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# COOKING VOCABULARIES AND THE CULINARY TRIANGLE OF LÉVI-STRAUSS[1]

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0. In The Culinary Triangle Claude Lévi-Strauss presents a model of the semantic field of cooking, looking at things from the outside.[2] He presents an abstract model of cooking methods which is independent of any particular culture. This model is intended to be universally applicable, although each language and culture may not utilize all the distinctions or may not utilize them in the same way. Lévi-Strauss' analogy is the universal theory of phonetics which is capable of describing the phonological systems of all languages of the world, where each language may use different phonological oppositions and combine -etic units into -emic ones in different ways.

My purpose is to examine the semantic structure of the cooking vocabulary in a number of languages, and in the light of these analyses to evaluate Lévi-Strauss' model. What I hope to show is that although Lévi-Strauss is correct in arguing that one can make universally valid statements about cooking, his culinary triangle is only partially supported by the data presented.

Part 1 will briefly discuss the theory and methodology of the semantic analyses; part 2 presents the semantic structure of the cooking vocabulary of several languages: those spoken by people noted for their cuisine (French, Chinese), several spoken by people not noted for their cuisine (Navajo, Jacaltec, Yoruba, Amharic) and in addition, English, German, and Japanese. Part 3 discusses Lévi-Strauss' culinary triangle in some detail and evaluates it with respect to the data in 2.

1. My original interest in cooking vocabularies stems from an attempt to use the set of culinary words in English to test the semantic theories of Lyons and Katz and Fodor.[3] Lyons has presented a version of the field theory, which assumes that the vocabulary of a language is organized into a number of conceptual or semantic fields. All the lexical items in each field are highly structured with respect to one another. The meaning of a linguistic unit is 'defined to be the set of (paradigmatic) relations that the unit in question

contracts with other units of the language (in the context or contexts in which it occurs)'.[4] These various relations are primitives in the theory, and they include the following semantic relationships:

(a) Incompatibility. Terms are incompatible if the assertion of one implies the denial of the others in the set, e.g., red, orange, green, blue, etc. To say that X is red implies X is not orange, X is not green, etc.

(b) Complementarity. This relationship is a special case of incompatibility where only two terms are involved, such as married-single. To say X is single implies X is not married.

(c) Antonymy. This relationship refers to incompatible pairs such as hot-cold, tall-short, and involves the notion of comparison. 'X is hotter than Y implies Y is colder than X.

(d) Converseness. Pairs such as buy-sell are converse, that is, the relationship is tied up with certain systematic sentence transformations. X bought a house from Y implies Y sold a house to X.

(e) Hyponymy. One of the most important semantic relationships, hyponymy is class inclusion. Tulip is a hyponym of flower. To say X is a tulip implies X is a flower. The more general term is the superordinate term.

(f) Synonymy. Synonyms imply one another. If X and Y are synonyms, X implies Y and Y implies X.

The list of primitive semantic relations is finite and probably quite small, but not necessarily closed. Other semantic relationships are needed to account for other terms, and they can be added as necessary for an adequate semantic description. Moreover, a semantic description must account for certain syntagmatic associations and presuppositions, e.g., the presupposition that kick implies foot as the instrument of the action of the verb.

Lyon's formulation of the field theory is not unlike some taxonomies found in anthropological linguistic literature.[5] However, whereas taxonomies usually consist of only incompatible and hyponymous relationships, Lyons' theory provides for others and hence is richer.

The semantic theory of Katz and Fodor, which Katz (1966) has continued to develop, is a version of componential analysis, also commonly used in anthropological linguistics. Katz' theory goes beyond previous componential analyses in trying to integrate the lexical items into a generative grammar. The field theory and componential analyses complement one another, and together they do more than either one can alone. The results of a field analysis shows the relationship of lexical items to one another, and this in turn provides the basis for a componential analysis. In fact, the field theory provides excellent motivation for deciding whether or not to include a component as a part of the meaning of an item since almost any commonly shared piece of information is a potential semantic component. Only components necessary to separate the lexical items that contrast need to be included.

The cooking words in all of the languages I have examined can be described with the semantic relationships of hyponymy, synonymy, and incompatibility. Thus, common taxonomic charts are adequate. However, sometimes these

relationships are only partial, that is, words may be partially synonymous, or partially hyponymous. Occasionally informants cannot decide on the kind of semantic relationship. Finally, it seems to be the case that speakers of the same language frequently structure each field slightly differently. Two words may be synonymous for one speaker but be incompatible for another. Some speakers may judge a term to be a hyponym of a second term, whereas other speakers will find the terms incompatible. One solution to this problem is to use a large number of speakers and use statistics making the analysis, but I did not do so for this paper.[6]

2. A thorough analysis of cooking vocabularies would include more things than I can include in this study, since it would deal with syntactically related forms (nominalizations, morphologically related modifiers, collocations, etc.) and metaphorical extensions of the words used. I will concentrate on paradigmatic contrasts, although many languages utilize compounds, derivations, and phrases to supplement the morphologically different words.

English contains more different cooking words than any other language discussed here — at least 35.[7] However, this includes some which are little known, such as shirr and coddle, a few compounds, such as pan-fry and oven-bake, and some that are limited in their distribution, as scallop and plank. For example, one can plank a steak or scallop potatoes; but the grammar must not generate *the steak is planking, whereas the steak is broiling is acceptable.

The most general term of the set is cook, and there are various levels of generality. In one sense it refers to an activity, and it contrasts with bake as an activity. Baking refers to the preparation of bread, cake, pie, and other items we call baked goods, while cooking refers to the preparation of other foods. However, in the more specific sense, cook and bake are processes, and it is this latter sense that is most relevant to the study. The structure of the most important cooking words in English can be summarized by the following chart:

<table>
<tr><td colspan="8">cook</td></tr>
<tr><td colspan="4">boil$_1$</td><td colspan="3">fry</td><td>broil</td><td>bake</td></tr>
<tr><td colspan="2">simmer</td><td colspan="2">full boil$_2$</td><td>sauté</td><td colspan="2">French fry<br>deep fry</td><td>grill</td><td>barbecue,<br>charcoal</td><td>roast</td></tr>
<tr><td>poach</td><td>stew</td><td>parboil</td><td>stewing</td><td colspan="5"></td></tr>
<tr><td></td><td>braise</td><td colspan="6"></td></tr>
</table>

Figure 1

There is some overlap of lexical items, in that grill overlaps with broil and fry, depending to some extent on dialect variation and collocation differences (grilled cheese sandwich rather than fried cheese sandwich). Roast overlaps

with broil and bake due to historical change in cooking methods. Whereas roasting of meats used to be done on a spit by an open fire, when modern stoves became popular such foods were prepared in the oven (by baking), but the collocation of to roast and meat remained.

Figure 1 shows which lexical items contrast and which are hyponyms of others, but it does not show how the various items differ. However, a componential analysis can fill in this information.

The following components are widely applicable to the cooking words in English and the other languages described:

(1) [±Water]: This component is applicable to almost every cooking word. The component [Water] must be interpreted liberally to include other water-based liquids, such as stock or wine. $Boil_1$ and all its hyponyms are marked [+Water] and all others are [-Water].

(2) [±Fat]: (Oil or grease are included.) Fry and its hyponyms are marked [+Fat] and all others are [-Fat].

There is some redundancy since [+Water] implies [-Fat] and [+Fat] implies [-Water]. By utilizing these redundancy rules, fewer components need to be stated for each lexical item. Two components are needed, however, since a word may be marked [-Water] and [-Fat], as are broil, bake, and their hyponyms.

(3) [±Direct heat]: This component distinguishes between a heat source from which the heat is direct or radiated, like a broiler or open fire, and that which is indirect or conducted, like an oven. Part of the motivation for establishing this component is to limit the number of different ones by employing binary choices. However, in some languages (e.g., German) it may be more economical to establish [+Oven] or [+Broiler] as nonbinary components. Broil and its hyponyms are marked [+Direct heat] and bake and its hyponyms are marked [-Direct heat]. The component does not apply to the other terms.

The following three components are binary, like the previous three, but they apply to only a few lexical items:

(4) [±Vigorous cooking action]: $Boil_2$ and steam are marked [+Vigorous] while simmer, poach, stew, and braise are [-Vigorous]. This component does not apply to other words.

(5) [±Long cooking time]: Long and short are relative terms, and no specific measure of time can be specified, as say three hours; the time depends on what is cooked. Parboil is [-Long time]; stew is [+Long time]. Other terms are unmarked.[8]

(6) [±Large amount of cooking substance]: This component is necessary to separate deep fry and French fry, marked [+Large amount (Fat)], from sauté, marked [-Large amount (Fat)].

(7) [±Submerged]: Steam is marked [-Submerged]. Boil and its hyponyms other than steam are marked [+Submerged]. Naturally, this component can only apply to the boiling of solid food. Boil and its equivalent in most languages, however, can be used for liquid (e.g., soups) as well. Fry and its hyponyms could be marked [+Submerged],

but since this subset of lexical items does not contrast with any word with a meaning 'not submerged in fat', i.e., cooking over the fat, this could be treated as a presupposition rather than a component. A presupposition is a commonly shared belief which speakers feel is true about a word but is not properly part of its definition. This component is inapplicable to other words.

The remainder of the components are highly specific, but they can be placed into three general categories. They are not binary.

(8) [Special kind of utensil]: The components included in this category are [+Covered pot] for braise, and possibly [+Frying pan] for fry (to account for frying in non-stick pans where no fat is needed). To this category we can add general presuppositions, as [-Direct heat] implies [+Oven]; boil and fry and their hyponyms imply the use of some sort of pot; and by stretching the category, the component [+Hot coals] could be added to account for the meaning of charcoal (or charcoal-broil) and barbecue.

(9) [Special ingredient used or food implied]: Barbecue has the optional component [+Barbecue sauce]. This word has a range of meaning not adequately shown in Figure 1 since it can refer to cooking something either by broiling over hot coals or cooking by broiling or baking with a barbecue sauce or both.

(10) [Special purpose intended by the cooking process]: Poach has the component [+To preserve shape (of food cooked)] and stew the component [+To soften].

These components and categories account for all the components of meaning (except one) necessary to describe the cooking words in the nine languages discussed here. The only additional category needed is a Special motion while cooking, and the component is [+Stir]. There are other presuppositions which can be stated, and they appear to be universal. For example, cooking presupposes a heat source. Boil and some of its hyponyms can collocate with solids and liquids, whereas other terms collocate only with solids (e.g., boil soup, boil eggs, roast eggs, *roast soup). Boiling refers to the action of the liquid, whereas the other terms refer more directly to the food being cooked. Amharic has a lexical contrast between boiling solids and liquids.

English has an auxiliary set of words for browning:

| brown | | | | |
|---|---|---|---|---|
| toast | rissoler | sear | parch | flamber |

Figure 2

These words can easily be handled by the components established above. All have [+To brown surface] as the purpose, from category 10, and [-Water]. Flamber requires a special substance, [+Alcohol], from category 9, rissoler requires [+Long cooking time] and sear [-Long]. The brown set of terms parallel fry, broil, and bake: to toast is to brown by broiling and takes [-Fat], [+Direct heat]; to parch is to brown by baking, and has [-Fat], [-Direct heat]; to sear and to rissoler mean to brown by frying, and take [+Fat].

The cooking vocabularies of French and German are interesting to look at because although they have English cognates they structure differently from the English terms. Most of the French cooking words were borrowed into

English after the Norman conquest, and English has retained some terms which did not survive into modern French, e.g., broil. German has likewise borrowed from French but retains more Germanic words than English.

French does not make a paradigmatic contrast between cook and bake as activities as does English; cuire corresponds to cook, but bake (bread, cakes, pies) would be translated by a phrase, faire du pain, faire un gâteau, etc. Boulanger was rejected by one informant altogether; another accepted it, but judged it to be rare and technical. If used at all, it would refer to the activities of a professional baker.

The structure of French cooking process words is difficult to diagram since many of the specific terms overlap or fall between two (or more) general terms.

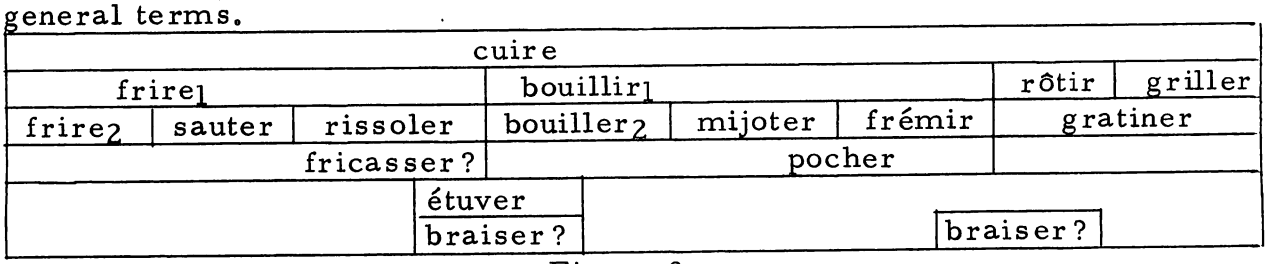


Figure 3

The four immediate hyponyms of cuire are similar to those in English:

bouillir$_1$ to boil: [+Water].

rôtir to roast or bake: [-Water], [-Fat], [±Direct heat].

(Rôtir refers to cooking in an oven or on a spit over a fire).

griller to broil: [-Water], [-Fat], [+Direct heat].

(To make toast is faire griller le pain.)

frire$_1$ to fry: [+Fat].

The more specific cooking words are more problematic than the preceding, and some of the English translations tend to be misleading:

frire$_2$ to deep fry: [+Fat (+Large amount)].

sauter: [+Fat (-Large amount)], [-Long cooking time].

rissoler: [+Fat], [+Long cooking time].

fricasser: This is hard to place with respect to other hyponyms of frire$_1$, since length of cooking time does not seem to be relevant. Informants said that no water was used in this cooking process, but cookbook glossaries suggest that some water (or water-based liquid) is added. Apparently fricasser is limited to collocations with meat and fowl. Tentative components are [+Fat], [+Water (Small amount)]?, [+Special food implied (Meat, fowl)].

Whereas English has a contrast between boil and simmer, French has a three-term contrast. Though earlier a binary contrast was established, [±Vigorous cooking action], a modification is required for French.

bouillir$_2$ full boil: [+Water], [+Vigorous cooking action].

mijoter to simmer: [+Water], [-Vigorous cooking action (just above boiling point)].

frémir to barely simmer, literally to shiver: [+Water], [-Vigorous cooking action (just below boiling point)].

There may be other parameters here as well. One informant suggested

that bouillir and frémir refer to the action of the water, but that mijoter might apply to the food in the water. Moreover, mijoter would be more appropriately used if the cooking liquid were a sauce, wine, or stock.

pocher to poach: [+Water], [-Vigorous cooking action], [-Long cooking time].

gratiner to cook so as to brown the surface: [-Water], [-Fat (though butter may be put on top)], [±Direct heat (oven is usually used, but broiler may be)], [+Special ingredient (cheese)] (this is optionally implied), [+Special purpose (to brown)].

The last two words étuver and braiser are not common, and my informants were not sure about their meaning. They seem to overlap with frire, and bouillir$_1$, but in different ways. One informant thought braiser might overlap with rôtir.

étuver to braise or simmer in butter: (this would be applied to foods that normally have a fair amount of liquid in them, like vegetables.) The redundancy rule which excludes water and fat does not apply here. Tentative components are [+Water (-Large amount)], [+Fat (Butter)], [-Vigorous cooking action].

braiser to braise: This refers to a sequential process of browning, then cooking slowly with a small amount of liquid. (So does English braise.)
Time$_1$: [-Water], [+Fat (Large amount)].
Time$_2$: [+Water (-Large amount)]. [-Vigorous cooking action], [+Special utensil (Covered pot)]. One may use an oven to braiser, but this is apparently not a part of the meaning.

As in any semantic analysis there are subtleties and peculiarities. For example, rôtir would be used to describe baking apples, potatoes and other rough objects, while griller is used to describe making toast, even in an oven, 'because it is flat'. Possibly the collocational habits of griller and pain override the cooking method so long as the result is the same.

There are two auxiliary terms related to cuire: faire dorée to brown (before cooking) and flamber to brown with alcohol (after cooking).

German[9] has a distinction similar to that of cook-bake in English. Kochen and backen refer to the activities of preparing meals and baked goods respectively. However, German has no general process word with the range of English cook, as the following chart shows:

<table>
<tr><td colspan="2">kochen</td><td colspan="3">braten</td><td>backen</td></tr>
<tr><td>sieden</td><td>dünsten<br>schmoren<br>dämpfen</td><td>rösten</td><td>grillen</td><td>toasten</td><td></td></tr>
</table>

Figure 4

Kochen, the general use, referring to the activity of cooking can be used transitively only with an object like Essen meal, as in ich koche das Essen. Ich koche das Fleisch can only mean I boil the meat, and *ich koche das Fleisch indem ich es brate I cook the meat by frying it is contradictory.

kochen to boil: [+Water] ([-Fat] supplied by a redundancy rule.)

backen to bake: [-Water], [-Fat], [-Direct heat] (i.e., in oven).

braten to fry or broil: [-Water].

It seems necessary to state the next components disjunctively — [+Fat or + Direct heat]. This is not completely satisfactory, however, since braten seems to be characterized by its contrast with kochen and backen, cooking without water and not in an oven.

sieden to boil: This term is more or less synonymous with the specific meaning of kochen. Sieden can be used for commercial boiling (processing salt, glue, soap, etc.) whereas kochen is exclusively a culinary term.

dünsten, schmoren, dämpfen to steam, stew, braise: [+Water], [+Covered pot] (from category 8). The three terms are synonymous though there are dialectical variations; dämpfen is preferred in the southwestern part of Germany, dünsten in the south, and schmoren in the north.

rösten to roast or fry: [-Water], [+Frying pan] (category 8), [±Fat].

grillen to broil: [-Water], [-Fat], [+Direct heat].

toasten to toast: This may be a partial hyponym of grillen with the additional component to show that the object must be bread (from category 9).

In addition to these paradigmatic terms there are a number of phrases which are commonly used to make the meaning of braten more specific: in der Pfanne braten pan-fry, which is synonymous with rösten; auf dem Rost braten to broil, synonymous with grillen; and am grossen Stück braten to barbecue, usually a whole animal or large piece of meat. A few words have been borrowed from French (poachieren, sautieren, flambouieren), but these are not commonly used. Finally, German has two partially productive prefixes, an- and durch-, which produce ankochen parboil, anbraten sear, anbacken slightly bake, anbraunen slightly brown, durchkochen cook thoroughly, durchbraten fry thoroughly and durchbacken bake thoroughly.

English has retained the most general and common words cook and bake from its Germanic origin but has borrowed the rest from Old French. Even where a French or German term can best be translated by the English cognate, the meaning is not necessarily the same because the semantic structures of the languages are different. Part of the semantic analysis of a word must include its range of meaning and its boundaries, that is, the limits of its meaning.

Let us now look at two non Indo-European languages with noted cuisines, Chinese and Japanese. Figure 5 shows the structure of Mandarin Chinese culinary words:[10]

| pēng-jen | | | | |
|---|---|---|---|---|
| chŭ | cheng | káŏ | cháŏ | chien |
| lŭ | | | | |

Figure 5

pēng-jen to cook is the general term.

chŭ to boil: [+Water], [+Submerged].

cheng to steam: [+Water], [-Submerged]. This term may also imply that a special utensil, a steamer, is used.

káŏ to roast, bake, grill: [-Water], [-Fat], [±Direct heat]. Though káŏ has a wide range of meaning, distinctions can easily be made syntagmatically as in:

tsaì-hui -li kaŏ-paí-chŭ roast yams in ashes

tsaì-kaŏlu-li-kaŏ-paí-chŭ bake yams in an oven

tsaì-lútz-shèng-kaǒ-paí-chǔ cook yams on a grill
tsaì vegetable or cooked dish
paí-chú yam
hui ashes
lútz stove, kaǒlu oven
li inside
shèng on top

cháǒ to stir-fry: [-Water], [+Fat]. A new component from a new category must be added — [+Stir].

lǔ to boil in a special broth or soy sauce: [+Water], [+Submerged], [+Special cooking liquid] (category 9).

chien to fry or deep fry: [+Fat], [-Stir].

The structure of Japanese culinary terms can be illustrated by the following chart:[11]

| niru | musu | yaku | ageru |
|---|---|---|---|
| yuderu | taku | itameru | |

Figure 6

niru to boil: [+Water], [+Submerged],

musu to steam: [+Water], [-Submerged],

yaku to bake, roast, grill, pan-fry, etc.: [-Water], [±Fat], [±Direct]. This term is hard to characterize positively, since like German braten, it refers to cooking processes other than those which can be easily specified positively. For yaku, water or oil may be used, but the result will ultimately be dry.

ageru to deep fry: [-Water], [+Fat [+Large amount]].

taku: This term refers to a sequential process, niru followed by musu, though my informant felt that taku was more closely related to niru. Taku generally presupposes rice as an object although other objects are not impossible. The double process can be componentialized in two steps:
Time 1: [+Water], Object (rice) [+Submerged]
Time 2: [+Water], Object [-Submerged]

yuderu to hard boil (eggs): [+Water], [+Submerged], [+Long cooking time], [+Special food (eggs)].

itameru to stir-fry: [-Water], [+Fat [-Large amount]], [+Frying pan], [+Stir].

Japanese does not have a process word quite corresponding to the English cook. Ryo: risuru to cook is used to refer to the activity of cooking. Taku perhaps has a general sense close to the process sense of cook, but this is not a common term. Yaku plus modifiers would be used to refer to the preparation of bread.

Japanese has a number of compound verbs consisting of a cooking verb base plus another verbal base: -komu to cook something for a long time carefully[12] as in nikomu (niru+komu), yakikomu (yaku+komu), and takikomu; -ageru to finish [cooking] something (homophonous with ageru to deep fry) as in niageru to finish boiling, ageageru to lift out of the oil, yakiageru to finish steaming; han- half, as in hañyakinisuru to half bake (ni into condition of, suru to do), hañmusinisuru to half steam, hañyudenisuru to make soft-boiled eggs.

I now wish to turn to other non-Indo-European languages and to look at the culinary terms for cultures without a distinguished cuisine — Jacaltec, Yoruba, Navajo, and Amharic.

Jacaltec cooking words structure as in Figure 7:[13]

| tahce | | čo | leŋa |
|---|---|---|---|
| čika | henŋe | q'ance | |

Figure 7

Jacaltec apparently has no general term for cook, but there are several general terms, e.g., work, do woman's work which may be used and will be understood in context.

tahce to boil or steam: [+Water]. The water may be in the food itself; tahce may be used for cooking grain or fruit in corn husks.

čo to roast by putting in flames or coals: [+Water], [+Direct heat], [+Special food presupposed (meat)].

q'ance to brown or parch: a partial hyponym of čo; [+Water], [+Direct heat], [+Special food (grain)].

čika to boil: [+Water]. čika differs from tahce in that water must be added.

henŋa to cook until soft or bursting: [+Water], [+Long cooking time], [+Special food (grain)].

leŋa to smoke or preserve: [-Water], [-Direct heat], [+Long cooking time] [+Special purpose (to preserve)].

The structure of Yoruba cooking terms must be taken as tentative, since I had no access to native speakers, unfortunately. The analysis is based on definitions, translations, and cooking descriptions.[14]

| sè1 | | | | |
|---|---|---|---|---|
| sè2 | din | yan | | |
| bọ̀ ? | | ta | sun | bu |

Figure 8

sè has a general and specific sense. The general sense, sè1, means to cook by any method.

sè2 to boil, simmer, steam: [+Water], [+Special foods (starchy vegetables)].

bọ̀ to boil: [+Water], [+Special foods (meat, leafy vegetables, corn for cornstarch)]. It is unclear whether sè2 and bọ̀ are incompatible, or partially synonymous or whether one is a hyponym of the other.

din to fry: [+Fat].

yan to roast, bake: [-Water], [-Fat], [±Direct heat].

ta to roast: [-Water], [-Fat], [+Direct heat], [+Special food (ears of corn)]. Apparently ta is a peripheral cooking term, like the English scallop.

sun to roast in the fire: [-Water]; [-Fat], [+Direct heat (fire)].

bu to bake in hot ashes: [-Water], [-Fat], [+Direct heat (hot ashes)].

Sun and bu may be incompatible or partially incompatible with yan rather than hyponyms of it.

There are several suffixes, at least one of which is productive: -obę to dry, as in dinobę fry until dry yanobę toast until dry; -pamǫ to preserve, as in dinpamǫ to fry to preserve; and -jo until burned, as dinjo fry until burned.

According to Perchonock and Werner, Navajo cooking words exhibit the following structures:[15]

| shibéezhgo | sit'éego | łeeh yit'áago |
|---|---|---|

Figure 9

There seems not to be any general word to refer to the process of cooking, but chi' iyaan 'alneehgo to prepare food is used for the activity.

shibéezhgo to boil: [+Water].

sit'éego to bake, roast, fry or broil: [-Water], [±Direct heat], [±Fat].

łeeh yit'áago to broil, literally it has been put as a roundish object into the ground. Heat is assumed, and the term apparently refers to cooking underground foods which are wrapped in corn husks.[16] This term may be a peripheral cooking word in Navajo, since it does not seem to enter compounds freely as do the other two cooking words. On the basis of the translations, the components must include [-Water], but it is not clear what other ones are needed.

Navajo uses syntagmatic constructions to convey more precise information on cooking methods, as in ásaa' bee shibéezh boil in a pot, daa'ábee shibéezh boil in a kettle, tsíʔd bikáá' shibéezhgo boil over hot coals, béésh biikǫ'ó bikáá' shibéezhgo boil on a stove, tsét'ees bikáá sit'éego bake on a stone grill, tsee'ʔbee sit'éego fry in a skillet.

Navajo has seven verbs of eating,[17] a general term yiyą́ą́ʔ, and six others whose use depends on the nature of the object: hard or chewy objects, yiʔal; long stringy objects, yiłtšož; meat, yišɣal; one round object yiškhit; mushy food, yiłtsʔeeʔ; and separable objects, yištéél.[18] Since in English and other languages there is great overlap in the collocations of eat and cook (for obvious reasons) I wondered whether the Navajo verbs of cooking would be distinguished by the nature of the objects as are the verbs of eating. Apparently Navajo does not maintain a parallel distinction in verbs of cooking and eating. The cooking words are distinguished by the parameters of the cooking process itself, as in the other languages discussed.

Amharic cooking words exhibit the following structural relations:[19]

| bɛssɛlɛ | | | | |
|---|---|---|---|---|
| fɛlla | kʔɛkʔkʔɛlla | gaggɛrɛ | tʔɛbbɛssɛ | kʔolla |

Figure 10

The hyponyms of bɛssɛlɛ it cooked have the components as follows:

fɛlla it (a liquid) boiled: [+Water], [+Special class of thing cooked (Liquids)].

kʔɛkʔkʔɛlla it (a solid) boiled: [+Water], [+Special class of things cooked (Solid)].

gaggɛrɛ it baked: Apparently this term is used exclusively for baking bread in a disk-shaped pan on an open hearth, so more than the minimum components are necessary to completely characterize it: [-Water], [-Fat], [+Special utensils (Disk-shaped pan), (Open hearth)], [+Special food (Bread)].

tʔɛbbɛssɛ it fried: [+Fat].

kʔolla it parched: [-Water], [-Fat].

It may be the case that fɛlla and kʔɛkʔkʔɛlla are closer together in meaning than they are to other terms, but this suggestion is not verified.

Before turning to Lévi-Strauss, it may be useful to summarize the results of the previous analyses. All the languages studied have at least three paradigmatic contrasts (i.e. three different cooking words), but additional distinctions can be easily made syntagmatically. There is a weak correlation between

the number of paradigmatic contrasts and the cuisine of the culture. Navajo and Jacaltec have fewer words than French, but Yoruba has more than Chinese. Each language has a separate term for boiling, but the semantic space of baking, frying, roasting, and broiling is divided up somewhat differently by each language. The primary parameters for distinguishing among the main culinary terms are the use of water or fat and whether the heat is direct or radiated. Cooking terms usually presuppose certain utensils such as pots or an oven. All cooking words presuppose a heat source. However, where other categories are involved (use of a specific utensil, special sauce, long cooking time), they are less important and lower in the taxonomic tree than the use of water, fat, etc. That is, we would not expect to find a language which exhibited a structure such as:

| Cook | | | |
|---|---|---|---|
| In a pot | | In a kettle | |
| steam | boil | fry | boil |

Figure 11

These specific components vary from language to language, but they can be grouped into a relatively small number of categories. One can imagine other sorts of distinctions which could be used for making paradigmatic contrasts but are not: for instance, a language could have one set of terms for everyday cooking and another for ceremonial cooking, or use different lexical items depending on the shape of the food cooked, or one set of terms for preparing the noon meal and a different set for the evening meal.

That languages do in fact use the same general categories and that all of them are tied up with the process of preparing food is not surprising. In fact, other results would be surprising. Currently generative-transformational linguists have raised the issue of whether the similarities in languages are the result of genetic transmission. This view has not been argued for as strongly with respect to semantic features as for phonological and grammatical components.[20] It would be implausible to argue that similarities in cooking terminology are the result of genetic transmission, especially when cultural similarities are so available to explain the linguistic similarities. Perhaps linguists ought to take a closer look at some of these cultural similarities before rushing to premature conclusions about things being conceptually innate.[21]

3. Turning now to The Culinary Triangle I shall summarize the main points and see to what extent the data from 2 support Lévi-Strauss' assertions.

The first point is that oppositions like those used in phonology are appropriate to describe semantic structures.[22] A set of -etic oppositions which are realized somewhat differently -emically in different languages can be stated. Some components in the field of cooking words do seem to operate like binary distinctive features, particularly [Water], [Fat], and [Direct heat]. These features, like phonological features, provide information on whether the valence is positive or negative. [-Water] means that water must not be used: [-Direct heat] means that the source of the heat is indirect. Many components, however, are not of this sort. A component is either present or not, but there is no minus-use. Barbecue has the component [+Barbecue sauce], but there is

no cooking word with the component [-Barbecue sauce], meaning that such a sauce must not be used.

A second point made by Lévi-Strauss is that there is a basic distinction between boiling and roasting, bouillir and rôtir.[23] (But remember that rôtir has a wider range of meaning than the English cognate roast.) This observation is partially correct in that all languages distinguish between boiling and something else, though this something else is not necessarily roasting.

Lévi-Strauss establishes another opposition, culture/nature and associates boiling with culture and roasting with nature because a pot must be used for boiling but is not necessary for roasting.[24] His own data on this association are ambiguous, as he admits, since in many cultures roasted meat is associated with feasts and boiling with everyday food preparation. My data do not confirm Lévi-Strauss' association in any way.

Boiling and roasting form two points of the culinary triangle. The third is smoking. Smoking is like roasting in that no pot is needed and water is not used. It is a slow process like boiling, however. Smoking differs from roasting in that a large amount of air is necessary for smoking and the meat is not close to the fire. The oppositions close/distant and rapid/slow are proposed to characterize these differences.[25]

The only language investigated in 2 that in any way confirms Lévi-Strauss' model establishing boiling/roasting/smoking as equal subclasses of cooking methods is Jacaltec, where the term leŋa can mean to smoke or preserve and where this term is at the same level as tahce boil or steam and ʧo roast; but leŋa may be a peripheral cooking term, since it can also apply to preserving food without heat, e.g., by salting. Informants for other languages rejected analyses which treated smoking as a kind of cooking. Smoke or its equivalent was classed as incompatible with cook or its equivalent. In French, fumer like boulanger is related to cuire, but incompatible. Cuire applies to activities done at home; boulanger and fumer refer to activities done usually by professionals to produce things that might later be used for cooking or be served with other foods for a meal. The contrast in Chinese is most striking. pēng-jen to cook contrasts with yen to preserve or cure, and yen covers a range of meaning which includes curing, smoking and pickling (where no heat is used at all), as in yen tsaì to pickle vegetables and yen rù to cure meat.

If smoking (fumer) were replaced by baking, the model would become more plausible. Lévi-Strauss may have intended something similar to baking or he may have included baking in this category, but his examples would suggest otherwise.

As for the rapid/slow distinction, there is no particular reason to associate slow with boiling and smoking and rapid with roasting. This component can occur with any cooking method, as sauter/rissoler (hyponyms of frire) or parboil/stew (hyponyms of boil).

Lévi-Strauss establishes a three-way contrast among foods which are raw, cooked, or rotted, pointing out that what counts as raw or spoiled may vary from culture to culture. Raw is associated with roasting, since this cooking method may cook foods on the outside but leave them raw (or at least less thoroughly cooked) on the inside. Rotted is associated with boiling with

the qualification that the connection is metaphorical "the 'boiled' is not the 'spoiled'; it simply resembles it."[26] The culinary triangle can be diagrammed as follows:[27]

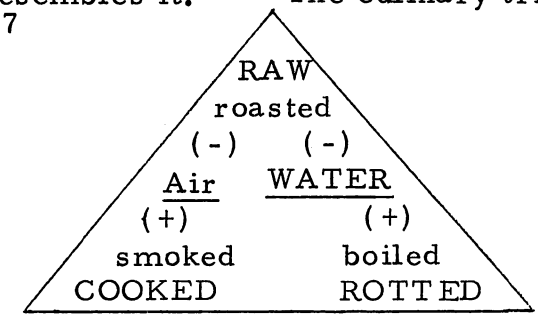


Figure 12

There is no evidence in my data to confirm these associations. Partial cooking can be associated with any cooking method, and parboil shows that rawness can be associated with boiling. The association of smoke with cooked food has been discussed. In both Jacaltec and Chinese there is a linguistic connection between cooking and ripening. In Jacaltec tahce can be translated as to cook (food) or to ripen (fruit). In Chinese shoú-te-tùng-tsi can refer to cooked food or ripened fruit and vegetables and shēng-te-tūng-tsi to raw food and unripened fruit or vegetables. The semantic distinction seems to be ready-to-eat as opposed to not yet ready.

Perhaps Lévi-Strauss' association of the boiled and the rotted is due to the fact that both boiled and rotted food is soft. However, a priori, it seems at least as plausible to associate the rotted with overcooking or burning. This may be the case in Japanese, where one meaning of yaku is to bake or roast and another meaning is to burn.

In Yoruba bu which means to roast in hot ashes has a second meaning — moldy, which would seem to be close in meaning to rotted.

It may be that all the cases we have been looking at are instances of purely fortuitous homonymy, in which case no conclusions can be drawn. But if there are in fact correspondences between cooked, raw, or rotted food and some method of cooking, then the data does not support Lévi-Strauss' a priori conclusions. Different languages make different correspondences.

To the basic culinary triangle (Figure 12), Lévi-Strauss says, other categories can be added. For example, where there is a distinction between grilling and roasting, the difference being that of the distance from the fire, grilling would be placed at the apex of the triangle and roasting half-way between grilling and smoking. Steaming can also be added, and it would be placed half-way between boiling and smoking, since steaming is characterized by the distance of food from the water.[28]

A more complex figure is necessary if frying is to be added, which might be illustrated by the diagram below. The model can be further modified by other distinctions which might be made, such as different terms used for animal as opposed to vegetable foodstuffs, seasonings, and permitted or restricted combinations.[29] The data described in 2 show that there are other relevant parameters such as thoroughness of cooking, length of time, kind of specific utensils, etc., which cannot necessarily be associated with specific methods.

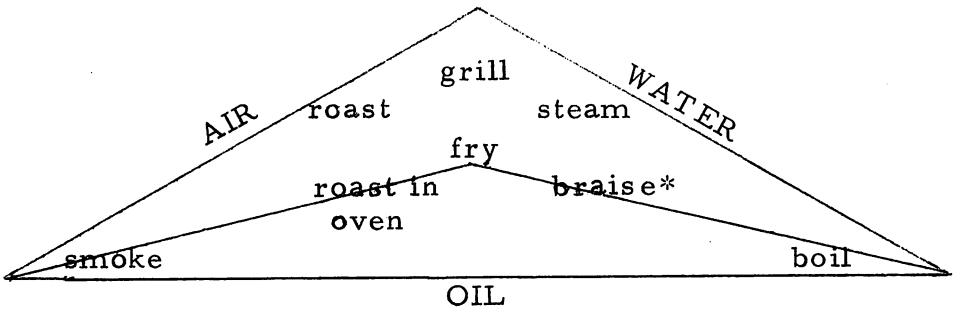


Figure 13

*Lévi-Strauss uses la cuisson à l'étouffe, not braiser

Lévi-Strauss' modified figure, now a tetrahedron, is a neat model of cooking practices, but it does not serve as an accurate model of how cultures are likely to categorize their own cooking practices, at least as revealed by the semantic structure of the lexical field. One might argue, of course, that the cognitive structure is not revealed by the semantic structure of the language, i.e., the language system has no (necessary) cognitive validity. Though there are dangers in generalizing from linguistic analysis, the semantic analyses presented above were based on informant judgments (wherever possible) of how lexical items patterned with respect to each other — which terms contrasted, which were close to one another, etc. The semantic structure was not based on translations, definitions, or any a priori model.

One advantage of Lévi-Strauss' model is that it allows one to place lexical items in between other items without making it necessary to decide whether a partially noncontrasting term is a hyponym of some other term. This is the case in Japanese, where taku to boil and then steam overlaps with níru to boil and musu to steam; in Chinese, where chein to deep fry is only partially included in cháǒ to stir-fry; in English, where roast overlaps with bake and grill; and in French, for many times.

Lévi-Strauss is correct, I believe, in arguing that it is possible to say things about cooking in general without respect to any particular culture. Moreover, it is possible to establish a relatively small set of components that will describe the oppositions of cooking terms in all languages (though each language will not use them all). The components cannot all be binary, like phonological distinctive features. Lévi-Strauss' main error, however, is to assume that we can have a neutral structure of cooking concepts that will be valid for all languages. As we have seen, each language selects some of the components and combines them in different ways, arranges them in different hierarchies, and finally produces different (though not radically different) semantic structures.

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NOTES

1. I wish to express my thanks to the many people who helped me by collecting data, serving as informants, and reading the manuscript. Needless to say, I am responsible for all mistakes.

2. Lévi-Strauss (1966, 1965), 587, 20. The first page number refers to the English translation, the second to the original.

3. Lehrer (1969), Lyons (1963, 1968), Katz and Fodor (1963).

4. Lyons (1963), 59.

5. E.g. Frake (1961).

6. See A. Lehrer (1970) for suggestions about handling indeterminacy and divided responses formally.

7. Lehrer (1969).

8. The meaning of [+ Long] is stretched to include the notion of cooking something slowly as opposed to quickly.

9. Based in part on an analysis by Ingred Saalfrank (1969).

10. Wade-Giles romanization. I wish to thank Caroline Wood for the Chinese data.

11. I am indebted to Yasuko Shiojiri and Edward Quackenbush for the Japanese data.

12. In isolation, -koma has a far more general meaning, often glossed as go into to pack into.

13. My appreciation to Christopher Day for collecting the data. Jacaltec is a Mayan language.

14. Bascom (1951). Yoruba spoken in Nigeria.

15. Perchonock and Werner (1969).

16. Oswald Werner (personal communication).

17. Landar (1964).

18. Many languages (e.g., Jacaltec, Yoruba) have several verbs of eating, where the nature of the object at least in part determines which verb is appropriate. In English, consider munch, nibble, slurp, lick.

19. I wish to thank Susan Hoben for the Amharic data. Amharic is a Semitic language, spoken in Ethiopia.

20. But see Bierwisch (1967).

21. See Lackowski (1968) for a brief discussion of this point.

22. Lévi-Strauss 586, 19. See footnote 2.

23. Ibid. 588, 21.

24. Ibid.

25. Ibid. 591-2, 25.

26. Ibid. 594, 28.

27. Ibid.

28. Ibid. 595, 29.

29. Ibid.