Chapter 1. Introducing Nwehu Nuswei

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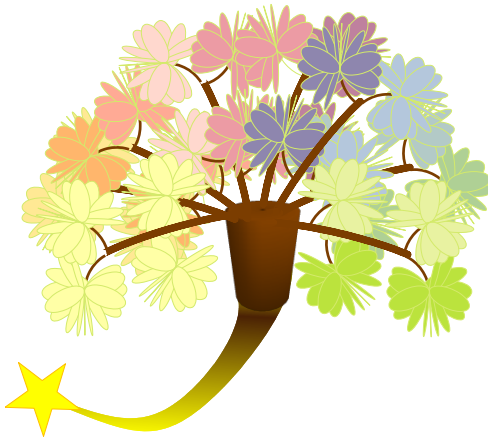


Imagine a language where all the words make sense... a language where the sounds aren't hard to pronounce... a language that is artificial, but combines pleasing and natural elements in an ideal balance... a language that reflects human nature but is designed to fit snugly into today's world of computers. *That's **Nwehu Nuswei.***

"Nwehu Nuswei" means "Communication system combining natural and artificial elements in harmony." Its development began in the 1970s inspired by 17th century renaissance ideas and continues well into the 21st century, nourished by contemporary brain function studies, practical psychology and quantum physics.

Its words "make sense" by combining logical vocabulary organization with research into how people perceive the emotional qualities of sounds. It doesn't borrow words from other languages, but makes a completely fresh start. It can be written in everyday (latin) letters, but also has its own distinctive letters. Based on a broad understanding of the languages of the word, it accommodates multiple ways of expressing your ideas, and doesn't force you to say things in ways you're uncomfortable with. For example, Nwehu Nuswei pronouns don't force anyone to talk about gender – but if you do want to talk about it, you can easily refer to male, female, or flexible-gender.

Instead of just talking about "past, present, future", Nwehu Nuswei also lets you talk about distant-time, intermediate-time, near-time; or time from the perspective of current reality, light-speed travel, or time-travel. As new discoveries are made, Nwehu Nuswei has built-in ways of welcoming new terms into the vocabulary.

Nwehu Nuswei offers an incredibly deep and rich system of verbal inflections, allowing you to easily express nuances that require a lot of words in natural languages – but at the same time, there is a simple, straight-forward way of expressing ideas that doesn't require a lot of learning-time or thought. It's designed to be a language that's easy to get started with, and will keep growing on you.

You may be wondering... How will Nwehu Nuswei be used? It *probably* won't ever be used, but who knows???

By the way... How is "Nwehu Nuswei" pronounced? Using the International Phonetic Alphabet (IPA): [nwɛˈhə nəˈswɛj]; or in pseudo-English: *nweh HUH nuh SWAY*.

Using its own letters, it's written 𐌽𐌿𐌴𐌷 𐌽𐌿𐌼𐌿𐌽.

1.1. General Principles of Nwehu Nuswei

There are six General Principles and several overall goals for this artificial language:

These are the six **General Principles** upon which the language is based:

❶ Related words have related sounds
❷ Phonetic symbolism is incorporated whenever possible
❸ Semantic structure is organized as much as is practical using the "me-first" principle.
❹ All words are represented digitally with sixteen bits.
❺ In speech, each word (with limited exceptions) has two syllables composed of a consonant followed by a vowel.
❻ Sixteen consonants and sixteen syllable nuclei (vowels) are used.

The **overall goal** – or challenge, if you will – is to create a language that is **easy for everybody to learn, yet richly expressive**.

There are several ways this challenge has been addressed:

- **Logical organization of the vocabulary space – words that mean similar things sound similar**
- **Minimal vocabulary for practical use, with expansive vocabulary options for enthusiasts**
- **Sounds chosen from among those most commonly used by people around the world**
- **Allowing – but not forcing – people to express things in ways similar to how their native language does it**
- **Consistency in how words are built – that is, no irregular inflections, special plural forms, number-categories, or bumps in the road**

Let's go into a little more detail on those general principles here...

1.1.1. Principle ❶ Related words have related sounds

Rather than build words based on any existing human language, the vocabulary is built according to hierarchical groups of related concepts. A similar artificial language was created in by John Wilkins in the 17th century: ***An Essay Towards a Real Character, and a Philosophical Language*** (London, 1668). Though few are now acquainted with Wilkins' work, it was the inspiration for Roget's Thesaurus, which uses Wilkins' semantic categories as the basis for its organization.

The result of this is that Nwehu Nuswei words that are related to one another usually sound similar. Whether or not this is a good idea has been debated, but as far as I know, never tested in practice. And regardless of the outcome of the debate, this particular artificial language is based on the hypothesis that related words should sound alike, and that humans can device categoies of concepts in useful and gnerally agreed-upon ways (see Closing Thoughts).

1.1.2. Principle ❷ Phonetic symbolism is incorporated whenever possible

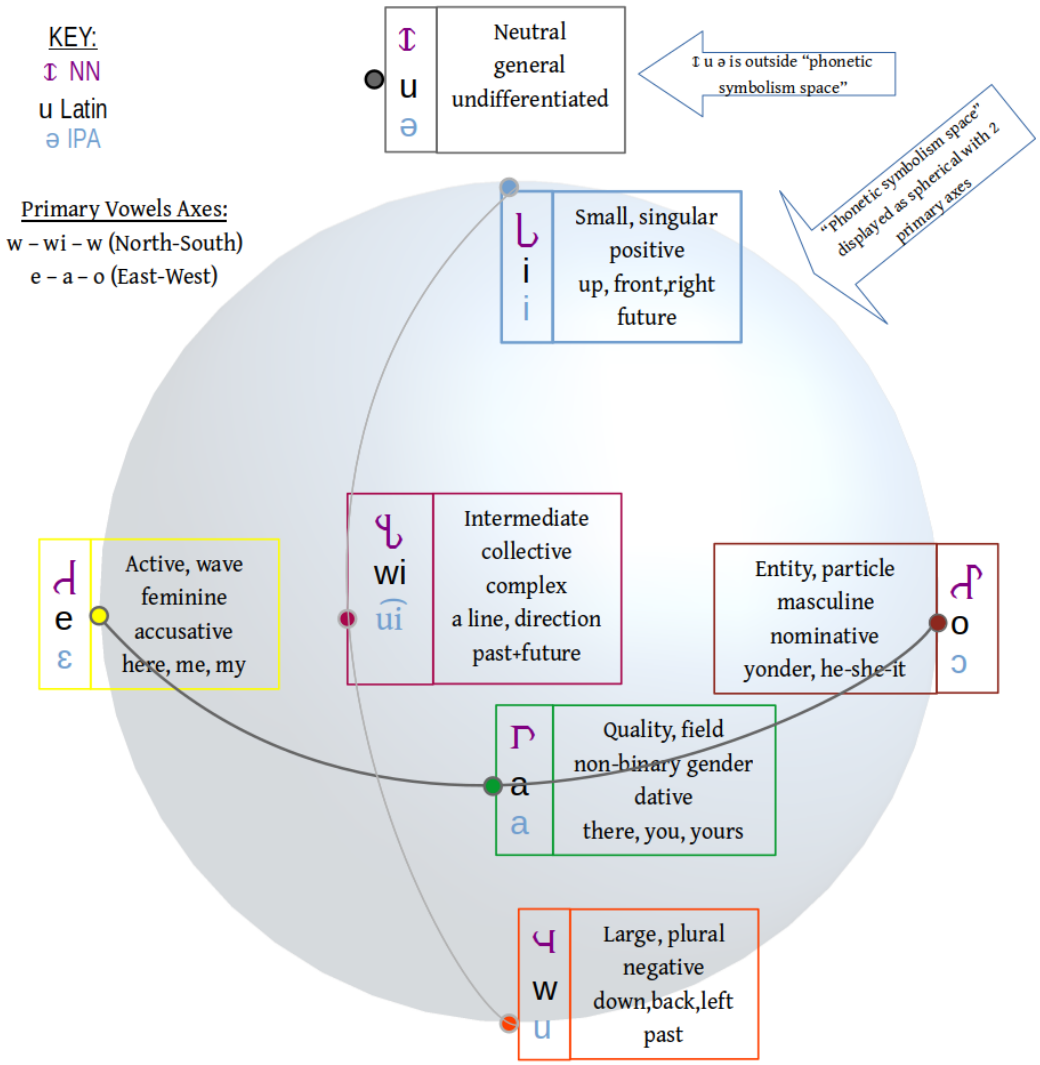
Phonetic symbolism is the idea that certain simple speech-sounds evoke fairly predictable associations to speakers of many, if not most, human languages.

I have studied this experimentally and in the literature, and found it to be true to a limited degree. The associations are weakest with consonants, strongest (though never overwhelmingly so) with vowels. The strongest associations are with size and with negative-positive polarity; hence, these are the primary sound-meaning associations used in Nwehu Nuswei (NN).

𝔇ρ 1.1: Sound-Meaning Associations

Size Associations	**Polarity Associations**
[i] smallest	[i] Positive
[ɛ] small	[u] Negative
[a, ə] neutral	
[u] larger	
[ɔ]largest	

𝔇ρ (Display) 1.2 (next page) illustrates the concept of a three-dimensional vowel space. It shows only the six basic vowels of NN plus *wi*. The remaining 9 vowels – compounds of two or three vowels (not shown in this figure) – fill the remaining three-dimensional space.
This concept is based on two primary axes: the vowels e – a – o (shown as East-West) and i – wi – w (shown as North-South). The tag next to each vowel lists the general semantic domains associated with these vowels. They apply primarily to the second syllable of words, which carry stress and also carry the finest granularity of lexical distinction.
By using them whenever possible, a consistency emerges which enables learners to deduce some of the meanings of unfamiliar terms as they become familiar with the language. While there are exceptions – words in which the fnal vowels have no particular meaning, such as numbers – this is the primary method by which the principle of "phonetic symbolism"is embodied in NN.



𝒟ρ 1.2
Nwehu Nuswei Phonetic Symbolism:
semantic space in the last vowel of words

1.1.3. Principle ❸ Semantic structure is organized as much as is practical using the "me-first" principle.

The "me-first" principle is observed in several languages, but has not to my knowledge been demonstrated to be universal.

It observes first that there are pairs of related concepts which are associated at some level of consciousness:

Group 1	Group 2
ego	other
small, simple	large, complex

In English, and in some other languages, when speakers speak about two things together, they tend to put words related to Group 1 first, followed by those related to Group 2. When asked why, they may simply say, "It sounds better that way".

Examples in English:

Ego	Other
me and them	*?them and me*
me and you	*?you and me*
to me and Tommy	*?to Tommy and me*

To me and Tommy is an interesting case, because children usually have to be "corrected" when they put "me first". In English, children are taught that it is more polite (or "grammatical") to name the other person first, but the frequency with which children have to be reminded illustrates the power of the "me first" principle. In other language (Spanish, to my knowledge) this is not considered a matter of politeness, and the normal word order puts the speaker ("me") first.

Small (word)	Larger (word):
bread and butter	**butter and bread*
cease and desist	**desist and cease*

1.1.4. Principle ❹ Sixteen-bit Words

Digital storage and transmission uses the simplest possible building blocks: units that can be either "on" or "off". These are called "**bits**", and can be represented physically in many ways, such as magnetic polarity (north-south), light (on-off), voltage (high-low), surfaces (solid-hole), and anything else that works simply, cheaply, and rapidly.

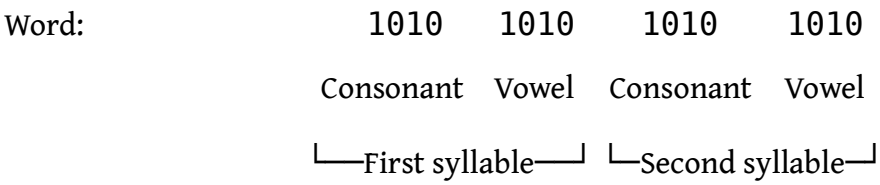
By themselves, single bits convey relatively little information, so they are clustered together. Because each bit can have only one of two values, two is the number-base upon which everything digital is (literally) based. (Most humans use ten as their number base, probably because we have ten fingers.)

Clusters of bits are therefore based on powers of two. $2^2 = 4$, so four bits together are the next unit to be used above single bits. (These are sometimes referred to as "nybbles" /ˈnɪbl̩z/.) Each "letter" in NN is composed of four bits (one nybble), and one nybble can have sixteen different values (numbered 0000 to 1111 in base 2, 0 to 15 in base ten, or 0 to F in base sixteen).

Four groups of four bits ($2^4 = 16$) are usually referred to in computer science as a "word". In NN, a computer "word" is a language "word". There are 65,536 (base ten) different possible combinations of bits in a "word"; so Nwehu Nuswei has 65,536 possible vocabulary words. (But one set of 4,096 words – those beginning with the sound F – are reserved for flexible redefinition within technical fields, providing potentially unlimited expansion as needed.)

1.1.5. Principle ❺ Each word has two CV syllables

In speech, each NN word has two syllables, each composed of a consonant followed by a vowel.



This very simple syllabic structure was chosen because it is found in practically every human language on earth. Many languages consist primarily of syllable with this consonant-vowel (CV) structure. Adopting this syllabic structure puts pronouncing NN easily within reach of just about all humans. All its words have a CVCV structure. This means that the first and third nybbles of each computer "word" represent one of sixteen different consonants; the second and fourth represent one of sixteen different vocalic elements.

Word-stress falls on the final syllable, but vowels are not to be "reduced" or "centralized" when unstressed.

However, one consonant, *h* /h/, and one vowel, *u* /ə/, can be dropped from pronunciation in unstressed syllables. Words beginning with *Hu-* are function-words, (FUNCTIONALS) intended to be pronounced as a single syllable, though always written and expressed digitally with the full four letters or sixteen bits. Likewise, words beginning with some *Su-* combinations can also be reduced to one syllable, though this is not required, since the resulting combinations are not used easily by speakers of all languages.

1.1.6. Principle ❻ Sixteen consonants and sixteen vowels

As explained under "Sixteen Bit Words" above, each NN word consists of sixteen bits considered as four groups (nybbles) of four bits each. (0000 0000 0000 0000) Each of the four groups can represent any of sixteen values. As described above under "Syllable Structure", the first letter – represented by the first four bits – is always a consonant; the second four bits represent a syllable nucleus (a vowel), the third a consonant, and the fourth another syllable nucleus.

Sixteen consonants are commonly found in most languages; NN uses the most common of these, to make pronunciation relatively easy for speakers of all languages. However, it is extremely rare to find sixteen distinct vowels in any one language, so Nwehu Nuswei uses clusters of vowels (diphthongs and triphthongs) as the nuclei of syllables.

Note that the same 4-bit patterns (numbers) are used for both consonants and vowels, so their spoken value is determined by their position as well as their pattern of bits.

Chapter 3 "Sound System" describes NN sounds in considerable detail. In this section, there is a general introduction to the sounds.

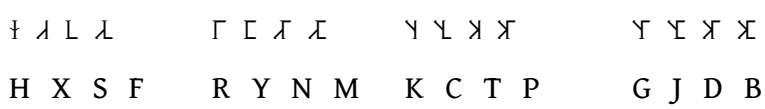
Ɒρ 1.3 lists the values and their interpretations in consonant and vowel positions:

Ɗp 1.3: "Latin" symbols are the commonly used latin alphabet letters which appear in this document and related materials. Nwehu Nuswei has a set of unique symbols illustrated in the next chapter. IPA is the "International Phonetic Alphabet" whose symbols have a clearly defined value. See https://www.internationalphoneticassociation.org/content/ipa-chart.

Base 10	Base 16	Consonant (Latin)	Consonant (IPA)	Vowel (Latin)	Vowel (IPA)
0	0	h	h	u	ə
1	1	x	ʃ	i	i
2	2	s	s	e	ɛ
3	3	f	f	ei	ɛi
4	4	r	ʁ	a	a
5	5	y	ʑ	ai	ai
6	6	n	n	o	ɔ
7	7	m	m	oi	ɔi
8	8	k	k	w	u
9	9	c	c	wi	ui
10	A	t	t	we	uɛ
11	B	p	p	wei	uɛi
12	C	g	g	wa	ua
13	D	j	ɟ	wai	uai
14	E	d	d	wo	uɔ
15	F	b	b	woi	uɔi

1.1.6.1. Consonants

The sixteen consonants chosen for Nwehu Nuswei can be represented its own character set, or in the Latin alphabet:



H X S F R Y N M K C T P G J D B

Using symbols of the International Phonetic Alphabet (IPA), the sounds are

/h ɕ s f ʁ ʑ n m k c t p g ɟ d b/.

These sounds were chosen to be distinctive enough that variations in pronunciation will not affect intelligibility; almost all languages have consonant sounds close enough to these that an equivalent is readily available. In English, the equivalent sounds are

[h ʃ s f ɹ ʒ n m k ʧ t p g ʤ d b].

which are usually spelled with these letters in English:

H Sh S F R Y N M K Ch T P G J D B.

However, English spellings are not used for all Nwehu Nuswei sounds. Sh is represented by the letter *x* and Ch by the letter c alone, so that each consonant has by only one letter. As mentioned above, each "letter" is also represented by a computer nybble. Refer to ᴅρ 1.3 above for the complete correspondence.

1.1.6.2. Syllable Nuclei

Very few languages have sixteen "pure" vowel sounds without using tones, voice qualities, or nasality - features not shared by a lot of the world's languages. So Nwehu Nuswei combines vowel sounds in the vocalic part of each syllable (the syllable "nucleus") to produce "diphthongs", a type of vocalic element that is found in the majority of human languages – though by no means all. And some of the resulting combinations are not as easy to distinguish as would be desirable, but the overall structure is relatively simple to pronounce and understand. What is more, this structure makes it possible to incorporate vowel "phonetic symbolism" (Principle ❸) – a feature which can potentially aid learning, memorization, and the overall intuitive quality of the language (as discussed above).

Six common vowel sounds are used as the basis for NN syllabic structure. In IPA, these are: /ə i ɛ a ɔ u/,

spelled in NN:

ᚼ ᛒ ᚲ ᚹ ᛇ ᛋ

U I E A O W

The corresponding English spellings are:

UH EE EH AH AW OO

as in

but, beet, bet, bot[1]*, bought, boot.*

Of course, each of these six simple vowels can be the only vowel in a syllable. But what about the other ten vocalic elements? These are diphthongs formed either by placing a *w* [ŭ, w] at the beginning, or an *i* [ĭ, j] at the end, or both. This gives us these ten combinations:

1 *Bot* (North American pronunciation) or *bath* (British pronunciation)

ᑯ	ᑲ	ᑳ	ᑫ	ᑭ	ᑮ	ᑯ	ᑰ	ᑱ	ᑲ
ei	*ai*	*oi*	*wi*	*we*	*wa*	*wo*	*wei*	*wai*	*woi*
[ɛj	aj	ɔj	wi	wɛ	wa	wɔ	wɛj	waj	wɔj],

for a total of sixteen vocalic elements. (For detailed discussion, refer to Chapter 3, "Sound System".)

Principle 1 of NN is that related words have related sounds. How are these sounds related to meanings in the vocabulary space? We explore this in the following section.

1.2. Semantic Space

The 65,536 possible words in NN are subdivided by analogy with Linnaean biological classification into 16 "FAMILIES", each beginning with its own arbitrary consonant (shown below in Ⱀρ 1.4). These FAMILIES are further subdivided into 16 arbitrary "GENI" (genuses), differentiated by the vowel of the first syllable. Each GENUS contains 16 "SPECIES", again arbitrarily assigned one of the possible 16 consonants of the second syllable. Finally, each individual lexical entry ("word") is assigned to one of the 16 possible vowels of the second syllable.

1.2.1. Semantic Space: how many words are there?

As mentioned, there are 65,536 possible words given the structure of the language. These are organized hierarchically by letter, from first to last. In this respect, NN follows the principle used by John Wilkins in his 1668 *Philosophical Language* mentioned above.

Consonant 1	16	'(Word) FAMILY'	Level 1
Vowel 1	16 × 16=256	'(Word) GENUS'	Level 2
Consonant 2	256 × 16=4096	'(Word) SPECIES'	Level 3
Vowel 2	4096 × 16=65,536	**'Word'**	Level 4

1.2.1.1. Families

𐤃𐤐 1.4: Nwehu Nuswei Word-Families

Initial (decimal)	Initial (hex)	Initial Consonant Latin	Initial Consonant NN	Category
0	0	**H**	𐤄	Functioners: Pronouns, articles, suffixes, various others
1	1	**X**	𐤇	The Verb
2	2	**S**	𐤎	Relations: Prepositions, space and time
3	3	**F**	𐤑	Variables: to be used as "jargon" in technical fields
4	4	**R**	𐤓	Household objects, common tools, vehicles
5	5	**Y**	𐤉	Animals and Macro-Biology
6	6	**N**	𐤍	General phenomena: Feelings, Emotions, Movements, Habits
7	7	**M**	𐤌	People, Family & Social Relationships, daily life
8	8	**K**	𐤊	Arts and Sciences 1
9	9	**C**	𐤒	Plants and Micro-Biology
10	A	**T**	𐤕	Quantities and Qualities
11	B	**P**	𐤐	Individual and Social Behavior
12	C	**G**	𐤂	Arts and Sciences 2
13	D	**J**	𐤆	Life Sciences
14	E	**D**	𐤃	Inorganic natural phenomena
15	F	**B**	𐤁	Medical Sciences

1.2.1.2. Geni

Since there are 16 GENI in each of 16 FAMILIES, there are 16^2 or 256 GENI, which are listed in the complete lexicon.

As an example, 𐤃𐤐 1.5 presents family **N--- 'General phenomena: Feelings, Emotions, Movements, Habits'** fully populated with GENI:

Dp 1.5: A Fully Populated FAMILY

2nd Letter	Hex	Initial Syllable	IPA	NN	Semantics
0	0000	nu-	nə	𐴀𐴉	General Phenomena
1	0001	ni-	ni	𐴀𐴊	Vision
2	0002	ne-	ne	𐴀𐴋	Sound
3	0003	nei-	nɛj	𐴀𐴌	Tactile sensation, Taste and Smell
4	0004	na-	na	𐴀𐴍	Emotions and Personalities
5	0005	nai-	naj	𐴀𐴎	Bodily actions
6	0006	no-	nɔ	𐴀𐴏	Movement
7	0007	noi-	nɔj	𐴀𐴐	Goal-directed action (social & mechanical)
8	0008	nw-	nu	𐴀𐴑	General Personalities & Perception
9	0009	nwi-	nwi	𐴀𐴒	Non-moving action
10	000A	nwe-	nwe	𐴀𐴓	Communication
11	000B	nwei-	nwɛj	𐴀𐴔	Non-relational space-time concepts
12	000C	nwa-	nwa	𐴀𐴕	God and theology: spirit, mind & will
13	000D	nwai-	nwaj	𐴀𐴖	Epistemology, Philosophy, Metaphysics
14	000E	nwo-	nwɔ	𐴀𐴗	General kinds of violent actions
15	000F	nwoi-	nwɔj	𐴀𐴘	Gestures and Postures

1.2.1.3. Species

In NN, detailed semantic space is populated in one of two ways: ORDINAL or DIMENSIONAL. Whenever possible, the DIMENSIONAL system is used, which follows more closely Basic Principle ❸ of phonetic symbolism, providing vowel word-endings that hint at the word's meaning.

1.2.1.3.1 Ordinal

ORDINAL space is one-dimensional, linear. Words may occupy sequential space in a domain whether or not they are related in a a logical way to the words adjacent to them in the numerical sequence. ORDINAL representation makes sense with concepts like numbers, dates, and measurements, but with other groups

of words it is sometimes employed simply to utilize vocabulary space efficiently, regardless of the semantic relations of neighboring terms. When this is done, it is done as a fall-back, because it fails to meet the phonetic symbolism Principle ❸.

𝔇ρ 1.6 illustrates ORDINAL organization of a word-SPECIES – the numbers from zero to sixteen in NN's hexadecimal numbering system. The NN numeric symbols are illustrated as well.

𝔇ρ 1.6: SPECIES populated using ordinal organization: "Hexadecimal integers"

Integers 0 – 0F	0	1	2	3	4	5	6	7
	tihu	*tihi*	*tihe*	*tihei*	*tiha*	*tihai*	*tiho*	*tihoi*

8	9	A	B	C	D	E	F
tihw	*tihwi*	*tihwe*	*tihwei*	*tihwa*	*tihwai*	*tihwo*	*tihwoi*

1.2.1.3.2 Dimensional

DIMENSIONAL semantic space makes use of the broad 'meanings' assigned to the (stressed) vowels at the ends of words, shown in 𝔇ρ 1.2 above. Since the six vowels are used in sixteen combinations, the result is, in effect, a multi-dimensionality in the vocabulary space within a sixteen-word SPECIES.

In addition to the observed associations between vowels and size shown in 𝔇ρ 1.1, NN establishes additional sound-semantic associations of its own, based roughly on the observed associations. The result is that populating a SPECIES using the dimensional plan, it is necessary to understand the subject matter of the SPECIES. This often requires considerable study and careful thought. How do the concepts in a subject area coordinate best with phonetic symbolism, with size, gender, and the extended priniples of PARTICLE, WAVE and FIELD (introduced in §1.1.3)?

Interaction between these factors often results in assigning meanings to words in NN that have no direct translation in English or other languages. This in turn requires careful consideration of how to translate or explain the resulting NN word-concepts in English or another familiar language. The use of this method of populating vocabulary space accounts for the slow development of the NN language, and the large number of subject areas not yet provided with NN vocabulary.

1.3. Dimensionality

The concept of "dimensionality" illustrated in 𝔇ρ 1.2 above requires some discussion. Dimensionality is central to much lexical organization in NN. While the macro-structure of the language is hierarchical, following Wilkins' (1668) Philosphical Language, the micro-structure is dimensional whenever possible.

The term "dimension" is used to convey the idea that a language is not a simple list of words – a single dimension. Rather, language should reflect as much as possible the complex relationship between concepts that exists in the minds of speakers. Of course, not all speakers relate words to words in the same way, nor do the relationships necessarily remain constant over time. But wherever there seems to be a consensus of relationship between concepts, NN should consider representing that relationship by using whatever tools are available within its own structure.

How does one know if there is a "consensus" on conceptual relationships? Much of the input comes from comparing what natural languages embody in their structure and vocabulary from cross-language studies such as the survey of personality-related words by Ashton and Lee, beginning about 2000[2]. Studies in anthropology, psychology, and brain imaging contribute as well. Software that creates "word-clouds" gives us insightful glimpses. Admitedly, a large factor is "instinct" – the instinct of the person or people developing the artificial language. Hopefully, these inventors' designs is inspired by a sense of beauty as well.

Over the decades of its development, several DIMENSIONS have emerged as important to NN. They include number, gender, and age, size, distance; also PARTICLE, WAVE, and FIELD.

1.3.1. Particle Wave, Field

In physics, many phenomena can be observed and explained in any of three ways: as **particles**, as **waves**, or as **fields**. For example, light can be studied as photon particles, as electro-magnetic waves, or as fields of illumination.

NN uses this concept, introduced into linguistics by Kenneth L. Pike[3]. Pike applies the three-fold analytic technique from physics to linguistics, describing linguistic items in terms of particles, waves, and fields.

In languages, words can refer to:

2 Ashton, Michael C.; Lee, Kibeom; Perugini, Marco; Szarota, Piotr; de Vries, Reinout E.; Di Blas, Lisa; Boies, Kathleen; De Raad, Boele (2004). "A Six-Factor Structure of Personality-Descriptive Adjectives: Solutions From Psycholexical Studies in Seven Languages". Journal of Personality and Social Psychology. **86** (2): 356–366.

3 Kenneth L. Pike. 1967. Language in Relation to a Unifed Theory of the Structure of Human Behavior (2nd edition).

entities, which are similar to *particles* in physics, and called "nouns" or "substantives" in linguistics;

actions, similar to *waves* in physics and known as "verbs" in linguistics; or

attributes, similar to *fields* in physics, and called "adjectives" when used with nouns, or "adverbs" when applied to verbs.

This three-fold distinction can be helpfully applied to many subject areas. It is used broadly in building the NN vocabulary by associating each mode with a vowel ending, as shown in Ɗρ 1.2 above. The following concept-sound relationship has been embodied in multiple parts of the NN vocabulary:

- ᑭ *e* /ɛ/: WAVE, active, action
- ᒋ *a* /a/: FIELD, descriptor, attribute
- ᑭ *o* /ɔ/: PARTICLE, entity, object

The most direct expression of this concept is in the FUNCTIONAL SPECIES ᑲᑉᓯ- *Hus*- 'Role-state Perpective'. This can be appended to other words as a MARKER to indicate the headword's status. In this species, *e* – *a* – *o* indicates WAVE – FIELD – PARTICLE, while *i* – *wi* – *w* indicate active – middle – passive. This is best understood in a two-dimensional grid (Ɗρ 1.8). This provides a good example of two-dimensional interaction using the six-vowel system. (Details in the chapter, "Functional Words".)

Ɗρ 1.8: ᑲᑉᓯ– Hus- Role-State Perspective

State ► / Role ▼		Unspecified activity focus		Active		Passive		Middle	
Core value				i		w		w-i	
unspecified, general	u	*husu*	Role or state of a language element	*husi*	Active; Exerting effect on another entity in the sentence	*husw*	Passive; Being acted upon	*huswi*	Middle; acting upon self
Wave: Action (Verb)	e	*huse*	Verbal (action) – WAVE	*husei*	Active transitive verb – WAVE	*huswe*	Passive verbal – WAVE	*huswei*	Middle verbal – WAVE
Field: State (Adjective, adverb)	a	*husa*	Adjectival – FIELD	*husai*	Active adjectival – FIELD	*huswa*	Passive adjectival FIELD	*huswai*	Middle adjectival FIELD
Particle: Entity (Noun)	o	*huso*	Substantive – PARTICLE; noun, entity, substantive	*husoi*	Active agent, ergative~ PARTICLE	*huswo*	Passive substantive – PARTICLE	*huswoi*	Middle substantive - PARTICLE

1.3.2. Gender and Age dimensions

Some SPECIES of words indicate gender and age. In those SPECIES, final vowel ᑭ *e* is associated with feminine, ᒋ *a* with gender flexibility, and ᑭ *o* with masculine. Youth is associated with ᒐ *i* , age with ᓴ *w* /u/, and ᓴ *wi*

with the state in between (adulthood). Please note that gender and age are represented in NN not because of some "sexist" or "ageist" attitude, but because practically all human languages express these distinctions, indicating that these are topics of great interest in human communication. For speakers who wish to avoid mention of gender or age, the final vowel ɪ *u* /ə/ allows total avoidance of these matters.

Gender and age are expressed in, among others, FUNCTION SPECIES ɬɪ⅄ *Hum-* 'Bio-Social Status', which can be used independently or appended as a suffix to pronouns or other words with which gender and age need to be associated. NN pronouns do not express gender; to express gender and age with pronouns, any of these words can be appended to a pronoun, in which case the first syllable is not pronounced in speech and the second syllable receives secondary stress: ɪᴾ⅄ᑉ ɪɪ⅄ᒐ *hamw-humi* [haˈmuˌmi] 'you-children'. Again, this is best understood in two dimensions:

Dp 1.7: ɬɪ⅄- Hum- Age and Gender

		Unmodified		Young		Old		Adult	
Core value		u		i		w		w-i	
unspecified, general	u	*humu*	Person	*humi*	Young person	*humw*	Elder person	*humwi*	Adult person, neither old nor young
female	e	*hume*	Female person	*humei*	Female youth	*humwe*	Elder female person	*humwei*	Adult female person
flex-gender	a	*huma*	Flex-genderd person	*humai*	Flex-gendered youth	*humwa*	Flex-gendered elder person	*humwai*	Flex-gendered adult person
male	o	*humo*	Male person	*humoi*	Male youth	*humwo*	Elder male person	*humwoi*	Adult male person

Gender and age are also incorporated directly in words for family relations. For example, ⅄ɪ⅄ᑎ *mume* [məˈmɛ] 'mother', ⅄ɪ⅄ᑎ *mumo* [məˈmɔ] 'father', ⅄ɪ⅄ᑯ *mumei* [məˈmɛj] 'daughter', ⅄ɪ⅄ᑎ *mumwo* [məˈmwɔ] 'grandfather'. Names for common animals use the same final vowels: ᒪᒐᒪɪ *yixu* [ʒiˈʃə] 'dog' and ᒪᒐᒪᑉ *yixw* [ʒiˈʃu] 'old dog'; or ᒪᒐ⅄ᑯ *yimei* [ʒiˈmɛj] 'female calf, heifer'.

1.3.3. Other Dimensions

The vowel structure illustrated above allows combining many concepts together. This can be done for various reasons, including representing common socio-linguistic combinations, or encouraging people to think more carefully about word-concept relations. Some examples are given in *Dp* 1.9:

Dp 1.9: Multiple Dimensionality

Role and Number:	ɬɪɪ–	*Huh-*
Genitive and Possessive:	ɬɪ⅄–	*Huf-*
Manner and comparison:	ɬɪᒪ–	*Huy-*

Attitudinal and size:	*Huc-*
Social rank and status:	*Huj-*
Abstractness and Reality:	*Nuh-*
Good and Bad:	*Nux-*
Natural and Artificial:	*Nus-*
Simplicity and Complication:	*Nuy-*
Peace and Harmony:	*Nun-*
Similarity and Uniformity:	*Num-*
Energy Exchange and Impact:	*Nuk-*
Task and Situation Evaluation:	*Nuc-*
Strange and Familiar and Common and Unusual:	*Nut-*
Pattern / Model and Copy and Imitation:	*Nup-*
Perfect and Right and Imperfect and Improper:	*Nug-*
Convenience, compatibility:	*Nuj-*
Progress and Growth and Regress and Decay:	*Nud-*

1.4. The Lexicon

The word-list or dictionary of Nwehu Nuswei consists of a set of fairly uniform spreadsheets. At any rate, the intention is for the spreadsheets to be uniform, but given the development of the language over several decades, there have been updates and improvements over time. Additionally, some FAMILIES are structured somewhat differently than the majority, and their spreadsheets have been constructed to reflect these diffeences. The majority are stored in Open Document Spreadsheet format (.ods), though some are in Microsoft Excel (.xlsx) format. For the most part they are constructed and maintained using open-source software (LibreOffice) but are readable in Microsoft Excel.

1.4.1. Organizational Structure

At the root of the global Nwehu Nuswei folder is the "Families" spreadsheet. This is the master list of the 16 initial consonants. The semantic space allocated to each of the 16 vowels in its first syllable is detailed on a separate worksheet (tab) in the "Families" file. These 16 tabs each list the 16 vowels following the initial consonant, together with the topics covered by words beginning with that syllable. In that way, 256 high-level concepts are defined in the "Families" master-file.

As noted above, the second level is called a GENUS. Each of the 16 FAMILIES has a subdirectory of its own. Within this directory, a second-level master-file is populated by linking its initial worksheet to the Families file. This is followed by 16 spreadsheet files, each representing one of the 16 vowels that follow the initial consonant. Semantic subspaces are defined for each of the 16 second-consonants that can follow the first

syllable. The second-level master-file thus defines 256 semantic spaces within the overarching space defined in the "Families" file for that initial consonant.

Within the subdirectory for each initial consonant, in addition to the second-level master-file there is a third-level detailed file for each of the 16 vowels of the first syllable which make up that FAMILY'S GENI. Its first worksheet is populated by linking to the semantic areas for the 16 GENI listed in the second-level file. As you probably guessed, it has 16 worksheets (tabs): one for each of the 16 consonants that begin the second syllable and determine a SPECIES. Each worksheet represents a SPECIES of words. Those worksheets list each of the 16 vowels that terminate words – that is, the actual words of Nwehu Nuswei – with their definitons: this is a page of the lexicon.

1.4.2. Structure of a Lexical Page

Given the mathematical skeleton forming the structure of NN, the words are generated computationally within each lexical page, including the Latin alphabet spelling, the IPA pronunciation, and the spelling in NN characters. Using a template file, it is possible to quickly set up an entire GENUS by entering the number of the first and second letters on the main sheet. This allows the language-developer to focus on applying useful semantics to each word, following the principles of NN outlined above. As a sample, the lexical page for *Mum-* ⅄ɪ⅄– 'Parents and children; grandparents and grandchildren' is shown in *Ɗρ* 1.10.

Ɗρ 1.10: Lexical entry for SPECIES Mum-

Nwehu Nuswei – Level 3 Word Species			Decimal	NN	Value of word (decimal)
Letter	1	m	7	⅄	28672
Letter	2	u	0	↥	0
Letter	3	m	7	⅄	112
			Value of first word in this species:		28784
Numeric (Hex):		7070	Pronounced:	NN	
Written:		mum	məm	⅄↥⅄	mə'm

Category: **Parents and children; Grandparents and grandchildren (either side)**

Decimal	Hex	4th, decimal	Roman	IPA	NN	Semantics
28784	7070	0	mumu	mə'mə	⅄↥⅄↥	Immediate (nuclear) family
28785	7071	1	mumi	mə'mi	⅄↥⅄⅃	Childhood
28786	7072	2	mume	mə'me	⅄↥⅄ᒍ	Mother
28787	7073	3	mumei	mə'mɛj	⅄↥⅄ᒍ	Daughter
28788	7074	4	muma	mə'ma	⅄↥⅄ᒋ	Parent
28789	7075	5	mumai	mə'maj	⅄↥⅄ᑲ	Child
28790	7076	6	mumo	mə'mɔ	⅄↥⅄ᑯ	Father
28791	7077	7	mumoi	mə'mɔj	⅄↥⅄ᑰ	Son
28792	7078	8	mumw	mə'mu	⅄↥⅄ᖷ	Parenthood
28793	7079	9	mumwi	mə'mwi	⅄↥⅄ᖸ	Grandchildhood
28794	707A	10	mumwe	mə'mwe	⅄↥⅄ᖹ	Grandmother
28795	707B	11	mumwei	mə'mwɛj	⅄↥⅄ᖹ	Granddaughter
28796	707C	12	mumwa	mə'mwa	⅄↥⅄ᖿ	Grandparent
28797	707D	13	mumwai	mə'mwaj	⅄↥⅄ᖿ	Grandchild
28798	707E	14	mumwo	mə'mwɔ	⅄↥⅄ᖾ	Grandfather
28799	707F	15	mumwoi	mə'mwɔj	⅄↥⅄ᖾ	Grandson

When a SPECIES is organized in using the DIMENSIONAL system (§1.3), the worksheet also echos the list in a two-dimensional form (Ɗρ 1.11):

Dp 1.11: SPECIES Mum- Dimensional Table

		Current		Younger		Older		Double-younger	
				i		w		w-i	
Core value		Immediate parents		Children		Grandparents		Grandchildren	
unspecified, general	*u*	*mumu*	Immediate (nuclear) family	*mumi*	Childhood	*mumw*	Parenthood	*mumwi*	Grandchild-hood
female	*e*	*mume*	Mother	*mumei*	Daughter	*mumwe*	Grandmother	*mumwei*	Grand-daughter
neutral, unspecified gender	*a*	*muma*	Parent	*mumai*	Child	*mumwa*	Grandparent	*mumwai*	Grandchild
male	*o*	*mumo*	Father	*mumoi*	Son	*mumwo*	Grandfather	*mumwoi*	Grandson

1.4.3. Room for Expansion

Provision is made within NN for the expansion of the lexicon into areas of technical and specialist detail. One of the 16 highest-level FAMILIES, 4096 words with the initial consonant ⅄ F, is reserved for "jargon". In some ways this is similar to the Uncode "Private Use Area", or the development of an XML ontology.

If a group of specialists needs more words than are allocated in the predefined NN lexicon, they can get together and develop a vocabulary of their own. They could start with one or more words in the predefined NN lexicon – representing the area upon which they want to expand, for example, ⅂ϥⅠ⇕ *Rwhu* 'electronics'. After organizing the electronic devices they are focused on and assigning words beginning with ⅄ F to each class and sub-sclass of device, these devices can be referred to using the compound-word such as ⅂ϥⅠ⇕–⅄ᒋᒍ⅂ᒍ *Rwhu-fane.*

As a proof-of-concept, the classification of minerals was undertaken, using the existing Nickel-Strunz system as the authoritative classification system. The FAMILY beginning with ⅄⅂––– *D----* represents 'Inorganic natural phenomena', with GENUS ⅄⅂ϥ–– *Dw--* representing 'Minerology'. To pick a mineral at random to illustrate, 'Eugenite' (Ag11Hg2, Nickel-Strunz code 1.AD.15c) uses the base-word ⅄⅂ϥ⅃ᒍ *dwxe-* 'metals and intermetallic alloys, sub-series 1.AD, Mercury-amalgam family' followed by ⅄ᒍ⊏ᗡ *feyai* as part of an ordinal sequence of sounds based on the Nickel-Strunz Code. Thus ⅄⅂ϥ⅃ᒍ–⅄ᒍ⊏ᗡ *dwxe-feyai* is the NN term for 'Eugenite'. The expansion FAMILY is explained in more detail in Chapter 18 "F--- Expansion Words".

1.4.4. Lexicon Progress

As of this writing (2023-12-23) only about 34% of the total 65,536-word vocabulary space has been populated. That includes the verb, pronouns, articles and many function words; calendar, numbers and measures, basic family relations; familiar domestic and wild animals; spacial and temporal relations; chemical elements and common compounds; and a selection of interesting topics in human relations,

philosophy, and language. There is a long way to go, since populating the lexicon requires understanding the topics, in order to reflect the relationships between concepts in the dimensional structure of Nwehu Nuswei. That's a large part of what makes it so fun and interesting to accept the challenge of inventing a highly structured, logical yet human language.