Isogloss
Open Journal of Romance Linguistics

Received: 01-03-2024
Accepted: 25-09-2024
Published: 09-12-2024

Word- or root-derived? A semantic test for instrumental denominal verbs in Italian

Alice Suozzi
Ca' Foscari University of Venice
alice.suozzi@unive.it

Anna Cardinaletti
Ca' Foscari University of Venice
cardin@unive.it

How to cite: Suozzi, Alice & Anna Cardinaletti. 2024. Word- or root-derived? A semantic test for instrumental denominal verbs in Italian. RLLT23, eds Lisa Brunetti, Ioana Chitoran & Alexandru Mardale. Special Issue of *Isogloss. Open Journal of Romance Linguistics* 10(7)/6, 1-24.
DOI: https://doi.org/10.5565/rev/isogloss.412

Abstract

Denominal verbs, in spite of their name, can be derived from either a noun or a root. In non-morphologically transparent languages, only semantic cues help distinguish the two classes, i.e., the entailment of existence of the corresponding noun (Kiparsky 1982, 1997). In this work, we present a novel semantic test which is the first attempt at distinguishing noun-derived from root-derived Instrumental Denominal Verbs (IDV) on a purely semantic basis, overcoming the flaws observed in previous syntactic tests. By explicitly asking Italian native speakers to mention the instruments that can be used to perform the action denoted by the verb, we measured the entailment of existence through the number of instrument nouns produced and the frequency of production of the corresponding instrument noun. Our test also contained parasynthetic verbs, whose behavior was influenced by the interaction between their derivation process and their meaning.

Keywords: denominal verbs, instruments, semantics, roots, syntax.

1. Introduction

Denominal verbs (DVs) have fascinated researchers for decades. Several studies have tapped into the semantics of DVs, the word-formation processes that bring them about, and the starting point of their derivation (a.o., Adams 1973, Clark & Clark 1979, Kiparsky 1982, 1997, Kaliuščenko 2000, Arad 2003, Štekauer *et al*. 2012, Fabrizio 2013, Baeskow 2019, Van Goethem & Koutsoukos 2022). With respect to the last issue, DVs are taken to fall into two groups, i.e., DVs derived from nouns and DVs derived from roots (Kiparsky 1982, 1997; Arad 2003, 2005). Thus, the label *denominal* is just a descriptive label for these verbs, without any implication about the starting point of their derivation. In the former case, there is a direct derivational relation between V and N, while this is not the case in the latter, as both V and N are derived from one and the same root (Marantz 2000; Arad 2003, 2005). In morphologically transparent languages, such as Hebrew, both morphological and semantic cues that help distinguish noun-derived from root-derived DVs are available. In less morphologically transparent languages, like English and Italian, only semantics allows us to determine whether a DV belongs to the former kind or to the latter[1]. In particular, only noun-derived verbs entail the existence of their corresponding noun, whereas root-derived ones do not (Kiparsky 1982, 1997). In past research, this semantic criterion, known as the entailment of existence, was tested on Instrumental Denominal Verbs (IDVs), i.e., verbs whose corresponding noun serves as the instrument for the action denoted by the verb, through a syntactic diagnostic. It has been shown that only in the case of root-derived IDVs, using an instrument which is different from the incorporated one results in a grammatical sentence, whereas the same operation yields an ungrammatical sentence in the case of noun-derived IDVs.

Several critiques of such a test have been raised (Harley & Haugen 2007, Dowd 2010). We address these critiques by developing a semantic test to distinguish noun- from root-derived IDVs, applying it to Italian IDVs. The main contribution of our study is thus a more effective semantic test, which better differentiates noun- from root-derived IDVs and addresses the shortcomings of the traditional test.

The paper is structured as follows: in Section 2, we present an overview of Denominal Verbs in general (Section 2.1), focusing on their semantics and the morphological process used for their creation, and of Instrument Denominal Verbs in particular (Section 2.2). Section 3 is dedicated to the distinction between noun-based and root-based derivation. In Section 3.1, we present the cues that help determining the origin of a DV in morphologically transparent languages, while Section 3.2 focuses on the semantic criterion available for less-morphologically transparent languages, such as English and Italian. The corresponding syntactic test and its shortcomings are discussed in the same section. Section 4 is devoted to the presentation of the novel semantic test we propose. In Section 4.1, we tackle the issue of measuring the semantic entailment of existence and put forth our predictions. We then detail the materials we

[1] The expression "morphologically transparent" is used here to denote languages like Hebrew, where "word-creating morphology is mostly overt and is easily distinguishable from the root" (Arad 2003: 741) and, consequently, the distinction between word- and root-derived words "has both morphological and semantic manifestations" (Arad 2003: 739). In contrast, in "less morphologically transparent" languages, such as English and Italian, word-creating morphology may be covert, e.g., through conversion or zero-derivation. Hence, in these languages "morphological cues are not always available to determine whether a verb is derived from a noun" (Arad 2003: 755) or not.

used and the sample of participants that took part in the experiment, and we discuss the results. Some conclusions are drawn in Section 5.

2. Denominal Verbs

2.1. Semantic and morphological notes on Denominal Verbs

Denominal verbs carry a formal and a semantic relation with a noun, defined "parent" noun (Clark & Clark 1979), base noun (Gottfurcht 2008), or source noun (Michaelis & Hsiao 2021). Since DVs are not necessarily noun-derived, as we shall see in the next sections, we label the nouns *corresponding*. This label is particularly suitable because it underlines the noun-verb relationship without implying that it is derivational in nature.

From a semantic perspective, DVs denote events in which the *denotata* of their corresponding nouns participate in a non-arbitrary way (Baeskow 2019) and are generally interpreted as involving their canonical use (Kiparsky 1997). Semantic analyses of DVs have focused on how the corresponding noun meaning is related to the DV meaning and how the two interact. Various semantic classes of DVs have been identified, depending on the role that the *denotatum* of the corresponding noun plays in the event denoted by the verb (e.g., Marchand 1969, Clark & Clark 1979, Kaliuščenko 2000, Plag 1999, Gottfurcht 2008, Rimell 2012). The role played by the denotatum in turn influences the overall meaning of the verb, i.e., its event and argument structure. To illustrate, we report the semantic classes identified by Gottfurcht (2008), subsequently adapted by Michaelis & Hsiao (2021). This classification also incorporates the labels used in the classification by Clark and Clark (1979) and Plag (1999). In Table 1, "CORR." stands for corresponding.

Table 1. Main semantic classes of DVs

Verb class	Event Structure	Example	Role of the CORRESPONDING NOUN
Resultative	x causes y to become like [CORR. NOUN]	victimize, powder	Result
Similative	x acts as [CORR. NOUN]	tyrannize, nerd	Agent
Performative	x enacts [CORR. NOUN]	botanize, tango	Performance
Ornative	x causes [CORR. NOUN] to go to/from a location	rubberize, mud	Theme
Locative	x causes y to go to [CORR. NOUN]	canonize, box	Location
Instrumental	x uses [CORR. NOUN] to perform an action	notarize, hammer	Instrument

Source: Adapted from Gottfurcht (2008: 12, 100) and Michaelis & Hsiao (2021: 3)

As shown in Table 1, the corresponding nouns' *denotata* can play a variety of roles, hence the existence of numerous classes.[2] Indeed, Kiparsky (1997: 17) observes that each "verb can inherently express at most one semantic role (theme, instrument, direction, manner, path…)".

This principle is known as *Lexicalization Constraint* and has been challenged by subsequent works (e.g., Kaschak and Glenberg 2000, McIntyre 2016, Schönefeld 2018, Baeskow 2019, Michaelis & Hsiao 2021). As an instance, the verb *trash* may be both a *Resultative* verb (*to turn x into trash*), whose corresponding noun acts as the Result, and an *Ornative* verb (*to place trash into x*), whose corresponding noun plays the Theme role (Michaelis & Hsiao 2021: 3).

Furthermore, many DVs constitute exceptions to the other principle formulated by Kiparsky (1997: 482), i.e., the *Canonical Use Constraint* (cf. McIntyre 2016, Michaelis & Hsiao 2021, Van Goethem & Koutsoukos 2022). More generally, it has been observed that rigid classifications of DVs purely based on semantics are highly complicated, because of factors like "metaphoric shifts, idiosyncratic specialization, context-dependency and semantic change (Van Goethem & Koutsoukos 2022: 7)", the latter two being especially relevant in novel denominal verbs (Michaelis & Hsiao 2021). Nonetheless, we adopt the label *Instrumental* to refer to the verbs investigated in this work, i.e., verbs whose corresponding noun functions as the instrument in the event they denote. Although we acknowledge the difficulties arising from a purely semantic classification of DVs (cf. Aronoff 2007), this label is especially suited for our purposes, since the meanings of Instrumental Denominal Verbs (IDVs) are usually fairly stable and compatible with the description given in Table 1.

Let us now turn to morphology, since – as hinted at above – DVs also carry a formal relation with their corresponding nouns. Cross-linguistically, the most frequent processes used for the creation of these verbs are (i) suffixation, as in (1a); (ii) prefixation, as in (1b); (iii) parasynthesis, i.e., the simultaneous application of two separate affixes, as in (1c); (iv) conversion/zero-derivation, as in (1d) (Kaliuščenko 2000). Conversion and zero-derivation are traditionally taken to be different processes that underlie the creation of DVs and typically contrasted (Rimell 2002). Conversion is considered to be a category shift, with no (overt or covert) morphemes causing it. In zero-derivations, a covert affix is assumed to exist and to cause the change in category. English DVs (1d) are analyzed as resulting from either conversion (Bauer 1983, Plag 1999, 2003) or zero-derivation (Marchand 1969, Adams 1973, Kiparsky 1982).[3] We do not take a stance as to whether DVs like *to bottle* result from the former or the latter process, as it is beyond the scope of this work. Therefore, we lump the two word-formation processes together to signal that the underlying word-formation process could be either of them and that, more relevantly, in the DVs under investigation in this work, no overt morphemes mark the derivation.

[2] The reader should keep in mind that the one presented here is only one of the various semantic classifications put forth over the years, which differ from each other in many respects, such as the number of DV classes identified (e.g., Marchand 1969, Clark & Clark 1979, Kaliuščenko 2000, Rimell 2012). We only presented one of them, as a systematic overview of these classifications is beyond the scope of this work.

[3] For an overview of the debate, cf. Bauer (1983), Štekauer (1996), Plag (1999) and Rimell (2012).

(1) Van Goethem & Koutsoukos (2022: 7)

a. das Symbol	>	symbolisieren	(German)
‘the symbol’	>	‘to symbolize’	
b. huis	>	verhuizen	(Dutch)
‘house’	>	‘to move (house)’	
c. stof	>	afstoffen	(Dutch)
‘dust’	>	‘to dust off’	
d. bottle	>	to bottle	(English)

The strategies (i-iv) are not used in the same proportions across languages. That is, each language displays a preference for one of the word-formation processes, which is thus the most frequently used in that language to create DVs. For instance, in English, conversion/zero-derivation is the preferred process and the most frequently used to create DVs (Gottfurcht 2008).

2.2. Instrumental Denominal Verbs in Italian

This work focuses on Instrumental Denominal Verbs (IDVs) in Italian (for a typological and diachronic overview of these verbs cf. Luschützky & Rainer 2013). As hinted at by Kiparsky (1982), IDVs represent a large class in English, and the same observation holds for Italian, thus showing that the Instrument role is particularly suited to be inherently expressed by a verb. In Table 2, some examples of IDVs in Italian are displayed, with the corresponding instrument nouns:

Table 2. Some examples of IDVs in Italian and their corresponding nouns.

Verb	CORRESPONDING INSTRUMENT NOUN
avvelenare **‘to poison’**	*Veleno* ‘poison’
incatenare **‘to chain’**	*catena* ‘chain’
incollare **‘to glue’**	*colla* ‘glue’
martellare **‘to hammer’**	*martello* ‘hammer’
pettinare **‘to comb’**	*pettine* ‘comb’
segare **‘to saw’**	*sega* ‘saw’
spazzolare **‘to brush’**	*spazzola* ‘brush’

Semantically, all Italian IDVs fit into the class of Instrumental DVs proposed for English (Table 1). Indeed, the corresponding noun participates as the instrument in the event denoted by the verb, and Italian IDVs display the event structure reported in Table 1, i.e., x uses [CORR. NOUN] to perform an action[4]. Corresponding instrument

[4] Determining what an instrument is in terms of thematic roles- is far from being a trivial operation. Indeed, several authors have interrogated on the nature of this role (e.g., Schlesinger 1989; Croft 1991; Dowty 1991; Talmy 2000; Koenig et al. 2003, 2007; Rissman 2013a, 2013b;

nouns may be concrete objects, e.g., *catena* ‘chain’, *pettine* ‘comb’, *sega* ‘saw’, etc. or substances, e.g., *glue* ‘colla’, *veleno* ‘poison’ (cf. Table 2).

As for the word-formation processes involved in the creation of IDVs, two main patterns are identified, i.e., conversion/zero-derivation (Fabrizio 2013) as in (2a) and parasynthesis (Iacobini 2004) as in (2b). IDVs obtained by suffixations exist as well, although they are rarer in Italian. In (2c), the verb *bisturizzare*, which means *to extirpate*, is obtained by adding the suffix *-izz-* to the instrument noun *bisturi* ‘scalpel’.

(2)	a. martello	>	martell-are
	‘hammer	>	‘to hammer’
			N stem + verb inflectional endings
	b. colla	>	in-coll-are
	‘glue’	>	‘to glue’
			Prefix + N stem + verb inflectional endings
	c. bisturi	>	bistur-izz-are
	‘scalpel’	>	‘to extirpate’
			N stem + derivational suffix + verb inflectional endings

While it is evident that (2c) is obtained via suffixation, one could argue that also (2a) is actually an instance of suffixation. However, this is not the case as the verb endings, i.e., the thematic vowel (*-a-*) and the infinitival suffix (*-re*), are indeed inflectional and not derivational.

It is also worth mentioning that even if the parasynthetic verb *incollare* ‘to glue’ is both prefixed and suffixed with the inflectional endings, we treat both (2a) and (2b) as instances of conversion/zero-derivation, as far as the category shift (i.e., from noun to verb) is concerned, because in Italian, prefixation alone is generally understood as not triggering category shift. The issue is however not uncontroversial. See, for instance, Montermini (2008) who proposes that in the case of parasynthetic verbs, the prefix does trigger the category shift. Furthermore, languages vary in this respect (cf. Corbin (1999) for French).

Whatever the correct analysis of the verbs in (2a) and (2b) is, it is orthogonal to the issue addressed in this paper, namely whether the derivation starts from a noun or from a root. We discuss this issue in the following sections.

3. Not all Denominal Verbs are denominal

In spite of the label *denominal*, Denominal Verbs are not always derived from a noun. When approaching noun-verb pairs such as those in Table 2 and in (2), two main analyses of the noun-verb relation are available in the literature, i.e., derivational and non-derivational (e.g., Selkirk 1982, Kiparsky 1982, Marantz 2000).

Derivational analyses can have two directions: either (a) the verb is derived from a noun, i.e., it is the result of a derivational process “specifically taking a noun

Rissman et al. 2015, 2022; Rissman & Rawlins 2017; Huyghe & Wauquier 2020; Suozzi et al. 2024). A thorough overview of the semantics of this role is outside the scope of this work, but we refer the interested reader to the aforementioned studies.

as its input" (McIntyre 2016: 1412); or (b) the noun is derived from the verb (the verb thus not being denominal). In non-derivational analyses, there is not a derivational noun-verb relation as both the verb and the noun are derived from a third element, i.e., a root. The root, in turn, can be (a) category-neutral or (b) underspecified with respect to the noun or verb category, "and may thus be used in either noun-typical or verb-typical environments without any process which specifically turns it into a noun or verb" (McIntyre 2016: 1412). The options are summarized in (3):

(3) **Derivational analyses**:
a. The verb derives from a noun (direction: N > V). The verb is denominal.
b. The noun derives from a verb (direction: V > N). The verb is not denominal.

Non-derivational analyses:
The verb and the noun derive from a root, which can be:
i. Category-neutral.
ii. Underspecified between noun and verb categories.

A lively debate surrounds the nature of roots, i.e., their being either category-neutral (i) or underspecified (ii), and many arguments in favor of either proposal have been put forth (for (i): Arad 2003, Harley 2005, Borer 2014; for (ii) Farrell 2001). In this paper, we remain agnostic as to the nature of roots, and we do not expand on them any further as it is beyond our aims.

What is relevant here is that two groups of (I)DVs are identified, one which actually consists of noun-derived verbs (a), and the other that is composed of root-derived verbs, be it the root category-neutral or underspecified for category (i-ii). Furthermore, we only take into consideration derivational analyses of the type (a), i.e., we exclude cases where the noun is derived from the verb and/or the derivation is overtly visible.[5] An additional remark is in order with respect to parasynthetic verbs: in Italian, all parasynthetic IDVs are analyzed as noun-derived (Iacobini 2004, Serrano-Dolader 2015). However, in this case the label 'noun-derived' only refers to the part of speech on which the verbs are based (i.e., noun-derived as opposed to adjective- or verb-derived). Nothing has been said on their derivation in terms of roots *versus* nouns. In what follows, particular attention will be given to IDVs resulting from this morphological process.

3.1. Root- versus noun-derived verbs: morphological and semantic cues

The existence of noun-derived and root-derived DVs is evident in Semitic languages (Doron 2003, 2008, Arad 2003, 2005, Brice 2017), their "morphology being a relatively transparent system" in which the root-/noun-based derivations are visible on a surface level (Brice 2017: 162).

[5] Although verb-derived instrument nouns are outside the scope of this work, it is worth mentioning that nouns of this kind exist in Italian, which are obtained via conversion/zero derivation. To illustrate, consider the nouns *sveglia* 'alarm', *prolunga* 'extension cable' and *pressa* 'press'. *Sveglia* and *prolunga* contain verb prefixes (*s-* and *pro-*, respectively), whereas *pressa* corresponds to an old verb inflected form (i.e., a past participle). We thank an anonymous reviewer for suggesting that these nouns – since they retain the verb prefixes – are similar to cases like *misger* in Hebrew (see (5b) below).

In Hebrew (like other Semitic languages), the starting point for word-formation are tri-consonantal roots which are inserted into (noun or verb) patterns so as to create words. “The combination of roots with patterns serves a double purpose: it makes the segmental root into a pronounceable string and turns the (category-neutral) root into a noun, a verb or an adjective” (Arad 2003: 742). Each root may be inserted into different patterns, meaning that multiple words can be derived from the same root. To illustrate, in (4) examples of different words derived from the same root are provided.

(4) Hebrew, Arad (2003: 746)
Root √sgr

a. Pattern: CaCaC (v)	sagar ‘to close’
b. Pattern: hiCCiC (v)	hisgir ‘to extradite’
c. Pattern: hitCaCCe (v)	histager ‘to cocoon oneself’
d. Pattern: CeCeC (n)	seger ‘closure’
e. Pattern: CoCCayim (n)	sograyim ‘parentheses’
f. Pattern: miCCeCet (n)	misgeret ‘frame’

Exploiting “the specific morphophonological making of the language” (Arad 2003: 739) and focusing on verb morphology, Arad (2003, 2005) has unveiled that in Hebrew, root-derived and noun-derived DVs differ from each other in both form and interpretation. Let us consider (5):

(5) Hebrew, Arad (2003: 746)

a. seger	-	sagar
‘closure’	-	‘to close’
b. misgeret	>	misger
‘frame’	>	‘to frame’

In (5a), both the verb (sagar ‘to close’) and the noun (seger ‘closure’) are derived from the root √sgr, as already shown in (4a) and (4d), respectively. In (5b), the noun misgeret ‘frame’ is instead derived from the root (cf. (4f)), while the verb misger ‘to frame’ is derived from the noun itself. The noun-based derivation is visible in that the verb not only shows the consonantal root √sgr, but it also retains the nominal prefix *m-*, carried over from the nominal pattern (4f).

Let us now turn to the semantic side: root-derived verbs, and more generally root-derived words, can have different meanings (cf. (4a-c)), although they share a common semantic core inherited by the root, e.g., in (5a), the noun and the verb share the core meaning of “closing”. The meaning of noun-derived verbs is instead strictly tied to that of the noun they are derived from (cf. (5b)).

Therefore, in languages like Hebrew, root-derived verbs differ from noun-derived ones both morphologically, as only noun-derived verbs retain the nominal prefix, and semantically, as only the meaning of noun-derived verbs is strictly tied to that of their corresponding noun.

3.2. When morphology does not help: the entailment of existence

As Arad (2003) herself points out, it is not always possible to formally establish whether a verb is derived from a noun or a root. Even in Hebrew, which is a morphologically transparent language, some verbs do not morphologically display the direction of the derivation (e.g., *kis* 'pocket' – *kiyes* 'to pick-pocket'). This is the most frequent scenario in less morphologically-transparent languages, such as English and, crucially, Italian. In these languages, DVs and particularly IDVs are frequently formed via conversion/zero-derivation. As a consequence, noun-verb pairs do not carry any morphological clue as to the starting point of the derivation.

When morphological cues are absent, semantics helps distinguish between root- and noun-derived verbs (Kiparsky 1982, 1997, Arad 2003). The semantic diagnostics proposed by Kiparsky (1982, 1997) and subsequently adopted by Arad (2003), defined "entailment of existence", holds for all DVs. In a nutshell, the entailment of existence states that only noun-derived DVs entail the existence of the noun from which they are derived, whereas the same is not true for root-derived DVs. To put it differently, similarly to what happens in Hebrew noun- versus root-derived DVs, only the meaning of the former is tied to the meaning of the corresponding noun, which is – in a way – fixed within the verb (Rimell 2012).

With respect to IDVs, the actions denoted by noun-derived IDVs can only be performed with the corresponding instrument noun's *denotatum*, whereas it is possible to perform the actions denoted by root-derived IDVs with entities different from the corresponding instrument noun's *denotatum*. The entailment of existence is illustrated by the contrast in (6), taken from Kiparsky(1982):

(6) a. He hammered the nail with a rock
b. *She taped the picture to the wall with pushpins

The contrast in acceptability between (6a) and (6b) shows that it is possible to hammer something with a rock, i.e., to perform the action denoted by the verb with something different from the corresponding instrument noun's *denotatum* (*hammer*$_N$), whereas it is only possible to tape something with *tape*$_N$, i.e., with the corresponding instrument noun's *denotatum*. Contrasts in acceptability like (6) are taken to prove that *tape*$_V$ is noun-derived and *hammer*$_V$ is root-derived. This kind of contrasts has become the most widely-used diagnostics to establish whether a verb is noun- or root-derived. Its use is so widespread, and its reliability so acknowledged that noun-derived IDVs are defined as belonging to the "*tape*-type" and root-derived ones to the "*hammer*-type".

Nonetheless, this syntactic test is far from being uncontroversial (Rimell 2012). It has been observed that many factors may contribute to the difference in acceptability between sentences like (6a) and (6b), which have nothing to do with the root- *versus* noun-based derivation. First, recalling the *Canonical Use Constraint* (Kiparsky 1982), the unacceptability of sentences like (6b) may result from the choice of an instrument (i.e., *pushpins*) whose manner of use is too different from the characteristic manner of use of the corresponding instrument noun (Harley & Haugen 2007). In a similar vein, Dowd (2010) rephrased the "too different manner of use" argument, emphasizing that other aspects of the IDVs' meanings may play a role in determining the unacceptability of sentences like (6b). Specifically, *hammer*$_V$ is primarily defined by the function of its corresponding instrument noun, thus allowing instruments that differ from a

hammer$_{N}$ in form but whose function is similar to it. On the contrary, *tape*$_{V}$ is defined by its form. Hence, using an instrument noun whose form is very different results in an unacceptable sentence. Indeed, compare (6b) to (7) below:

(7) Lola taped the poster to the wall with band-aids (Harley & Haugen 2007: 9)

(7) clearly shows that the unacceptability of sentences like (6b) may result from the choice of an instrument noun which is too different from the IDV's corresponding instrument noun, either because it has a different manner of use or a different function or form.

Furthermore, many unacceptable sentences become acceptable in specific scenarios (Harley & Haugen 2007). When speakers are presented with a sentence that is unacceptable because of a "semantic anomaly", they are always able to make an interpretive effort so as to find a scenario where the sentence is acceptable. This has been pinpointed as a further drawback of using contrasts in acceptability between sentences as a diagnostic for a semantic criterion (Harley & Haugen 2007). The limitations of the syntactic test used to measure the entailment of existence have led some authors (e.g., Harley & Haugen 2007) to cast doubt upon the existence of two different classes of IDVs.

Nonetheless, since morphology-based evidence for the existence of noun-*versus* root-derived verbs is found not only in Semitic languages like Hebrew (Arad 2003, 2005), but also in unrelated languages such as Dutch (Don 2005), this distinction is taken to be universal (Marantz 2000; Arad 2003, 2005). The observed cross-linguistic variation is taken to be due to individual differences in morphology and the lexicon.

Following Marantz (2000) and Arad (2003, 2005), we claim that two classes of IDVs exist, but the *state-of-the-art* syntactic diagnostics used so far is not suited to measure the entailment of existence criterion. Since the criterion used for identifying noun- and root-derived verbs is semantic, a semantic test is more appropriate to measure the semantic entailment of existence of the corresponding instrument noun, and it allows us to overcome the shortcomings observed for the contrasts in acceptability. The semantic test we elaborated for Italian IDVs is presented in the next section.

4. How to measure the entailment of existence for Italian IDVs: The "Top 10 Instruments…" questionnaire

The first issue to tackle is how to measure the entailment of existence of each corresponding noun for Italian IDVs. In (8), we briefly recall how the entailment of existence is defined and how noun- and root-derived IDVs mainly differ from each other:

(8) **Entailment of existence**:
Only noun-derived IDVs entail the existence of the corresponding instrument noun, i.e., the action denoted by a noun-derived IDV can only be performed with the corresponding instrument noun. The action denoted by a root-derived verb can be performed with other instrument nouns.

In Section 3.2, we underlined the need for a semantic test and for a way to effectively measure the entailment of existence. To this purpose, we decided to directly ask Italian native speakers which instruments they think can be used to perform a particular action, denoted by an IDV, with the "Top 10 Instruments…" questionnaire. For each verb, we analyzed (i) the number of instrument nouns produced by the participants, with the expectation that participants would produce a lower number of instrument nouns (ideally only the corresponding instrument noun) for noun-derived than for root-derived IDVs; in addition, we expected the corresponding instrument noun to always be among the produced instrument nouns for noun-derived IDVs, while this is not necessarily true for root-derived verbs; and (ii) the frequency of production of the corresponding instrument noun, i.e., the proportion of participants who produced the corresponding instrument noun, expecting that for noun-derived IDVs, the corresponding instrument noun would be produced by all participants, whereas the frequency of production would be lower for root-derived IDVs. Taken together, (i) and (ii) measure how much a given IDV entails the existence of its corresponding instrument noun, as (i) specifically targets the number of possible semantic fillers of the instrumental slot for each IDV under investigation and (ii) taps into the likeliness of the corresponding instrument noun. To put it differently, the frequency of production tells us which instrument noun is understood to be most likely used to perform the action denoted by the verb. A summary of the two parameters considered with the corresponding expectations is provided in (9):

(9) **Parameters considered for each IDV**:
(1) Number of instrument nouns
Noun-derived IDVs < root-derived IDVs
(2) Frequency of production
Corresponding noun of noun-derived IDVs more frequently produced than corresponding noun of root-derived IDVs

4.1. Materials and participants

The "Top 10 Instruments…" questionnaire was inspired by an unpublished norming experiment on direct objects by Annie Lederer (as quoted in Resnik 1993). It was created and administered online through *Qualtrics* (https://qualtrics.com). 25 high-frequency IDVs were manually selected from the Italian *Vocabolario di Base* (De Mauro 2016). By only choosing high-frequency verbs, we wanted to make sure that every participant was familiar with them and was able to mention the corresponding instrument nouns, so as not to add any uncontrolled factors of difficulty. Some examples of the selected IDVs are illustrated in (10). The complete list of IDVs is provided in the Appendix.

(10) avvelenare 'to poison'
incollare 'to glue'
incoronare 'to crown'
pettinare 'to comb'
recintare 'to fence'
sciare 'to ski'

spazzolare ‘to brush’
telefonare ‘to phone’

Each IDV was presented in isolation and, for each one, participants were explicitly asked to name each and every instrument that they thought could be used to perform the action denoted by the verb, from a minimum of one to a maximum of ten. In Figure 1, an example of the instructions received by the participants is presented. The instructions were repeated for each IDV.

Figure 1. Example of instructions received by the participants

VERBO: MARTELLARE

Scrivi tutti gli strumenti che ti vengono in mente pensando all'azione descritta dal verbo ("Cosa si usa per martellare?"), da un minimo di 1 a un massimo di 10.

‘**VERB**: TO HAMMER’

‘Write down all the instruments that pop into your mind when you think of the action described by the verb (“What does one use to hammer? ”), from a minimum of 1 to a maximum of 10.’

It is important to highlight how the features of our test overcome the shortcomings of the traditional approach. These issues were mainly caused by (i) the conflation of semantics and syntax, and (ii) the *a priori* selection of instrument nouns that were too different from the corresponding instrument nouns of the IDVs under investigation. We address both problems by presenting each verb in isolation and by asking the speakers to provide the instrument nouns. Regarding (i), our test focuses solely on semantics, maximizing the semantic factor and avoiding confusion between semantic and syntactic perspectives. As for (ii), rather than providing predetermined instrument nouns that could influence sentence grammaticality (cf. Section 3.2), we ask speakers to supply the relevant instrument nouns themselves. This design allows us to determine whether an IDV entails the existence of its corresponding instrument noun and directly targets the entailment of existence, eliminating any potential confounding factors.

Different kinds of verbs were included in the questionnaire. For some verbs, the corresponding instrument nouns are concrete objects (e.g., *martello* ‘hammer’, *sega* ‘saw’, *pattini* ‘skates’) which are inherently instrumental, i.e., they are categorically instrumental. Other nouns instead become instrumental in the event denoted by the verb (e.g., *colore* ‘color’ for the verb *colorare* ‘to color’), i.e., their instrumental meaning is relational. Furthermore, some of them are substances (e.g., *colla* ‘glue’ and *veleno* ‘poison’). Choosing different IDVs allowed us to encompass a variety of IDVs entailing various kinds of instrument nouns, instead of only focusing on the morphological word-formation process. This, in turn, is useful to pinpoint possible semantic factors that interact with such processes. Furthermore, 10/25 verbs are parasynthetic, which give us useful insights on the nature of this word-formation process.

94 Italian native speakers took part in the experiment. Participants did not have any time limit to complete the questionnaire, which could be compiled from either laptops or smartphones. The data were subsequently manually analyzed by the researchers. Five participants were excluded from the sample because they either did not answer or provided inappropriate answers for more than four IDVs. Hence, 89 participants were considered for the data analysis.

4.2. Results

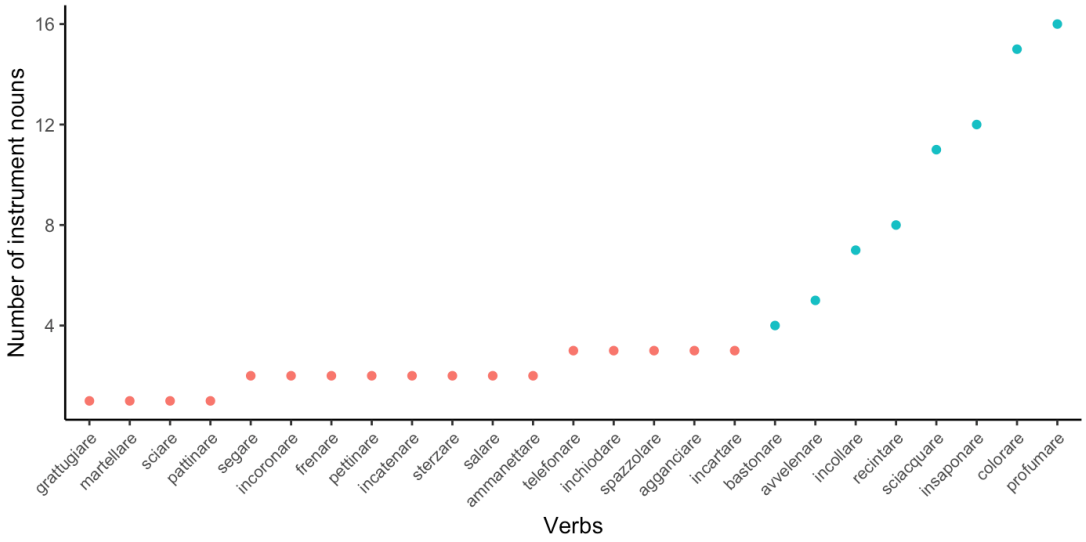
Let us start with the number of instrument nouns produced for our sample of IDVs. Based on this parameter, two groups of verbs are identified. Namely, 15/25 IDVs (Group 1) activated a low number of instrument nouns, which ranges from 1 to 3[6]; the remaining IDVs, i.e., 10/25 (Group 2) activated a high number of instrument nouns, which goes from 4 to 16. The main descriptive statistics for the two groups are reported in Table 3:

Table 3. Descriptive statistics w.r.t. the number of instrument nouns activated

	Mean (±SD)	Median	Minimum	Maximum
Group 1 (15/25)	2.06 (±0.75)	2.00	1.00	3.00
Group 2 (10/25)	9.75 (±4.46)	9.50	4.00	16.00

The number of instrument nouns activated by each verb is displayed in Figure 2. Pink markers identify IDVs that activated 1 – 3 instrument nouns, i.e., Group 1; Group 2 (4 – 16 instrument nouns) is identified by blue markers.

Figure 2. Number of instrument nouns activated by each IDV



With respect to the number of activated instrument nouns, the nonparametric Mann-Whitney U test revealed a significant difference between Group 1 and Group 2 ($W = 0$; p-value < 0.001).[7]

[6] We decided to set the threshold at three instrument nouns because for some verbs, e.g., *inchiodare* 'to nail', two instruments must be used at the same time, i.e., nails and hammer; for others, e.g., *telefonare* 'to phone', new instruments are now available, e.g., laptops or apps like Skype, Zoom, etc.

[7] Since our sample consists of both transitive and intransitive verbs, an anonymous reviewer suggested that we consider transitivity as an independent variable, so as to be sure that this factor did not influence the number of activated instrument nouns. We performed the same test, considering transitivity as a categorical variable with two levels (transitive vs.

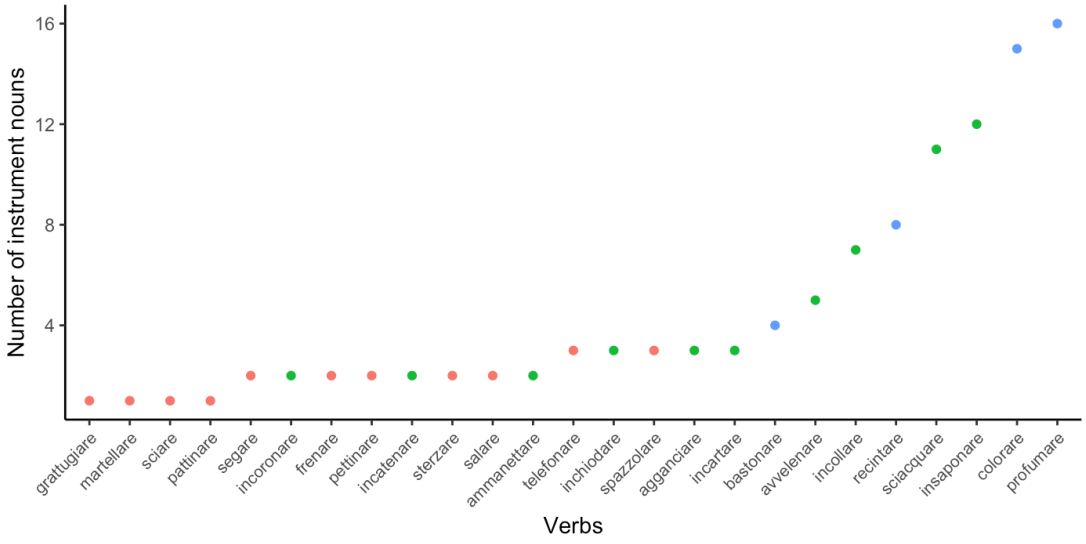
Let us now display the same results, but considering the 10 parasynthetic verbs separately, in order to better investigate their behavior with respect to the number of activated instrument nouns. In Table 3 and Figure 2, they fall either into Group 1 or Group 2. Considering them as an independent group, we end up with 11/25 verbs belonging to Group 1, 4/25 verbs belonging to Group 2, and 10/25 parasynthetic verbs. In Table 4, the main descriptive statistics for the three groups are reported:

Table 4. Descriptive statistics w.r.t. the number of instrument nouns activated, considering parasynthetic verbs as a separate group

	Mean (±SD)	**Median**	**Minimum**	**Maximum**
Group 1 (11/25)	1.81 (±0.75)	2.00	1.00	3.00
Group 2 (4/25)	10.75 (±5.73)	11.50	4.00	16.00
Parasynthetic (10/25)	5.00 (±3.77)	3.00	2.00	12.00

Figure 3 displays the number of instrument nouns activated by each verb. Pink markers identify IDVs belonging to Group 1; Group 2 (4 – 16 instrument nouns) is identified by blue markers, whereas parasynthetic verbs (2 – 12 instrument nouns) are identified by green markers.

Figure 3. Number of instrument nouns activated by each IDV, considering parasynthetic IDVs as an independent group



With respect to the number of activated instrument nouns, parasynthetic verbs – considered separately – display an intermediate behavior relative to Group 1 and Group 2 (Table 4). Figure 3 provides an even more precise picture: 6/10 parasynthetic verbs pattern with Group 1, while 4/10 pattern with Group 2. Nonetheless, parasynthetic verbs that pattern with Group 1 are among those that activate a higher

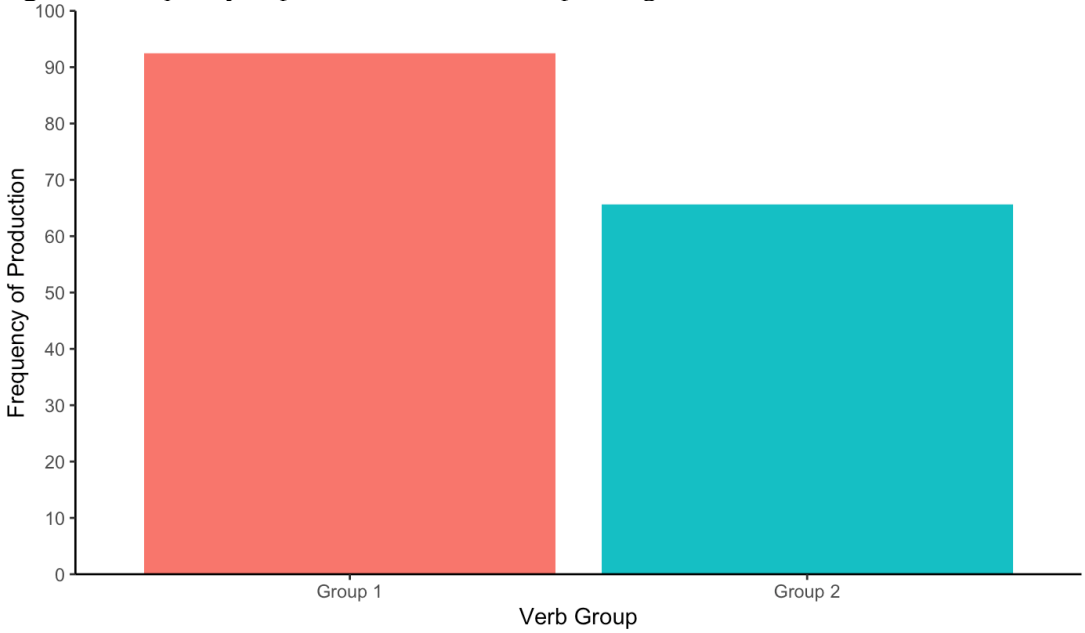
intransitive): the Mann-Whitney U test did not reveal any statistically significant difference in the number of activated instrument nouns (W = 22; p-value = 0.06).

number of instrument nouns (2 or 3). Indeed, the Kruskal-Wallis test reveals that the difference in the number of activated instrument nouns depending on the group of verbs is significant (χ^2=13.84, df = 2, p-value < 0.001), and the pairwise comparisons (Wilcoxon test, *Bonferroni* correction) show that parasynthetic verbs are more similar to Group 2 than to Group 1. Indeed, parasynthetic IDVs do not statistically differ from IDVs belonging to Group 2 (p-value = 0.162), while they significantly differ from those composing Group 1(p-value = 0.012).

Let us now turn to the frequency of production of the corresponding instrument nouns. The existence of two groups of IDVs established on the basis of the number of activated instrument nouns is confirmed. The two groups identified so far also differ with respect to the frequency of production of the corresponding instrument nouns.

For verbs of Group 1, which activated the lowest number of instrument nouns, the corresponding instrument nouns were produced by the 92.49% of the participants on average. For Group 2, which activated the highest number of instrument nouns, the corresponding instrument nouns were only produced by the 65.59% of the participants on average. This pattern is shown in Figure 4, where the same colors used in Figure 3 identify the two groups (i.e., pink = Group 1, blue = Group 2).

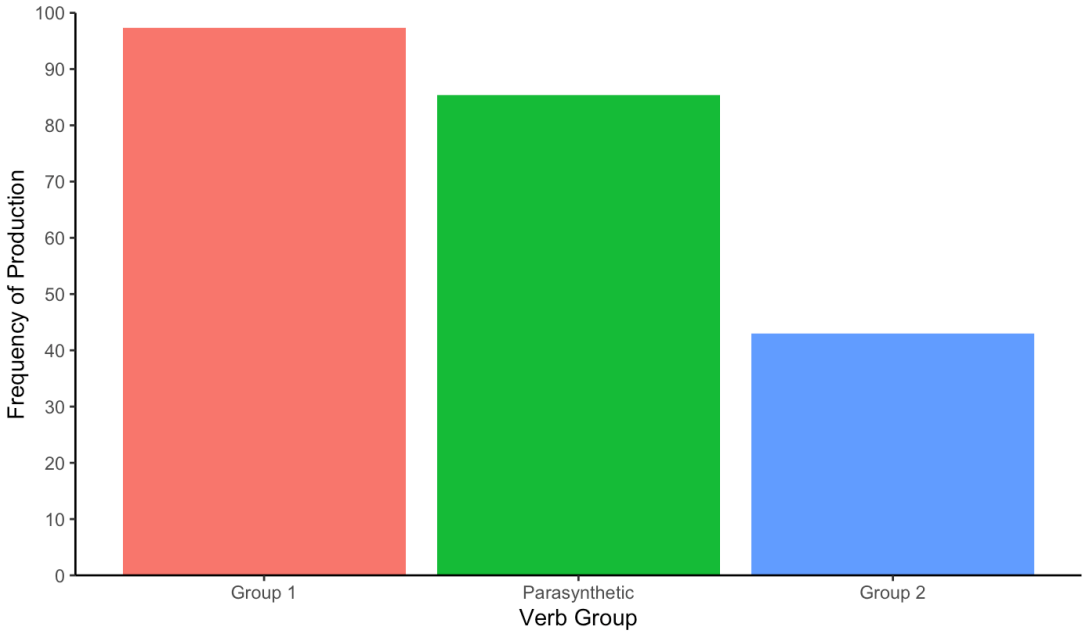
Figure 4. Frequency of production of the corresponding instrument nouns



The difference is statistically significant (Mann-Whitney U test, W = 102, p-value = 0.03), meaning that in the case of IDVs belonging to Group 1, participants significantly more frequently produced the corresponding instrument noun.

Let us now observe the behavior of parasynthetic IDVs relative to those of Group 1 and Group 2, displayed in Figure 5.

Figure 5. Frequency of production of the corresponding instrument nouns, considering parasynthetic IDVs as an independent group



Similarly to what happens with respect to the number of activated corresponding instrument nouns, for parasynthetic IDVs the corresponding instrument nouns were produced by an intermediate number of participants, on average (85.43%), relative to those produced by Group 1 (97.35%) and Group 2 (43.00%). If we consider parasynthetic IDVs as an independent class, the effect of the verb type with respect to the frequency of production of the corresponding instrument noun is on the threshold of statistical significance (Kruskal Wallis test, χ^2=6.16, df = 2, p-value = 0.05).

To complement the data presented so far, in Table 5 we provide some examples of IDVs belonging to Group 1, Group 2, and of some parasynthetic verbs that pattern with either group, together with the instrument nouns they activated and their frequencies of production.[8]

[8] An anonymous reviewer observes that polysemy could influence the participants' responses given that the verb's meaning is not clarified by a complement in the instructions (cf. figure 1) and provides the example of *sterzare*, which has a literal 'to steer' and a figurative meaning 'to swerve'. Polysemy did not seem to influence the participants' responses. No instrument noun produced by the participants was associated to/activated by a possible non-literal sense of the IDVs that constitute our sample.

Table 5. Examples of IDVs and the instrument nouns they activated.

	Verb	Corresponding instrument noun	Activated instrument nouns
Group 1	grattugiare ‘to grate’	grattugia ‘grater’	grattugia ‘grater’ (100%)
	martellare ‘to hammer’	martello ‘hammer’	martello ‘hammer’ (100%)
	spazzolare ‘to brush’	spazzola ‘brush’	spazzola ‘brush’ (100%) pettine ‘comb’ (72%) spazzolino ‘toothbrush’ (33%)
Group 2	colorare ‘to color’	colore ‘color’ (0%)	pastelli ‘crayons’ (70.6%) pennelli ‘paint-brushes’ (70.6%) pennarelli ‘markers’ (52.9%) acquerelli ‘watercolors’ (47%) tempere ‘tempera’ (41.1%) matita ‘pencil’ (23.5%) penne ‘pens’ (17.6%) evidenziatore ‘highlighter’ (5.8%) etc.
	recintare ‘to fence’	recinto ‘fence’ (0%)	staccionata ‘fence’ (66.6%) rete ‘net’ (38.8%) filo spinato ‘barbed wire’ (27.7%) siepe ‘hedge’ (17.6%) transenne ‘hurdles’ (11.1%) corda ‘rope’ (11.1%) muro ‘wall’ (11.1%) nastro ‘ribbon’ (5%)
Parasynthetic IDVs (patterning with Group 1)	incatenare ‘to chain’	catena ‘chain’	catena ‘chain’ (94%) lucchetto ‘lock’ (40%)
	ammanettare ‘to handcuff’	manette ‘handcuff’	manette ‘handcuff’ (100%) corda ‘rope’ (33.3%)
Parasynthetic IDVs (patterning with Group 2)	avvelenare ‘to poison’	veleno ‘poison’	veleno ‘poison’ (94%) cibo ‘food’ (12.5%) medicine ‘medications’ (12.5%) funghi ‘fungi’ (6.2%) siringa ‘syringe’ (6.2%)
	incollare ‘to glue’	colla ‘glue’	colla ‘glue’ (100%) scotch ‘tape’ (40%) resina ‘resin’ (8%) mastice ‘sealant’ (8%) albume ‘egg white’ (4%) pennello ‘paintbrush’ (4%) patafix (4%)

It should be noted that for 11/15 IDVs belonging to Group 1, the corresponding instrument noun was produced by the 100% of the participants and listed as the first instrument by each of them. Even for verbs like *spazzolare* ‘to brush’, which activated more than one instrument noun, the corresponding instrument noun *spazzola* ‘brush’ is the most frequently produced by the participants (100%). On the contrary, not only verbs of Group 2 activate a higher number of instrument nouns, but the corresponding instrument nouns do also not reach the highest frequency of production and in two cases, reported in Table 5, they were not produced by any participant (0%).

4.3. Discussion

The semantic test "The top 10 instruments…" identifies two main classes of IDVs in Italian, whose behavior differs in terms of both the number of instrument nouns activated and the frequency of production of their corresponding instrument nouns. That is, they differ in the entailment of existence of their corresponding instrument nouns.

We suggest that the two classes identified by the semantic test correspond to noun-derived and root-derived IDVs, respectively. Group 1 activated a low number of instrument nouns, and the corresponding nouns were always produced as the first instrument. Hence, these verbs strongly entail the existence of their corresponding instrument nouns: we interpret them as being noun-derived. Examples of these verbs are: *grattugiare* 'to grate', *incatenare* 'to chain', *martellare* 'to hammer', *sciare* 'to ski', *segare* 'to saw', etc.

Group 2 activated a high number of instrument nouns, and the corresponding nouns are not frequently nor necessarily produced. These verbs, which are *colorare* 'to color', *profumare* 'to perfume', *recintare* 'to fence' and *bastonare* 'to bat', do not necessarily entail the existence of the corresponding nouns and can be taken to be derived from a root. With these verbs, the apparently incorporated noun was never pronounced as the first instrument and – interestingly – for *colorare* 'to color' and *recintare* 'to fence', the nouns *colore* 'color' and *recinto* 'fence' were not produced at all.

Among the verbs that constitute our experimental sample, 10 are parasynthetic IDVs. These verbs pattern with either noun-derived or root-derived IDVs, although they are in general more similar to the latter than to the former. Furthermore, considering them as a separate group revealed that they activated an intermediate number of instrument nouns with an intermediate frequency of production of their corresponding nouns, albeit their corresponding instrument noun being often the most frequently produced. Hence, the issue arises as how to classify these verbs with respect to the noun- versus root-based derivation.

Parasynthetic IDVs that pattern with root-derived IDVs (Group 2) are reported in (11):

(11) avvelenare 'to poison' (< veleno 'poison')
incollare 'to glue' (< colla 'glue')
insaponare 'to soap' (< sapone 'soap')
sciacquare 'to rinse' (< acqua 'water')

The remaining six parasynthetic IDVs, reported in (12), pattern with noun-derived verbs.

(12) agganciare 'to hook' (< gancio 'hook')
ammanettare 'to handcuff' (< manette 'handcuffs')
incartare 'to wrap' (< carta 'paper')
incatenare 'to chain' (< catena 'chain')
inchiodare 'to nail' (< chiodo 'nail')
incoronare 'to crown' (< corona 'crown')

The comparison of (11) and (12) may suggest a possible explanation for the peculiar behavior of parasynthetic IDVs, as their behavior is not clear-cut and unexpected within a binary classification such as that of root- versus noun-derived IDVs. Indeed, the fact that they do not neatly pattern with either root- or noun-derived verbs may be due to some aspects of their meaning that interact with their derivation process and/or affect the outcome of our semantic test.

The corresponding instrument nouns of all the verbs in (11) denote substances, which can be found in different objects: precisely these objects were produced as instrument nouns. As an example, the corresponding noun of $poison_V$ is $poison_N$, which can be found within *food*, *medications*, *mushrooms* and can be administered with a *syringe*. These are the instrument nouns which were produced for the verb *avvelenare* 'to poison'. The same goes for the other parasynthetic verbs which pattern with root-derived IDVs. Crucially, the same pattern is observed for the verb *profumare* 'to perfume', whose corresponding noun is a substance: the instrument nouns produced by participants for this verb are the objects that serve to contain and/or diffuse the substance. On the contrary, the corresponding instrument nouns of parasynthetic IDVs that pattern with noun-derived ones denote concrete individual objects (e.g., *manette* 'handcuffs', *catena* 'chain', etc.). We interpret this variation in the behavior of parasynthetic IDVs as caused by the interaction between their derivations and the meaning of their corresponding nouns (this is also consistent with data collected on DVs in other languages, such as in Portuguese; cf. Rodrigues Soares 2009). Crucially, the *denotata* of the corresponding instrument nouns may also play a role for verbs like *colorare* 'to color' or *recintare* 'to fence'. In the former case, the corresponding noun primarily denotes a property (hence, as mentioned above, its instrumental role is relational and not categorial). In the latter, the corresponding noun is can denote the fence as well as the territory delimited by the fence itself.

5. Conclusions

In this work, we proposed a novel semantic test aimed at distinguishing noun-derived from root-derived IDVs. After briefly introducing the notion of Denominal Verbs and the main word-formation processes for their creation, we turned to the starting point of their creation, i.e., nouns versus roots.

The main criterion formulated to distinguish noun-derived from root-derived Denominal Verbs in absence of morphological cues was discussed, i.e., the entailment of existence. Subsequently, the main shortcomings of the syntactic test traditionally used to measure the entailment of existence were overviewed and, focusing on Instrumental Denominal Verbs in Italian, we presented our novel semantic test (i.e., the "Top 10 Instruments…" questionnaire), which is the first attempt at identifying noun- and root-derived IDVs on a purely semantic basis. Through this test, aimed at semantically assessing the entailment of existence, we identified two classes of IDVs in Italian: (a) noun-derived IDVs, which entail the existence of their corresponding nouns, and (b) root-derived IDVs, which do not necessarily entail the existence of their corresponding nouns. Furthermore, we observed that parasynthetic IDVs do not neatly pattern with noun-derived nor with root-derived IDVs, apparently constituting an intermediate class, which was not previously identified nor expected in the literature. We interpreted their peculiar behavior as the result of the interaction between their

derivational process and their meaning, something which should be further investigated in the future.

The semantic test proposed in this work directly tests the semantic entailment of existence of the instrument. Since it is exclusively semantic, it is less prone to the criticalities observed for acceptability judgments. Furthermore, it is particularly suited to be a cross-linguistic tool, as it can be easily applied to different languages, allowing researchers to make comparisons on IDVs in different languages as well as to extend the test to other denominal verbs. We leave open to future research (i) a more accurate investigation of parasynthetic verbs, in order to better investigate the interaction between their meanings and their derivational relations, and (ii) the creation of different versions of the test with diverse samples of IDVs, so as to increase the reliability of our semantic test when dealing with such verbs.

Acknowledgments

The audience at the 53rd LSRL, two anonymous reviewers, and the editors of this special issue are kindly thanked for questions, comments and criticisms that have led to substantial improvement. Any errors that remain are our own.

References

Adams, Valerie. 1973. *An introduction to modern English word-formation*. London: Longman Group Limited.

Arad, Maya. 2003. Locality constraints on the interpretation of roots: The case of Hebrew denominal verbs. *Natural Language and Linguistic Theory* 21: 737−778.

Arad, Maya. 2005. *Roots and Patterns: Hebrew Morphosyntax*. Dordrecht: Springer.

Aronoff Mark. 2007. In the beginning was the word. *Language* 83(4): 803–830.

Baeskow, Heike. 2019. Denominal verbs in morphology. In R. Lieber, & M. Aronoff (eds.), *Oxford Research Encyclopedia of Linguistics.* Oxford, UK: Oxford University Press. https://doi.org/10.1093/acrefore/9780199384655.013.502

Bauer, Laurie. 1983. *English word-formation*. Cambridge, UK: Cambridge University Press.

Borer, Hagit. 2014. The category of roots. In A. Alexiadou, H. Borer, & F. Schäfer (eds.), *The Roots of Syntax, the Syntax of Roots*, 112–148. Oxford: Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199665266.003.0006

Brice, Henry. 2017. The root and word distinction: an experimental study of Hebrew denominal verbs. *Morphology* 27, 159–177. https://doi.org/10.1007/s11525-016-9297-0

Clark, Eve, & Herbert Clark. 1979. When nouns surface as verbs. *Language* 55(4): 767–811. https://doi.org/10.2307/412745

Corbin, Danielle. 2001. Préfixes et suffixes: du sens aux catégories. *Journal of French Language Studies* 11(1): 41–69.

Croft, William. 1991. *Syntactic Categories and Grammatical Relations*. Chicago: Chicago University Press.

De Mauro, Tullio. 2016. dizionario.internazionale.it/nuovovocabolariodibase.

Don, Jan 2005. Roots, deverbal nouns and denominal verbs. In G. Booij, E. Guevara, A. Ralli, S. Sgroi, & S. Scalise (eds.), *Morphology and linguistic typology. Proceedings of the fourth Mediterranean Morphology Meeting*, 1-13. https://doi.org/10.26220/mmm.2366

Doron, Edit. 2003. Agency and voice: the semantics of the Semitic templates. *Natural Language Semantics* 11: 1–67.

Doron, Edit. 2008. 'trumato shel habinyan lemashma'ut hapo'al' [the contribution of the template to verb meaning]. In G. Hatav (ed.), *Modern linguistics of Hebrew*, 57–88. Jerusalem: Magnes Press.

Dowd, Andrew Ryan. 2010. More on instrumental denominal verbs. *Snippets* 21: 7–8.

Dowty, David R. 1991. Thematic proto-roles and argument selection. *Language*, 67(3): 547–619.

Fabrizio, Claudia. 2013. The meaning of a noun converted into a verb. A semantic exploration on Italian. *Rivista di Linguistica* 25(2), 174 – 219.

Farrell, Patrick. 2001. Functional shift as category underspecification. English Language and Linguistics 5(1): 109– 130. https://doi.org/10.1017/S1360674301000156

Gottfurcht, Carolyn A. 2008. Denominal Verb Formation in English. Ph.D. thesis, Northwestern University.

Harley, Heidi. 2005. How do verbs get their names? Denominal verbs, manner incorporation, and the ontology of verb roots in English. In N. Erteschik-Shir, & T. Rapoport (eds.), *The syntax of aspect*, 42–64. Oxford: Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199280445.003.0003

Harley, Heidi, & Jason D. Haugen. 2007. Are there really two different classes of instrumental denominal verbs in English? *Snippets* 6: 6–7.

Huyghe Richard & Marine Wauquier. 2020. What's in an agent? *Morphology* 30: 185-218.

Iacobini, Claudio. 2004. Parasintesi. In M. Grossman, & F. Rainer (eds.), *La formazione delle parole in italiano*, 167–188. Tübingen: Niemeyer.

Kaliuščenko, Vladimir D. 2000. *Typologie denominaler Verben*. Berlin, Boston: Max Niemeyer Verlag. https://doi.org/10.1515/9783110952148

Kaschak, Michael P., & Arthur M. Glenberg. 2000. Constructing Meaning: The Role of Affordances and Grammatical Constructions in Sentence Comprehension. *Journal of Memory and Language* 43: 508–529. https://doi.org/10.1006/jmla.2000.2705

Kiparsky, Paul. 1982. Word formation and the Lexicon. In *Proceedings of the Mid-America Linguistics Conference*. Lawrence: University of Kansas, 3−92.

Kiparsky, Paul. 1997. Remarks on denominal verbs. In A. Alsina, J. Bresnan, & P. Sells (eds.), *Complex Predicates*. Stanford: CSLI, 473−499.

Koenig, Jean-Pierre, Gail Mauner & Breton Bienvenue. 2003. Arguments for adjuncts. *Cognition* 89: 67–103.

Koenig, Jean-Pierre, Breton Bienvenue, Gail Mauner & Kathy Conklin. 2008. What With? The Anatomy of a (Proto)-Role. *Journal of Semantics*, 25(2): 175–220.

Luschützky, Hans Christian & Franz Rainer. 2013. Instrument and place nouns: A typological and diachronic perspective. *Linguistics* 51(6): 1301–1359.

Marantz, Alec. 2000. Roots: the universality of root and pattern morphology. Paper presented at the *Conference on Afro-Asiatic Languages*. University of Paris VII.

Marchand, Hans. 1969. *The categories and types of present-day English word-formation. A synchronic-diachronic approach*. München: C.H. Beck'sche Verlagsbuchhandlung.

McIntyre, Andrew. 2016. Denominal Verbs: An Overview. *Word-Formation: An International Handbook of the Languages of Europe*, 1406–1423.

Michaelis, Laura A. & Allen Minchun Hsiao. 2021. Verbing and linguistic innovation. Frontiers in Communication 6. https://doi.org/10.3389/fcomm.2021.604763

Montermini, Fabio. 2008. *Il lato sinistro della morfologia. La prefissazione in italiano e nelle lingue del mondo*. Milano: Franco Angeli.

Plag, Ingo. 1999. *Morphological productivity: Structural constraints in English derivation*. Berlin: De Gruyter.

Plag, Ingo. 2003. *Word formation in English*. Cambridge, UK: Cambridge University Press.

Resnik, Philip S. 1993. *Selection and Information: A Class-Based Approach to Lexical Relationships*. Ph.D. Dissertation. University of Pennsylvania.

Rimell, Laura D. 2012. *Nominal Roots as Event Predicates in English Denominal Conversion Verbs*. Ph.D. thesis, New York University.

Rissman, Lilia. 2013a. *Event Participant Representations and the Instrumental Role: A Cross- Linguistic Study*. Ph.D. Dissertation. Johns Hopkins University.

—— 2013b. Periphrastic use: a modal account of instrumentality. In Yelena Fainleib, Nicholas LaCara, & Yangsook Park (Eds.) *Proceedings of the 41st Annual Meeting of the North-East Linguistics Society*, Vol. 2, 137–150. Amherst, MA: GLSA Publications.

Rissman, Lilia & Kyle Rawlins. 2017. Ingredients of Instrumental Meaning. *Journal of Semantics*, 34(3): 507–537.

Rissman, Lilia, Kyle Rawlins & Barbara Landau. 2015. Using instruments to understand argument structure: Evidence for gradient representation. *Cognition*, 142: 266–290.

Rissman, Lilia, Saskia van Putten & Asifa Majid. 2022. Evidence for a Shared Instrument Prototype from English, Dutch, and German. *Cognitive Science*, 46: 2–42.

Rodrigues Soares, Alexandra. 2009. Portuguese converted deverbal nouns: Constraints on their bases. *Word Structure* 2(1): 69–107.

Schlesinger, Izchak M. 1989. Instruments as agents: on the nature of semantic relations. *Journal of Linguistics*, 25(1): 189–210.

Schönefeld, Doris. 2018. Friending Someone into Submission: Verbal Cues for Understanding. *Word Structure* 11(2): 211–237. https://doi.org/10.3366/word.2018.0125

Selkirk, Elisabeth O. 1982. *The syntax of words*. Cambridge: MIT Press.

Serrano-Dolader, David. 2015. Parasynthesis in Romance. In In P. O. Müller, I. Ohnheiser, S. Olsen, F. Rainer (eds.), *Word-Formation: An International Handbook of the Languages of Europe*, 524–536. Berlin, Boston: De Gruyter Mouton. https://doi.org/10.1515/9783110246254-031

Suozzi, Alice, Cardinaletti, Anna and Gianluca E. Lebani. 2024. On the argument status of Instruments in Italian. In M. Angster and M. B. Angster (eds.) *The verbal kaleidoscope: perspectives on the syntax and semantics of verbs*, 261–301. Zadar: Morepress.

Štekauer, Pavol. 1996. *A theory of conversion in English*. Frankfurt: P. Lang.

Štekauer, Pavol, Valera, Salvador, & Livia Körtvélyessy. 2012. *Word-Formation in the World's Languages. A Typological Survey*. Cambridge: Cambridge University Press. https://doi.org/10.1017/CBO9780511895005

Talmy, Leonard. 2000. *Toward a Cognitive Semantics, Vol. 1. Concept Structuring Systems (Language, Speech and Communication)*. Cambridge, MA: MIT Press.

Van Goethem, Kristel & Nikos Koutsoukos. 2022. How typology shapes the constructional network: Denominal verb constructions in English, Dutch and German. *Journal of Word Formation* 6(1): 7–57. https://doi.org/10.3726/zwjw.2022.01.01