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Licensing null arguments in recipes across languages[1]

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While much of the literature on recipe contexts has focused on English and the availability of null definite patients, this paper shows that both null agents and null patients are possible in recipes in a range of typologically and genetically diverse languages. It is proposed that null agents in recipes arise due to a variety of syntactic strategies, but null patients are uniformly licensed via a null topic in the left periphery in all the languages considered. These results indicate that while the recipe register does not directly dictate specific syntactic structures such as imperatives or null objects, the register can provide the pragmatic context necessary for certain syntactic processes, such as null topicalization.

KEYWORDS: Malagasy, null objects, null topicalization, recipe contexts, topic-drop

1. INTRODUCTION

Null arguments are a common feature of written recipes, as long noted in the literature (e.g. Haegeman 1987a, b, Massam & Roberge 1989, Massam 1992, Cote 1996, Culy 1996, Bender 1999, Ruppenhofer & Michaelis 2010, Ruda 2014, Weir 2017). In (1) below, there is no overt agent for any of the verbs and the verbs *cut* and *add* are missing their patient argument.

(1) $\emptyset_{agent}$ Take 2 carrots. $\emptyset_{agent}$ Cut $\emptyset_{patient}$ finely, before $\emptyset_{agent}$ adding $\emptyset_{patient}$ to potato mixture.

In the context of recipes, the agent corresponds to the person following the recipe and the patient is what we will call the OBJECT OF MANIPULATION, which is the entity

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that is being acted upon and that undergoes changes throughout the creative process (Massam, Bamba & Murphy 2017). Although the literature on recipes tends to refer to null subjects and null objects, we will adopt the terms 'agent' and 'patient' since thematic roles map differently to grammatical roles in different languages.

The literature on recipes has typically focused on the phenomenon of null definite patients, because these are generally ungrammatical in English. But as just noted, null agents are also found in recipe contexts. In this paper, we show that null agents and patients are a feature of recipes in a range of typologically and genetically diverse languages. Despite the fact that both arguments can be null, we argue that there is a fundamental asymmetry in the licensing of null agents and null patients. On the one hand, null agents in recipes are shown to be licensed via a range of different syntactic strategies across different languages, such as the imperative and the infinitive. On the other hand, we argue that that null patients in recipes are uniformly licensed when the null patient is bound by a null discourse topic merged in the left periphery. We will refer to this configuration as NULL TOPICALIZATION.

As for the relation between syntax and register, our working hypothesis is that the recipe register does not specify particular syntactic structures (there is no universal recipe syntax) but has pragmatic desiderata.[2] In the case of recipes, there is a preference for null agents and null patients. Languages can satisfy these desiderata in different ways. Two questions arise: first, how do different languages meet these desiderata? second, how is the relation between register and syntax mediated? In this article, we focus on the first question, drawing on cross-linguistic data. As noted above, we argue for an asymmetry in how null arguments are licensed: null agents come about due to a variety of syntactic means, while null patients are the result of null topicalization. For the second question, we suggest that the recipe register makes salient the object of manipulation. It is this pragmatic salience that gives rise to the option of null topicalization, even in languages where null topicalization is highly restricted (e.g. English). Thus, although register and syntax remain independent, they do intersect. We discuss the interface between register and syntax in Section 5.

We note in passing that Weir (2017) and Haegeman (2017, 2019) propose a unified analysis of null arguments found in recipes and in other instructional contexts, such as bottle labels (Sadock 1974), as well as those found in other reduced written registers such as diaries. We suspect, however, that the creative aspect of recipes, where the null patient corresponds to the object of manipulation that undergoes change leading to a specific output, makes them distinct from these other contexts. We therefore focus exclusively on null arguments in recipes.

This article is organized as follows. In Section 2, we examine null arguments in Malagasy recipes in detail. Section 3 then provides an overview of null agents and null patients in recipes from a range of languages, illustrating the variety of syntactic strategies deployed by different languages. We look more carefully at null patients

[2] Following many others (see references), we use the term 'register' rather than 'genre'. Nothing crucial hinges on this terminology, however. See Ferguson (1994) for a discussion of these terms.

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in Section 4, where we present our null topicalization analysis. Section 5 considers the implications for the register–syntax interface and concludes.

2. Malagasy

Malagasy is an Austronesian language spoken in Madagascar (and in the diaspora) by over 25 million people. The basic word order is V(erb)O(bject)S(ubject). Important for this paper is what we will call the VOICE system: verbal morphology that serves to advance one argument to the clause-final position. This position has many different labels in the literature (e.g. subject, topic), but for the purposes of this paper, we follow Pearson (2005) and call this position the TRIGGER and assume that it appears in the specifier of a TopicP projection that dominates TP. VOS word order is obtained via predicate fronting, as proposed by Pearson (2001, 2018), but the details of how word order is derived are not relevant for the purposes of this paper. In the examples below, the trigger is set in bold.[3]

(2) (a) Nividy akoho **i** **Bao**. (Malagasy)
PST.AT.buy chicken DET Bao
'Bao bought a chicken.'
(b) Novidin' i Bao **ny** **akoho**.
PST.TT.buy DET Bao DET chicken
'The chicken was bought by Bao.'
(c) Nividianan' i Bao akoho **i** **Soa**.
PST.CT.buy DET Bao chicken DET Soa
'Soa was bought a chicken by Bao.'
(Potsdam & Polinsky 2007: 278)

In (2a), the verb carries Actor Topic[4] morphology, and the agent (or highest argument) is the trigger (here *i Bao*). When the verb is marked for Theme Topic morphology, the trigger is a patient (*ny akoho* 'the chicken'), as illustrated in (2b). Finally, there is Circumstantial Topic verb morphology, where some other element, such as an instrument or location, is the trigger. In (2c), the trigger is a benefactive (*i Soa*). When the agent is not the trigger, as in (2b) and (2c), it is realized adjacent to the verb, with what is called genitive case. We note that there are other voices, such as the *a*-passive (Keenan 1976, Paul 2000), as shown in (3) (so-called because it involves the prefix *a*-). The trigger of these clauses is the patient of some ditransitive verbs or the location of verbs like *asiana* 'put'. In (3), for example, the trigger is *ny latabatra fiaskako* 'my worktable', the location where the flowers are placed.

[3] Unless otherwise indicated, data come from our own fieldnotes. Glossing follows the Leipzig Glossing Conventions (https://www.eva.mpg.de/lingua/pdf/Glossing-Rules.pdf), with the following additions: APASS = *a*-passive; AT = Actor Topic; C = common; CON = conclusive; CT = Circumstantial Topic; EMPH = emphatic; GT = Goal Topic; TT = Theme Topic; PERF = perfect.

[4] We adopt the labels that are standard in the Malagasy literature for the verbal morphology (e.g. Actor Topic, Theme Topic).

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(3) Asiana voninkazo **ny latabatra fiasako**. (Malagasy)
a-PASS.put flower DET table NMLZ.make.1SG
'Flowers are placed on my worktable.'

As noted above, the agent of non-Actor Topic verbs can appear as a genitive phrase, right adjacent to the predicate, as in (2b,c), but it can also be omitted, as in (3). All of these aspects of the voice system will be important in what follows.

2.1 *Malagasy recipes*

The recipe data in this paper are mostly taken from a 1983 cookbook, *Cuisine malgache, cuisine créole*, by Pierre Boissard. Some additional examples were elicited from native speakers. Data source annotations set in brackets are detailed in the list of additional data sources, after References.

Like English, Malagasy has null agents and null patients in recipes. We see in (4a) below that neither verb has an overt agent and that the verb *arotsaka* 'pour' is missing its patient (for this verb, the patient is always the topic of the *a*-passive form). Similarly, in (4b), the agents and patients of *ahandroina* 'cook' and *esorina* 'remove' are null.[5]

(4) (a) Sasana **ny vary** ary arotsaka ao anaty vilany. (Malagasy)
TT.wash DET rice and *a*-PASS.pour there in pot
'Wash the rice and pour into pot.'
[Boissard 1983: 31]

(b) … ho ahandroina folo minitra ary esorina.
FUT CT.cook ten minute and TT.remove
'… cook for ten minutes and remove.'
[Boissard 1983: 35]

We note here that Malagasy recipes do not use the imperative (unlike English). Malagasy has overt imperative morphology: the imperative forms for the verbs in (4a) would be *sasao* 'wash!' and *arotsahy* 'pour!', respectively. Moreover, Malagasy lacks a dedicated infinitive form, so we assume these verbs are not infinitives. Instead, what is striking about the verbal morphology in recipes is that it is typically non-Actor Topic, whether Theme Topic, Circumstantial Topic, or *a*-passive (see Keenan & Manorohanta 2001 for a discussion of the prevalence of non-Actor Topic forms in Malagasy texts). The question that now arises is how null agents and null patients are licensed in recipe contexts in Malagasy.

[5] Note that *ahandroina* 'cook' is in the Circumstantial Topic form. Normally, Circumstantial Topic is associated with an oblique topic (e.g. benefactive in (2c)), but for this verb, the topic is the patient.

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2.2 *Null agents*

As noted above (see example (3)), null agents are always possible with non-Actor Topic verbs (much like agents in English passive). We can see a null agent in the example below, where the verb *hosorana* 'smear' is Theme Topic and *ny volo* 'the hair' is the trigger.

(5) Hosorana lakomadina **ny volo.** (Malagasy)
FUT.TT.smear pomade DET hair
'The hair will be smeared with pomade.'
(Rajemisa-Raolison 1971: 105)

Much like null agents in English passives, the null agent here is interpreted as an indefinite or generic ('someone smeared pomade on the hair'). Given that most verbs in Malagasy recipes are in the non-Actor Topic form, null agents will always be possible.[6] No special licensing conditions are required.

2.3 *Null patients*

As just noted, most verbs in recipes are in non-Actor Topic forms, and mainly Theme Topic. Recall that when the verb is Theme Topic, the patient is in the trigger position. We illustrate with the example in (4), repeated here as (6). In (6a), the verb *sasana* 'wash' is Theme Topic and the patient, *ny vary* 'the rice' is the trigger. In the subsequent clause (6b), the verb *arotsaka* 'pour' is in the *a*-passive form, so the trigger is the patient (the rice), which is null.

(6) (a) Sasana **ny vary** … (Malagasy)
TT.wash DET rice
'Wash the rice …'
(b) … ary arotsaka ao anaty vilany.
and *a*-PASS.pour there in pot
'… and pour into pot.'
[Boissard 1983: 31]

In what follows, we argue that null patients arise due to an independently available phenomenon in the language, referred to as trigger-drop (or topic-drop) in the literature (Keenan 1976, Randriamasimanana 1986, Potsdam & Polinsky 2007). We provide examples in (7).

(7) (a) Manantena **Rabe**$_i$ fa hividy fiara ø$_i$. (Malagasy)
AT.hope Rabe COMP FUT.AT.buy car
'Rabe hopes to buy a car.'
(Potsdam & Polinsky 2007: 277)

[6] English recipes are in the imperative mood and therefore the null agent is second person. In Malagasy, however, the null agent is interpreted as indefinite. The person features of the null agent is thus subject to cross-linguistic variation. In all cases, however, the null agent is understood to be the person following the recipe.

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(b) Vangian' i Naivo (**izy**).
TT.visit DET Naivo 3
'Naivo is visiting (him/her/them).'

(Pearson 2005: 421)

Potsdam & Polinsky (2007) argue that the null arguments in (7) are *pro* rather than PRO. They propose that *pro* is licensed in Spec, TopP by Top^0 (recall that this is the position that triggers occupy in Malagasy) and that *pro* is identified via coindexation with the current discourse topic. Trigger-drop is possible in both root and embedded clauses, as illustrated in (7). Departing slightly from Potsdam & Polinsky (2007), we suggest that the null trigger is bound by a null discourse topic that is merged in the left periphery (similar to Huang's 1984, 1991 proposals for null objects in Mandarin Chinese – see Section 4 for more discussion).[7] If an overt trigger is present, such as *Rabe* in (7a), the trigger will preferentially be understood as being the same as the discourse topic (see Potsdam & Polinsky 2007: 292–296 for some discussion). Thus, while it may appear that the null trigger is bound by the overt trigger, we claim that the null discourse topic is the binder.

Instances of trigger-drop can easily be found in written texts, such as folk tales. In (8a), for example, the first clause contains the trigger, *ireo lefona ireo* 'those spears'. We suggest that a null discourse topic, coreferent with the preceding trigger, is merged in the left periphery of the second conjunct and binds the null trigger. Note here that the predicate *natorana* 'throw' in the second conjunct is in the *a*-passive form and therefore the null trigger is the missing patient of this verb (the spears in this instance). In (8b), on the other hand, the null trigger of the adjunct clause is bound by a discourse topic that does not correspond to the trigger of the main clause (*ianao* 2SG). Instead, the discourse topic is understood to be *peratra ity* 'this ring'.

(8) (a) Notatazan-d Ramanongavato tamim-pahakingana
PST.TT.catch Ramanongavato PST.P agility
ireo **lefona** **ireo** ary [TOP_i natorany haingana
DEM.PL spear DEM.PL and PST.*a*-PASS.throw.3 quick
teny amin'izy ireo indray $ø_i$]. (Malagasy)
PST.there P 3 DEM.PL again
'With agility, Ramanongavato caught those spears, and he quickly threw ø back at them.'

[Ravololomanga 1996]

(b) Dia omeko peratra ity **ianao**, [TOP_i ka tehirizo tsara $ø_i$].
then TT.give.1SG ring DEM 2SG COMP TT.keep.IMP good
'I am giving you this ring, so keep ø safe…'

[Ravololomanga 1996]

[7] We remain agnostic about the precise nature of the null element (e.g. *pro* vs. variable). What is crucial is that it is an empty category that is bound by a null topic in the left periphery. See also Section 4.3 for a discussion of the category and size of the null element.

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In other examples, there is no overt DP that corresponds to the discourse topic, much like the root clause in (7b). For example, in (9a) the missing trigger of *nodinihiny* 'examine' is a carpet, and in (9b), the missing trigger of *vonoy* 'kill' is a man, both previously mentioned in the story.[8]

(9) (a) [TOP$_i$ Mba nodinihiny kely indray ø$_i$], ka
EMPH PST.TT.observe.3 little again, COMP
gaga **izy**. (Malagasy)
surprised 3
'She examined ø again a little and was surprised.'
[Ravololomanga 1996]

(b) Handeha **ianareo** **vahoaka**, mitondra lefona,
FUT.AT.go 2PL people AT.carry.IMP spear
[TOP$_i$ dia vonoy ø$_i$ eo]!
COMP TT.kill.IMP there
'Go, my people, take spears and kill ø there!'
[Ravololomanga 1996]

Similar facts hold in recipes: the antecedent of the null trigger is always the current discourse topic. Unlike in other texts, however, in the context of recipes the discourse topic is fixed: it is always the object of manipulation. Like the folk tale example in (8a), the discourse topic in a recipe can be overtly expressed via a trigger. In (10a), for example, the object of manipulation is the meat (which corresponds to the trigger of the first clause), and it is this discourse topic that binds the null trigger in the second clause. Much like we saw in (9), there is not always an overt DP that corresponds to the discourse topic. In (10b), there is a null trigger in the first clause that is understood to be the location of the action of putting, as signalled by the *a*-passive morphology. The antecedent is the object of manipulation; in this case, the soup that the salt is being added to.

(10) (a) Tetehina mandinika **ny** **hena** [TOP$_i$ dia sasana ø$_i$]. (Malagasy)
TT.chop small DET meat COMP TT.wash
'Chop the meat and then wash.'
[Boissard 1983: 33]

(b) [TOP$_i$ Asiana sira ø$_i$] dia ahena **ny** **herin'** **ny** **afo**.
a-PASS.put salt COMP *a*-PASS.lessen DET strength DET fire
'Add salt then lower the intensity of the flame.'
[Boissard 1983: 35]

While the discourse topic can correspond to an overtly realized trigger (e.g. *ny hena* 'the meat' in (10a)), it can't correspond to most other syntactic positions. In (11), for

[8] As noted by an anonymous reviewer, (9b) presents a case of a topic shift (much like (8b)): the discourse topic does not correspond to the trigger of the main clause.

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example, the trigger of the first conjunct is *ny tahon'anana* 'the vegetable stems' but in the context of the second conjunct, this leads to a pragmatically dispreferred interpretation where the stems are put in the pot (rather than the leaves). In other words, the discourse topic cannot be understood as the possessor *anana* 'vegetables'.

(11) ??Esorina **ny tahon'anana** ary arotsaka ao
TT.remove DET stem'vegetable and *a*-PASS.pour LOC
anaty vilany. (Malagasy)
in pot
'Remove the vegetable stems and put in pot.'
= put the stems in the pot (strange interpretation)
≠ put the vegetables in the pot

Note that the English translation of (11) has a similar interpretation. We suggest that *anana* 'vegetable' has been backgrounded (as a possessor in Malagasy or in a compound in English) and therefore cannot correspond to the discourse topic.

Finally, we note that the discourse topic does not have to correspond to the overt trigger, as in (12) below (see also (9b) above). Here the trigger in the main clause is *ny herin'ny afo* 'the intensity of the flame' but the discourse topic is the object of manipulation, the soup that the salt is being added to.

(12) Ahena **ny herin' ny afo** [TOP$_i$ dia
a-PASS.lessen DET strength DET fire COMP
asiana sira ø$_i$]. (Malagasy)
TT.put salt
'Lower the intensity of the flame and then add salt.'

In other words, although there is an overt trigger in (12) (*ny herin'ny afo* 'the intensity of the flame'), the null trigger in the second clause is bound by the discourse topic (the object of manipulation, the soup). Thus, the null patient can correspond to a previous trigger, as in (8a) and (10a), or to a discourse topic, as in (9), (10b) and (12).

Summing up, Malagasy recipes have null agents and null patients. Null agents are possible due to non-Actor Topic voice morphology, which independently licenses null agents. Null patients arise due to trigger-drop, a widespread phenomenon in the language. We note in passing that both properties rely on non-Actor Topic voice, predicting that null arguments should not be possible with Actor Topic verbs. In this context, the few instances of Actor Topic in the recipe book were revealing. The verb is always *mangotraka* 'boil', which is an unaccusative verb, lacking an agent. Given that an overt agent is not possible, the trigger is therefore the highest argument (here the patient), and it can undergo trigger-drop. In other words, because *mangotraka* 'boil' is unaccusative, it patterns with non-Actor Topic verbs in allowing trigger-drop of the patient.

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(13) … avela mangotraka 15 minitra. (Malagasy)
a-PASS.leave AT.boil 15 minutes
'… let boil 15 minutes.'

[Boissard 1983: 33]

Complicating the picture is the fact that *manongotra* 'boil' is embedded under the matrix predicate *avela* 'let'. A more careful study of other voice forms in recipes is left to future research.

What Malagasy recipes have shown is that null agents and null patients are attested in recipes contexts outside of English, but the question arises as to whether the licensing conditions for these null arguments differ across languages. To better understand the cross-linguistic variation, we now turn to null arguments in recipe contexts in a range of languages.

3. Null agents and patients in other languages

We have just seen how Malagasy licenses null agents and null patients in recipes, via non-Actor Topic morphology and trigger-drop, respectively. This section investigates other languages to show that a range of syntactic strategies are used cross-linguistically. We note here that our language sample is based on convenience but does include languages from different language families and with different typological properties. Moreover, our discussion of recipes in these languages should not be taken as exhaustive, but merely illustrative. For example, French recipes may appear in either the infinitive or the imperative.

3.1 *Null agents in other languages*

As we saw at the start of the paper, English recipes use the imperative mood, where agents (subjects) are typically omitted.[9] In fact, Cotter (1997) considers the imperative to be the recipe's most distinguishing feature (see Fischer 2013, also Fisher 1983). Moreover, imperatives have been used in recipes since at least Middle English (Arendholz et al. 2013). An illustrative example is given in (14), where the agent of *sift* is null.[10]

(14) Sift the flour.

[9] We do not address the question of why the agent is typically omitted in imperatives (at least in English). See Ritter & Wolf (2017) for an analysis where the imperative subject is analyzed as a dropped default addressee topic. Given that we argue for a null topicalization analysis of null patients (objects) in recipes, in Section 4 we will distinguish between the different types of topics.

[10] To simplify the examples, for the remainder of the paper we often omit ø in the position of the null argument.

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Since the syntax of these null agents is presumed to be identical to the syntax of imperatives, null agents in recipes have not received much attention in the literature.[11]

Looking at other languages, both Niuean and Tagalog also use imperatives in recipes, as shown in (15)–(17). As seen for Niuean in (15), there is no overt agent for either verb (*helehele* 'slice' and *kai* 'eat').

(15) Helehele ke kai mafanafana poke hahau. (Niuean)
slice SBJV eat warm or cold
'Slice and serve warm or cold.'
[*Traditional Niuean Recipes*: 8]

While imperatives are not morphologically marked in Niuean, there is a special form of negation (*ua*) that is only used for imperatives (Seiter 1980), and it also occurs in recipes (16a) below. This negation is distinct from the sentential negation *nākai*, seen in (16b). We take this distribution to show that recipes indeed use the imperative in Niuean.

(16) (a) Ua halu e talo. (Niuean)
NEG.IMP peel ABS taro
'Don't peel the taro.'

(b) Ne nākai fano kehe a ia.
PST NEG go away ABS 3SG
'She did not go away.'
(Sperlich 1997)

A similar situation obtains in Tagalog, as in (17).[12]

(17) Lutuin ang sampalok sa tubig hanggang lumambot. (Tagalog)
GT-cook TOP tamarind.fruit in water until soft
'Cook the tamarind fruit in water until soft.'
(Milambiling 2011)

While the imperative is not overtly marked (imperatives are aspectless), there is a special form of the negation (*huwag*) that only occurs with imperatives and is also used in recipes (18a). The example in (18b) illustrates sentential negation (*hindi*) (data and glossing from Henrison Hsieh p.c.).

(18) (a) Huwag pa-kulu-in ang gatas. (Tagalog)
NEG CAUS-boil-PV NOM milk
'Don't boil the milk.'

[11] An exception is Massam (1992), who posits that the agent in recipes is not expressed at all, rather, the subject position is filled with an operator that binds the null patient.

[12] Milambiling (2011: 2 fn. 1) states that the verbs in recipes are not imperative. Henrison Hsieh (p.c.), however, points out that the negation facts suggest otherwise. He also notes that imperatives in Tagalog typically include an overt addressee/agent, unless this addressee is understood to be generic, as is the case in recipes.

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(b) Hindi ko p<in>a-kulo ang gatas.
NEG 1SG.GEN <PFV>CAUS-boil(PV) NOM milk
'I didn't boil the milk.'

Not all languages use the imperative in recipes, however. We have seen that Malagasy does not, and French and German recipes can appear in the infinitive, as illustrated in (19) and (20), respectively.

(19) Y verser la bière au gingembre. Couvrir et cuire. (French)
there pour.INF DET beer to.DET ginger cover.INF and cook.INF
'Pour the ginger beer. Cover and cook.'

(20) Pfifferlinge putzen. (German)
chanterelles clean.INF
'Clean the chanterelles.'

(Bubel & Spitz 2013: 168)

Notably, the infinitive is another syntactic structure that typically lacks an agent (subject).

Null agents can also arise due to *pro*-drop, as in Japanese, where recipes do not use the imperative; instead, the verb in marked with the conclusive form (a finite form that concludes a sentence and is not otherwise necessarily associated with a null agent) (Shimojo 2019).

(21) Toriniku-wa mawarini tsuiteiru abura-o teeneeni torinozoku. (Japanese)
chicken-TOP around attached fat-ACC thoroughly remove.CON
'Remove excess fat from the chicken thoroughly.'

(Shimojo 2019: 515)

Hinds (1976) notes that agents are always null in Japanese recipes. Since null agents are licensed in general in Japanese, via radical, or discourse, *pro*-drop, we can posit that this mechanism is also available in recipes.

Finally, Bulgarian recipes use middles for recipes (among other strategies; Vesela Simeonova, p.c.), as seen in (22).

(22) (a) Lukat se narjazva na sitno. (Bulgarian)
onion.DEF REFL cut.PRS.3SG at small
'Dice the onion.'
(b) Zadushava se za 5 min.
sauté.PRS.3SG REFL for 5 min
'Sauté for 5 minutes.'
(c) Posle se dobavyat morkovite.
then REFL add.PRS.3PL carrots.DEF
'Then add the carrots.'

In middle constructions, like imperatives and infinitives, agents are normally excluded.

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Summing up, we claim that the recipe register dictates that the agent is the person following the recipe, and that due to its pragmatically given identity, the agent is preferably null. Syntax operates on this directive via different means (imperative, infinitive, *pro*-drop, etc.), depending on the language.

3.2 *Null patients in other languages*

Just as we saw for agents, null patients are allowed in recipe contexts in all the languages we looked at. The possibility of null definite patients has been a puzzle for English, where such null arguments are typically not possible. Consider the contrast in (23), where (23a) is well-formed in the context of a recipe, but (23b) is not a recipe and the null argument of *boil* leads to ungrammaticality.[13]

(23) (a) Add carrots. Boil for about 3 minutes.
(b) I will add carrots. *Then I'll boil for about 3 minutes.

Many authors have addressed this issue (e.g. Haegeman 1987a,b, Massam & Roberge 1989, Massam 1992, Ruda 2014, Massam et al. 2017, Weir 2017). The details of their analyses differ, but for the most part, the differences between them relate to the nature of the null object (whether it be a trace, a DP, D, or *n*P, for example). With respect to the recoverability of the null object, however, all these authors consider that the null element must be bound by a null discourse-determined antecedent (referred to as a 'running topic' by Massam et al. 2017).[14] We assume that the same analysis applies to French. As seen in (24), repeated from (19), the patients of *couvrir* 'cover' and *cuire* 'cook' are null.

(24) Y verser la bière au gingembre. Couvrir et cuire. (French)
there pour.INF DET beer to.DET ginger cover.INF and cook.INF
'Pour the ginger beer. Cover and cook.'

The question then arises as to why this null patient is possible in English (and French) in recipe contexts like (23a), but not in (23b). We provide a more detailed discussion of null patients in English and more generally in the next section. The remainder of this section is devoted to null patients in recipes in the languages discussed in the preceding section.

In some languages, as we saw for Malagasy, the null patient arises due to a process of trigger-drop, which is found in other sentence types as well, whereby a null argument is bound by a null topic in the left periphery. A similar phenomenon

[13] The fact that the first reading for (23b) is that it is the referent of the first person pronoun that will undergo boiling is presented as an argument by Massam (1992) that the object is bound by the nominal in subject position. In the present paper, this interpretation would be due to the fact that, since null topics are not generally permissible in non-recipe contexts (in the absence of a strong pragmatic context), the null object sentence is interpreted in the only way possible, as an unaccusative. See Section 4 for more discussion of null definite objects in English.

[14] Some of these authors are explicit about how recoverability takes place while for others, this issue is backgrounded.

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occurs in Tagalog recipes. In (25), the verbs are in the Goal Topic voice, so the missing patients are the trigger of their proposition.

(25) Alisin at ligisin. (Tagalog)
GT.will.take.out and GT-squeeze
'Take out and squeeze.'

(Milambiling 2011: 3)

In some languages, *pro*-drop allows for the omission of the patient. For example, Bulgarian is a *pro*-drop language and the patient can be dropped in (26b). Recall that Bulgarian uses middles in recipes so the omitted patient ('the onion') is the subject of the verb *zadushava* 'sauté'.

(26) (a) Lukat se narjazva na sitno. (Bulgarian)
onion.DEF REFL cut.PRS.3SG at small
'Dice the onion.'
(b) Zadushava se za 5 min.
sauté.PRS.3SG REFL for 5 min
'Sauté for 5 minutes.'

(Vesela Simeonova, p.c.)

On the other hand, Japanese is a radical (or discourse-licensed) *pro*-drop language, so we can assume that the null patient ('the chicken') in (27b) arises via *pro*-drop.

(27) (a) Toriniku-wa mawarini tsuiteiru abura-o teeneeni (Japanese)
chicken-TOP around attached fat-ACC thoroughly
torinozoku.
remove.CON
'Remove excess fat from the chicken thoroughly.'
(b) batto-ni ire shio koshoo kaku shooshoo-o furu.
tray-DAT put salt pepper each little-ACC sprinkle.CON
'Put (the chicken) in a tray and sprinkle salt and pepper a little each (on them).' (Shimojo 2019: 515)

Finally, Niuean is also a radical *pro*-drop language, so we consider it to be like Japanese. We note in passing that there is no overt form for third person inanimate pronouns (and most, if not all, objects of manipulation are inanimate). Such pronouns are therefore obligatorily null. We can see this in the examples below. The example in (28a) illustrates that there is no overt correlate to the English pronoun *it*. The pronoun is syntactically present, we claim, as there is ergative case marking – a clear signal of transitivity. The recipe example in (28b) (repeated from (15)) could simply have the same null inanimate pronoun (Massam et al. 2017).[15]

[15] It is difficult to create sentences with animate objects of manipulation, as recipes do not create animate entities.

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(28) (a) Moua tuai e au. (Niuean)
find PERF ERG 1SG
'I've found it.'

[*Haia*: 263]

(b) Helehele ke kai mafanafana poke hahau.
slice SBJV eat warm or cold
'Slice to eat warm or cold.'

[*Traditional Niuean Recipes: 8*]

While the data are open to both interpretations, we assume in what follows that Niuean recipe null objects are licensed by the mechanism of optional *pro*-drop found elsewhere in this language.

Summing up, we have claimed that the recipe register dictates that the patient is the object of manipulation and that the patient is preferably null. It seems that with null patients, just as with agents, the syntax of individual languages operates on this directive in different ways, such as by trigger-drop, *pro*-drop, or via a running topic. Combined with the observations about null agents in the previous section, the picture in Table 1 emerges.[16]

As can be seen in Table 1, different languages have different syntactic strategies, which fits with our working hypothesis that there is no 'recipe syntax', per se. In the next section, however, we look more closely at null patients and consider some cross-linguistic similarities, which will lead us to a different conclusion: while null agents are licensed in a range of ways, null patients are uniformly licensed by null topicalization. The implications for the relation between syntax and register are discussed in Section 5.

Language	Null agents	Null patients
English	Imperative	Running topic
Niuean	Imperative	*Pro*-drop
Tagalog	Imperative	Trigger-drop
French	Infinitive	Running topic
Malagasy	Non-AT verbs	Trigger-drop
Bulgarian	Middle (*se*)	*Pro*-drop
Japanese	*Pro*-drop	*Pro*-drop

Table 1
Syntactic strategies for null agents and null patients – to be revised.

[16] Note that we have left German out of this table. While it is clear that infinitives allow for null agents in this language, we set aside a discussion of how null patients arise. Section 4, however, proposes a more general approach to null patients that we expect extends to German.

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4. More on null patients

As we saw in the previous section, it is clear that different languages use different syntactic resources to license null agents (imperative, infinitive, voice, etc.). At first glance, this also appears to be true for null patients. However, null topicalization, in which both the nominal in the argument position, and the topic in the left periphery are null, turns up in English (and French) and Malagasy (and Tagalog). We therefore now ask whether null topicalization could also account for null patients in recipes in radical *pro*-drop languages, such as Japanese and Niuean.

4.1 *Null patients and null topicalization*

As already noted, topicalization typically involves two entities, one in the argument position, and another in the left periphery. In more familiar cases, the former is null and the latter is overt, as in (29).

(29) Beans, I like.

It has been proposed, however, that in some cases, the left peripheral topic can also be null, as we saw in Malagasy, a phenomenon we refer to as NULL TOPICALIZATION. The connection between the possibility for null patients in a language and the option for null topicalization goes back at least to Huang (1984, 1991). Huang argues that null objects in Mandarin Chinese, a radical *pro*-drop language, are bound by a null topic in the left periphery. Thus, the null object of *renshi* 'know' in (30) is bound by TOP. He notes that what is special in this Mandarin sentence, in contrast to English, for example, is not that the object is null, since English topic-bound objects are also null, but that the TOPIC is null, which is allowed in Mandarin, but not in English, due to the discourse-oriented nature of the language.[17]

(30) TOP_i [Zhangsan shuo [Lisi bu renshi t_i]]. (Mandarin Chinese)
Zhangsan say Lisi not know
'Zhangsan said that Lisi does not know him/her/them/you.'
(Huang 1991: 57)

Null topics have also been argued to exist in several other languages, such as Malagasy, discussed above, and also European Portuguese, German, Russian, and Hebrew (e.g. Raposo 1986, Erteschik-Shir, Ibnbari & Taube 2013, Trutkowski 2016). These authors propose topic-drop to account for the existence of null objects in these languages, and this analysis is supported by the fact that such null objects are

[17] Holmberg & Nikanne (2002) argue that topic prominent languages such as Chinese, Tagalog, and Hungarian, have a feature in C that requires a topic. This is possibly the case in recipes too, with the coreferential element in the argument position then being (optionally) null. Note that the representation below is Huang's. For present purposes, we remain agnostic about the nature of the null element in argument position, but we address this issue below.

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always topical.[18] In German, for example, for an object to be null, its reference must be given by the discourse context and it must be salient, that is, more prominent at a point of time than other units of information (Trutkowski 2016). Adapting this proposal to recipe contexts is initially appealing as recipes by their nature always have a clear discourse topic – the object of manipulation. It is possible, therefore, to posit that across languages, null objects in recipes are bound by null topics. The proposal marries radical *pro*-drop (Barbosa 2011) and recipe null objects, as the latter now effectively exhibit register-determined radical *pro*-drop, to the extent that radical *pro*-drop involves null topicalization (Massam et al. 2017).[19]

In the literature on null topicalization, it has been observed that languages can vary in terms of what conditions license it, with Mandarin and Japanese allowing a wider range of options than German and Russian (Saito 2007, Erteschik-Shir et al. 2013).[20] Looking at English, for example, null topics are disallowed in contexts where they are permitted in German. Thus, in answer to the question in (31a), (31b) is ungrammatical, in contrast to the well-formed German example in (32b).

(31) (a) Where is your ring?
(b) *~~My ring~~ I have sold.

(32) (a) Wo ist dein Ring? (German)
where is your.SG ring.NOM
'Where is your ring?'
(b) __ Hab ich verkauft.
(~~my ring~~) have I sold
'I have sold it.'

(Trutkowski 2016: 1)

However, it is not the case that English altogether disallows null objects that are contextually given and highly salient. Rather, the licensing conditions for null topics are tighter than in some other languages, ruling out linguistic discourse topics (e.g. (31b)) and allowing only null topics that are directly discernable from deixis or extra-linguistic context (Noailly 1997; Cummins & Roberge 2004, 2005; Perez-Leroux et al. 2017). The latter option is also noted for Russian and Hebrew by

[18] Not all those working on topic-drop posit a null topic in the left periphery (e.g. Erteschik-Shir et al. 2013), as a result the word 'topic' in the term 'topic-drop' sometimes refers to the null argument. However, we assume the topic has a syntactic presence in the left periphery (see discussion in Thrift 2003, Barbiers 2007, Frascarelli & Hinterhölzl 2007, Sigurðsson & Maling 2010, Bianchi & Frascarelli 2010, and Sigurðsson 2011) and null topicalization refers to the nullness of the left peripheral topic.

[19] Others (Ruda 2014, Weir 2017) have also argued for a relation between discourse *pro*-drop and recipe null objects, but they have focused on the nature of the null object (being determinerless, as in East Asian languages), rather than on the role of topic binding. We do not adopt this line of argumentation, because not all radical *pro*-drop languages lack determiners (Massam et al. 2017).

[20] There is variation in analyses in terms of whether the null topic moves to the left periphery or is externally merged there (see Erteschik-Shir et al. 2013), and in terms of the nature of the null object. See further discussion below.

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Erteschik-Shir et al. (2013). The examples in (33) illustrate instances where the null object's reference is immediately salient in the extra-linguistic context (see Cummins & Roberge 2005 for similar examples).[21]

(33) (a) [A parent is looking for their cellphone and they know their child is hiding it behind their back.]
Come on, hand over.
(b) [Parent pointing at broccoli on plate in front of child.]
Eat!

In both examples in (33), it is clear that there is a null definite object. In particular, in (33b), the parent is telling the child to eat the broccoli, not just to eat something. Assuming that such objects are contextually topical, we can conclude that languages differ in the extent to which they allow null topicalization, with licensing conditions varying across pragmatic and discourse lines. This means that we need a more finely tuned approach to cross-linguistic options for null topicalization (Erteschik-Shir et al. 2013). We propose that while languages can have either more or less expansive conditions for null topicalization, recipes are always within the boundaries of admissibility, across (all) languages.[22] Therefore, a language like English, with very particular tight constraints on null topicalization, nonetheless allows it in the recipe context.

There is an interesting correlation between the conditions on null topicalization in non-recipe contexts and in recipe contexts. Schulz (2003) notes that null topicalization is not available for all types of topics, for example shifted topics, but is used only for continued topics.[23] This difference has also been observed in Japanese recipes by Shimojo (2019). Japanese recipes can use overt topics: they are used to introduce new ingredients (e.g. *toriniku-wa* 'chicken' in (34a)). Recipes can also deploy null topics (e.g. 'the chicken' in (34b)) to bind null patients, but in contrast to the overt topics, the null topics are the continued ingredients and are used in what Shimojo calls series cohesion (similar to null anaphora in texts), where the same entity (the continued topic) is manipulated across an ongoing set of instructions.[24]

[21] Of course, English also allows null non-specific objects (e.g. *I was reading all morning*) but we set these aside as their use is not limited to recipes and hence they are not relevant to our discussion.

[22] Until recipes are studied across a wider range of languages, it is impossible to determine what might be universal, but we have shown here that at least there are commonalities across a range of unrelated languages.

[23] See Frascarelli & Hinterhölzl (2007) for a full discussion of various types of topics, and also Rizzi (1997). Frascarelli & Jiménez-Fernández (2019) propose that null subjects can also be licensed by a null Aboutness-Shift topic.

[24] Other factors can constrain null patients as well. Thrift (2003) notes that acceptability of null objects can depend on person features, where first and second person are less acceptable (see also Cardinaletti 1990). Thrift suggests this might be related to the fact that the reference for first and second person shifts in conversation. Since first and second person null objects are not found in recipes we set this variation aside.

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(34) (a) Toriniku-wa mawarini tsuiteiru abura-o teeneeni
chicken-TOP around attached fat-ACC thoroughly
torinozoku. (Japanese)
remove.CON
'Remove excess fat from the chicken thoroughly.'

(b) batto-ni ire shio koshoo kaku shooshoo-o furu.
tray-DAT put salt pepper each little-ACC sprinkle.CON
'Put (the chicken) in a tray and sprinkle salt and pepper a little each (on them).'

(Shimojo 2019: 515)

Thus, overt and null topics play different roles in the discourse, both in regular null topic contexts and in recipe null topic constructions, with null topicalization being employed in cases of continued or series cohesion topics.

As we noted above, Niuean is another language that allows null objects more broadly than English, but Massam (2020) argues that null objects in Niuean are in fact found in very specific contexts. Once such context is where the object is highly topical, with a close linguistic antecedent in an immediately local, but syntactically separate, sentence, as in the two examples below.[25]

(35) A: Ti fakaako mogo ia, ka.ha, au i hinei … he fale
then teach time then right 1SG LOC here . LOC house
tuitui. (Niuean)
sew
'And I was taught right then here … in the sewing house.'

B: e
Yes.

A: Fakaako nī ka.ha he fifine pālagi.
teach just right ERG woman European
'The European woman just taught (me).'

[LMR]

(36) Ti mamate e tau kulene ia haaku. Ai kitia e au.
then die ABS PL grandparent DEM my not see ABS 1SG
'Then those grandparents of mine died. I did not see (them).'

[LMR]

If recipes constitute a cross-linguistically discourse-licensed null topic context, then Niuean recipe null objects such as in (15) are the same as those in non-recipe contexts in the language such as (35) and (36), which are bound by null topics.

[25] Null objects are also found in contexts where they are coindexed with a matrix absolutive argument across certain complementizers (with meanings such as *while*, *when*, *then*), and in constructions that are similar to 'tough constructions' (Massam 2020).

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We thus see that across languages we find null patients that have been argued to be bound by null topics in the left periphery. These null left-peripheral topics might be licensed (i.e. achieve referential identity) very restrictively, by means of the extra-linguistic context (as in English), or they might be licensed by discourse topics from the preceding discourse (as in Mandarin Chinese, German, among others), with varying conditions on locality, degree of topicality, and so on. Based on this previously discussed phenomenon, our claim here is that recipe context sentences are provided with topics by virtue of their register, and that these topics are permitted to be null across (all) languages because of their tightly defined pragmatic and discourse topicality. We return to a discussion of the interface between register and syntax in Section 5, but we now look more closely at the syntax of null topicalization.

4.2 *How null topicalization works*

In this subsection, we define the notion of topic that we claim is relevant for the proposed null topicalization and we illustrate how this phenomenon applies in different languages.

We adopt the core definitions of the different kinds of topic found in Frascarelli & Hinterhölzl (2007). Crucial for recipes are FAMILIAR TOPICS, which are given, are typically destressed and pronominal, and are involved in topic continuity. We claim that in recipes, there is a null familiar topic in the left periphery of the clause that binds a null argument. Note that while there is some debate in the literature on the availability of topics in imperatives (Zhang 1990, Barbiers 2007, Koopman 2007, among others), Frascarelli & Jiménez-Fernández (published online 21 March 2021) show that some types of topics (given and contrastive) are permitted in imperatives, with some interlinguistic variation (see also Haegeman 2012). As noted in Section 4.1, the constraints on this null topic binding vary among languages, but the recipe context always licenses this null topic. Moreover, the null topic always corresponds to the object of manipulation. The exact syntactic position of the argument is not fixed, rather it is the thematic role of patient and the syntax of recipes in a given language will determine the syntactic position of the patient. We illustrate below.

In English, recipes are in the imperative and as a result the patient is always mapped to the direct object, as in (37) (repeated with minor modifications from (1) above).

(37) Take 2 carrots. Cut $\emptyset_{\text{patient}}$ finely, before adding $\emptyset_{\text{patient}}$ to potato mixture.

The proposed structure of the second sentence is represented as in (38), where TOP corresponds to the two carrots introduced in the previous sentence:[26]

[26] Following Ruppenhofer & Michaelis 2010: 159 fn. 1), we take the missing argument of *add* to be a parasitic gap.

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(38) [TOP$_i$ Cut ø$_i$ finely, before adding ø$_i$ to potato mixture].

The same representation can be extended to French recipes, as well as recipes in radical *pro*-drop languages like Japanese and Niuean.

In Malagasy and Tagalog, however, the patient is not in the direct object position, but in the trigger position. We nevertheless posit the same analysis: a null topic in the left periphery of the second clause of (39) binds the null patient of the verb *sasana* 'wash'. This verb is in the Theme Topic voice and therefore the patient is the trigger.

(39) Tetehina mandinika ny hena [TOP$_i$ dia sasana ø$_i$]. (Malagasy)
TT.chop small DET meat COMP TT.wash
'Chop the meat and then wash.'

[Boissard 1983: 33]

Again, we assume that the null familiar topic is not a root phenomenon and can appear in the left periphery of embedded and adjunct clauses. Familiar topics have independently been argued to not be a root phenomenon (Bianchi & Frascarelli 2010, Jiménez-Fernández & Miyagawa 2014, Jiménez-Fernández 2020, inter alia).

For languages like Bulgarian, the precise details depend on the analysis of middles. In other words, the null topic could bind a null patient in the subject position, as in (40a), much like we saw for Malagasy. On the other hand, the topic could directly bind the null patient in its merge position (as object), as in (40b), along the lines of the English example in (38).

(40) (a) [TOP$_i$ ø$_i$ zadushava se za 5 min]. (Bulgarian)
sauté.PRS.3SG REFL for 5 min
'Sauté for 5 minutes.'

(b) [TOP$_i$ zadushava se ø$_i$ za 5 min].
sauté.PRS.3SG REFL for 5 min
'Sauté for 5 minutes.'

(Vesela Simeonova, p.c.)

What unites these examples is that there is binding of a null patient by a null topic in the left periphery. The null patient can be in different syntactic positions, depending on the language. The register therefore plays an important role here in constraining what the null topic can bind. Outside of recipes, familiar topics are not normally constrained to a particular thematic role. But in recipes, the familiar topic is always the object of manipulation and therefore the patient.

4.3 *Summary*

We have suggested here that patient drop arises due to null topicalization, following the work of others cited above, such as Huang (1991) and Erteschik-Shir et al.

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(2013). We have also seen that languages differ in terms of what constraints exist regarding the licensing of null topics. Some languages allow null topicalization more freely than others. However, we have claimed that the recipe context always licenses null patients via null topicalization cross-linguistically. In other words, recipe context null patients are always licensed by null topicalization.

We note in passing that we do not address the categorial nature of the null patient in a recipe. Both Ruda (2014) and Weir (2017) propose that it is a D-less nominal, on analogy with East Asian languages that exhibit discourse or radical *pro*-drop, and lack determiners (Tomioka 2003).[27] However, as argued by Massam et al. (2017), Niuean is also a radical *pro*-drop language, but it arguably does not lack determiners. We tacitly adopt Massam et al.'s view, where the null object is a D, that is, a simple deictic pointer, definite but without identifying content, which it receives from its antecedent (Roberts & Holmberg 2010, Baltin 2012). We leave this issue aside here, as our main point involves the licensing of the null topic, rather than the categorial nature of the null patient itself.[28]

5. Conclusion

Most of the research on recipe contexts tends to focus on one language and one issue, for example on how to explain null definite objects in English. By taking a cross-linguistic perspective, we see that instances of recipes in a range of languages share two key properties: null agents and null patients. We can understand this nullness functionally. The null agent corresponds to the reader, that is, the person following the recipe. There is no need to make this argument overt. The null patient is the object of manipulation and as a result, it is highly salient and can be null. But the functional account doesn't tell us how any given language will make these null arguments possible in the syntax.

The languages explored in this paper show that different strategies are used by different languages. As can be seen in the table below (revised from Table 1), null agents arise due to a variety of syntactic means that exist independently in the language. In the case of null patients, however, we have claimed that they are always the result of null topicalization. Table 2 improves on Table 1 by capturing the generalization that the apparently different processes that lead to null patients (e.g. trigger-drop, *pro*-drop) all involve the same syntactic structure: the null argument is bound by a null topic in the left periphery.

The emerging picture for agents conforms straightforwardly to our initial hypothesis that register does not dictate specific syntactic structures. Instead, the syntax of

[27] As for null objects outside of recipe contexts, Huang (1991) argues that they are variables, while Potsdam & Polinsky (2007) consider them to be *pro*, and Perez-Leroux et al. (2017) consider them to be N, the minimal instantiation of a nominal object, which they consider to be obligatory in all clauses.

[28] Similarly, we set aside the issue of the Person value of the null agent, which we noted earlier can be second person in imperatives, or arbitrary in infinitives, middles and in Malagasy non-Actor Topic voice.

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Language	Null agents	Null patients
English	Imperative	Null topicalization
Niuean	Imperative	Null topicalization
Tagalog	Imperative	Null topicalization
French	Infinitive	Null topicalization
Malagasy	Non-AT verbs	Null topicalization
Bulgarian	Middle (*se*)	Null topicalization
Japanese	*Pro*-drop	Null topicalization

Table 2
Syntactic strategies for null agents and null patients – revised.

each language plays a role in realizing the pragmatic desiderata of the register. For null patients, however, several questions arise regarding the precise relation between the register and syntax. Does the recipe register provide the null topic that licenses the null patient? If yes, then we are committed to the view that a register can directly license a particular syntactic configuration (see Bender 1999). Alternatively, it is possible that the salience of the topic in recipe contexts is so strong that it fits into every language's allowable space for the licensing of null topicalization. We have seen that in all languages considered, even English, null topicalization is an option, given the right discourse or pragmatic context. Crucially, the licensing of null patients involves an independently available syntactic construction, not a mechanism only found in recipes. If this is the case, then we do not need a direct link between the recipe register and syntax. While we contend that the second approach is preferable, we leave it to future research to determine which approach to register and syntax is ultimately correct.

REFERENCES

Arendholz, Jenny, Wolfram Bublitz, Monika Kirner-Ludwig & Iris Zimmerman. 2013. Food for thought – or, what's (in) a recipe? A diachronic analysis of cooking instructions. In Gerhardt et al. (eds.), 119–137.

Baltin, Mark. 2012. Structural signature of pronouns. Ms., New York University. lingbuzz/001598.

Barbiers, Sjef. 2007. On the periphery of imperative and declarative clauses in Dutch and German. In van der Wurff (ed.), 95–112.

Barbosa, Pilar. 2011. *Pro*-drop and Theories of *pro* in the Minimalist Program, Part 2: Pronoun deletion analyses of null subjects and partial, discourse, and semi *pro*-drop. *Language and Linguistics Compass* 5(8), 571–587.

Bell, Allan, Karen Davis & Donna Starks. 2000. *The languages of the Manukau region* (Woolf Fisher Research Report). Auckland: Woolf Fisher Research Centre, University of Auckland.

Bender, Emily. 1999. Constituting context: Null objects in English recipes revisited. *University of Pennsylvania Working Papers in Linguistics* 6, 53–68.

Bianchi, Valentina & Mara Frascarelli. 2010. Is topic a root phenomenon? *Iberia* 2, 43–88.

Bubel, Claudia & Alice Spitz. 2013. The way to intercultural learning is through the stomach: Genre-based writing in the EFL classroom. In Gerhardt et al. (eds.), 157–187.

Cardinaletti, Anna. 1990. Subject/object asymmetries in German null-topic constructions. In Joan Mascaró & Marina Nespor (eds.), *Grammar in progress: GLOW essays for Henk van Riemsdijk*, 75–84. Dordrecht: Foris.

Cote, Sharon Ann. 1996. *Grammatical and discourse properties of null arguments in English*. Ph.D. dissertation, University of Pennsylvania.
Cotter, Colleen. 1997. Claiming a piece of the pie: How the language of recipes defines community. In Anne L. Bower (ed.), *Recipes for reading: Community cookbooks, stories, histories*, 51–72. Amherst, MA: University of Massachusetts Press.
Culy, Christopher. 1996. Null objects in English recipes. *Language Variation and Change* 8, 91–124.
Cummins, Sarah & Yves Roberge. 2004. Null objects in English and French. In Julie Auger, J. Clancy Clements & Barbara Vance (eds.), *Contemporary approaches to Romance linguistics*, 121–138. Amsterdam: John Benjamins.
Cummins, Sarah & Yves Roberge. 2005. A modular account of null objects in French. *Syntax* 8, 44–64.
Erteschik-Shir, Nomi, Lena Ibnbari & Sharon Taube. 2013. Missing objects as topic drop. *Lingua* 136, 145–169.
Ferguson, Charles A. 1994. Dialect, register and genre: Working assumptions about conventionalization. In Douglas Biber & Edward Finegan (eds.), *Sociolinguistic perspectives on register*, 15–30. New York: Oxford University Press.
Fischer, Kerstin. 2013. The addressee in the recipe: How Julia Child gets to join you in the kitchen. In Gerhardt et al. (eds.), 103–117.
Fisher, Mary Frances Kennedy. 1983. *With bold knife and fork*. New York, NY: Paragon.
Frascarelli, Mara & Roland Hinterhölzl. 2007. Types of topics in German and Italian. In Kerstin Schwade & Susanne Winkler (eds.), *On information structure, meaning and form*, 87–116. Amsterdam: John Benjamins.
Frascarelli, Mara & Ángel L. Jiménez-Fernández. 2019. Understanding partiality in *pro*-drop languages: An information-structure approach. *Syntax* 29, 162–198.
Frascarelli, Mara & Ángel L. Jiménez-Fernández. How much room for discourse in imperative? The lens of interface on English, Italian and Spanish. *Studia Linguistica*, https://doi.org/10.1111/stul.12153. Published online 21 March 2021, Wiley Online Library.
Gerhardt, Cornelia, Maximiliane Frobenius & Susanne Ley (eds.). 2013. *Culinary linguistics*. Amsterdam: John Benjamins.
Haegeman, Liliane. 1987a. Complement ellipsis in English: Or how to cook without objects. In Anne-Marie Simon-Vandenbergen (ed.), *Studies in honour of René Derolez*, 248–261. Ghent: Seminairie voor Engelse en Oud-Germaanse Taalkunde R.U.G.: University of Ghent.
Haegeman, Liliane. 1987b. Register variation in English: Some theoretical observations. *Journal of English Linguistics* 20, 230–248.
Haegeman, Liliane. 2012. *Adverbial clauses, main clause phenomena and the composition of the left periphery: The cartography of syntactic structures*. Oxford: Oxford University Press.
Haegeman, Liliane. 2017. Unspeakable sentence: Subject omission in written registers. A cartographic analysis. *Linguistic Variation* 17, 229–250.
Haegeman, Liliane. 2019. Register-based subject omission in English and its implication for the syntax of adjuncts. *Anglophonia French Journal of English Linguistics* [online] 28. http://journals.openedition.org/anglophonia/2873.
Hinds, John. 1976. A taxonomy of Japanese discourse types. *Linguistics* 184, 45–53.
Holmberg, Anders & Urpo Nikanne. 2002. Expletives, subjects, and topics in Finnish. In Peter Svenonius (ed.), *Subjects, expletives, and the EPP*, 71–106. Oxford: Oxford University Press.
Huang, C.-T. James. 1984. On the distribution and reference of empty pronouns. *Linguistic Inquiry* 15, 531–574.
Huang, C.-T. James. 1991. Remarks on the status of the null object. In Robert Freidin (ed.), *Principles and parameters in comparative grammar*, 56–76. Cambridge, MA: MIT Press.
Jiménez-Fernández, Ángel. 2020. *Syntax–information structure interactions in the sentential, verbal and nominal peripheries*. Newcastle upon Tyne: Cambridge Scholars.
Jiménez-Fernández, Ángel & Shigeru Miyagawa. 2014. A feature-inheritance approach to root phenomena and parametric variation. *Lingua* 145, 276–302.
Keenan, Edward. 1976. Remarkable subjects in Malagasy. In Charles Li (ed.), *Subject and Topic*, 247–301. New York: Academic Press,
Keenan, Edward & Cecile Manorohanta. 2001. A quantitative study of voice in Malagasy. *Oceanic Linguistics* 40, 67–85.
Koopman, Hilda. 2007. Topics in imperatives. In van der Wurff (ed.), 153–180.
Massam, Diane. 1992. Null objects and non-thematic subjects. *Journal of Linguistics* 28, 115–37.

Massam, Diane. 2020. *Niuean: Predicates and arguments in an isolating language*. Oxford: Oxford University Press.

Massam, Diane, Kazuya Bamba & Patrick Murphy. 2017. Obligatorily null pronouns in the instructional register and beyond. *Linguistic Variation* 17, 272–291.

Massam, Diane & Yves Roberge. 1989. Recipe context null objects in English. *Linguistic Inquiry* 20, 134–139.

Milambiling, Lareina. 2011. Null object constructions in Tagalog. In Lisa Armstrong (ed.), *Proceedings of the Canadian Linguistics Association 2011*. Canadian Linguistic Association. http://homes.chass.utoronto.ca/~cla-acl/actes2011/Milambiling_2011.pdf.

Noailly, Michèle. 1997. Les mystères de la transitivité invisible. *Langages* 127, 96–109.

Paul, Ileana. 2000. *Malagasy clause structure*. Ph.D. dissertation, McGill University.

Pearson, Matthew. 2001. *The clause structure of Malagasy: A minimalist approach*. Ph.D. dissertation, UCLA.

Pearson, Matt. 2005. The Malagasy subject/topic as an A'-element. *Natural Language & Linguistic Theory* 23, 381–457.

Pearson, Matt. 2018. Predicate raising and perception verb complements in Malagasy. *Natural Language & Linguistic Theory* 36, 781–849.

Perez-Leroux, Ana-Teresa, Mihaela Pirvulescu & Yves Roberge. 2017. *Direct objects and language acquisition*. Cambridge: Cambridge University Press.

Potsdam, Eric & Maria Polinsky. 2007. Missing complement clause subjects in Malagasy. *Oceanic Linguistics* 46, 277–308.

Rajemisa-Raolison, Regis. 1971. *Grammaire malgache*. Fianarantsoa: Librairie Ambozontany.

Randriamasimanana, Charles. 1986. *The causatives of Malagasy*. Honolulu, HI: University of Hawai'i Press.

Raposo, Eduardo. 1986. On the null object in European Portuguese. In Osvaldo Jaeggli & Carmen Silva-Corvalán (eds.), *Studies in Romance linguistics*, 373–390. Dordrecht: Foris.

Ritter, Elizabeth & Lavi Wolf. 2017. The information structure of imperatives. In Andrew Alexander Monti (ed.), *Proceedings of the 2017 Annual Conference of the Canadian Linguistic Association.* https://cla-acl.artsci.utoronto.ca/wp-content/uploads/actes-2017/Ritter_E.Wolf_L.2017CLAProceedingsPaper.pdf.

Rizzi, Luigi. 1997. The fine structure of the left periphery. In Liliane Haegeman (ed.), *Elements of grammar*, 281–337. Dordrecht: Kluwer.

Roberts, Ian & Anders Holmberg. 2010. Introduction: Parameters in minimalist theory. In Theresa Biberauer, Anders Holmberg, Ian Roberts & Michelle Sheehan (eds.), *Parametric variation: Null subjects in minimalist theory*, 1–57. Cambridge: Cambridge University Press.

Ruda, Marta. 2014. Missing objects in special registers: The syntax of null objects in English. *The Canadian Journal of Linguistics* 59, 339–372.

Ruppenhofer, Josef & Laura Michaelis. 2010. A constructional account of genre-based argument omissions. *Constructions and Frames* 2, 158–184.

Sadock, Jerrold. 1974. Read at your own risk: Syntactic and semantic horrors you can find in your medicine chest. In M. La Galy, R. Fox & A. Bruck (eds.), *Papers from the Tenth Regional Meeting, Chicago Linguistic Society* (CLS 10), 599–607. Chicago, IL: Chicago Linguistic Society.

Saito, Mamoru. 2007. Notes on East Asian argument ellipsis. *Language Research* 43, 203–227.

Schulz, Barbara. 2003. Crossing the borders of functional and formal linguistics: An optimality theoretic account of German topic drop. In K. Ikeda, J. Robideau, J. Ballantyne, T. Garneau, S. Hall & L. Lanz (eds.), *Selected papers from The Seventh College-wide Conference for Students in Languages, Linguistics and Literature*, 188–201. University of Hawaii, Manoa.

Seiter, William. 1980. *Studies in Niuean syntax*. New York: Garland Press.

Shimojo, Mitsuaki. 2019. Topicalization in Japanese cooking discourse. *Open Linguistics* 5, 511–531.

Sigurðsson, Halldór Ármann. 2011. Conditions on argument drop. *Linguistic Inquiry* 42, 267–304.

Sigurðsson, Halldór Ármann & Joan Maling. 2010. The empty left edge condition. In Michael Putnam (ed.), *Exploring crash-proof grammars*, 59–86. Amsterdam: John Benjamins.

Sperlich, Wolfgang. 1997. *Tohi Vagahau Niue: Niue language dictionary*. Alofi & Honolulu, HI: Government of Niue & University of Hawai'i Press.

Thrift, Erica. 2003. *Object drop in the L1 acquisition of Dutch*. Ph.D. dissertation, University of Amsterdam.

Tomioka, Satoshi. 2003. The semantics of Japanese null pronouns and its cross-linguistic implications. In Kerstin Schwabe & Susanne Winkler (eds.), *The interfaces: Deriving and interpreting omitted structures*, 321–339. Amsterdam: John Benjamins.
Trutkowski, Ewa. 2016. *Topic drop and null subjects in German*. Berlin: De Gruyter. https://doi-org.proxy1.lib.uwo.ca/10.1515/9783110446173
Weir, Andrew. 2017. Object drop and article drop in reduced written register. *Linguistic Variation* 17, 157–185.
van der Wurff, Wim (ed.). 2007. *Imperative clauses in generative grammar: Studies in honour of Frits Beukema*. Amsterdam: John Benjamins.
Zhang, Shi. 1990. *The status of imperatives in theories of grammar*. Ph.D. dissertation, The University of Arizona.

ADDITIONAL DATA SOURCES

Niuean

Haia: An Introduction to Vagahau Niue. 2009. Wellington: Ministry of Education, Wellington, New Zealand.
LMR: Interviews from the Languages of Manukau Region (LMR) project (Bell, Davis & Starks 2000). [Courtesy of Donna Starks and Ofania Ikiua.]
Traditional Niuean Recipes. Compiled by Team EduKai, through The University of Canterbury, and the Pacific Islands Trade and Invest group through the 21 Day Pacific Challenge.

Malagasy

Boissard, Pierre. 1983. *Cuisine malgache, cuisine créole*. Antananarivo: Librairie de Madagascar.
Ravololomanga, Bodo. 1996. *Le lac bleu*. Paris: Harmattan.

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