3-30-1978

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Fugal, Robert (1978) "WH- Words from a Jokobsonian Point of View," Deseret Language and Linguistic Society Symposium: Vol. 4 : Iss. 1 , Article 15.
Available at: https://scholarsarchive.byu.edu/dlls/vol4/iss1/15

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WH- WORDS FROM A JAKOBSONIAN POINT OF VIEW

Robert Fugal

Scientific analysis has led the way to the discovery of many important abstractions. Starlight analysis has led to the discovery of quasars and galaxies. Physics analysis has led to the discovery of the theory of relativity. Biochemical analysis has led to the discovery of DNA. The list could go on, but the point here is that analysis is a proven method of learning truth, a practical means of discovering intangible realities.

For a long time biochemists tried to figure out what made chromosomes. By analysis, they discovered that chromosomes were made of genes and genes of proteins. By noticing the similar way each protein reacted in identical chemical environments they discovered a common invariant atomic structure possessed by each of the proteins. Because each protein had the common structure, each was classified as an amino acid. You can see the structural diagram of six of these amino acids in figure one. Each structural diagram represents the invariant structure of each of the proteins shown, and the circled part is the common invariant structure. The common invariant causes the acids to react in similar ways in different chemical environments. However, by noticing the slightly different way the different proteins react in identical chemical environments, the chemists discovered marked differences among the various acids. They also found that the marked difference or the unique part of each acid caused the acid to respond in some unique and predictable ways in different chemical environments. This predictability then helped them discover the structure of the highly complex molecule, DNA, (See figure two) and thereby explain many heretofore mysteries of genetic inheritance. The work is not complete, and much money and manpower are still spent on biochemical analysis.

One success story breeds hope of another. Roman Jakobson, famous for his work in phonology, successfully analyzed the Russian case system. As he did so, he discovered some very abstract semantic distinctive features that defined the invariant meaning of the Russian cases. These features, comparable to the organic elements that make up amino acids, seem to be universal building blocks of meaning; by combining in different ways, they define the essential, abstract and invariant meaning of each lexical and grammatical unit of a language. As much as biochemical analysis, Jakobsonian semantic analysis merits the attention of researchers and scholars. Jakobson has provided many keen insights into language which, if researched and developed, could lead to discoveries as important to linguistics as DNA is to genetics.

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Amino Acids

Phenylalanine (Phe)

Tyrosine (Tyr)

Tryptophan (Trp)

Lysine (Lys)

Arginine (Arg)

Histidine (His)

Common Invariant

Figure 1.

Sketch of DNA

Figure 2.

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Jakobson has said "... the most difficult part in the study of words is the lexicon. Linguistics is now trying, step by step, to classify lexical units."¹ This paper attempts to take one small, exploratory step toward classifying lexical units according to Jakobson's theory of language. Two major goals of the paper are, first, to show the common invariant meaning of the words what, which, who, when, where, and why and, second, to demonstrate the invariant meaning of each of them. Before doing so, however, it is necessary to explain a few important concepts from the Jakobsonian point of view.

According to Jakobson, "language is not a set of ready made sentences, but rather a system of signs."² (Figure three.) Unlike many linguists, Jakobson believes that the linguistic sign is a "necessary, dependent, indissoluble duality, a combination of a signans and a signatum."³ The signans, or form, is the physical speech sound that carries the signatum (meaning) or translatable, intelligible essence of speech. In other words, form is the embodiment of the knowable but intangible meaning, which cannot be separated from the form. Jakobson is amused by American linguists who try to study form without meaning. He compares such studies to physiologists studying the behavior of a chicken without a head. He feels that it would be as great a mistake to assume that it is normal for form to be without meaning as it would be to assume that a chicken is normal without its head.⁴ He maintains that "no form exists without some meaningful function to fulfill ... and that] formal differences are always meaningful."⁵

A major consequence of this conception of language and more particularly the notion of the linguistic sign is the principle of invariance. Jakobson says, "The question of the variants leads to the greatest problem in linguistics: the problem of invariants. There always has to be a common denominator ..."⁶ He also says,

³Waugh, Roman, p. 36.
⁴Van Ballaer, p. 46.
⁵Waugh, Roman, p. 43.
"Language is a system of signs."

\[ s = \text{sign} \]
\[ ss = \text{sub system} \]
One the level of words there is always meaning. But has a word one meaning or a number of meanings? The distinction has to be made between homonyms, words with really different meanings, and families of words where it is clear that there is one basic meaning with, furthermore, a high number of partial, contextual, meanings. The important question in such a case is, 'what is the invariant?'

In short, the principle of invariance means that for every linguistic form, there is only one real and invariant meaning, regardless of how many different referents or contextual variants the form may have.

Linguistic forms may have many contextual variants because "meaning is a classification, a categorization imposed by language or extralinguistic reality." Because meaning classifies extralinguistic reality, it is natural for some meaningful forms to be able to classify, or include in their categorization, many different items from the world of experience. Each different item categorized or referred to by a linguistic sign is only a contextual variant, not a different meaning. Thus, a distinction must be made between meaning and reference. "Jakobson has always contended . . . that meaning is to be constantly and rigorously separated from its support--reference (denotatum) or ontological reality." Jakobson supports his argument by citing examples of meaning that does exist without reference. For example, "ambrosia" and "unicord" and "quarks," while they may not have a real referent are translatable and meaningful. He summarizes "in general, the symbol cannot indicate any particular thing; it denotes a kind of thing." Therefore, the linguistic sign has a form inseparably linked to one invariant meaning which classifies a "kind of thing" rather than any "particular thing." Many particular things classified under one sign give rise to the contextual variants of that sign. Poets, scientists, inventors, advertizers, college students, slang users, etc. constantly use established linguistic signs to categorize new feelings, discoveries, gadg-

7 Van Ballaer, p. 31.

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ets, products, complaints, people, etc. Consequently, contextual variants become infinite. Amazingly, some linguists take on the impossible task of listing all the contextual variants of a sign. A more productive goal is to find the invariant meaning of the sign, the linguistic basis of classification that permits poets and others to use signs in novel contexts and still communicate. (The author feels that a poet's genius is an intuitive knowledge of what a sign can and cannot categorize and which sign best categorizes the subject at hand. Consequently, poetic language, especially metaphor, often demonstrates most vividly the real invariant meaning of a sign.)

Another important Jakobsonian concept is that of the "code." Linda Waugh characterizes the "code" as follows:

In terms of the semiotic non-material nature of the whole, we have the antinomy and means-end relation between code and message, where message is defined by Jakobson as the unique, semelfactive, single act of speech, while the code is the system which underlies and makes possible that and every other message. Code then, is not a material entity but rather a semiotic one.

The code is made up of many different sub-codes. At one level of sub-codes, the linguistic sign is the main constituent. (Figure three is a graphic representation of a very small portion of the code.) At this level, the meaning of the sign is given in relation to the meanings of the other signs of that particular sub-code, similar to the way an amino acid is analyzed and characterized by its relationship to other amino acids. For example, the meanings of the different tense forms can be known only in relation to each other. One cannot know the meaning of past tense forms without knowing the meaning of present tense forms and future tense forms. Similarly, one cannot know the complete meaning of what without knowing the meaning of which, who, when, where, and why.

The difference between code and message creates a "dialectic tension" known as deixis.

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11 Van Baller, p. 33.
12 Waugh, Roman, p. 18.
13 Waugh, Roman, p. 20.
In deictic categories or deictic features, the extralinguistic reality embraces the speech situation, and so the classification or categorization necessarily includes the speech situation itself. Thus, in the definition of deictic units or features or processes, the speech situation must be taken into account. By this definition, \textit{I, you, today, now, here, this, come, etc.} are all deictic. Any category which presupposes a given linguistic context is necessarily deictic, for the speech situation is a necessary part of its definition.\textsuperscript{14}

The \textit{wh-} words are deictic because they presuppose or depend upon a given linguistic context. They derive their meaning by pointing to antecedents in the message and to referents in extralinguistic reality.

The last important definition is that of the distinction between the terms "marked" and "unmarked."

In semantics, MARKED [+ feature X] refers to the necessary presence of the information given by the feature in all the contexts in all the uses of the particular item. In other words, the item must invariantly carry whatever unit of information is given by the feature. UNMARKED [Ø feature X] means that the information given by feature X is not necessarily present in all the contexts where the unmarked form occurs. It means either presence or absence of that particular piece of information given by X.\textsuperscript{15}

The following analysis attempts to describe the common semantic features of \textit{what, which, who, when, where, and why} and each of their correlations in the linguistic code, thereby contributing to the knowledge of lexical units in English.

As suggested by their name, \textit{wh-} words are somewhat related in form. Their phonemic representations, /hwat/, /hwic/, /hu/, /hwen/, /hwer/, /hwai/, show that each form starts with the sound /h/ followed by a rounded semi-vowel or vowel. This similarity in form is likely to indicate some similarity in meaning.

\textsuperscript{14}Waugh, "The Semantics," p. 87.

\textsuperscript{15}Waugh, "The Semantics," pp. 85-86.
In fact, they are very similar in meaning. As mentioned above, the wh- words are all deictic: they all point to some referent in their context. When a speaker says, "What are you doing?" the hearer cannot know the meaning of "what" without knowing the linguistic context "are you doing." The referent of "what" includes some sign of group of signs in the message of which it is a part, i.e. "wayt" refers to its answer (the sign /swimin/ or whatever) and indirectly to the referent of the answer (the real act of swimming). "What" and the other wh- words are deictic because they presuppose their own linguistic context and thus the speech situation is a necessary part of their definition. Transformationalists show that wh- words refer to other parts of the context by showing the referent in the deep structure when the wh- word is a relative, e.g. the boy (the boy broke his shin) cried loudly and by showing "something" as the referent when the wh- word is an interrogative or indefinite.

Another meaning that seems to be common to all these words is that they are marked for one of Jakobson's semantic distinctive features, dimensionality. In other words, each of them categorizes a referent that has limits, bounds, or dimensions, or each imposes limits, bounds, or dimensions on its referent. When a speaker says, "What are you doing?" the hearer knows that he is requested to describe the limits of or type of activity. He may answer "Just eating" and thereby define the limits of his activity. His activity does not extend across the boundary into other activities such as running, jumping, etc.

Wh- words also are marked for objectiveness: in the mind of the speaker/hearer they bring their referents into an existence independent from all other parts of ontological reality. When a speaker says "What have you done?" the word "what" refers to the hearer's past action and singles it out or gives it an independent existence in the mind of the hearer. Objectiveness makes wh- words especially appropriate for interrogatives because the wh- words tell the hearer to bring the referent (answer) into an independent existence so that it may be examined.

Sentences A through R show that what, which, who, when, where, and why all are marked at least for deixis, dimensionality and objectiveness.

A. What did you say?* Nothing.
B. What do you think of my new dress?
C. Joe wanted to know what was the matter.

*Taken from the Oxford English Dictionary.
D. Which way shall I go? To the left.
E. They conformed to the rules, observing the spirit rather than the letter of the law. Which was just as well.*
F. Can you remember the store which was by Joe's house?
G. Who said that? The Democrats.
H. The boy who broke his shin cried and cried.
I. Sally told who her boyfriend was.
J. When did you get there? At 5:00.
K. I can't remember when I last saw a movie.
L. At 5:00 when I get off work I'm going to the bakery.
M. Where did you come from? Heaven.
N. He didn't say where he was going.
O. I'm going back to the place where I came from.
P. Why do you keep poking me? Because I like to.
Q. I don't know why she swallowed that fly.
R. She refused to tell me the reason why she couldn't come.

"What" in sentence A refers to the sign "Nothing" and is, therefore, deictic. "What" requests an independent answer limited in number of signs whose referent is also limited and independent. An endless string of signs with an infinite meaning would be an inappropriate answer. The referent of "nothing" is limited: it is bounded on all sides by something, and furthermore, the referent of "nothing" exists all by itself, independent of all things. If the answer were "You're up a creek without a paddle" it also would be limited in number of signs and in referent, and the limited number of signs, like the limited referent, would have an independent existence. Because "what" limits or bounds its referent, it has dimensionality. Because "what" requests that its referent be brought into an independent existence, it has objectiveness. Item B is so similar to A that it need not be discussed at length, but it is interesting to that the questioner obviously is not asking for an infinite listing of everything the responder thinks about the dress, only a limited, independent reply. In item C Joe wanted to know the limited problem which existed independently outside of his knowledge, the limited knowledge of a problem that existed independent of other problems in someone else's mind. Item D, like A and B, uses "which" to refer to the limited answer with an independent existence. In item E deixis, dimensionality, and objectiveness become quite apparent. The referent of "which" is the entire preceding sentence, which in turn refers to the limited reality "they conform to the rules, observing the spirit rather than the letter of the law." The "which" separates the conformity from all other reality in the mind of both the speaker and hearer. The "which" in item F refers to "store," which obviously is limited and exists independently.
"Who" in item G, "when" in J, "where" in M and "why" in P are like A, B and D in that they presuppose an answer in their linguistic context--they are deictic. They also enforce dimensionality and objectiveness upon both their answers and the referents of their answers. Each answer is made of a finite number of signs. The referent of "the democrats" is a limited number of people that as democrats are distinct, separate or independent of all other reality. The referent of "at 5:00" is a limited portion of time separate from all other reality. "Heaven" is a place that exists separate from the world and is bounded in that it does not cross the border into earthly things. "because I like to" is an independent and limited reason for "poking me."

The "who" in item H refers to the boy, who obviously has bounds and limits and is singled out from the rest of reality. "When" in L refers to the limited and independent time "5:00 p.m." In O "where" refers to "the place" which is limited and set apart from the rest of reality by the phrase "where I came from." "Why" in item R refers to a limited and independent reason for the girl not to come. "Who" in item I refers to the name or description of Sally's boyfriend. Sally would be the first to admit that he is limited in form and exists in her mind completely independent of all else. "When" in sentence K refers to the single independent time that "I last saw a movie." Item N shows that "where" refers to a limited and independent place that "he" was going. The "why" in Q refers to the unique and limited reason that made her "swallow that fly."

Further examination of the contextual variants of each of the wh- words supports the existence of the common invariant described above and also illustrates the unique invariant structure of each word thereby showing the relationships that exist among them.

The major contextual variants of "what" are its use as an interrogative, an indefinite, an exclamatory, and other uses. Following are several contextual variants of "what" used in these categories.

Interrogative 1. What are these wounds in thine hands?*
   Then shall he answer them, Those with which I was wounded in the house of my friends.
2. What are the technical words . . . ?*
3. You noticed that young man, sir, in at Darby's. Yes. What is he. Deserter, sir.*
4. What on earth is that?
5. What did you do that for?
6. What time is it?
7. If Tom dies, what then?
8. What child is this?
9. What did you say?*

Indefinite
10. Milton means what he says.*
11. You may have half a dozen legs for what I know, as it is difficult to discover any under the petticoats you wear *
12. They changed what they could*
14. There are few madmen but what are observed to be afraid of the strait waistcoat.*
15. I will take what indulgence the . . . reader will give me.*

Exclamatory and Other
16. What a lovely day
17. Daddy, I've decided to marry Joe. "What "
18. What with hunting, fishing, canoe making and bad weather, the progress of the august travellers was so slow.*
19. My lady will know the what and the why.*

In sentence 1 "what" refers to "wounds." Since the referent is a part of the question, the question almost seems pointless. But it is not pointless because "what" requests that further but limited explanation about the wounds be given an independent existence. Notice the type of referent that is bounded or limited by the word "what" in sentences 2 through 9: Sentence 2, some technical words; Sentence 3, "deserter"; Sentence 4, some unnamed object; Sentence 5, a reason; Sentence 6, a specific time; Sentence 7, the probably result of Tom's death; Sentence 8, a child; Sentence 9, a message. "What" in sentence 10 refers to the form and meaning of Milton's words. "What" in sentence 11 refers to the limited knowledge of the speaker. In sentence 12 it refers to the limited and independent things that "they" could change. Sentence 13 says that John has the ability to discern the bounds and true limits of things in extralinguistic reality and to give them an independent existence: he can match the limited meaning of signs with their limited referents. The "what" in sentence 14 refers to a limited group, madmen, and their specific fear of the strait waistcoat. One way to think of it is to imagine the word "what" drawing a line around the madmen and calling attention to the fact that there are just a few of them. In sentence 15, "what" refers to specific or limited quantity of indulgence that the reader will give to the speaker.

"What" as an exclamatory really shows its objectiveness and dimensionality. In sentence 16, the "what" refers to the lovely day which has bounds and limits just as do the words "a lovely day." The exclamation singles a day out for special recognition. The "what" in sentence 17 works just like "what" in sentence 16 only more intensely. Sentence 18 refers to the progress of the travellers and the reasons why it was so slow. It would be impossible to list every reason.
because they may be infinite, so the speaker uses "what" to delimit or bound all of the reasons aside from the ones mentioned, and then adds to them the major reasons of hunting, fishing, etc. Sentence 19 shows the use of "what" as a sign of itself. In other words, the referent of "what" is the word "what." Although there could be an infinite listing of contextual variants of the word "what," it can be seen from those listed above that "what" is always deictic and it always limits, bounds or circumscribes some portion of extralinguistic reality and gives it an independent existence.

"Which" is like "what" in that it has deixis, dimensionality and objectiveness. But it is different from "what" in that it is marked for a deictic objectiveness, which is more specific than regular objectiveness. It separates a referent from other referents of the same class. Thus, the word "which" takes a portion of extralinguistic reality, bounds it, gives it a special, independent existence, and then separates its referent from other referents of the same class or group. Note these qualities in the following sentences.

Interrogative
20. When the question is asked, Was Jesus the Messiah?" the obvious reply is, "Which Messiah?"*
21. Which is Julie?
22. But which is it to be? Fight or make friends?*

Indefinite
23. I have an assignment due today, but I've forgotten which.
24. I can't tell which is which.
25. When, which happened every day, they forgot their disguises for awhile, they talked quite freely.*

Relative
26. Let us suppose that there is a town which is able to support two banks.*
27. His mother had ten children, of which he was the oldest.*
28. He is on the high road to get all the men for which he has asked.*
29. These were works which, though I often inspected, I did not accurately study.*
30. The monuments spoken of in the second part of the following poem, which monuments do now exist as I have there described them.*

In sentence 20, "which" implies that of the many Messiahs that have existed, which one was the independent being named Jesus. In sentence 21, the speaker wants to know of all the persons which one is named Julie or which one is the independent person names Julie. Sentence 22 uses "which" to refer to one of two courses of action. Whichever one is to
be will be independent of the other. In sentence 23, "which" refers to the particular assignment independent of all other assignments that is due today. In sentence 24, the "I" has an inability to distinguish one independent referent from another. In sentence 25, "which" refers to the specific and independent action of "they" who forgot their disguises. In sentence 26, of all the towns that exist, the speaker is supposing an independent one that is able to support two banks. Sentence 27 and 28 each use the word "which" to separate people from the entire set of people. Sentence 29 uses "which" to separate all works from those that the speaker often inspected but did not accurately study. In sentence 30, "which" refers to the independent monuments as described by the speaker.

"Who" is like "what" and "which" in that it is marked for deixis, dimensionality and objectiveness. Like "which," it also has deixis and objectiveness, but in addition to these markings, "who" is also marked for deictic duplication, i.e. a copying of some of the speaker's characteristics into the referent's. When a speaker uses the word "who," he indicates that there is a duplication or a similarity of some of his qualities in the referent of the word "who." For example, a person speaking of another person uses the word "who" because he considers the other person to be a person. If a boat is speaking to another boat, it uses the word "who" because the other boat has qualities similar to its own. If a person speaks of a cat in terms of "who," he considers the cat to have certain person-like qualities. These features can be seen in the following contextual variants of the word "who."

Interrogative 31. Who is my mother?
32. And who--who does she say dared to commit this outrage?*
33. Who on earth made that mess?

Indefinite 34. When I look at the twins, I can't tell who is who.
35. Let's take a trip to the land of marriage and see who and who are together.*
36. John, Bill, and I don't know who all left early last night.

Relative 37. My friend Bill, who has red hair, is lazy.
38. The man who has red hair is lazy.
39. The winds, who think they rule the mariner, are ruled by him.*
40. Even the lowest creature who floats on the pool's surface feels some half-conscious pleasure in the mere act of living.*

Substantive 41. It wasn't a what, it was a who.*
In sentence 31, obviously the speaker has some of his mother's traits. Sentences 32 through 38 all use "who" to refer to persons and all are spoken by persons. Both the speakers and the referents have the quality "personality" in common. In sentence 39, a person is talking about a thing, the winds. However, the person attributes the person-like characteristic of ruling and being ruled to the winds. Therefore, there is a deictic duplication of qualities of the speaker in the referent. The same type of duplication occurs in sentence 30. Although the speaker certainly does not consider the lowest creature who floats on the pool's surface to be a human, he does consider that they have a human characteristic, that is, "some half-conscious pleasure in the mere act of living." Sentence 41 makes an interesting distinction between a "what" and a "who." The "what" is unmarked for the duplication that "who" has.

At this point it is interesting to investigate the relationships among "what," "who," and "which." The difference between "what" and "which" is that "which" separates its referent from a class of similar referents while "what" separates its referent from all of reality. The difference between "which" and "who" is that "who" copies some of the features of the speaker into its referent while "which" does not. This relationship is shown in the following diagrams.

Because "what" is unmarked for objectiveness and duplication, it simply makes no comment as to whether or not its referent has those features. Consequently, it can and often does refer to items with those features in extralinguistic reality. For example, in the question "what box are you going to take?" "what" refers to a particular independent
box that is going to be taken. In the question "what girl are you going to take out?" "what" refers to "girl," which has deictic objectiveness and deictic duplication. Likewise, "which" can refer to items in the extralinguistic reality that have deictic duplication, for example, "which boy won the prize?" However, "who" cannot refer to things that do not have deictic duplication. For example, one cannot say, "the couch who is in the corner" without indicating that the couch has something in common with the speaker. Similarly, "which" cannot be used in a sentence without deictically "objectifying" its referent and "what" cannot be used in a sentence without delimiting the boundaries of the referent.

Minimal pairs help demonstrate these relationships.

**Interrogative**
42. What/which/who came?
43. What/which/who made the noise?
44. What/which/who is behind the door?
45. What/which/who is sitting there on the table?

**Indefinite**
46. What/which/who steals my purse steals trash.
47. I know what/which/who you want.

**Relative**
48. My friend what/which/who is a Mormon is nice.
49. Our Father what/which/who are in heaven.
50. He is a linguist what/which/who gives me the right to say that.

**Substantive**
51. He can't tell a what from a who or a which.

The possibilities of the referent of "what," "which," and "who" in sentence 42 are different. When one says "what came?" the speaker only knows that some limited, independent referent came. But if someone says "which came?" he must know the class of possibilities and is attempting to find out the independent one that did arrive. When one says "who came?" he knows that the referent of "who" has some qualities similar to his own. If one hears a noise and asks "what made the noise?" he does not know or imply that whatever made the noise is any particular thing or has any qualities like himself. But, if one asks "which made the noise?" he knows a class of things that could have made the noise and is trying to isolate the particular thing that made the noise. If one asks "who made the noise?" he knows that someone like himself made the noise. The same relationships hold true for the sentence in numbers 44 through 51.

It is interesting to note that if a person is sitting on the table and one asks "What is sitting there on the table," the person on the table becomes offended because the
speaker fails to indicate that the person sitting on the table has the qualities of a person. If the speaker asks "Which is sitting on the table," his emphasis is on discerning which person of the many possible persons that could sit on the table is really sitting there.

Another interesting situation is that indicated in number 50. The use of "what" can readily be eliminated because there is no referent in the sentence that is sufficiently unmarked for "what." However, either "which" or "who" could possibly fit in the sentence. If a person says "He is a linguist which gives me the right to say that," the referent of "which" can be either the fact that he is a linguist or the linguist himself as opposed to another linguist. In the first instance, "which" delimits or sets bounds for the fact that he is a linguist and objectifies or isolates that fact from the other facts for the hearer's consideration. In the second instance, the word "which" objectifies or isolates the linguist himself from all other linguists. If a person says "He is a linguist who gives me the right to say that," the only referent of "who" in the sentence is "linguist" because "linguist" is the only referent in the sentence that has some qualities of the speaker.

The situation presented in 49 is similar to that of 50. "What" can be readily eliminated because it is not sufficiently marked for the referents in the sentence. If a person says "Our Father which art in heaven," he objectifies or singles out the Father in heaven as opposed to the one of earth. But, if a person says "our Father who art in heaven," he not only specifies the one in heaven but also indicates that the referent has some person-like attributes. Sentence 51 indicates that "he" cannot distinguish a referent without deictic duplication or deictic objectiveness from referents marked for those features.

"When" is like "what," "which," and "who" in that it is marked for deixis, dimensionality and objectiveness, but it is different from all of them in that it is marked for transitivity also, i.e. "when" indicates a close contact between its referent and its predicate. (In this respect, "when" is much like the preposition "on" which indicates the close contact between its object and its modifier.) For example, in the sentence "She came when he left" "when" indicates a contact between the two actions. In the sentence "I'll go when I'm called" the "when" indicates contact, transitivity or simultaneity of the two actions. In "at noon, when the buzzer rings, you are dismissed," "when" puts its predicate, "the buzzer rings," in contact with its referent, "noon." One way to imagine this transitivity is to imagine that the two actions share the same border. Notice the transitivity or contact indicated by "when" in the following variants.
| Interrogative | 52. When is a horse like a herring? --When he's hard rode.* |
| 53. When should I come visit you, Mr. Adams? At 5:00. |
| 54. Since when is it, good Father, that the principle libertine has altered his morals so much?* Since Pope Paul passed away. |
| Indefinite | 55. You'll know when to turn once you get there. |
| 56. I hope to see my Pilot face to face When I have crossed the bar.* |
| 57. I was a grown young man of twenty by when it happened.* |
| Relative | 58. There are times when an example is needed. |
| 59. It was midnight when I finished my paper. |
| Conjunction | 60. When great national interests are at stake, the party system breaks down. |
| 61. What's the good of my pretending to stand out, when I can't help myself?* |
| Substantive | 62. I have very little reason to doubt about the issue of things, but the when and the how are known to him.* |

In each of the above sentences "when" links its predicate with its referent: in 52, "the horse is hard rode" is linked with "the horse is like a herring"; in 53, "at 5:00" contacts "I should come visit you, Mr. Adams"; in 54, "the principal libertine alters his morals" contacts "since Pope Paul passed away"; in 55, "you get there" is contiguous with "you'll know to turn"; in 56, "I have crossed the bar" is linked with "I hope to see my Pilot"; in 57 "it happened" is linked with "I was a grown young man"; in 58, "an example is needed" borders with "there are times"; in 59, "I finished my paper" is linked with "midnight"; in 60, "great national interests are at stake" co-occurs with "the party system breaks down"; in 61, "I can't help myself" is linked with the situation "my pretending to stand out"; in 62, the "issue of things" is linked with the word "when."

"Where" is like the other wh- words except that it is marked for restrictiveness, i.e. the referent of "where" shows the periphery of the predicate of "where." Notice the restrictedness in the following contextual variants.

| Interrogative | 63. Where the deuce am I?* |
| 64. Spencer, where have you been? |
| 65. I must go suddenly, but where to?* |
| 66. And where is Emma's joy if Henry flies?* |
| Indefinite | 67. You come from no one knows where.* |
| 68. Let's go where we can get a better view. |
| 69. I'll stay where I am. |

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70. I hastened to the black hole where Tom was confined.*
71. Looking for all the world like some great dog that has entered a house where dogs are forbidden.*
72. I discovered the place where I made the mistake.
73. Where Powell parted company most fiercely from the Radicals was in his steadfast patriotism.*
74. They are rude where they should be reverent.*
75. He got victuals enough one where or another.*
76. In this heaven there is no other where Than in the Mind Divine.*

In the interrogative uses "where" requests a knowledge of the peripheral setting that focuses in on the predicate of "where." In the indefinite uses, "where" functions in the same way. For example, in 68 the peripheral setting focuses in on the predicate "we can get a better view." Restrictedness is most easily seen in the relative uses of "where." In 70 "the black hole" describes the periphery that is then focused by "where" to the predicate "Tom was confined." The predicates focus or restrict each other when "where" is used as a connective as is shown in 73 and 74. The "where" in 76 refers to a very general setting that is focused in or restricted to "the Mind Divine."

Why" is like the other wh- words in that it is marked for deixis, dimensionality and objectiveness, but it is also marked for transitivity and restrictedness. This can be seen in the following contextual variants.

77. Why was Pul thus marked for vengeance from the beginning?*
78. Why don't you take up Greek?
79. The poor live pleasantly without our help, why then should we not learn to live without theirs?*
80. Why books, why chapters, why titles, why any arrangement at all, they queried.*
81. It is easy to explain why the Roman Catholic was treated with less indulgence.*
82. We can perceive the reason why a small proportion of carbonic oxide is always formed during the decomposition of nitre by charcoal.*
83. It would be useless to deny that your life is in grave danger . . . But that is no reason why you should surrender it without a struggle.*
84. But the Why? The final causes, the moral consequences, and the particular detail, is only here conjectured about.*

85. The reader who may not be acquainted with the when, and the why and the how of the surrender.*

In each of the above sentences, "why" refers to an independent, limited, peripheral setting that is put in contact with the effect or predicate.

If the above analysis is correct, each of the wh-words, like each amino acid, shares a common invariant meaning composed of the semantic distinctive features deixis, dimensionality and objectiveness. Also, each wh-word has its own invariant meaning as shown below:

<table>
<thead>
<tr>
<th>What</th>
<th>Which</th>
<th>Who</th>
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</thead>
<tbody>
<tr>
<td>+ deixis</td>
<td>+ deixis</td>
<td>+ deixis</td>
</tr>
<tr>
<td>+ dimensionality</td>
<td>+ dimensionality</td>
<td>+ dimensionality</td>
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<tr>
<td>Ø deictic</td>
<td>Ø deictic</td>
<td>Ø deictic</td>
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<tr>
<td>Ø objectiveness</td>
<td>objectiveness</td>
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<tr>
<td>Ø duplication</td>
<td>Ø duplication</td>
<td>duplication</td>
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</tbody>
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<table>
<thead>
<tr>
<th>When</th>
<th>Where</th>
<th>Why</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ deixis</td>
<td>+ deixis</td>
<td>+ deixis</td>
</tr>
<tr>
<td>+ dimensionality</td>
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<td>+ dimensionality</td>
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<td>+ transitivitiy</td>
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<tr>
<td>Ø restrictedness</td>
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<td>+ restrictedness</td>
</tr>
</tbody>
</table>

If common invariants and invariant meanings can be found for wh-words, they also can be found, maybe with much effort, for other signs in the code. If other signs in the code do have invariant meanings, they can be listed only once in the lexicon. Also, they can be understood perfectly in new contexts. Further studies, more rigorous than this one, should be made to see if the above analysis is true and if invariant meanings really can be found for all of the signs in the linguistic code.
BIBLIOGRAPHY


