

## 10. On the argument status of Instruments in Italian

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This study aims at discussing the semantic and syntactic status of Instruments in Italian and to account for their syntactic optionality. Our claim is that Instruments are not adjuncts; instead, semantically they are arguments/secondary participants and, syntactically, secondary complements. Their optionality is thus to be treated as an instance of argument omission, ruled by semantic recoverability: the more an Instrument is recoverable from the verb the more it is syntactically dropped. Our proposal, inspired by Pustejovsky's (1995) classification of arguments, is supported by the analysis of three corpora of spoken Italian.

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### 1. Introduction

Instruments have been extensively studied over the years (s. Lakoff 1968; Rappaport-Hovav & Levin 1988; Dowty 1991; Koenig *et al.* 2003; Rissman 2013; Rissman & Rawlins 2017, among others), but no consensus has been reached on their status. They have been alternately considered as adjuncts (Dowty 1982; Rappaport-Hovav & Levin 1988; Jackendoff 1990; Bresnan 1982; Rissman & Rawlins 2017), arguments (Abney 1989; Schütze 1995), or secondary complements (Speas 1990; Ono 1992; Brunson 1992; Cardinaletti 2015; 2016; 2019).

The main issue with the classification of Instruments is the mismatch between their semantic and syntactic behaviour: while Instruments are in many cases semantically required by the verb, they are always syntactically optional. In other words, if Instruments are semantic arguments but syntactic adjuncts, this «would be a case where the semantic structure of the verb does not determine syntactic argument behavior.» (Rissman 2013: 16).

In this study, we address the issue of the argument status of Instruments along with their optionality, showing that their syntactic omission – far from being a proof of them being adjuncts – is in fact to be treated as an instance of argument omission. Applying Pustejovsky's (1995) tripartition of arguments to Instruments in Italian, we claim that different types of Instruments exist, depending on their semantic recoverability and their incorporation into the verb meaning, and that these two factors rule the pattern of their production/omission. Finally, we present the results of a corpus analysis that confirms our predictions about the omission of Instruments.

The paper is organized as follows: in section (2), a semantic and syntactic definition of Instruments is provided; section (3) is devoted to a review of the main semantic (3.2.1) and syntactic (3.2.2) diagnostics for argumenthood and to their application to Instruments; our proposal is illustrated in section (4). In section (5), the corpus analysis is described. In section (6), we draw some conclusions.

## 2. Instruments in Italian

### 2.1. A semantic definition

Since the first attempts at the definition of Instruments, their causal nature was stressed. Fillmore (1968: 24) characterized Instruments as «causally involved in the action or state identified by the verb». They have successively been defined “causal intermediaries” (Talmy 1976; Jackendoff 1990; Goldberg 2002), i.e. intermediate entities in the causal chain between the Agent and the Patient (Croft 1991). In a similar vein, Talmy (2000) defined them as both the acted-upon entity of one part of the causal chain and the “cause” of another part. According to Dowty (1991), they share some features with the proto-role Agent as well as with the proto-role Patient. Brunson (1993) made an even stronger claim: Instruments cannot be described as an independent thematic role. Instead, together with Agents, Instruments are “disconstituents” of a single Cause role, i.e. they are different syntactic constituents that realize a single – broader – thematic role.

However, since at least Marantz (1984), it has been observed that Instruments do not always play a causal role in the event by which they are implied; in fact, different interpretations of Instruments (Dowty 1994) or Instrumental subroles (Marantz 1984; Ono 1992; Schütze 1995; Schlesinger

1995; Koenig *et al.* 2003, 2007) have been identified, depending on the role the Instrument plays in the event.<sup>160</sup>

In order to address this issue, we propose the following definition of Instruments which – as will be clear in section 3.2.1 – best captures the different types of Instruments, particularly the non-intermediary ones.

- (1) The Instrument is the participant which, being somehow manipulated by the Agent, contributes to the realization of the event by which it is implied.

## 2.2. The syntax of Instruments

Instruments are mapped onto syntax via two linking rules (Lakoff 1968; Koenig *et al.* 2003, 2007). The first rule links the Instrument to the complement of the preposition ‘with’, *con* in Italian, as in (2a), while the second links it to the complement of the active form of the verb ‘to use’, *usare* in Italian, as in (2b).<sup>161</sup>

- (2) a. X V Y [con [Z]]  
       ‘X V-s Y [with [Z]]’  
       b. X usa [Z] per V Y  
       ‘X uses [Z] to V Y’

Thus, a DP is syntactically realizing an Instrument if it can occur as Z in both (2a) and (2b).

The possibility for a DP to occur in both the structures, and particularly in (2b), has been used as a diagnostic for identifying instruments (Lakoff 1968; Koenig *et al.* 2003, 2007), since it rules out non-instrumental meanings of the PP headed by *con* ‘with’ (henceforth, *con*-PP), e.g. comitative or modal meanings, as in (3):

- (3) a. *Marco ha potato la siepe {con le cesoie/con precisione/con Sara}*  
       ‘Marco trimmed the hedge {with shears/with precision/with Sara}’  
       b. *Marco ha usato {le cesoie/\*la precisione/\*Sara} per potare la siepe*  
       ‘Marco used {the shears/\*the precision/\*Sara} to trim the hedge’

<sup>160</sup>The different types of Instruments are described in detail in section 3.2.1 since their existence makes a strong case for considering Instruments arguments.

<sup>161</sup>According to Lakoff (1968) and Koenig *et al.* (2003, 2007), the structure in (2b) is a paraphrase of the structure in (2a) but see Rissman (2013) and Rissman & Rawlins (2017) for the differences in meaning between the two.

Italian exhibits a third strategy for the syntactic realization of Instruments, i.e. the clitic pronoun *ci* ‘with it’, as in (4).

- (4) (*Con il coltello*<sub>i</sub>) Gianni *ci*<sub>i</sub>=*ha* tagliato il pane  
 (With the knife<sub>i</sub>) Gianni with.it<sub>i</sub>=has cut the bread  
 ‘Gianni cut the bread with it’

Our work focuses on the structures in (2a) and (4), i.e. on the instrumental PP (henceforth, *inst-PP*) and on the instrumental clitic (henceforth, *inst-cl*), for two main reasons: first, cross-linguistically the PP is a more prototypical realization of Instruments than the complement of ‘to use’;<sup>162</sup> second, the *inst-PP* provides a better insight on the relationship between the verb meaning and the selection of (a class of) Instruments than the verb ‘to use’ does. See the sentences in (5), which replicate Rissman & Rawlins’ (2017) observations for English:

- (5) a. *Gianni ha usato il coltello per tagliare il pane*  
 ‘Marco used the knife to cut the bread’  
 b. *Marco ha usato il coltello*  
 ‘Marco used the knife’

In (5a) the instrumental DP *il coltello* ‘the knife’ is selected by the embedded verb *tagliare* ‘to cut’, in spite of syntactically being the internal complement of the verb *usare* ‘to use’; this is further proved by the fact that (5b) is interpretable only as long as the meaning of the infinitival clause is available in the (extra-)linguistic context.

The choice of also focusing on the *inst-cl* naturally follows, since the antecedent of the clitic pronoun is the PP and not the *use*-complement DP.

However, following Lakoff (1968) and Koenig *et al.* (2003, 2007) we used the possibility of occurring in both (2a) and (2b) as a diagnostics to rule out non-instrumental meanings, since the clitic pronoun *ci* and the *con-PP* are polysemic. Throughout the work, we use ‘*inst-PP*’ and ‘*inst-cl*’ to refer to *con-PPs* and the clitic pronoun *ci* when they are used in their instrumental function.

<sup>162</sup> Languages realize Instruments via either adpositional or case marking (Haspelmath 2014; Van Hooste 2018); an additional strategy is Noun Incorporation (Baker 1988; Johns 2017), which is always displayed by languages that possess either of the two strategies above.

In Italian, Instruments are always optional, i.e. they can be omitted without making the sentence ungrammatical, as in (6):

- (6) a. *Luca sta giocando con la palla*  
 ‘Luca is playing with the ball’  
 b. *Luca ci=sta                    giocando*  
 Luca with.it=is            playing  
 ‘Luca is playing with it’  
 c. *Luca sta giocando*  
 ‘Luca is playing’

### 3. Instruments: arguments or adjuncts?

#### 3.1. The argument/adjunct distinction

The distinction between arguments and adjuncts is central to many theoretical frameworks (among others, Bresnan 1982; Chomsky 1981; Foley & Van Valin 1984; Pollard & Sag 1987), where the information about arguments is considered to be encoded in the semantic representation of verbs guiding the construction of sentences, while the information about adjuncts is not (Koenig *et al.* 2003).

The argument/adjunct distinction has traditionally been claimed to be categorical and dichotomic. However, various participants such as Locations, Passive Agents, and Instruments (Haspelmath 2014) do not neatly pattern as arguments nor as adjuncts and are thus difficult to classify. Moreover, the diagnostics for argumenthood are believed not to be always conclusive (Schütze 1995; Miller 1997; Koenig *et al.* 2003; Birtić & Brač *this volume*).

Because of these uncertainties, it has been proposed that the argument/adjunct distinction is non-categorical, but scalar (Langacker 1987; Schütze 1995; Croft 2001; Rissman 2013); that a third intermediate class exists, the one of quasi-arguments, secondary complements (DeAdmond & Hedberg 1998; Cardinaletti 2015; 2016; 2019) or “theta-marked adjuncts” (Speas 1990); or that each participant is represented as both an argument and an adjunct (Dowty 2003).

### 3.2. Instruments and the argument-adjunct classification

In the next sections, through the application of the main diagnostics for argumenthood to Italian Instruments, it will be shown that their behaviour is better understood by combining the hypothesis of a non-categorical argument-adjunct distinction with the hypothesis of a third class, the one of secondary complements.

#### 3.2.1. Semantic criteria

The main semantic diagnostics for argumenthood follow from the definitions of arguments provided over the years (e.g. Dowty 1982; Marantz 1984; Pollard & Sag 1987; Grimshaw 1990; Jackendoff 1990):

##### *I. Semantic obligatoriness*

Arguments are obligatorily entailed by the verb meaning, while adjuncts are not (Dowty 1982; Marantz 1984; Grimshaw 1990). Koenig *et al.* (2003) call it the Semantic Obligatoriness Criterion (SOC)<sup>163</sup>.

Koenig and colleagues (Koenig *et al.* 2003; Koenig *et al.* 2007) conducted a comprehensive survey on English verbs: they asked trained participants to answer two questions, given in (7):

- (7) a. Does one of the verb's senses describe situations in which one participant must or can use another participant to perform an action?  
Yes, it must/Yes, it can.
- b. Does one of the verb's senses describe situations in which one participant must or can perform an action described by the verb *with* something?  
Yes, it must/Yes, it can.

The first question is focused on the linking rule that associates the Instrument with the complement of the verb *to use*, the second question on the rule that associates it with the complement of the preposition *with*. The two questions target the positions Instruments can occur in, as mentioned in

<sup>163</sup> «**Semantic Obligatoriness Criterion** (SOC): If *r* is an argument participant role of predicate *P*, then any situation that *P* felicitously describes includes the referent of the filler of *r*.» (Koenig *et al.* 2003: 72)

(2). If the answers to both questions were *Yes, it must*, then the Instrument is semantically required by the verb; otherwise, the Instrument is semantically optional (allowed but not required by the verb).

Their study showed that Instruments «come in two categories. They are sometimes semantically required by the meaning of the verb; and they are sometimes not semantically required, but merely permitted» (Koenig *et al.* 2007: 177). In the former case, they are semantic arguments of the verb, in the latter they are not; in other words, only in the first case they are part of the verb meaning. The two types of verbs have different semantic representations (Koenig & Davis 2006). With verbs that semantically require an Instrument, henceforth verbs [+I], the latter is part of the semantic representation, and the preposition *with* only redundantly marks a portion of meaning already included in the verb's one. On the contrary, with verbs that semantically allow – but not require – the Instrument, henceforth verbs [±I], the instrumental component of meaning is added to the verbal semantics by the preposition.<sup>164</sup>

## II. Restricted range of verbs

As discussed by Marantz (1984), arguments can only occur with a restricted range of verbs – Semantic Specificity Criterion (Koenig *et al.* 2003) –<sup>165</sup> while “pure” adjuncts can modify virtually every verb.<sup>166</sup> This criterion is strictly linked to semantic obligatoriness: both, considered alone, are necessary

<sup>164</sup> In an unpublished work we replicated the survey of Koenig *et al.* (2003). We selected 752 verbs that entail an Instrument and asked eight trained participants – MA students and PhD candidates in Linguistics – to answer two questions for each verb. The questions are the Italian translation of the ones used by Koenig and colleagues. Overall, the collected judgements showed that the distinction individuated for Instruments in English holds for Italian as well, confirming the intuition that the contrast between two variants (one semantically obligatory and the other semantically optional, both syntactically optional) of the same role type is endemic to the Instrumental role.

<sup>165</sup> «**Semantic Specificity Criterion** (SSC): If *r* is an argument participant role of predicate *P* denoted by verb *V*, then *r* is specific to *V* and a restricted class of verbs/events.» (Koenig *et al.* 2003: 73)

<sup>166</sup> Not all adjuncts behave alike with respect to this criterion: some adjuncts display restrictions on the verb they can occur with. This is one of the reasons that led to the theorization of more than one class of adjuncts, e.g. event-internal vs. event-external, or theta-marked vs. pure adjuncts (Ernst 2001; Speas 1990).

but not sufficient conditions.<sup>167</sup> A participant must meet both conditions, semantic obligatoriness and the possibility of occurring with a restricted range of verbal heads in order to be classified as an argument.

Participants that pattern as semantic arguments are implied by a narrower range of verbs, as *del pericolo* ‘of the danger’ in (8a), while participants that pattern as adjuncts, not being implied in the semantic representation of the verb, can modify every event, as *nel pomeriggio* ‘in the afternoon’ in (8b) shows (the examples are adapted from Schütze 1995: 102).

- (8) a. *John {ha informato il suo amico/\*ha visto il suo amico/\*ha colpito il suo amico/\*ha ammirato il suo amico/\*ha sorpreso il suo amico} del pericolo.*  
 ‘John {informed his friend /\*saw his friend /\*hit his friend /\*admired his friend /\*surprised his friend} of the danger.’
- b. *John {è morto/ha starnutito/è esploso/si è rotto il braccio/ha visto Fred/ha riso di Bill} nel pomeriggio*  
 ‘John {died/sneezed/explored/broke his arm/saw Fred/laughed at Bill} in the afternoon’

Restrictions on the distribution of instruments exist, i.e. instruments tend to co-occur with a narrow range of verbs (Brunson 1993; Levin 1993).

Instruments are only entailed by [+ dynamic] verbs that assign a causal role (Brunson 1993), e.g. *spostare* ‘to move’ (9a, 9b), while many other classes of verbs, like non-causal verbs, e.g. *sentire* ‘to hear’ (9c, 9d), stative verbs, e.g. *abitare* ‘to live’ (9e, 9f), psychological verbs, e.g. *pensare* ‘to think’ (9g, 9h), and verbs of change of state, e.g. *cadere* ‘to fall’ (9i, 9j), do not entail instruments.<sup>168</sup>

- (9) a. *Lara ha spostato la palla [con un bastone]*  
 ‘Lara moved the ball [with a stick]’
- b. *Lara ha usato [un bastone] per spostare la palla*  
 ‘Lara used [a stick] to move the ball’
- c. *#Lara ha sentito un rumore [con le cuffie]*  
 ‘#Lara heard a noise [with her headphones]’

<sup>167</sup> As Bresnan (1982) pointed out, locative and temporal participants are always entailed by events and should be considered arguments. However, they can modify every verb, i.e. they are not semantically specific. Considering both SOC and SSC prevents us from considering locative and temporal participants as arguments, when they are not.

<sup>168</sup> In the examples (9c-j), ‘#’ is used instead of ‘\*’ to underline a semantic more than syntactic anomaly, since we are talking about primarily semantic constraints. The symbol ‘\*’ marks as usual an ungrammatical sentence.

- d. *#Lara ha usato [le cuffie] per sentire un rumore*  
'#Lara used [her headphones] to hear a noise'
- e. *#Lara abita a Roma [con una casa]*  
'#Laura lives in Rome [with a house]'
- f. *#Lara usava [una casa] per abitare a Roma*  
'#Lara was using [a house] to live in Rome.'
- g. *#Lara pensava a Luca [con una canzone]*  
'#Lara was thinking of Luca [with a song].'
- h. *#Lara usava [una canzone] per pensare a Luca*  
'#Lara was using [a song] to think of Luca'
- i. *#Lara cadde [con una spinta]*  
'#Lara fell [with a push]'
- j. *#Lara usò [una spinta] per cadere*  
'#Lara used [a push] to fall'

The second restriction on the distribution of Instruments states that they require the presence of an Agent (Gruber 1965), whether explicit (10a) or implicit/unspecified (10b). Otherwise, the sentence is ungrammatical (10c).

- (10) a. *Alberto ha rotto la finestra [con un sasso]*  
'Alberto broke the window [with a rock]'
- b. *La finestra è stata rotta [con un sasso]*  
'The window was broken [with a rock]'
- c. *\*La finestra si è rotta [con un sasso]*  
'\*The window broke [with a rock]'

Finally, since the Agent is always required and [+ animate] (Lakoff, 1968), the subject DP associated with the Agent must always be [+ animate]. Thus, Instruments can only occur with a [+ animate] subject DP, as the contrast between (11a, 11b) and (11c, 11d) shows:

- (11) a. *Gianni ha ucciso Lucio [con la dinamite]*  
'Gianni killed Lucio [with the dynamite]'
- b. *Gianni ha usato [la dinamite] per uccidere Lucio*  
'Gianni used the dynamite to kill Lucio'
- c. *\*L'esplosione ha ucciso Lucio [con la dinamite]*  
'\*The explosion killed Lucio [with the dynamite]'
- d. *\*L'esplosione ha usato [la dinamite] per uccidere Lucio*  
'\*The explosion used [the dynamite] to kill Lucio'

The three main restrictions seen so far show that Instruments – unlike pure adjuncts, e.g. temporals or locatives – cannot freely modify every verb. On the contrary, they can only occur with [+ dynamic] [+ causative] verbs, within events that imply an Agent, the latter being associated with a [+ animate] subject DP.

Crucially, such constraints apply to both Instruments of [+I] and [±I] verbs: the examples in (9a, 9b), (10a, 10b), and (11a, 11b) involve Instruments of [±I] verbs which, in spite of being semantically optional, behave like semantic arguments as far as the Semantic Specificity Criterion is involved. The same is true for Instruments of [+I] verbs, which in addition are semantically obligatory.

### III. Dependence on the head for the interpretation

The interpretation of arguments depends on the verbs that select them, while the interpretation of adjuncts is independent (Grimshaw 1990; Marantz 1984; Pollard & Sag 1987), see (12):

- (12) *Maria ha {regalato un libro/dato ascolto} a Marco ieri*  
 ‘Maria {gave a book / listened} to Marco yesterday’

While the interpretation of *ieri* ‘yesterday’ does not change depending on the predicate (‘to give’/ ‘to listen’), the interpretation of *a Marco* ‘to Marco’ does, depending on the verb by which it is selected. Thus, the PP is an argument, while the AdvP is an adjunct.

Different interpretations of Instruments have been identified as well, which depend on the predicate by which they are entailed (Marantz 1984; Dowty 1994; Schütze 1995).

- (13) a. *Avvistare la cometa con un telescopio*  
 ‘Sight the comet with a telescope’  
 b. *Spazzare il pavimento con la scopa*  
 ‘Sweep the floor with the broom’  
 c. *Attaccare un quadro con i chiodi*  
 ‘Fasten a picture with the nails’  
 d. *Coprire il tavolo con la tovaglia*  
 ‘Cover the table with the tablecloth’

In (13a), no change in the position of the Instrument is entailed; in (13b), the Instrument moves but not to a specific position; in (13c), the

Instrument ends up to a specific position; in (13d), the Instrument shows a higher degree of affectedness, comparable to that of direct objects. The four interpretations depend on the verbs and not on the Instruments themselves: *tovaglia* ‘tablecloth’ in (13d) could be replaced by *telescopio* ‘telescope’ and then the telescope would show a higher degree of affectedness than it does in (13a) (Dowty 1994).

Marantz (1984) and Schütze (1995) identified a difference in the semantic interpretation of Instruments that perhaps makes an even stronger case for the argumenthood of Instruments.

Instruments can be interpreted as playing either a causal role or a merely helping one (Marantz 1984). This distinction was confirmed by Ono (1992), who distinguished between intermediary and facilitating Instruments;<sup>169</sup> this was successively expanded on (Schlesinger 1995; Koenig *et al.* 2003; 2007), and three different types of Instruments were identified: intermediary (14a), enabling (14b) and ancillary (14c).

- (14) a. *Alberto ha tritato i funghi [con il coltello]*  
 ‘Alberto chopped the mushrooms [with the knife]’  
 b. *Lucia è entrata nella stanza [con la chiave]*  
 ‘Lucia entered the room [with the key]’  
 c. *Marco mangia la zuppa [con il cucchiaino]*  
 ‘Marco eats the soup [with the spoon]’

Only in (14a) the Instrument plays an actual causal role in that the act of the Agent (i.e. picking and moving the knife) directly causes the contact between the Instrument and the Patient (i.e. the knife and the mushrooms) which in turn directly causes a change of state or location in the Patient (here it causes the mushrooms to become chopped); in (14b), the Instrument (i.e. the key) enables Lucia to enter the room, but it surely does not cause her

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<sup>169</sup> Ono (1992) hypothesized that intermediary Instruments are always semantically required by and included in the semantic representation of the verb, while facilitating (i.e. ancillary) are not. Nonetheless, the terms ‘semantically obligatory’ and ‘semantically optional’ cannot be considered as equivalent of ‘intermediary and ‘facilitating’, given that some causal instruments are semantically optional, e.g. the verb *rompere* ‘to break’ is considered to semantically allow but not require an Instrument; yet, when the Instrument is present, it always plays a causal role (but the opposite is not true, i.e. facilitating instruments are never obligatory). Therefore, it is better to maintain the two distinctions separate.

to enter it. In this case, the Instrument is a necessary precondition for the event to happen. In (14c), the Instrument (i.e. the spoon) just helps Marco to eat the soup, where the concept of “helping” is defined as follows (Koenig *et al.* 2007: 214):

«An eventuality  $e_1$  helps the occurrence of token  $e_2$  of the event category C [if and only if] (i) there is an ordering of tokens of C along a pragmatically defined scale (ease of performance, how good the resulting state is, fewer unwelcome ‘side effects’); (ii)  $e_1$  caused the token  $e_2$  of C to be higher on that ordering than it would otherwise have been.»

In (14c) the spoon is the eventuality that causes the event of eating (C) to be higher on some pragmatically defined scales, e.g. ease of performance (it is easier to eat a soup with a spoon than it would be with bare hands), fewer side effects (if the soup is hot, the eater could get burnt without a spoon), etc.

The interpretation of Instruments as intermediary, enabling or ancillary depends on the event by which the Instrument is implied and, thus, on the verb that selects it. Consequently, according to this criterion, both [I+] and [I±] Instruments behave like semantic arguments.

Recalling what was said in section 2.1, it is now clearer why a definition of Instruments in purely causal terms does not cover all the possible interpretations of Instruments.

In this section, we inspected the main semantic criteria for semantic argumenthood; according to the first criterion, two classes of Instruments were identified, one of semantically obligatory and one of semantically optional Instruments. Both classes are semantic arguments according to the second and third criteria as well.

Instruments of [+I] verbs are semantic arguments, Instruments [±I] verbs are secondary participants – because of their optionality – yet selected for and entailed by the verb.

### 3.2.2. Syntactic diagnostics

Following the assumption that the argument/adjunct distinction made at the level of argument structure reflects onto syntax (Levin & Rappaport 1988; Grimshaw 1990; Jackendoff 1990; Speas 1990), several syntactic diagnostics were proposed in order to establish the status of instruments (for a comprehensive review, see Schütze 1995).

### I. Iterativity test

This test is derived from the Theta-criterion (Chomsky 1981) and its subsequent formulations (Bresnan 1982; Pollard & Sag 1987). The iterativity test distinguishes arguments from adjuncts in that phrases expressing arguments cannot freely iterate (15a), whereas phrases expressing adjuncts can, as long as they differ in their level of granularity (Goldberg 2002), as (15b) shows (Rome – city > hotel – building > hall – room). If two phrases expressing adjuncts do not differ in their level of granularity, the iteration is disallowed, e.g. *\*They met at the hotel at the restaurant* (hotel – building = restaurant – building).

- (15) a. *\*Hanno prestato il libro a Maria a Laura*  
 ‘\*They lent the book to Maria to Laura’  
 b. *Li ha incontrati a Roma nell'albergo nella hall*  
 ‘She met with them in Rome in a hotel in the hall’

With respect to the iterativity test, instrumental phrases (inst-PP) behave like arguments: they cannot be iterated whether they are semantic arguments of [+I] verbs (16a) or secondary participants of [±I] verbs (16b).

- (16) a. *\*Ha incollato i fogli [con la colla con lo scotch]*  
 ‘\*He glued the paper with the glue with the tape’  
 b. *\*Ha colpito l'auto [con un bastone con un sasso]*  
 ‘\*She hit the car with a stick with a rock’

According to the iterativity test, inst-PPs expressing Instruments of either [+I] or [±I] verbs behave like arguments.

### II. (Revised) Ordering test

This test relies on the assumption that phrases expressing arguments typically precede phrases expressing adjuncts. Here, the revised version of this test will be applied, which states that a phrase expressing an adjunct cannot precede a phrase expressing an argument, even when the former is focused (Schütze 1995), as (17b) shows (the examples are translated from Schütze 1995):

- (17) a. *Chris ha messo un libro sul tavolo dopo pranzo*  
 ‘Chris put a book on the table after lunch’  
 b. *\*Chris ha messo un libro dopo PRANZO sul tavolo (non dopo cena)*  
 ‘\*Chris put a book after LUNCH on the table (not after dinner)’

Both Instruments of [+I] and [±I] verbs can occur before phrases expressing arguments, as in (18b) and (18d), respectively:

- (18) a. *Sara ha legato il carretto al palo [con una corda]*  
 ‘Sara tied the handcart to the stake [with a rope]’  
 b. *Sara ha legato con una CORDA il carretto al palo (non con lo scotch)*  
 ‘Sara tied with a ROPE the handcart to the stake (not with the tape)’  
 c. *Sara ha mangiato la zuppa con il cucchiaino*  
 ‘Sara ate the soup with a spoon’  
 d. *Sara ha mangiato con il CUCCHIAIO la zuppa (non con le bacchette)*  
 ‘Sara ate with the SPOON the soup (not with the chopsticks)’

According to this test, inst-PP expressing Instruments of either [+I] or [±I] verbs behave like arguments.

### III. Anti-reconstruction effect test

The C condition of the binding theory differently applies to *wh*-phrases containing referential expressions depending on whether they are arguments or adjuncts, as shown by the contrast in (19) (the examples are translated from Ono 1992: 199):

- (19) a. *\*Quali foto di John<sub>i</sub> pro<sub>i</sub> ha distrutto?*  
 ‘\*Which pictures of John<sub>i</sub> did he<sub>i</sub> destroy?’  
 b. *?Quali foto vicino a John<sub>i</sub> pro<sub>i</sub> ha distrutto?*  
 ‘Which pictures near John<sub>i</sub> did he<sub>i</sub> destroy?’

The contrast between (19a) and (19b) shows that coreference is possible only when the referential expression is an adjunct (Speas 1990). Speas (1990) additionally points out that not all adjuncts show anti-reconstruction effects; that is, adjuncts which are assigned a theta role by the verb (“theta-marked adjuncts”) do not show anti-reconstruction effect, e.g. the benefactive *for Mary’s brother* in *\*For Mary<sub>i</sub>’s brother, she<sub>i</sub> was given some old clothes* (Speas 1990: 52), while “pure” adjuncts, i.e. those which are not assigned a theta role by the verb, do, e.g. the rationale *for Mary’s valor* in *For Mary<sub>i</sub>’s valor, she<sub>i</sub> was awarded a purple heart* (Speas 1990: 52).

This asymmetry in anti-reconstruction effect can be used to determine whether Instruments are arguments or adjuncts, or, more precisely, the hypothesis that instruments are “pure” adjuncts can be ruled out if they do not show anti-reconstruction effects. Consider (20):

- (20) a. \**Con quale coltello di Marta, lei<sub>i</sub> ha tagliato le verdure?*  
 ‘\*With which of Marta<sub>i</sub>’s knives, did she<sub>i</sub> chop the vegetables?’  
 b. \**Con quale cucchiaino di Marta, lei<sub>i</sub> ha mangiato la zuppa?*  
 ‘\*With which of Marta<sub>i</sub>’s spoons did she<sub>i</sub> eat the soup?’

As shown in (20a), Instruments of [+I] verbs do not display anti-reconstruction effects, which is consistent with the hypothesis that they are arguments. (20b) shows that Instruments of [ $\pm$ I] verbs do not display anti-reconstruction effects either. Thus, neither of them is a “pure” adjunct according to this test (Ono 1992).

#### IV. Pro-form replacement

The pro-form replacement test has been used to prove that Instruments are adjuncts, since they cannot be replaced by the verbal pro-form *farlo* ‘to do so’ (Levin & Rappaport 1988; Randall 1992; Rissman 2013). Consider (21):

- (21) a. *Sara ha riempito il camion di/con il fieno [con un forcone]*  
 ‘Sara loaded the truck with hay with a fork’  
 b. \**Sara ha riempito il camion di/con il fieno e Marco l’ha fatto di/con il cartone*  
 ‘\*Sara loaded the truck with hay and Marco did so with cardboard’  
 c. *Sara ha riempito il camion di fieno [con un forcone] e Marco l’ha fatto [con una gru]*  
 ‘Sara loaded the truck with hay [with a fork] and Marco did so [with a crane]’  
 d. *Sara ha attaccato il poster [con la colla] e Marco l’ha fatto [con lo scotch]*  
 ‘Sara attached the poster with the glue and Marco did so with the tape’

While the *locatum* in (21a) *di/con il fieno* ‘with the hay’ cannot be left out from the verbal pro-form, hence the ungrammaticality of (21b), inst-PP expressing Instruments of [+I] and [ $\pm$ I] verbs are left out from the pro-form, as in (21c) and (21d).

However, the pro-form substitution only singles out elements that are placed under the V’ node (Ono 1992). That is, the test does not demonstrate that the inst-PP are adjoined to VP; rather, it only excludes that they are under the V’ node. Their syntactic structure is something like (22):

- (22) Sara ha [<sub>VP</sub> [<sub>V’</sub> riempito il camion di/con il fieno] con un forcone]  
 ‘Sara [<sub>VP</sub> [<sub>V’</sub> loaded the truck with hay] with a fork]’

The representation in (22) is consistent with their being “theta-marked adjuncts”, secondary complements or quasi arguments.

### V. Cliticization

The possibility of being cliticized is perhaps the strongest case for considering instruments secondary complements (Cardinaletti, 2015; 2016; 2019). In Italian and other Romance languages, virtually every primary – (23a), (23a) – and secondary – (23b), (23b) – complement of the verb can be cliticized while VP-external adjuncts cannot – (23c), (23c). The following examples are adapted from Cardinaletti (2016: 50).

- (23) a. *Sara mangia un panino*  
 ‘Sara eats a sandwich’  
 a’. *Sara lo=mangia*  
*Sara it=eats’*  
 ‘Sara eats it’  
 b. *Esco sempre con Gianni*  
 ‘I always go out with Gianni’  
 b’. *Ci=esco sempre*  
*with.him=go\_out always*  
 ‘I always go out with him’  
 c. *Gianni è felice a casa dei genitori*  
 ‘Gianni is happy at his parents’  
 c’. \**Gianni ci=è felice*  
*Gianni there=is happy’*  
 ‘\*Gianni is happy there’

Inst-PPs can be cliticized, whether they express Instruments of [+I] or [±I] verbs, as in (24a, 24a) and (24b, 24b), respectively.

- (24) a. *Taglio il pane con il coltello*  
 ‘I cut the bread with the knife’  
 a’. *Ci=taglio il pane*  
*with.it=cut.PRS.1SG the bread’*  
 ‘I cut the bread with it’  
 b. *Ho aperto la scatola con le forbici*  
 ‘I opened the carton box with the scissors’  
 b’. *Ci=ho aperto la scatola*  
*with.them=have.PRS.1SG opened the box’*  
 ‘I opened the carton box with them’

The possibility of being cliticized supports the view of instruments as secondary complements.

### 3.2.3. Summary

In this section, we applied three semantic criteria and five syntactic diagnostics to Instruments in Italian.

Two types of Instruments are identified by the Semantic Obligatoriness Criterion, i.e. Instruments that are semantically required and Instruments which are semantically allowed but not required by the verb; according to the other semantic criteria, Instruments of [+I] verbs are arguments and Instruments of [±I] verbs secondary participants, more strongly entailed by the verb meaning than adjuncts and assigned the theta role by it. Iterativity test – the syntactic diagnostics more intertwined with semantics – leads us to the same conclusion.

As for the other syntactic diagnostics, the pro-form replacement test only excludes that Instruments of [+I] and [±I] verbs are syntactic arguments, i.e. that they are under the V' node. However, according to the anti-reconstruction effect test, both of them behave like arguments, and the possibility of being cliticized excludes that they are adjuncts.

The tests applied so far converge in excluding that Instruments of [+I] and [±I] verbs are pure adjuncts and in demonstrating that they are secondary complements or quasi-arguments occupying an intermediate position between the V' and the VP node, and thus sharing more properties with arguments than with adjuncts.

## 4. The omission of Instruments: between semantics and syntax

The optionality of Instruments, i.e. the possibility of being omitted without the sentence becoming ungrammatical, has been considered the strongest argument in favour of their being adjuncts.

Nonetheless, after having demonstrated that Instruments of neither [+I] nor [±I] verbs are adjuncts, we claim that syntactic optionality of Instruments is not an argument in favour of their being adjuncts; instead, their syntactic omission should be considered as an instance of null arguments, something analogous to the null object or object drop, as will be discussed in detail in section 4.1.

## 4.1. Shadow, Default and Open Instruments

Schütze (1995: 101), paraphrasing Jackendoff (1977), observes that «arguments to a particular lexical head can be obligatory, whereas modifiers are (almost) always optional, but the converse is not true: there are **optional arguments**.» (our emphasis)

The most studied optional argument is the direct object (cf. Levin 1989; Resnik 1993; Cappelli & Lenci 2020; Cappelli 2022; among others). Its omission is called *object deletion*, *intransitivization*, and *object-drop*; the omitted objects are referred to as *null complements*, *implicit objects*, and *dropped objects*.

Verb meaning plays a major role in determining argument omission (Levin 1993). In particular, a “key determinant” (Cappelli & Lenci 2020: 131) factor in argument omission is their semantic recoverability (Hopper & Thompson 1980; Levin 1993; Resnik 1993, 1996; Conklin *et al.* 2004; Medina 2007; Glass 2020), determined by the verb meaning.

The notion of semantic recoverability, i.e. the possibility for the omitted argument to be interpreted by the listener through the semantics of the verb (and of the other arguments), is strictly related to the amount of information arguments and verbs provide about each other (Pustejovsky 1995). Pustejovsky (1991, 1995; for Italian, Ježek 2017, *this volume*) distinguishes among three types of arguments based on their informativity with respect to the verb and on their recoverability from the verb meaning alone.

We applied such a distinction to Instruments in Italian, identifying Shadow, Default and Open Instruments.

### 4.1.1. Shadow Instruments

In Italian, Shadow Instruments (SI) – as shadow arguments – are «semantically incorporated in the meaning of the verb» (Ježek 2017: 15)<sup>170</sup> and, thus, completely recoverable from the verb meaning alone and minimally informative with respect to the verb.

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<sup>170</sup> We will only refer to semantic incorporation, in order to avoid the discussion on whether these verbs are examples of incorporation à la Baker (1988) or are derived from different syntactic/morphological/lexical processes, such as conversion or zero-suffixation (Hale & Keyser 1993; Fabrizio 2013). Albeit being extremely interesting, this discussion is beyond the scope of this work.

An example of a verb entailing a SI is *spazzolare* ‘to brush’, which semantically incorporates the Instrument *spazzola* ‘brush’ (25). Therefore, SI are always interpreted as a single instrumental lexical item, e.g. for the sentence *Maria martella il muro* ‘Maria hammers the wall’, the only possible interpretation is that she is doing it with a hammer (hence, the SI is interpreted as a single lexical item).

- (25) *Spazzolare* ‘to brush’  
 ⇒ INST: {*spazzola* ‘brush’}

Other examples of verbs entailing SI (henceforth, shadow-verbs) in Italian are *telefonare* ‘to phone’ (INST: {*telefono* ‘phone’}), *pettinare* ‘to comb’ (INST: {*pettine* ‘comb’}), *pugnalare* ‘to stab’ (INST: {*pugnale* ‘dagger’}), etc.

Since SI are uninformative with respect to the verb, they must be omitted in the surface structure, as shadow arguments must be (Pustejovsky 1995; Ježek 2017), in order to avoid redundancy: this is the Non-Redundancy Constraint (Fabrizio 2013).

- (26) a. *Sara spazzola suo fratello*  
 ‘Sara brushes her brother’s hair’  
 b. ??*Sara spazzola suo fratello con la spazzola*  
 ‘??Sara brushes her brother’s hair with the brush’  
 c. *Sara spazzola suo fratello con la spazzola che ha comprato ieri*  
 ‘Sara brushes her brother’s hair with the brush that she bought yesterday’

The comparison between (26a) and (26b) clearly shows that the acceptability of the latter is degraded. However, (26c) is acceptable: Shadow Instruments can be syntactically realized when they are modified, since only through modification they become informative with respect to the verb again.

#### 4.1.2. Default Instruments

Default Instruments (DI) – as default arguments – are selected by the verb and consist of a restricted and semantically coherent class of entities, as in (27):

- (27) *Tagliare* ‘to cut’  
 ⇒ INST: {*cutting\_objects*}

Other examples of verbs entailing DI (henceforth, default-verbs) are *sparare* ‘to shoot’ (INST: {firearms}), *bucare* ‘to pierce’ (INST: {piercing\_ objects}), *vestire* ‘to dress’ (INST: {clothes}), etc.

When referring to the entire class of entities, DI are uninformative with respect to the verb and maximally recoverable from its meaning alone; therefore, they are usually omitted. Default arguments are syntactically realized only when the speaker wants to refer to a single instance of the class, since only in that case they are informative with respect to the verb. Consider the examples in (28), for the verb *mangiare* ‘to eat’, whose default object is the class {food}. (28a) is perfectly fine: the default object is omitted, and interpreted as the whole class of entities, while (28b) is weird, because the syntactically realized object is redundant. (28c) is acceptable, since the speaker refers to a single instance of the class, making the default object informative:

- (28) a. *Ieri ho mangiato \_*  
           ‘Yesterday I ate \_’  
           ⇒ OBJ: {food}
- b. *??Ieri ho mangiato cibo*  
           ‘Yesterday I ate food’
- c. *Ieri ho mangiato la pizza*  
           ‘Yesterday I ate pizza’

On the contrary, DI are often shadowed (i.e. interpreted as a single instrumental lexical item, like SI) by the co-combination of the verb and its internal complement, as in (29). As a consequence, DI are omitted more often than, for instance, default objects.

- (29) a. *Tagliare le verdure*  
           ‘To chop the vegetables’  
           ⇒ INST: {coltello ‘knife’}
- b. *Tagliare il prato*  
           ‘To cut the lawn’  
           ⇒ INST: {tagliaerba ‘lawn mower’}
- c. *Tagliare i capelli*  
           ‘To cut someone’s hair’  
           ⇒ INST: {forbici ‘scissors’}

DI are slightly more informative than SI with respect to the verb meaning; however, they are still highly retrievable (i) from the verb alone,

which usually selects for a semantically coherent narrow class of entities, and (ii) from the direct object combined with the verb.

#### 4.1.3. Open Instruments

In Pustejovsky's words (1995), true arguments encode grammatically relevant participants, but not inherent properties of the verb; they must be syntactically realized in order for the verb meaning to be complete and for the verb to be interpreted.

As for Instruments, the third class is that of Open Instruments (OI) – instead of “True” – because OI, unlike true arguments, are still syntactically optional;<sup>171</sup> this label highlights the fact that OI are unrecoverable from the verb meaning alone – which usually selects for a broad (and not always semantically coherent) class of entities (30) – without entailing their syntactic obligatoriness.

- (30) *Rompere* ‘to break’  
 ⇒ INST: {*martello* ‘hammer’, *palla* ‘ball’, *mazza* ‘bat’, etc.}

Other examples of verbs that entail OI (henceforth, open-verbs) are *andare* ‘to go’, *distruggere* ‘to destroy’, *sporcare* ‘to dirty’, etc.

In some cases, OI can be recovered via pragmatic factors, such as the speakers' background knowledge. Compare (31a) with (31b):

- (31) a. *Marta ha distrutto la parete*  
 ‘Marta destroyed the wall’  
 ⇒ INST: {*martello* ‘hammer’, *dinamite* ‘dynamite’, *fuoco* ‘fire’, etc.}  
 b. *Marta è andata a Parigi*  
 ‘Marta went to Paris’  
 ⇒ INST: {*aereo* ‘airplane’, *treno* ‘train’, *auto* ‘car’, etc.}

In (31a), the OI is unrecoverable when syntactically omitted. In (31b), if the listener knows the starting point of Marta's trip, the range of possible Instruments narrows down: for instance, if Marta went to Paris from Dourdon, then she is likely to have used the train or a car. If she went to Paris from Cape Town, then airplane is the likeliest Instrument.

<sup>171</sup> Such property is consistent with their syntactically being secondary complements.

OI are more informative with respect to the verb – and less recoverable from its meaning alone – than SI and DI, and therefore more likely to be syntactically realized.

## 4.2. Relating semantics and syntax: the pattern of omission of Instruments

In the previous section, three classes of Instruments were identified:

- (i) SI are uninformative with respect to the verb and maximally recoverable from its meaning; they must be omitted unless they are further modified.
- (ii) DI are recoverable from the verb meaning – and uninformative – when the speakers refer to the entire class of entities, and thus omitted; unlike default arguments, they are also omitted when shadowed by the co-combination of the verb and the direct object.
- (iii) OI are maximally informative with respect to the verb and minimally recoverable from its meaning. They tend to be more often syntactically realized.

Hence, we have:

<b>Semantic recoverability:</b>	Shadow	>	Default	>	Open
	↓				
<b>Syntactic omission:</b>	Shadow	>	Default	>	Open

Omission of Instruments is principled; namely, it is ruled by semantic recoverability, as it happens for object drop; the more an Instrument is recoverable from the verb meaning, the more it is syntactically omitted. In addition, Instruments tend to be more frequently recoverable from the verb meaning than, e.g. direct objects, in that, for instance, DI can be shadowed by the co-composition between the verb and its internal argument, as in (29), and pragmatic factors can contribute to ease the recoverability of OI, as in (31b).

If Instruments are only produced when they are not recoverable from the verb meaning, we expect them to be rarely syntactically realized and to be produced more often in co-occurrence with open-verbs than with shadow- and default-verbs. Finally, we expect them to co-occur with shadow- and default-verbs only under specific circumstances, i.e. when they are not recoverable. For instance, we expect them to co-occur with shadow-verbs when they are

modified and to co-occur with default-verbs when the speakers want to refer to a single Instrument of the selected class, as long as it is not shadowed by the co-composition of the verb and its internal argument.

## 5. Corpus analysis

A comprehensive corpus analysis of Italian spontaneous speech was performed in order to investigate the pattern of production/omission of Instruments as well as to investigate the validity of our proposal; therefore, we focused on (i) the relative frequencies of occurrence of the inst-cl and the inst-PP among adult speakers; (ii) which verbs they co-occur with.

### 5.1. Selection of corpora and methodology

Three spoken corpora of Italian were analysed:

- **Lessico di frequenza dell’italiano parlato (LIP, DeMauro *et al.* 1993, VOLIP Alfano *et al.* 2014)**: only the sub-corpora containing spontaneous speech (conversations, phone conversations, debates, etc.) were considered. For the clitic pronoun *ci*, 1.683 utterances were analysed, 2.378 occurrences were manually classified depending on their function; for the *con*-PP, 932 utterances were analysed, 1.182 occurrences were manually classified depending on their function.
- **KIP (Mauri *et al.* 2019)**: only three types of texts were considered (i.e. conversations, semi-structured interviews and meetings between students and professors). For the clitic pronoun *ci*, 87 texts were analysed, 3.838 occurrences were manually classified depending on their function; for the *con*-PP, 88 texts were analysed, and 1.688 occurrences were manually classified depending on their function.
- **ParlaTO (Cerruti & Ballarè 2021)**: all the semi-structured interviews were considered. For the clitic pronoun *ci*, 49 texts were analysed, 5.265 occurrences were manually classified depending on their function; for the *con*-PP, 50 texts were analysed, 1.454 occurrences were manually classified depending on their function.

A total of 11.481 occurrences of the clitic *ci* and 4322 of the *con*-PP were found in the corpora and considered for the present analysis. Ten functions of the clitic pronoun were considered: (i) accusative (first person plural);

(ii) dative (first person plural); (iii) inflected forms of the verb *esserci* ‘to be there’; (iv) locative; (v) instrumental; (vi) comitative; (vii) inflected forms of the verb *averci* ‘to have’; (viii) complex verbs (where the clitic only has an intensifying function, but no meaning); (ix) reflexive/reciprocal; (x) clitic cluster *ci si*.

For the *con*-PP, on the contrary, the range of functions is narrower. *Con*-PPs cover less functions than the clitic *ci* in Italian. The main functions of *con*-PPs, in Italian, are comitative, manner and causal. We did not consider the causal function of *con*-PPs as a separate function in the classification, as it was outside of the scope of our work. Although a more fine-grained classification of *con*-PPs would be possible, the presence of idiosyncrasies in their use in Italian would have made it extremely difficult to elaborate such a classification. We therefore decided to maintain the categorization simple in order to focus on the inst-PP and avoid as many uncertainties as possible. Three functions are considered: (i) instrumental; (ii) comitative; (iii) modal; the occurrences that do not fall into either of these classes are coded as (iv) others.

## 5.2. Results

### 5.2.1. Frequencies of occurrence

In the LIP corpus, the inst-cl only represents the 0.38% of the total; in the KIP the 0.52% and in the ParlaTO the 0.53%; considering all the corpora, the inst-cl counts 57 occurrences out of 11.481 (Table 1). Concerning the *con*-PP, the frequencies of occurrence of its instrumental function are higher: the inst-PP represents the 7.58% of the total in the LIP corpus, the 5.63% in the KIP and the 6.19% in the ParlaTO, with 275 occurrences out of 4.322 considering all the corpora (Table 1).

Table 1. Absolute and relative (%) frequencies of the inst-cl and the inst-PP, in LIP, KIP, ParlaTO.

Corpora	inst-cl (absolute)	inst-cl (%)	inst-PP (absolute)	inst-PP (%)
LIP	9/2378	0.38	90/1182	7.58
KIP	20/3838	0.52	95/1686	5.63
ParlaTO	28/5265	0.53	90/1454	6.19
All corpora	57/11841	0.50	275/4322	6.36

Figure 1 shows that the instrumental function of the clitic pronoun *ci* is the least produced of all the functions considered. Figure 2 shows that the instrumental function of the *con*-PP – despite counting more occurrences than the *inst-cl* (s. Table 1) – is far from being frequently produced, when compared with the main other functions of the *con*-PP.

Figure 1. Frequency (%) of occurrence of the clitic pronoun *ci*, functions (i-x), all corpora.

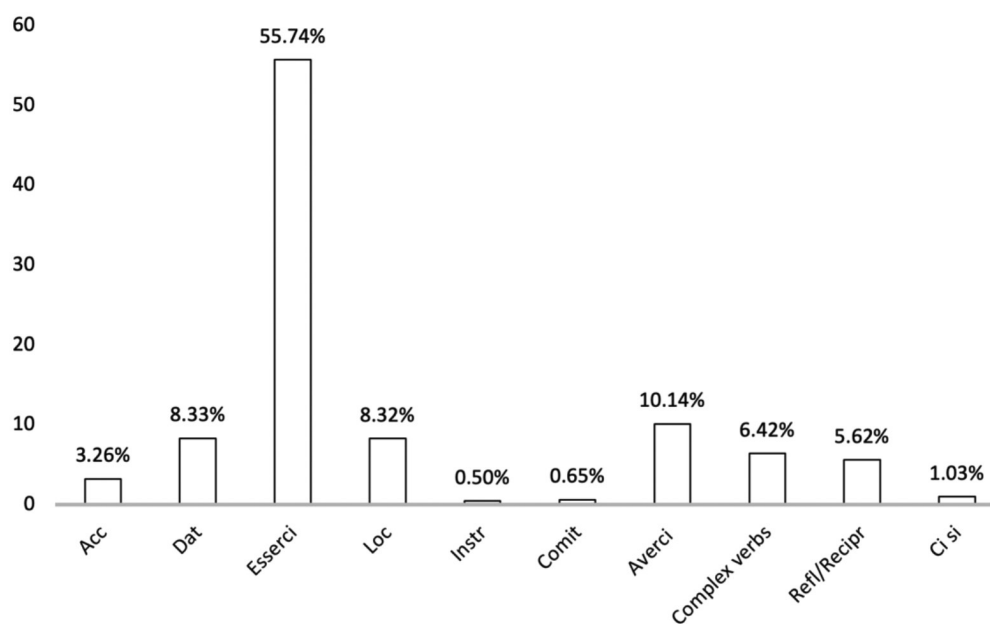
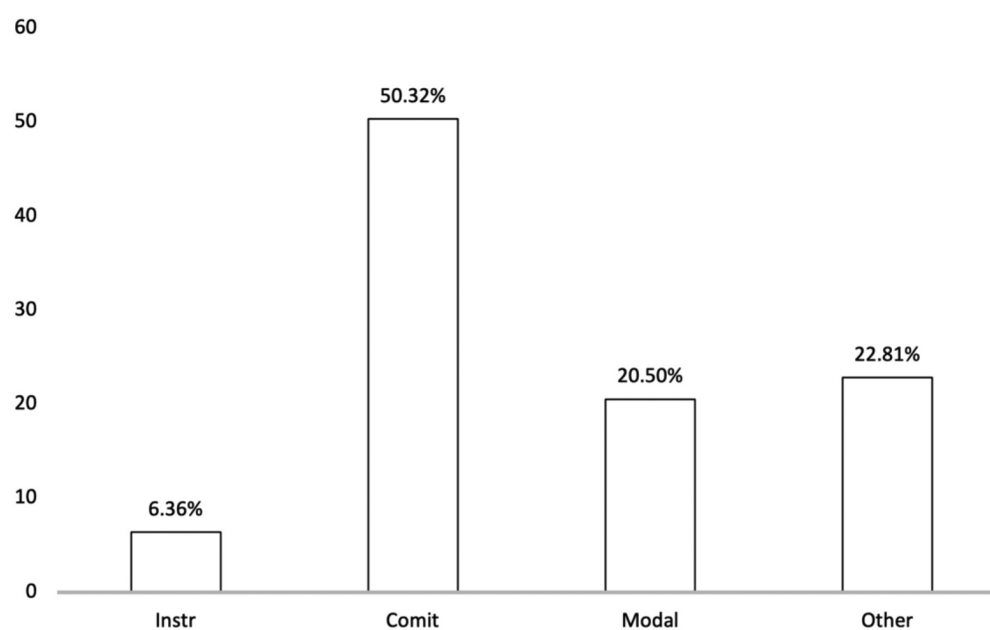


Figure 2. Frequency (%) of occurrence of the *con*-PP, functions (i-iv), all corpora.



The corpus analysis revealed that in spontaneous speech, both the inst-cl and the inst-PP are scarcely produced, with the inst-PP being more produced than the clitic; such data are consistent with our first prediction, i.e. Instruments are often recoverable from the verb alone and therefore omitted. A complete list of all the verbs that co-occur with inst-PPs and inst-cl is found in the Appendix with the total occurrences of each verb in the corpora.<sup>172</sup>

### 5.2.2. Types of verbs that co-occur with Instruments

Information about which types of verbs (shadow-, default- or open-) Instruments tend to co-occur with is useful to have a better insight on their pattern of production/omission.

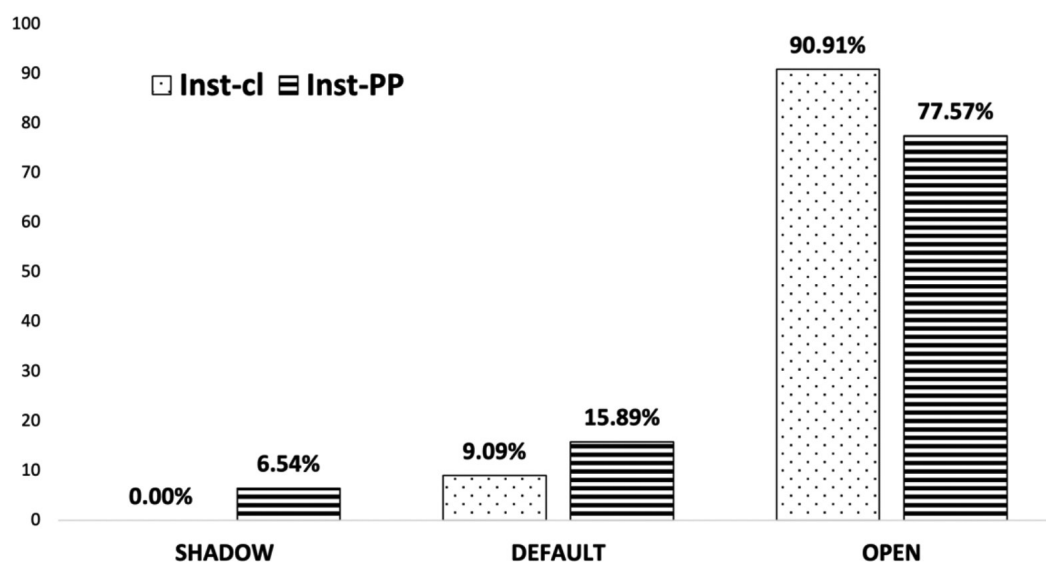
The inst-cl – which counts 57/11.481 occurrences – co-occurs with 10 different verbs; one out of 10 is a default-verb (*scrivere* ‘to write’), nine are open-verbs (e.g. *creare* ‘to create’, *giocare* ‘to play’, *costruire* ‘to build’, etc.), and zero co-occurrences with shadow-verbs are found.

The inst-PP – which counts 275/4.322 occurrences – co-occurs with a wider range of verbs, i.e. 107 different verbs: of these, 7 are shadow-verbs (e.g. *stampare* ‘to print’, *avvelenare* ‘to poison’, *telefonare* ‘to phone’), 17 are default-verbs (e.g. *scrivere* ‘to write’, *mangiare* ‘to eat’, *pescare* ‘to fish, etc.’) and 83 are open-verbs (e.g. *uccidere* ‘to kill’, *distruggere* ‘to destroy’, *aprire* ‘to open’, etc.). Figure 3 shows the percentages of co-occurrence with such verbs:

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<sup>172</sup> If it is conceivable to hypothesize that inst-PPs/inst-cl are rarely produced because the verbs that entail them are less frequent than the verbs that entail, for instance, a locative or comitative argument/adjunct, the list in the Appendix shows that this is not the case. For instance, among the verbs that most frequently co-occur with an Instrument, *fare* ‘to do’ (13613 occurrences), *andare* ‘to go’ (7385 occurrences), and *venire* ‘to come’ (7385 occurrences) are found. Crucially, *andare* and *venire* require a locative argument.

Figure 3. Frequency (%) of co-occurrence of shadow-, default-, open-verbs with inst-cl and inst-PP, all corpora.



As Figure 3 shows, both the inst-cl and the inst-PP tend to co-occur more frequently with open-verbs than with shadow- and default-verbs: indeed, consistently with our proposal, they are more informative (and not redundant) with respect to open-verbs than they are with respect to shadow- and default-verbs.

### 5.2.3. Instruments co-occurring with shadow- and default-verbs: special circumstances

In order to provide a better insight of the production/omission pattern of Instruments in Italian, the cases where inst-PP and inst-cl co-occur with shadow-, default-, and open-verbs must be investigated in detail. This analysis is necessary for two reasons: on the one hand, not taking into consideration the frequency of occurrence of shadow-, default- and open-verbs (as in Figure 3) within the three corpora does not provide an exhaustive picture of the instrument distribution; on the other hand, looking at the raw proportion of co-occurrence of an inst-PP/cl with a verb relative to the total occurrences of that verb may be misleading. See Table 2 and Table 3, where these proportions are shown for the inst-PP and the inst-cl, respectively.<sup>173</sup>

<sup>173</sup> As stated in section 2.2, ‘inst-PP’ and ‘inst-cl’ refer to *con*-PPs and the clitic pronoun *ci* when they are used in their instrumental function.

In Tables 2 and 3, the column “Total occurrences of the verbs” refers to the total occurrences of the verbs with which inst-PPs and inst-cl co-occur, not to all verbs in the corpora.

Table 2. Proportion co-occurrence with an inst-PP/total occurrences, for shadow-, default-, open-verbs, all corpora.

Verb type	Number of verbs (lexemes)	Co-occurrence with an inst-PP (occurrences)	Total occurrences of the verbs	Proportion of co-occurrence/total occurrences
<i>Shadow-verbs</i>	7	11	412	0.027
<i>Default-verbs</i>	17	35	4736	0.007
<i>Open-verbs</i>	83	229	48138	0.005
<i>Total</i>	107	275	53283	0.005

Table 3. Proportion co-occurrence with an inst-cl/total occurrences for shadow-, default-, open-verbs, all corpora.

Verb type	Number of verbs (lexemes)	Co-occurrence with an inst-cl (occurrences)	Total occurrences of the verbs	Proportion of co-occurrence/total occurrences
<i>Shadow-verbs</i>	0	---	---	---
<i>Default-verbs</i>	1	1	897	0.001
<i>Open-verbs</i>	10	56	16770	0.003
<i>Total</i>	11	57	17667	0.003

As suggested above, Table 2 and Table 3 provide relevant information about the production/omission of Instruments: they show that Instruments (both inst-PPs and inst-cl) rarely co-occur with open-verbs, too. Indeed, the co-occurrence with Instruments represents a small fraction of the total occurrences of such verbs (0.005 for inst-PPs, 0.003 for the clitic). This is consistent with our proposal, since – as shown in (31b) – OI can be made recoverable by pragmatic factors, i.e. by both the linguistic and the extra-linguistic context. Looking at the proportion of co-occurrence with the inst-cl relative to the total occurrences of the verbs shown in Table 3, the distribution of the inst-cl is also consistent with our proposal, i.e. open-verbs occur with the inst-clitic more frequently (0.003) than shadow- (0 occurrences) and default-verbs (0.001) do.

However, looking at the same proportion in Table 2, one could conclude that actually shadow-verbs tend to co-occur more frequently with inst-PP (0.027) than default- (0.007), and default-, in turn, more often than open-verbs (0.005). This is why the raw proportion may be misleading, if not complemented by additional data on the circumstances where the inst-PP co-occur with the three types of verbs.

The core of our hypothesis is that Instruments are not syntactically realized unless they are informative with respect to the verb, i.e. when they are not recoverable from the verb alone. Indeed, a generalization can be made about the conditions that allow the production of inst-PP with shadow- and default-verbs, which do not exclude each other. Inst-PP can be syntactically realized:

- i. with shadow-verbs if they are modified;
- ii. with shadow- and default-verbs when they are atypical, i.e. they do not realize the (class of) Instrument(s) selected by the verb;
- iii. with shadow- and default-verbs when the context is pragmatically marked, e.g. with irony, contrastive focus, etc.
- iv. with default-verbs when one wants to mention a single element of the entire class selected by the verb (with the Instrument not being shadowed by the verb+internal complement).

The circumstances in (i-iv) decrease the recoverability of Instruments making their syntactic realization necessary. Let us now see some examples taken from the corpora (32):

- (32) a. *Sai la sera che mi ero **avvelenata con la pizza marcita*** (KIP, convers. id: BOA3004)  
 ‘You know, the evening when I poisoned myself with the rotten pizza’  
*Avvelenare* ‘to poison’ – Shadow (INST: {*veleno* ‘poison’})
- b. *Ha **murato la porta con assi e chiodi*** (KIP, convers. id: TOD2002)  
 ‘He bricked up the door with boards and nails’  
*Murare* ‘to wall/brick up’ – Shadow (INST: {*muro* ‘wall’})
- c. *Sì che puoi **scrivere con la mano*** (KIP, convers. id: TOA1005)  
 ‘Yes, of course you can write with your hand’  
*Scrivere* ‘to write’ – Default
- d. *Insomma **giocavamo non so con mh ...***  
*Con i pattini con la bicicletta* (KIP, convers. id: TOD2012)  
 ‘Well, [we] played with I don’t know mh ... With our skates with our bicycle’  
*Giocare* ‘to play’ – Open

e. A: *Durante il cammino sentivam delle frasi che ci colpivano*

(KIP, convers. id: BOD2010)

‘During the walk we heard some sentences that impressed us’

B: *ci=creavamo delle canzoni*  
with\_them=create.IMPF.1PL some songs’

‘We used to create some songs with them’

*Creare* ‘to create’ – Open

In (32a), the inst-PP *con la pizza* ‘with the pizza’ co-occurs with a shadow-verb: it is further modified by the adjective *marcia* ‘rotten’; it is also atypical, i.e. it does not realize the Shadow Instrument selected by the verb, i.e. *veleno* ‘poison’. Moreover, the context is pragmatically marked with irony. In (32b), the inst-PP *con assi e chiodi* ‘with boards and nails’ co-occurs with a shadow-verb (*murare* ‘to brick up’) and, again, it is atypical, i.e. it is not *con il muro* ‘with the wall’, the Instrument selected by the verb. In (32c), the inst-PP *con la mano* ‘with your hand’ co-occurs with a default-verb: it realizes an atypical Instrument because one cannot usually write with their hand, and the context is pragmatically marked: the speaker is correcting a wrong presupposition of the interlocutor. In (32d) and (32e), the inst-PP and the inst-cl, respectively, co-occur with open-verbs and do not need to be modified, be atypical or occur in a pragmatically marked context, since they are unretrievable from the verb meaning alone.

The examples in (32a), (32b) and (32c) are representative of many instances of co-occurrences of inst-PP and shadow- or default-verbs found in the corpora. In Table 4, the number of modified (i), atypical (ii) or single elements of the class (iv) inst-PPs in co-occurrence with shadow- and default-verbs are reported, in order to provide a more fine-grained picture of the distribution of inst-PPs in co-occurrence with such verbs. Open-verbs are left out since no instances of circumstances (i-iv) are found for them.

Table 4. Number of atypical, modified, “single element of the class” inst-PPs for shadow-, default-verbs, all corpora.

Verb type	Modified INST	Atypical INST	Single element of the selected class (only for Default)	Proper Shadow/ Default INST	Total number of inst-PPs
<i>Shadow-verbs</i> (7)	2 (+ 1 out of 8 atypical INST are additionally modified)	8	---	1	11
<i>Default-verbs</i> (16)	(2 out of 19 single elements are additionally modified)	14	19	2	35

As can be seen in Table 4, the only proper SI which is pronounced is *lingua* ‘tongue’ for the verb *leccare* ‘to lick’: the sentence is about a cat which licks her kittens to clean them (as opposed to the necessity for the owner of the cat to clean them). Therefore, the context is slightly pragmatically marked since the speaker is correcting a wrong presupposition of their interlocutor. Consistently with our hypothesis, other inst-PPs are either atypical (8/11), e.g. for verbs like *stampare* ‘to print’, *tappare* ‘to cork’, *avvelenare* ‘to poison’, or modified (2/11), e.g. for *registrare* ‘to record’, *telefonare* ‘to phone’ (or both, e.g. 1/11 for *avvelenare* ‘to poison’).

Regarding DI, consistently with our proposal, 19/35 inst-PPs realize a single element of the class selected by the verb (and the DI is not shadowed in context), e.g. for verbs like *comprare* ‘to buy’, *pagare* ‘to pay’, *decapitare* ‘behead’; 14/35 inst-PPs are atypical, e.g. for verbs like *disegnare* ‘to draw’, *pescare* ‘to fish’, *scrivere* ‘to write’. Only 2/35 are proper DI, in that the inst-PP expresses the class of entities selected by the verb. In one case, this happens in the sentence *Lavarla con quali prodotti?* ‘Which products can I wash it with?’: the context is pragmatically marked in that it is a question. In the other case, the sentence is *Allora aveva comprato le magliette con i soldi invece di prendere i soldi ha preso le maglie* ‘So he bought the t-shirts with the money, instead of taking the money he took the t-shirts’: here, the subject of the sentence was expected to keep the money instead of buying some t-shirts with them. Thus, the amount of money is specific and was mentioned before; moreover, the speaker is highlighting that buying the t-shirts instead of keeping the money was an unexpected and surprising action.

It is now possible to present a revised version of Table 2, i.e. a more precise mean proportion of co-occurrence with inst-PP relative to the total occurrences in the corpora for the three types of verbs, excluding atypical SI and DI, as in Table 5:

Table 5. Proportion co-occurrence with an inst-PP/total occurrences for shadow-, default-, open-verbs, all corpora, revised version.

Verb type	Number of verbs (absolute)	Co-occurrence with a proper SI, DI and OI (absolute)	Total occurrences of the verbs (absolute)	Proportion of co-occurrence/total occurrences
<i>Shadow-verbs</i>	7	1	412	0.002
<i>Default-verbs</i>	17	21	4736	0.004
<i>Open-verbs</i>	83	229	48138	0.005
<i>Total</i>	107	251	53283	0.01

The predictions that stem from our proposal are confirmed by the data collected through the corpus analysis: Instruments are rarely produced because they are easily recovered from the verb meaning ( $\pm$  internal argument;  $\pm$  pragmatic factors); for the same reason, they tend to co-occur more frequently with open-verbs than they do with shadow- and default-verbs; finally, when they co-occur with shadow- and default-verbs, they do so under specific circumstances (i-iv), all of which decrease their recoverability, making their syntactic realization more likely.

Furthermore, the contexts outlined in (i-iv) explain why the inst-cl is less produced than the inst-PP: inst-cl cannot occur in such contexts. Indeed, clitics cannot be modified (the context in (i) is thus ruled out); if the Instrument is atypical or the speaker wants to mention a single element of the class selected by the verb, the full PP needs to be spelled out (ruling out the contexts in (ii) and (iv)); clitics cannot occur in pragmatically marked contexts, e.g. they cannot be focused, etc. – the context in (iii) is ruled out as well.

## 6. Conclusions

A long debate has surrounded the argument status of Instruments over the years. Nonetheless, no straightforward conclusions have been reached. The main issue, when considering Instruments is the mismatch between semantics and syntax: indeed, Instruments that are semantically required by the verb remain syntactically optional; in turn, their optionality has been used as a proof of their being adjuncts. Our study addressed both issues, which are interrelated.

First, we applied the main semantic and syntactic diagnostics for argumenthood to Instruments in Italian, in order to determine whether they are arguments, secondary complements or adjuncts; we concluded that semantically obligatory Instruments are arguments, while semantically optional Instruments are secondary participants – entailed and selected for by the verb, albeit more weakly. Syntactically, both types of Instruments are secondary participants/quasi-arguments, selected and assigned their theta-role by the verb.

We then turned to the issue of their optionality: since Instruments are not adjuncts, their omission is not random, but principled, and it is to be treated as an instance of argument omission. We claimed that it is ruled by semantic recoverability, which depends on the amount of information a verb and its arguments provide about one another. A slightly revisited version of Pustejovsky's (1995) classification of arguments was then applied to Instruments in Italian: Shadow, Default and Open Instruments were identified. The three classes differ in the amount of information they add to the amount already provided by the verb and in their recoverability from the verb meaning, i.e. Shadow Instruments are uninformative and maximally retrievable; Open Instruments are maximally informative and minimally recoverable, while Default Instruments (in isolation) occupy an intermediate position.

Afterwards, we linked semantic recoverability of these classes with the omission of Instruments, claiming that the more recoverable an Instrument is, the more it is syntactically dropped: Shadow Instruments are maximally omitted, Open Instruments are maximally likely to be produced, while Default Instruments behave more like Shadow ones in context – in that they tend to be shadowed by the co-composition of the verb and its internal argument.

Finally, we analysed three corpora of spoken Italian, in order to test our predictions about the pattern of production/omission of Instruments; our data showed that Instruments are rarely produced as both inst-PP and inst-cl (with the latter being produced less frequently than the former); that they tend to co-occur with verbs that entail Open Instruments and that they co-occur with verbs that entail Shadow and Default Instruments only under very specific circumstances, i.e. when they are not recoverable from the verb meaning. The results of the corpus analysis are consistent with our predictions.

To sum up, our proposal organically accounts for both the debated argument status of Instruments and the mismatch between semantics and syntax, providing a solid explanation for its syntactic omission which is consistent with the real linguistic datum.

## Appendix

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### Abbreviations

#	semantically anomalous sentence
*	completely ungrammatical sentence
?/??	sentences whose acceptability/grammaticality is degraded, at different degrees
DI	default instrument
INST	instrument
inst-cl	instrumental clitic
inst-PP	instrumental PP
OI	open instrument
SI	shadow instrument

### Complete list of shadow-, default- and open-verbs found in KIP, ParlaTO and LIP

If nothing is added, the verb only co-occurs with an inst-PP; otherwise, it is specified if it co-occurs /with both inst-PPs and inst-cl or with the inst-cl only.

Verb	Type	Co-occurrence with an inst-PP/inst-cl	Total occurrence
Avvelenare 'to poison'	Shadow	2	2
Leccare 'to lick'	Shadow	1	8
Murare 'to brick/wall up'	Shadow	1	4
Registrare 'to record'	Shadow	1	119
Stampare 'to print'	Shadow	3	91
Telefonare 'to phone'	Shadow	1	181
Tappare 'to cork'	Shadow	2	7
Asciugare 'to dry/wipe'	Default	1	7
Cacciare 'to hunt'	Default	1	9
Comprare 'to buy'	Default	6	304
Coprire 'to cover'	Default	3	35
Dipingere 'to paint'	Default	1	7
Disegnare 'to draw'	Default	2	51
Lavare 'to wash'	Default	3	149
Mangiare 'to eat'	Default	3	506
Osservare 'to watch/inspect'	Default	1	24
Pagare 'to pay'	Default	4	460
Parlare 'to speak/communicate'	Default	1	2034
Pescare 'to fish'	Default	2	32
Ragionare 'to think/discuss'	Default	1	26
Richiamare 'to call again/to attract'	Default	1	57
Scrivere (both inst-PP and inst-cl) 'to write'	Default	4 (3 inst-PP + 1 inst-cl)	847
Suonare 'to play an instrument, music, ...'	Default	1	187
Decapitare 'to behead'	Default	1	1
Accompagnare 'to escort'	Open	1	52
Accontentare 'to please'	Open	1	1

Affrontare 'to face'	Open	1	51
Aggiungere 'to add'	Open	2	65
Ammazzare 'to kill violently'	Open	4	60
Andare 'to go'	Open	23	7385
Angosciarsi 'to agonize'	Open	1	3
Annunciare 'to announce'	Open	1	8
Aprire 'to open'	Open	3	239
Arricchirsi 'to get rich'	Open	4	13
Arrivare 'to arrive'	Open	10	1253
Articolare 'to enunciate'	Open	1	8
Ascoltare 'to listen'	Open	2	234
Attaccare 'to attack'	Open	1	58
Attirare 'to attract/lure'	Open	1	11
Attrezzare 'to equip'	Open	1	9
Aumentare 'to increase'	Open	1	45
Battere 'to beat up'	Open	1	52
Campare (both inst-PP and inst-cl) 'to live + to economically sustain oneself'	Open	4 (1 inst-PP + 3 inst-cl)	11
Chiudere 'to close'	Open	2	231
Cogliere 'to hit'	Open	1	10
Colpire 'to hit'	Open	3	48
Combattere 'to fight'	Open	1	17
Comunicare 'to communicate'	Open	1	37
Consolare 'to cheer up'	Open	1	2
Contribuire 'to contribute'	Open	1	14
Correggere 'to correct/adjust'	Open	1	25
Costruire (both inst-PP and inst-cl) 'to build'	Open	2 (1 inst-PP + 1 inst-cl)	66
Creare (inst-cl only) 'to create'	Open	2	158
Dimostrare 'to demonstrate'	Open	2	49
Dire 'to say/to communicate'	Open	2	6325
Distruggere 'to destroy'	Open	1	24
Divertirsi 'to enjoy oneself'	Open	1	55
Entrare 'to enter'	Open	4	469

Fare (both inst-PP and inst-cl) 'to do' (this verb has a very general meaning, which is further specified by its internal complement)	Open+	60 (44 inst-PP + 16 inst-cl)	13613
Fissare 'to secure/attach/fasten'	Open	1	28
Formarsi 'to form'	Open	1	22
Giocare (both inst-PP and inst-cl) 'to play'	Open	26 (5 inst-PP + 21 inst-cl)	332
Girare 'to wander'	Open	4	312
Guadagnare (both inst-PP and inst-cl)	Open	17 (1 inst-PP + 16 inst-cl)	75
Guardare 'to look at/to watch'	Open	4	860
Imparare 'to learn'	Open	1	232
Inviare 'to send'	Open	1	34
Isolarsi 'to isolate oneself'	Open	1	20
Lavorare 'to work/to do a job'	Open	1	1283
Macchiare 'to stain'	Open	1	4
Mandare in paranoia 'to fester into paranoia'	Open	1	1
Martirizzare 'to martyr'	Open	1	1
Mettere 'to put'/metterci 'to take time'	Open	7	1725
Minacciare 'to threaten'	Open	1	3
Misurare 'to measure'	Open	1	10
Modificare 'to change/modify'	Open	1	32
Muoversi 'to move/to go somewhere'	Open	9	86
Partire 'to leave'	Open	3	554
Passare 'to go through some place'	Open	3	816
Pigliare (both inst-PP and inst-cl) 'to take' (informal)	Open	2 (1 inst-PP + 1 inst-cl)	106
Portare 'to bring/to carry'	Open	2	1027
Prendere 'to take'	Open	8	1074
Provare 'to try'	Open	1	435
Rafforzare 'to strengthen'	Open	1	4
Rapire 'to kidnap/abduct'	Open	1	6
Reggere 'to bear/carry/handle'	Open	2	4
Rendere 'to change a thing'	Open	1	94
Riempire 'to fill'	Open	1	39

Rientrare 'to enter again'	Open	1	62
Sbloccare 'to unlock'	Open	1	6
Scendere 'to go down'	Open	2	134
Seguire 'to follow'	Open	1	115
Sistemare 'to fix'	Open	1	37
Spalmare 'to spread'	Open	1	2
Spostarsi 'to move'	Open	3	281
Svuotare 'to empty'	Open	1	9
Toccare 'to touch'	Open	2	69
Tormentare 'to torment'	Open	1	1
Tornare 'to go back'	Open	1	585
Trastullarsi 'to enjoy oneself'	Open	1	1
Trattenere 'to hold/restrain'	Open	1	12
Trovare (both inst-PP and inst-cl) 'to find'	Open	3 (2 inst-PP + 1 inst-cl)	981
Uccidere 'to kill'	Open	2	41
Urtare 'to unwillingly touch/to irritate'	Open	1	3
Uscire 'to get out'	Open	2	592
Vedere 'to see/to watch'	Open	2	2238
Venire 'to come'	Open	4	1890
Vincere (inst-cl only) 'to win'	Open	3	1371
Vivere (both inst-PP and inst-cl) 'to live/here: to make a living'	Open	6	1317

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