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The Syntax Semantic interface in Auxiliary Selection. Experimental data from L2 and FL German Speakers of Italian[**]

1. *Introduction*

Auxiliary selection is a linguistic phenomenon that has been investigated for several decades, both in a cross-linguistic perspective and in language specific ones. In this respect, this process has been often described as exclusively syntax-driven, so that auxiliary selection would only depend on the argument structure featured by different verbs. Nevertheless, subsequent research has pointed out the relevance of factors related to other levels of language analysis, in particular to semantics. An approach that gives an account for both language acquisition and language learning has been adopted only recently.

Against this background, the present research will deal with auxiliary selection in Italian as Second Language (L2) and Foreign Language (FL) by L1 German speakers from a Generative perspective, according to which language is an innate human faculty and syntax is the 'generative' level of Grammar.

In the first Section, some basic notions about the X' Theory are outlined, so as to provide a basic account on the narrow-syntax phenomena that are involved in the linguistic process of auxiliary selection in Italian. Section 2 provides a general overview on the linguistic phenomenon under examination, taking into account the major previous proposals. In addition, the issue of auxiliary selection in Italian as L2 and FL will be introduced, also in a contrastive perspective with German, and a working hypothesis is proposed. In Section 3 the experimental test is presented with the relevant methodology of

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[**] The present investigation is based on a joint study on auxiliary selection conducted with Roberto Tata, on which the student has also based his thesis work (Tata, 2020). I am grateful to him for granting full and exclusive use of the data, which have been reviewed and reworked for the purposes of this paper.

investigation, while the outcomes will be illustrated in Sections 4 and 5. Section 6 provides conclusive remarks. The results obtained from the experiment will be discussed in an aggregated way through synoptical Tables, so as to propose a comprehensive explanation and offer suggestions for future studies.

2. *Argument Structure and Auxiliary selection in the Generative Framework*

2.1 *From θ-roles to the derivation of the sentential Subject*

According to general tenets, the syntactic derivation of the clause proceeds 'bottom-up', following the so-called Extension Condition (Chomsky, 1995). This means that the sentence originates within the Verbal Phrase (VP), which is the syntactic 'phase' of Lexical Insertion, where the relations between a predicate and its arguments are realized and interpreted.

Specifically, 'arguments' are merged either in the Specifier or in the Complement positions of the Verb according to argument selection, bringing about an argument structure (Fillmore, 1968; Ramchand, 2014). As the cognitive representation of an event is presumably the same for the speakers of all languages, it is claimed that the argument structure is part of Universal Grammar.

In the VP, arguments receive their 'θ-roles', following the 'θ-Criterion', which states that «each argument bears one and only one θ-role, and each θ-role is assigned to one and only one argument» (Chomsky, 1981: 35). Importantly, θ-roles are the possible semantic roles that the arguments can serve in the event described by the verb, excluding circumstantial (i.e., adjunct) constituents with their semantic features (potentially unlimited)[1]. In particular, we will deal with:

a. <agent>: the argument typically endowed with [+animate] and [+human] semantic features, serving as the first participant in dynamic and formally transitive actions (e.g., eat). However, it can also be the sole participant selected in 'agentive' events,

[1] θ-roles have been variously analysed and represent a debated topic in the literature. In this study, we adopt a framework that satisfies both theoretical and typological approaches, following Puglielli & Frascarelli (2011: 330).

that is to say an event in which the action performed does not modify a <patient> (e.g., walk);

b. <patient>: the argument modified by dynamic actions; hence the second participant in transitive (or ditransitive) structures;
c. <theme>: the argument serving as the first or sole participant in stative or resultative events, which undergoes a change of state, location, or position (e.g., fall);
d. <experiencer>: an [+animate] argument usually endowed with the [+human] feature, which is the first or sole participant in sensory or psychological events (e.g., tremble);
e. <locative>: an argument referring to a place in which, to which, or from which stative or cambiative events take place.

Even though θ-roles are semantic categories, they have an «impact on the structural level» (Puglielli & Frascarelli, 2011: 91). As a matter of fact, since the arguments serving as <patient> and <theme> are not in control of the event described by the verb, they are collocated in a low position in the hierarchy, namely Compl,VP. On the contrary, the <agent> and the <experiencer> are merged in Spec,VP, where they c-command every other linguistic item in the VP, manifesting their 'syntax-semantic control' on the event described by the verb.

For an illustration of this concept, consider the examples (1a-b) below, and relevant Figures, with the Italian verb *affondare* ('sink'), which can be realized either as a transitive verb (in which the verb assigns <patient> θ-role to the argument in Compl,VP) or as an intransitive unaccusative verb), in which a <theme> is selected as the only participant undergoing a non-agentive event:

(1) a. *Il* *pirata* *affonda* *la* *nave*
the pirate sink.3SG the boat
'The pirate is sinking the boat.'

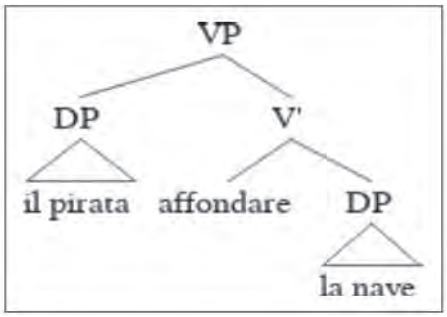

Fig. 1a: θ-roles selection in a transitive VP.

(1) b. *La* *nave* *affonda*
the boat sink.3SG
'The boat is sinking.'

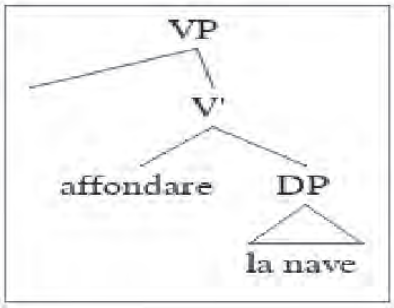

Fig. 1b: θ-roles selection in an unaccusative VP.

Since every clause must have a Subject (Chomsky, 1982; Chomsky, 1995; Rizzi, 2006), after Lexical Insertion in the VP, the argument 'promoted' to the Subject (syntactic) function must move from the VP to the Specifier of the Inflectional Phrase (IP), in which Nominative Case and agreement (i.e., person-related ϕ-features and Tense-Aspect-Mood 'TAM' features) take place. Examples (2a-b), and relevant Figures, provide an illustration for the derivation of complex and simple predicates:

(2) a. *Il* *bimbo* *ha* *mangiato* *la* *pasta*
the child have.3SG eat.PP the pasta
'The child has eaten pasta.'

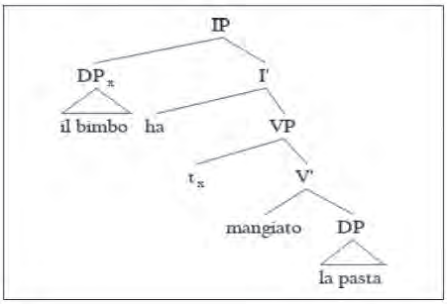

Fig. 2a: Syntactic derivation of a complex predicate.

(2) b. *Il* *bimbo* *mangia* *la* *pasta*
the child eat.3SG the pasta
'The child is eating pasta.'

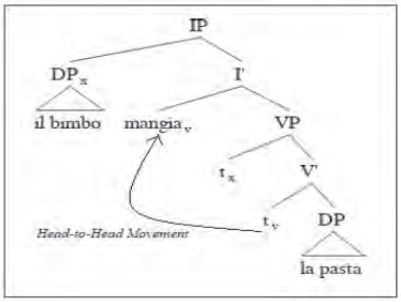

Fig. 2b: Syntactic derivation of a simple predicate.

As is shown, agreement occurs in a Spec-Head relation between the Subject and an inflected predicate, which can be either the auxiliary (merged in the I°) or the verb (that 'Head-to-Head' moves into I°).

Given this basic overview, in the next Section we will deal with the main topic of this work, namely, auxiliary selection.

2.2 *Auxiliary selection in Italian*

Based on generative accounts, auxiliary selection in Italian can be clearly explained if the argument structure of a given event is taken into account (cf. Frascarelli *et al.*, 2012).

In traditional grammars (but still in contemporary textbooks and materials destined to learners of Italian as an FL), it is generally claimed that the syntactic property of transitivity (hence, the presence of a direct object) is significant to establish which verbs select *avere* ('have') as an auxiliary. On the contrary, the alternation between *avere* and *essere* ('be') with intransitive events is much vaguer and in fact remains largely unexplained. As a consequence, learners of Italian can only memorize alternations such as those in (3)-(4) below:

(3) *Luca* *ha* *camminato*
Luca have.3SG walk.PP
'Luca has walked.'

(4) *Domenico* *è* *arrivato*
Domenico be.3SG arrive.PP
'Domenico has arrived.'

The alternation at issue can be provided a principled explanation if based on the θ-role of the argument serving as the syntactic Subject of the sentence. Indeed, following Perlmutter's (1978) 'Unaccusative Hypothesis', intransitive verbs can be divided in two subgroups selecting different auxiliaries in Italian. This hypothesis, based on the different positions of arguments 'Merge' in the VP, has been later supported by substantial empirical evidence (Burzio, 1986), showing that:

i. the intransitive verbs that select an <agent> /<experiencer> Subject, which is merged in Spec,VP, require the auxiliary *avere*; these verbs are called 'unergatives' (e.g., *camminare* 'walk', *tremare* 'tremble', *lavorare* 'work'),

ii. the intransitive verbs that select a <theme> Subject, which is merged in Compl,VP, require *essere*; these verbs are defined 'unaccusatives' (e.g., *diventare* 'become', *uscire* 'go out', *sciogliersi* 'melt').

In other words, the selection of the auxiliary *avere* does not depend on the presence of a direct object (which is the prerogative of transitive verbs only), but on the 'agentivity' of the argument serving the Subject function. Taking this into account, the difference between (3) and (4) is immediately clear: the former is an unergative verb, while the latter is unaccusative.

2.3 *The relevance of Aspect*

Even though the process of auxiliary selection in Italian clauses can be explained in terms of agentivity of the constituent serving the Subject function, some verbs apparently select both auxiliaries in the same context. Consider (5) below:

(5) *Il* *tuono* *ha/è* *rimbombato*
the thunder have/be.3SG rumble.PP
'The thunder has rumbled.'

In this respect, in Sorace (2000) it is claimed that the intra-language variability in auxiliary selection is due to the influence of the 'Aspect' of the sentence and the 'Telicity' of the verb (cf. Cinque, 1999; Schumacher, 2008). Based on this proposal, the so-called Auxiliary Selection Hierarchy (ASH) has been formulated, which captures the differential susceptibility of (monadic) intransitive verbs to variable auxiliary selection across languages.

As is shown in Table 1 below, the extremes of the hierarchy proposed are, on one side, the so-called 'core verbs', that is to say prototypical (resultative and stative) unaccusative verb and, on the other side, prototypical unergative ones:

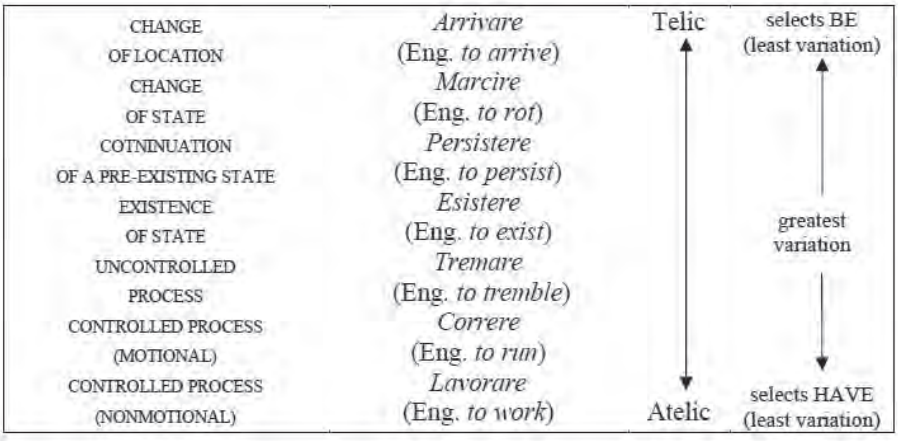

Table 1: Auxiliary Selection Hierarchy (adapted from Rastelli, 2007).

However, though this proposal can provide a plausible explanation for the general case, it cannot give a full account for (i) the existence of verbs with multiple lexical entries and (ii) pseudo-intransitivity (that is to say, the possibility of omitting an argument when it has little relevance in the given context). An immediate illustration for both (i) and (ii) is provided by a controlled motional process like *atterrare* ('land'), a verb having multiple lexical entries, with different auxiliaries; moreover, the transitive entry allows for a pseudo-intransitive realization, since the object ranges over a limited set of referents, hence there is no need to mention it:

(6) a. *Il* *pilota* *ha* *atterrato* *[l'aereo]* TRANSITIVE
the pilot have.3SG land.PP the plane
'The pilot has landed [the plane].'

b. *Il* *pilota* *è* *atterrato* UNACCUSATIVE
the pilot be.3SG land.PP
'The pilot has landed.'

As a consequence, we reckon that Sorace's ASH should be revisited, taking into full account the lexical and interface factors that characterize the phenomenon under examination.

Similar alternations can be found in German. Indeed, though Diedrichsen (2013) points out that the 'motion' feature is a stronger factor for unaccusativity in German than in other languages (as many verbs that express movement without any sense of direction select *sein* 'be'), according to the same author, there is a subclass of motion verbs (specifically the verbs of 'manner of motion') that generally selects *sein*, but may also select *haben* ('have') when a change of location or a direction is not specified, as it is shown in (7a-b) below:

(7) a. *Die* *Gäste* *haben* *getanzt.*
the.NOM guests have.3PL dance.PP
'The guests have danced.'

b. *Sie* *sind* *um* *den* *Saal* *getanzt.*
they be.3PL around the.3DAR.M hall dance.3PP
'They have danced around the hall.'

It is clear that the semantics of the verb plays a role in the selection of auxiliary in German, but entrusting the alternation of the auxiliary only on verbal Aspect does not allow for an explanation.

2.4 *The Working Hypothesis*

The ASH has had a great impact on studies focusing on the auxiliary selection process in Italian as a FL and as an L2, respectively. Specifically, Sorace (2000: 860) claims that «the syntax of auxiliary selection tends to be acquired earlier with certain verbs and later with others, both in first and second language acquisition». Hence, according

to this theory, users of a language (both L1 and L2/FL users) would learn first the auxiliary selected by the so-called core verbs, since these verbs have a more consistent aspectual characterization. This speculation has been supported by Ježek and Rastelli (2008), in which it is shown that learners of Italian as FL, besides manifesting negative transfer phenomena in their outputs, tend to perform better with core verbs as far as auxiliary selection is involved.

Nevertheless, a problem that the ASH has brought about is whether the auxiliary selection process is syntax-driven or lexically driven by a certain verb. Hence, many studies in language learning and acquisition have focused on understanding if and to what extent the actional (i.e., telic) content of predicates is accessible to language learners.

In this line of research, Rastelli (2007) maintains that the first access to actional content of predicates by learners of Italian as FL is plausibly incomplete, since (i) learners seem to be unaware of the difference in Aspect between different past tenses in Italian, (ii) learners tend to realize time expressions which are in conflict with the aspectual configuration of the verbs, and (iii) learners spread telicity outside the verbs, through the insertion of adjuncts. In addition, in Rastelli (2007) it is claimed that a period of latency exists, in which learners do not seem to worry much about which auxiliary to choose: what counts is what surrounds the verb rather than the effort of detecting the actional content of the verb itself.

In the formal approach maintained in the present work, we hypothesize that auxiliary selection is 'syntax driven' on a clausal level, rather than lexically driven, for all language users, regardless of their levels of proficiency. Specifically, it depends on the relation between argument roles merged in the VP and the syntactic function they serve in the clause. This kind of explanation can provide substantial support to a formal Syntax-Semantics Interface approach to auxiliary selection. Interfering factors, connected with semantic features like Aspect and the *Aktionsart*, which are more language specific, are supposed to be more typical of early phases of acquisition, and gradually solved with growing proficiency.

To verify the validity of our working hypothesis and provide a novel and alternative explanation to the phenomenon of auxiliary selection, within the Syntax-Semantics formal framework adopted, the experimental design of our test and relevant results will be the focus of the following Section 3.

3. *The experimental test and methodology of investigation*

3.1 *Objectives and research questions*

Taking the above as a starting point, this research aims to provide an answer to three crucial research questions, namely

a. what are the semantic and syntactic factors involved in the auxiliary selection process in L1 German speakers of Italian as L2/FL, and what differences can be found in comparison with Italian native speakers?
b. what (if any) differences can be found in the auxiliary selection process between L1 German speakers of Italian as L2 and Italian as FL;
c. what (if any) differences can be found between L1 German users of Italian as L2 and as FL across different levels of proficiency?

3.2 *The experimental test*

In order to provide an answer to the research questions presented in the previous Section, an original production test has been designed. The experiment, written and distributed online through the LimeSurvey platform, consisted of (a) a written and partially guided production experiment, (b) a socio-demographic survey, (c) a questionnaire that aimed at self-psychometric judgements on the influence of various linguistic factors on the linguistic phenomenon under exam.

The guideline was followed by a graphic representation of the event described by the prospected sentence. The representations were cartoons, originally drawn with the specific objective of setting in foreground the image of the character serving the Subject function in the prospected sentence. Informants were given 24 verbs as prompts and asked to describe the event in the cartoon, providing an active sentence and using the given verb in its present perfect form. In particular, the 24 prompts, conveniently randomized, aimed at the following kinds of sentences:

a. 6 sentences with verbs admitting more than one lexical entry with different argument structure (polysemous verbs), expected

to be produced in their transitive form (i.e., *fallire* 'lose', *atterrare* 'land', *suonare* 'play', *trascorrere* 'spend', *affondare* 'sink', *vivere* 'live');

b. 6 sentences with the same verbs as above, expected to be produced in their intransitive unaccusative form;
c. 6 sentences with motion verbs, selecting *avere* as auxiliary in standard Italian; 2 verbs allowing for a transitive implementation (*attraversare* 'cross' and *correre* 'run') and 4 verbs used in their unergative form (*ballare* 'dance', *camminare* 'walk', *nuotare* 'swim', *volare* 'fly');
d. 6 filler sentences (using *incontrare* 'meet', *uscire* 'go out', *rompere* 'break', *sbagliare* 'miscalculate', *partire* 'leave', *frequentare* 'attend').

In Figure 3 a sample cartoon is provided to illustrate the instruction which preceded every cartoon and the specific prompt used for *atterrare* ('land') and obtain sentences like *l'aereo è atterrato* ('the plane has landed') and *il pilota ha atterrato l'aereo* ('the pilot landed the plane'):

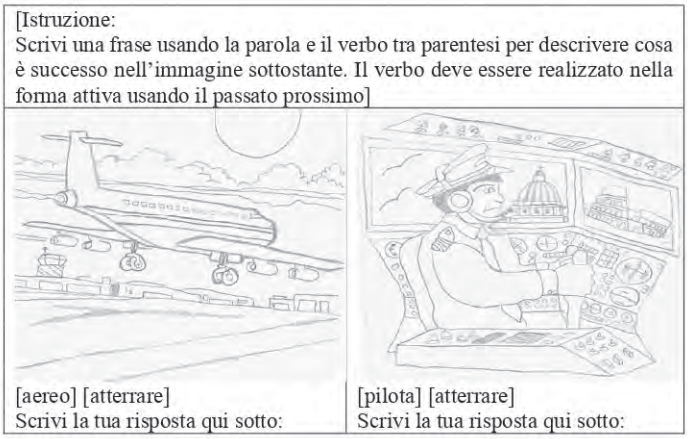

Fig. 3: Sample cartoon used in the experimental test.

3.3 *The informants: socio-demographic data*

The present study benefited from the collaboration of 87 informants. Specifically, this group is composed of (i) 29 Austrians, all users of Italian as FL, with German as L1 (henceforth AUS), (ii) 29 Italians,

all born in South Tyrol, users of Italian as L2, with German as L1 (henceforth SOU), (iii) 29 Italians, all users of Italian as L1, as a Control Group (henceforth ITA). Their mean age is 25, mostly women (85%); the majority of them declared to have a linguistic education (62%). In particular, 83% of AUS informants took Italian courses, compared to only 24% of SOU informants. This means that the users of Italian as FL in this research were (or have been) mainly university students of a foreign language faculty, while the users of Italian as L2 are more likely to have learnt Italian in non-academic contexts. As we will see, this distinction will play an important role in this investigation.

The (non ITA) informants were also asked to indicate their level of proficiency in Italian, choosing between Elementary (A1-A2), Intermediate (B1-B2) and Advanced (C1-C2). Based on the answers to these questions, we divided the informants into three groups: (a) Elementary/Intermediate group (≤B1+ level), (b) Intermediate/ Advanced group (B2+-C1 level) and (c) Advanced/Proficient group (≥C1+ level), obtaining the subdivision shown in Table 2 below:

	≤B1+ level	B2+-C1 level	≥C1+ level
AUS	19	5	5
SOU	11	4	14

Table 2: Number of AUS and SOU informants per proficiency category.

4. *The self-psychometric questionnaire*

The psychometric questionnaire was aimed at collecting judgements on the importance of a number of factors involved in the process of auxiliary selection in Italian, and an optional question related to the presentation of the linguistic phenomenon at issue in the didactic materials used by the informants as a support to study Italian. Judgments were expressed in terms of 'Yes', 'No' and 'I don't know'. The factors considered were: (a) [±human] Subject, (b) [+<agent>] Subject, (c) [[±perfective] aspect, (d) [+motion] verb, (e) [+transitive] verb, (f) phrasal relationships in the sentence. In order to make these factors understandable to informants with no linguistic background, these notions have also been reformulated in the form of questions, as is shown in Table 3 below:

Factors	*Reformulations*
[+human] Subject	*Presenza di un soggetto umano* 'Occurrence of a human Subject'
[-human] Subject	*Presenza di un soggetto non umano* 'Occurrence of a non-human Subject'
[+<agent>] Subject	*Presenza di un verbo d'azione* 'Occurrence of a verb of action'
[+perfective] aspect	*Rappresentazione dell'evento in corso* 'Representation of an ongoing event'
[-perfective] aspect	*Rappresentazione dell'evento concluso* 'Representation of an event concluded'
[+motion] verb	*Presenza di un verbo di movimento* 'Occurrence of a motion verb'
[+transitive] verb	*Presenza di un verbo che seleziona un oggetto diretto* 'Occurrence of a verb that selects a direct object'
phrasal relationships in the sentence	*Tipologia di parole da usare obbligatoriamente con il verbo* 'Type of words to be used mandatorily with the verb'

Table 3: Reformulations of relevant linguistic notions.

This questionnaire was proposed after the experimental test, because we feared that reading and reflecting on such questions might affect the spontaneity of informants' responses in the linguistic part of the test, thus biasing the results. Nevertheless, we prefer to expose them immediately before the linguistic part, because we think that they can provide some interesting key to understand the experimental results.

4.1 *Assessment of the self-psychometric judgements*

In order to assess the results of the questionnaire, we compared the total number of Yes and No answers in different combinations[2]. Specifically, we compared the results:

a. retrieved from the part of the questionnaire referring to *avere* as auxiliary,
b. retrieved from the part of the questionnaire referring to *essere* as auxiliary,

[2] 'I don't know' answers have not been included in this report since their number is immaterial.

c. retrieved from both parts mentioned above, in an aggregated way.

Hence, the data obtained from (a) and (b) illustrate what the informants considered as the distinctive semantic features and syntactic properties for the selection of *avere* and *essere*. On the other hand, the data obtained in (c) reveal what linguistic factors are considered crucial in the choice between one auxiliary or the other. The degree of relevance of the involved factors in the auxiliary selection process was quantified by carrying out the Fisher Test, which allows for the identification of a statistic value, known as 'p-value'.

The outcomes will be assessed in an aggregated way, focusing on each group of informants and, for the sake of space, we will only focus on the factors that are significant for the present discussion, starting with ITAs' judgements, as they serve as control group for the analysis of the answers provided by users of Italian as FL and L2.

Let us then consider Figure 4 below, in which the number of Yes (left column in Figures 4, 5 and 6 below)/No (right column) answers is given for ITA to the eight questions of the questionnaire. The data are ordered from the most statistically significant on the left, to the least statistically significant on the right:

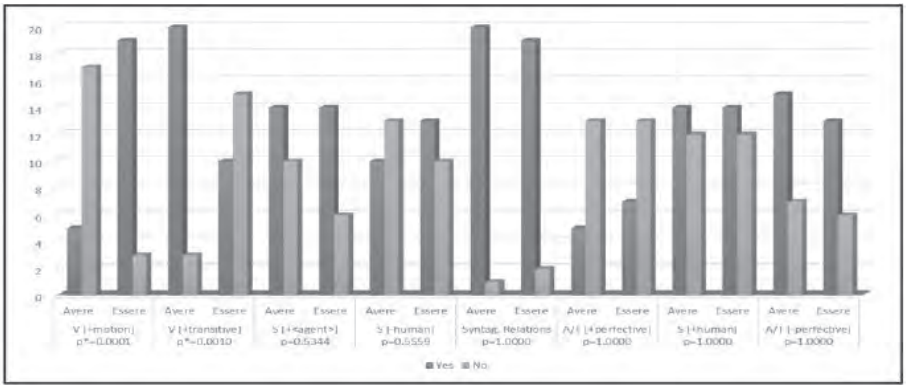

Fig. 4: Influencing factors in auxiliary selection according to ITA.

As we can see, the most relevant factor in the auxiliary selection process according to ITA speakers is that the verb is endowed with the [+motion] semantic feature (p=0.0001). This outcome is plausibly due to a generalisation that derives from the high frequency of *essere* in sentences with motion verbs, supported by the norm as it is presented in relevant teaching materials. As a matter of fact, we will see that the feature of motion is not as crucial as it is generally claimed.

Motion is followed by the syntactic implementation of *transitivity* (p=0.001), which, conversely, favours the emergence of *avere*. This outcome was also expected, since the presence of a direct object primes the occurrence of *avere*, as it is also suggested in traditional grammars.

From a statistical perspective, it is interesting to notice that transitivity is ten times less significant than motion in the factors determining auxiliary selection according to ITA. Nevertheless, this fact should not be surprising, since transitive verbs are not the only kind of verbs which select *avere* as auxiliary: this auxiliary is also associated to unergatives. On the contrary, only unaccusatives are linked to the selection of *essere*. Therefore, *essere* as an auxiliary primes production of unaccusative verbs (usually endowed with the semantic feature of motion) more significantly than *avere* does with transitive verbs.

Moving on to the judgements produced by the target informants, Figures 5 and 6 below show the crucial factors indicated by AUS and SOU, respectively:

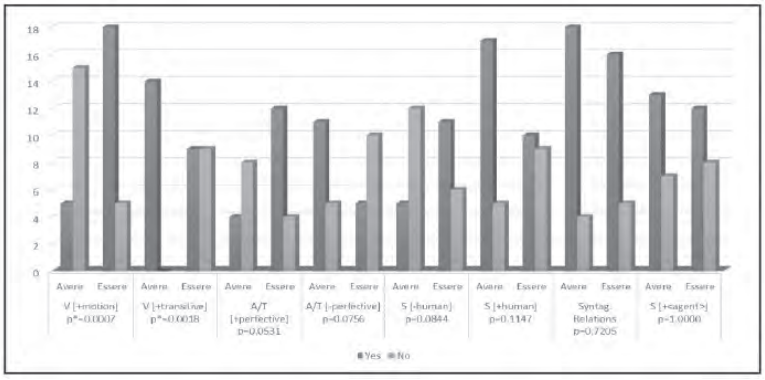

Fig. 5: Influencing factors in auxiliary selection according to AUS.

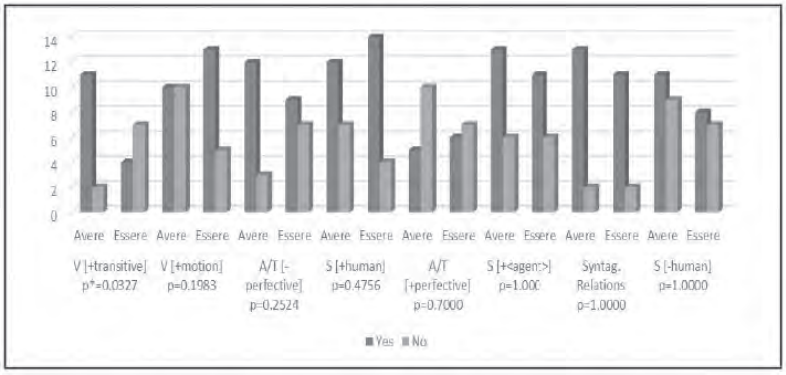

Fig. 6: Influencing factors in auxiliary selection according to SOU.

As is shown, according to AUS learners, motion is the main feature that leads auxiliary selection (p=0.0007). This outcome could be expected, due to teaching materials and a possible interference coming from their mother tongue, in which motion is extremely relevant in the process at issue. The second significant linguistic factor is transitivity (p=0.0018). We can conclude that AUSs' results perfectly match ITAs' outcomes. It is also interesting to notice that no 'No' answers were given by AUS to the corresponding question for *avere*, showing once again the crucial role assigned to transitivity for auxiliary selection in classes of Italian as L2.

As for SOU learners, they interestingly reverse the order of priority and assign transitivity the role of the only significant factor (p=0.0327) to choose between *avere* and *essere*. Hence, motion is not statistically significant according to them. From a statistical perspective, it can be noticed that in this case there is no evident peak or clear-cut differences between 'Yes' and 'No' answers in relation to the two auxiliaries, determining the impression that SOUs are more disoriented than AUSs in auxiliary selection.

We surmise that this disorientation might be due to the context and input of L2 learning, which is different from the context and the input related to FL learning. Indeed, it is typically a non-academic context of learning, in which a metalinguistic awareness is not often developed, and the non-standard input to which they are exposed (coming from native and, possibly, regional specific speakers). On the contrary, AUS learners take into consideration the same linguistic factors as ITAs because the input they are exposed to is a standard variety of Italian and the language learning process is probably supported by courses of linguistics, in which a more attentive focus on the factors involved in language phenomena might arise.

In the next Section we will analyse the productions of the informants, in order to check whether the factors acknowledged as crucial in the self-psychometric questionnaire are actually relevant in the decision-making process or, rather, if the importance acknowledged is only the effect that the 'rules' presented in the didactic materials have on the informants' beliefs.

5. *The linguistic experiment: data and analysis*

5.1 *Assessment of the outputs*

In order to assess informants' outputs, the productions obtained have been categorised according to the auxiliaries selected and the presence of a direct object. Thus, the structures were divided into the following four groups:

a. transitive structures with *avere* as the auxiliary,
b. transitive structures with *essere* as the auxiliary,
c. intransitive structures with *avere* as the auxiliary,
d. intransitive structures with *essere* as the auxiliary.

The percentage values of each group have been calculated in relation to the total amount of outputs. Furthermore, relevant values have been subdivided according to the proficiency categories described in Table 2 above, so as to examine the relation between auxiliary selection and competence.

Finally, we also examined the sentences produced with respect to the different linguistic factors involved in the process of auxiliary (discussed above in this paper), namely:

a. the agentive role of the Subject and its potential 'control' on the event described in the sentence;
b. the syntactic function (and the related distributional properties) served by the phrase given in the prompt;
c. the semantic [±human] feature of the phrases serving the Subject function.

In the next Sections we will discuss the outcomes in an aggregated way, but also specifically with respect to verbs and groups of informants. First we will discuss the outcomes related to the different lexical entries of 'polysemous' verbs, then we will turn to auxiliary selection with 'motion' verbs selecting *avere* as auxiliary in standard Italian[3]. In conclusion, we will briefly examine the data retrieved from the outputs across different levels of proficiency in Italian.

[3] Note that the percentages shown in the column diagrams do not always add up to 100% in the sum of the answers to the two options (i.e., *avere* and *essere*). This is because the responses that did not directly refer to the image or the words given as prompts (cf. the sample given in Figure 3) have been excluded.

5.2 *Polysemous verbs: entries selecting* avere *and* essere

Each polysemous verb was given to be used in two prompts of the experiment, one where the prospected sentence was expected to feature *essere* and one where the prospected sentence was expected to feature *avere*.

Let us start the illustration with the verb *atterrare* ('land') in Figures 7 and 8, the former intended to stimulate the unaccusative realization of this verb (hence, the production of *essere*), whereas the latter its transitive counterpart (with *avere*). Here and in the rest of presentation, each cartoon will be flanked by a diagram illustrating the values scored for relevant answers (in percentages). The three columns in the diagrams provide, respectively, ITA, SOU and AUS values:

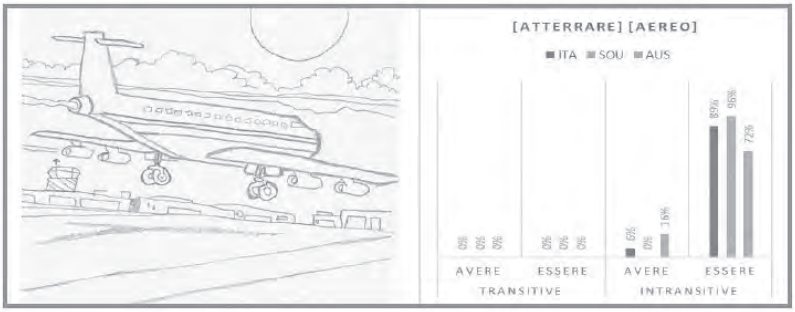

Fig. 7: Outcomes with *atterrare* (prospected entry: UNACCUSATIVE).

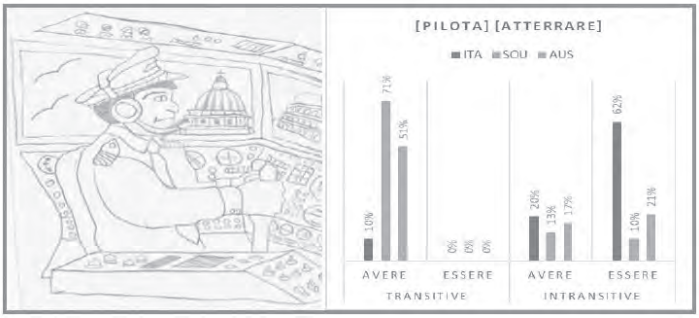

Fig. 8: Outcomes with *atterrare* (prospected entry: TRANSITIVE).

As we can see, when the prompt aimed at the production of clauses featuring the intransitive entry of the verb (Figure 7), almost all informants realized sentences with *essere* (only a small portion of AUSs (16%) and ITAs (6%) used *avere*, as if the verb were unergative).

On the other hand, when the prompt aimed at the production of the transitive entry of the same verb (Figure 8), informants' answer split. In particular, ITA speakers show a preference for sentences selecting *essere* as auxiliary (62%), even if the Subject of these sentences is a pilot (as prompted by the cartoon), that is to say, an agentive referent who is semantically in control of the event described by the verb *atterrare*. We suggest that this outcome is due to the fact that *atterrare* is intuitively perceived by native Italians as a 'cambiative' (i.e., a motion) verb, rather than as a dynamic and formally transitive one. The majority of SOU and AUS speakers, on the other hand, mainly stick to the prompt, opting for a transitive interpretation of the verb, with the explicit realization of a direct object[4].

In the case of *affondare* ('sink'), when the prompt was aimed at the production of an intransitive sentence, the boat was the only protagonist of the cartoon (Figure 9), whereas the transitive prompt features the [-human] referent *cannon* as the prospected Subject (Figure 10):

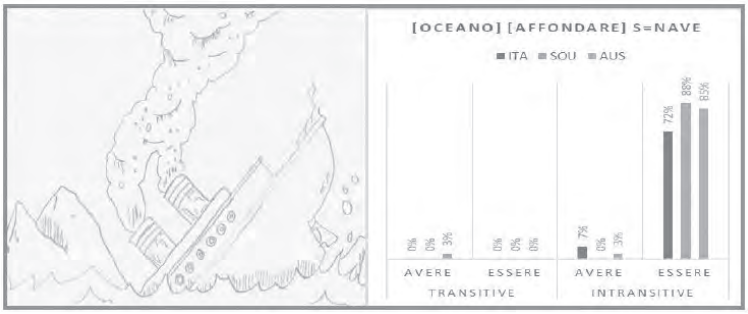

Fig. 9: Outcomes with *affondare* (prospected entry: UNACCUSATIVE).

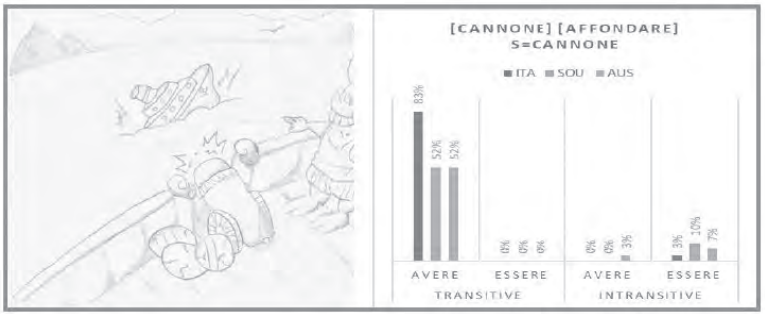

Fig. 10: Outcomes with *affondare* (prospected entry: TRANSITIVE).

[4] Some speakers also produced structures exhibiting *avere* with no (explicit) direct object. However, we reckon that these outputs do not correspond to unergative structures, but to pseudo-intransitive realization of the transitive verb, since the object of the verb *atterrare* ranges over a very restricted set of possible referents (like the *aereo*).

As we can see in the diagrams, almost all informants have produced the type of sentences we prospected, namely an intransitive sentence using *essere* with Figure 9 and a transitive realization with *avere* for Figure 10. In particular, the latter shows that either agent animacy is not compelling to trigger a transitive realization of the verb or that the informants have considered the cannon as an 'instrument' and the pirate as the actual agentive Subject of this event. We will resume these considerations later in subsequent cases of this paper.

In the case of the verb *trascorrere* 'pass'/'spend', most informants produced sentences with *essere* when the prospected clause was unaccusative, as we can see in Figure 11:

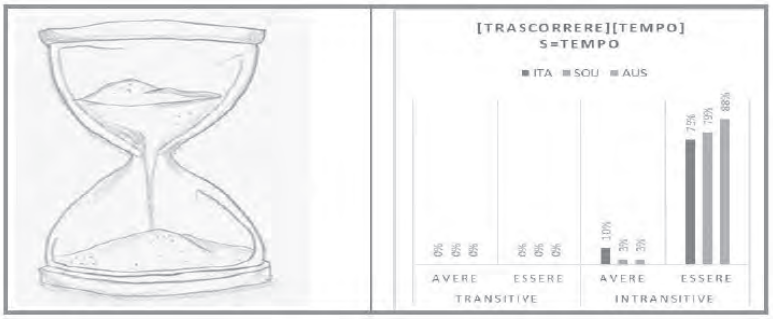

Fig. 11: Outcomes with *trascorrere* (prospected entry: UNACCUSATIVE).

This outcome was expected given the occurrence of a [-human] Subject which undergoes the event expressed by the verb. Nonetheless, it is interesting to notice that 10% of ITA have used the auxiliary *avere* (as if it were an unergative verb) and, in these cases, an aspectual adverb is always present in the response (like *rapidamente* 'quickly' or *lentamente* 'slowly'), thus confirming the existence of a correlation between the selection of *avere* and the semantic feature of Aspect (in line with Sorace's (2000) ASH; cf. § 2.3)[5].

When the prompt was aimed at a transitive realization of *trascorrere*, most informants have selected *avere* (cf. Figure 12 below) and, since a direct object was not 'visually' given in the cartoon, an abstract object has been produced (like 'vacations', 'summer holidays', etc.) for an explicit realization of transitivity.

[5] A considerable part of the informants also decided to realize a transitive sentence having *il tempo* ('the time') as a concrete object for the transitive clause and a [+human] referent for the Subject function, producing sentences like *Ho trascorso il tempo facendo tante attività* ('I spent my time doing many activities'). As said in footnote 3, such sentences have been excluded.

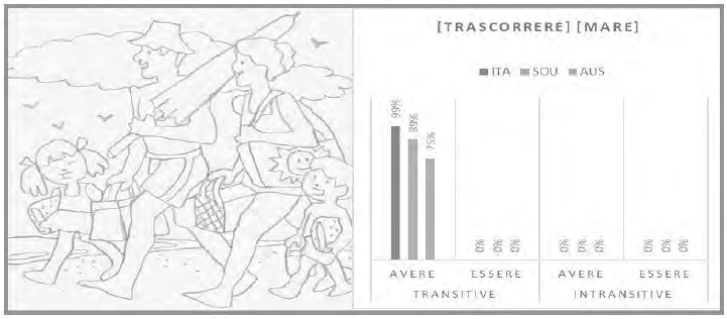

Fig. 12: Outcomes with *trascorrere* (prospected entry: TRANSITIVE).

However, the lack of an explicit object, led different SOU (11%) and AUS (25%) learners to produce sentences in which *trascorrere* is used as motion verb (possibly also because it contains the lexical root of the motion verb *correre* 'run') and, in these cases, a consistent variation can be found in auxiliary selection, as is shown in Figure 13 below:

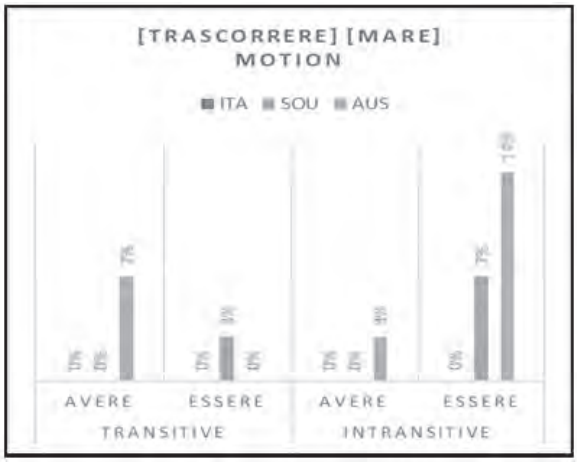

Fig. 13: Outcomes with *trascorrere* used as a motion verb.

This might be due to the fact that *trascorrere* is not a high frequency verb, so that SOU and AUS weren't able to determine which structure should be used in the target language.

Suonare also provides an interesting case since, when the prompt was intended to obtain an unaccusative realization, most informants of the three groups produced sentences with the auxiliary *avere* and no direct object (as if it were an unergative verb). Consider Figure 14 below:

Fig. 14: Outcomes with *suonare* (prospected entry: UNACCUSATIVE).

As noticed with *trascorrere* above, the intransitive realization was accompanied by an aspectual phrase, like *per ore* ('for hours') or *tutta la mattina* ('all morning'), thus producing [+durative] events. These cases seem to provide further support to Sorace's (2000) theory, according to which verb Aspect plays a crucial role in auxiliary selection.

However, an alternative explanation can be based on Syntax-Semantic considerations. Indeed, it is also feasible to assume that 'verbs of emission' (such as *suonare*) allow for an agentive interpretation even though the explicit Subject is [-human], if the latter is considered the 'instrument' of a 'covert' agentive Subject (like in the case of the cannon discussed for *affondare* above). In addition, the unergative nature of the verb under exam seems to be confirmed in German by the fact that the corresponding verb (*klingen*) selects *haben* (and not *sein*) as an auxiliary, despite being intransitive, as is shown in (8):

(8)	*Das*	*Telefon*	*hat*	*geklingelt*
	the.NOM	telephone	have.3SG	ring.PP
	'The telephone has rung.'			

Since the argument structure of verbs is assumed to be 'universal' and argument semantics has an impact in auxiliary selection, we might conclude that this impact is greater in German than in Italian (cf. Puglielli & Frascarelli, 2011 for discussion), so that the Subject of a verb like *suonare* is assumed to be agentive also when the Subject is an instrument. Further investigation is obviously needed to support this line of analysis.

As for the realization of a transitive event, this was not controversial at all. As we can see in Figure 15 below almost all informants have produced transitive structures with *avere* and a direct object, as expected:

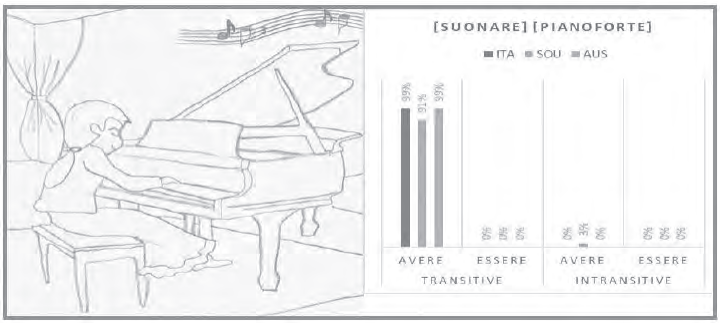

Fig. 15: Outcomes with *suonare* (prospected entry: TRANSITIVE).

The absolute preference for an agentive Subject – as opposed to sentences in which the Subject undergoes the action expressed by the verb – is clearly shown with the verb *fallire* (‘fail’). Indeed, when the cartoon aimed at the production of intransitive sentences (something like *la rapina è fallita* ‘the robbery failed’) only a few ITAs, half of the SOUs and a quarter of the AUS have produced structures with *essere* as auxiliary. On the contrary, most informants produced transitive sentences with *avere* and a [+human] Subject, as we can see in Figure 16a and Figures 16b-c below:

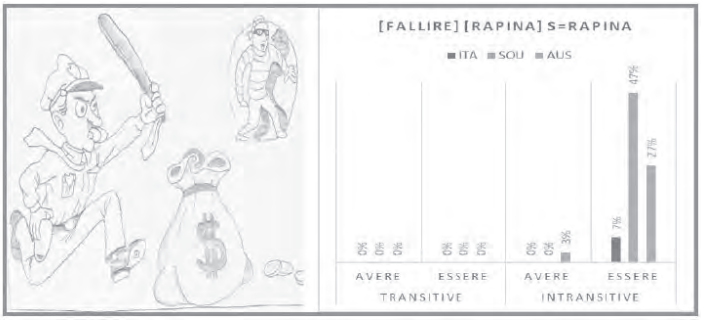

Fig. 16a: Outcomes with *fallire* (prospected entry: UNACCUSATIVE).

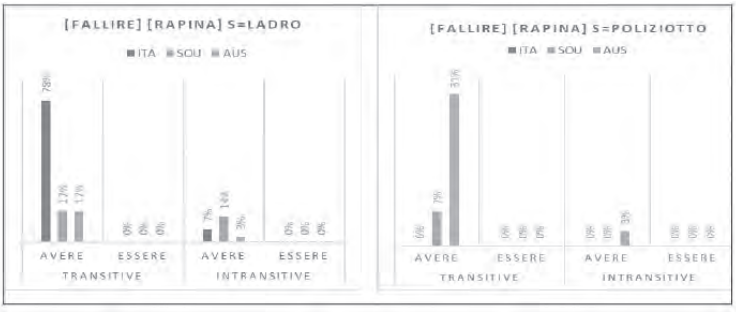

Fig. 16b-c: Outcomes with *fallire* (prospected entry: UNACCUSATIVE).

In this respect, it is interesting to notice that ITAs preferred the *ladro* ('thief') as the protagonist of the event (*il ladro ha fallito la rapina* 'the thief failed the robbery'), whereas AUS speakers the *poliziotto* ('policeman'), in causative sentences like *il poliziotto ha fatto fallire la rapina* ('the policeman had the robbery failed'). Interestingly, in these sentences a direct object often occurred.

With the transitive implementation of *fallire* ('lose'), *avere* was also the auxiliary preferred by all groups (mostly producing a pseudo-intransitive construction) as is shown in Figure 17:

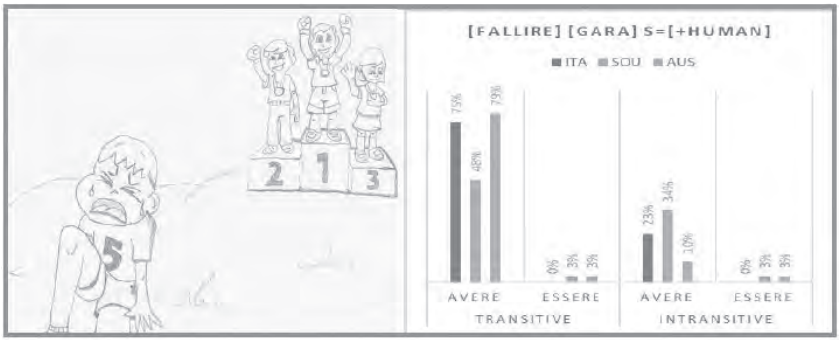

Fig. 17: Outcomes with *fallire* (prospected entry: TRANSITIVE).

Let us finally consider the prompt verb *vivere* and the data illustrated in Figure 18, starting as usual with the cartoon stimulating the unaccusative realization:

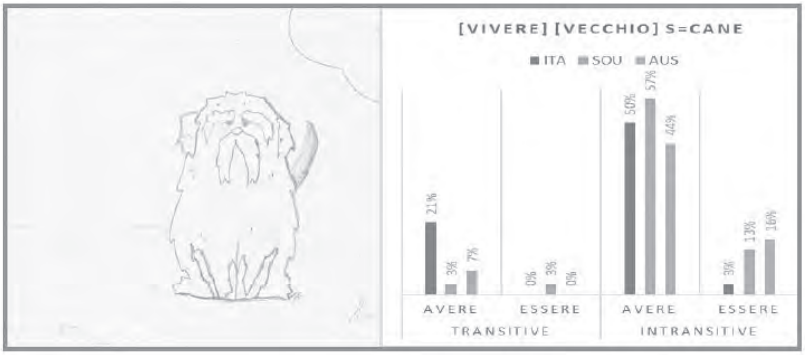

Fig. 18: Outcomes with *vivere* (prospected entry: UNACCUSATIVE).

As we can see, almost half of the informants in the three groups produced acceptable sentences with the auxiliary *avere*, as if the verb were unergative. We surmise this outcome shows that the verb under

examination is intuitively perceived as describing an action, rather than a state. Hence, a verb that requires an agent to serve as the Subject of the sentence, triggering the emergence of *avere*.

It must be said that the verb *vivere* can also have a transitive realization in Italian (in which the <patient> is explicitly realised). As a matter of fact, 21% of ITA produced sentences like (9):

(9) *Il mio cane ha vissuto le migliori avventure*
the my dog have.3SG lived the best adventures
da vecchio
as old
'My dog had the best adventures as an old man.'

The emergence of intransitive structures with *essere* in SOU and AUS learners can be once more explained by the absence of a direct object. This seems to disfavour the selection of *avere* in non-native speakers, even when the Subject is intuitively agentive.

As for the prompt intended to trigger a transitive realization, the auxiliary *avere* is dominant as expected (cf. Figure 19 below). However, since no explicit direct object was given in the cartoon, this verb is mainly used as an unergative by all informants and, again, some SOU and AUS speakers use *essere*, possibly for the reason discussed above.

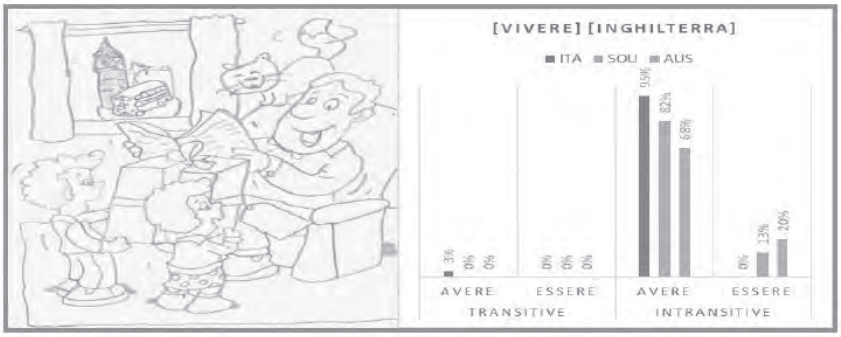

Fig. 19: Outcomes with *vivere* (prospected entry: TRANSITIVE).

To sum up, the results discussed in this Section have shown that variation in auxiliary selection tends to occur similarly in all groups, with differences between ITAs, on the one hand, and L2/FL, on the other, that can be attributed to a greater adherence to the relationship between the semantic and the syntactic hierarchy in the realisation of the Subject and the lack of explicit indications for the realization of a direct object.

5.3 *Motion verbs: entries selecting avere*

In this Section, we will focus on the productions prompted by motion verbs that select *avere* as an auxiliary in standard Italian. Hence, unergative verbs in which the Subject has an agentive role, though excluding the presence of a direct object. We will see that in this syntax-semantic context, auxiliary variation is more intense than with polysemous verbs, both with ITAs and with L2/FL learners – allegedly for different reasons (to be discussed later).

Starting our presentation with the verb *camminare* ('walk'), Figure 20 shows that in this case ITA speakers always used the auxiliary *avere*, without variations. On the contrary, both auxiliaries can be found with SOUs and AUSs and, in particular, AUS speakers decidedly preferred *essere* (68%), which is the standard auxiliary for motion verbs in German (like in Italian for the most frequently used unaccusative motion verbs (such as *andare* 'go', *venire* 'come', *arrivare* 'arrive', *partire* 'leave', etc.).

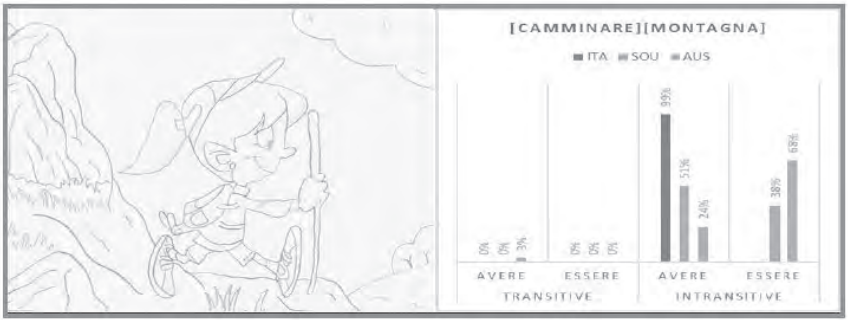

Fig. 20: Outcomes with *camminare* (sole possible entry: UNERGATIVE).

In this case, it is feasible to suggest that the selection of *essere* by SOU and AUS speakers is due to both the interference from their L1 and an overgeneralisation operated from the auxiliary used for Italian unaccusative verbs of motion, which is however not applicable with ergative verbs. The fact that SOU speakers performed better than AUSs might be attributed to the fact that SOUs are exposed to a more consistent amount of natural input in their target language, which makes them follow ITAs' actual production more than AUS can.

A larger exposure to a natural input in the target language can also be the cause of the results obtained with the verb *ballare* ('dance') when the prompt aimed at the production of sentences with the verb used in its unergative form. Consider Figure 21 below:

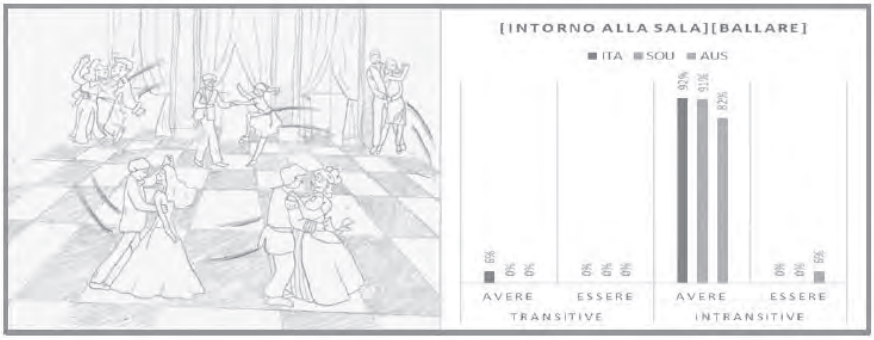

Fig. 21: Outcomes with *ballare* (prospected entry: UNERGATIVE).

As is shown, despite the cartoon and the context clearly describe an action implying movement, the use of *essere* is practically immaterial in this case. As a matter of fact, this verb selects *avere* in German (like in Italian), hence no interference could bias the performance of AUS and SOU speakers.

Some confusion was instead caused by the ergative verb *nuotare* ('swim'), in which the semantic component of movement is evidently more foregrounded than with dancing, probably due to the fact that swimming is a physical activity connected with sport. Hence, though the use of *avere* is dominant for both L2 and FL learners, *essere* was produced by 17% SOU and 27% AUS speakers, as is shown in Figure 22 below:

Fig. 22: Outcomes with nuotare (sole possible entry: UNERGATIVE).

The verb *volare* ('fly') also brought about an interesting contribution for the present analysis. Let us consider Figure 23 below:

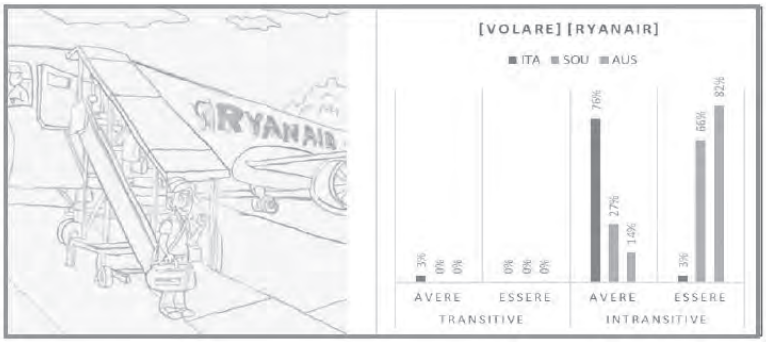

Fig. 23: Outcomes with *volare* (prospected entry: UNERGATIVE).

Similarly to the three verbs previously examined, ITAs' answers show no variations in the unergative interpretation of *volare*, whereas an unaccusative interpretation emerges with L2 and FL speakers of Italian, so that *essere* is definitely preferred (by 66% and 82%, respectively). Hence, the outcomes obtained with *volare* are different from *ballare* and *nuotare.*

This result seems to confirm the hypothesis previously outlined concerning the relevance that L2/FL learners of Italian assign to the semantic feature of (Subject) control on the event as a trigger for the selection of *avere*. In other words, the outputs obtained show that the control exercised by the Subject on the motion activity at issue plays a crucial role in the *avere*/*essere* alternation, superseding argument structure in the VP. As a matter of fact, the cartoon in the prompt prospected a passenger as the Subject of the prospected sentence and a passenger has clearly no control in the action of flying (though passengers have an agentive role in their will to fly with an airplane).

The influence deriving from the Subject's control on the motion activity is also evident from the outcomes related to the verb *correre* ('run'), illustrated in Figure 24 below:

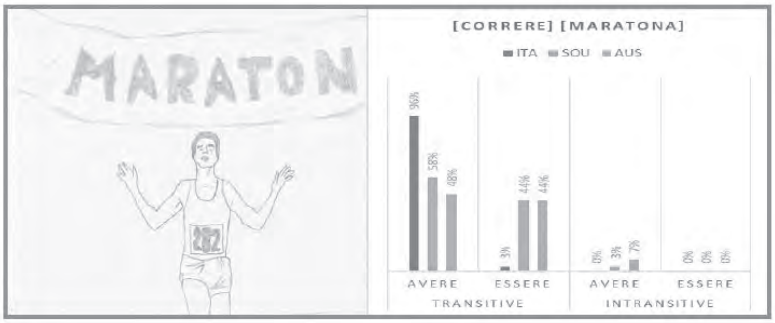

Fig. 24: Outcomes with *correre* (prospected entry: TRANSITIVE).

As indicated in the caption, the realization of *correre* was expected to be transitive, since the cartoon triggered the realization of a direct object (i.e., the marathon), and not simply the activity of running for its own sake.

However, even if the direct object was mostly realized by all informants (hence, the prompt achieved the desired outcome), the auxiliary *essere* was selected by learners of Italian almost in the same percentages as *avere.* In other words, L2/FL speakers produced the auxiliary *essere* in a transitive structure. Hence, it can be claimed that the relevance of the semantic notion of control for AUS and SOU learners of Italian can also supersede the syntactic realization of a transitive construction.

This assumption is supported by the fact that, while the use of *essere* with transitive structures is always perceived as agrammatical in Italian, *sein* is not completely excluded in German when direct objects occur with a verb involving motion. Indeed, both options in (10a-b) are considered grammatical by German speakers:

(10) a. *Ich* *bin* *den* *Marathon* *gelaufen*
I.NOM be.1SG the.SCC marathon run.PP

b. *Ich* *habe* *den* *Marathon* *gelaufen*
I.NOM have.1SG the.SCC marathon run.PP
'I have run the marathon.'

Finally, when a verb of motion only has a transitive entry, as it happens with the verb *attraversare* ('cross'), the effect of the semantic feature of motion plummets for all groups of informants. Consider Figure 25:

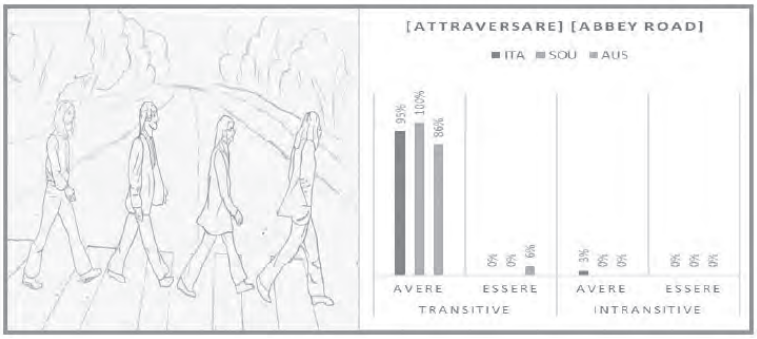

Fig. 25: Outcomes with *attraversare* (sole possible entry: TRANSITIVE).

As we can see, (almost) all informants have produced a transitive sentence, with a direct object and the auxiliary *avere*. In this case it must be noted that the corresponding verb in German (*überqueren*) also obligatorily selects the auxiliary *haben*. This means that the combination of a unique Syntax-Semantic mapping and a positive transfer from the learner's mother-tongue can be considered a guarantee for a correct and unambiguous realisation.

6. *Concluding remarks*

To conclude the present analysis, let us confront the data obtained, starting with polysemous verbs. Relevant outputs are presented in Table 4 below, in which we have indicated with a grey background the percentages that indicate a significant preference over the others:

PROSPECTED		UNACCUSATIVE				TRANSITIVE			
REALIZATION		TRANS		INTRANS		TRANS		INTRANS	
AUXILIARY		**AVERE**	**ESSERE**	**AVERE**	**ESSERE**	**AVERE**	**ESSERE**	**AVERE**	**ESSERE**
atterrare	ITA	0%	0%	6%	89%	10%	0%	20%	21%
	SOU	0%	0%	0%	96%	71%	0%	10%	10%
	AUS	0%	0%	16%	72%	51%	0%	21%	21%
affondare	ITA	0%	0%	7%	72%	83%	0%	0%	3%
	SOU	0%	0%	0%	88%	52%	0%	0%	10%
	AUS	0%	0%	3%	85%	52%	0%	3%	7%
trascorrere	ITA	0%	0%	10%	75%	99%	0%	0%	0%
	SOU	0%	0%	3%	79%	89%	0%	0%	0%
	AUS	0%	0%	3%	88%	75%	0%	0%	0%
suonare	ITA	0%	0%	89%	7%	99%	0%	0%	0%
	SOU	0%	0%	95%	3%	91%	0%	3%	0%
	AUS	0%	0%	88%	10%	99%	0%	0%	0%
fallire	ITA	0%	0%	0%	7%	75%	0%	23%	0%
	SOU	0%	0%	0%	47%	48%	3%	34%	3%
	AUS	0%	0%	3%	27%	79%	3%	10%	3%
vivere	ITA	21%	0%	50%	3%	3%	0%	95%	0%
	SOU	3%	3%	57%	13%	0%	0%	82%	13%
	AUS	7%	0%	44%	16%	0%	0%	68%	20%

Table 4: Total outcomes with polysemous verbs.

As we can see, when the prompt was intended to stimulate an unaccusative production of the verb, a transitive realization is almost totally excluded (except for *vivere* 'live' with ITA informants, 21% of whom has produced idioms like *vivere una vita* 'live a life'). However, the intransitive realization is not always associated with *essere*. In this respect, the data interestingly show that variation in auxiliary selection

is not random, but based on specific interpretive reasons. In particular, *essere* is definitely selected only when the Subject is felt as an argument who has no control on the relevant event (i.e., *atterrarre* 'land', *affondare* 'sink', *trascorrere* 'pass'), whereas *avere* emerges (both with native speakers and learners), when the Subject is either interpreted as an instrument (the so called 'efficient cause'), like in *suonare* 'ring', or when it is not considered completely 'passive' in the relevant event (as in *vivere* 'live'). An intransitive realization of *fallire* 'fail', on the other hand, is excluded by ITAs and is controversial for learners, since the object of a failure is evidently felt as inherent in the event.

When the prompt was intended to trigger a transitive realization, the data show that *avere* dominates, even though an intransitive sentence is produced if no clear object can be associated with the verb (*vivere* 'live').

These outcomes strongly support the crucial correlation existing between the hierarchy of argument roles and the hierarchy of syntactic functions discussed in Puglielli & Frascarelli (2011: 26-27): agentive actors, having control on the action, are the best candidate for the Subject function and trigger the selection of *avere* with few variations. Furthermore, the emergence of *avere* is also tightly connected with the syntactic property of transitivity, hence with the explicit realization of a direct object. It can be thus claimed that the Syntax-Semantic interface plays a basic role in auxiliary selection and a formal integration of notions like 'argument roles' and 'syntactic functions' in teaching courses might help learners to avoid mistakes in this respect. The influence of verb Aspect is also important, but it appears to have a subsidiary role in the process of learning Italian as a L2/FL with German L1 speakers.

Let us now consider Table 5, in which the results obtained with motion unergative verbs are summarized:

REALIZATION		TRANS		INTRANS	
AUXILIARY		**AVERE**	**ESSERE**	**AVERE**	**ESSERE**
camminare	ITA	0%	0%	99%	0%
	SOU	0%	0%	51%	38%
	AUS	3%	0%	24%	68%
ballare	ITA	6%	0%	92%	0%
	SOU	0%	0%	91%	0%
	AUS	0%	0%	82%	6%
nuotare	ITA	0%	0%	99%	0%
	SOU	10%	0%	67%	17%
	AUS	7%	3%	58%	27%
volare	ITA	3%	0%	76%	3%
	SOU	0%	0%	27%	66%
	AUS	0%	0%	14%	82%
correre	ITA	96%	3%	0%	0%
	SOU	58%	44%	3%	0%
	AUS	48%	44%	7%	0%
attraversare	ITA	95%	0%	3%	0%
	SOU	100%	0%	0%	0%
	AUS	86%	6%	0%	0%

Table 5: Total outcomes with motion unergative verbs.

As is shown, the expected auxiliary, namely *avere*, is mostly realized by informants and, once again, variation depends on the possibility of realizing a direct object. Thus, a transitive realization is generally preferred with *correre* ('run') and *attraversare* 'cross', whereas an intransitive production is most frequent for the other verbs examined, as expected. Nonetheless, FL and L2 speakers always show variations depending on Subject control. Hence, *camminare*, *volare* and *correre* feature high percentages for *essere*, as the Subject is clearly not considered as (fully) agentive. In addition, also in this case, auxiliary selection is affected by interferences from the learners' mother tongue and Aspect considerations.

A final short mention is in order with respect to auxiliary selection across levels of language proficiency. As one may recall, SOU and AUS informants were divided into three levels (cf. § 2.1). In this respect, results have shown that the mean linguistic behaviour of non-native speakers is stable and similar to the one of native speakers in relation to some verbs, while significant variation and differences are noticeable in relation to specific predicates, with an absolute parallelism with the alternations discussed in Tables 4 and 5.

So, while verbs like *suonare* brought about a stable linguistic behaviour (which is also similar to the one of native speakers), most controversial verbs (like *fallire*) led to a great variety of structures and auxiliaries across levels of language proficiency in both their lexical entries.

We reckon that the contrast between the former and the latter verbs can be ascribed to interferences from the informants' mother tongue. As a matter of fact, the different entries of the former verbs correspond to different predicates in German. In fact, the Italian verb *suonare* corresponds to the German verbs *spielen* (when it is used in a transitive form) and *klingen* (when it is used in an intransitive form). Given this fact, we suggest that learners of Italian are metalinguistically aware of the existence of a distinction in the lexical entries of a certain polysemous verb in Italian. As a consequence, we claim that in this case satisfactory production stems from positive transfer phenomena.

On the contrary, an Italian polysemous verb like *fallire* corresponds to verbs that are polysemous in German as well, namely, *scheitern*. This means that in these cases polysemy is homogeneous in both languages. Therefore, it is harder for L1 German speakers to manage the distinction between the different lexical entries entailed in the two verbs.

Obviously, given the limited number of informants, this experiment can be only considered a pilot for further investigations. Nevertheless, it has consistently highlighted a number of important factors in the learning of auxiliary selection by native German-speaking learners, which can be taken up and explored in future research.

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