Constituting Context: Null Objects in English Recipes Revisited[*]

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1 Introduction

This paper addresses the problem of null objects in English recipes. In general, English does not allow zero realization of object noun phrases (1).

(1)*Sandy prepared the deep-fried tofu and Kim devoured __.

However, as shown in (2), they are allowed in certain contexts.

(2) Roll each piece in kuzu or cornstarch and set __ aside.

Allowing for the possibility of null objects is straightforward, and there are several possible syntactic analyses (discussed below). The more difficult problem is accounting for their distribution, which has something to do with the non-linguistic context.

Previous discussions of null objects in English recipes make reference to the notion of register. For the purposes of this paper, *register* will be used to refer to clusters of formal linguistic properties associated with a 'context'. The term *context* will be used to refer to the socially and culturally constructed concomitants of an utterance or text. This includes what Hymes (1972) calls *setting* and *scene* as well as his *ends* (goals and purposes) and *participants* together with the recognition that all of these components are socially constituted by the acts of the participants.

The definition of register given above is not controversial. However, the view of context taken up here is at odds with the way context is treated in most previous syntactic work on register. Such work usually assumes that contexts exist independent of people and prior to the linguistic acts that reflect them. One of the purposes of this paper is to articulate a view of register that does not rely on this reification of contexts.

The other purpose of this paper is to explore the implications of the distribution of null objects for a competence theory of syntax. Culy (1996) argues that such phenomena require a second component of language knowledge,

[*]I would like to thank Chris Culy, Mary Rose, Ivan Sag, Tom Wasow and Arnold Zwicky for helpful discussion of this paper.

dubbed ‘the user’s manual’. Haegeman 1987 argues that separate registers are generated by separate grammars with different parameter settings. Here I will be arguing for a view of grammar akin to that proposed in Hudson 1996. On this view, monolingual speakers have one grammar that includes social information linked to individual words and constructions.

In the remainder of this paper, section 2 will present the data. Section 3 will review previous analyses. Section 4 presents the case for non-reified context. Finally, section 5 presents a new HPSG analysis of null objects in English.

2 Data

This section presents the data to be accounted for by any analysis of null objects in English, relying heavily on Culy’s (1996) VARBRUL analysis of null objects in recipes.

2.1 Null Objects in Recipes

Culy’s modern corpus[1] consisted of the direction portions of 50 recipes, 10 each from five modern cookbooks. Each token was a potential object noun phrase, either an overt object noun or an instance where the verb selects for an object but none was expressed. In the 50 recipes there were 675 such tokens.

Culy coded the data for the factor groups shown in Table 1. The dependent variable was the form of the noun phrase, either noun, pronoun or zero. There were two syntactic factors, the morphological form of the selecting verb, and the grammatical function of the antecedent to the object noun phrase. Culy included the referent of the object noun phrase as the semantic factor. The discourse factor was lookback, or the number of clauses to last mention. Finally, the source cookbook was coded as an index of style.

The percentage of zeros or null objects as a portion of all object noun phrases ranged from 29.1% in the cookbook with the fewest zeros to 45.4% in the cookbook with the most. When nouns are excluded and Culy considers the ratio of zeros to zeros and pronouns together, the range is from 80.4% in the cookbook with the fewest zeros, to the cookbook with the most zeros becoming a knockout factor.

There are several important things to note in Culy’s results. The first is that null objects occur frequently in recipes, and that this frequency varies across cookbooks. Even more striking is the high portion of zeros among all

[1] He also presents a very interesting diachronic study.

Group	Factors	Type
form	noun, pronoun, zero	dependent variable
verb form	imperative, present part., infinitive, inflected	syntactic
grammatical function of antecedent	subject, object, oblique indeterminate, none	syntactic
referent of the object NP	“finished”, “almost done” “working on”, “other”	semantic
distance to last mention	number of clauses (max 20)	discourse
source	cookbook code	style

Table 1: Factor groups in Culy 1996

pronominals, that is zeros and pronouns together. In fact, when Culy restricted his corpus to the pronominals, the only factor group that was significant in the VARBRUL runs was *source*, that is, individual style. Further, the discourse factor was significant in all of the runs Culy did except that comparing only zeros to overt pronouns. Culy draws from this the conclusion that null objects pattern very closely with overt pronouns in their discourse properties.

These empirical results are important because they further constrain the syntactic analysis of these facts. The preferred analysis will represent the discourse similarities between over pronouns and zeros as well as the stylistic differences between them.

2.2 Null Objects Outside Recipes

Although most studies of null objects use recipes as data, null objects also occur in other contexts. Sadock (1974) discusses null objects in product labels (3) and Fitzpatrick et al. (1986) find them in Navy message narratives (4). It would not be surprising to find them in still other contexts.

(3) Keep __ out of reach of children.

(4) 72 manhours expended to correct __.

Although the only studies I’m aware of concern the written modality, null objects also occur in the spoken language. For example, I found three tokens while listening to 13 minutes of the program “Vegetarian Cooking Secrets of the CIA (Culinary Institute of America)". They come from two chefs who both sounded like native speakers of English.[2]

(5) The vinaigrette is just simple
all it is is lemon juice
lemon juice
with a little bit of salt
whenever you make a vinaigrette it's good to add salt
again, it's a flavor enhancer
we're then going to whisk in
pure olive oil
extra virgin olive oil
after you've **whisked** __ (.) and made a bit of an emulsification
you wanna make sure you taste your vinaigrette

(6) We're gonna plate it now.
When you **plate** __, make sure
that you give the fennel
some height

(7) Okay, we're also gonna add some
tomatillo
the little green husk tomatoes
some cilantro
and a little bit of tomato paste
(.)
and **season** __ with a little salt

This section has shown that, while null objects are unacceptable in the decontextualized sentences usually studied by linguists, they are common in recipes and in some other contexts. I now turn to a review of previous analyses of this phenomenon.

3 Previous Analyses

As far as the syntax is concerned, Culy (1996) identifies three types of analysis: deletion accounts, which involve a rule that deletes an object noun phrase;

[2]In these examples, the line breaks represent intonational units. The null objects are represented with __ and the verbs with dependent null objects are in **bold face**. The symbol (.) represents a pause.

semantic accounts, where a special entry for the selecting verb causes the object position to be present in the semantics but not in the syntax; and empty category accounts.

As for the relationship to non-linguistic context, again there are three extant proposals: multiple grammars, with the choice of grammar dependent on context; a single grammar augmented with a 'user's manual'; and a single grammar with social information integrated in the grammar itself.

The following subsections summarize two existing analyses which each instantiate one combination of syntactic analysis and view of grammar.[3]

3.1 Culy 1996

Culy's answer to the problem of the restricted distribution of null objects is to make use of a separate component of linguistic knowledge. He writes, "The regularities of registers ... should not be expressed in the grammar *per se*, but in a separate component regulating the use of language – a sort of user's manual." (1996:112) As for the syntax, Culy's analysis is a version of the semantic account.

(8) gives an example of a lexical entry on Culy's analysis.

(8) verb: *mix*
subcategorization:

$$\text{NP:}\begin{bmatrix}\text{SUBJ}\\ \text{AGT}\\ x\end{bmatrix}, \text{NP:}\begin{bmatrix}\text{OBJ}\\ \text{TH}\\ y\end{bmatrix}$$

semantics: "*mix* (*x*,*y*)"
[Culy 1996:113]

Here, x and y are variables in the semantics. If the object is realized overtly, the y will be linked to the semantics of that noun phrase. If it is not realized overtly, the variable y remains a free variable in the semantics. The user's manual then specifies what do with free variables. Culy (1996:113) writes, "If the usage rules do not allow for the discourse binding in a particular context (or register), then the use of the null argument will be infelicitous (or 'ungrammatical')." To paraphrase, the user's manual says things like, "if the context is a recipe, then interpret free variables in the semantics like third person pronouns." If the user's manual has no rule for interpreting free variables in the current context, then their use is ungrammatical.

[3] Massam and Roberge (1989) is another instance of an empty category account. Since they do not discuss the relationship to non-linguistic context, this account will not be reviewed here.

3.2 Haegeman 1987

Haegeman (1987) provides an account of the multiple grammars type. She argues that 'register variation' is an instance of language-internal parametric variation. That is, that the registers of a language may differ from each other in their parameter settings (where parameters are understood as in Chomsky 1981).

Syntactically, this is an empty category approach. Haegeman argues that the null objects have properties akin to *wh*-traces and that they are in fact topic-linked traces. On the basis of this, she attributes the difference between recipe English and other English (the presence of null objects) to a difference in the setting of the parameter that is responsible for the differences between topic prominent and subject prominent languages. 'Core' English is subject prominent while recipe English is topic prominent.

4 The Relationship of Context to Register

In this section, I will argue that the two accounts discussed above involve a reification of context. Culy's user's manual makes reference to the context in order to determine the grammaticality of a string. This requires the relevant aspects of context to exist prior to the processing of the sentence. Context does exist prior to each utterance in the sense that there is shared common ground based on the exchanges so far, shared cultural beliefs, etc. However, as I will discuss below, much recent work in anthropology and sociolinguistics has shown that linguistic activity also plays a part in constituting the context.

Haegeman's account (and to a lesser extent, Culy's as well) has the further problem that it only allows for a restricted set of registers. On her account, each register has its own grammar defined at the macro level of parameter settings. While Haegeman is not explicit about the relation of register to context, we can assume by her treatment of this relation as unproblematic that registers on her account simply have one or more contexts that they are appropriate to. This leads us to a finite set of contexts that are predetermined. This too would seem incompatible with a situation in which speakers are continually mutually constructing contexts.[4]

[4]However, I do not mean to imply that people do not have knowledge of certain social contexts as 'crystallized' entities which go with specific linguistic formulae. It is important to note that even in this case language is constitutive of context. Every time such a crystallized context occurs, it is because the participants perform or invoke it and mutually recognize that performance or invocation of which linguistic behavior

4.1 Language Constituting Context

In recent years, there has been a move in sociolinguistic research from analyzing language as reflecting social structure to researching how language plays a part in constituting social structure.

An important thread of research in this area has concerned itself with sociolinguistic variation and how it relates to speaker identity.[5] For example, Eckert (in press) is an in-depth study of how high school students produce phonological variation as a part of identity building.

The constituting work of language extends beyond identity, however. As Schiffrin writes, "language is potentially sensitive to all of the contexts in which it occurs, and ... language **reflects** those contexts because it helps to constitute them." (1987:5, emphasis in original.) Schiffrin cites the phenomenon of adjacency pairs (Schegloff and Sacks 1973) where, for example, the asking of a question sets up the context for the next utterance to be understood as an answer. Another example of language constituting context comes from the use of honorifics in Japanese. For example, Kondo (1990:141–145) finds that speakers of Japanese use honorifics differentially in the different rooms of a house as part of the process of creating a formal space in one part of the house and a more informal space in another.

Finally, language can be used to 'recontextualize' events in the past or 'precontextualize' events in the future (Ochs 1992). Ochs gives a particularly clear example of recontextualization regarding praise in joint caregiver-child activities. In mainstream American culture, when a caregiver and child complete a joint activity, the caregiver will usually praise the child and downplay or mask their own role with such expressions as "Look at the beautiful castle you made!". In contrast, Western Samoan caregivers socialize young children into a reciprocal praising practice where praise by one participant is followed by reciprocal praise by the other. Thus the American caregiver recontextualizes the activity as the child's individual effort, while the Western Samoan caregiver recontextualizes it as cooperative (1992:354–355).

In summary, language has a constitutive relation to three dimensions of social reality: identity, context of utterance, and the content of the utterance. In speaking we continually construct who we are, the social situation we find ourselves in and the situation we are describing or reporting.

In the case of a recipe, it is perhaps the current context that is most obviously constructed by the linguistic choices. That is, a recipe is a *recipe* and

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is one part.

[5]Kiesling and Schilling-Estes (1998) present the various lines of research in this area and the differences between them. See also Cameron 1990.

not a description of how someone made a meal on a certain day or a poem or anything else partially by virtue of the linguistic forms which embody it. However, as Penelope Eckert points out (p.c.), the three dimensions of social reality discussed here are all interrelated and speakers never do constitutive work on one without also affecting and invoking the others.

4.2 A Social Value for Null Objects

The result of all these studies is to call into question the relationship between context and register, which was previously taken to be unproblematic. If language plays a part in constituting the context, then an account of the restricted distribution of null objects cannot appeal to context as an independent, static entity.

However, if context is seen as constituted by language and other social practices, the relationship between grammatical features and social context can be understood as similar to the relationship between linguistic presuppositions and conversational common ground as proposed in Lewis (1979). Lewis posits rules of accommodation which apply in many cases where linguistic constraints would be violated. For example, he argues that definite descriptions presuppose that the entity they pick out is the most salient entity fitting the description. In many cases, the entity picked out isn't the most salient one until the definite description has been uttered.

Similarly, we can posit a social value associated with the linguistic resource of null objects. This social value will be part of the construction of the context, etc., whenever a null object is used. Thus null objects only occur in certain contexts because, in some sense, they bring the context with them. We can create 'ungrammatical' sentences with null objects because the process of construction is delicate and relies on the hearer being able to recognize the speaker's *intention* (cf. Grice 1957 and Clark 1996). It's hard to throw in a null object willy nilly if it doesn't go well with what else is going on in the sentence/discourse.

In the case of null objects as they are used in recipes and other instructional writing, the social value for each of the three dimensions might be as sketched in (9).

(9) **Social situation:** The giving of instructions, from one in authority to one who has chosen some product. The product may be something to use (medicine) or something to make (recipe).

Identity of speaker: One in authority. In the case of cookbooks, the authority is that of a good cook. In the case of product pack-

> aging, the authors are faceless and the authority, in some cases, becomes that of the disembodied voice of truth.
>
> **Situation described:** The use or production of the product described is constructed as requiring care – it must be done just so, or something will go wrong.

Alternatively, one may apply Ochs's (1992) theory of direct and indirect indexing.[6] In this case, null objects might be associated only with the practice of giving instructions. The giving of instructions, in turn, would be associated with/co-constructed with authority and careful action. Note that it's the practice of giving instructions that is associated with authority (and with the null objects) and not simply the issuing of commands or the use of imperatives. The authority ascribed to the author of a recipe is different from the power of a superior officer in the military, and imperatives can get used when the speaker has no authority as in *Stop teasing me!* or *Help!*.

Note also that this doesn't preclude null objects from also having some other, distinct social value. Just as linguistic elements can be ambiguous in denotative meaning, there is no reason for them not to be ambiguous in social value.

To summarize, the view of the relation between contexts and linguistic forms that I am arguing for here is as follows: Speakers have knowledge of the social effect conventionally associated with individual words and constructions in the grammar and they deploy these linguistic resources in their speech and writing to constitute context and the other dimensions of social reality. Not only does this view not rely on context already 'being there', it also allows for speakers to use their linguistic competence to generate fine-grained variations in context by combining various linguistic constructions and thus their social values.

The next section shows how this view of register can be incorporated into an analysis of null objects in terms of a competence grammar.

5 HPSG Analysis

This view of the relationship between register and context articulated in the previous section demands a theory of grammar which can associate social information with words and with syntactic constructions. One theory which can make this association directly is Head-driven Phrase Structure Grammar (HPSG), and in particular recent versions of HPSG which incorporate a the

[6] I am indebted to Mary Rose for pointing this out.

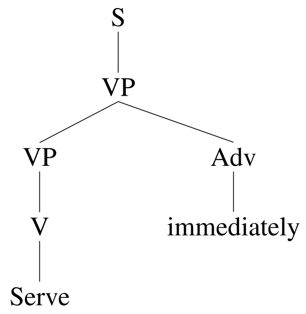
notion of syntactic constructions (Sag and Wasow 1999, Ginzburg and Sag 1999).[7]

HPSG views grammar as a system of signs. Signs are pairings of form (phonology and syntax) and meaning (semantics and pragmatics). These signs are modeled with feature structures. Tree structure is encoded in feature structures by means of daughter attributes.

This analysis I propose is of the semantic account type. In particular, it involves a non-branching rule that discharges one noun phrase complement requirement of a verb. In (11), which gives the proposed structure for (10) in terms of a familiar tree diagram, this non-branching rule is the lower one, where VP dominates V.

(10) Serve __ immediately.

(11)



The details of the construction that licenses the non-branching VP are given in (12).

(12)
$$\begin{bmatrix} \textit{null\_obj\_cx} \\ \text{SYNSEM} \mid \text{LOCAL} \begin{bmatrix} \text{CAT} \begin{bmatrix} \text{HEAD} & \boxed{1} \\ \text{VAL} \mid \text{COMPS} & \boxed{2} \end{bmatrix} \\ \text{CONX} \begin{bmatrix} \text{SOCIAL} \begin{bmatrix} \text{SITUATION} & \textit{`instructions'} \\ \text{SELF} & \textit{`authority'} \\ \text{DESCRIBED} & \textit{`care required'} \end{bmatrix} \end{bmatrix} \end{bmatrix} \\ \text{HD-DTR} \mid \text{SYNSEM} \mid \text{LOCAL} \begin{bmatrix} \text{CAT} \begin{bmatrix} \text{HEAD} & \boxed{1}\ \textit{verb} \\ \text{VAL} \mid \text{COMPS} & \left\langle \textit{pro\_ss} \right\rangle \oplus \boxed{2} \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

[7] Two others are Construction Grammar (Kay and Fillmore 1999) and Word Grammar (Hudson 1990).

In this rule, the feature SYNSEM represents information about the mother node. (More precisely, the information to the right of the string SYNSEM is the value of this feature. It is this value which represents information about the mother node.) The feature HD-DTR (head daughter) represents information about the daughter node. Since this is a non-branching rule, there are no other daughter features.

The syntactic effects of the rule are represented under the two CAT (for 'category') features: one inside SYNSEM | LOCAL and one inside HD-DTR | SYNSEM | LOCAL. The rule says that the first element of the daughter's complements list should be specified as a *pro_synsem*. (The complements list is $\langle pro\_ss \rangle \oplus \boxed{2}$). Then with the $\boxed{2}$, it says that the mother's complement requirements are the same as the rest of the daughter's original complement requirements. In this way, it discharges the direct object requirement of the daughter verb while associating pronominal semantics with that argument position.

The specification HEAD *verb* on the daughter restricts this rule to applying to verbs. Prepositions can also appear with null objects in instructional writing, as in (13) (from Haegeman 1987:243).

(13) Do not play in __ or around __.

However, the possibility of null objects appears to be more restricted with verbs than with prepositions (examples from Massam and Roberge 1989:136):

(14) a. Take foil. *Cover cookies with __ immediately.
b. Mix the lemon juice and chopped parsley. *Then sprinkle scallops with __.

Therefore examples such as (13) should most likely be treated with a separate (but related) construction.

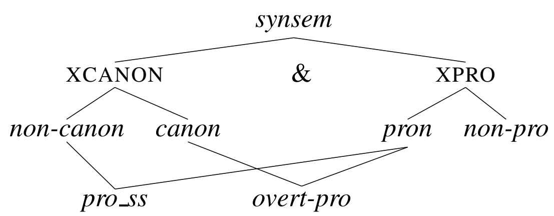
So far, this is a straightforward application of HPSG to the problem of null objects. In order to account for the distribution of this construction, I propose to add information about its pragmatic effects to this representation. These will be encoded in a new feature called SOCIAL inside the value of the existing CONX (context) feature. This information is broken down into three types corresponding to the three dimensions of social reality discussed above: information about the current situation, information about the speaker, and information about situation described. Finally, note that the feature SOCIAL is intended to encode the contribution made to the social context by the use of this construction.

Culy (1996) and Haegeman (1987) provide arguments which will allow us to test the syntactic validity of this analysis. First, there are Culy's objections to semantic accounts in general that attempt to encode register information in the grammar.[8]

Culy's first objection is that semantic accounts fail to capture the similarities between null objects and overt pronouns. The reason for this is that null objects would have to have been introduced by the verb, while overt pronouns are their own signs.

On my analysis, the null objects are introduced by a construction, which would have the same problem except that they are represented via a special synsem type, the *pro_synsem*. The parallelism between null objects and overt pronoun objects can be represented in terms of synsem types. (15) shows a part of the synsem type hierarchy.

(15)



Two of the dimensions that synsems are classified on are their canonicity and whether or not they are pronominal. Non-canonical synsem types are those, like *pro_synsem*, that never correspond to any phrase structure position. Thus while *pro_synsem* and the synsem type for overt pronouns differ in their canonicity, they both share the supertype *pronominal*. The type *pronominal* will house all the information they have in common.

Another one of Culy's objections is that as purely semantic entities, it would not be possible to represent any binding properties for the null objects. On my analysis, since *pro_synsem* is a syntactic (as well as semantic) entity, it will be possible to represent its binding properties. (16) gives a partial description of the type *pro_synsem*.[9]

[8] Culy ends up proposing a semantic account that avoids these objections by moving the register information to the user's manual. The analysis presented here overcomes the same objections without this move largely due to advances in HPSG that have occurred in the meantime, in particular, the development of *pro_synsem* and of constructions.

[9] *Ppro* (for 'personal pronoun') is the content type assigned to pronouns as opposed to anaphors in Pollard and Sag 1994.

(16)
$$\begin{bmatrix} \textit{pro\_synsem} & \\ \text{LOCAL} & \begin{bmatrix} \text{CAT} & \begin{bmatrix}\text{HEAD} & \textit{noun}\end{bmatrix} \\ \text{CONT} & \textit{ppro}\end{bmatrix}\end{bmatrix}$$

Culy also objected that creating special entries for verbs to introduce the null objects constituted an unnecessary, unmotivated, and unwieldy increase in the size of the lexicon. By using a construction instead, this analysis entails no increase in the size of the lexicon. The same lexical entry for *serve* that gives rise to *Kim served it warm* is also involved in *Serve warm*.

As a second set of tests of syntactic adequacy, there are the properties that Haegeman (1987) used to identify the empty category she posited as a *wh*-trace.

First, there is the fact that it is 'syntactically active', i.e., can control the unexpressed subject of an adjunct or of an infinitival complement:

(17) a. Bake __ until golden brown.
b. Allow __ to cool.

Here, the null object (of *bake* or *allow*) is controlling the unexpressed subject of the next phrase (*golden brown* or *to cool*). Since the null object does have a position on the argument structure list of the matrix verb, it should not be a problem to represent these control relations.

Second, Haegeman's account predicts that null objects should license parasitic gaps, as in (18) (1987:244):[10]

(18) Dry __ with a clean towel before you deepfry __.

On my analysis, this sentence would involve two separate instances of the null object construction, one for each verb. This predicts the existence of sentences like the authentic example in (19) where there is a null object in the adjunct but not anywhere else.[11]

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[10] I think this example is considerably improved if the verb in the adjunct is non-finite, as in *before deepfrying* __.

[11] Haegeman also tries to show that null objects obey island constraints, but the purported island violations only degrade the null object examples to ?, while parallel *wh*-movement examples are rated * (Haegeman 1987:240–241):

(i) a. ?Boil eggs for the salad while you roast __.
b. *What did you boil eggs while you roasted __?

Thus is would appear that the marginal status of (ia) requires a different explanation.

(19) To serve the birds freshly stewed, let them stand 10 minutes before cutting __ so the juices do not run freely.

6 Conclusion

In this paper I have advocated two things: first, a view of the phenomenon called register in which register helps to constitute context rather than simply reflecting it, and second a view of grammar where social information is incorporated along with traditional grammatical information.

In this concluding section I would like to ask if the first conclusion entails the second. To put it differently, could either of the other views of grammar be made compatible with the view of register advocated here?

Let us start with the separate grammars approach. It seems pretty clear that this one is incompatible because it requires a fixed set of contexts, as discussed in §4 above.

Initially, the user's manual approach looks more promising, since it could be made to treat the constructions individually. In this case, the rules would not be of the form, "if the context is a recipe, then interpret free variables in the semantics like third person pronouns." Rather, the equivalent rules would be stated as "if there is a free variable in the semantics, interpret it like a third person pronoun and try to understand the context as an instance of giving instructions."

Thus, in general, it looks like a user's manual approach could be made compatible with the view of context and register advocated here. However, there is some reason to believe it might become unwieldy. In the case of null objects, Culy was able to cleverly avoid replicating the grammatical information (verb that requires a noun phrase complement in a sentence lacking that complement) in the user's manual by referring instead to semantic variables. It is an empirical question whether this would be possible for the other socially meaningful syntactic constructions. If not, then the user's manual approach requires duplicating grammatical information outside of the grammar. In this case, it seems preferable to move the social information into the grammar.

However, there still may be a use for the user's manual. This analysis is not meant to deny that people do have a notion of 'recipe' and what it entails linguistically. This kind of knowledge seems somewhat separate from sentence grammar, so this could be a good fit for the user's manual.

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