AN EXAMPLE OF APPLIED PSYCHOLINGUISTICS:

COMPARING AMBIGUITY IN JAPANESE AND ENGLISH

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The Early History of Psycholinguistics

There have been in fact two major eras in which psycholinguistic interests have flourished, one historical and one modern. The first took place around the turn of the century, primarily in Europe; the second took place in the 1950s and 1960s, primarily in America (Blumenthal, 1987; Reber, 1987). Blumenthal (1970, 1974) has painted Leipzig's Wilhelm Wundt as the influential master psycholinguist during that first era, for Wundt was prepared to demonstrate that language could be explained on the basis of psychological principles (see Wundt, 1900, 1910-1920). This was also a period in the developing history of the social sciences when linguistics was prepared to exchange its older, Romanticist evaluation of language on cultural and aesthetic principles, for a more modern, scientific approach to language. Wilhelm Wundt, and the new psychology, offered this possibility with the rigor and the enthusiasm that only a new scientific discipline can offer. Many younger linguists were keen to import this new rigor and scientific vision to linguistic theory and research, and for a time psychological concerns were directly reflected in the emerging field of linguistics. For example, we linguists all know Leonard Bloomfield as the prototypical structuralist, and often quote his famous 1933 book as the classic text of the structuralist period in linguistics. But few know his little-known first book of 1914, even fewer have read it, and fewer still realize that it pays careful homage to the Wundtian psychology alluded to above.

After the devastating first war, there was a decline in the power and consequent influence of German intellectual life, and Wundtian cognitive psychology was correspondingly weakened in the attention it commanded. Thus, Bloomfield's later 1933 book parallels the

newer aspirations of the powerfully emerging behaviorism. This is what accounts for the sharp split between mentalism and mechanism in Bloomfield's work, and the injunction against the former in all structuralist explanations of language description. Moreover, though Bloomfield himself was obviously sympathetic to behaviorist tenets, psychological theory no longer guides linguistic theory (see Kess, 1983), and this is an intellectual posture which continues to characterize linguistics throughout this century.

Curiously, there was to be another era of intellectual unity, equally fertile, equally enthusiastic, and equally brief (see Reber, 1987, and McCauley, 1987). This was the era after the late 1950s, and on into the I 960s, a time when linguistic theory fueled the engines of psycholinguistic enterprise. Specifically, the form of linguistic theory was the type of linguistics founded on the theoretical pattern of generative transformational grammar, as first proposed by Noam Chomsky in 1957, elaborated in 1965, and universalized in 1968.

But this unity of purpose also faded after several decades of experimentation based on Chomskyan theory, leaving us now with a more balanced, and certainly a more eclectic view of what psycholinguistic theory should pursue in attempting to offer explanations for natural language. This paper pays particular attention to the history of psycholinguistics since that second ferment in the 1950s. The major reason for doing this is because this recent history reflects the changing roles of linguistics and psychology vis-a-vis one another in the developing discipline of psycholinguistics.

Metaphors and Signposts

Disciplines erect signposts for their convenience as well as guidance (in much the way that Kuhn's 1962 STRUCTURE OF SCIENTIFIC REVOLUTIONS suggests).

And they employ metaphors from other successful developments that they find useful. In our own field, the following have arisen:

I. "Linguistics as biology", with much attention paid to language change and delineating families of languages.

2. In this century, the taxonomic orientation of structuralism was really "language as chemistry", where one discovered the units of language structure, as for example, the phonemic units that constitute the phonology of a language.

3. In the fifties, Chomsky's generative grammar, as first laid out (1957) in Syntactic Structures, was really a shift to a view of 'language as mathematics". The mode of inquiry was deductive, as was mathematical inquiry, although the goal was an understanding of competence, the abstract characterization of the knowledge that native speakers have that makes them native speakers of a language. This knowledge, albeit knowledge of language structures and language operations, was viewed as a mathematical object which could be described by a set of rules; such a set of rewrite rules attempted to realize the explicitness requirement that generative grammar prided itself on.

4. "Language as information processing". Language is now seen as a symbolic process, often leading to decisions, based on knowledge, and not as the ultimate and only interesting knowledge set. Human minds using natural language, as well as computers using programmatic "languages", manipulate symbols and and make decisions on the basis of stored and inferred knowlesdge. It is inevitable that psycholinguistics, and linguistic theory, would have to become involved in a larger field of inquiry, that is, the nature of knowledge, the structure of mental representations, and how these are used in mental processes like reasoning and decison-making.

Chomskyan notions had in a way already set the stage for this new focus of interest, not so much by the observation that linguists were really cognitive psychologists (1968), but by the very nature of what the description of comptetence entailed. Generative grammar had attempted to characterize speakers' knowledge of their language, and this to a large degree entails understanding the cognitive processes underlying the language facility. An information processing view of language would now also require that we understand how these mental representations operate, in tasks like acquisition of knowledge from discourse by direct extraction or by inference, and then its storage, recall, cross-classification, or whatever in the process of reasoning and decision-making. This means that psycholinguistics no longer just takes into account findings from psychology and linguistics as the umbrella discipline for theory, research, and the findings of such research. Instead, one now sees psycholinguistics as also being subsumed under the larger scheme of research, in that truly broad interdisciplinary activity that has come to be labelled as *cognitive science*.

1. Formative
2. Linguistic
3. Cognitive
4. Cognitive Science

    a. Linguists' interests in grammatical formulations with "psychological reality"

    b. Psychologists' interests in the role of linguistic structures in language processing (cf. Tanenhaus and Carlson's 1989 book entitled **Linguistic Structures in Language Processing.**

The Four Modern Periods:

Formative (1951-1959)

This period boasted a good relationship between linguistics and psychology, because both were committed to an operationalist philosophy: structuralism in linguistics and behaviorism in psychology.

An operationalist approach in philosophy of science terms derives theoretical constructs from observable data by using a set of verifiable operations which are highly explicit.

1. structuralism in linguistics defined units like phoneme and morpheme in terms of operational procedures.

2. behaviorism in psychology gave primacy to observable data, and devoted its theoretical efforts to the elaboration of operational methods which guaranteed that any explanatory device (like "drive" or "habit strength") was anchored in the real world.

   Behaviorist methodology focussed upon rigorous experimental design and statistical analysis of data.

3. Information Theory was a third partner in this Formative Period, largely as a

source of ideas and models. Linguists took the states of messages as their area of research inquiry, and psychologists took the states of communicators, and by default, the encoding and decoding processes.

4. Both were interested in topics like language universals (see Greenberg 1961 on language universals) and encouraged research like Carroll's Southwest Project in Comparative Psycholinguistics investigating the Whorf Hypothesis. The striking characteristic of this period in psycholinguistics is its diversity.

   If one asks what psycholinguistics does, the answer is "Everything!".

Linguistic Period

The rise of tranformational generative grammar in linguistics is followed by its theoretical domination of psycholinguistics research, particularly from 1960 to 1969.

TG criticisms of behaviorism and the basic tenets of generative grammar dictate the shape of psycholinguistic research.

1. Chomsky (1957, 1959) destroys the two cornerstones of psycholinguistic research in the formative period.

2. Chomsky argues that an operationalist philosophy cannot provide adequate grammars of natural languages.

3. that a deductive approach is required.

4. that linguistic theory has as its proper domain the competence of speakers, not their performance (1965).

Thus, the previous division of labor was called into question, as well as the theories.

In linguistics, this was a shift in paradigm, but in psycholinguistics this was the introduction of one where there was none.

The starting point was the observation that the study of competence was certainly a place to step off into the study of performance, but that the former was crucial to understanding the latter.

Thus, the centrality of grammar was taken as a basic assumption, and the sentence emerges as the prime unit in this quest to understand grammar.

Thus, most psycholinguistic experiments dealt with the understanding and use of sentences, because the sentence played such an important role in TG.

Some of these early experiments even hinted that production of sentences is isomorphic to the derivation of that sentence by the grammar.

Because of generative grammar's pursuit of linguistic universals, there was soon considerable interest in language acquisition as well.

Lenneberg's (1967) work on the biological foundations of language most fully develops the argument for innateness, fully chronicling the argument with evidence from other sciences, but relying for its original impetus from Chomsky's generative grammatical theory.

The basic argument is that the capacity for language acquisition is species-specific and is a genetically determined attribute of humans.

But the rapid pace with which formalizations changed in linguistic theory placed a heavy burden on even committed psychologists trying to keep track.

There was also a fragmentation in TG which leads to a decline in the unity and optimism which marked earlier stages.

Cognitive Period:

First of all, one should note that cognitive in this sense does not have quite the same meaning as in an earlier cognitive psychology, though there was indeed similarity between Gestalt cognitive psychology and TG in their rejection of behaviorism (see Neisser 1967).

The crucial differences here rest more in the area of language acquisition and what the so-called "intrinsic capacity" to learn language really means.

Fodor (1966) had already noted that perhaps what is brought to bear is a set of learning principles, and Lenneberg (1967) had also seen language in a much broader sense.

The major premise that underlies a cognitive approach is the dependence of language upon human cognition, that language is but one of several outcomes of more fundmental cognitive processes.

Chomsky himself paved the way with his (1968) comment that linguistics is a field concerned with human cognition, and that linguists are really cognitive psychologists.

Perhaps the best early representative of the cognitive approach was Bever's (1970) paper on the cognitive basis for linguistic structures. Bever rejected the centrality and independence of grammar, arguing that the cognitive capacity described in grammatical accounts of competence is only one manifestation of human language and is in no way prior to or independent of other cognitive and behavioral systems involved in the acquisition and use of language.

Thus, the acquisition of language is a result of the interaction between linguistic and other behavioral systems, such that the nature of linguistic systems is ultimately a product of more basic cognitive structures.

Some even went so far as to suggest that perhaps TG was more a theory of about having linguistic intuitions, so that this type of language behavior is no more closely related to the ultimate nature of language than learning, perceiving, and speaking.

For the best contemporaneous assessment of what was learned from linguistic input, see Fodor, Bever and Garrett's (1976) summation of psycholinguistic achievements based on linguistic theory (see also Kess 1977). Their review of this line of experimentation re-confirms the reality of the taxonomy of sentences (the sentence family and intersentential distances) implied in transformational syntax, but not the psychological reality of transformations.

Cognitive Science

As linguists, we can take note of MIT Press publication, edited by Bresnan, Halle, and Miller in 1978: *Linguistic Theory and Psychological Reality*

Basically, the linguistic approach named here is one which takes information processing constraints into account.

"Correctness" of a grammatical theory is not being argued here, for these can all be internally "correct"; it is a question of usefulness or compatibility of a grammatical system that is attuned to problems of psycholinguistic research.

For example, the derivation of truncated passives or the ordering of center-, left-, and right-embeddings in terms of processual difficulty.

"Psychological reality" is thus a term we should reserve only for grammars which have relevance to language processing and which are in turn constrained by language processing factors

Problem of psychological validity is of course only a problem for those linguists who wish to make psychological claims about their theories and resultant grammars; many of course do not wish to; BUT certainly psychological reality is a desideratum for any linguistic theory which truly wishes explanatory power about the nature of language

Such realistic theories of language thus describe our language knowledge and linguistic abilities in a way that incorporates performance abilities that are crucial to information processing tasks.

Modern Conflict/Convergence between Psychology and Linguistics

But now the models and metaphors come from elsewhere.

A new focus of interest has emerged, one which has now put linguistics and psycholinguistics in league with the powerful influence of those mechanical devices that are having their effect on all fields of knowledge. The eighties now enjoy a new paradigm, the computational

paradigm, obviously catalyzed by the use of computers as models of language processing functions.

Secondly, it is typical of the times that names previously associated with formal syntax or semantics now are committed to problems of conceptual representation and the structure of human cognitive systems. For example, in discussing semantics and cognition, Jackendoff (1983) admits that the problems of semantics in linguistics is really a problem of conceptual representation, common to all forms of cognition. Similarly, in formulating the "cognitive grammar" approach to analyzing syntactic and semantic structure, Langacker (1986) espouses the basic premise that language is not a self-contained system separate from general cognitive systems, and that the findings of linguistics and cognitive psychology should be integrated.

Thirdly, psychologists are once again interested in the role of linguistic structures in language processing. An excellent example of this can be seen in recent texts like Carlson and Tanenhaus (l989a) and Marslen-Wilson (1989a). Psychology and linguistics once again interact, and in a real way, as joint papers are authored by a linguist and a psychologist, and even single-authored papers exhibit research goals and a breadth of knowledge not confined to a single discipline (see Kess 199la, b).

Psychology in the 1970s began to be disenchanted by linguistic theory, given its limited applicability to dealing with how we actually produce or comprehend language, and psychological investigations of language processing made less and less reference to linguistic theory. Carison and Tanenhaus (1989b) claim that psycholinguistics is currently more vibrant than it has been since the I 960s, and that this is accompanied by a renewal of interest in the role of linguistic structure in language behavior.

But linguistic theory, at least as we have known it in its recent forms, does not occupy the center-stage in this new refurbishing of the old partnership, and for a number of reasons. There is robust evidence for the role of surface structure in processing, but not for transformations. Computational models of language are unnecessarily complicated by transformations, and increasingly look to other more workable devices as serious competitors within linguistics minimize or eliminate transformations altogether. The interaction of linguistic structure and language processing may be the focal topic of psycholinguistic research, but that interaction is now subject to the double, and equally important, rigors of linguistic analysis and psychological experimentation.

It is also worth noting that while psychology and linguistics may be converging again, this does not mean they subscribe to same philosophy of science.

One of the current questions is whether the language processing system is modular or interactive, and much recent research probes the degree of **modularity** or interaction in the system. Modularity suggests that the processing system is composed of a series of modules, each handling some specific type of information without reference to the activities of other such modules.

In sharp contrast, an interactive explanation of processing rests on the assumption that the levels of language knowledge are not cut off from one another, and that there is an active exchange of information.

Given their traditional preoccupation with levels of language knowledge, linguists have favored the modularity hypothesis, while psychologists have been more attracted to interactive explanations of language and learning principles. The two disciplines may once again be more compatible, but they also tend to confront the major issues from different perspectives.

One interactive model that has been attractive to some psychologists lately is connectionism, in which processing units activate units to which they are connected on other levels.

Much recent research probes the degree of modularity or interaction in the system, and this issue motivates some of the papers in this volume as well. Given their traditional preoccupation with levels of language knowledge, linguists have favored the modularity hypothesis, while psychologists seem less impressed with its explanatory power.

No matter how the disciplines confront such major issues, one thing is certain. Linguistic explanations of language structure, are attuned to experimental evidence bearing on language processing, for some formal structures may be better explained by reference to processing features. And, ideally at least, psychological theorizing is better informed about the processing system by accurate accounts of linguistic structure.

This is a vast improvement over earlier psycholinguistics of the 1950s when the operationalist philosophy of structuralism and behaviorism underwrote compatibility on some grand, but essentially vague, scale. It is better than the 1960s when linguistic theory baldly sent one-way traffic into psychological experimentation, and certainly better than the mutual dis-

enchantment of 1970s. The 1980s, and most especially, the 1990s seem to have taken us back to the mutual pursuit of what role is played by 'linguistic structure in language processing'. This does not mean that all psychologists support linguistic research interests, nor does it mean that all linguists support psychological research interests. In fact, a number of cognitive psychologists exhibit a frosty skepticism of the value of linguists' insights--certainly a historical reversal of the linguistic posture of impenetrability of an earlier decade. But both theory and practice seems to be looking in the direction of the other discipline, and from this, both disciplines will profit, and we may yet see a truly cognitive science, a science of the mind.

Comparing Ambiguity in Japanese and English

Ambiguity is a common structural feature of natural language, for a sequence of words may allow more than one interpretation of the grammatical relationships between elements in the sentence or because a word has more than one meaning. Most of the time we are not conscious of linguistic ambiguity, for our task in processing what we see or read is to comprehend the intended meaning, not to consider the vast range of possible meanings for a string of words.

The study of ambiguity has been a central area of study in both linguistics and psycholinguistics, and this talk attempts to give some idea of what we have learned about ambiguity in Japanese and English.

Structural Ambiguity

Types of Structural Ambiguity in Natural Language

Ambiguous structures are possible at the structural levels of syntax and semantics in language. These have been typically termed syntactic ambiguity and lexical ambiguity; syntactic ambiguity can either be found the level of surface structure or underlying structure, while lexical ambiguity refers to possible multiple meanings for a single vocabulary item. Sentences can thus be ambiguous at the lexical level of word meaning (lexical ambiguity); on the surface level of syntactic relationships with ambiguity in the surface structure **(sur-**

face structure ambiguity); or at the deep structure level of logical relationships between underlying syntactic constituents **(deep or underlying structure ambiguity)**.

English:

1. Lexical ambiguity: **The tourists enjoyed the Portuguese port.**

2. Surface structure ambiguity: **Old men and women are advised to apply for their benefits.**

3. Deep structure ambiguity: **Cheating students will not be tolerated.**

Japanese:

I. Lexical ambiguity: **Pikunikku ni ikkoo to omotta ga, hidoi KAZE de ikenakatta** (‘I wanted to go on a picnic, but I couldn’t because of a bad COLD/WIND’).

2. Surface structure ambiguity: **Ookina mu to neko** ga asonde iru (‘Big dogs and cats are playing around’). OR **Kawai kodomo no yoofuku....** (‘The cute child’s dress....’

3. Deep structure ambiguity: **Inu wa neko yori mo nezumi ga suki desu** (‘Dogs like rats better than cats’).

Lexical Ambiguity:

Many words in a language have more than one meaning, and in fact, some very common words have a great many meanings. For example, some English nouns like **thing** and verbs like **turn** have dozens of meanings. This is true for all natural languages, and not surprisingly, Japanese will have multi-purpose nouns like koto and verbs like **suru** with dozens of uses.

Polysemy: Words with several meanings which are related to one another. For example, **open** has a number of related meanings like ‘expanding, making openings in, revealing’ and so forth. Japanese: **amai** (‘sweet; generous; soft; lax; sentimental’)

Some instances of polysemy in lexical items are clearly cases of extension of an original meaning, so that the two meanings are in some sense related. Sometimes this is easily seen, as in sentences (1-2), but in other cases the semantic overlap is less obvious, as in sentence (3-4).

a. English: **He did not actually expect the paper to COVER everything**.

b. Japanese: **Kodomo o ASOBASEta** (‘I let the children play’) vs. **Tochi o ASOBASE-te oku no wa mottainai** (‘It is wasteful to leave the ground unused’).

c. English: **The housewife was angry that she could not find her GLASSES.** OR **Scrooge’s plumber was angry that HE could not find HIS PIPE.**

d. Japanese: **Haha wa OTAMAJAKUSHI ga mitukaranakute komatta** (‘Mother had trouble in finding a cooking scoop’; ‘Mother had trouble in finding a tadpole’) and **Haha wa OTAMAJAKUSHI ga yomenai** (‘Mother cannot read the musical notes’).

2. Homonymy: Words which either sound alike or look alike, that is, they either have the same phonological shape or the same orthographic shape, but have entirely unrelated meanings.

a. Homophones sound the same: /**bark**/, as in the bark of a tree or the bark of a dog. Japanese: **hakaru** (‘to measure weight, size, quantity’; ‘to plot, scheme’)

b. Homographs are written the same: bow, as in **He decided to put a bow on the present** or **The queen received a curtsy from each female guest guest and a bow from each male guest at the royal ball.**

Japanese: **butugo/hutugo** (‘Buddhist terms’/’French’) or **oozei/taisei** (‘multitude’/’general trend’)

OVERHEAD

3. Categorial ambiguity: Words which may vary by part of speech class; the ambiguous words may or may not be related to the same focal meaning.

   a. Related: **red**, as in the adjectival use in **the red leaves of autumn** vs. the nominal use in **the red of autumn.**

      Japanese: **midori (Adj.** as in **midori-juuji** 'green cross'; N. as in **yama no midori** 'mountain green, plants')

      Japanese: **kessaku** ('masterpiece' (N.); 'hilarious' (Adj.), as in **kessaku na dekigoto/hanashi/monogatari**

   b. Unrelated: **sink**, as in the nominal use in **Grant's Plumbing replaced the sink** vs. the verbal use in **The Titanic began to sink toward dawn.**

      Japanese: chikai 'close' (Adj.); BUT tones change on 'promise' (N.) and 'basement' (N.)
      kooen: 'park' and 'lecture';
      kaidan: 'meeting' and 'stairs'
      shikaku: 'qualification', the sense of sight', and 'dead angle'
      saishuu: 'final' and 'gathering'
      kooji: 'happy event' and 'construction'

Syntactic Ambiguity: Syntactic ambiguity arises when the syntactic relationships among the words or phrases in a sentence are not unique. That is, the analysis of words or phrases can go two ways in terms of the grammatical relationships among those items. Recall that this can happen at the level of surface structure or at the level of deep structure.

I. Surface

   a. English: **Experienced linguists and students are urged to join CUSO.** OR **Professional linguists and students are urged to join CUSO.**

b. Japanese: **Tositotta otoko to onna ga suwatte iru** ('The old man and woman are sitting'; 'An old man and a woman are sitting').

2. Underlying

a. English: **Cheating students will not be tolerated.**

b. Japanese: **Kanada no imin wa itsumo mondai desu** ('The immigrants from Canada are always the problem'; 'The emigrants to Canada are always the problem').

Embedded or NOT?: Consider the interpretation of syntactically ambiguous sentences of the **NP1 wa V-te NP2 VP** type. Sentences of this type can have the NPI subject of the matrix sentence (e.g., **okaasan**) or the NP2 subject of the embedded clause (e.g., ojisan) as the subject of **V-te.**

1. Thus, **Okaasan wa asi no hone o otte nyuuin site iru ojisan no tokoro e omimai ni ikenakatta** allows two possible readings:

2. **Okaasan wa asi no hone o otte....** 'Breaking her leg, Mother could not go to visit her uncle who was in hospital'

3. **...asi no hone o otte nyuuin site iru ojisan....** 'Mother could not visit her uncle in the hospital, who had broken his leg'.

4. 'Mother could not visit Uncle Tony in the hospital, because of the smallpox'.

5. 'As a result of the smallpox, Mother was unable to visit Uncle Tony in the hospital'.

Garden path sentences may be the best examples of how we build the most likely syntactic tree until contrary information tells us otherwise. For example, read sentence (1) below to a friend who has not heard it before (taken from Lashley 1951). You will note that he or she will interpret it as (la), until realizing that the word could not possibly be writing, but has to be **righting,** as in (ib).

1. Rapid /raytIN/ with his uninjured hand saved from loss the contents of the capsized canoe.

   a. Rapid writing with his uninjured hand saved from loss the contents of the capsized canoe.

   b. Rapid righting with his uninjured hand saved from loss the contents of the capsized canoe.

2. The horse raced past the barn fell.

3. The horse raced past the barn fell.

4. The man expected to win the election died.

5. The man expected to win the electiondied.

6. Fat people eat accumulates.

7. Fat people eat accumulates.

8. The horse raced past the barn fell.

Kureru vs Ageru: Japanese garden path sentences ending in either **kureru** or **ageru** can lead the parser up the garden path because they may require re-analysis of previously established syntactic structures. 1. kureru ‘speaker has someone do the activity of the main verb for him/her’ vs.

2. ageru ‘speaker does the activity of the main verb for a third person’.

These structures may lead parsers to go down the garden path in kureru-final sentences because the syntactic role of the implied (but not expressed) noun phrase **watakushi** ga in the embedded clause cannot be confirmed until the parser encounters the verb **kureta** at the end of the sentence. Consider the following garden path **kureru** sentences and their **ageru** controls.

1. Garden path sentence: **Ane ga Osaka de juken shita toki issho ni itte**

KURETA 'When I took an exam in Osaka, my sister went there with me'

2. Control sentence: **Ane ga Osaka de juken shita toki issho ni itte AGETA** 'When my sister took an exam in Osaka, I went there with her'

Functional Roles and Syntactic Structure: Another kind of structural ambiguity arises when the syntactic structure does not overtly mark functional case-like relationships. The underlying case grammar roles that nouns may have with their verbs are invariant; they are marked in some languages like Latin, German, and Russian, but not marked in English and Japanese. For example, in English the case roles are unmarked in the subject noun. Although boy and key both fill the subject position in the following sentences, they stand in different functional relationships to the verb, namely, boy as agent and key as instrument.

2. The key opened the door.

In Japanese the case roles are also unmarked in the noun, with case-marking postpositions complementing word order to mark the role the noun fulfills.

1. But some particles like **de** and **ni** serve more than one function.

2. **de** can show either the location of activity or instrumental case;

3. **Tokyo de (hataraku); enpitu de**

4. **ni** can show either stative locative, direction, temporality, or beneficiary.

5. **Tokyo ni (iru); Tokyo ni (iku); sanji ni; Tadao ni**

Paraphrases:

Some paraphrases of the exact same sentence can be ambiguous, while in a slightly transformed fashion, the same sentence is not. For example, sentence (1) below is ambiguous while its paraphrase in (2) can only have the first meaning listed for (I).

1. **The boy is looking up the street.** Meaning either 'The boy is searching for the street (in a street-map inventory)' or 'The boy is gazing up the street'.

2. The boy is looking the Street up.

The same is true for the following Japanese sentences. For example, sentence (1) below is ambiguous while its paraphrase in (2) can only have the first meaning listed for (1).

1. **Kare wa nessin ni gengogaku o benkyoo suru yoo susumeta** (‘He fervently recommended (me) to study linguistics’; ‘He recommended (me) to study linguistics hard’).

2. **Kare wa gengogaku o benkyoo suru yoo nessin ni susumeta** (‘He fervently recommended (me) to study linguistics’).

Discourse Ambiguity

Theme, Anaphora, and Given vs. New Information

The things we say not only convey new information, they also continue commentary on given information which has become the theme of the discourse. When this happens, the theme may be referred to anaphorically by a pronominal form or a reduced clause which expects that both speaker and hearer are aware of the discourse theme. This is what produces discourse contributions which are objectively ambiguous, but which simply refer back to the discourse theme as shared given information. Consider the following Sentences. The English reply can be used when the waitress comes back with the lunch orders for several customers at the table; the Japanese one can be used when one orders to the waiter. Such utterances rarely cause us to reconsider the structure of the animal kingdom, and our main concern is to make sure we get the plate we ordered.

1. **I’m the fish!** That is, ‘I’m the one who ordered the fish!’

3. **I’m a fish!** That is, ‘I’m one of those who ordered fish!’

4. THE vs. A===OLD vs. NEW information

Indirect Speech Acts

The things we say also convey intentions, for speaking is an activity and every sentence we utter is a speech act of some kind. But some speech acts are not utterances in which a speaker means exactly and literally what the surface form of the sentence seems to convey. Contrast the following true questions with their pseudo-'question' counterparts.

1. True question: **Can you speak English?**

2. Pseudo-question': **Can you open that door?.**

3. True question: **Kimi wa Eigo ga dekiru?** ('Can you speak English?')

4. Pseudo-'question': **Moo ichido itte kureru?** ('Can you say it again?')

Although such pseudo-'questions' may look like questions, they are not; the correct response to such 'questions' is not a yes/no answer, but to carry out the activity suggested in the 'question'. These discourse ambiguities are called Indirect Speech Acts, because the speech act is expressed by a sentence which has a literal reading other than the true intention of the sentence.

Negation

Negative questions can engender another kind of ambiguity in Japanese. In Japanese, the answer normally affirms or negates the question itself, not the proposition involved in it.

1. By the way, English speakers respond to negative questions, such as **Aren't you going?,** according to content or intention; reply would be **No, I am not going.**

2. Japanese speakers respond in agreement or disagreement with the literal form; reply would be **Yes, I am not going,** literally **Yes, your sentence format is correct, it is the case that I am not going.**

3. Therefore, the answer No to a negative question is, virtually, **Yes.**

But when negative questions are really pseudo-questions conveying affirmative intentions,

they are not really "negative" and the answers can refer to the "affirmative" intention. This conflict can result in ambiguity, particularly when it is not clear whether the question is a true question or a pseudo-'question'.

I. **Koohii nomitaku nai no?** ('Wouldn't you care for a coffee?').
Ee (lit.'Yes') (can mean either yes or no).

2. **Kore ii to omowanai no?** ('Don't you think **this** is nice?').
lie (lit.'No') (can mean either yes or no).

These ambiguities of discourse function are not limited to the relationship between requests and 'questions'. Some questions are executed by uttering what seems to be an assertion.

I. **Oh, I see your glass is empty** really means **Shall I give you a refill?.**
Similarly, some negations are performed by uttering what seems to be an assertion.

2. **Gee, I'm on a diet** is really a polite negation to the offer **Have a piece of cheesecake.**

3. **Maa, watasi daietto-chuu desu no** ('Gee, I'm on a diet') is really a polite negation to the offer **Have a piece of cheesecake.**

Irony and Sarcasm as Discourse Ambiguity: The appearance of irony and sarcasm is often based on the perceived difference between the literal meaning of the utterance and its second meaning in an ironic sense. The intended second meaning is often the opposite of what the words are actually saying. For example, consider the following.

1. Positive meaning negative: **My, but you're exceptionally clever today!**

2. Negative meaning positive: **Well, now, that wasn't such a shabby idea after all!**

3. Positive meaning negative: **Anata-tte hontoo ni kashikoi wa ne** ('Oh, you are really smart!') really means **How stupid you are!**

4. Negative meaning positive: **Waruku nai ne** (‘It’s not bad!’).

Ambiguity in Discourse Intention

Lastly, we should note that speakers sometimes have a vested interest in using a certain level of ambiguity in their discourse, and do not make their intentions clearly known. As a result, the discourse is inherently ambiguous, for the speaker does not commit to an intended meaning. The listener must take on the responsibility of interpreting the speaker’s conversational move; only then is the speaker is forced to react to this interpretation, committing to one meaning or another. For example, consider the following conversational exchanges in English and Japanese.

ENGLISH Background: Ruth and Rachel are colleagues; Ruth is a visitor in Rachel’s town. Rachel expects Ruth for a visit at her home in the afternoon. Ruth calls Rachel in the morning:

Ruth: {...openings + phatic talk)

TI Ruth: **I realize now that we won’t have the car today. Can you tell us how to get to your place by bus.**

Rachel: {slight pause)

T2 Rachel: **It’s bus no. 7, but it does not run very frequently, I think you’d better take a cab.**

Rachel has to decide whether Ruth means what she says, or does she mean that and something else, like asking for a ride. The turn TI may be conventional direct request for information, or it could also be

an indirect request to be picked up. Very simply, did Ruth call because she wanted Rachel to come and pick her up? Maybe she did not want to openly acknowledge that she is making this request?

JAPANESE Background: Akira and Kyoko are friends. On the weekend Akira calls Kyoko to

ask for....a date?

Akira: **{** ...openings + phatic talk)

Akira: **Nani siteru no? Benkyoo?** 'What are you doing? Study?'

Kyoko: **lie, betsu ni nani mo site nai wa.** 'No, I'm not doing anything special.'

Akira: **Soo. Boku mo hima de ne. Eiga demo ikkoo ka to omounda kedo....** 'Oh... neither am I.

Actually I'm thinking of going to the movies.'

Ti Akira: **Tokorode, kimi wa "A" wa mada mite-nai-n dayo ne?** 'By the way, you haven't seen "A" yet, have you?'

Kyoko: (slight pause)

T2 Kyoko: **Ee mada mite-nai wa. Demo "B" wa sensyuu mita-n dakedo, omosirokatta wa yo.**
Osusume suru wa. 'No, not yet. But "B", which I saw last week, was pretty good. I recommend you see it.'

Kyoko has to decide whether Akira is asking for her comment on the movie or he is asking for a date. The turn TI may be an indirect question asking for information or could also be an indirect invitation for a date. Does Akira want to go to the movie by himself or with Kyoko? Why does he ask her about "A" that he assumes she has not seen yet? Maybe he does not want to openly acknowledge that he is asking for a date?

Many of our conversational gambits are of this type, where we may toss out an utterance with more than one possible interpretation; the speaker then awaits the resolution by the listener. If the hidden intention is perceived, then it will be fulfilled with no loss of face in having made an awkward request or an uncomfortable observation.

Passives vs. Honorifics
So Where is Japanese Different? Unique?

Japanese has another type of ambiguous structures that cannot be handled on the surface level. In Japanese the passive construction and the honorific construction share the same bound morpheme **(r)are**, which is attached to the verb stem. This results in the ambiguity in terms of the functional role of the nouns.

(1) Sensei ga nigaoe o kakareta (‘The teacher drew a portrait of somebody’ (honorific) vs. ‘The teacher had somebody draw his portrait’ (indirect passive)).

(2) Yamada-san wa Tanaka-san ni denwa sareta (’Mr. Yamada gave a call to Mr. Tanaka’ (honorific) vs. ‘Mr. Yamada was phoned by Mr. Tanaka’ (direct passive)).

(3) comes from either **Yamada-san ga Tanaka-san ni denwa sita** (‘Mr. Yamada phoned Mr. Tanaka’) or **Tanaka-san ga Yamada-san ni denwa sita** (‘Mr. Tanaka phoned Mr. Yamada’) through honorification and passivization, respectively.

Left-Branching in Japanese

It is well-known that languages often differ in the directionality of their syntactic build-up, developing from the phrasal head or matrix clause in either a a left-branching direction or a right-branching direction.

OVERHEADS of embedding/branching sentence types.

Japanese is of course a left-branching language, and allows the progressive leftward embedding seen in the following Japanese sentences.

1. **John ga neko o katte iru** ‘John keeps a cat’

2. **John ga katte iru neko ga nezumi o koroshita** ‘The cat that John keeps killed a rat’

3. **John ga katte iru neko ga koroshita nezumi ga chiizu o tabeta** ‘The rat that the cat that John keeps killed ate the cheese’

4. **John ga katte iru neko ga koroshita nezumi ga tabeta chiizu wa kusatte ita** 'The cheese that the rat that the cat that John keeps killed ate was rotten'

One of the main problems faced for processors is the fundamental difference in ambiguity points in left- and right-branching languages. Japanese exhibits a large number of potentially ambiguous turning points at which the syntax can cease or expand. One is never really sure if closure has been reached!

In terms of sentential expansion, indeterminacy is theoretically the rule rather than the exception, as seen in the following Japanese sentences.

1. **John ga neko o katte iru** 'John keeps a cat'

2. **John ga neko o katte iru tomodachi ni atta** 'John met his friend who keeps a cat'

3. **John ga neko o katte iru tomodachi ni atta shuumatsu no tenki wa, subarashikatta** 'The weather on the weekend when John met his friend was glorious'

This indeterminacy is enhanced by other structural features of Japanese syntax, namely, the features of pro-drop, the complete absence of relative pronouns, and the relative lack of complementizers. For example, consider the following Japanese sentences in contrast to their English glosses.

1. **Mary ga kasa o katta** 'Mary bought an umbrella'

2. Pro-drop: **Mary ga [EC] katta** 'Mary bought [EC]'

3. Pro-drop: **[EC] Kasa o katta [EC] Bought an umbrella**'

4. Absence of relative pronouns: **[Mary ga katta] kasa ga tsubureta** 'The umbrella [WHICH Mary bought] was broken'

There are a few instances in which new clauses are introduced by independent syntactic markers, but they are not always that helpful. For example, the marker **to** accompanies verbs of speaking in a way that signals the clause boundaries are about to change, but they do not mark the preceding clause boundaries.

5. **John ga [[Mary ga katta] kasa ga tsubureta] TO ITTA** 'John SAID THAT [the umbrella [which Mary bought] was broken]'

As if this were not enough, a flexible word order and the frequent occurrence of empty categories (EC) only serve to increase this indeterminacy, making it impossible to know whether a single NP marks the beginning of a clause or not.

1. Free word order: Canonical order of **John ga saihu o nusunda** 'John stole a wallet' can become **Saihu o John ga nusunda** 'John stole a wallet'

2. Empty NP: **[EC] saihu o nusunda** '[EC] stole a wallet' vs. **John ga [EC] nusunda** 'John stole [EC]'

3. Free word order, embedded clause with **ga: Mary ga [saihu o...John ga nusunda] to itta** 'Mary said that John stole (her) wallet'

Thus, in Japanese the parser (you or me or the computer) is never really sure whether what follows is an embedded clause or not. This is pretty impressive as a language-specific kind of ambiguity.... Until we recall that left-branching languages are in the majority. Until we recall that that freedom in word order varies by degrees across languages....

Conclusion

What we really conclude is that ambiguity is a common feature of natural language, in both structural format and discourse organization, and Japanese and English are no exceptions to this rule. They are similar in many ways because of the universal constraints that natural languages incur in conveying an infinite range of meanings via a limited range of structural devices. But they also exhibit some interesting language-specific features which arise because of the specific patterns they prefer or allow.