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# Resultative secondary predicates in cooking recipes: an empirical study of Germanic and Romance languages

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**Abstract:** The present article provides a contrastive corpus-based analysis of resultative secondary predicates in recipe contexts. Two Germanic languages (Dutch and English) and two Romance languages (French and Spanish) are investigated. Based on a sample of 4,000 (i.e., 1,000 per language) resultative constructions (RCs) retrieved from a tailor-made corpus of cooking recipes, this study sheds new light on Talmy's typological dichotomy between satellite-framed and verb-framed languages. Specifically, it is shown that (i) Adjectival phrases (APs) are not totally excluded from Romance RCs but their occurrence is restricted in several ways. (ii) Prepositional phrases (PPs) can be headed by a whole range of prepositions (or 'result markers') which exhibit important differences in terms of semantic properties, token frequency, and distribution across verb classes: 'weak' result markers, which mainly consist of locative prepositions (viz. *in* 'in' in Dutch, *in* in English and *en* 'in' and *a* 'to' in Spanish) occur almost exclusively in RCs that contain achievements, which are argued to be less dynamic, depictive-like instances of the construction. By contrast, 'strong' result markers (e.g., *tot* 'to/until' in Dutch, *to*, *into*, and *until* in English, *en* 'in' in French and *a punto de* 'to point of' in Spanish) combine with various aspectual classes, including activities, and may therefore give rise to 'strong' (i.e., aspect-shifting) RCs. Finally, (iii) although they are both 'satellite-framed' languages, Dutch and English impose different restrictions on the formal encoding of APs, which are very often preceded by the preposition *until* in English as a result of discourse and internal language factors.

**Keywords:** resultative secondary predicates; prepositions; corpus-based linguistics; Romance; Germanic languages; cooking recipes

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# 1 Introduction

Resultative constructions (RCs) are constructions in which the subject or direct object referent is conceived of as undergoing a change of state as a result of the event denoted by the verb. Thus, in example (1), *the floor* becomes clean as a result of the sweeping. Likewise, in example (2), *the door* becomes red as a result of the painting. The same goes for example (3): *the vase* is in pieces as a result of the breaking. The change of state is syntactically encoded by a Resultative Secondary Predicate (henceforth RSP) (Halliday 1967: 63), which can be an adjectival phrase (AP) (e.g., *clean* and *pink*, cf. [1] and [2]), or a prepositional phrase (PP) (e.g., *into pieces*, cf. [3]).[1]

(1) John swept the floor clean. (Beavers 2012: 909, [4b])

(2) Lisa painted her door pink. (Boas 2003: 25, [2.4])

(3) The vase broke into pieces. (Iwata 2020: 349, [12])

## 1.1 Germanic resultative constructions

Most prior research on RCs has investigated these constructions in Germanic languages, and more particularly in English. The reasons behind this interest can be summarized as follows. First, English RCs exhibit a wide range of distinct syntactic patterns: they can contain transitive verbs, with subcategorized (cf. [1]) and non-subcategorized objects (cf. [4]), and intransitive verbs, both unaccusative (cf. [3]) and unergative ones (cf. [5]) – also used with non-subcategorized objects.[2] In other words, these constructions can overrule the valency and the selectional restrictions of the verb: *sweep* is usually restricted to object noun phrases (NPs) that refer to a surface, and not an instrument (e.g., *Sue swept the floor/*the broom*) and *bark* cannot select for a direct object since it is intransitive (e.g., **The dog barked the chicken*).

(4) Sue swept the broom to pieces. (Boas 2003: 7, [1.12e])

(5) The dog barked the chickens awake. (Mateu Fontanals 2000: 73, [2a])

Several analyses have been proposed to account for sentences like (4) and (5). For instance, in 'Small Clause' (or SC) analyses (Aarts 1992; Bowers 1997; Chomsky 1981,

**1** NPs are also attested with verbs that describe (i) a chromatic change (e.g., *I painted the car a pale shade of yellow* [Simpson 1983]) and (ii) a performative act of nomination (e.g., *Arthur was named the king of all England* [Matushansky 2008; Métairy 2020; Métairy et al. 2020]).

**2** Unlike subcategorized objects (e.g., *John swept the floor* [*clean*]), non-subcategorized objects (e.g., *The dog barked the chickens* *[*awake*]) are not lexically selected by the main verb.

1986; Hoekstra 1988, 1992; Hornstein and Lightfoot 1987; Stowell 1981), non-subcategorized object NPs are said to be licensed as subjects of the SC, which is itself lexically selected by the main verb (e.g., *The dog* [$_{V}$ *barked* [$_{SC}$ *the chickens* [$_{AP}$ *awake*]]]).[3] Alternatively, in constructional approaches (Boas 2003; Fillmore et al. 1988; Goldberg 1995; Goldberg and Jackendoff 2004; Iwata 2020), non-subcategorized NPs are argued to be licensed by the (transitive) resultative construction, which is conceived of as a conventionalized pairing of syntactic form (viz. [$NP_1$ VP $NP_2$ $XP_3$]) and meaning (viz. $X_1$ CAUSE $Y_2$ [BECOME $Z_3$] by V-ing). Under this view, the postverbal NP (e.g., *the chickens*) and the resultative AP (e.g., *awake*) are solely contributed by the construction, and not by the verb.

Second, English RCs can modify the verb's aspectual reading (Vendler 1957, 1967), converting activities (i.e., durative and atelic events) into accomplishments (i.e., durative and telic events) (Beavers 2012; Dowty 1979; Rothstein 2004; Tenny 1994). Thus, in (1), the RSP *clean* provides an endpoint to the event denoted by the verb *sweep* (i.e., the sweeping event ends when the state of being clean is reached). In the literature, aspect-shifting RCs like (1) are regarded as instances of 'strong' RCs (Washio 1997). They are contrasted with what is referred to as 'weak' RCs. These RCs contain verbs that denote a telic event (for instance, an accomplishment, e.g., *paint* in [2]) or an achievement, e.g., *break* in [3]). Therefore, in such contexts, the RSP only specifies or intensifies a result already incorporated in the verb semantics.

And third, English RCs are also known for their puzzling distribution (Beavers 2002, 2013; Boas 2003; Cappelle 2014; Carrier and Randall 1992; Rodríguez Arrizabalaga 2003; Wechsler 2001, 2005; Wyngaerd 2001). To put it simply, while some "verb + RSP" combinations are allowed, others are not. For instance, the verb *drive* only accepts RSPs that refer to a pejorative mental state, which include *crazy*, *bonkers*, *over the edge*, and *to the brink of lunacy* but not *happy* and *to the brink of ecstasy*, which are hence ruled out in this context (cf. [6]). The RSP is not only subject to lexical restrictions but is also limited in terms of morphosyntactic categories: thus, with *pound*, PPs are allowed but not NPs (cf. [7a]). The NP *the pancake* must be introduced by a preposition. However, with *paint*, and more generally with chromatic change verbs, it is

**3** SC analyses also aim to account for the so-called 'Direct Object Restriction' (DOR) (Simpson 1983), which entails that English RSPs cannot be predicated of the subject of a transitive (e.g., **I ate the food sick*) or an unergative verb (e.g., **I danced tired*). Thus, as argued by Hoekstra (1988: 119), the DOR follows from the fact that the subject of the RSP must occur in the SC subject position (hence, after the main verb). Nonetheless, although subject-oriented RCs with transitive/unergative verbs are rare, they are not impossible. Several examples are provided by Wechsler (1998), e.g., *He followed Lassie free of his captors* and by Verspoor (1997), e.g., *John danced mazurkas across the room* (cited in Hovav and Levin 2001: 770).

the other way around: NPs are accepted but not PPs (cf. [7b]).[4] A similar contrast is observed in example (8): unlike *shoot*, which can occur with both the AP *dead* and the PP *to death* (cf. [8a]), *beat* can only occur with the PP (cf. [8b]). Given that the RSPs involved in each pair in (7) and (8) are semantically related, one can assume that the choice between one or the other RSP morphosyntactic category largely depends on the verb subcategorization.

(6) He drove her {crazy/bonkers/over the edge/to the brink of lunacy/*happy/*to the brink of ecstasy}.
(Carrier and Randall 1992: 184, [26])

(7) a. She pounded the dough {PP into a pancake/NP *a pancake}.
b. She painted the barn {NP a weird shade of red/PP *(in)to a weird shade of red}.
(Carrier and Randall 1992: 183, [22]–[24])

(8) a. The outlaw shot the miller {AP dead/PP #to death}.
b. The outlaw beat the miller {PP to death/AP *dead}.
(Examples adapted from Beavers 2002: 2, [4])

Note, however, that the distributional facts illustrated in (8) have also been explained on semantic grounds (Beavers 2002, 2013; Rodríguez Arrizabalaga 2003; Wechsler 2001, 2005; Wyngaerd 2001). The occurrence of either *dead* or *to death* in the sentence is argued to correlate with the verb's aspectual reading: while *dead* tends to occur with verbs that denote punctual events (e.g., *shoot*, *knock dead*), *to death* tends to appear with verbs that describe durative events (e.g., *beat*, *stab*, *strangle to death*). Interestingly, when used with the PP, the verb *shoot* receives an iterated reading (i.e., the outlaw shot the miller several times), which is not available with the AP. The correlation between the verb's aspectual properties and the formal encoding of the RSP will be further explored in Section 4.4.

English RCs have also been studied from a comparative perspective. Most studies compare English with Romance languages (Legendre 1997; Mateu 2012; Mateu Fontanals 2000; Napoli 1992; Rodríguez Arrizabalaga 2003, 2014, 2016; Washio 1997), and, to a lesser extent, with other Germanic languages, such as German (Boas 2003; Oya 2002) and Dutch (Hoeksema and Napoli 2019; Hoekstra 1988; Lauwers et al. 2021).[5]

**4** *To* and *into* may not be acceptable with chromatic verbs, but *in* can perfectly occur with these verbs:

(1) The walls were freshly ***painted in a cheerful yellow and rich brown***.
https://www.nytimes.com/2011/06/05/fashion/gluten-free-bakeries-and-cafes.html (07/04/2023, 16:00)

**5** See De Cuyper (2004), Kaufmann and Wunderlich (1998), Métairy (2022a, 2022b), Morita (2009), and Riaubiené (2015) for a cross-linguistic analysis of RCs.

Like in English, Dutch RCs are also fairly flexible: they can contain activity (e.g., *schaatsen* 'skate', cf. [9]) and change of state verbs (e.g., *maaien* 'mow', cf. [10]), adjectival (e.g., *kapot* 'broken', cf. [9]) and prepositional RSPs (e.g., *tot dwerg* 'to dwarf', cf. [11]), subcategorized (cf. [10]) and non-subcategorized objects (cf. [9]). In other words, Dutch allows both strong (i.e., aspect-shifting) and weak (i.e., non-aspect-shifting) RCs.

(9) Hij schaatste het ijs kapot. (Hoekstra 1988: 115, [34c])
'He skated the ice cracked.'

(10) Hij maaide het gras kort. (Hoekstra 1988: 117, [38b])
'He mowed the grass short.'

(11) Alice is tot dwerg gekrompen. (Kaufmann and Wunderlich 1998: 24, [77b])
'Alice shrunk to a dwarf.'

Although these different sub-types of Dutch RCs have been identified in previous literature, how frequent and productive they are compared to their equivalents in other Germanic languages remains largely unknow.[6] And yet, findings drawn from more recent empirical studies suggest that Dutch RCs exhibit language-specific properties. For instance, as extensively shown in Gyselinck (2018), fake reflexive RCs associated with a non-literal intensifying meaning (e.g., *Lisa danced herself to pieces last night*) appear to attract an impressive variety of verbs and intensifiers in Dutch (2018: ix–xvii), which do not always have a counterpart in English, cf. (12).

(12) Een vijftiental beloften ***loopt zich de pleuris uit het lijf*** […].
'(lit.) Some fifteen reserves run themselves the pleurisy out of the body […].'
'Some fifteen reserves are running themselves to pieces […].'
(Gyselinck 2018: 3, [8])

Similarly, Métairy et al. (2020) have demonstrated that status nouns are always marked by the preposition *tot* 'to' in Dutch resultative nomination constructions, regardless of the verb used (cf. [13]). By contrast, in English, *to* is usually found with directional verbs (e.g., *John was promoted/fast-tracked to manager*).[7]

(13) Het gebied ***is uitgeroepen tot een nationaal park***.
'The area is proclaimed [to] a national park.' (Métairy et al. 2020: 10, [42])

**6** Productivity can be defined in terms of *type frequency* (i.e., number of distinct lexical types attested in a slot) and *hapax frequency* (i.e., number of one-off occurrences) (Barðdal 2008; Zeldes 2013).

**7** This preposition can be found with other verb types in archaic expressions (e.g., *take to wife*).

In this article, I investigate whether there are further intra-Germanic differences in the behavior of RCs, limiting my research to English and Dutch.

Contrary to Germanic languages, Romance are said to lack fully productive RCs (Acedo-Matellán 2012; Aske 1989; Bigolin and Ausensi 2021; Mateu 2012; Mateu Fontanals 2000; Mateu and Rigau 2010; Snyder 2001). The productivity imbalance between Germanic and Romance RCs has been argued to follow from a fundamental typological dichotomy between satellite- versus verb-framed languages, which was originally introduced in Talmy's (1985, 1991) pioneering work on the syntactic encoding of complex motion events. In satellite-framed languages (e.g., Germanic languages), the path of an event – that is, the goal (cf. [14]) and, by metaphorical extension, the result (cf. [15]) – is encoded by a separate phrase (i.e., a so-called 'satellite' [Talmy 1985: 102]), whereas the manner in which the action of an event is carried out is specified in the verbal root:

(14) a. John [MANNER stormed] [PATH into] the kitchen. (English)
b. Jan [MANNER stormde] de keuken [PATH binnen]. (Dutch)

(15) a. Marc [MANNER scrubbed] the floor [PATH clean]. (English)
b. Mark [MANNER schrobde] de vloer [PATH schoon]. (Dutch)

By contrast, in verb-framed languages (which are prominent in Romance), the path of an event is incorporated in the verbal root, whereas the manner of action is expressed by an adjunct.[8]

(16) a. Jean [PATH est entré] dans la cuisine [MANNER en trombe]. (French)
b. Juan [PATH entró] en la cocina [MANNER a toda velocidad]. (Spanish)
'John entered (in) the kitchen like a whirlwind.'

(17) a. François [PATH a nettoyé] le sol [MANNER à la brosse]. (French)
b. Francisco [PATH limpió] el suelo [MANNER con un cepillo]. (Spanish)
'Francis cleaned the floor with a brush.'

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**8** For some authors (Mateu 2012; Mateu Fontanals 2000; Mendívil Giró 2003; Snyder 2001), the dichotomy between satellite- and verb-framed languages stems from the fact that the latter would lack productive root compounding. More precisely, satellite-framed motion patterns are argued to be derived via a conflation operation whereby a manner root (e.g., $\sqrt{FLOAT}$) is directly merged, forming a compound, with another (phonologically empty) verbal head that selects for a SC-like Path complement, cf. (1). By contrast, verb-framed motion patterns are derived by incorporation (or copy) of a Path root (e.g., $\sqrt{INTO}$) into the verbal head, cf. (2). While incorporation is available in both Germanic and Romance languages, conflation is only allowed in Germanic languages.

(1) The bottle$_j$ [[$_V$ $\sqrt{\text{FLOAT-GO}}$] [$_{PP/SC}$ t$_j$ into the cave]] (Mateu 2012: 257, [10.9b])

(2) The bottle$_j$ [$_V$ enter$_i$ [$_{PP/SC}$ t$_j$ $\sqrt{\text{~~into~~}_i}$ the cave]] (floating) (Mateu 2012: 257, [10.9a])

However, scholars have become aware of the relevance of RCs in Romance as well: see, for instance, Napoli (1992), Riccio (2018), and Romagno (2020) for Italian; Riegel (1996, 2001), Legendre (1997), Muller (2000), Dagnac (2009), and Métairy (2020, 2022a, 2022b) for French; Bosque (1990), Demonte and Masullo (1999), and Rodríguez Arrizabalaga (2003, 2014, 2016, 2022) for Spanish; and Farkas (2009, 2011, 2015) and Baciu (2014) for Romanian. Romance RCs will be presented in Section 1.2.

## 1.2 Romance resultative constructions

This section aims to summarize the main properties that characterize Romance RCs. Given that there is an extensive body of literature that covers this topic in different Romance languages, providing an exhaustive account of RCs in each Romance language individually would be beyond the scope of this paper. See, however, Métairy (2022b: 56–67) for a more detailed overview of these constructions.

Examples of Romance RCs are given below:

(18) Scolare gli spaghetti asciutti. (Italian)
'Drain the spaghetti dry.'
(Napoli 1992: 79, [121b])

(19) Le vase s'est brisé en mille morceaux. (French)
the vase SE.is broken in thousand pieces
'The vase broke into a thousand of pieces.'
(Legendre 1997: 83, [70b])

(20) Les quatre hommes ont battu Pierre à mort. (French)
the four men have beaten Peter to death
'The four men beat Peter to death.'
(Buchard 2006: 81, [107])

(21) Raid las mata bien muertas. (Spanish)
Raid them kill very dead
'Raid knocks them dead/Raid finishes them off.'
(Bosque 1990: 196)

(22) Se baten las claras a punto de nieve. (Spanish)
SE beat the whites to point of snow
'Beat the egg whites to snow.'
(Rodríguez Arrizabalaga 2016: 56, [2])

(23) El a prăjit carnea scrum. (Romanian)
he has fried the meat ash
'He has fried the meat to ashes.'
(Farkas 2009: 65, [12d])

In prior literature, Romance RCs are said to exhibit the following properties: first, they only allow transitive verbs (e.g., Spanish: *batir las claras* 'beat the egg whites', cf. [22]) and unaccusative verbs (e.g., French: *se briser* 'break', cf. [19]). Thus, RCs with unergative verbs and non-subcategorized objects (e.g., *bark*, cf. [5]) do not seem available in Romance (Legendre 1997: 83; Mateu Fontanals 2000: 73; Rodríguez Arrizabalaga 2016: 57).

Second, Romance RCs are said to mostly – if not exclusively – combine with telic verbs and are, therefore, regarded as weak RCs (Baciu 2014: 65; Bigolin and Ausensi 2021: 6; Mateu 2012: 258; Washio 1997: 26–30). In other words, Romance RCs either involve accomplishments (e.g., Romanian: *prăji* 'fry', cf. [23]) or achievements (e.g., French: *se briser* 'break', cf. [19]). Note that such RCs do not constitute exceptions to Talmy's (1985, 1991) generalization since the path of the event (that is, the change of state) is already incorporated in the verb and is only further specified by the RSP. In fact, some authors even argue that RCs do not exist in Romance precisely because they would lack RCs that contain atelic verbs (hence, the strong type), which are regarded as true, genuine instances of RCs (Acedo-Matellán 2012; Aske 1989; Bigolin and Ausensi 2021; Mateu 2012; Mateu Fontanals 2000; Mateu and Rigau 2010; Snyder 2001). Nonetheless, in my opinion, one should rather carefully describe the different types of RCs available in a given language than restrict the concept of 'RCs' and offer a reductionist definition of these constructions which does not take into account the fact that, even though weak RCs indeed differ from strong RCs, they share common properties with the latter – in other words, they are still resultatives. And third, there seems to be a general consensus to the effect that Romance RCs mostly involve PPs (Farkas 2009: 61; Legendre 1997: 46; Napoli 1992: 84; Rodríguez Arrizabalaga 2016: 72).

That being said, the examples illustrated above call into question some of these generalizations: (i) activity verbs can also be found in Romance, for instance in French (e.g., *battre à mort* 'beat to death', cf. [20]) and in Spanish (e.g., *batir a punto de nieve* 'beat to snow', cf. [22]). Therefore, strong RCs do seem to be possible in these languages as well (Métairy 2022a: 259–261; Rodríguez Arrizabalaga 2014, 2022; Romagno 2020). (ii) APs in Romance RCs are possible (e.g., Italian: *asciutti* 'dry'), but tend to be intensified, for instance, via the addition of a degree adverb (e.g., Spanish: *bien muertas* 'very dead', cf. [21]). In Romanian, bare NPs are also attested. Such NPs can refer either to a newly created entity (e.g., *scrum* 'ash', cf. [23]) or to a property when used metaphorically (e.g., *lună* 'moon' and *oglindă* 'mirror', cf. [24]).

(24) Fata a frecat podeaua lună/ oglindă.
the girl has scrubbed the floor moon/ mirror
'The girl scrubbed the floor as clean/shiny as the moon/mirror.'
(Farkas 2011: 69, [4b])

## 2 Goal and scope of this study

Several empirical and theoretical questions arise from the observations made above, especially regarding the RSP's morphosyntactic category. For instance, PPs are described as the most prototypical category for the expression of a result in Romance (Farkas 2009: 61; Ionescu 1998: 152; Legendre 1997: 46; Napoli 1992: 84; Rodríguez Arrizabalaga 2016: 72). However, little is known about the range of prepositions accepted in this slot in each Romance language, and about the differences between them in terms of semantics, frequency, and distribution across verb classes. While relevant research has been carried out on English prepositions (viz. *in*, *into*, and *to*) in Beavers (2002, 2013) and in Iwata (2020: 260–287), PPs in Romance RCs have not been thoroughly investigated, let alone from a quantitative, corpus-based perspective (see, however, Lauwers et al. [2018] and Enghels and Lauwers [2020] for an analysis of the prepositions *en* 'in' and *de* 'of' in RCs with chromatic verbs in French and in Spanish, respectively, and Rodríguez Arrizabalaga [2022] for the preposition *hasta* 'until'; cf. also Section 4.4.4 below).

Note that this is also true for prepositions in Germanic languages other than English (e.g., *tot* 'to' or *in* 'in' in Dutch, Section 1.1). However, Romance PPs are particularly interesting because, compared to APs, they can combine with (atelic) activity verbs and may thus give rise to strong RCs, which match the satellite-framed pattern. In other words, while they have been completely ignored in certain studies (Mateu Fontanals 2000; Washio 1997), Romance PPs challenge Talmy's dichotomy between 'satellite-' and 'verb-framed' languages (Beavers et al. 2010; Croft et al. 2010; Martínez Vázquez 2015; Verkerk 2014: 47–77).

Few authors have tried to account for the predominance of PPs in Romance RCs (see in particular Morita 1998: 321; Rodríguez Arrizabalaga 2003: 128). Indeed, one can wonder what is so special about PPs, enabling them to express a result more freely than other categories. In other words, the question is: what do PPs (e.g., *beat to death*) have that APs (e.g., *beat dead*) do not have? As suggested by the aforementioned authors, one possible answer is that PPs contain a preposition which may serve as an explicit 'result marker'. When combined with a certain type of NP, namely, NPs that do not refer to locations but to states (e.g., *to death*), status (e.g., *to manager*), or objects (e.g., *to pieces*), some prepositions can convey a resultative meaning, which,

in the case of *to* in English, is inherited from its goal semantics in motion events. However, in line with Beavers (2002, 2013) and Iwata (2020), I will show in this study that prepositions can construe different types of resultative meanings which interact with the verb's idiosyncratic and aspectual meaning, hence accounting for their distribution across verb classes.

As for adjectival RSPs, they have been mostly analyzed from a comparative Germanic versus Romance perspective, leaving out potential intralinguistic differences in terms of frequency, lexical openness, and distribution (see, however, Boas [2003] for an in-depth corpus-based comparison of English and German RCs). This is especially true for Romance, where adjectival RSPs are marginal. Moreover, the conditions for their occurrence in Romance need to be further investigated: for instance, why Romance adjectival RSPs tend to be modified by intensifying degree adverbs is not entirely clear. For some scholars, this can be explained on pragmatic grounds (Napoli 1992: 75–76; Rodríguez Arrizabalaga 2016: 74): adverbial modification makes the AP syntactically heavier, which then draws attention to the result of the process, not the process itself. Although this may be a sound explanation, I believe that it is incomplete, and that semantic factors should also be considered.

The present article reports on a contrastive corpus-based analysis of RCs in two Germanic languages (Dutch, English) and two Romance languages (French, Spanish). This investigation is limited to a discourse genre that provides frequent contexts for RCs, viz. cooking recipes. Indeed, most examples of Romance RCs cited in the literature are expressions that typically occur in recipe contexts (Brdar et al. 2020; Demonte and Masullo 1999: 2492; Legendre 1997: 83; Napoli 1992: 78; Rodríguez Arrizabalaga 2016: 71). The reason as to why Romance RCs are used more productively in this genre of discourse is rather straightforward. In cooking recipes, a detailed description of the result is essential to the success of the dish: thus, 'cook the meat' does not amount to 'cook the meat medium-rare'. Under normal circumstances (outside the culinary field), this kind of information is not as relevant and therefore does not need to be overtly expressed (see Rodríguez Arrizabalaga [2016: 66] for a similar hypothesis).

Furthermore, cooking recipes mostly consist of a list of instructions, with short, concise, and 'straight to the point'-like sentences. In this regard, RCs are likely preferred over long, complex sentences (e.g., *Bash the ingredients to a rough paste* > *bash the ingredients until they form a rough paste*), which are nevertheless referentially equivalent. In the long run, this discourse-related factor may have boosted the development of a culinary "jargon", where RCs appear to be more frequent and productive than in everyday-life conversations. Germanic languages are most probably sensitive to this parameter as well. However, given that they are satellite-framed languages, these languages can exhibit RCs without the intervention of discursive factors. By contrast, in verb-framed languages, such as the Romance

languages under discussion, where RCs are more marginal, such factors appear to play a crucial role in the occurrence of these constructions.

# 3 Methodology

Section 3 presents the methodological protocol used to gather and annotate 4,000 occurrences of RCs in the four languages studied, i.e., Dutch (nl.), English (en.), French (fr.) and Spanish (sp.), retrieved from a tailor-made quadrilingual corpus of cooking recipes. This corpus consists of recipes extracted from three different websites in each language (see Table 8 in the Appendix), which was then compiled in Sketch Engine (Kilgarriff et al. 2014). In order to reduce the heterogeneity of the sample due to geographic variation, websites were chosen for this study that make use of a specific variety of each language, namely Flemish Dutch, British English, Hexagonal French, and Peninsular Spanish.[9] Each sub-corpus contains around 600,000 tokens.

## 3.1 Cleaning phase and research delineation

Several constructions have been excluded from the sample of RCs: (i) phrasal verb constructions, which involve a preposition or an adverb (Aarts 1989; Cappelle 2005; Declerck 1991; Iacobini 2009; Müller 2002: 253–390), cf. (25) and (26):

(25) ***Roll*** the dough ***out*** on a floured surface. (English)

(26) ***Snijd*** het houterige stukje van de asperges ***weg***. (Dutch)
'Cut the woody part of the asparagus away.'

(ii) caused-motion constructions, which describe a change of location (Beavers et al. 2010; Boas 2003; Goldberg 1995; Iwata 2008), cf. (27)–(30):

(27) ***Divide*** the remaining icing ***into three bowls***. (English)

(28) ***Meng*** de Rice Krispies ***door de gesmolten chocolade***. (Dutch)
'Mix the Rice Krispies through the melted chocolate.'

(29) ***Cassez*** les œufs ***dans un saladier*** et battez-les en omelette. (French)
'Crack the eggs into a bowl and beat them into an omelet.'

**9** The traditional varieties of English, French, and Spanish have been chosen because of their internal geographical homogeneity (compared to the many varieties used in Latin America, for instance). The inclusion of Flemish Dutch and Hexagonal French is also motivated by practical reasons: Ghent University, where this study was conducted, is a Flemish University and Hexagonal French is the French variety spoken by the author.

(30) ***Reparte*** la mezcla ***en 6 recipientes***. (Spanish)
'Distribute the mixture into 6 containers.'

And, (iii) adverbial resultative constructions with morphologically marked adverbs (Broccias 2004; Geuder 2000; Iwata 2020; Quirk et al. 1985: 560), such as, en. *thinly*, fr. *finement* 'finely', sp. *finamente* 'finely', cf. (31)–(33). In such constructions, the adverb indirectly describes a property of the entity created via the verbal process: for instance, in example (31), the event of slicing the apples leads to the creation of apple slices which have the property of being thin. These constructions have been excluded from the analysis on the basis of three criteria. The first one is a morphological criterion: (i) the suffixes *-ly* in English and *-ment(e)* in Romance are generally regarded as explicit markers of adverbial status (Hummel 2017a: 14). Thus, although they establish a predicative relationship with a nominal referent (which is here not explicitly expressed in the sentence), marked adverbs cannot be formally analyzed as predicates. The second and third criteria for exclusion relate to their distribution: (ii) unlike prototypical predicates, for instance APs, they can precede the main verb (e.g., *Thinly/*thin slice the apples*) and (iii) they can only combine with lexical verbs, which exclude causative verbs (e.g., *Roll out/*make the dough thinly*):

(31) Peel, core and ***thinly slice*** the apples.

(32) ***Ciselez finement*** les herbes.
'Finely chop the herbs.'

(33) ***Pica*** las verduras ***finamente***.
'Finely chop the vegetables.'

From a semantic point of view, constructions featuring adverbs are not much different from constructions with their adjectival counterparts, e.g., en. *thin*, fr. *fines* 'thin', sp. *finas* 'thin', cf. (34)–(36).

(34) Trim and ***slice*** the spring onions ***thin***.

(35) Les pommes et/ou les poires doivent être ***coupées très fines***.
'The apples.F.PL and/or pears.F.PL must be cut very thin.F.PL.'

(36) ***Picar*** las alcaparras ***muy finas***.
'Chop the capers.F.PL very thin.F.PL.'

Indeed, on a par with marked adverbs, these APs are not predicated of the direct object's referent, but of the entity that emerges from the verbal event. Consequently, in previous literature, this type of adjectival constructions has been referred to as 'spurious' (Washio 1997: 17), 'pseudo' (Demonte and Masullo 1999: 2493; Levinson 2010: 138), or even 'adverbial' RCs (Mateu Fontanals 2000: 89), taking the 'non-object' scope of the adjectival form as a symptom of adverbhood, assimilating it to a manner-of-process

interpretation. In my view, this conclusion is a bit too extreme. That we cannot simply discard these 'pseudo' RCs from the domain of resultative predication is also advocated by Broccias (2013), who argues that this phenomenon is only a by-product of the semantics of some verbs used in the RC. When the verb describes an event that inherently results in the creation of an entity (or set of entities), which is the case of *chop*, *grind*, or *slice*, the RSP can only be predicated of this new entity.[10] Therefore, following this author, we have considered adjectival constructions like those in (34)–(36) as instances of RCs and have included them in our dataset.

Note that the APs *finas* 'thin' in Spanish (cf. [36]) and *fines* 'thin' in French (cf. [36]) agree in gender and number with the postverbal NP. In Romance, agreement is generally observed with predicative APs (cf. [37]) but not with APs used for adverbial functions (cf. [38]).[11] Agreement morphology has been taken as evidence for non-adverbial status.

(37) María vive contenta. (Hummel 2017a: 14)
'Mary lives happy.F.SG.'

(38) María habla rápido. (Hummel 2017a: 14)
'Mary speaks fast.M.SG.'

Then, in order to be in line with the Romance system, (iv) constructions with uninflected APs (cf. [39]) and APs with no apparent agreement marking (cf. [40]) in Spanish have been removed from the final dataset.

(39) ***Picar muy fino*** las alcaparras.
'Chop very thin.M.SG the capers.F.PL.'

(40) ***Picar muy fino*** el ajo.
'Chop very thin.M.SG the garlic.M.SG.'

**10** This phenomenon does not only happen with verbs of material disintegration but also with verbs of combining, such as *mix*, cf. (1). Thus, what becomes "a dough" is the mixture obtained via the combination of all these ingredients and not the ingredients individually.

(1) For the flatbreads, ***mix*** the flour, a good pinch of salt and 120 ml of cold water ***into a dough***.

**11** Nonetheless, it should be noted that cases of inflected adverbs in Romance have been reported, in Spanish (cf. [1]) and in French (cf. [2]). See Felíu Arquiola and Pato (2019), Pato Maldonado and Felíu Arquiola (2020), and Corminboeuf (2022).

(1) Vamos ***directos*** a la playa. (Ledgeway 2017: 48, [4a])
we.go. direct.M.PL to the beach
'Let's go directly to the beach'

(2) Il commença donc à se dandiner tout en marmonnant une chanson que seul lui pouvait entendre tant il la chantait ***basse***. (Hummel 2017b: 274, [16])
'[…] a song.F.SG he sang so low.F.SG. that only he could hear it.'

Things are quite different in Dutch since there is no morphological difference between adjectives (41) and adverbs (42) in this language. In other words, contrary to what is observed in English, French, and Spanish, Dutch adverbs are never marked by a specific adverbial morpheme, such as English *-ly*, French *-ment*, and Spanish *-mente*. This typological contrast is known as the "flexible" versus "differentiated" languages dichotomy, cf. Hengeveld (1992: 15, 20–21, 62–72); Hengeveld et al. (2004) and Hengeveld and van Lier (2010), cited in Hummel (2017a: 18).

(41) Ze is een mooi meisje.
'She is a beautiful girl.'

(42) Ze zingt mooi.
she sings beautiful
'She sings beautifully.'

That is why, in cases of 'pseudo' RCs, it is impossible to decide whether the AP in Dutch (e.g., *fijn* 'thin', cf. [43] and *grof* 'coarse', cf. [44]) is used as a predicate or as an adverb. Therefore, such APs have been included in the analysis and annotated as bicategorical 'adjective-adverb' items.

(43) ***Snij*** de ui ***fijn***.
'Cut the onion thin.'

(44) ***Hak*** de kappertjes ***grof***.
'Chop the capers coarse.'

Table 1 summarizes our analysis of adjectival and adverbial constructions in the four languages under study.

## 3.2 Corpus annotation

As a second step, 1,000 hits of the RC were retrieved manually in the four languages studied (that is, 4,000 in total) from the corpus of cooking recipes. RCs turn out to be more frequent in Germanic languages, and particularly in Dutch, than in Romance: as shown in Table 2, a higher number of tokens had to be read in French and Spanish in order to collect 1,000 hits of the construction than in Dutch or English. This is indicated by the normalized token frequency calculated for each language: per 1,000 tokens, 12.6 RCs were found in Dutch, 6.7 in English, 4.2 in French, and 2.4 in Spanish.

Each occurrence of an RC was annotated according to several variables. These variables concern the morphosyntactic category of the RSP (viz. PPs [e.g., *into pieces*],

**Table 1:** Cross-linguistic analysis of adverbial and adjectival constructions.

| Examples | Analysis | In vs. out |
|---|---|---|
| **Verb + *-ly* and *-ment(e)* marked adverbs**<br>Couper *finement* les pommes.<br>Cortar *finamente* las manzanas.<br>'Thinly slice the apples.' | Adverb | ✗ |
| **Verb + uninflected APs in Romance**<br>*Picar muy fino* las alcaparras.<br>'Chop very thin.M.SG the capers.F.PL.' | Adverb | ✗ |
| **Incl. Verb + APs with no apparent agreement morphology**<br>*Picar muy fino* el ajo.<br>'Chop very thin.M.SG the garlic.M.SG.' | | |
| **Verb + uninflected APs in Dutch**<br>Snij de ui *fijn*.<br>'Cut the onion thin.' | Adjective-adverb | ✓ |
| **Verb + uninflected APs in English**<br>Cut the onion *thin*. | Adjective | ✓ |
| **Verb + inflected APs in Romance**<br>Picar las alcaparras *muy finas*.<br>'Chop the capers.F.PL very fine.F.PL.' | Adjective | ✓ |

**Table 2:** Normalized token frequency of the RC by language.

| Language | Hits | Stopped at (no. of tokens read) | Normalized token frequency | Corpus size (no. of tokens) |
|---|---|---|---|---|
| Dutch | 1,000 | 79,466 | 12.6 | 577,227 |
| English | 1,000 | 147,901 | 6.7 | 639,244 |
| French | 1,000 | 237,686 | 4.2 | 612,692 |
| Spanish | 1,000 | 405,811 | 2.4 | 575,253 |

APs [e.g., *dry*]), the lexeme of the preposition (e.g., *into*, *to*, *until*, etc.) as well as the formal make-up of the complement within the PP – that is, whether it is encoded by an AP (e.g., *until smooth*) or an NP (e.g., *until a golden caramel*). Further important variables were considered during the annotation process, such as the verb lexeme (viz. *cut*, *whisk*, *fry*, etc.) and the semantic verb class. Each verb class will be presented in Section 4.

# 4 Results

This section is organized around three main findings that emerge from the results of the corpus analysis. First, adjectival RCs are available in both French and Spanish.

However, they are not frequent and they include a limited set of different APs and verbs, which tend to denote telic events (Section 4.3). Second, adjectival RCs are more frequent and more productive in Dutch than in other languages, including English, where most adjectives are in fact contained inside a PP headed by the preposition *until*. And third, various prepositional RCs have been identified in the four languages studied. They are characterized by specific semantic properties, token frequencies and distributions across verb classes (Section 4.4). Before presenting these findings, I will first list the verb classes attested in RCs and illustrate them with corpus examples in each language (Section 4.1).

## 4.1 Verb classification

In total, 234 verbs were found with an RSP in our 4,000-token dataset, i.e., Dutch: 55, English: 101, French: 59, Spanish: 19 (see Tables 10–13 in the Appendix). These verbs have been divided into nine semantic classes, which are presented below:[12]

(i) *Cut* verbs (e.g., en. *tear*, nl. *verdelen* 'divide', fr. *tailler* 'carve', sp. *cortar* 'cut', cf. [45]–[48]) describe processes that lead to a change in the material integrity of some entity (Levin 1993: 245). They refer to a separation which can be done with a bladed instrument (e.g., knife, scissors) or using one's hands and the actions result in the creation of discrete entities of a certain size and shape (e.g., slices, chunks, cubes). From an aspectual point of view, *cut* verbs denote achievements (i.e., punctual and telic events). However, when such events are iterated (as is usually the case in cooking recipes), this iteration yields an accomplishment reading. Consider, for instance, the event of slicing a cucumber: the slicing event ends when there is no more cucumber left (that is, when there are only slices of cucumber).

(45) ***Tear*** the hearts ***into quarters***.

(46) ***Verdeel*** de broccoli ***in roosjes***.
'Divide the broccoli into florets.'

(47) À l'aide d'une râpe, ***taillez***-la ***en fines lamelles*** comme des spaghettis.
'Using a grater, carve it into thin strips like spaghetti.'

(48) Pelar y ***cortar*** las zanahorias ***a rodajas***.
'Peel and cut the carrots into slices.'

(ii) *Grind* verbs (e.g., en. *crush*, nl. *malen* 'grind', fr. *mixer* 'grind with a blender', sp. *triturar* 'mash', cf. [49]–[52]) are also verbs of disintegration. However, the

12 A more thorough comparative analysis of these verb classes is provided in Métairy (2022a).

processes denoted by these verbs are carried out with different types of instruments, such as a fork, a mortar, or an electric food processor, and lead to the creation of a mass entity (e.g., purée, coulis, powder). *Grind* verbs describe accomplishments, which are durative, and telic events: the event of grinding, crushing, mashing, etc. ends when the pieces contained in the processed substance have reached the desired size. Thus, *grind* verbs denote continuous processes which do not consist of a series of punctual subevents.

(49) […] then ***crush*** the garlic and anchovy ***to a coarse paste***.

(50) ***Maal*** de gepelde amandelen ***fijn*** in de blender of een hakmolen.
'Grind the peeled almonds until fine in a blender or chopper.'

(51) ***Mixez en coulis*** la chair de la mangue avec un peu de sucre dans un blender.
'Blend the flesh of the mango to a coulis with a little sugar in a blender.'

(52) Cuando estén bien blandos, retirar y ***triturarlos en puré***.
'When they are soft, remove them and mash them to a purée.'

(iii) *Beat* verbs (e.g., en. *press*, nl. *kloppen* 'beat', fr. *fouetter* 'whisk', sp. *batir* 'beat', cf. [53]–[56]) refer to processes that involve a repeated contact with some entity. This repeated contact, which varies in terms of intensity (e.g., *pat* vs. *pound*) and the instrument used (e.g., *roll* vs. *whisk*), subsequently impacts this entity. Nonetheless, it does not necessarily lead to a determined change of state: for instance, one can whisk cream for a while without causing it to reach a specific consistency. In this sense, *beat* verbs describe activities (i.e., durative and atelic events).

(53) ***Press flat*** with the back of a fork and carefully drop into the hot oil.

(54) ***Klop*** de slagroom ***stijf*** met wat bloemsuiker.
'Beat the cream until stiff with some icing sugar.'

(55) ***Fouettez*** la crème ***en chantilly*** et ajoutez le sucre glace.
'Whisk the cream to whipped cream and add the icing sugar.'

(56) En otro bol, ***bate*** las claras ***a punto de nieve*** y después agrega las yemas.
'In another bowl, beat the egg whites to snow and then add the yolks.'

(iv) *Shape* verbs (e.g., en. *flatten*, nl. *vouwen* 'fold', fr. *façonner* 'shape', sp. *montar* 'raise', cf. [57]–[60]) describe processes that alter the initial shape or state of an entity (this change is not obtained via material disintegration or cooking). This class includes verbs associated with distinct semantic properties: while some verbs provide information about the new shape of the entity in question (e.g., en. *flatten the dough* → make the dough into a flat object; sp. *montar las*

*claras* '(lit.) raise the egg whites' → get the egg whites foamy resulting in an increase of their volume), others simply entail that a change of shape is taking place (e.g., en. *shape*, *mould*, and *form*, fr. *façonner* 'shape', *former* 'form', and *mouler* 'mould'). This second subset of verbs obligatorily requires an RSP (e.g., *shape the dough *[into a ball]* vs. *flatten the dough [into a disk]*). *Shape* verbs mostly denote accomplishments (viz. durative and telic events).

(57) Use your fingers to ***flatten*** the dough ***into a disk***.

(58) Leg de vulling op 1 helft van het deeg en ***vouw dicht***.
'Place the filling on 1 half of the dough and fold tight.'

(59) ***Façonnez*** chacune d'elles ***en boule***.
'Shape each one of them into a ball.'

(60) Luego, ***montamos*** las claras ***a punto de nieve*** con el resto del azúcar.
'Then, raise the egg whites to snow with the rest of the sugar.'

(v) *Cook* verbs (e.g., en. *toast*, nl. *bakken* 'fry', fr. *cuire* 'cook', cf. [61]–[63]) refer to various methods of cooking ingredients. They also denote accomplishments: the cooking event ends when the ingredients are cooked.

(61) Lightly ***toast*** the coconut ***until golden***.

(62) Verhit een pan en ***bak*** de spekblokjes ***krokant***.
'Heat a pan and fry the cubes of bacon until crispy.'

(63) Faites ***cuire*** les pâtes ***al dente*** dans un grand volume d'eau salée.
'Cook the pasta until al dente in plenty of salted water.'

(vi) *Blend* verbs (e.g., en. *bring together*, nl. *roeren* 'stir', fr. *ficeler* 'tie' [64]–[66]) denote processes whereby things are mixed or attached together. This semantic class includes both telic (result-oriented) verbs (e.g., en. *bring together*) and atelic (manner-oriented) verbs (e.g., nl. *roeren* 'stir').

(64) Using your hands, ***bring*** the dough ***together into a ball***.

(65) ***Roer*** de geweekte mastellen ***tot een dikke broodbrij***.
'Stir the soaked mastels to a thick bread paste.'

(66) *Bouquet garni:* choix de plantes aromatiques, ***ficelées en petit fagot*** […].
'*Bouquet garni:* a selection of aromatic herbs, tied into a small bundle […].'

(vii) *Wipe* verbs (e.g., en. *scrub*, cf. [67], nl. *borstelen* 'brush', cf. [68]) describe how things can be removed from surfaces and objects. Equivalent verbs exist in Romance (e.g., fr. *frotter* 'scrub', *brosser* 'brush', sp. *fregar* 'scrub', *cepillar* 'brush') but none of them have been found with an RSP in the Romance corpus

sample. One possible explanation for this observation is that *wipe* verbs rarely combine with PPs in cooking recipes. Recall that, in this particular genre, prepositional RCs usually entail the creation of an object (or set of objects). However, it is difficult to imagine a situation where an event of wiping, scrubbing, brushing, etc. leads to this kind of outcome. Thus, we could assume that PPs are not found with *wipe* verbs because the types of events they denote do not alter the material integrity or shape of the affected entity, which is necessary in the creation of a new object. Given that the RSP is preferably encoded by a PP in Romance, especially when it occurs with activity verbs, this can explain why *wipe* verbs have not been attested in these languages.

(67) ***Scrub*** the potatoes ***clean*** and get rid of any gnarly bits.

(68) ***Borstel*** de champignons ***schoon*** en snij ze in kwartjes.
'Brush the mushrooms clean and cut them into quarters.'

(viii) *Put* verbs (e.g., en. *arrange*, cf. [69], fr. *déposer* 'lay', cf. [70]) describe how things are placed with respect to some location.

(69) Slice pears and ***arrange fanned out*** on the pastry.

(70) ***Déposez*** sur le dessus les lamelles de radis ***en écailles***.
'Lay the radish slices on top in a scale-like pattern.'

(ix) Finally, inherently resultative verbs (e.g., en. *get*, nl. *brengen* 'bring', fr. *rendre* 'make', sp. *hacer* 'make', cf. [71]–[74]) describe processes that solely consist in a change of state. The means through which this change of state is achieved is not specified. Semantically underspecified, these verbs cannot occur in a sentence without the RSP (e.g., *make the dough *[into a ball] vs. roll the dough [into a ball]*). In the literature, they have been referred to as 'causative operators' (Gross 1981: 23, 1998; Muller 2000: 22) or 'support verbs' (Demonte and Masullo 1999: 2507) in order to account for their semantic underspecification.

(71) The problem you'll have is **getting** the pasta ***thin enough to work with***.

(72) ***Breng op smaak*** met peper en zout.
'Season (lit. bring to taste) with pepper and salt.'

(73) Mouillez avec un peu d'huile pour ***rendre*** le mélange ***homogène.***
'Add a little oil to make the mixture homogeneous.'

(74) En primer lugar, ***hacemos*** las cebollas ***a trocitos muy pequeños*** […].
'First of all, we make the onions into very small pieces […].'

## 4.2 General overview of the RSP morphosyntactic categories

Table 3 provides a general overview of the morphosyntactic categories attested in the RSP slot in Dutch, English, French, and Spanish.[13]

As shown in Table 3, the RSP can be encoded by (i) a PP (e.g., *into slices*, *to a paste*, *until fine*) or (ii) an AP (e.g., *flat*, *dry*, *thin*).[14] PPs are more frequent in the languages of our sample (cf. nl: 53 %, en: 96.7 %, fr: 98 %, sp: 94.8 %). They are followed by APs (cf. nl: 47 %, en: 3.3 %, fr: 2 %, sp: 5.2 %). Interesting cross-linguistic contrasts can be observed: first, APs are much more frequent in Dutch than in English (cf. 47 vs. 3.3 %) – although both languages are satellite-framed. Second, even in Romance, APs are not distributed evenly: they are more frequent in Spanish than in French (cf. 5.2

**Table 3:** Frequency of RSP morphosyntactic categories by language ($X^2$ = 1,120.4, df = 3, $p$ value < 0.001).[a]

| | Dutch | | | English | | | French | | | Spanish | | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | #[b] | % | SR | # | % | SR | # | % | SR | # | % | SR | # | % |
| **PPs** | 495 | 53 | −10.9 | 957 | 96.7 | 3.6 | 964 | 98 | 4 | 944 | 94.8 | 3 | 3,360 | 86 |
| **APs** | 439 | 47 | 27 | 33 | 3.3 | −8.9 | 21 | 2 | −9.9 | 52 | 5.2 | −3.4 | 545 | 14 |
| **Total** | | **934** | | | **990** | | | **985** | | | **996** | | **3,905** | |

Notes. [a]The statistical analysis has been conducted with R Studio (https://www.R-project.org/). [b]The columns show the raw frequency, the relative frequency, and standardized residuals. The standardized residuals show which cells contribute the most to the significance of the chi-square test result: standardized residuals greater than +2 indicate that the observed frequency is significantly higher than the expected frequency (= there are more observations than we would have expected under the null hypothesis), while standardized residuals lower than −2 indicate that the observed frequency is significantly lower than the expected frequency (= there are fewer observations than we would have expected under the null hypothesis). The larger the residuals the greater the contribution (Levshina 2015: 217–221). See also the association plot in Figure 1 (cf. Appendix).

**13** Although they are included in the 4,000-token sample of RCs, inherently resultative verbs have been removed from the analysis of the RSP morphosyntactic categories to make sure that the proportion of APs is not overestimated, especially in Romance. As is well known, these verbs can freely combine with resultative APs in these languages (fr. *rendre quelqu'un fou* 'drive someone crazy'; sp. *hacer a alguien feliz* 'make someone happy'). Therefore, I decided to only consider RCs that contain lexical verbs.

**14** The Italian expression *al dente* 'firm' is also included in this category. Although it is originally a PP (viz. to the tooth), this expression has been reanalyzed as an AP, as evidenced by the fact that it can be preceded by a degree modifier in French (viz. *très* 'very', cf. [1]) and by a preposition (viz. *until*, cf. [2]) in English.

(1) Faites ***cuire*** les coquillettes ***très al dente***.
'*Cook* the shell pasta *very al dente*.'

(2) Tip the macaroni into the boiling salted water and ***cook until al dente***, according to packet instructions.

vs. 2 %). Quite surprisingly, the frequency of APs is even higher in Spanish than in English (cf. 5.2 vs. 3.3 %), where this morphosyntactic category is expected to occur more freely. Nonetheless, as will be seen in Section 4.3, Romance APs are limited in terms of number and diversity of lexical types. Moreover, they turn out to be quite different from the ones found in Germanic languages since they tend to be intensified via the addition of degree modifiers.

In the following sections, each RSP morphosyntactic category is thoroughly looked into, starting with APs (Section 4.3) and then PPs (Section 4.4).

## 4.3 Adjectival phrases

Examples of adjectival RCs in the four languages under scrutiny (i.e., Dutch, English, French, and Spanish) are provided in (75)–(78):

(75) ***Roer*** de zachte boter ***wit-romig*** samen met de suiker en de vanillesuiker.
'Stir the softened butter white-creamy together with the sugar and vanilla sugar.'

(76) ***Blend smooth***, adding just as much sugar as you need to match your taste.

(77) Pour obtenir une crème bien mousseuse, veillez à ***battre*** les blancs d'œufs ***très fermes***.
'To obtain a very frothy cream, make sure to beat the whites very firm.M.PL.'

(78) ***Picar*** el ajo y la chalota ***muy pequeños*** y mezclarlos con la zanahoria.
'Chop the garlic and shallot very small.M.PL and mix them with the carrot.'

As pointed out earlier, the frequency of APs is much higher in Dutch (47 %) than in English (3.3 %), French (2 %), and Spanish (5.2 %) (Table 3). Given that Dutch and English are both satellite-framed languages, one would expect to observe a comparable frequency of APs in these two languages. A question that naturally arises at this point is: why APs are so frequent in Dutch in particular? The first reason is that Dutch adverbs are not morphologically marked and are therefore formally identical to adjectives (Section 3.1). Some Dutch lexical items, for instance *fijn* 'thin' in *snij de ui fijn* 'cut the onion thin' and *grof* 'coarse' in *hak de kappertjes grof* 'chop the capers coarse', which were annotated as APs, may correspond to two distinct morphosyntactic categories in English, namely APs (e.g., *thin*) and *ly*-adverbs (e.g., *thinly*). The latter is, however, not included in the 1,000-token sample. Therefore, the fact that adjectives are used both for adjectival and adverbial functions in Dutch partly explains why APs are more frequent in this language. Nonetheless, even if we

remove these ambiguous items, the frequency of APs is still much higher in Dutch (439–196 = 239) than in English.

Another parameter seems to play a role in the cross-linguistic distribution of APs: in English, most APs are headed by the preposition *until*. Indeed, out of 317 APs found in the English sample, 285 (90 %) are preceded by *until* and therefore regarded as PPs, as against 32 (10 %) occurring with no preposition. This is a very interesting finding considering that *until*-RCs have been overlooked in the literature (see, however, Beavers 2008; Rodríguez Arrizabalaga 2014, 2022). In fact, the lack of interest in *until*-RCs is quite a paradox since the preposition *until* is sometimes used to account for the meaning of RCs (i.e., *water the tulips [until they are] flat* [Carrier and Randall 1992]). This type of RC will be investigated in Section 4.4.3. By contrast, Dutch APs are almost never introduced by a preposition: only one AP has been attested with the preposition *tot* 'to/until', cf. (79). It could be argued that *tot* 'to/until' is added to the sentence precisely to mark the adjectival RSP *gaar* 'cooked', which occurs at a long distance from the main verb *bakken* 'fry', following several adjuncts. However, other examples with a similar structure are attested without a preposition, cf. (80).

(79) ***Bak*** het varkensvlees 5–6 minuten aan beide kanten ***tot gaar***.
'Fry the pork for 5–6 minutes on both sides until cooked.'

(80) ***Kook*** de asperges samen met het preiwit en de ui 12 minuten ***gaar*** in de kippenbouillon.
'Cook the asparagus together with the leek and the onion in the chicken stock for 12 minutes until tender.'

If we look at the adjectival type frequency in Table 4, we can see that adjectival RCs are more productive in Germanic languages than in Romance. Dutch exhibits the highest type frequency with 23 types. It is followed by English with nine types, then by Spanish and French with only four types each. Thus, despite a relatively higher token frequency (52 tokens), Spanish allows a limited number of types, which also belong to the same semantic field (viz. *fino* 'thin', *pequeño* 'small', *menudo* 'thin'). By contrast, English shows a lower token frequency (32 tokens) but allows a higher variety of types (viz. *dry*, *clean*, *open*, *flat*, *small*, *smooth*, etc.). This low diversity of types observed in Spanish is very likely due to the fact that the Spanish RC is almost restricted to one semantic verb class, viz. *cut* verbs. Although RCs that contain *cut* verbs are very frequent in the four languages studied, they happen to be even more frequent in Spanish (sp. 94 %, fr. 78.6 %, nl. 64.5 %, en. 38.3 %). The limited productivity of APs could then be correlated with the limited productivity of the verb slot in this language.

**Table 4:** Adjectival types by language.

| Language | Type freq. | Lemmas |
|---|---|---|
| Dutch | 23 | *fijn* 'thin' (157), *gaar* 'cooked' (65), *los* 'loose' (63), *grof* 'coarse' (40), *bruin* 'brown' (33), *krokant* 'crispy' (16), *glad* 'smooth' (14), *droog* 'dry' (7), *stijf* 'stiff' (7), *glazig* 'translucent' (6), *schoon* 'clean' (6), *dicht* 'closed' (5), *luchtig* 'light' (4), *zacht* 'soft' (3), *hard* 'hard' (2), *knapperig* 'crispy' (2), *open* 'open' (2), *rul* 'loose' (2), *bleek* 'pale' (1), *groot* 'big' (1), *plat* 'flat' (1), *schuimig* 'foamy' (1), *wit-romig* 'white-creamy' (1) |
| English | 9 | *dry* (13), *clean* (4), *open* (4), *flat* (3), *small* (3), *smooth* (2), *thin* (2), *fanned out* (1), *rough* (1) |
| French | 4 | *al dente* 'al dente' (17), *fin* 'thin' (2), *ferme* 'firm' (1), *serré* 'tight' (1) |
| Spanish | 4 | *fino* 'thin' (43), *pequeño* 'small' (7), *picado* 'chopped' (1), *menudo* 'small' (1) |

It should also be pointed out that Romance APs are very often associated with intensifying degree adverbs, and more precisely, so-called 'boosters' (Quirk et al. 1985) (viz. fr. *très* 'very', *bien* 'well'; sp. *muy* 'very', *bien* 'well', cf. [81]–[83]).[15] In Spanish, these adverbs can be associated with a diminutive (e.g., *bien picadita* 'very chopped' [83]), which has the same intensifying function (Armstrong 2012; Bosque 1990; Rodríguez Arrizabalaga 2016). Spanish diminutives consist of the adjectival root and the *-ito/a* suffix.

(81) Farinez un plan de travail et **étalez** la pâte ***très fine*** au rouleau.
'Flour a work surface and roll out the dough very thin with a rolling pin.'

(82) Garnissez l'intérieur de la dinde avec la farce et ***ficelez*** la volaille ***bien serrée***.
'Fill the inside of the turkey with the stuffing and tie the chicken.F.SG very tight.F.SG.'

(83) Sin perder de vista la carne, que no se nos queme, **cortamos *bien picadita*** la cebolla.
'Without losing sight of the meat, (making sure) that it does not burn, we cut the onion.F.SG very chopped.F.SG.DIM.'

**15** Examples of Spanish RCs with unmodified APs are provided in Demonte and Masullo (1999: 2492), see (1) and (2). Note, however, that these examples are not retrieved from corpora. Their acceptability is in fact rather dubious: both examples have been rejected by our Spanish informants.

(1) Batir los huevos cremosos.
'Beat the eggs creamy.'

(2) Cernir la harina fina.
'Sift the flour fine.'

Modified APs are indeed far more frequent in Spanish (40/53, 75.5 %), than in Dutch (24/439, 5.5 %), and in English (2/33, 6 %). In French, the situation is slightly different: *al dente* 'al dente', which is the most frequent AP (17/21, 81 %), tends to resist adverbial modification, although it is not entirely excluded (e.g., *cuire très al dente* 'cook very al dente' [cf. Note 14]). This is probably due to the fact that this term refers to a specific level of cooking, which, in principle, cannot be construed as gradable. However, the other APs found in the French sample are also modified by a degree adverb. This observation is in line with previous findings on Romance RCs and is corroborated by French native speakers' intuitions: according to my informants, sentences (84) and (85) are more acceptable when the AP is preceded by *très* 'very':

(84) Battez les bancs d'œufs ??fermes/très fermes.
'Beat the egg whites ??stiff/very stiff.'

(85) Étalez la pâte ??fine/très fine.
'Spread the dough ??thin/very thin.'

The question that arises at this point is: why can Romance APs only occur in RCs if they are intensified? One could argue that adding a degree adverb (or reduplicating the adjective, as observed in Italian, e.g., *stirare la camicia piatta piatta* 'iron the shirt very flat' [cf. Napoli 1992: 75]) is one way of foregrounding the resulting state denoted by the AP by making it syntactically heavier, and thus deviating attention from the primary predication (Armstrong 2012: 21; Napoli 1992: 75–76; Rodríguez Arrizabalaga 2016: 74). However, in my view, this might be more a consequence of the phenomenon rather than an explanation. Instead, I believe that Romance adjectival RSPs are more readily accepted when the state they denote is interpreted as exceeding an assumed norm or standard (Quirk et al. 1985: 589): thus, 'the egg whites are very stiff' entails that the consistency of the egg whites is even stiffer than what is usually regarded as stiff. In other words, when expressing a high degree of a given property, the resulting state becomes sufficiently marked to be overtly mentioned. Conversely, if the AP refers to a property that is perceived as 'neutral', for instance if the egg whites must be just stiff, perhaps one does not need to be that explicit and can make use of other strategies to encode this information, for instance with verb modifiers (e.g., *bien battre les blancs* 'beat the egg whites well').

This condition might also apply to Romanian nominal RSPs, such as *lună* 'moon' and *oglindă* 'mirror' (cf. [24], repeated in [86] for convenience), which refer metaphorically to the property of being shiny. This example is then interpreted as follows: the girl scrubbed the floor in such a way that it became as shiny as the moon or a mirror. When speaking of the floor, the adjective *shiny* entails a very high degree of cleanliness. Note that reaching this degree presumably requires more 'scrubbing' on

the part of the agent. Then, *freca lună/oglindă* '(lit.) scrub moon/mirror' in Romanian and *scrub clean* in English, while being semantically very similar, seem to serve distinct communicative functions: one is to intensify the action denoted by the verb, the other is to encode a complex change of state.

(86) Fata a frecat podeaua lună/oglindă. (Farkas 2011: 69, [4b])
'(lit.) the girl scrubbed the floor moon/mirror.'
'The girl scrubbed the floor shiny.'

In addition, Romance APs are almost always found in weak RCs: most of them combine with verbs that describe events that inherently lead to a change of state. In French, these include (i) verbs of disintegration (e.g., *couper* 'cut', cf. [35]), (ii) verbs of cooking (e.g., *cuire* 'cook', cf. [63]), (iii) verbs of change of shape (e.g., *étaler* 'spread out', cf. [81]), and (iv) verbs of combining and attaching (e.g., *ficeler* 'tie', cf. [82]). In Spanish, APs are only attested with verbs of disintegration (e.g., *picar* 'chop', cf. [78], *cortar* 'cut', cf. [83]). By contrast, Germanic APs also occur activity verbs (e.g., nl. *roeren* 'stir', cf. [74] and *borstelen* 'brush', cf. [68]; en. *press*, cf. [53] and *scrub*, cf. [67]). See Table 14 in Appendix.

There is one example in French that could be considered as an instance of strong RCs, namely *battre les blancs très fermes* (cf. [77]). When used without the AP *très fermes* 'very stiff', the verb *battre* 'beat' can be interpreted either as an activity or as an accomplishment, hence its compatibility with *pendant* 'for' and *en* 'in' (cf. [87]). However, when the AP is added to the sentence, *en* 'in' is preferred over *pendant* 'for' (cf. [88]), which suggests that this element provides an explicit endpoint to the beating event. This aspectual ambiguity may follow from the fact that, in this particular expression (viz. *battre les blancs* 'beat the egg whites'), the result of the event is conventionally expected and therefore entailed in the VP: when beating egg whites, especially with an electric whisk, one usually intends to obtain a foam with a rather stiff consistency. In other expressions where the result is not as strongly entrenched, *battre* 'beat' is only construed as denoting an activity (e.g., *battre un tapis pendant/??une heure* 'beat a carpet for/??in an hour').

(87) Marie a battu les blancs d'œufs pendant/en 5 minutes.
'Mary beat the egg whites for/in 5 minutes.'

(88) Marie a battu les blancs d'œufs très fermes en/??pendant 5 minutes.
'Mary beat the egg whites very stiff in/??for 5 minutes.'

To summarize, we have shown in this section that the RSP can also be encoded by an AP in Romance. However, Romance adjectival RSPs are characterized by a certain number of properties: first, they are not very frequent and limited to a few (semantically related) lexical items. Second, they are very often associated with

intensifiers, suggesting that APs are acceptable in Romance RCs provided that they express a high degree of the property denoted by the adjectival head. And third, they almost always occur in weak RCs: that is, the AP merely specifies a result that is already incorporated in the verb semantics. We have also observed a very interesting contrast within the Germanic languages: adjectival RSPs turn out to be much more frequent in Dutch than in English, where APs are mostly headed by the preposition *until* (Section 4.4.3).

## 4.4 Prepositional phrases

This section deals with prepositional RSPs. Recall that PPs constitute the most frequent RSP morphosyntactic category in both Germanic and Romance languages (nl. 53 %, en. 96.7 %, fr. 98 %, sp. 94.8 %, Table 3).

### 4.4.1 Identification of two classes of prepositions

The RSP can be headed by a wide range of prepositions, namely *in* 'in' and *tot* 'to/until' in Dutch; *in*, *into*, *to*, and *until* in English; *en* 'in/to' and *à* 'in/to' in French; and *en* 'in', *a* 'to', and *a punto de* 'to point of' in Spanish. Most of these prepositions originally describe spatial relationships, that is, they indicate where the referent is located with respect to some location. In English, both the prepositions *in* (cf. [89a]) and *into* (cf. [89b]) refer to the notion of inclusion, meaning that the referent is or ends up inside some location (Quirk et al. 1985: 674). Unlike *in*, which is mostly used in stative contexts, *into* entails that the referent is moving from the outside to the inside of a container. By contrast, the preposition *to* (cf. [89c]) indicates the endpoint of a path, viz. the goal. It is viewed as a dimensionless location (cf. 'a mere point' [Quirk et al. 1985: 674]). Like *into*, *to* is restricted to dynamic contexts.

(89) a. Mary is in the kitchen.
b. Mary ran into the kitchen.
c. Mary flew to London.

Note that *in* may also construe a directional meaning (Beavers et al. 2010: 363; Nikitina 2008). However, this interpretation is only possible when the path between the theme referent and the goal is short: for instance, if John is standing by the door outside the room in Example (90).

(90) John walked in [/into] the room. (Beavers et al. 2010: 47, [49a])

In more abstract uses, for instance in RCs, these prepositions roughly exhibit the same meaning – the only difference is that the selected NP refers to a state, not a

location. Thus, as argued in Iwata (2020: 270), with *to*-PPs (e.g., *beat to death*), the referent is conceived of as moving along an abstract path, going through multiple intermediate states, before reaching an endpoint, viz. death. For instance, if one is beaten to death, one may first get stunned, then unconscious and eventually die. By contrast, with *into*-PPs (e.g., *fall into a coma*), the referent is conceptualized as entering an abstract container, viz. the coma. As will be shown later, these semantic nuances play a crucial role in the distribution of these prepositions across verb classes.

Unlike the prepositions mentioned so far, the preposition *until* does not apply to spatial contexts. It specifies a temporal endpoint, that is, a point in time up to which the verbal event is carried out. This preposition selects for temporal adverbs (cf. [91]) and temporal clauses (cf. [92]) and, by extension, APs and past participles (cf. [93]), which can be seen as elliptical syntactic patterns.

(91) Mary slept until noon.

(92) Mary slept until her kids got home.

(93) Beat the sugar and egg yolks together until pale and fluffy/until combined.

*Until*-PPs like those in (93) have been included in the sample of English RCs for the following reasons: first, they exhibit the same meaning as adjectival RCs and can then alternate with the latter. Compare, for instance, Examples (94) and (95). Second, some verbs, especially verbs of cooking, only accept APs when these are preceded by *until* (e.g., *fry until crispy*, *bake until golden-brown*, *beat until stiff*). Note that this syntactic constraint does not apply to Dutch equivalents which can perfectly occur with unmarked APs (e.g., *krokant bakken* 'fry crispy', *goudbruin bakken* 'bake golden-brown', *stijf kloppen* 'beat stiff'). Therefore, in order not to restrict the range of verb types found in RCs (or functionally equivalent constructions) in a particular language, these *until*-PPs have been included in the analysis.

(94) ***Blend smooth***, adding just as much sugar as you need to match your taste.

(95) For the curry paste, put all the ingredients in a food processor and ***blend until smooth***.

Certain authors, for instance Beavers (2008) and, more recently, Bigolin and Ausensi (2021), have argued that PPs headed by the preposition *until* and its counterpart in other languages, viz. *hasta* 'until' in Spanish (Martínez Vázquez 2015; Rodríguez Arrizabalaga 2014, 2022) and *jusqu'à* 'until' in French (Fortis 2010), are adjunct-like 'limit markers' (Beavers 2008: 285), not argumental goal markers (viz. *to* in English). Therefore, in their view, *until*-PPs should not be regarded as genuine RSPs. The grammatical status of such PPs will be further addressed in Section 4.4.4.

Like its English cognate, *in* 'in' in Dutch is a locative preposition (cf. [96]). However, it can also convey a directional meaning when used as a postposition (cf. [97]). See Den Dikken (2003) and Koopman (2010).

(96) Marie is in de keuken.
'Mary is in the kitchen.'

(97) Marie rende de keuken in.
'Mary ran into the kitchen.'

The preposition *tot* 'to/until' introduces an endpoint, which can be spatial or temporal. In spatial uses, it can be followed by another locative preposition, viz. *aan* 'at' (cf. [98]), as opposed to the directional preposition *naar* 'to' (cf. [99]). This might suggest that *tot* 'to' is a kind of 'limit marker' as described in Beavers (2008) and might in fact be better translated as *until* in English in (98). Also note that, according to our Dutch informants, the two sentences have slightly different semantic interpretations: while (99) is considered the most neutral or standard way of describing directed motion events, (98) puts more emphasis on the climbing itself and therefore entails that the theme referent puts more effort into it.

(98) Jan is tot (aan) de top geklommen.
'John climbed to/until (at) the top.'

(99) Jan is naar de top geklommen.
'John climbed to the top.'

In addition, *tot* 'to/until' can be found in the same temporal adverbial contexts (cf. [100] and [101]). However, contrary to English *until*, it can also combine with NPs which refer to objects (e.g., *tot puree mixen* 'mash to a purée') or statuses (e.g., *tot koning kronen* 'crown to king' [Métairy et al. 2020]). APs are possible but very rare (e.g., *tot gaar bakken* 'fry until cooked').

(100) Isabelle heeft tot 10 uur geslapen.
'Isabel slept until 10 o'clock.'

(101) Isabelle heeft geslapen tot de kinderen thuiskwamen.
'Isabel slept until her kids got home.'

Spanish roughly exhibits the same dichotomy: *en* 'in' is a locative preposition that expresses inclusion (cf. [102]). It can also convey the notion of support, for instance, in *El libro está en la mesa* 'The book is on the table' (Roegiest 1977), in which case *la mesa* 'the table' is viewed as a surface, not as a container. By contrast, the preposition *a* 'to' specifies the goal of directed motion events, e.g., *ir* 'go' and *volar* 'fly' (cf. [103]).

(102) María está en la cocina.
'Mary is in the kitchen.'

(103) María fue/voló a Madrid.
'Mary went/flew to Madrid.'

Nonetheless, it should be noted that *a* 'to' is not strictly restricted to directional contexts: as pointed out by Fábregas (2007), it can be found with stative verbs, e.g., *estar* 'be' (cf. [104]) and *permanecer* 'remain' (cf. [105]). In these examples, *a* could be translated by *at* in English.

(104) Juan está al sol. (Fábregas 2007: 177, [19a])
'John is standing at the sun.'

(105) Juan permaneció al borde del acantilado. (Fábregas 2007: 177, [19b])
'John stayed at the border of the cliff.'

The complex preposition *a punto de* 'to point of', which consists of the directional preposition *a* 'to' followed by the bare noun *punto* 'point', lexically encodes the idea of reaching a (non-spatial) endpoint.[16] To my knowledge, this preposition is mostly attested with a resultative 'endpoint' meaning in recipe contexts, combining with concrete NPs (e.g., *nieve* 'snow' and *turrón* 'nougat', which are both used metaphorically in Example [106]) and, more rarely, with deadjectival NPs (e.g., *transparencia* 'transparency' in Example [107]).[17]

(106) ***Bate*** las claras ***a punto de nieve/turrón***.
'Beat the egg whites to snow.'

(107) Bien, ***se rehoga*** la cebolla ***a punto de transparencia***, que no quede marrón.
'Well, stir-fry the onion to transparency, so that it does not brown.'
https://www.rionegro.com.ar/juan-falu-en-yo-como-ensena-como-hacer-unas-buenas-empanadas-tucumanas-1545425/ (Métairy 2022a: 264, [64])

Finally, the situation is quite different in French: in spatial uses, the prepositions *en* and *à* are underspecified and can receive either a locative (e.g., *Je suis en France/à Paris* 'I'm in France/in Paris') or a directional interpretation (e.g., *Je vais en France/à Paris* 'I'm going to France/to Paris') depending on the verb it occurs with (e.g., *être* 'be' vs. *aller* 'go'). Furthermore, both prepositions are also characterized by a more abstract meaning (De Mulder and Amiot 2013; Goyens et al. 2003), compared to *dans* 'in' which indicates a concrete container (cf. [108a]). PPs headed by *en* and *a*, on the

**16** When selecting for a non-finite verb, *a punto de* 'to point of' may also receive an inchoative reading (e.g., *Estaba a punto de salir cuando llamaste* 'I was about to go out when you called').
**17** The expression *a punto de turrón* 'to point of nougat' is mostly used in Mexican Spanish.

other hand, are interpreted as denoting a functional space (cf. [108b]), which yields a characterization of the subject (i.e., Antoine is cooking, for instance as a cook in a restaurant).

(108) a. Antoine est dans la cuisine.
b. Antoine est en cuisine/à la cuisine.
'Antoine is in the kitchen.'

Nonetheless, in more abstract uses, *en* and *à* exhibit distinct meanings. For instance, in examples (109)–(114), the PPs headed by *à* 'to' specify an endpoint: the event denoted by the verb (e.g., beating someone) is carried out until a certain state is reached (e.g., the person is dead). This claim is supported by the fact that *à* 'to' in (109)–(114) cannot occur with copular verbs (e.g., **Il est à mort* 'he is to death'), as opposed to what is observed in other examples where *à* is integrated into a fixed adjectival expression, e.g., *cuire le rosbif à point* 'cook the roast medium rare' => *le rosbif est à point* 'the roast is medium rare'). However, most of these expressions do not seem very productive.[18] Some of them sound rather archaic (cf. [110]), others are typically used in the jargon of very high-class cooking (cf. [112]), metallurgy (cf. [113]) and the hotel industry (cf. [114]).[19]

(109) battre quelqu'un à mort => jusqu'à ce qu'il/elle meure
'beat someone to death' 'until they die'

(110) saigner un animal à blanc => jusqu'à ce qu'il soit vidé de son sang
'(lit.) bleed an animal to white' 'until it gets drained of blood'
'bleed an animal dry'

(111) se gratter à sang => jusqu'à saigner
'(lit.) scratch oneself to blood' 'until bleeding'

(112) glacer des légumes à brun => jusqu'à ce qu'ils brunissent
'(lit.) glaze the vegetables to brown' 'until they get brown'

(113) chauffer du métal au rouge => jusqu'à ce qu'il soit rouge
'(lit.) heat metal to red' 'until it gets red'

**18** Note that *à mort*-PPs can combine with many verbs (e.g., *battre* 'beat', *poignarder* 'stab', *lapider* 'stone', *tabasser* 'beat up', etc.), suggesting that this micro-construction is fairly productive in French. See Rodríguez Arrizabalaga (2014) for a corpus analysis of a similar construction in Spanish (e.g., *Juan apuñaló a Tomás hasta la muerte* 'John stabbed Tom to death').

**19** Nowadays, the expression *saigner à blanc* 'bleed dry/white' is mostly used metaphorically to describe situations where someone is slowly deprived of money, resources, etc.

(114) nettoyer une chambre à blanc => jusqu'à ce qu'elle soit impeccable
'(lit.) clean a hotel room to white' 'until it gets perfectly clean'

Conversely, RCs constructed with *en* 'in' are quite numerous and diverse. They involve various verb classes, which include (i) verbs of chromatic change (e.g., *peindre en rouge* 'paint red', *teindre en blond* 'dye blond'), (ii) verbs of putting (e.g., *disposer en pile* 'arrange in a pile'), (iii) verbs of disintegration (e.g., *éclater en sanglots* 'burst into tears', *réduire en cendres* 'reduce to ashes'; *tomber en lambeaux* 'falling to pieces', *tailler en pièces* 'cut to ribbons'), (iv) verbs of assembling (e.g., *se réunir en cercle* 'gather in circle', *regrouper en meute* 'group in packs'), and (v) verbs of transformation (e.g., *transformer en cygne* 'turn into a swan'). Except color terms, all the NPs introduced by *en* 'in' refer to a resultant object.

For the sake of simplicity, the prepositions identified in the corpus have been divided into two classes, namely *in(to)*-prepositions (e.g., nl. *in* 'in'; en. *in* and *into*; fr. *en* 'in'; sp. *en* 'in'), which express inclusion, and *to*-prepositions (e.g., nl. *tot* 'to/until'; en. *to* and *until*; fr. *à* 'to'; sp. *a* 'to' and *a punto de* 'to point of'), which express the attainment of an endpoint.

Let us now have a look at the relative frequencies of these PPs. As indicated in Table 5, *in(to)*-PPs are more frequent than *to*-PPs in Dutch (80.6 vs. 19.4 %), in Spanish (94.4 vs. 5.6 %), and, more particularly, in French (98.7 vs. 1.3 %). In English, this is the other way around (41.3 vs. 58.7 %). These observations can be explained as follows: first, unlike English *to* and Spanish a 'to', French *à* 'to' is not a salient goal marker (occurring with locative and directional verbs) and can be used with a resultative 'endpoint' meaning only in few fixed expressions (cf. [109]–[114]). In addition, there is no French equivalent of Spanish *a punto de* 'to point' and the preposition *jusqu'à* 'until', which is regarded as the French counterpart of English *until*, has not been attested in the sample of French RCs. Second, the preposition *until* in English can combine with APs and past participles. However, these morphosyntactic categories are rarely attested with *to*-prepositions in the other three languages. In other

**Table 5:** Frequency of *in(to)*-prepositions and *to*-prepositions by language ($X^2$ = 1,165.1, df = 3, $p$ value < 0.001).[a]

| | Dutch | | | English | | | French | | | Spanish | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | # | % | SR | # | % | SR | # | % | SR | # | % | SR | # |
| *in(to)*-PPs | 399 | 80.6 | 0.5 | 394 | 41.3 | −13 | 952 | 98.7 | 7.1 | 891 | 94.4 | 5.5 | 2,636 |
| *to*-PPs | 96 | 19.4 | −1.03 | 563 | 58.7 | 24.9 | 12 | 1.3 | −13.6 | 53 | 5.6 | −10.6 | 724 |
| **Total** | | **495** | | | **957** | | | **964** | | | **944** | | **3,360** |

Note. [a]See the association plot in Figure 2 (cf. Appendix).

words, English *to*-PPs are more because *to* and *until* cover distinct morphosyntactic domains.

In the following sections, we further investigate the behavior and distribution of *in(to)*- (Section 4.4.2) and *to*-prepositions (Section 4.4.3) in the four languages studied.

### 4.4.2 *In(to)*-prepositions

Table 6 presents the distribution of *in(to)*-prepositions (i.e., nl. *in* 'in'; en. *in*, *into*; fr. *en* 'in'; sp. *en* 'in') across the verb classes identified in Section 4.1.

As shown in Table 6, Dutch *in* 'in' combines with only one verb class, viz. *cut* verbs, e.g., *snijden* 'cut' (cf. [115]). Spanish *en* 'en' shows a similar distribution: this preposition is mostly attested with *cut* verbs, e.g., *picar* 'chop' (cf. [116]). It can also occur with *grind* verbs (e.g., *triturar* 'grind', cf. [117]), albeit not frequently (only one occurrence was found).

(115) Pel de aardappelen en ***snij*** ze ***in schijfjes***.
'Peel the potatoes and cut them IN slices.'[20]

(116) ***Pica*** el pimiento ***en daditos***.
'Chop the pepper IN small dices.'

(117) Cuando estén bien blandos, retirar ***y triturarlos en puré***.
'When they are soft, remove them and grind them IN purée.'

**Table 6:** Verb classes combining with *in(to)*-prepositions.

| | ***in*** **(nl)** | | ***in*** **(en)** | | ***into*** **(en)** | | ***en*** **(fr)** | | ***en*** **(sp)** | | **Total** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **#** | **%** | **#** | **%** | **#** | **%** | **#** | **%** | **#** | **%** | **#** |
| *Cut* verbs | 399 | 100 | 36 | 90 | 293 | 82.7 | 728 | 76.5 | 890 | 99.9 | 2,346 |
| *Grind* verbs | – | 0 | – | 0 | 2 | 0.6 | 49 | 5.2 | 1 | 0.1 | 52 |
| *Beat* verbs | – | 0 | – | 0 | 27 | 7.6 | 84 | 8.8 | – | 0 | 111 |
| *Shape* verbs | – | 0 | – | 0 | 26 | 7.3 | 72 | 7.6 | – | 0 | 98 |
| *Cook* verbs | – | 0 | – | 0 | – | 0 | 1 | 0.1 | – | 0 | 1 |
| *Blend* verbs | – | 0 | – | 0 | 6 | 1.7 | 6 | 0.6 | – | 0 | 12 |
| *Put* verbs | – | 0 | 4 | 10 | – | 0 | 12 | 1.2 | – | 0 | 16 |
| **Total** | **399** | | **40** | | **354** | | **952** | | **891** | | **2,636** |

**20** Literal translations are indicated in small caps.

Unlike its Dutch and Spanish cognate, English *in* is not very frequent: only 40 occurrences of *in*-RCs were found. *In* combines with two verb classes, namely *cut* verbs (90 %) and *put* verbs (10 %) (cf. [118]–[119]).

(118) 1 Cucumber, ***cut in long sticks***

(119) ***Arrange*** half of the apple slices ***in a single layer*** on the base of the pastry case.

By comparison, *into* is much more frequent (354 occurrences). It is found with various verb classes, including *cut* verbs (82.7 %) (cf. [120]), *beat* verbs (7.6 %) (cf. [121]), *shape* verbs (7.3 %) (cf. [122]), *blend verbs* (1.7 %) (cf. [123]) and, finally, *grind* verbs (0.6 %) (cf. [124]). Note that this last verb class comprises only two verbs which have been attested once, e.g., *dissolve* and *mash*.

(120) Peel and roughly ***chop*** the onion ***into wedges***.

(121) On a lightly floured surface, ***roll*** the dough ***into a rectangle about 20 × 45 cm***.

(122) ***Shape*** the dough ***into a ball*** and wrap in cling film.

(123) ***Tie*** the bay leaves, thyme, savoury and parsley stalks ***into a small bundle*** with twine.

(124) Spoon over the muscovado sugar, which will soon ***dissolve into a very good syrup***.

The present data shows that locative prepositions (viz. nl. *in* 'in'; en. *in*, sp. *en* 'in') are quite restricted in terms of verb classes. However, this behavior is in fact expected considering that locative prepositions are prototypically used in non-dynamic spatial contexts and are therefore less suited to express a change. Nonetheless, why these prepositions tend to occur with *cut* verbs in particular still needs an explanation. As noted in Section 3.2, *cut* verbs describe iterated achievements. One could argue that RCs that contain achievements to some extent resemble depictive constructions since, in such instances, the event named by the verb and the completion of the change of state are concomitant (i.e., one cut = one separate piece created).[21,22]

**21** Depictive predicates refer to a state that occurs at the same time as the event denoted by the verb (Halliday 1967: 63). They can be complements of evaluative verbs (e.g., *Mary considers Kim smart*) or temporal adjuncts, oriented to the subject (e.g., *John left the party angry*) or the object of the matrix verb (e.g., *Bill ate the meat raw*).

**22** Other instances of RCs containing achievement verbs can be found in English (outside the culinary field):

(1) The outlaw shot the miller dead.

Therefore, due to their resemblance with depictive constructions, RCs that contain achievements are more prone to accept locative (that is, non-dynamic) prepositions. In Iwata (2020: 281), English *in* is argued to be only possible with verbs that lexically entail a change of state, which also include accomplishments. However, this claim is not supported by the following sentences: most accomplishment verbs (e.g., *blend* or *grind*) are not accepted with the preposition *in* 'in'.

(125) Blend everything to/into/*in a paste.

(126) Grind the almonds to/into/*in a powder.

The preposition *en* 'in' in French is extremely frequent: as indicated in Table 5, 98.7 % of French PPs are headed by this preposition alone. In addition, *en* 'in' occurs with all the verb classes, viz. *cut* verbs (76.5 %) (cf. [127]), *beat* verbs (8.8 %) (cf. [127]), *shape* verbs (7.6 %) (cf. [129]), *grind* verbs (5.2 %) (cf. [130]), *put* verbs (1.2 %) (cf. [131]), *blend* verbs (0.6 %) (cf. [132]), and, finally, *cook* verbs (0.1 %) (cf. [133]).[23] Note that Example (127), along with Example (55) provided in Section 4.1, is particularly interesting. These examples provide concrete evidence that strong RCs are possible in Romance, thus corroborating previous findings (Rodríguez Arrizabalaga 2022; Romagno 2020).

(127) ***Coupez*** la patate douce ***en dés***.
'Cut the sweet potatoes IN dices.'

(128) ***Battez*** les œufs ***en omelette*** dans un saladier.
'Beat the eggs IN omelet in a salad bowl.'

(129) ***Étaler*** la pâte ***en carré*** sur une surface farinée.
'Spread out the dough IN square on a floured surface.'

(130) ***Écrasez***-les ***en purée*** à l'aide d'une fourchette.
'Mash them IN puree with a fork.'

(131) ***Disposez*** les pancakes ***en pile*** sur un plat au fur et à mesure qu'ils sont cuits.
'Arrange the pancakes IN pile on a platter as they are cooked.'

(132) ***Ramassez***-la ***en boule*** et mettez-la au frais.
'Bring it together IN ball and refrigerate it.'

---

(2) The archbishop crowned Elizabeth Queen of England.

(3) The vase broke into pieces.

**23** These results call into question the semantic map of Romance RSPs proposed by Riaubiené (2015: 131).

(133) Faites revenir aubergines et tomates dans 50 g de beurre et laissez-les ***cuire en coulis épais***.
'Sauté the eggplants and tomatoes in 50 g of butter and let them cook IN thick coulis.'

Thus, considering both its token frequency and the number of verb classes it combines with, we can conclude that *en* 'in' is the default or factotum preposition for the expression of a result in French. As observed earlier, the use of its cognates in the other languages studied (viz. nl. *in* 'in'; en. *in* 'in'; sp. *en* 'in') in RCs is much more limited. This cross-linguistic contrast can be related to certain properties that these prepositions display in other uses. First, in spatial uses, French *en* 'in' is not strictly restricted to locative contexts and can also indicate a change of location (e.g., *Je vais en France* 'I'm going to France'). This contrasts with purely locative prepositions (viz. nl. *in* 'in'; en. *in* 'in'; sp. *en* 'in'), which can construe a directional meaning only in very limited circumstances (Section 4.4.4). We could then assume that French *en* 'in' more easily expresses a change of state due to its underspecification in spatial uses. Second, this preposition has been shown to be generally more productive in the abstract domain. As shown in Pottier (1962: 326), the PP *en feu* 'in fire' in French in (134a), which is interpreted as referring to an abstract container, and by extension, an activity, cannot be translated by e*n fuego* 'in fire' in Spanish (134b).[24] The verb *arder* 'burn' in Spanish will be used to encode this event (134c).

(134) a. La maison est en feu.
b. *La casa está en fuego.
'The house is in fire.'
c. La casa está ardiendo.
'The house is burning.'

**24** As rightly noted by an anonymous reviewer, *estar en llamas* 'be in flames' does exist in Spanish. Nevertheless, other examples reveal further mismatches between French and Spanish and seem to support Pottier's observation:

| | | |
|---|---|---|
| fr. *être en joie/en colère* 'be in joy/in anger' | vs. | sp. **estar en alegría/cólera* > *estar feliz/furioso* 'be happy/mad' |
| fr. *être en larmes* 'be in tears' | vs. | sp. **estar en lágrimas* > *llorar* 'to cry' |
| fr. *être en prière* 'be in prayer' | vs. | sp. **estar en oración* > *orar* 'to pray' |
| fr. *être en nage* 'be in swim' | vs. | sp. **estar en nado* > *sudar mucho* 'to sweat a lot' |

### 4.4.3 *To*-prepositions

Table 7 presents the distribution of *to*-prepositions (viz. nl. *tot* 'to/until'; en. *to*, *until*; fr. *à* 'to'; sp. *a* 'to', *a punto de* 'to point of') across verb classes.

As shown in Table 7, the preposition *tot* 'to/until' in Dutch occurs with various verb classes, which include *grind* verbs (35.4 %) (cf. [135]), *blend* verbs (25 %) (cf. [136]), *beat* verbs (21.8 %) (cf. [137]), *shape* verbs (11.4 %) (cf. [138]), *cook* verbs (5.2 %) (cf. [139]), and, finally, *cut* verbs (1.04 %) (cf. [140]). Only one occurrence of RCs constructed with *tot* 'to/until' has been attested with the verb *snijden* 'cut'. In this example, however, *snijden* 'cut' appears to form a complex predicate with the resultative AP *open* 'open'. The result denoted by this complex predicate is then further specified by the PP (e.g., *tot een grote lap* 'to a large slice').[25] This yields the following interpretation: the turkey fillet is cut almost in half lengthwise and opened like a book until a large slice is obtained.

**Table 7:** Verb classes combining with *to*-prepositions.

| | ***Tot* (nl)** | | ***to* (en)** | | ***until* (en)** | | ***à* (fr)** | | ***a* (sp)** | | ***a punto de* (sp)** | | **Total** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **#** | **%** | **#** | **%** | **#** | **%** | **#** | **%** | **#** | **%** | **#** | **%** | **#** |
| *Cut* verbs | 1 | 1.04 | 2 | 6.2 | – | 0 | 8 | 66.6 | 28 | 96.6 | – | 0 | 39 |
| *Grind* verbs | 34 | 35.4 | 13 | 40.6 | 25 | 4.7 | – | 0 | 1 | 3.4 | – | 0 | 73 |
| *Beat* verbs | 21 | 21.8 | 9 | 28.1 | 91 | 13.2 | – | 0 | – | 0 | 10 | 41.7 | 131 |
| *Shape* verbs | 11 | 11.4 | – | 0 | 16 | 3 | – | 0 | – | 0 | 14 | 58.3 | 41 |
| *Cook* verbs | 5 | 5.2 | 2 | 6.2 | 337 | 63.4 | 4 | 33.3 | – | 0 | – | 0 | 348 |
| *Blend* verbs | 24 | 25 | 6 | 18.7 | 62 | 11.7 | – | 0 | – | 0 | – | 0 | 92 |
| **Total** | **96** | | **32** | | **531** | | **12** | | **29** | | **24** | | **724** |

25 This entails that Example (140) contains two RSPs: the first one is an AP, the second one is a PP. A similar configuration is found with the complex predicate *plat duwen* 'push flat' (1).

(1) Verdeel in 4, rol er gelijke balletjes van en ***duw*** ze ***een beetje plat tot een hamburger***.
'Divide into 4, roll into equal balls and press them a little flat TO a hamburger.'

Given that the word-by-word translation of these two Dutch RCs does not yield acceptable sentences in English, this could suggest that Goldberg's (1995) Unique Path Constraint does not always apply in Dutch. As suggested by an anonymous reviewer, this could be explained by the fact that the Dutch APs *open* 'open' and *plat* 'flat' can be analyzed as the separable component of 'separable complex verbs' (Booij 2010): these verbs appear as one word in subordinate clauses (e.g., *open-snijden*, *plat-duwen*) or as two separate words in main clauses (cf. Examples [140] and [1] above). Thus, we could argue that a PP can be further added to these Dutch adjectival RCs because they form more 'synthetic' structures (cf. Section 4.4.4).

(135) ***Stamp*** de aardappelen ***tot puree***.
'Mash the potatoes TO purée.'

(136) Giet er de bouillon en de room bij en ***roer tot een mooie saus***.
'Pour in the stock and cream and stir TO a nice sauce.'

(137) ***Klop*** het mengsel ***tot een smeuïge slagroom***.
'Beat the batter TO a smooth cream.'

(138) ***Vorm*** het gehakt ***tot een langwerpig broodje***.
'Shape the minced meat TO an oblong bun.'

(139) ***Bak*** het varkensvlees 5–6 minuten aan beide kanten ***tot gaar***.
'Fry the pork for 5–6 minutes on both sides TO cooked.'

(140) ***Snij*** het kalkoengebraad ***open tot een grote lap***.
'Cut open the turkey fillet TO a large slice.'

In fact, in all these examples, the PP describes a progressive change of state. This semantic interpretation is *a priori* compatible with *stampen* 'mash', *roeren* 'stir', *vormen* 'shape', *bakken* 'fry', but not with *cut* verbs, (e.g., *snijden* 'cut', *snipperen* 'chop', *verdelen* 'divide', etc.), which entail that the result (viz. the creation of a separate piece) is achieved instantaneously (see exception in [140] with *open snijden* 'cut open'). It can then be concluded that *tot* 'to/until' and *in* 'in' are used in complementary distribution, the former occurring with activities and accomplishments, hence durative events (e.g., *tot/*in puree mixen* 'blend TO/*IN a puree'), the latter with achievements (e.g., *in/*tot stukken snijden* 'cut IN/*TO pieces').

The preposition *to* in English can be found with *grind* verbs (40.6 %) (cf. [141]), *beat* verbs (28.1 %) (cf. [142]), *blend* verbs (18.7 %) (cf. [143]), *cook* verbs (6.2 %) (cf. [144]), and, finally, *cut* verbs (6.2 %) (cf. [145]). English *to* differs from Dutch *tot* 'to/until' in several respects: first, *shape* verbs do not occur with this preposition. Second, *cut* verbs can combine with *to*, albeit not frequently: only two occurrences of RCs that involve this verb class are constructed with *to*, against 293 occurrences constructed with *into* (cf. Table 6). Hence, both prepositions show clear preferences for certain verb classes.

(141) Tip in the frozen watermelon mixture and ***blitz to a pink snow***.

(142) In another bowl, ***whisk*** the cream and mascarpone ***to soft peaks***.

(143) Place […] into a food processor and ***blend to a smooth paste***.

(144) Add the red wine vinegar and runny honey and leave to ***reduce down to a really sticky glaze***.

(145) Desiree potatoes, roughly ***cut to pieces*** all the same size and unpeeled.

The preposition *until* is extremely frequent (531 occurrences). It mostly occurs with *cook* verbs (63.4 %) (cf. [146]) but is also attested with *beat* verbs (18.4 %) (cf. [147]), *blend* verbs (11.5 %) (cf. [148]) and *shape* verbs (3.2 %) (cf. [149]). Like Dutch *tot* 'to/until', *until* does not seem to be compatible with *cut* verbs.

(146) Add the bacon and ***cook until golden and brown***.

(147) ***Beat*** the butter and sugar together ***until light and fluffy***.

(148) Beat in the egg yolks and brandy and ***stir until combined***.

(149) Or, ***freeze*** the mixture ***until solid***, then blitz in a food processor […].

In a nutshell, *to* and *until* tend to combine with verbs that denote durative events, which includes activities (e.g., *bash*, *beat*, *whisk*) and accomplishments (e.g., *cook*, *blitz*, *freeze*). However, achievements (e.g., *cut*, *chop*, *slice*), which are punctual events, require other prepositions, such as *into* or *in* (Section 4.4.2).

Based on these distributional facts, we argue – following Beavers (2002, 2013) – that there is a correlation between the verb's aspectual meaning and the semantics of the prepositions heading the RSP. As noted in Section 4.4.1, with *to*-PPs, the referent is conceptualized as progressively moving along an abstract path to an endpoint (e.g., *beat to death*). However, achievements have no progression phase (Rothstein 2004: 38). We can therefore assume that there is a semantic clash between *to*-PPs, which focus on progression, and punctual events.[26] Because they are durative, activities and accomplishments are more prone to combine with such PPs. The same analysis can be applied to English *until*-PPs since they also specify the reaching of an endpoint. By contrast, with English *into*-PPs, the referent is conceptualized as moving from the outside to the inside of an abstract container (e.g., *fall into a coma*). Thus, instead of focusing on progression, this preposition puts more emphasis on transition. That is why *into*-PPs are preferred over *to*-PPs not only with achievements but also with certain accomplishments perceived as less durative (e.g., *flatten*, *bundle*, cf. [150]), compared, for instance, to *grind* or *cook* verbs, which entail a more drastic transformation of the initial object.

This correlation follows from the homomorphism that holds between the verbal event and a given scale in telic sentences (Wechsler 2005: 260). In the literature, telic events are described as being homomorphic with the change undergone by the

**26** The same clash is observed with punctual readings of semelfactives:

(1) ??With a single shot to the head, the outlaw shot the miller to death.

affected participant, that is, the patient or theme (Dowty 1991; Jackendoff 1996; Kratzer 2004; Krifka 1998). Consider the sentence *Mary drowned*. As the drowning event goes by, Mary has less and less air in her lungs. This event reaches an endpoint when Mary has no more air left (i.e., Mary is either unconscious or dead). In a way, telic events can be conceived of as involving a scale, which here corresponds to the volume of air in Mary's lungs. This scale can be directly encoded in the verb semantics (e.g., *drown*) or be provided by a direct object (e.g., *eat an apple*) or a path phrase.

Nonetheless, it should be noted that generic change of shape verbs (e.g., *shape*, *form*, and *mould*), which yet describe durative events, obligatorily select for *into*-PPs (cf. [150]). This is due to the fact that these verbs focus on the change itself (that is, the transition to a new shape or object), and not the means through which this change is achieved. This then suggests that the choice of preposition is also determined by the verb's idiosyncratic meaning.

(150) en. flatten into/?to a disk vs. nl. tot/*in een schijf pletten
en. bundle into/*to a bouquet garni vs. nl. tot/*in een bouquet garni bundelen
en. shape into/*to a ball vs. nl. tot/*in een bal vormen

The situation is slightly different in Dutch since there is no equivalent of *into*, which combines with more verb classes than purely locative prepositions, including Dutch *in* 'in' (Section 4.4.2). Therefore, when *in* 'in' is not allowed, for instance, with accomplishments, e.g., *pletten* 'flatten', *bundelen* 'bundle', *vormen* 'shape', there is only one preposition left in this language that can be used with these verbs, namely *tot* 'to/until'.

Let us now move on to Spanish *to*-prepositions: the preposition *a* 'to' mostly occurs with *cut* verbs (96.6 %), e.g., *picar* 'chop' (cf. [151]). It has been found only once with the verb *reducir* 'reduce' (cf. [152]), which is included in the *grind* verb class. Thus, Spanish *en* 'in' and *a* 'to' seem to exhibit the same distribution across verb classes. As for *a punto de* 'to point of', it combines with *beat* verbs (e.g., *batir* 'beat', cf. [153]) and *shape* verbs (e.g., *montar* 'raise', cf. [60]) – hence, durative events.

(151) Pelar y ***picar*** la cebolla y el ajo ***a dados pequeños***.
'Peel and chop the onion and the garlic TO small dices.'

(152) Cocer las patatas, pelarlas y chafarlas con la mantequilla hasta ***reducirlas a puré bien fino***.
'Cook the potatoes, peel them and mash them until reduced TO very fine puree.'

(153) En otro bol, ***bate*** las claras ***a punto de nieve*** y después agrega las yemas.
'In another bowl, beat the egg whites TO POINT OF snow and then add the yolks.'

The behavior of Spanish *a* 'to' is quite surprising. Considering that *a* 'to' is a goal marker, this preposition was expected to behave more like English *to*, and less like purely locative prepositions, viz. nl. *in* 'in', en. *in*, sp. *en* 'in'. This could indicate that *a* 'to' is not as strongly associated with a goal or resultative semantics as the other prepositions found in this language, such as *hasta* 'until' or *a punto de* 'to point of'. As a matter of fact, based on certain distributional properties, it has even been argued that *a* 'to' is a locative preposition (Fábregas 2007, contra Demonte 2011): on the one hand, it can occur with some stative verbs (e.g., *Juan está al sol* 'John is standing at the sun', Section 4.4.1) and, on the other hand, it is not compatible with all manner-of-motion verbs (for instance, with internal bodily motion verbs, e.g., *bailar* 'dance'), contrary to *hasta* 'until' (e.g., *Pedro bailó *a/hasta su casa* 'Peter danced *to/until his house'). Although Fábregas' claim might be a bit too extreme, these facts can explain why *a* 'to' does not act as a 'strong' result marker in Spanish prepositional RCs, being restricted to depictive-like configurations (Section 4.4.2).

In French, prepositional RSPs are rarely headed by *à* 'to' (i.e., only 12 occurrences). This preposition is attested with two verb classes only: *cut* verbs (66.6 %), e.g., *peler* 'peel' (cf. [154]) and *cook* verbs (33.3 %), e.g. *réduire* 'reduce' (cf. [155]).

(154) ***Pelez à vif*** les pamplemousses et prélevez les segments de chair.
'Peel the grapefruits off and remove the flesh segments.'

(155) Laisser ***réduire à demi-glace***.
'Reduce TO half-glaze.'

Note that, in some examples (e.g., *peler à vif* 'peel off', *cuire à point* 'cook medium-rare', *réduire à sec* 'reduce until dry'), the preposition *à* 'to' is desemanticized and forms a fixed adjectival expression with its complement. That is why these *à*-PPs can be used as predicates in copular constructions (cf. [156]) and as modifiers in attributive constructions (cf. [157]), contrary to other *à*-PPs illustrated in (155) and in (109)–(114) in Section 4.4.1.

(156) Le pamplemousse est à vif, la viande est à point, la rivière est à sec
'The grapefruit is raw', 'the meat is medium-rare', 'the river is dry'

(157) Une plaie à vif, une viande à point, une rivière à sec
'A raw wound', 'a medium-rare meat', 'a dry river'

### 4.4.4 Summary and discussion

In this section, I have shown that prepositional RSPs can be headed by a whole range of prepositions. They can either refer to a relation of inclusion (viz. nl. *in* 'in'; en. *in* and *into*; fr. *en* 'in'; sp. *en* 'in') or to the reaching of an endpoint (viz. nl. *tot* 'to/until'; en. *to* and *until*; fr. *à* 'to'; sp. *a* 'to' and *a punto de* 'to point of'). There are considerable differences in the way these prepositions interact with the different verb classes in the construction: for instance, the prepositions *in* 'in' in Dutch, *in* in English, and *en* 'in' and *a* 'to' in Spanish almost always combine with *cut* verbs, which describe iterated achievements (i.e., a repetition of telic and punctual events). In such instances, the verbal event and the completion of the change of state happen at the same time (i.e., one cut = one separate piece created). In other words, these prepositions, which are prototypical locative prepositions (with the exception of Spanish *a* 'to'), occur in less dynamic, 'depictive-like' RCs. They can thus be regarded as 'weak' result markers.

By contrast, (i) the directional prepositions *to* and *into* in English, (ii) the so-called 'limit markers' *until* in English and *tot* 'to/until' in Dutch (along with *jusqu'à* 'until' in French and *hasta* 'until' in Spanish, which have not been attested in this study), (iii) the factotum preposition *en* 'in' in French, and, finally (iv), the complex preposition *a punto de* 'to point of' in Spanish, can be regarded as 'strong' result markers. These prepositions combine with more aspectual classes, which include activities, e.g., nl. *kneden* 'knead' (cf. [158a]); en. *bash* (cf. [159a]); sp. *batir* 'beat' (cf. [160a]), *acuchillar* 'knife' (cf. [160b]), accomplishments, e.g., nl. *stampen* 'mash' (cf. [158b]); en. *mix* (cf. [159b]), and achievements, e.g., en. *break* (cf. [159c]).

(158) a. **Kneed** met vochtige handen **tot [/*in] een geheel**.
'Knead with damp hands TO [/*IN] a whole.'
b. Giet af en **stamp** ze fijn **tot [/*in] puree**.
'Drain and finely mash them TO [/*IN] a purée.'

(159) a. **Bash** with a pinch of salt **to/into [/*in] a rough paste**.
b. Stir into the dry ingredients and **mix to/into [/*in] a medium-firm dough**.
c. **Break** the chocolate **into [/?in] small pieces**.

(160) a. Separamos las claras y las **batimos a punto de [/*en/*a] nieve**.
'Separate the egg whites and beat them TO POINT OF [/*IN/*TO] snow.'

b. Un joven **acuchilla hasta la muerte [/#a muerte]** a su madre en Lasarte.[27]
'A youth knifes his mother UNTIL the death [/#TO death] in Lasarte.'
(Rodríguez Arrizabalaga 2014: 138, [61])

Nonetheless, as shown in this paper, some of these 'strong' result markers show preferences for certain verb classes. Thus, because they refer to a progressive change of state, the 'endpoint' prepositions *to* and *until* in English preferably combine with verbs that describe durative events, viz. activities and accomplishments, and tend to reject achievements, which have no duration. This is also true for the prepositions *tot* 'to/until' in Dutch and *a punto de* 'to point of' in Spanish. By contrast, the preposition *into* in English, which focuses on transition, is required with (i) achievements and (ii) certain result-oriented verbs (e.g., *shape*, *make*, *turn*).

One 'strong' result marker stands out from the others in terms of distribution, namely French *en* 'in'. The RSP is headed by this preposition regardless of the verb's aspectual reading (and, contrary to English *into*, does not show particular tendencies): *en*-PPs are attested with activities (e.g., *malaxer* 'knead', cf. [161]), accomplishments (e.g., *cuire* 'cook', cf. [162]) and achievements (e.g., *trancher* 'slice', cf. [163]).

(161) Ajouter les œufs, **malaxer** la pâte **en boule**.
'Add the eggs, knead the dough IN ball.'

(162) Laissez-les **cuire en coulis épais**.
'Let them cook IN thick coulis.'

(163) **Tranchez** les poires **en petits cubes**.
'Slice the pears IN cubes.'

Compared to its cognates in other languages, e.g., Spanish *en* 'in', French *en* 'in' is characterized by a more systematic use, even outside recipe contexts. This is illustrated in (164): French *en*-PPs correspond to PPs headed by various prepositions in Spanish, namely *a punto de* 'to point of', *a* 'to' and *de* 'of'. Based on these observations, it can be concluded that *en* 'in' is the default preposition for the expression of the result in French.

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**27** As pointed out by Rodríguez Arrizabalaga (2014: 139), *a muerte* 'TO death' also exists in Spanish (1). However, this expression only has an intensifying meaning which is also available with *hasta la muerte* 'UNTIL the death' in Spanish and *à mort* 'TO death' in French).

(1) Un joven ***acuchilla a muerte*** a su madre en Lasarte.
'A youth repeatedly *knifes* his mother in Lasarte.'
(Rodríguez Arrizabalaga 2014: 140, [61'])

(164)

| | | | | | |
|---|---|---|---|---|---|
| fr. | battre en omelette | vs. | sp. | batir a punto de tortilla |
| | ‘beat IN omelet’ | | | ‘beat TO POINT OF omelet’ |
| fr. | réduire en cendres | vs. | sp. | reducir a cenizas |
| | ‘reduce IN ashes’ | | | ‘reduce TO ashes’ |
| fr. | tomber en lambeaux | vs. | sp. | caer a pedazos |
| | ‘fall IN pieces’ | | | ‘fall TO pieces’ |
| fr. | peindre en rouge | vs. | sp. | pintar de rojo |
| | ‘paint IN red’ | | | ‘paint OF red’ |

French PPs can also be introduced by the preposition *à* ‘to’. Nonetheless, compared to *en* ‘in’, this preposition occurs in a very limited set of RCs (e.g., *cuire à point* ‘cook medium rare’, *réduire à demi-glace* ‘reduce to half glaze’). Interestingly, although *à* ‘to’ and *en* ‘in’ are semantically underspecified in spatial uses, these prepositions appear to construe distinct meanings when used in RCs, namely an ‘endpoint’ and a ‘resultant object’ meaning, respectively.

These two types of prepositional RCs can thus be paraphrased as follows:

(165) Glacer les légumes à blanc/à brun.
‘Glaze the vegetables TO white/TO brown.’
= Glaze the vegetables until they are white/brown

(166) Frire les légumes en beignets.
‘Fry the vegetables IN fritters.’
= Fry the vegetables so that they form fritters

That being said, according to some authors (Beavers 2008; Bigolin and Ausensi 2021; Demonte 2011; Mateu 2012), PPs headed by so-called ‘limit markers’ (e.g., *until* in English, *hasta* ‘until’ in Spanish, *jusqu’à* ‘until’ in French) are semantically and structurally distinct from Path phrases (headed by *to* in English) and, therefore, do not yield genuine satellite-framed patterns (contra Martínez Vázquez 2015; Rodríguez Arrizabalaga 2014, 2022). As shown in Beavers (2008), *until*-PPs can occur in a broad range of constructions where they serve a delimitation function, including temporal adverbs and clauses (cf. [167]) and spatial numerals (cf. [168]). The confusion between goal and limit markers would then be due to the fact that limits are often path limits with motion verbs.

(167) a. Durmió hasta el mediodía/hasta que sus hijos llegaron a casa.
b. Elle a dormi jusqu’à midi/jusqu’à ce que ses enfant rentrent à la maison.
‘She slept until noon/until her kids got home.’

(168) a. Cuantos metros hay desde el suelo hasta el techo?
b. Combien de mètres y a-t-il du plancher jusqu’au plafond?
‘How many meters from the floor to the ceiling?’
(Beavers 2008: 311, 44–45)

From a syntactic point of view, *until*-PPs tend to be analyzed as adjuncts. In Mateu (2012: 36), it has been shown that Italian motion verbs take the auxiliary *avere* 'have' when occurring with the preposition *fino a* 'until' (cf. [169]), and not *essere* 'be', which is considered a marker of unaccusativity and, hence, directed motion (cf. [170]). The absence of auxiliary shift has been taken as evidence that PPs headed by *fino a* 'until' are not goal arguments, as opposed to those headed by the preposition *a* 'to'.[28]

(169) Gianni {ha/*è} ballato fino alla cucina. (vs. Gianni {ha/*è} ballato)
'John {has/*is} danced to the kitchen.' 'John {has/*is} danced'

(170) Gianni {è/*ha} volato a Roma. (vs. Gianni {ha/*è} volato)
'John {is/*has} flown to Rome.' 'John {has/*is} flown'

A similar phenomenon can be observed in Dutch: when no directional PP is expressed, motion verbs generally select the auxiliary *hebben* 'have' (cf. [171]). Note that, with *hebben* 'have', the focus of the sentence is on the verbal action itself. *Zijn* 'be' is also possible but the use of this auxiliary strongly implies that the theme referent has reached some location. However, when the directional PP is added, *zijn* 'be' is preferred over *hebben* 'have'. Nonetheless, this auxiliary shift only happens with *naar* 'to' (cf. [172]), not with *tot* 'to/until' (cf. [173]). As shown below, the meaning of these two prepositional patterns can be captured by two distinct paraphrases.

(171) Arne heeft/#is geklommen.
'Arne {has/#is} climbed.'

(172) Arne is gedanst naar de kamer.
'Arne is danced to the room.'
= Arne reached the room by dancing.

(173) Arne heeft gedanst tot de kamer.[29]
'Arne has danced to the room.'
= Arne performed the act of dancing until he reached the room.

*Until*-PPs in cooking recipes also exhibit properties that are typical of adjuncts. For instance, (i) English *until*-PPs can co-occur with a goal PP (cf. [174]), which would

**28** Nonetheless, as pointed in Martínez Vázquez (2015), citing Sorace (2000: 876), there is no homogeneous behavior across motion verbs in terms of auxiliary selection. For instance, the verb *nuotare* 'swim' requires *avere* 'have' even with combined with *a* 'to':

(1) Paola {ha/*è} nuotato/a a riva. (vs. Paola {ha/*è} nuotato/a)
'Paola {has/*is} swum to the shore.' 'Paola {has/*is} danced'

**29** Note that *tot* 'to/until' can occur with *zijn* 'be' when combined with the locative preposition *aan* 'at', cf. Example (98), repeated below for convenience:

(1) Jan is tot aan de top geklommen.
'John is climbed until at the top.'

violate Goldberg's (1995) Unique Path Constraint if both PPs were considered Path phrases. This constraint stipulates that an argument cannot be predicated of two distinct paths – for instance, a concrete (viz. goal) and a metaphorical path (viz. resulting state). (ii) *Until*-PPs can be separated from the main verb by several adjuncts (cf. [175]). By contrast, APs are either adjacent (e.g., *pat dry the chicken*) or very close to the main verb, following the direct object (e.g., *pat the chicken dry*). Finally, (iii) they are very often coordinated with a time indication (cf. [176]), which goes hand in hand with their semantics of delimitation.

(174) Stir everything into the egg mixture until smooth.

(175) Fry the bread cubes, [[1]in batches], [[2]in a frying pan] [[3]over a high heat] [[4]for 2 minutes], [[5]turning frequently], until golden-brown and crisp.

(176) Cover, lower the heat and cook for 15 minutes, or until tender.

Quite interestingly, Spanish *hasta la muerte*-PPs turn out to be felicitous in such adjunct-like configurations (cf. [177]), but not French *à mort*-PPs (cf. [178]). Therefore, the contrast observed between (177) and (178) could be an indication that the distinction between *until*-PPs and *to*-PPs is cross-linguistically valid. It goes without saying that further investigation is needed to fully understand the semantics and syntactic properties of *until*-PPs and how they can be integrated into Goldberg and Jackendoff's (2004) family of RCs.

(177) Fue apuñalado por su cuñado varias veces hasta la muerte.
'He was stabbed by his brother-in-law several times UNTIL death.'

(178) *Il a été poignardé par son beau-frère de plusieurs coups de couteau à mort.
'*He was stabbed by his brother-in-law several times TO death.'

Nonetheless one could wonder why these *until*-RCs occur so frequently in English cooking recipes, especially when compared to what is observed in Dutch, where only one occurrence of "*tot* + adjective" has been found (e.g., *tot gaar bakken* 'fry until cooked'). I believe that the frequent use of *until*-RCs in cooking recipes is related to the types of processes involved in such contexts. Cooking processes are somewhat delicate and require precision. The success of the dish is indeed at stake: if cooking instructions are not carefully followed (e.g., the vegetables are under- or over-cooked), the whole dish may be – if not ruined – not as tasteful as it should be (Rodríguez Arrizabalaga 2016: 71). Thus, *until* can be added to the sentence in order to specify a careful managing of time. By contrast, adjectival RCs describe processes that seem to have less incidence on the success of the dish (e.g., *wipe/scrub clean*, *pat/spin dry*): for instance, the vegetables cannot be "too clean", or perhaps, if they are not perfectly clean, that's not so bad. Naturally, this discourse-related factor also holds in Dutch, which does not need additional marking. However, this may have to do with the selectional restrictions of each preposition: *tot* 'to/until' tends to occur

with NPs, and not APs. Then, we can assume that there is a way of highlighting the notion of degree in English but not in Dutch, at least not when the result is encoded by an AP. Note that, if it is specified that a certain degree of a property must be achieved (for instance, a high degree of cleanliness), the adjective must be preceded by *until* (e.g., *wipe/scrub until completely clean*), even when the latter can perfectly occur without marking in other circumstances.

As rightly pointed it out by a reviewer, the occurrence of *until*-PPs could also be motivated by internal language factors. With its poor inflectional morphology, English is argued to be a more analytical language than Dutch (Lamiroy 2011: 175–176): for instance, there is only one form in English to mark plural nouns, viz. the *-s* suffix (e.g., *dogs*), against two in Dutch, viz. *-s* (e.g., *meisjes* 'ladies') and *-en* (e.g., *landen* 'lands'). Likewise, the English present tense paradigm includes only one suffix, viz. *-s* for the third person singular (e.g., *he/she sings*). By contrast, Dutch present tense is marked by three distinct forms, viz. zero for first person singular (e.g., *Ik kom* 'I come'); *-t* for second (e.g., *Jij komt* 'you come') and third person singular (e.g., *hij/zij komt* 'he/she comes'), and *-en* for plural (e.g., *wij/jullie/zij komen* 'we/you/they come').

*Until*-PPs could be considered more analytical structures than APs given that the latter can be incorporated into separable complex verbs in Dutch (Booij 2010). These verbs have the particularity to appear as one word in subordinate clauses (e.g., adjective-verb) or as two separate words (e.g., verb + adjective) in main clauses. Several Dutch APs listed in Table 4 may indeed exhibit this alternation: for instance, *dicht* (> *dichtvouwen* 'fold-tight'), *schoon* (> *schoonborstelen* 'brush-clean'), *open* (> *openknippen* 'cut-open'), *fijn* (> *fijnmalen* 'grind-fine'). Thus, the fact that Dutch opts for a 'more synthetic' adjectival strategy whereas English tends to opt for analytical *until*-PPs might also be explained by this tendency in Germanic languages.

# 5 Conclusion

In this article, I have conducted a fine-grained corpus-based study of RSPs in cooking recipes in four languages, i.e., Dutch, English, French, and Spanish. I have shown that (i) prepositional RSPs are cross-linguistically more frequent than adjectival RSPs in this discourse genre. (ii) Prepositional RSPs are headed by various prepositions or result markers which do not have the same semantic properties, frequency, and distribution across verb classes: 'weak' result markers (e.g., nl. *in* 'in'; en. *in*; sp. *en* 'in', *a* 'to') mainly occur in RCs that contain achievements, which are perceived as less dynamic and are, in this sense, close to depictive constructions, whereas 'strong' result markers (e.g., nl. *tot* 'to/until'; en. *to*, *into*, *until*; fr. *en* 'in'; sp. *a punto de* 'to point of') combine with various aspectual classes, including activities, and may thus give rise to strong RCs. Therefore, I have provided further empirical evidence that strong RCs, which are considered genuine satellite-framed patterns, also exist in

Romance (Martínez Vázquez 2015; Métairy 2022a; Rodríguez Arrizabalaga 2014, 2022; Romagno 2020; contra Bigolin and Ausensi 2021). (iii) Adjectival RSPs are not totally excluded from Romance RCs. Nonetheless, they are not frequent, nor diverse, being limited to few lexical types, and mostly occur in weak RCs. These Romance adjectival RSPs tend to be intensified, which makes them semantically and morphosyntactically marked. Finally, (iv) I have shown that there are important intralinguistic differences in the use of RCs. First, in Romance, French RCs attract a greater diversity of verbs than Spanish RCs, which mostly involve the same verb class, namely *cut* verbs. This productivity contrast has been explained by the fact that French *en* 'in', which introduces most RSPs, have wider scope in the abstract domain than Spanish prepositions. Second, in Germanic languages, adjectival RSPs are more frequent in Dutch than in English, where adjectives tend to be contained inside a PP headed by the preposition *until* as a result of both discourse and internal language factors. In future research, the generalizations drawn from this cross-linguistic study should be compared with data from other discourse genres in order to verify that the four languages display the same behavior with respect to RCs.

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**Data availability statement:** The data used for this study is available at https://doi.org/10.5281/zenodo.8266914.

# Appendix

**Table 8:** List of the different websites used to compile our corpus in each language.

| Language | Websites | Tokens |
|---|---|---|
| Dutch | https://dagelijksekost.een.be/ | 233,006 |
| | https://15gram.be/ | 212,305 |
| | https://www.libelle-lekker.be/ | 131,916 |
| | **TOTAL** | **577,227** |
| English | https://www.jamieoliver.com | 222,953 |
| | https://www.gordonramsay.com | 416,291 |
| | https://www.bbc.co.uk/food | |
| | https://www.theguardian.com/tone/recipes | |
| | **TOTAL** | **639,244** |
| French | https://cuisine.larousse.fr/ | 247,849 |
| | https://www.regal.fr/ | 238,467 |
| | https://www.cuisineaz.com/ | 126,376 |
| | **TOTAL** | **612,692** |
| Spanish | https://www.elespanol.com/cocinillas/ | 249,785 |
| | https://elcomidista.elpais.com/ | 204,980 |
| | https://www.hogarmania.com/cocina/recetas | 120,488 |
| | **TOTAL** | **575,253** |

**Table 9:** Number of verb types (and tokens) by semantic class in each language (sample size = 1,000 tokens by language).

| Verb class/language | Dutch | English | French | Spanish | Total |
|---|---|---|---|---|---|
| *Cut* verbs | 13 (579) | 22 (341) | 22 (737) | 12 (970) | 69 |
| *Grind verbs* | 5 (66) | 11 (41) | 5 (49) | 2 (2) | 23 |
| *Beat* verbs | 11 (79) | 13 (139) | 7 (85) | 1 (10) | 32 |
| *Shape* verbs | 5 (17) | 10 (42) | 11 (73) | 2 (14) | 28 |
| *Cook* verbs | 12 (138) | 29 (341) | 2 (22) | 0 | 43 |
| *Blend* verbs | 3 (53) | 9 (75) | 4 (7) | 0 | 16 |
| *Wipe* verbs | 4 (6) | 2 (5) | 0 | 0 | 7 |
| *Put* verbs | 0 | 2 (6) | 5 (12) | 0 | 7 |
| Resultative verbs | 2 (66) | 3 (10) | 3 (15) | 2 (4) | 10 |
| **Total** | **55** | **101** | **59** | **19** | **234** |

**Table 10:** Verbs attested in the English RC.

| Verb classes | Class members | # |
|---|---|---|
| *Cut* verbs | *cut* (191), *chop* (48), *slice* (35), *divide* (18), *break* (15), *tear* (8), *carve* (3), *dice* (3), *snap* (3), *crumble* (2), *flake* (2), *peel* (2), *split* (2), *grate* (1), *portion* (1), *pull* (1), *rip* (1), *separate* (1), *shave* (1), *shred* (1), *snip* (1), *strip* (1) | 341 |
| *Grind* verbs | *blitz* (18), *grind* (4), *mash* (4), *pulse* (4), *crush* (3), *whiz* (3), *dissolve* (1), *liquidise* (1), *process* (1), *purée* (1), *smash* (1) | 41 |
| *Beat* verbs | *whisk* (35), *beat* (28), *roll (out)* (26), *knead* (14), *pat* (11), *bash* (10), *whip* (5), *pound* (3), *work* (2), *churn* (1), *press* (1), *scrunch* (1), *spin* (1) | 139 |
| *Shape* verbs | *shape* (18), *cream* (9), *rise* (4), *flatten* (3), *fold* (2), *freeze* (2), *form* (1), *increase* (1), *prove* (1), *mould* (1) | 42 |
| *Cook* verbs | *cook* (117), *bake* (56), *fry* (55), *toast* (17), *simmer* (16), *heat* (14), *grill* (8), *roast* (8), *boil* (5), *chill* (5), *sweat* (5), *sauté* (4), *steam* (4), *stir-fry* (4), *bubble* (3), *melt* (3), *barbecue* (2), *griddle* (2), *reduce* (2), *warm* (2), *blanch* (1), *chargrill* (1), *deep-fry* (1), *hard-boil* (1), *microwave* (1), *pan-roast* (1), *parboil* (1), *poach* (1), *sear* (1) | 341 |
| *Blend* verbs | *stir* (24), *blend* (20), *mix* (20), *fold in/together* (4), *bring together* (3), *coat* (1), *combine* (1), *incorporate* (1), *tie* (1) | 75 |
| *Wipe* verbs | *wipe* (3), *scrub* (2) | 5 |
| *Put* verbs | *arrange* (5), *put* (1) | 6 |
| Resultative verbs | *get* (4), *make* (4), *turn* (2) | 10 |
| **TOTAL** | | **1,000** |

**Table 11:** Verbs attested in the Dutch RC.

| Verb classes | Class members | # |
|---|---|---|
| *Cut* verbs | *snijden* 'cut' (443), *hakken* 'chop' (51), *snipperen* 'chop' (44), *verdelen* 'divide' (11), *scheuren* 'tear' (10), *raspen* 'grate' (6), *plukken* 'break off' (4), *trekken* 'pull' (3), *breken* 'break' (2), *pulken* 'tear' (2), *versnipperen* 'shred' (2), *knippen* 'cut' (1), *schaven* 'shave' (1) | 579 |
| *Grind* verbs | *mixen* 'grind' (42), *stampen* 'mash' (10), *malen* 'grind' (7), *pureren* 'purée' (5), *prakken* 'mash' (2) | 66 |
| *Beat* verbs | *kloppen* 'beat' (55), *(uit)rollen* 'roll (out)' (5), *deppen* 'pat' (3), *kneden* 'knead' (3), *persen* 'press' (2), *schudden* 'shake' (2), *duwen* 'push' (1), *klutsen* 'beat' (1), *schrapen* 'scrape' (1), *slaan* 'beat' (1), *zwieren* 'spin' (1) | 75 |
| *Shape* verbs | *pletten* 'flatten' (10), *strijken* 'spread' (5), *opbollen* 'round' (1), *vormen* 'shape' (1), *vouwen* 'fold' (1) | 17 |
| *Cook* verbs | *bakken* 'bake' (62), *koken* 'cook' (59), *schroeien* 'sear' (4), *stoven* 'simmer' (3), *fruiten* 'fry' (2), *roerbakken* 'stir-fry' (2), *binden* 'reduce' (1), *blancheren* 'blanch' (1), *branden* 'burn' (1), *kleuren* 'color' (1), *roosteren* 'roast' (1), *stomen* 'steam' (1) | 138 |
| *Blend* verbs | *roeren* 'stir' (40), *mengen* 'mix' (12), *bundelen* 'bundle' (1) | 53 |
| *Wipe* verbs | *borstelen* 'brush' (2), *spoelen* 'rinse' (2), *boenen* 'scrub' (1), wrijven 'rub' (1) | 6 |
| Resultative verbs | *brengen* 'bring' (60), *maken* 'make' (6) | 66 |
| **TOTAL** | | **1,000** |

**Table 12:** Verbs attested in the French RC.

| Verb classes | Class members | # |
|---|---|---|
| *Cut* verbs | *couper* 'cut' (496), *découper* 'cut' (65), *détailler* 'cut' (63), *tailler* 'carve' (33), *diviser* 'divide' (19), *casser* 'break' (12), *fendre* 'open' (8), *trancher* 'slice' (8), *peler* 'peel' (6), *séparer* 'separate' (6), *ouvrir* 'open' (4), *répartir* 'distribute' (4), *émincer* 'mince' (3), *partager* 'share' (2), *briser* 'shatter' (1), *débiter* 'cut' (1), *déchiqueter* 'shred' (1), *entailler* 'notch' (1), *éplucher* 'peel' (1), *hacher* 'mince' (1), *râper* 'grate' (1), *s'éffriter* 'crumble' (1) | 737 |
| *Grind* verbs | *réduire* 'reduce' (26), *mixer* 'grind' (10), *écraser* 'crush' (8), *broyer* 'grind' (3), *concasser* 'grind' (2) | 49 |
| *Beat verbs* | *battre* 'beat' (41), *rouler* 'roll' (18), *fouetter* 'whip' (12), *travailler* 'work' (10), *malaxer* 'knead' (1), *presser* 'press' (1), *tourner* 'spin' (1) | 85 |
| *Shape* verbs | *monter* 'raise' (34), *étaler* 'spread' (15), *façonner* 'shape' (10), *abaisser* 'flatten' (3), *étendre* 'spread' (3), *aplatir* 'flatten' (2), *former* 'shape' (2), *enrouler* 'roll up' (1), *fermer* 'close' (1), *mouler* 'mould' (1), *ramollir* 'soften' (1) | 73 |
| *Cook* verbs | *cuire* 'cook' (19), *réduire* 'reduce' (3) | 22 |
| *Blend* verbs | *ramasser* 'gather' (3), *ficeler* 'tie' (2), *rassembler* 'bring together' (1), *réunir* 'gather' (1) | 7 |
| *Put* verbs | *disposer* 'arrange' (6), *déposer* 'place' (3), *dresser* 'put up' (1), *poser* 'place' (1), *verser* 'pour' (1) | 12 |
| Resultative verbs | *transformer* 'transform' (8), *mettre* 'make' (5), *rendre* 'make' (2) | 15 |
| **TOTAL** | | **1,000** |

**Table 13:** Verbs attested in the Spanish RC.

| Verb classes | Class members | |
|---|---|---|
| *Cut* verbs | *cortar* 'cut' (773), *picar* 'mince' (132), *trocear* 'slice' (33), *partir* 'divide' (18), *dividir* 'divide' (3), *pelar* 'peel' (3), *desmenuzar* 'shred' (2), *separar* 'separate' (2), *desgarrar* 'tear' (1), *laminar* 'slice' (1), *porcionar* 'slice' (1), *rotar* 'break' (1) | 970 |
| *Grind* verbs | *reducir* 'reduce' (1), *triturar* 'grind' (1) | 2 |
| *Beat* verbs | *batir* 'beat' (10) | 10 |
| *Shape* verbs | *montar* 'raise' (13), *levantar* 'raise' (1) | 14 |
| Resultative verbs | *hacer* 'make' (2), *poner* 'make' (2) | 4 |
| **TOTAL** | | **1,000** |

**Table 14:** List of telic and atelic verbs found in adjectival RCs in each language.

| Language | Verbs | | Types |
|---|---|---|---|
| | **Atelic verbs** | **Telic verbs** | |
| Dutch | *kloppen* 'beat' (44), *roeren* 'stir' (29), *deppen* 'pat' (3), *borstelen* 'brush' (2), *schudden* 'shake' (2), *boenen* 'scrub' (1), *duwen* 'push' (1), *klutsen* 'beat' (1), *persen* 'press' (1), *schrapen* 'scrape' (1), *slaan* 'beat' (1), *wrijven* 'rub' (1), *zwieren* 'spin' (1) | *snijden* 'cut' (87), *bakken* 'bake/fry' (60), *koken* 'cook' (57), *hakken* 'chop' (46), *snipperen* 'chop' (36), *mixen* 'mix' (18), *malen* 'grind' (6), *raspen* 'grate' (6), *schroeien* 'sear' (4), *stampen* 'mash' (4), *strijken* 'spread' (4), *plukken* 'break off' (3), *stoven* 'simmer' (3), *fruiten* 'fry' (2), *prakken* 'mash' (2), *roerbakken* 'stir-fry' (2), *spoelen* 'rinse' (2), *blancheren* 'blanch' (1), *branden* 'burn' (1), *kleuren* 'color' (1), *pletten* 'flatten' (1), *pulken* 'tear' (1), *pureren* 'puree' (1), *roosteren* 'roast' (1), *stomen* 'steam' (1), *trekken* 'pull' (1), *vouwen* 'fold' (1) | 40 |
| English | *pat* (10), *wipe* (3), *scrub* (2), *press* (1), *spin* (1) | *slice* (4), *cut* (3), *chop* (2), *steam* (2), *blend* (1), *crush* (1), *put* (1), *snip* (1) | 13 |
| French | *battre* 'beat' (1) | *cuire* 'cook' (17), *couper* 'cut' (1), *étaler* 'spread' (1), *ficeler* 'tie' (1) | 5 |
| Spanish | | *picar* 'chop' (35), *cortar* 'cut' (13), *laminar* 'slice' (1), *partir* 'divide' (1), *trocear* 'slice' (1) | 5 |

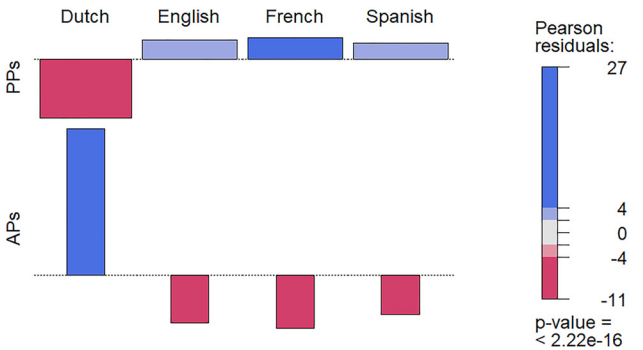


**Figure 1:** Frequency of RSP morphosyntactic categories by language: association plot of residuals.

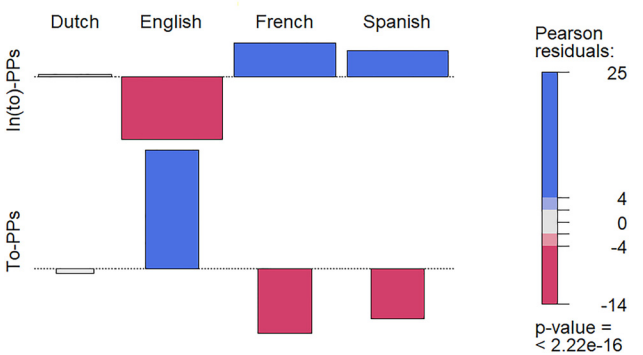


**Figure 2:** Frequency of *in(to)*-PPs and *to*-PPs by language: association plot of residuals.

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