

Semantic cuisine

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Structural semantics seeks to discover certain relationships among the words in the vocabulary of a language.¹ This area of linguistic analysis has received relatively little systematic study by most linguists until recently (Gleason, 1962: 86), and the vocabulary has been considered a rather unorganized set of items.

One approach which has been successful in semantic analysis, however, is the FIELD THEORY. According to this view the vocabulary of a language is organized into lexical or conceptual fields, and the items within each field are tightly structured with respect to each other. The field approach has been successfully applied to some semantic areas, for example, kinship terms, colour terms, plant taxonomies and other fields with clear denotational referents. In some semantic analyses, the field theory is implicit, although the term FIELD is not used, but a set of vocabulary items which are related are analysed together (Bierwisch, 1967; Bendix, 1966).

However, most semantic analyses of this sort deal only with paradigmatic contrasts, e.g. a set of commutable nouns, verbs, or adjectives, but such a set constitutes only part of a field. Syntagmatic presuppositions (*kick with a foot*, *lambs bleat*) and productive or partially productive word-building processes also constitute an important part of the lexical field and should be studied along with the paradigmatic sets (Lyons, 1963: 78, 1968: 428). The importance of syntagmatic presupposition has long been advocated by Porzig (1934, 1950).

I have applied this approach to the lexical field of cooking terms in English, which includes a basic set of verbs and formally and semantically related nouns and adjectives. This analysis shows, I believe, that the items in the field are highly organized and that the semantic and syntactic analyses tend to support each other.

My assumptions and conclusions agree in general with those of Lyons (1963). In particular, I assume that a transformational grammar as developed by Chomsky (1957, 1965, etc.) and others provides the best basis for the statement of the semantic relations that hold between lexical items. In this respect I am also in agreement with Katz & Fodor (1963), Katz & Postal (1964) and Katz

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(1966, 1967). However, I invoke the notion of SITUATION or UNIVERSE OF DISCOURSE in the establishment of semantic fields, and I accept that 'the context of situation . . . must be held to comprehend all the conventions and presuppositions accepted in the society in which the participants live, in so far as these are relevant to the understanding of the utterance' (Lyons, 1963: 63; cf. also Lyons, 1968: 413). This does not imply that we must first represent all the knowledge speakers have about the world before we begin a semantic analysis (cf. Katz & Fodor, 1963: 178), but merely that it is legitimate and necessary to use such information in the course of semantic analysis. The notion of 'universe of discourse' is relevant to semantic analysis in that certain lexical items contrast paradigmatically in some fields but not in others.

Reference is distinguished from meaning (or sense), but it is accepted that reference may be appealed to in establishing the meaning of a lexical item. The meaning of a lexical item is described in terms of the relations (of incompatibility, antonymy, hyponymy, synonymy, etc.; cf. Lyons, 1968: 443-170) that hold between it and other lexical items. The results of an investigation carried out in terms of this view of meaning can then be converted, as I will demonstrate below, into a componential description of the kind proposed by Katz & Fodor (1963) and other semanticists.

In what follows I use the terms 'word' and 'lexeme' interchangeably to stand for 'lexical item'.

The field of culinary terms in English is most conveniently treated by taking verbs as basic in describing the paradigmatic contrasts, although in a few cases lexemes may be synchronically derived from nouns. The set of verbs is as follows:

cook, boil, simmer, stew, poach, braise, parboil, steam, reduce, fry sauté, pan-fry, French-fry, deep-fry, broil, grill, barbecue, charcoal (or charcoal-broil), plank, bake, roast, shirr, scallop, brown, rissoler, sear, parch, toast, burn (unhappily) and flamber.

In addition, a number of semantically compound terms are found (*French-fry* is grammatically, but not semantically, compound):

steam-bake, pot-roast, oven-poach, pan-broil and oven-fry.

Lexemes such as *smoke* and *thaw* are used in food preparation, but they do not belong to this narrow field. The more general field of food preparation would include not only the subset of cooking lexemes, but subsets for mixing, chopping, coating, adding ingredients, separating substances, preserving, etc.

The word *cook* has three levels of generality. In its most general sense (*cook*₁) it means to 'prepare a meal', belonging to the field of household tasks along with *dust, wash, vacuum*, etc., and belonging to the field of occupations, with *repair electrical appliances, sweep chimneys*, etc. My use of SENSE, it should be noted, is

somewhat different from what is often meant by this term, for I do not wish to suggest that these three senses are necessarily distinct. In fact, there is great overlap. The first sense is the least marked and the third sense is the most marked.

A slightly less general sense of *cook* (*cook*₂) contrasts with *bake*. (*Bake* has a general and specific use, too, but the one here is general, *bake*₁.) The semantic distinction is that baking refers to the preparation of cakes, cookies, breads, pastries and other things which are sold in bakeries and prepared by professional bakers. Cooking refers to the preparation of most other kinds of foods. *Cook*₂ and *bake*₁ are the only lexemes in the field which occur intransitively with an animate subject. *I can cook* or *I sauté mushrooms* is acceptable, but not **I sauté* (except in those circumstances in which the corresponding agentive *-er* nouns might be used 'absolutely': see below. For example, a chef might say to his subordinates *X will grill*, *Y will sauté*, etc.). Sentences like *He is boiling* or *He fried* would not be interpreted within the culinary field.

The most marked sense of *cook* (*cook*₃) involves the application of heat which produces an irreversible change in the object (food) cooked. The most specific use is incompatible with *cool* and *chill*, whereas *cool* and *chill* are included in the more general sense of *cook* because the preparation of some foods, e.g. puddings, requires both heating and cooling, and we would still wish to apply the term *cook* to the preparation of such foods.

The lexical field covered by *cook*₃ can be divided into four main categories headed by the lexemes *boil*, *fry*, *broil* and *bake*₂ (the specific sense). The terms constitute an almost closed set and are largely incompatible with one another. These four lexemes, then, are hyponyms of *cook*₃.

Of this set *boil* has the most complex subset of terms included in it. *Boil* has a general and specific meaning. Both senses involve cooking with liquid, usually water or a water-based liquid (stock, wine, milk), but oil (grease, fat) is excluded. The phrase *boiling in oil* is semantically acceptable in many contexts because oil, like other liquids, has a boiling point, can have things immersed in it, etc. But in the culinary field this phrase is unusual. (Actually some modification is required since we can speak of letting a kettle of oil or butter boil or simmer; but instead of *boiling a solid in oil or fat*, the term *deep fry* is used.)

The specific sense of *boil*, *boil*₂ adds the component of vigorous action (occasionally referred to as a *full boil*, though the modifier need not be present for this meaning), and this sense contrasts with *simmer*. *Simmer* means 'to cook just below the boiling point' without the rolling bubbles which characterize *boil*₂. *Boil*₁, the general sense, is unmarked with respect to the vigour of the process and includes both *simmer* and *boil*₂. *Simmer* and *boil*₂ collocate with both liquids and solids. However, if what is boiled is a solid, it is presupposed that some liquid is present. *The meat boiled in a dry pan* is anomalous, although one might boil tomatoes without additional liquid since the natural juices provide enough liquid.

The lexemes *poach* and *stew* are hyponyms of *simmer* (and therefore of *boil*, since the relationship is transitive). *To poach* is 'to cook by surrounding with simmering (not boiling) water or other liquid using care to retain shapes' (*Betty Crocker*, 1956: 14). Foods which are typically poached are eggs, fish and fruit. *Stewing* is 'a long slow method of cooking . . . in a liquid which is kept at simmering point' (*Good Housekeeping Cooking Encyclopedia*, 1964: 407), and applies to meat, vegetables and fruit. Since fruit can be poached or stewed, and since poaching and stewing are extensionally identical, the possibility arises of treating *poach* and *stew* as synonyms, used in free variation with fruit and in complementary distribution with other foods. This proposal is not satisfactory, however, since the purpose of these cooking processes is semantically relevant, and the purposes are different. The purpose of poaching is to retain the shape of the food, while that of stewing is to make the food softer, and a long cooking time achieves this purpose. In the case of fruit, where poaching and stewing seem to be the same, the difference in meaning still exists. One would poach a fruit to preserve its shape and stew it to make it soft, although these ends can often be accomplished simultaneously. We speak of *stewed tomatoes* but hardly of *poached tomatoes* because tomatoes do not usually retain their shape when cooked in water. Here is a case where we can separate reference and meaning. (Poached eggs and boiled eggs differ in their reference in that the former are cooked without shells while the latter are cooked with them. While it would be possible to define *poach* and *boil* to account for this difference, the semantic description would be complicated to a point of diminishing returns. It is therefore preferable to treat *poached egg* and *boiled egg* as unitary lexemes. Another term, *coddle*, seems to collocate only with *egg*, so that *coddled egg* may be considered a lexemic unit. Since cookbooks and dictionaries disagree as to exactly how to coddle an egg, it is difficult to abstract any precise meaning for *coddle*). *Poach* and *stew* collocate only with solid (or solidifiable) foods, which is logical, given the purpose of the processes. One cannot preserve the shape of a liquid by boiling it in water or make a liquid softer.

Braise refers to two processes carried out sequentially. Braised food (meat and vegetables) is 'browned in a little fat, then cooked in a little liquid over a low heat in a covered pan' (*Gastronomique*, 1960: 303). After the first process (browning, see below), the rest of the cooking is done by stewing. The semantic overlap of *stew* and *braise* is paralleled by identical collocational preferences. All of the cookbooks consulted as well as the *Shorter Oxford English Dictionary* agree that braising is done in a tightly covered pot, and therefore the use of a lid is probably to be specified in a semantic description of *braise*. This further component makes *braise* a partial hyponym of *stew* rather than a synonym:

Braise = *stew* and [+Lid]

Braise is also a partial hyponym of *brown*.

To *parboil* is 'to partially cook food in boiling water'. The term is used only with solids, and the *simmer-boil* distinction does not apply. *Parboil* contrasts with *stew* with respect to the length of time involved (short v. long). *Parboil* brings up a presupposition that should perhaps be incorporated into the semantic description – that at least some of the other cooking lexemes assume that food will be thoroughly cooked. The sentence *These cooked potatoes are half raw* is rather anomalous unless stress and intonation patterns suggest an ironical use of the word *cooked*.

The two remaining lexemes in the *boil* set are *steam* and *reduce*, which are incompatible with *simmer*. In order to *steam* a food, 'the water must not be allowed to go off the boil' (*Good Housekeeping*, 1964: 406) and the food is not submerged in the liquid as it is in the other boiling processes. To *reduce* is 'the process of boiling a mixture . . . in an uncovered pan . . . to evaporate surplus liquid and give a more concentrated result' (*Pocket Guide to Good Cooking*, 1955: 234). The purpose of the process – to reduce the bulk – is a relevant component, and a vigorous boil and an uncovered pan accomplish this more efficiently than simmering a liquid in a covered pan. Although there may be some doubt as whether to include [–Lid] and [+Vigorous boil] as components of the meaning of *reduce*, I will do so since these components occur in the analysis of other lexemes subsumed under *boil*₁. *Reduce* collocates with liquids and *steam* with solids.

Figure 1 summarizes the terms which are hyponyms of *boil*. This chart is arranged with respect to the vigour of the boiling action, while one arranged according to collocations preferences or restrictions would look somewhat different.

boil ₁ (unmarked)				
simmer		boil ₂ (marked)		
poach	stew	parboil	steam	reduce
	braise			

Figure 1

(A lexeme is a hyponym of a term above it; lexemes on the same line are incompatible if separated by a vertical bar.)

The set of cooking words headed by *fry* includes *fry*, *sauté*, *pan-fry*, *French-fry* and *deep-fry*. Frying is characterized by the use of fat (oil, grease) in cooking, although the fat may be present in the food being fried. The invention of non-stick frying pans requires a modification of this analysis. For some speakers, *fry* is characterized by cooking a food in a frying pan or similar utensil above the

heat source. Water, however, must not be used. Such an analysis requires disjunct components.

[+ Fat] v. [+ Cooking in frying pan above heat]

A further complication is that for some speakers, *fry* contrasts with *deep-fry*, although they will admit that deep-frying is a kind of frying. This case suggests that *fry* may have a general and specific use. *Pan-fry* is sometimes used for the specific sense. *Pan-fry* is partially synonymous with *sauté*, but *sautée* requires fat while pan-frying need not. *French-fry* and *deep-fry* are synonymous, involving a relatively large amount of fat, that is, enough to cover what is being fried, and both are incompatible with *sauté*, which is characterized by a small amount of fat. *Fry* collocates with solids.

The term *broil* and its hyponyms – *grill*, *barbecue*, *charcoal* and *plank* – bring up the problems of dialect differences and range of reference. *To broil* is ‘to cook directly under a heating unit or directly over an open fire’. Although *broil* is a common American term, *grill* is used in Great Britain instead. (‘*Broil* is the older English word and was current in British cookery books up to about 1900’: *New York Times Cook Book*, 685.) *Broil* and *grill* are partially synonymous, but *grill* has a slightly wider range of application than *broil*. *To grill* is ‘to broil on an open grill or cook on a griddle’. Cooking a food (e.g. pancakes or hamburgers) on a griddle is referentially more like frying than broiling, so that grill may have to be considered a partial hyponym of *fry* as well as of *broil*. (We could establish *grill* as the more general term, with *broil* a hyponym of it, but this is not satisfactory for American English because *broil* is the commoner word, used at a rank equal to *fry*, *bake* and *boil*. *Grill* is less common.)

The lexeme *barbecue* has two senses. The one that is relevant to cooking is ‘broiling over a bed of glowing coals’. The component added to those of *broil* is that the source of heat is hot coals. The other sense of *barbecue* involves cooking a food with a special sauce, usually containing tomato, vinegar and seasoning. By using such a sauce one can barbecue meat by baking it as well as by broiling it.

Charcoal (or *charcoal-broil*) is synonymous with *barbecue* with respect to the method of cooking, but the use of a sauce is not implied.

To plank is ‘to cook (usually meat or fish) on a wooden board in a hot oven or under a broiler’. There is some semantic overlap with *bake*, but *plank* can be considered a hyponym of *broil* contrasting with *barbecue* and *charcoal*.

The set of *broil* lexemes is restricted to collocations with solids, mainly meat, poultry, fish and occasionally vegetables.

To bake is ‘to cook by dry heat in an oven’ such that the heat acts ‘by conduction and not by radiation’. That is, the source of heat is indirect rather than direct as for broiling.

The general sense of *bake*, as suggested above, *bake*₁, refers to the preparation

of bread, pastries, etc., and English has a number of pairs of terms for these products before and after they are baked: *dough-bread*, *batter-cake*. The specific use of *bake*, *bake*₂, is another method of cooking, contrasting with *fry*, *broil* and *boil*, and most bakery products are prepared by this method. (Doughnuts may be fried, however.) *Bake* collocates primarily with solids.

The principal lexeme related to *bake*₂ is *roast*, but there is a semantic difficulty in this classification. 'In its true sense, roasting means cooking by direct heat in front of an open fire . . . but the modern method of cooking in a closed oven, though normally called by this name, is really baking' (*Good Housekeeping Cooking Encyclopedia*, 364). We see that *roast* overlaps with *broil* semantically in that some roasted foods (meat, marshmallows) are cooked over (or under) an open fire. One alternative is to establish *roast*, as an equal member of the set of lexemes *bake*, *broil*, *boil* and *fry*, but *roast* does not contrast with *bake* and *broil* and is not completely synonymous with either term. Nor is there adequate motivation for establishing two senses of *roast*, one synonymous with *bake* and the other SYNONYMOUS with *broil*. It is more accurate to attribute to *roast* a range of meaning which overlaps with *bake* and *broil*, making *roast* only a partial hyponym of *bake*.

Shirr and *scallop* are the remaining hyponyms of *bake*. *Shirr*, used primarily for eggs, means 'to bake in a small shallow container'. *To scallop* is 'to cook and serve in a scallop shell or a dish like one' (*English Cooking*, 1960: 232). But the scalloped foods are usually cooked in a cream sauce, and this sauce is a semantic component, perhaps more important than the baking dish used.

The lexemes included under *cook* which have been discussed so far can be summarized as in Figure 2. The range of *roast* extends over *bake* and *broil* and that of *grill* over *broil* and *fry*.

Cook									
boil		fry		broil			bake		
simmer	(full) boil	sauté pan-fry	French-fry deep-fry	grill	barbecue charcoal	plank	roast	shirr	scallop
See Figure 1									

Figure 2

Brown heads another subset of lexemes subsumed under *cook*. This set is related to the *fry-broil-bake-boil* set but cannot be placed in a hierarchical relationship to it. *To brown* is 'to give a dish . . . an appetizing golden-brown colour by placing it under the grill or in a hot oven' (*Good Housekeeping*, 472) or by frying. Boiling is excluded because boiling a food does not brown it (unless the water cooks out, in which case one is no longer boiling the food). Therefore, *brown* implies *not boil*.

Burn in the culinary field is related to *brown* as a gradable member of a pair. *To burn* is 'to brown too much'. One can burn a food by overfrying, overbaking or overbroiling. Boiling, for the reason mentioned above, is excluded.

Brown has four hyponyms: *sear*, *rissoler*, *toast* and *parch*. *To toast* is 'to brown by direct heat', that is, by broiling; *to parch* is 'to brown with dry heat', that is by baking, and *to sear* and *rissoler* mean 'to brown by frying'. Searing is done quickly, rissolering, slowly. The four hyponyms of *brown* collocate with solids, but *brown* can be applied to things like butter (which would be in a liquid state) in addition to solids.

The lexeme *flamber*, meaning 'to flame with brandy or fortified wine', is another hyponym of *cook*, but it is a comparatively rare word. Its rarity, of course, reflects American and British culinary habits. Although *flamber* contrasts with *fry*, *broil*, *bake* and *boil*, I shall tentatively classify it with the *brown* set, since flaming food in this way browns and crisps the surface of the food. Moreover, the thing to be flambéed is often previously cooked by some other method (e.g. duck, steak).

brown ← → burn				
parch	toast	sear	rissoler	flamber

Figure 3

There are a number of compound lexemes in the culinary field: *steam-bake*, *pot-roast*, *oven-poach*, *pan-fry*; and presumably many new ones can be generated: *charcoal-bake*, *simmer-grill*, *oven-brown*, etc. How these compounds should be classified semantically depends on whether priority is to be given to reference or formal signals. Pot-roasting, for example, is almost the same as braising, although *pot-roast* has a narrower range of collocations than *braise*. This would make *pot-roast* a hyponym of *boil* rather than of *bake*. Even if reference is selected as the determining factor, it is difficult to classify a term like *oven-poach*, which is referentially like baking in some respects and like boiling in other respects.

The compound lexemes clearly show the limitation of hierarchical analysis. The range of lexemes like *roast* and *grill* partially extending over two other terms also reveals this limitation. A componential analysis might handle these semantic relationships more conveniently. In a componential analysis one looks for the smallest number of components which will provide all of the relevant information, and so the most general elements are sought. However, some definitions call for quite specific and unique components, as 'in a small shallow container' in the case of *shirr*.

An examination of even the very specific components reveals that they can be grouped into a small number of classes. For example, a number of cooking terms involve, as part of their meaning, a certain kind of utensil. We can state that a special utensil is relevant without specifying what that utensil is. Although this would not result in a complete semantic analysis, it shows that the seemingly large number of unique components can be determined by a few relevant parameters.

The following components and parameters are involved in the cooking vocabulary of English:

Use of water (wine, milk, etc.)	[+ Liquid] v. [– Liquid]
Use of fat	[+ Fat] v. [– Fat] ²
Direct or radiated heat v. conducted heat	[+ Direct] v. [– Direct]
Vigorous v. gentle cooking action	[+ Vigorous] v. [– Vigorous]
Long v. short cooking time	[+ Long time] v. [– Long]
Large amount v. small amount of some substance	[+ Large] v. [– Large] ³

The following specifications involve unique components, but a binary notation can show whether a given parameter is relevant or not to the semantic analysis:

Kind of cooking utensil	[+ Relevant]
Special ingredient added (sauce)	[+ Relevant]
Special purpose (e.g. preserve shape)	[+ Relevant]

In Figure 4 where certain distinctions do not apply or where parameters are irrelevant,⁴ there is a blank, although 0 could be marked. As in phonology, ‘–’ implies a feature, not the irrelevance of one.

This chart handles compound lexemes, but does not deal with *grill* and *fry* adequately. A statement allowing disjunct components would be more satisfactory. For example,

Grill: [– Liquid], [+ Direct heat v. on griddle]
or
Fry: [– Liquid], [+ Fat v. special utensil (frying pan)]

[2] This is somewhat redundant because usually [+ Liquid] implies [– Fat] and [+ Fat] implies [– Liquid].

[3] The use of binary notation is purely a convenience, and there is no implication of a binary structure of semantics. One could easily establish several degrees of vigorous cooking action, length of cooking time, etc., but it is not necessary to do so for this field.

[4] This analysis lists only the components necessary to distinguish lexemes from one another within the field. An analysis based on the theory outlined by Katz, Fodor, and Postal would assign additional semantic markers to most terms: e.g. (Process (Irreversible)) (Application of Heat) and perhaps others. Components such as [Liquid] would be given the status of distinguishers, as would the highly specific components, such as [Utensil: small dish].

[5] Hot coals.

The main advantage of a componential analysis is that it provides insight into how and why partially anomalous sentences are easily understood. Consider an instruction *to poach an egg in oil*. Although *poach* calls for [+Liquid] and [−Fat] and the instruction blocks these components, there are still some components left to provide some understanding of the sentence: [+Preserve shape], [+Gentle cooking action] plus those in all cooking words (Heat), (Process), etc. Communication is likely to break down, however, when all components are blocked, as *Fry the egg in water in a cold oven*.

Certain asymmetries can be noticed in the analysis. For example, a special utensil is specified for terms like *braise*, *roast* and *fry*, but not for *boil*, *broil*, etc., even though certain utensils (or appliances) are characteristically used when braising and roasting, and this information is common knowledge. The asymmetry is intentional, however, and components (many embracing information about the world) were introduced as needed in order to distinguish lexemes which we wish to distinguish. The dilemma in semantics is this: on one hand, 'there is no serious possibility of systematizing all the knowledge in the world that speakers share' (Katz & Fodor, 1963: 178) and on the other hand such knowledge is often used to understand (disambiguate, etc.) utterances. But the dilemma is in fact not real. We draw on as much information about the world as we need to for semantic purposes. There is no need to draw any *a priori* distinction about a speaker's knowledge about the world and his knowledge about his language.

In considering the grammatical properties of the set of lexemes described above, it becomes apparent that not all of the forms are basically verbs. Some verbs, which are derived from other parts of speech, have certain syntactic limitations, e.g. *plank* and *scallop*. Whereas *The meat is stewing* or *The salmon is poaching* are acceptable sentences, **The meat is planking* or **The potatoes are scalloping* go beyond the fringe of grammaticality. The verb *plank* is derived from the noun, and *scallop* probably from *scallop shell* (with additional semantic extension). Interestingly enough, it is the least general words which do not fit into the pattern with the rest of the set. A potential productive device for English is to derive new verbs from utensils or vessels. The meaning of such new forms would be 'to cook [a food] in (on) an X by (method most suitable)'. *To casserole celery* would mean 'to cook celery in a casserole dish', and if this were done by baking, *casserole* as a verb would be a hyponym of *bake* in the lexical field of cookery. It seems to me that only a semantic theory that deals with the universe of discourse or sociocultural settings can make semantic projections with much accuracy. When a verb is derived from a noun, there are a large number of possible meanings, but a context or semantic field together with the presuppositions which speakers share about that field greatly limit the number of meanings.

Cook and *bake* are the only lexemes in the set which can freely occur intransitively with an animate subject (or alternatively, with a deleted object). *I cook*,

SEMANTIC CUISINE

	Non-fat liquid	Fat	Direct heat	Vigorous action	Long cooking time	Large amount of special substance	Other relevant parameters			Collocates with	
							Kind of utensil	Special ingredient	Additional special purpose	Liquids	Solids
cook ₃										+	+
boil ₁	+	-								+	+
boil ₂	+	-		+						+	+
simmer	+	-		-						+	+
stew	+	-		-	+				+ To soften	-	+
poach	+	-		-					+ Preserve shape	-	+
braise	+	-		-			+ Lid			-	+
parboil	+	-			-					-	+
steam	+	-		+			+ Rack, sieve, etc.			+	+
reduce	+	-		+					+ Reduce bulk	+	-
fry	-	+					+ Frying pan			-	+
sauté	-	+				-				-	+
pan-fry	-	+					+ Frying pan			-	+
French-fry	-	+				+				-	+
deep-fry	-	+				+				-	+
broil	-	-	+							-	+
grill	-	-	+				? (Griddle)			-	+
barbecue	-	-	+ ⁵					+ BarBQ sauce		-	+
charcoal	-	-	+ ⁵							-	+
plank	-	-	+				+ Wood board			-	+
bake ₂	-	-	-							-	+
roast	-	-	±				+ Small dish			-	+
shirr	-	-	-	-			+ Shell			-	+
scallop	-	-	-					+ Cream sauce		-	+
brown	-				+				+ Brown surface	-	+
burn	-									-	+
toast	-	-	+						+ Brown	-	+
rissoler	-	+			+				+ „	-	+
sear	-	+			-				+ „	-	+
parch	-	-	-						+ „	-	+
flamber	-	-	+					+ Alcohol	+ „	-	+
steam-bake	+	-	-				(?) Lid			-	+
pot-roast	+	-		-						-	+
oven-poach	+	-	-				+ Frying pan			-	+
pan-broil	-	-	+							-	+
oven-fry	-	+	-							-	+

Figure 4

but not * *I fry*. Sentences like *She can cook* or *Henry bakes* imply the general senses of the terms. The semantic generality of these words is paralleled by greater syntactic freedom.

Most of the other verbs in the cooking field (and the marked sense of *cook* and *bake*) seem to be basically transitive verbs, with the intransitive form derived from them.

X sautéed onions (adverb of manner) → *Onions sauté* (adverb).

An adjunct is necessary for an acceptable sentence.

Onions sautéed quickly, but not **Onions sauté*.

Simmer seems to be an exception, however. One would say *John lets the water simmer*, not **John simmers the water*.

Boil is an odd member of the cooking set, and it patterns somewhat differently from the other verbs. It is a more general term than other words in the field in that it patterns in several other fields as well. Perhaps it is not primarily a cooking word at all, as are *fry*, *broil*, *toast*, etc., but has been 'borrowed' into it. *Boil* and some of its hyponyms (*reduce*, *simmer*) collocate with liquids whereas the other lexemes collocate only with solids or solidifiable foods. Moreover, *boil* is the only lexeme of the set which takes the adjectival suffix *-able*. **Fryable*, **simmerable*, **broilable* do not occur as words in English, while *boilable* does, but interestingly enough – not in its application to cooking. A typical kind of boilable item is waterproof baby pants, and the meaning in this context is 'can be boiled without becoming ruined'.

In dealing with derivational items, many linguists would include productive processes in the grammar. 'Grammatical rules are intended to generate all grammatical utterances, whether they happen commonly to be used or not' (Lees, 1960: 152). Although there is considerable merit in Lees's proposal, I believe that it is also relevant for the linguist to show in his description which forms in fact occur and which do not, at least in studies of the lexicon. 'Accidental' gaps may now and then reveal new systematic insights. To say that *fryable* does not occur because words in the culinary lexical field do not take *-able* is, to be sure, not a very profound explanation, but it is a step above no explanation at all. And by studying other lexical fields or by looking at the nonlinguistic situation, perhaps a more satisfactory explanation will be found.

Nominals formed from past or present participles are productive for all verbs, as in *steamed rice*, *barbecued ribs*, *stewing beef*, *broiling rack*, though *planking steak* is marginal.

Among the other nominalizations, the *-er* suffix is the most common one in the lexical field. *The Shorter Oxford English Dictionary* consistently defines *-er* terms in this semantic field as 'one who or that which –'. This is quite accurate in looking at the process from a productive point of view. However, of the lexemes actually in use with *-er*, all except one are inanimate. (*Broiler*, *fryer*, and

roaster, referring to chickens, are neither agentive nor instrumental: see below.) A *toaster* is a THING for toasting; a *roaster* is a THING for roasting. The animate sense is readily available, and we can easily imagine a situation in which it might be used. For example, a chef might delegate jobs to his assistants, saying *X will be the bread-toaster, Y the mushroom-broiler, and Z the egg-poacher*.

The only *-er* animate derivative in common use in the culinary field is *baker*, and it is related to the general sense of *bake*, referring to the preparation of bread, pastry, cakes, etc. The corresponding lexemes for the general sense of *cook* are *cook*⁶ and *chef*, with *cook* having a wider range of application than *chef* and with some difference in professional status. The occurrence of these currently used, animate agent nominalizations reinforces the semantic analysis establishing a general sense of *bake* and *cook*.

The inanimate lexemes taking *-er* include *broiler, roaster, toaster* and *cooker*, although the last term is primarily British. (*Stove* would be used in America.) A number of *-er* lexemes are compounds, for example, *pressure-cooker, egg-poacher, French-fryer* and *double-boiler*. The rules for generating compounds are not the same in each case. For example, we can generate

X poaches eggs → poacher of eggs → egg-poacher (Lees, 1960: 152)
but hardly

X boils double → *boiler of double → double-boiler.

A few lexemes with *-er* are neither agentive nor instrumental, for example, *fryer* and *boiler*, referring to chickens. These words have a different deep structure from the agentive or instrumental *-er* lexemes (McIntosh, personal communication). This sense of *fryer* is 'a chicken to be fried'.

The derivation of nouns from verbs (and vice versa) without any formal change is a productive derivational process in English, occurring in the culinary field as well. A noun so derived from a cooking verb is used either to refer to a utensil (*grill, barbecue*), a food (*roast, toast*), or an event (*barbecue, bake*).

Figure 5 summarizes some of these nominalizations. Others can be added, of course. The diagram (on p. 52) also shows that the derived terms fall into a small number of classes

Not only can this chart be extended with new terms, but new derivations can

[6] One might suggest that there is a low-level rule (2), operating upon the output of the more general (1), as follows:

(1) *cook-er* → *cooker*

(2) *cooker* [+Animate] → *cook*

Children have been observed to produce such utterances as *Mummy is a good cooker*, presumably by transformation from the structure underlying *Mummy cooks well*. Their later 'internalization' of rule (2) is comparable to their 'internalization' of such low-level rules as *fly* + *ed* → *flew*, etc.

be generated. It seems likely, however, that new nominalizations would fall into one of these categories.

One further nominalizing suffix occurs in this culinary field, *-ery* in the words *cookery* and *bakery*. But the suffix has different meanings, at least in the commonest senses of the words.

Cook: cookery ≠ bake: bakery

Cookery is the art of cooking (cf. *flattery*), whereas *bakery* is a place for baking (cf. *scullery*). The *Shorter Oxford English Dictionary* defines *cookery* in addition as 'a place for cooking', but the ordinary term is *kitchen*. Lexemes like **fryery*, **broilery* and **grillery* do not occur. This fact further reinforces the establishment of general sense of *cook* and *bake*.

Process	Appliance or utensil			Food	Event
	-er	Ø	Different form		
cook	cooker (pressure -) (double)		stove	cooker (an apple)	
boil	boiler		pot, pan		
poach	(egg) poacher				
stew				stew	
deep-fry	deep-fryer				
French-fry	French-fryer				
fry			frying pan skillet		
broil	broiler	grill		fryer broiler (mixed) grill	(fish) fry
grill					
barbecue		barbecue			barbecue
bake			oven	baker (an apple)	(clam) bake
roast	roaster			roaster	(wiener)
toast	toaster			roast	roast
				toast	

Figure 5

The compound verb lexemes (*pan-broil*, *pot-roast*, *oven-poach*) employ a productive device, that is, productive within the semantic field. A new lexeme is formed by combining a noun referring to a utensil (vessel, appliance) with a verb referring to a process. In addition to those lexemes already listed, one

might generate *griddle-bake*, *charcoal-poach*, *oven-fry* or *skillet-boil*. The following rule sketches this derivation:

$NP_1 + V + (NP_2) + \text{prep.} + D + NP_3 \rightarrow NP_3 - V$
 where NP_3 is a utensil and V is a cooking process.

For example,

X bakes (pancakes) on a griddle → griddle-bake.

There does not seem to be any certain way to predict which components of the two processes are to be selected for the meaning of the new word. *Oven-fry* in fact refers to cooking with fat in a very hot oven, but it could refer to enclosing a frying pan in such a way as to make some kind of oven on top of the stove. One cannot form new verbs with two utensils (vessels, appliances) such as **to pot-stove* or with two processes **to boil-roast*, unless something sequential is implied, that is, 'to boil and then to roast'.

A large number of cooking lexemes have additional meanings, that is, they pattern in other lexical fields as well as the cooking field. Although there is not space to present a complete analysis of these other senses, one interesting result of the analysis emerges. Some of these other uses fall into a small number of classes, forming subpatterns within the major pattern. For example, a number of cooking words are used in the field of emotional states, particularly referring to states of anger or agitation: *boil*, *simmer*, *steam*, *stew* and *burn*. Certain semantic relationships hold in the emotional field as in the culinary one. For example, a person who is *boiling* is more agitated than one who is *simmering*. (Terms like *heat*, *warm*, *cool*, *chill*, *freeze*, *thaw*, etc., pattern in the field of food preparation in a semi-technical way and in the emotional field as well, so that the inter-relationship of terms in fields is even greater than I have shown here.)

Another subfield is that of torture, with *fry*, *grill* and *burn*. The explanation for these senses can be sought in the gloomy pages of human history.

A number of terms are used to refer to states of physical discomfort caused by heat, as *I'm roasting*, *I'm cooking in here* or *It's roasting in this room*, *It's steaming in here*. Even in these extensions certain cooking components are retained. *Roasting* conveys the notion of dry heat, while *steaming* suggests dampness and humidity.

These subpatterns emerge most clearly in the study of semantic fields. Such investigations may help us understand better the dynamics of the metaphorical extension of words and will perhaps bring systematic observations to the traditional studies of figures of speech (cf. Bierwisch (1967), who suggests a similar point in extending certain visual adjectives in German to auditory uses). In a given semantic field, e.g. cooking, if one or more lexemes have senses in another field, e.g. emotional states, the other words in the first field are available for

application to the second field, and they carry with them all or any relevant components.

A similar process is at work in derivational extensions in a field. Since *barbecue*, *clambake* and *wiener-roast* exist as social events, one can easily and meaningfully extend the rest of the culinary vocabulary to uses like *we're going to a boil tomorrow*, or *to a potato boil*. New lexical formations, like *to casserole celery*, as suggested above, are modelled on other items in the same field. The same sort of dynamics operates with collocations and semantic restrictions. *Cook* normally collocates with words subsumed under *food*, for example, *chicken*, and many food terms belong to other lexical fields as well, in this case *bird*. It is a short extension for any bird to be classified as *food*, whether people normally cook it and eat it or not.

The study of the meaning of words becomes much more orderly when placed in a lexical field, especially a field which deals with a specific universe of discourse. A lexical field and a universe of discourse are abstractions, too, but they provide a useful, and I believe valid, intermediate level between the meaning(s) of an item in isolation and its meaning in a specific utterance in a specific speech situation.

An analysis of the field of cooking words reveals patterns which should be explored in other fields as well. In analysing the verbs and their derivations, the syntactic and semantic analyses tend to support each other. *Cook* and *bake*, which are semantically more general than the other lexemes, also have greater syntactic freedom. They are the only verbs in the field which permit the object to be deleted when the subject is agentive, the only ones with commonly used animate nominalizations, and the only words which take the *-ery* suffix.

The study of lexemes derived from the cooking verbs shows that these derivations fall into a small number of sets. That is, nouns derived from cooking verbs can be classified as appliances (utensils, vessels), foods, or events. Since there are a number of empty slots in the matrix, one might predict the meaning that a speaker would attach to the new item. The same word in another field might be given an entirely different meaning. By studying phenomena of this sort within a given universe of discourse, I would expect the responses of speakers to be more uniform than responses to words in isolation. In short, this approach shows better the productive aspects of the lexicon – not just what words mean now, and not just how old words combine to form new sentences, but how old words can extend their meanings. This is a synchronic process, not a diachronic one.

The study of words in fields may lead to revealing generalizations about semi-productive processes. For example, no cooking lexeme takes the *-able* suffix (except for *boil*, but not in that field). Investigations of other fields are necessary to verify this prediction.

Finally, in looking at the other meanings of the words, for example, non-culinary senses of words in the cooking field, one discovers minor patterns

operating within a major one. However, these minor patterns are best discovered by studying the major field. This phenomenon offers other insights into the productive processes of the lexicon. A number of cooking words are potentially available for use in the fields of emotion and torture since a few words already pattern in these two fields.

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