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AVE' AND *TENE'*: ANOTHER LOOK AT AUXILIARY SELECTION IN AQUILAN

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Abstract

This paper presents a unified approach on two poorly understood problems of auxiliary selection in the Aquilan dialect. The first problem pertains to the distribution of an auxiliary verb that denotes the notion of "possession", *tene'*. The second problem pertains to the distribution of a more standard auxiliary verb, *ave´*, which denotes the notion of "existence" in compound tenses, in suppletive distribution with *esse*. A proposed solution is that the distribution of both auxiliary verbs can be accounted via a simple analysis of Aquilan's person-driven agreement: how a verb interacts with its arguments. This analysis is based on a formal (type-logical) representation of Distributed Morphology combined with Type-Logical calculi, and shown to correctly account and predict the distribution of these auxiliary verbs.

Keywords
Aquilan; auxiliary selection; distributed morphology; type-logical calculi; situation semantics

AVE' Y *TENE'*: OTRA MIRADA A LA SELECCIÓN AUXILIAR EN EL DIALECTO DEL AQUILA

Resumen

Este artículo presenta un enfoque unificado de dos problemas poco conocidos referidos a la selección del auxiliar en el dialecto del Aquila. El primer problema se refiere a la distribución de un verbo auxiliar que denota la noción de "posesión", *tene'*. El segundo problema se refiere a la distribución de un verbo auxiliar más estándar, *ave'*, el cual denota la noción de "existencia" en tiempos compuestos, en distribución supletiva con *esse*. Una solución propuesta es que la distribución de ambos verbos auxiliares

puede explicarse a través de un simple análisis de concordancia entre personas en el dialecto del Aquila: cómo un verbo interactúa con sus argumentos. Este análisis se basa en una representación formal (de tipo lógico) de morfología distribuida combinada con cálculos de tipo lógico, y se presenta como una manera de dar cuenta correctamente de estos verbos auxiliares y de predecir su distribución.

Palabras clave

dialecto del Aquila; selección auxiliar; morfología distribuida; cálculos de tipo lógico; situación semántica

1. Introduction: Auxiliary Selection and Aquilan: The Case of *Tene'* and *Ave'*

The Aquilan dialect, or *Aquilan*, is an Italian dialect spoken in L'Aquila and surrounding zones. Aquilan belongs to the "middle Italian" dialects, which are spoken in Northwest Abruzzo, Northeast Lazio and Southern Umbria (Vignuzzi 1997; Avolio 1992, 1993, 2009; Ursini 2013a). Several studies document a complex system of auxiliary verbs that occur in simple and compound tense forms. These are *esse* ('to be'), *ave'* ('to have') and *sta'*, which expresses a "temporary" relation among related entities (Giammarco 1973; Avolio 1992; Legendre 2007, 2010). However, a fourth auxiliary verb, *tene*', is often not discussed in detail. *Tene'* usually combines with two noun phrases (henceforth: NPs), and conveys an "ownership" relation that holds between the two entities that these NPs denote. The exact syntactic status of the object NP is not crucial, insofar as the "ownership" relation can be successfully established. This is shown in (1)-(2):

(1) *Mario te nna mela*
Mario is-T an apple
'Mario has got an apple'

(2) *Mario te speranza de vince jju premio*
Mario is-T hope to win the prize
'Mario is hopeful to win the prize'

The example[1] in (1) says that Mario owns an apple or, in the perhaps more intuitive American English gloss 'has got' an apple. The example in (2) can be glossed as Mario "possessing" a perhaps more abstract property: that of being hopeful to win. In both cases, both hope and one apple are conceived as "belonging" to Mario, although at fairly different conceptual levels. So, *tene'* covers part of the meaning range that *avere* 'to have' covers in Italian, hence taking its place in distributional patterns. The auxiliary *esse* covers another major part of *ave'*s distribution, since *esse* is the main auxiliary in all compound tenses for verbs and inflectional forms. The only exceptions are the third person, singular and plural of compound tense forms, as examples (3)-(6) show:

(3) *Mario ha magnato nna bruschetta*
Mario is-H eaten a bruschetta
'Mario has eaten a bruschetta (slice)'

(4) *Mario e Luigi ao magnato nna bruschetta*
Mario and Luigi have-H eaten a bruschetta
'Mario and Luigi have eaten a bruschetta (slice)'

(5) *Ji so magnato nna bruschetta*
I am-S eaten a bruschetta
'I have eaten a bruschetta (slice)'

(6) *Vo' sete magnato nna bruschetta*
You-PL. are-S eaten a bruschetta
'You have eaten a bruschetta (slice)'

[1] I follow Maierborn (2005) approach to the Semantics of the *ser* and *estar* copulae/auxiliary verbs, in also glossing *ave'* and *tene'* as combinations of a basic copula/auxiliary verb *be* plus a marker that captures the auxiliary verb's specific meaning. The four markers I use in this paper are "-S" for *esse*, "-T" for *tene',* "-H" for *ave'*. Other abbreviations for glosses are: SG.= Singular, PL.= Plural, 1ST, 2ND, 3RD PS.= First, Second, Third person; INF.= Infinitive.

The data in (3)-(6) are amply attested and, together with those in (1)-(2), suggest that morpho-syntactic patterns of auxiliary selection in Aquilan are tightly related to semantic relations. However, no significant analysis exists of the distributional and semantic relations between *tene'*, *ave'*, *esse* and their arguments. The goal of this paper is to offer such an analysis, by giving a unified account of the data we discussed in (1)-(6) within a broader theory of auxiliary selection. We couch our solution in the framework of *Distributed Morphology*, although we also employ tools from closely related frameworks (*Type-Logical calculi*, *Situation Semantics*). By answering this question, we aim to account and, possibly, define accurate predictions on the distribution of *tene'*, *ave'*, and *esse*, which may be generalized beyond the Aquilan data. The paper is structured as follows. Section 2 presents a more thorough picture of the data; section 3 presents a syntactic analysis of the data. Section 4 presents a semantic analysis, while section 5 discusses a general framework for Auxiliary selection. Section 6 offers some conclusions.

2. The Data: The Distribution of *Tene'*, *Ave'* and *Esse*

The goal of this section is to present the distribution of *tene'* and *ave'* in Aquilan, and outline the types of empirical problems they present, for a theory of auxiliary distribution. Our starting point is that of the distribution of *tene*' in Aquilan. The distribution of *tene'* parallels that of auxiliary verbs *tener* in Spanish or *(have) got* in American English, as they can also denote an "ownership" relation (Gutiérrez-Rexach 2007; McIntyre 2012). Such an "ownership" relation involves *referents*, entities in a (formal) model of Discourse (Kamp, van Genabith & Reyle 2011: ch. 0), and holds between the properties of a referent and the referent itself. Consider (7)-(11):

(7) *Ji tengo nna machina nova*
I have-T a car new
'I have got a new car'

(8) *Ji tengo paura*
I have-T fear
'I am scared'

(9) *Ji tengo onore*
I have-T honour
'I have got honour'

(10) *Ji tengo ji picchieri*
I have-T the glasses
'I have got the glasses'

(11) *Ji tengo tutti ji arrosticini*
I have-T all the skewers
'I have got all the skewers'

Examples (7)-(9) show that both bare (*paura*, *onore*) and indefinite Noun Phrases (henceforth: NPs) can occur as complement arguments of *tene'*. Examples (10)-(11) instead show that definite or quantified NPs (*ji picchieri* 'the glasses', *tuti ji arrosticini* 'all the skewers', respectively) can combine with *tene*'. Both bare and non-bare (quantified, (in)-definite) NPs can denote abstract or physical properties that are ascribed to the entity denoted by the subject NP (Chierchia & Turner 1988; Landman 1991: ch. 3; Chierchia 1998). If NPs denote referents that can stand in an ownership relation with the subject, e.g. whether the speakers owns or "has got" all the skewers or honour, the selected auxiliary is *tene'*. A different picture, however, emerges when other relations between referents are established. If the object NP denotes a "class" or "kind" of entities and the subject NP belongs to such a class, then *esse* must combine with these NPs, as shown in (12)-(15):

(12) *Mario é professo'*
Mario is-S professor
'Mario is a professor'

(13) **Mario tiene professo'*
Mario is-T professor
'Mario has got professor'

(14) *Mario é nnu quatranu simpatico*
Mario is-S a boy nice
'Mario is a nice boy'

(15) **Mario tiene nnu quatranu simpatico*
Mario is-T a boy nice
'Mario has got a nice boy'

Examples (12)-(15) show that "capacity-denoting" bare (object) NPs must combine with *esse*, since they denote a capacity of the subject NP referent (De Swart, Winter & Zwarts, 2007; Gutiérrez-Rexach 2007). So, *professo'* 'professor' must combine with *esse*, not with *tene'*, to denote Mario's membership to the "class" of professors. The same holds for attributive indefinite NPs, such as *nnu quatranu simpatico* 'a nice boy', since they also denote a certain "group" of referents that Mario belongs to (Chierchia 1998). Once we look at other types of complement phrases, similarly fine-grained patterns of distribution emerge as well. We first discuss Prepositional Phrases (henceforth: PPs)[2]. PPs headed by prepositions such as *de* 'of', *pe* 'to, for' or *co'* 'with' can act as heads of a phrase that takes one or two NPs as its own arguments. When they take two argument NPs, they can also denote an object or property that can stand in an ownership relation with the referent NP referent. Some examples are in (16)-(22):

(16) *Ji tengo ji requisiti pe vince*
I have-T the requisites to win
'I have got the requisites for winning'

[2]A *caveat* on syntactic matters is necessary. Generative approaches contend that these complement phrases are prepositional rather than nominal, in nature (Chomsky 1995; Hale & Keyser 2002; Harbour 2007). This approach contrasts with descriptive accounts that consider these Phrases as modified or restricted NPs (e.g. Huddleston & Pullum 2002: ch. 4; for English). The proposal we will sketch in section 3 takes a neutral stance, to these matters.

(17) *Ji tengo tutte le versio' dejju libbro*
I have-T all the versions of-the book
'I have got all the versions of the book'

(18) *Mario tiene nnu quatranu simpatico come cuggino*
Mario is-T a boy nice how cousin
'Mario has got a nice boy as a nice cousin'

(19) *Ju tavolo é dde legno*
The table is-S of wood
'The table is made of wood'

(20) **Ju tavolo tiene dde legno*
The table is-T of wood
'The table is made of wood'

(21) *Sso jochittu é pe pazzia'*
This toy is-S for playing-around
'This toy is designed for playing around'

(22) **Sso jochittu tiene pe pazzia'*
This toy is-T for time-wasting
'This toy is designed for wasting time'

Examples[3] (16)-(18) show that PPs such *ji requisiti pe vince* 'the requisites for winning' and *tutte le versio' dejju libro* 'all the versions of the book' can combine with

[3]Note that the preposition *ajju* is the *conflation* of the preposition *a* and the definite article *ju.* Conflation is defined as the combination of two syntactic heads into one (Talmy 1985; Hale & Keyser 2002), which in Italian dialects is often marked by *Raddoppiamento Sintattico*, 'Sintactic doubling' (Frascarelli 2000). A related phenomenon is *gemination*, which occurs when the indefinite article *nnu 'a'* involves a geminated

tene'. In both cases, the PP introduces a property/entity that is restricted to a certain "sub-class" of properties, via the mediating effect of a preposition (*pe*, *de*). Since the resulting PP still denotes a property or object, the ownership relation can be established, and *tene*' combined with these PPs. When only the external NP occurs in a PP, this PP denotes a class to which the subject NP referent belongs. So, only *esse* can combine with *dde legno* '(made) of wood' or *pe pazzia'* 'for playing around', as examples (19)-(22) show. Overall, these examples show that the same semantic tension between an ownership (*tene'*) and a membership (*esse*) relation plays a key role in auxiliary selection, with complement PPs. A similar pattern, although in a perhaps subtler form, emerges with participial forms.[4] Participial forms can occur as part of compound tense forms, but also as internal arguments of a PP. In either case, they can denote a class of referents to which the subject referent NP belongs to, as well as the "temporal arc" in which this relation holds (i.e. future, past, present). Some examples are in (23)-(25), in which PPs are marked as optional via brackets:

(23) *Mario *te'/é 'ntronato (da quanno era quatrano)*
Mario *is-T/is-S dumbed (from whenhe was child)
'Mario is dumb since he was a child'

(24) *Mario *te'/é gnorante (da venne)*
Mario *is-T/is-S headstrong (from sell)
'Mario is extremely stubborn

(25) *Mario te/*é gnoranza (da venne)*
Mario is-T/*is-S stubborness (from sell)
'Mario is to sell'

initial consonant, with vowel-ending auxiliaries (cf. (16)-(22)). Our written examples (e.g. *nna*) follow standard graphemic conventions of Aquilan (Vignuzzi 1997).

[4] For our discussion, the exact categorial status of participial forms as either verbal or adjectival is immaterial, as in either case it is their semantic ability to denote properties that have a predicative-like semantics that plays a part in the licensing of either auxiliary. See D'Alessandro & Roberts (2008, 2010) for discussion.

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Both an adjective phrase such as *gnorante* 'stubborn', and a past participle such as *'ntronato* 'dumbed' (literally: '(become) dumb') can only combine with *esse*, but not with *tene*', as shown in (23)-(24). In both cases, these complete phrases denote a certain property ascribed to Mario: being stubborn and dumb, respectively. One key property that distinguishes these examples from those involving NPs, such as (16)-(18), is the predicative nature of these participial forms. Both participial forms capture a certain class of referents, e.g. those dumb since they were children, to which Mario belongs. As in the case of attributive NPs in (11)-(15), then, participial forms can occur with *esse*, but not with *tene'*, as they denote a membership relation between a referent and a certain class of referents. Note that the property of being headstrong can be predicated of Mario, as shown in (25), but only insofar it is introduced via a corresponding bare NP. One final aspect of *tene'* and its distribution pertains to its ability to combine with infinitival verbal forms, and denote a notion of necessity. Consider examples (26)-(27), which make this notion precise:

(26) *Mario e Luigi tengono magna' la pecora alla cottora*
Mario and Luigi are-T eat-INF. the sheep at-the cauldron
'Mario and Luigi must eat the traditional sheep's stew'

(27) *Vojatri tenete penza' a compra' llo vino*
You-PL.-EXC. are-T think-INF. to buy the-NEUT. wine
'You guys must focus on buying wine'

Examples (26)-(27) suggest that the combination of *tene'* with the infinitival form of a verb can denote an *eventuality* that the subject partakes in (Parsons 1990; Kratzer 2003; Ramchand 2008). Such eventualities can either be *processes* such as eating a sheep stew, or *states* such as thinking to some task. In either case, *tene'* denotes that the subject must perform such eventuality: Mario and Luigi, sooner or later, must eat the traditional sheep's stew. Therefore, part of Mario and Luigi's properties consist in their thinking to buy wine, in an unspecified but certain future moment.

Overall, the data discussed in this section highlight a distributional picture of *tene'*, and *esse* for that matter, which is based on three key aspects. The first is that *tene'* denotes an ownership relation between an individual and a property. This property can be either conceived as a physical possession of a referent (e.g. having an apple), or some more abstract quality ascribed to this referent (e.g. being dumb, or having honour). The second is that the semantic properties of its complement phrase seem to emerge from its fine-grained syntactic structure, as the subtle distributional differences suggest. The third is that the semantic status of this phrase as being either class- or property-denoting determines whether *tene'* or *esse* can occur, in context. An account of *tene'* and its properties must capture these three aspects under a unified approach.

We now focus on *ave'* and *esse.* The distribution of the auxiliary verb *ave'* is extremely limited. Standard analyses of Aquilan report that *ave*' can only occur with transitive and unergative verbs, in their third person form (singular and plural). For all other paradigmatic cases, *esse* is the standard form, to the effect that *ave'* acts as a suppletive form for *esse* (Giammarco 1973; Vignuzzi 1997; Legendre 2007, 2010).[5] We show this distributional pattern in (28)-(35):

(28) *Mario ha magnato nna mela*
Mario is-H eaten an apple
'Mario has eaten an apple'

(29) *Tu sci magnato nna mela*
You are-H eaten an apple
'You have eaten an apple'

(30) *Quissi ao magnato nna mela*
These are-H eaten an apple
'They have eaten an apple'

[5]An interesting generational variation that we leave aside is the apparent disappearance of *ave'* in the inflectional paradigm, in younger generations of native speakers. Since we lack a detailed field analysis that pin-points the status of this emergent pattern, we leave aside this form of generational variation aside.

(31) *Vo'* *sete* *magnato nna mela*
You-PL. are-S eaten an apple
'They have eaten an apple'

(32) *Ji so* *laorato nna frega*
I am-S worked a lot
'I have worked a lot'

(33) *Quisso ha/*è* *laorato nna frega*
He is-H/*is-S worked a lot
'He has worked a lot'

(34) *Nu semo laorato* *nna frega*
We are-S worked a lot
'We have worked a lot'

(35) *Quissi ao/*so'* *laorato nna frega*
These are-H/*are-S worked a lot
'They have worked a lot'

Examples (28)-(31) show how this distributional pattern emerges with the transitive verb *magna'* 'to eat', while examples (32)-(35) show this pattern with the unergative *laora'* 'to work'. Note that, since *ave'* acts as suppletive form of *esse*, ungrammaticality arises when *esse* occurs with third person subject NPs, as shown in (33) and (35). As amply discussed in the literature, most if not all Italian dialects show fairly complex agreement patterns, usually labelled as *person-driven* agreement systems (Maiden & Parry 1997; Savoia 1997; D'Alessandro & Roberts 2008, 2010). Person-driven systems can be thought as agreement systems in which the morpho-semantic features of subject and object NPs play a role in the selection of a given auxiliary verb. As our data suggest, Aquilan displays such a system to an extent, for at least two reasons. First, the person and number *features* of the complement NP determine the features that appear on the

auxiliary verb (cf. (1)-(27)). Second, subject NP features can also determine the auxiliary verb that can occur in a sentence, *tene', esse* or *ave'* (cf. (28)-(35)). So, auxiliary distribution seems to rely on the morphological and semantic properties of argument NPs, as it is the case in person-driven systems.

Another important factor, as D'Alessandro & Roberts (2008, 2010) also observe for the closely related Eastern Abruzzese dialect, is that the subject NP must carry a third person feature. Although these works propose an elegant syntactic account of this distribution of features, they also assume that the semantic import of these features plays a key distributional role. These authors suggest that the third person, denoting a non-specific value for person features, can only combine with an auxiliary that shares the same non-specific interpretation. Therefore, they seem to postulate that in person-driven systems, such as Aquilan, the morpho-syntactic features of a verb's arguments may determine with auxiliary verb can (and cannot) occur in a sentence.

We do not discuss further distributional patterns for our auxiliary verbs, as they are not crucial here (but see e.g. D'Alessandro & Roberts 2008, 2010; for a broader picture). We observe that, once we bring together the data on the distribution of *tene'* and *ave'*, and consequently of the intermediary *esse*, a certain empirical picture emerges, in which two aspect are essential. First, Aquilan includes a person-driven agreement system that determines, via the morpho-semantic features of a verb's argument, the auxiliary verb that can occur in a sentence. Second, since these features directly determine the semantic content of both arguments, they also establish the type of semantic relation that can hold between the entities denoted by these arguments. Hence, *tene'*, *ave'* and *esse* denote different semantic "shades" of a relation that holds between types of referents in Discourse. Our goal in the remainder of the paper, then, is that of giving a unified morpho-semantic account (sections 3, 4), and a corresponding analysis (section 5).

3. The Solution: Distributed Morphology meets Type-Logical Calculi

The goal of this section is to present our framework, first introduced in Ursini (2011, 2013a, b, c), Ursini & Akagi (2013), and show how it can handle our Aquilan data. We

choose one variant of the *Minimalist Program* (Chomsky 1995), known as *Distributed Morphology* (henceforth: DM), as our morpho-syntactic background (Embick & Noyer 2001, 2006; Harbour 2007; Harley 2012). Our reasons for choosing this variant over others are based on the two core assumptions that form the theoretical kernel of this theory. First, one core operation, known as *Merge*, recursively operates on morphemes as bundles/sets of features, generating larger structures (words, phrases, sentences) as a result. Second, the semantic and phonological components of grammar cyclically receive the outputs of this process, and generate semantic (meanings) and phonological (utterances) outputs. Since our main goal is to account how the distributional patterns of auxiliaries in Aquilan determine the range of possible interpretations and agreement phenomena, this framework appears germane to our empirical goals.

To make our analysis maximally explicit and formally precise, we employ some key notions from a framework related to the Minimalist Program, that of *Type-Logical calculi* (henceforth: TL calculi, Jäger 2005; Moortgat 2010; Morryll 2011). TL grammars or calculi are based on the assumption that sentences are the result of combining together basic syntactic templates or *types*, via few universal "operators". Such combinations are successful, if he combined constituents have matching types, when they are combined together. One intuition is that a transitive verb (e.g. *hugs*) is a constituent that combines or *merges* with two arguments (e.g. *Harlock* and *Mayu*), to generate a full sentence (e.g. *Harlock hugs Mayu*). If a transitive verb merges with another transitive verb (e.g. *dances*), instead, the result is an ungrammatical sentence (e.g. **Harlock hugs dances*).

For our purposes, two formal aspects of TL calculi are crucial. First, TL calculi allow us to define Merge as a *binary*, *associative*, *idempotent* connective. Merge takes two morphemes (binary) and forms a larger syntactic unit, in which either constituent may determine the type of the larger constituent (associativity). We follow several proposals, both categorial (e.g. Morryll 2011) and not (e.g. Phillips 2006), and assume that Merge is an *asymmetric* operation, known as *Merge Right*. Its asymmetry is based on the fact that constituents are merged in a top-down, incremental manner, so that each new lexical item is merged with the partial sentence previously derived. In linear terms, the result corresponds to adding new lexical items "on the right": for instance, *Princess* is added to the partial sentence *Mario loves* to obtain *Mario loves Peach*.

Second, TL calculi allow us to define morphemes, as sets of features, via the second connective *Product*, which is *binary*, *associative* and *commutative*. The Product operation allows us to capture the intuition that morphemes can correspond to the product of more basic morpho-semantic features. For instance, agreement morphemes that include number and person features can be seen as the product of these two features, "bundled" together into a more complex morpheme. So, our choice of connectives is motivated on our need to account how auxiliary *tene'* and *ave'/esse* display control properties over their arguments, as we discussed so far[6].

We turn to formal matters. We represent Merge (right) via the slash symbol "/", and Product via the symbol "•". For types, we need one preliminary consideration. In standard TL calculi, the basic syntactic types are defined according to standard, descriptive syntactic classifications: *s* for sentences, *n* for nouns, *np* for noun phrases, *pp* for prepositional phrases. These types form an *atomic* set of syntactic types *ATOM={s,n,np,pp}*) (Jäger 2005; Moortgat 2010). DM research, however, has shown that basic syntactic categories (nouns, prepositions, etc.), can be best seen as specific instances of more abstract morphological categories (cf. also Hale & Keyser 2002). Using our data as an example, both *magna'* as an infinitival verb form, and *friddu* as a Noun Phrase can be the syntactic arguments of the auxiliary verbs *ave'* and *tene'* (*e.g. tengo magna' and tengo friddu).* Under standard assumptions about types, the shared argument status of *magna'* and *friddu* is lost.

To avoid this problem, we assume that one basic type ***p***, mnemonic for "phrase", forms our set of atomic, morphological types. The basic type ***p*** represents a constituent that is "complete", such as a head that has combine with its arguments. From this basic type, more complex types can be defined via Merge and Product, recursively, as well as how these types can combine and interact in derivations. We give the definition of our morphological types in (36):

[6]Psycholinguistic evidence on sentence production also supports a Merge right account (Levelt 1989; Phillips 2006; Jarema & Libben 2007), a point that we also take to be in favour of our proposal, although not a crucial one.

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(36)

1. **p** *is a morphological type*	(Lexical type)
2. *If* ***x*** *is a type and* ***y*** *is a type, then* ***x/y*** *is a type*	(Type formation: merge)
3. *If* ***x*** *is a type and* ***y*** *is a type, then* ***x•y*** *is a type*	(Type formation: product)
4. *If* ***x/y*** *is a type and* ***y*** *is a type, then* ***(x/y)/y=x, y/(y/x)=x***	(Type reduction)
5. *Nothing else is a type;*	(Closure property)

This definition reads as follows. Given a basic atomic type **p** (rule 1), complex types can be defined as the Merge or Product of more basic types (rule 2,3). When two complex types are merged, the result is (usually) a simpler type, a type that in which matching information is discarded (rule 4). No type can exist, that does not respect these rules (rule 5). These rules allow us to define fairly complex type sets. A minimal set of types that we employ in our analysis, however, consists in the set *TYPE={****p****,****p/p****, ****p•p/p/p•p****,****p•p****}*. In words, ***p*** is the type of phrases, whether they are bare arguments (*friddu*, *Mario*) or fully derived sentences; ***p/p*** is the type of partially complete phrases (*Mario è*), while ***p/p/p*** is the type of heads, *qua* incomplete phrases (e.g. *tene'*, *ave'*).

The Product type ***p•p*** allows us to represent compound types: for instance, a bare NP such as *Mario* can be seen as the combination of a root, plus an abstract morpheme that carries singular and male features. Hence, a simplified representation for the type assigned to *Mario and* other NPs is ***p•p***, rather than ***p***. More fine-grained analyses of features are possible, via a simple indexation mechanism that specifies the morpho-syntactic feature type at hand (Adger 2010; Adger & Svenonius 2010). For instance, we can have $p_{num}•p_{pers}$ for the compound type of person and number. However, since we only need to discuss the role of PERSON features, we can employ our simplified approach, without loss of formal adequacy. So, with Product types we can model agreement phenomena, as a reflex of basic combinatorial operations. Intuitively, our auxiliary verbs can only combine with NPs that have matching features. If NPs are assigned the Product type ***p•p***, then verbs such as *tene'* and *ave'* are assigned the type ***p•p/p/p•p***, lest the result be ungrammatical.

We return to the role of the Product type once we analyse the distribution of our verbs. For the moment, however, we add one final aspect of our derivational approach: we define how *derivations* unfold over time. We represent morphological derivations as follows. We introduce an *Index Set I* to mark the distinct steps in a derivation, with *I={t,t+t,t+2,...,t+n}*. Here, the symbol "+" represents *addition*, an operation that derives our progressive intervals of time in sentence production. In each derivation, the operation *Lexical Selection* represents the selection of a lexical item as an active unit in the derivation, while *Merge Introduction* represents the merge of two input constituents, and the resulting output constituent. We abbreviate these operations as LS, MI in the derivations. We can now offer a type assignment in (37), and a derivation of (8) and (12), repeated here as (38a)-(39a):

(37) a. ***p•p/p/p•p****::={tene', ave', esse, da,,...}*

b. ***p****::={gnoranza da venne,nna mela,nna frega…}*

c. ***p/p•p****::={laorato, Ji tengo,*

Mario è,…}

d. ***p•p****::={Mario,paura,professo',gnoranza,venne,Ji, quisso,...}*

(38) a. *Ji tengo paura*

b. *t.* [Ji$_{p}$] (LS)

t+1. [tengo$_{p/p/p}$] (LS)

t+2. [Ji$_{p}$]/[tengo$_{p/p/p}$]:=[$_{p/p}$[Ji$_{p}$] tengo$_{p/p/p}$] (MI)

t+3. [paura$_{p}$] (LS)

t+4. [$_{p/p}$[Ji$_{p}$] tengo$_{p/p/p}$]/[paura$_{p}$]:=[$_{p}$[Ji$_{p}$] tengo$_{p/p/p}$ [paura$_{p}$]] (MI)

(39) a. *Mario é professo'*

b. *t.* [Mario$_{p}$] (LS)

t+1. [è$_{p/p/p}$] (LS)

t+2. [Mario$_{p}$]/[è$_{p/p/p}$]:=[$_{p/p}$[Mario$_{p}$] è$_{p/p/p}$] (MI)

t+3. [professo'$_{p}$] (LS)

t+4. [$_{p/p}$[Mario$_{p}$] è$_{p/p/p}$]/[professo'$_{p}$]];=[$_{p/p/p}$[Mario$_{p}$] è$_{p/p/p}$[professo'$_{p}$]] (MI)

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For reasons of space, our derivations include the type ***p/p/p*** for heads and ***p*** for NPs, rather than the types ***p•p/p/p•p*** and ***p•p***. The type ***p*** of phrases includes phrases with their own internal structure (e.g. *gnorante da venne, nnu quatranu*), which we do not analyze in detail for simple reasons of space. The derivations in (39) and (40) read as follows. Both *ji* 'I' and *Mario* are treated as simple NPs, like the property- and kind-denoting *paura* 'fear' and *professo* 'teacher'. From a purely morphological point of view, the structures that emerge from the derivations of these sentences are isomorphic, although the two auxiliaries are sensible to the categorial features of each noun phrase type. A similar consideration applies to sentences which minimally differ with respect to the merged auxiliary verb. We offer a derivation of (25) repeated as (39a), to illustrate this point:

(40) a. *Mario te/*é gnoranza da venne*

b. *t.* [Mario$_{\mathbf{p}}$] (LS)

t+1. [te$_{p/p/p}$] (LS)

t+2. [$_{p}$Mario]/[te$_{p/p/p}$]:=[$_{p/p}$[Mario$_{p}$] te$_{p/p/p}$] (MI)

t+3. [gnoranza$_{p}$] (LS)

t+4. [$_{p/p}$[Mario$_{\mathbf{p}}$] te$_{p/p/p}$]/[gnoranza$_{p}$]]:=[$_{p}$[Mario$_{p}$] te$_{p/p/p}$ [gnoranza$_{p}$]] (MI)

t+5. [da$_{p/p/p}$] (LS)

t+6. [$_{p}$[Mario$_{p}$] te$_{p/p/p}$ [gnoranza$_{p}$]]/[da$_{p/p/p}$]:=[$_{p/p}$[Mario$_{p}$] te$_{p/p/p}$ [[gnoranza$_{p}$] da$_{p/p/p}$] (MI)

t+7. [venne$_{p}$] (LS)

t+8. [$_{p/p}$[Mario$_{p}$] te$_{p/p/p}$ [gnoranza$_{p}$] da$_{p/p/p}$]]/[venne$_{p}$]:=

[$_{p}$[Mario$_{\mathbf{p}}$] te$_{p/p/p}$ [[gnoranza$_{p}$] da$_{p/p/p}$ [venne$_{p}$]]] (MI)

c. *t.* [Mario$_{p}$] (LS)

t+1. [è$_{p/p/p}$] (LS)

t+2. [Mario$_{p}$]/[te$_{p/p/p}$]:=[$_{p/p}$[Mario$_{p}$] te$_{p/p/p}$] (MI)

t+3. [gnoranza$_{p}$] (LS)

t+4. [$_{p/p}$[Mario$_{p}$] è$_{p/p/p}$]/[gnoranza$_{p}$]]=* (Type mismatch: Derivation crashes)

The two derivations in (40b) and (40c) read as follows. The steps *t* to *t+4* derive the "basic" sentences *Mario te gnoranza* and **Mario è gnoranza*. By step *t+4*, the ungrammatical (39c) is derived, and blocks (crashes) the derivation. Intuitively, *gnoranza* carries the wrong features, so it cannot merge with è without the sentence being ungrammatical. The derivation in (39b) can proceed, since *tene'* can merge with *gnoranza*, an NP which then becomes part of the phrase *gnoranza da venne*. Recall now that both our verbs have product types as their arguments, although we do not represent this fact for reasons of space. In both cases, the morphological type of the NP *gnorante* and that of *è* match: what seems to make the derivation crash is the mismatch in the specific values assigned to each product type. In other words, the distinction seems also semantic in nature, rather than purely morphological. We show that this is the case not only for the *tene'*/*esse* distinction, but also for *ave'*/*esse*, by offering a derivation of (32)-(33) repeated as (41a)-(42a):

(41) a. *Ji so laorato 'nna frega*

b. *t.* [Ji$_{p}$] (LS)

t+1. [so$_{p/p/p}$] (LS)

t+2. [Ji$_{p}$]/[so$_{p/p/p}$]:=[$_{p/p}$[Ji$_{p}$] so$_{p/p/p}$] (MI)

t+3. [laorato$_{p/p}$] (LS)

t+4. [$_{p/p}$[Ji$_{p}$] so$_{p/p/p}$]/[laorato$_{p/p}$]:=[$_{p/p}$ [Ji$_{p}$] so laorato$_{p/p}$] (MI: Cut rule)

t+5. ['nna frega$_{p}$] (LS)

t+6. [$_{p/p}$[Ji$_{p}$] so laorato$_{p/p}$]/['nna frega$_{p}$]:=[$_{p}$[Ji$_{p}$] so laorato$_{p/p}$ ['nna frega$_{p}$]] (MI)

(42) a. *Quisso ha laorato 'nna frega*

b. *t.* [Quisso$_{p}$] (LS)

t+1. [ha$_{p/p/p}$] (LS)

t+2. [Quisso$_{p}$]/[ha$_{p/p/p}$]:=[$_{p/p}$[Quisso$_{p}$] ha$_{p/p/p}$] (MI)

t+3. [laorato$_{p/p}$] (LS)

t+4. [$_{p/p}$[Quisso$_{p}$] ha$_{p/p/p}$]/[laorato$_{p/p}$]:=[$_{p/p}$[Quisso$_{p}$] ha laorato$_{p/p}$] (MI: Cut rule)

t+5. ['nna frega$_{p}$] (LS)

t+6. [$_{p/p}$[Quisso$_{p}$] ha laorato$_{p/p}$]/['nna frega$_{p}$]:=[$_{p}$[Quisso$_{p}$] ha laorato$_{p/p}$['nna frega$_{p}$]] (MI)

The key aspects of the derivations in (41b)-(42b) are as follows. We assign type ***p/p*** to the participle form *laorato*, treating participial forms as the abstract "verbs" (one-place Heads) of Hale & Keyser (2002) and similar works. As unary elements, they merge with the unary constituents *ji so'* or *Quisso ha* forms another unary (***p/p***) constituent via the *cut rule* instance of Merge (Jäger 2005: ch. 1; Morryll 2011: ch. 1). The result is the formation of a compound tense form, also of type ***p/p***, via a process often known as "restructuring" in the literature (Chierchia & Turner 1988; Manzini & Savoia 2005). In other words, *ji so laorato* is a verbal form that can still Merge with an object NP, much like the "simple" form *ji so*.

Overall, we now have a morphological analysis that correctly captures the distributional properties of *tene'*, *ave'* and *esse*. However both derivations indirectly show that, even if we assume that *esse* and *ave'* take product types as their arguments, the critical difference in feature values for person still cannot be captured in its entirety. With *è* in place of *ha*, (42b) would derive the same ungrammatical structure, since both verb forms carry the third person feature. To explain this difference, we must turn to semantic matters.

4. The Solution: Semantics

The goal of this section is to provide a *Situation Semantics* interpretation, a specific variant of Model-Theoretic Semantics (Kratzer 1989, 2007; Barwise & Etchemendy 1990; von Fintel 1994).[7] The key assumptions are as follows. We assume that all our morphemes denote *situations*. Situations can be seen as spatio-temporal entities that can be "complex", as events and states denoted by verbs (e.g. being a man, running). They can also be "simple", so that they represent single individuals (e.g. Mario). The domain of situations is a *partially ordered set S* (i.e. a *Lattice* <*S,≤*>). In this domain, the following

[7] Standard TL calculi employ possible-worlds Semantics as models of interpretation (e.g. Morryll 2011). The minimal difference between these two approaches to semantic matters is that Situation Semantics includes the system of axioms that we discuss in this section. See Barwise & Etchemendy (1990) for further discussion.

holds: *s≤s'* holds if *sÇs'=s* and *sÈs'=s'*. In words, if a situation is part of another situation, then their intersection will be the "smaller" situation, and their union will be the "bigger" situation. The set of *semantic* types can be defined via situations, and a recursive definition based on the interpretation of Merge- and Product-structures, as shown in (43):

(43) 1. *a is a semantic type* (Lexical type)
2. *If a is a type and b is a type, then <a,b> is a type* (Functional type)
3. *If <a> is a type and <b> is a type, then <a>•<b>=<aÇb>* (Compound type)
4. *If <a,b> is a type and <b> is a type, then <a,b>/<b>=<a>* (Function application)
5. *Nothing else is a type* (Closure property)

In words, given a basic type of atomic situations (rule 1), a more complex set of types can be defined via the possibility of combine situations either via Merge, or via the Product type (rules 2, 3). The basic principle of *function application* can then be defined accordingly (rule 4), together with a closure principle (rule 5). A smallest type set that we can define via this definition, then, is the "mirror" type *TYPE'={<s>,<s,s>,<s,<s,s>>,<s∩s>}*. In our DM/TL calculus approach, the definition in (41) can be seen as a consequence of our definition in (36). Both DM and TL assume a tight correspondence between morphological processes and their corresponding interpretation, as the type of the former defines the type of the latter. This relation is captured in the definition of the isomorphism between morphological, semantic types and their interpretation in (44):

(44) MORPHOLOGY⇒SEMANTICS⇒INTERPRETATION

p/p/p ⇒ *<s,<s,s>>* ⇒ *λx.λy.s:P(x,y)*

p/p ⇒ *<s,s>* ⇒ *λx.s:f(x), λy.s:P(x,y)*

p ⇒ *<s>* ⇒ *s, s:P(a,b), s:f(c)*

p•p ⇒ *<s∩s>* ⇒ *s∩s', s:P(a,b) ∩ s':P(c,d), s:f(c) ∩ s':f'(c)*

In words, this definition says that heads are interpreted as part-of relations over situations, partially complete phrases as functions, and phrases as simple or structured

situations. When a morpheme corresponds to a feature set (*qua* compound type), its interpretation is the intersection/product of two (or more) situations. As this definition makes obvious, features can denote compound or structured situations, which in turn can denote different types of semantic objects, e.g. properties or kinds. To capture functions and relations, we employ a standard form of λ-calculus (Gamut 1991). These model-theoretical objects are respectively defined as situations in which a part-of relation between other situations holds (i.e. we have *λx.λy.s:P(x,y)*), and as situations in which some property holds (i.e. we have *λx.s:f(x)*). The semantic differences among the relations that *ave'*, *tene'* and *esse* denote build upon this core relational component, which represents the "membership" meaning associated to each verb. Past participial forms and partially derived phrases denote functions, instead, which can in turn be defined as properties, whether they are one or two-place (partially saturated) predicates. For instance, *laorato* denotes a situation in which a subject NP referent has performed an action, in this case working. In our treatment, we leave aside aspectual and temporal matters aside, as they do not play a crucial role in our analysis, although our treatment is consistent with standard approaches (Kratzer 2003; Ramchand 2008).

Aside predicates, we also have argument types. Situations can also act as the semantic arguments of relations and functions, and be instantiated in different sub-types. We focus on compound types, as they play a key role in our account, in particular those that are the result of compound functions over an argument (e.g. *s:f(c)∩s':f(c)*). Since we assume that features denote properties, their standard denotations are represented as *λx.s:f(x)*. For instance, number feature such as MALE can be represented as *λx.s:male'(x),* as per standard assumptions (Harbour 2007; Adger 2010; Harley 2012). When features occur as compound types, they can be taken to correspond to saturated, conjoined properties ascribed onto individuals. For instance, the interpretation of *Mario* as a singular, male noun can be represented as *s:atom'(m)∩s':male'(m)*, with *atom'* being the property that identifies singular referents (Link 1998; Szabolczi 2010).

Since we do not analyse NPs and their structure in detail, this treatment suffices to capture the interpretation of compound types and, as we are going to show, to account our distributional patterns. Also, since we operate on a Boolean algebra, structured situations defined over saturated properties can be identified with their properties or

situations, as our notation entails (Landman 2000: ch. 8; Szabolczi 2010; Morryll 2011: ch. 2). Hence, we can either omit arguments (i.e. we have *s:atom'∩s':male'*) or properties (i.e. *s:(m)∩s':(m)*), and represent compound types directly.[8] We give a semantic type assignment in (45), an interpreted fragment in (46):[9]

(45) a. *<s,<s,s>>::={tene', ave', esse, da,,...}*

b. *<s>::={gnoranza da venne,nna mela,'nna frega…}*

c. *<s,s>::={laorato, Ji tengo,Mario è,…}*

d. *<s∩s>::={Mario,paura,professo',gnoranza,venne,Ji, quisso,...}*

(46) a. [[tene']]:=*λx.λy. s:¬(x≤y)*, [[esse]]:=*λxs.λys.**Id**s:(x≤y),* [[ave']]:=*λxs.λy..**Id**s:¬(p':(x)≤y),*

b. [[nna mela]]:=*s:apple'*, [[nna frega]]:=*s:lot'*, [[gnoranza]]:=*g:stub*

c. [[laorato]]:=*λy.w:work':(y)*

d. [[Mario]]:=*s:atom'(m)∩s':¬participant'(m)*, [[Ji]]:=*p:participant(x)*,

[[quisso]]:=*s:atom'(x)∩s':¬participant'(x)*, [[paura]]:=*f:fear'*, [[professo']]:=*t:∪(prof')*

The denotations for *tene', esse* and *ave'* are based on Maierborn (2005); Gutiérrez-Rexach (2007); Ursini (2011, 2013a, b). They represent these two auxiliary verbs as denoting a situation in which a relation between two referents *x* and *y* is defined. For instance, *tene'* denotes an "inverted" relation in which the subject NP referent *x* acts as the "whole" entity, of which more specific properties are spelt out. Negation inverts the direction of the part-of relation, since we have *s:¬(x≤y)=s:(y≤x)*. On the other hand, *esse* and *ave'* denote a part-of relation in which a referent is defined as being part of a larger class of referents, defined by having the same identifying property. The ***Id*** operator captures the fact that the part-of relation maintains its original "direction", although equivalent notations would be adequate (e.g. *λx.λy. s:+(x≤y)*, cf. Harbour 2007: ch. 3). The minimal distinction between *esse* and *ave'* lies in the requirement on their subject argument. While *esse* can take any subject NP, *ave'* can only take a non-specific (3rd

[8] In this way, our situations share several properties with structured meanings (cf. Cresswell 1985; Chierchia & Turner 1988), and could be seen as *structured situations* (cf. Barwise & Seligman 1997).

[9] The "[[.]]" represents the *interpretation function*, the function that assigns a semantic value to each syntactic unit.

person) subject NP. Morphological features denote properties *p* that, in turn, act as presuppositions, implicit properties defined over arguments (Heim 2008; Adger 2010).

Aside auxiliary verbs, NPs such as *Mario* denote compound situations, sets of situations that denote properties of Mario, as (46d) shows. Bare NPs such as *professo'* and *gnoranza* differ in respectively denoting a (singular) kind referent and a property (De Swart *et al.* 2007; Chierchia 1998). The pronouns *Ji* and *quisso* denote properties defined over non-specific referents *x*, again as per standard assumptions (Kratzer 2009; Kamp *et al.* 2011). We offer simplified denotations for indefinite NPs (*nna mela*) as their precise semantic details are not crucial, here. The denotation for the past participle *laorato* follows a similar simplified analysis, since it lacks temporal and aspectual features and values, which could nevertheless be added (cf. Parsons 1990; Kratzer 2003). In all of our denotations, we use indexes to represent "global" situations (e.g. *w* for *work*). The operations *Interpretation* (Int) and *Function Application/Composition* (FA/FC) are the semantic counterparts of *Lexical Selection* and *Merge Introduction*, respectively. Once we have our interpreted terms, we can now offer the interpretations of (38)-(42) in (47)-(50):

(47) a. *Ji tengo paura*

b. *t.* [[Ji]]:=$p{:}part'(x)_{<s>}$ (Int)

t+1. [[tengo]]:=$\lambda xs.\lambda y.s{:}\neg(x \leq y)_{<s,<s,s>>}$ (Int)

t+2. [[Ji]]/[tengo]]:=$(p{:}part'_{<s>})\lambda xs.\lambda y.s{:}\neg(x \leq y)_{<s,<s,s>>}{:}=\lambda y.s{:}\neg(\ p{:}part' \leq y)_{<s,s>}$ (FA)

t+3. [[paura]]:=$f{:}fear'_{<s>}$ (Int)

t+4. [[Ji tengo]]/[[paura]]:=$\lambda y.s{:}\neg(p{:}part' \leq y)_{<s,s>}(f{:}fear'_{<s>}){:}=s{:}\neg(\ p{:}part' \leq f{:}fear')_{<s>}$ (FA)

(48) a. *Mario é professo'*

b. *t.* [[Mario]]:=$(s{:}at'(m) \cap s'{:}\neg part'(m))_{<s>}$ (Int)

t+1. [[è]]:=$\lambda x.\lambda y.\mathbf{Id}s{:}(x \leq y)_{<s,<s,s>>}$ (Int)

t+2. [[Mario]/[è]]:=$(s{:}at'(m) \cap s'{:}\neg part'(m)_{<s>})\lambda xs.\lambda y.s{:}\mathbf{Id}(x \leq y)_{<s,<s,s>>}{:}=$

$\lambda y.s{:}\mathbf{Id}((s{:}at'(m) \cap s'{:}\neg part'(m)) \leq y)_{<s,s>}$ (FA)

t+3. [[professo']]:=$t{:}\cup(prof')_{<s,s>}$ (Int)

t+4. [[Mario è]]/[[professo']]:=$\lambda y.\mathbf{Id}s{:}((s{:}at'(m) \cap s'{:}\neg part'(m)_{<s>}) \leq y)_{<s,s>}(t{:}\cup(prof'){:}=$

$\mathbf{Id}s{:}\neg((s{:}at'(m) \cap s'{:}\neg part'(m)) \leq t{:}\cup(prof'))_{<s>}$ (FA)

(49) a. **Mario è gnoranza*

b. *t.* [[Mario]]:=($s{:}at'(m)\cap s'{:}\neg part'(m)$)$_{<s>}$ (Int)

t+1.[[è]]:=$\lambda x.\lambda y.$***Id***$s{:}(x\leq y)_{<s,<s,s>>}$ (Int)

t+2. [[Mario]/[è]]:=$(s{:}at'(m)\cap s'{:}\neg part'(m))\lambda x..\lambda y.s:$***Id***$(x\leq y)_{<s,<s,s>>}:=$

$\lambda y.s:$***Id***$((s{:}at'(m)\cap s'{:}\neg part'(m))\leq y)_{<s,s>}$ (FA)

t+3. [[gnoranza]]:= $g{:}stub_{<s>}$ (Int)

t+4. [[Mario è]]/[[gnoranza]]:=$\lambda y.$***Id***$s{:}((s{:}at'(m)\cap s'{:}\neg part'(m))\leq y)_{<s,s>}(t{:}\cup(prof')){:}=$

Id$s{:}\neg((s{:}at'(m)\cap s'{:}\neg part'(m))\leq t{:}\cup(prof'))=\#$ (FA)

(50) a. **Quisso è laorato 'nna frega*

b. *t.* [[Quisso]]:=$s{:}atom'(x)\cap s'{:}\neg part'(x)_{<s>}$ (Int)

t+1.[[è]]:=$\lambda x.\lambda y.$***Id***$s{:}(x\leq y)_{<s,<s,s>>}$ (Int)

t+2. [[Quisso]]/[[è]]:=$(s{:}atom'(x)\cap s'{:}\neg part'(x)_{<s>})\ \lambda x.\lambda y.$***Id***$s{:}(x\leq y)_{<s,<s,s>>}:=$

$\lambda x.\lambda y.$***Id***$s{:}((s{:}atom'(x)\cap s'{:}\neg part'(x)\leq y)_{<s,,s>}$ (FA)

t+3. [[laorato]];=$\lambda y.w{:}work'(y)_{<s,,s>}$ (Int)

t+4. [[Quisso è]/[laorato]]:=

$(\lambda y.$***Id***$s{:}((s{:}atom'(x)\cap s'{:}\neg part'(x)\leq y)_{<s,,s>})(\lambda y.w{:}work'(y))_{<s,s>}:=\#$ (FC)

Our derivations read as follows. The derivation in (47b) says that one of the (current) properties of the speaker is that having fear, while the derivation in (48b) says that Mario is part of the professor "kind". The "direction" of the part-of relation captures the fact that if this relation is established between Mario and the property of being stubborn, as in (49b), an un-interpretable sentence results. We have an atomic situation, *g:stub*, to have the complete set of situations that *m* stands for, as its proper parts. Since this is by definition impossible, the sentence is un-interpretable, something we represent via "#". This result, together with the results in (47a) and (48a), can be extended to the patterns discussed in (1)-(22). This is the case, since it captures in a principled manner why *tene'* and *è* either can or cannot combine with property- or kind-denoting object NPs.

A similar case occurs in (50b). When *quisso è* merges with *laorato*, it "adds" an argument to the property denoted by the past participle, marked as a third person form,

and which acts as a presupposition in the denotation of *ave'* (i.e. we would roughly have *λy.w:work'((s:atom'(x)∩s':¬part'(x))≤y))*). However, *laorato* and other participial forms lack such a presupposition: otherwise, they would not combine with first and second form subject NPs and with *esse* (e.g. *so laorato*). So, the result of introducing an illicit presupposition renders the sentence uninterpretable. oughly, we would have *x=¬part'(x)*, an impossible (structured) situation (cf. Heim 2008; Kamp *et al.* 2011: ch.4). We derive the ungrammaticality/un-interpretability of (50a), and similar other examples, as a semantic effect. Therefore, we can offer an account of all our examples in (1)-(35), since we have an account that correctly predicts grammatical/interpretable and ungrammatical/uninterpretable sentences. Hence, we can move to the conclusions.

5. Conclusions

In this paper we have offered an account of the distribution of *tene'*, *ave'* and *esse*, Aquilan auxiliary verbs that respectively denote two instances of a general part-hood/membership relation. We have suggested that their semantic difference lies in the "direction" of this relation. While *ave'* denotes a relation between a subject (*Mario*) referent and an object class/kind (*professo'*), *tene'* inverts this relation: an object denotes a property (*gnoranza*) of the subject. This account, morpho-semantic and semantic in nature, correctly predicts that sentences in which *tene'* merges with the wrong type of NPs complements, are ungrammatical, hence uninterpretable (e.g. **Mario è gnoranza*). We have then shown that this distinction applies to *esse* as well, as *ave'* and *esse* ultimately act as suppletive forms of a perhaps more abstract auxiliary form. While *esse* occurs with first and second person subjects, in compound tenses, *ave'* only occurs with third person subjects. We have suggested that this distinction is semantic in nature. While *ave'* operates a presupposition-like restriction on its arguments, *esse* can merge with a subject NP denoting any person value. This account correctly captures our distributional data, grammatical and ungrammatical alike.

The analysis in which we couch this account is based on a variant of Distributed Morphology that implements formal methods from Type-Logical calculi, and a Situation

Semantics interpretation. The key aspect of this formal analysis is that the distributional patterns we discussed in examples (1)-(35) can be now *predicted*, as a consequence of our assumptions about morphological and semantic processes. If an auxiliary verb merges with argument NPs carrying non-matching features, then the resulting sentence will be ungrammatical; and *vice versa*. Other solutions, whether they are couched within a minimalist framework or not, are certainly possible (cf. D'Alessandro & Roberts 2008, 2010; Legendre 2007, 2010; on closely related data). For reasons of space, we do not compare our solution to these other proposals, or discuss a broader set of data than the ones analysed in this paper: we leave such matters for future research.

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