapropisms – mistaken use of a word in place of a similarly sounding one
Neologisms – a newly coined or invented word
Oxylalia – abnormally rapid speaking
Palilalia – meaningless repetition of one's own words or speech
Paragrammatisms – substitution errors in the use of grammatical words/word parts
Paraphasias – language error due to syllable (literal) or word (verbal) substitutions
Primary progressive aphasia – neurodegenerative disorders of language
Prosody – the pattern of intonation, rhythm, and stress in speech and language
Speech – the verbal expression of language
Stuttering – the continued involuntary repetition of sounds, especially initial consonants
Telegraphic speech – simplified language consisting of a few key words, e.g., noun-verb
Wernicke's aphasia – fluent language disorder with impaired comprehension
Xenolalia – speaking in a previously unknown foreign language

TABLE 3

Associated Features that Favor Non-Neurogenic Language Disorders

1	Normal cognitive, neurological, and neuroimaging examinations
2	Delayed onset or poor temporal relationship with presumed neurological event
3	Associated or triggered by significant life events or psychological disturbance
4	Related to the presence of a known psychiatric or psychological disturbance
5	Remission that is related to resolution of comorbid psychogenic symptoms
6	Remission that is related to resolution of psychological disturbance
7	Relatively rapid or easy response and reversibility with minimal intervention
8	Presence of functional speech disorders such as dysphonia or psychogenic stuttering
9	Presence of other functional neurological disorders
10	Presence of medically unexplained symptoms

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TABLE 4
Speech and Language Features that Favor Non-Neurogenic Language Disorders

1	Does not meet criteria for a primary speech disorder, such as dysphonia, dysarthria, stuttering, or apraxia of speech
2	Language otherwise normal in comprehension, repetition, and naming
3	Does not have deficits in reading and writing
4	Irregularity and inconsistency in language disorder, varying with person, place, topic
5	Selective or idiosyncratic word usage
6	Linguistic features that are not consistent with neurogenic language disorders and that may overlap with a higher-order thought disorder: <ul style="list-style-type: none">a. Improbable or implausible mistakes in spontaneous speechb. Dysgrammatisms in otherwise fluent conversational speechc. Variability and inconsistencies in grammar and other linguistic featuresd. Specific lalias and word usage abnormalitiese. FAS with dysgrammatisms and ability to imitate other accents
7	Tendency to speak in caricature of “Broken English”, childlike, or foreign accent
8	Indifference and lack of concern for language problem
9	Lack of improvement with facilitation techniques: <ul style="list-style-type: none">a. Automatic speech (e.g., counting or reciting the alphabet)b. Speaking or singing in unison
10	Excessive improvement with distraction or fatigue