

# COGNITIVE CONSTRAINTS AND DIFFERENCES IN CONCEPTUALIZATION: EMPLOYING THE PRINCIPLE OF TEMPORAL SEQUENCE (PTS) IN THE EXPLANATION OF L2 CHINESE WORD ORDER ERRORS FROM A LEARNER CORPUS OF ITALIAN L1 SPEAKERS

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The cognitive-functional framework on word order, pioneered by the studies of James Tai (1985, 1989 *inter alia*), has revealed the underlying diagrammatic iconicity of Standard Mandarin Chinese word order, also highlighting the differences in the conceptualization of various word order patterns between Chinese and English from an acquisitional perspective. This contribution aims to focus on the cognitive constraints underlying the conceptualization of Chinese syntax by Italian L1 learners, through the application of the Principle of Temporal Sequence (PTS), one of the most discussed iconic principles within the literature on the cognitive-functional framework. The study's objective was pursued through the analysis of a corpus of word order errors derived from written compositions by Italian-speaking learners with different levels of language proficiency. The results also shed light on the potential that the PTS holds in providing explicit descriptions and clearer explanations of L2 Chinese word order errors for instructional purposes.

*Keywords:* Chinese as a Second Language, Structural Iconicity, Principle of Temporal Sequence, Corpus Linguistics

## 1. Introduction

In recent years, alongside the growing global interest in studying Mandarin Chinese (MC), the literature on Chinese as a second language has increasingly emphasized the need to revitalize and innovate the field, particularly by strengthening its connection with other, potentially interdisciplinary, research areas, including theoretical linguistics and L2 acquisition and learning (Tao 2016; Yuan 2022). The linguistic model used for analyzing MC grammar in this study is the so-called cognitive-functional framework, introduced by the studies of James H.-Y. Tai (1985; 1989; 1993), drawing on concepts from George Lakoff and Ronald Langacker's cognitive approach, Paul J. Hopper and Sandra A. Thompson's functional approach, and John Haiman's work on syntactic iconicity. According to the

literature pertaining to this theoretical framework, the syntactic structure of MC can be simply motivated by considering factors such as informational status and iconicity. The framework has been adopted in various studies on word order, particularly emphasizing its usefulness in the acquisition and teaching domains (e.g., Hu 1995; 2022; Jiang 2009; 2017; Loar 2011; Morbiato 2017; 2019; Tucci 2021; 2023). Focusing solely on the surface order of linguistic constituents, the authors working within the cognitive-functional framework define iconic principles capable of naturally describing and explaining several regularities in word order. This study proposes the application of one of the foundational principles of the framework, the Principle of Temporal Sequence (PTS), to explain numerous ungrammaticalities in word order found in a corpus of errors drawn from native Italian learners of MC as an L2. Specifically, the study highlights the challenges Italian learners may face due to fundamental differences in word order conceptualization: unlike Italian, MC relies heavily on word order to convey meaning, given its isolating and iconic nature (Haiman 1985). This conceptual divergence is central to the present study. Languages such as Italian, having undergone extensive grammaticalization, often rely on morphological marking (e.g., verbal inflections), subordination, connectives and a more flexible word order, where information structure can freely override iconic sequencing: this aligns with the view that as a natural language becomes more grammaticalized, its iconic reflections are increasingly eroded (e.g., Givon 1984; Haiman 1985). In contrast, MC exhibits a higher degree of diagrammatic iconicity, where syntactic structure more transparently reflects conceptual structure. A crucial manifestation of this principle, which will be exemplified through the error analysis in section 6, is how MC preserves temporal sequencing even in structures involving prepositions, many of which retain traces of their original verbal nature (Sun 1997; Zhang 1995). This fundamental difference in linguistic encoding means that Italian learners' L1-based conceptualizations of word order often conflict with the cognitive constraints imposed by the PTS, leading to the systematic error patterns analyzed in this paper.

The second section of the article will present the underlying logic of the PTS, situating the principle within the broader landscape of linguistic iconicity studies. The third section explains the research objectives of this study and introduces its methodological framework. Section four will briefly introduce the taxonomic study by Jiang (2009), from which the current study draws its methodology, analysis, and classification of the errors in the corpus. An alternative taxonomy, limited to the sub-principles of the PTS, will be proposed in the section, drawing from word order errors in the corpus. Section five details the data collection, while section six is dedicated to the analysis and discussion of errors identified as PTS violations, according to the new taxonomy. In the seventh and final section, the absolute and relative frequencies of the errors are analyzed.

## *2. The Principle of Temporal Sequence*

The Principle of Temporal Sequence (PTS) is one of the foundational principles of the cognitive-functional framework of word order in MC, first introduced by Tai in his article "Temporal Sequence and Chinese Word Order" (1985) and further developed by the

author in the structuring of the Cognitive-Functional Framework of Chinese Language in various subsequent articles (Tai 1989; 1993; 1999; 2002; 2005; 2011). The principle is cited in almost all theoretical literature pertaining to the cognitive-functional approach to MC (e.g., Ho 1993; Hu 1995; 2022; Jiang 2009; 2017; Loar 2011; Morbiato 2017; 2019; Tucci 2023). Tai (1985, 50) defines it in the following terms: “the relative word order between two syntactic units is determined by the temporal order of the states which they represent in the conceptual world.” Tai proposes the PTS as an independent principle, unconnected to other motivations (e.g., pragmatic-discursive), elevating it as proof of the marked iconicity of MC and the relative transparency of the language and its grammar from a conceptual perspective. In the history of modern linguistics, Jakobson (1965) was among the first linguists to challenge the long-established ‘Saussurean’ dogma of the arbitrariness of the linguistic sign, focusing on the iconicity between chronological-temporal order and the order of sentence constituents, citing its simplest manifestation in the dictum attributed to Julius Caesar, *veni, vidi, vici*, where the *ordo naturalis* of the events is reflected in the superficial sequence of the constituents. Following Jakobson, various studies on iconicity and linguistic motivation (e.g., Dirven and Despoor 2004; Givon 1991; Radden and Panther 2004; Haiman 1980; 1985; Langacker 2008; Tabakowska 2009) cite temporal iconicity relevant to linear order (‘principle of sequentiality’ or ‘principle of sequential order’) as one of the most evident examples of diagrammatic or structural iconicity (Siewierska 2006, 646; Taylor 2002, 46) and extralinguistic (or exophoric, Nöth 2001) iconicity between content and form in the morphosyntax of the world’s languages. The uniqueness of the PTS lies in the fact that, although its underlying iconic motivation is considered universally valid, it is with the syntactic structure of MC that it assumes a binding character, imposing constraints on linguistic structure<sup>1</sup>. This means that where no other motivations (e.g., pragmatic-discursive) compete, a word order not conforming to the PTS would tend to produce an ungrammatical sentence. According to Tai (1985, 64), the PTS “must be held as a word order principle of greatest generality in Chinese grammar” and “it governs the word order behaviors of the majority of the syntactic categories definable in this language.” According to Tai, MC grammar therefore possesses a high degree of semantic transparency, and the motivations based on temporal iconicity can extend to the syntax of structures involving lexical classes traditionally marked as functional (the so-called *xuci* 虚词 [empty words]). Given its nature, the PTS seems to fully belong to a variation of the principle of sequential order commonly discussed in the literature on linguistic iconicity. However, reviewing Tai’s definition of the principle, the motivational scope of the PTS seems to extend beyond the *ordo naturalis*, referring to an order related to the ‘conceptual’ world. Ho (1993, 139) refines Tai’s definition, stating that under the PTS, “what happens earlier in cognitive experiences tends to be linguistically represented

<sup>1</sup> To my knowledge, studies specifically investigating the regulatory power of temporal sequencing principles in languages other than Mandarin Chinese (MC) are scarce. However, several contrastive analyses, notably between MC and English (e.g., Hu 2005; Jiang 2007; Morbiato 2017; 2019) and between MC and Italian (e.g., Tucci 2021; 2023), have already explored the PTS’s explanatory power. These works consistently show that the regulatory force of temporal sequencing in English and Italian is not as strong as in MC.

earlier in the utterance.” Ho clarifies that temporal iconicity is reflected in linguistic elements both ‘explicitly’ and ‘implicitly’: time expressions and verbs are entities naturally bearing temporal characteristics or capable of creating temporal relations with other entities within the sentence. Temporal iconicity is implicit in the case of functional lexical classes, primarily prepositions, most of which in MC have a verbal origin that remains relatively transparent (see, for example, Zhang 1995; Sun 1997). Loar (2011, 5) provides a concise but comprehensive overview of the operational scope of the principle, highlighting its explanatory power in ‘active’ sentences:

The PTS is operative in active sentences, i.e., sentences which describe active events. Events are essentially tied to change, either changing themselves or bringing about a change in the entities associated with them [...]. This feature of active events makes them more sensitive to time, or they are closely associated with temporal change; phrased in another way, time is required for events. Hence, PTS operates in active sentences as the governing principle in the organization of clause elements, such as adverbials, complements, etc.

Consider, for example, the role of the PTS in motivating the placement of the locative phrase ‘*zai* 在+ location’ in relation to the verb in (1a, b):

- (1) a. 小猴子在马背上跳。  
*Xiao houzi zai ma bei shang tiao.*  
 The little monkey was jumping on the horse’s back.  
 b. 小猴子跳在马背上。  
*Xiao houzi tiao zai ma bei shang.*  
 The little monkey jumped on the horse.

In (1a), the little monkey (*xiao houzi* 小猴子) is already on the horse’s saddle (*ma bei shang* 马背上) and then starts jumping (*tiao* 跳), while in (1b), the horse’s saddle is the place where the little monkey ends up only after jumping. Both examples follow the temporal sequence of events, but it is the pre- or post-verbal placement of the locative phrase that disambiguates the sentence’s meaning. Justifying the two instances in (1) in terms of PTS is possible given the different aspectual viewpoints of the verb *tiao* in the two examples – atelic in 1a and telic in 1b – in relation to the prepositional phrase. Now consider the two instances in (2), where the placement of the locative phrase ‘*zai* 在 + location’ does not result in a change of meaning between (2a) and (2b):

- (2) a. 他住在北京。  
*Ta zhu zai Beijing.*  
 b. 他在北京住。  
*Ta zai Beijing zhu.*  
 He lives in Beijing.

According to Tai (2002; 2011), in this latter kind of sentence, the PTS does not hold explanatory power simply because the placement of the locative phrase is not constrained by temporal factors. The difference lies solely in the informational focus that one wishes to attribute to the sentence (event in 2b or location in 2a). In this context, Loar (2011, 179) highlights how verb classes that denote durative states, such as posture verbs (e.g., *zhu* 住), are not governed by the PTS: “the location where the subject referent takes an action relating to a certain posture is just the location where he assumes the posture.” Given these observations, we could attempt to formalize the principle as in (3), which reads: if and only if the intrinsic temporal characteristics of X and Y are comparable in terms of anteriority/posteriority, and  $T_1$  is a temporal state anterior to  $T_2$  in the conceptual world, then the linguistic symbol S identifying X precedes the one identifying Y in the linear order of the sentence.

$$(3) \quad [\text{Comp}(T(X), T(Y)) \wedge T_1(X) > T_2(Y)]_{\text{conceptual world}} \Leftrightarrow [SX > SY]_{\text{linear order}}$$

Considering only those word order patterns where the constituents under examination are comparable in temporal terms, the PTS is seen in the literature as having motivational power in the following word order regularities/constructions (Ho 1993; Hu 1995; 2022; Jiang 2009; 2017; Loar 2011; Morbiato 2017; 2019; Tai 1985; 1989; 1993 *inter alia*; Tucci 2023; Zhang 2019): relative placement of clauses connected by temporal connectives; relative placement of verbs in sequence in the absence of explicit connectives; pre-verbal and post-verbal placement of prepositional phrases, placement of resultative complements in relation to the verb, placement of duration and frequency expressions in relation to the verb, placement of comparison terms in comparative sentences in relation to the predicate; placement of manner and instrument adverbs in relation to the verb; placement of nominal time phrases in relation to the verb; placement of aspectual particles; subordination relationships in simple and complex sentences<sup>2</sup>. For reasons of space, it will not be possible to provide examples for each of these word order patterns. However, in section 6, the explanatory power of the principle will be exemplified in relation to some of these, limited to the entries in the taxonomy of the PTS constructed based on the word order errors present in the corpus under analysis.

### 3. *Aims, Research Questions, and Methodological Remarks*

This study is grounded in a cognitive-functional approach to Error Analysis with a primarily pedagogical aim. It investigates the applicability of the Principle of Temporal Sequence (PTS) as an explanatory framework for word order errors in a corpus of L2 Chinese essays written by Italian native speakers. The specific aims are:

1. To ascertain the degree to which and the frequency with which word order errors in the corpus can be systematically described and explained as violations of the PTS.

<sup>2</sup> It is important to note that not all the aforementioned authors posit the PTS as a comprehensive explanatory framework for all the word order patterns under consideration. For a more detailed examination, readers are directed to the cited works.

2. To test the only existing PTS taxonomy (Jiang 2009; 2017) against the corpus data and, based on this analysis, to propose a revised, pedagogically-oriented version of it that accurately reflects the error patterns of Italian L1 learners.

To achieve these aims, the study is guided by the following research questions:

- RQ1: What percentage of word order errors in the corpus can be attributed to a violation of the PTS and its sub-principles? How are these absolute and relative frequencies distributed across different years of study?
- RQ2: How can Jiang's (2009) taxonomy of the PTS sub-principles be refined to better classify the specific error types produced by Italian L1 learners?

A crucial aspect of this study's methodology is the distinction between error type and error cause.

- Error Type: For the purpose of this paper, an 'error type' is defined as the violation of a specific rule or principle within the target language's grammatical system. Here, the error types are the violations of the PTS sub-principles (e.g., 'Action Series', 'Locative Expressions'). The classification is therefore intralingual, describing how the learner's production deviates from the target norm of MC.
- Error Cause: This refers to the underlying psycholinguistic reason for the error, such as negative L1 transfer, overgeneralization of a different L2 rule, or communication strategies.

This study's primary focus is the classification of error types to build a pedagogically useful taxonomy based on the cognitive-functional framework. Investigating the definitive error cause is beyond its scope. While plausible causes like negative L1 transfer are mentioned in the analysis to provide context, the central claim is not about L1 transfer itself, but about the explanatory power of the PTS in organizing and making sense of these errors.

#### 4. *On a Taxonomy of the PTS*

Jiang Wenying is the first scholar to focus in detail on the potential of the cognitive-functional framework and the PTS in the field of language teaching. Her 2009 monograph, *Acquisition of Word Order in Chinese as a Foreign Language*, inspired the methodology used in identifying and analyzing errors in the present research. Following a cross-sectional analysis of a corpus of word order errors produced by L2 Chinese learners who are native English speakers (N = 403), the author compiles the first cognitive-functional taxonomy of the principles governing word order in MC. According to Jiang's analysis, 62% of the word order errors in her corpus (N = 249) can be explained in terms of a violation of the PTS. Jiang replicated her study in 2017, with a smaller corpus of errors (N = 129), attributing 68% of the errors to a violation of the PTS. The results of this research undoubtedly seem to demonstrate the pervasiveness of the PTS in motivating MC word order, or at least the explanatory power the principle holds in accounting for word order errors in the interlanguage of L2 learners of MC. For explanatory purposes, Jiang divides the PTS into six different sub-principles in her taxonomy, based on a heterogeneous division of formal and semantic criteria, particularly adopting Ho's classification of the principle's explanatory power. These sub-principles are further subdivided into various types, as reported in the left column of Table 1, adapted from Jiang (2009, 149).

Table 1 - *PTS Sub-principle Types in Jiang (2009) and in the Present Study*

<i>Jiang (2009)</i>		<i>This study</i>	
<i>Sub-principle</i>	<i>Type</i>	<i>Sub-principle</i>	<i>Type</i>
<b>1 Action Series</b>	1.1 Natural Iconicity	<b>1 Action Series</b>	1.1 VO Relations
	1.2 Conceptual Iconicity		1.2 Action Direction
	1.3 Direction + Action		1.3 Aspectual Particles
	1.4 LE Position		
<b>Locative Expressions</b>	2.1 Location + V	<b>2 Locative Expressions</b>	3.1 Time + V
	2.2 V + Location		3.2 V + Time
<b>3 Time Expressions</b>	3.1 Time + V	<b>3 Time Expressions</b>	
	3.2 V + Time		
	3.3 Duration + <i>Mei(you)</i> + V		
<b>4 Beneficiary</b>		<b>4 Beneficiary</b>	5.1 Adverbial + V
			5.2 V + Complement
<b>5 Modifiers of V.</b>	5.1 Adv. + V	<b>5 Modifiers of V.</b>	
	5.2 V + Adv.		
<b>6 Subsidiary Relations</b>		<b>6 Subsidiary Relations</b>	

This study adopts Jiang's methodology for structuring the taxonomy in sub-principles and sub-principle types but modifies certain entries in light of the error analysis conducted on the corpus. A first issue arises concerning the sub-principle 'Action Series', which is directly borrowed from Ho's (1993) classification. Jiang subdivides this sub-principle into four different subtypes. The first two, 'Natural Iconicity' and 'Conceptual Iconicity', respectively refer to the natural and conceptual order of events in terms of PTS. While the illustration of the first type refers essentially to the sequence of actions in line with serial verbs and VO order, the second has much more general and undefined contours. In Jiang's (2009, 165) words, this type "determines the word order for action series that happen conceptually: what conceptually appears earlier in one's mind precedes what appears later." The issue with this definition lies in its generic nature from a taxonomic perspective, leading the author to classify different types of word order errors under this category, including ungrammaticalities related to comparative constructions, the placement of prepositional phrases, adverbs, verb-object sequences, etc<sup>3</sup>. It does not help from a pedagogical perspective to frame the motivational power of this sub-principle type in specific language segments. This is thus a category that, in our view, presents issues primarily from a classification standpoint: given the generic nature of conceptual iconicity in terms of PTS, the labeling of this type could encompass other types and sub-principles of an eminently conceptual nature, such as type 1.3, 'Direction + Action', and sub-principle 3.4, 'Beneficiary', among others. In the taxon-

<sup>3</sup> For comparison, refer to the corpus of word order errors in the appendix of Jiang (2009).

omy of PTS sub-principles adopted in this study, it was therefore decided not to include this sub-principle type. The first type, ‘Natural Iconicity’, has been renamed and its explanatory scope has been refined (see section 6.1). It should also be noted that two sub-principle types, ‘V + Location’ under the ‘Locative Expressions’ sub-principle, and ‘Duration + *mei(you)* + V’ under the ‘Time Expressions’ sub-principle, do not appear in the taxonomy used in this study, since no errors related to their violation were found in the corpus analyzed. The updated taxonomy is presented on the right column of Table 1. The entries of the taxonomy will be illustrated and exemplified in section 6.

### 5. Data Collection

The learner corpus collected for the study, compiled during 2022, was derived from the analysis of 349 written essays manually produced by Italian-speaking students in their first (N = 101), second (N = 116), and third (N = 114) year of a bachelor’s degree in Linguistic Sciences and Foreign Literatures at the Catholic University of the Sacred Heart in Milan during the 2016–2017 academic year. Written exams from Italian-Chinese or non-Italian native speakers were excluded from the analysis. The written essays, manually composed during the 2016–2017 academic year, were part of a final exam taken over two different sessions. Each student was allowed to freely develop their written work based on topics covered in class throughout the academic year, without any further suggestions or instructions<sup>4</sup>. Table 2 reports, for each year of study: (1) an indication of the participants’ linguistic knowledge range in terms of characters known, based on an estimate made according to the class content and the characters contained in the textbook used in class, the second edition of the *New Practical Chinese Reader* (Liu 2015); (2) the total number of hours of MC instruction the students were expected to attend during their academic path leading to the written exam<sup>5</sup>; (3) the number of essays considered for analysis; (4) the total number of characters derived from the sum of the written compositions; (5) the average number of characters per essay; (6) the errors per year of study; (7) the relative average of errors per 1,000 characters; (8) and the standard deviation.

<sup>4</sup> Below are the titles of the written prompts on which the compositions were based. The students were allowed to choose one from the following prompts. Year 1: 我感冒了 [I caught a cold]; 我跟妈妈去商场买东西 [I went shopping with my mum]; 一次生日聚会 [A birthday party]; 我来介绍一下我的大学 [Let me introduce my university]. Year 2: 请介绍一下你家的房子或者你租的房子 [Describe your family’s house or the one you are renting]; 记一次音乐会 [Memories of a concert]; 记一次旅行 [Memories of a trip]. Year 3: 我的兴趣与爱好 [My hobbies and interests]; 我的家或者我家的书房 [My home] or [The study in my home]; 谈谈中国人和意大利人休闲方式的异同 [Discuss the similarities and differences between how Italians and Chinese spend their leisure time]; 我的房间 [My room].

<sup>5</sup> Note, however, that lecture attendance was never compulsory.

Table 2 - *Corpus Sampling and Errors*

<i>Year</i>	<i>Proficiency (1)</i>	<i>Hours (2)</i>	<i>Compositions (3)</i>	<i>Characters (4)</i>	<i>Average (5)</i>	<i>Errors (6)</i>	<i>E*1k/C (7)</i>	<i>SD (8)</i>
1	200–300	60	101	11,108	116.92	123	11.07	1.17
2	500–700	120	117	22,288	190.49	247	11.08	1.76
3	1,000–1,200	180	113	29,875	255.34	257	8.60	2.11
<b>Tot</b>			<b>331</b>	<b>63,271</b>	<b>181.29</b>	<b>627</b>	<b>9.90</b>	<b>1.80</b>

From the essays produced by first-year students ( $N = 101$ ), 123 errors were extracted; from the second-year students ( $N = 117$ ), 247 errors; and from the third-year students ( $N = 113$ ), 257 errors, for a total of 627 word order errors (1). The process for identifying errors followed the methodology outlined in Jiang (2009; 2017), which is roughly modeled on the classic framework of Error Analysis. The investigation focused exclusively on word order errors (misordering). Sentences that, despite containing other types of agrammaticality (e.g., omissions, additions, lexical errors), also featured a clear word order error were included in the analysis. The definition of ‘error’ adopted here encompasses both deviations that result in an ungrammatical sentence and those that render it inappropriate in relation to the discursive context (Jiang 2009). This required a process of reconstructing learners’ communicative intention (Corder 1981). In ambiguous cases, where an erroneous sentence allowed for multiple possible grammatical corrections (e.g., an unmarked and a marked/topicalised form), the choice of the reference form was guided by an analysis of the discursive context in order to determine the most plausible structure. To guarantee the accuracy of the data analyzed and the correct interpretation of the meaning underlying students’ output, the error identification process for word order errors in the corpus was replicated on a random sample of approximately 30% ( $N = 99$ ) of the essays selected for analysis by a native Chinese-speaking teacher. The agreement percentage between the two evaluators on the percentage of samples considered was 97.5% for the first year, 94% for the second year, and 97.6% for the third year, ensuring the reliability of the error identification process. The values of indicators (7) and (8) reveal that the distribution of errors across essays is rather contained for each year of study, although increasing year by year.

## 6. Discussion and Exemplification of Results

The error classification process also followed the methodology outlined in Jiang (2009; 2017)<sup>6</sup>. A total of 286 word order errors were attributed to violations of the PTS, account-

<sup>6</sup> It is perhaps worth emphasizing again that, within this methodological framework, the traditional phases of error description and explanation in the context of Error Analysis tend to converge. As in Jiang (2009; 2017), the error is not merely described as a violation of a given iconic principle, but is also explained by it. The breach

ing for 45.54% of the total errors ( $N = 627$ )<sup>7</sup>. The following subsections will illustrate the motivational power of the principle by applying it to the word order errors found in the corpus, which arise due to its violation.

### 6.1 Sub-principle 1, 'Action Series'

This sub-principle reflects the most basic manifestation of the PTS, whereby if more than one action is present in a sentence, the action that occurs first precedes in the linear order the one that occurs later (see Jiang 2009, 89). Given the broad motivational power of this sub-principle, it was decided to subdivide it into three different subtypes in the taxonomy. Under the first type, 'VO Relations' (1.1), errors caused by the incorrect positioning of constituents in the unmarked 'Verb + Object' sequence within verbal phrases and in serial verb constructions, with or without the addition of temporal connectives, were classified. The errors in this type deviate from the linear sequences permitted by the PTS, such as the unmarked ' $V_x + O_x$ ' and serial verb constructions ' $V_1(O_1) + V_2(O_2) + (V_x)(O_x)$ '. In (4a), the error is caused by the incorrect positioning of  $O_1$  of the first verb *xueyuan* 学院 [institute] in relation to the compound  $V_2O_2$  *shang ke* 上课 [to have class]. A construction like ' $V_1 + V_2O_2 + O_1$ ', allowed in Italian, does not respect the PTS in Mandarin Chinese, thus producing an ungrammatical sentence.

- (4) a. \*每天八点我们一起去上课学院。  
*Meitian ba dian women yiqi qu shang ke xueyuan.*  
 a'. 每天八点我们一起去学院上课。  
*Meitian ba dian women yiqi qu xueyuan shang ke.*  
 a''. Ogni giorno alle 8 andiamo insieme a fare lezione all'istituto.  
 Every day at 8 o'clock, we go together to attend classes at the institute.

Example (5a), while perfectly grammatical, was identified as an incorrect sentence in the context of the learner's communicative intent, which suggested an interpretation equivalent to (5a'). As can be seen from the translation, in Italian, the VO structure *zuo qiche* 坐汽车 is rendered with the addition of a post-verbal prepositional phrase (by car). However, in Mandarin Chinese, the post-verbal insertion of the VO compound generates a serial verb sequence whose interpretation is strictly bound by the temporal relationships underlying the PTS. It is worth noting that in Italian, the sequence of events aligns with the interpretation in (5a') for a serial verb construction like (5b). However, the grammaticalization of one of the verb phrases into a prepositional adjunct (*in auto* [by car]) leads

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of the principle becomes the semantic-cognitive motivation behind the syntactic agrammaticality. Although the ultimate cause of the error may lie in L1 transfer or other learner strategies – something that can be reasonably assumed but not empirically verified – the analysis interprets it as a violation of a rule internal to the L2, specifically, as an error type subordinate to a violation of the PTS.

<sup>7</sup> The classification process was replicated by an Italian-speaking CM teacher trained in the principles of the cognitive-functional framework for CM. To calculate inter-rater agreement, 100% of the total errors ( $N=627$ ) were considered. The percentage of agreement in identifying the error typology between the two reviewers reached 97.83%, (587/600), ensuring the reliability of the classification process.

to an unmarked order where this adjunct is placed at the end of the sentence for emphasis, thereby overriding the normal constraints of temporal sequencing.

- (5) a. #饭馆离房子不太远，我去那儿坐汽车。  
*Fangguan li fangzi bu tai yuan, wo qu nar zuo qiche.*  
 Il ristorante non è molto lontano dall'appartamento, vado là per prendere l'auto.  
 The restaurant is not far from the apartment, I'm going there to pick up the car.
- a'. 饭馆离房子不太远，我坐车去那儿。  
*Fangguan li fangzi bu tai yuan, wo zuo qiche qu nar.*  
 Il ristorante non è molto lontano dall'appartamento, sono andato là in auto.  
 The restaurant is not far from the apartment, I went there by car.
- b. Ho preso l'auto e sono andato là.  
 I took the car and went there.
- b'. Sono andato là e ho preso l'auto.  
 I went there and took the car.

The second subtype of the sub-principle, 'Action Direction', is directly borrowed from Jiang's (2009) taxonomy entry 'Direction + Action': "conceptually, direction instruction appears in one's mind earlier than the action instruction" (Jiang 2009, 166). In other words, the entity performing the action already knows which direction to take before starting to move. The error in (6a) is caused by the incorrect placement of the locative prepositional phrase *cong women de chaoshi* 从我们的超市 [from 'our' supermarket] in relation to the verb *qi(che)* 骑(车). In this type of error, the word order faithfully follows the temporal sequence of events in the real world: the subject *wo* 我 [I], before taking the bike to go to the beach (*qi(che) dao haibian* 骑(车)到海边), must already be at the supermarket, which, as the starting point of the action, is thus placed before it in terms of PTS. The fact that these kind of sentences adhere to the PTS can probably always be traced back to the verbal origin of most directional prepositions, such as *cong* 从 (Sun 1997). In Italian, by contrast, it is worth noting that the unmarked order expresses an action's starting point using a prepositional phrase in the focal position, preventing it from establishing a temporal relationship with other linguistic entities. The same can be said for the prepositional phrase *in bicicletta* [by bicycle], which is rendered in CM with the verbal phrase *qi zixingche* [to ride a bicycle].

- (6) a. \*星期天我常常骑从我们的超市到海边。  
*Xingqitian wo changchang qi cong women de chaoshi dao haibian.*
- a'. 星期天我常常从我们的超市骑车到海边。  
*Xingqitian wo changchang cong chaoshi qi dao haibian.*  
 Di domenica vado spesso al mare in bicicletta dal nostro supermercato.  
 On Sundays, I often ride my bike to the beach from our supermarket.

In (7a), the direction expressed by the locative expression *qianbian* 前边 [in front] erroneously follows the action *zou* 走 [walk], thus violating the PTS. Such an order, however, is allowed in Italian, as demonstrated by the translation of (7a').

- (7) a. \*从车站我走前边十分钟。  
*Cong chezhan wo zou qianbian shi fenzhong.*  
 a'. 从车站往前走十分钟。  
*Cong chezhan wang qian zou shi fenzhong.*  
 Vado dritto per dieci minuti dalla stazione dei bus.  
 I go straight for ten minutes from the bus station.

The third subtype, 'Aspectual Particles' (1.3), is also borrowed from Jiang's (2009) taxonomy entry 'Le Position'. Unlike the latter, it also includes ungrammaticalities related to the placement of the experiential aspectual particle *guo* 过, which can be found in the corpus. In Mandarin Chinese, in the case of a serial verb sequence ' $V_1 + V_2$ ' representing actualized/completed actions, the aspectual particle *le* must obligatorily be placed after  $V_2$ , as the actualization of  $V_2$  implies the implementation of  $V_1$  (Loar 2019, 25). From a PTS perspective, the error in (8a) is due to the placement of the post-verbal aspectual particle *le* after the first verb *qu* [to go].

- (8) a. \*我们也去了参观美术馆。  
*Women ye qu-le canguan meisbuguan.*  
 a'. 我们也去参观了美术馆。  
*Women ye qu canguan-le meisbuguan.*  
 Siamo anche andati a visitare la galleria d'arte.  
 We also went to visit the art gallery.

A sequence like ' $V_1 + le + V_2$ ', as in (8a), indicates only the actualization of the action in  $V_1$ , failing to express the one in  $V_2$ . Errors regarding the placement of the aspectual particles *le* and *guo* after  $V_1$  can probably be explained by the fact that Italian directly marks any aspectual and temporal morphemes within its verbal morphology. In contrast, the linear order in MC places the independent morpheme *le* – grammaticalized from the homographic verb *liao* [to complete, to finish] (Sun 1996) – directly after the verb, thus adhering to the temporal sequence. On the other hand, in terms of PTS, the interpretation of the particles' placement is consistent with the conceptualization underlying the temporal relationships between actions expressed in a sentence with serial verbs.

## 6.2 Sub-principle 2, 'Locative Expressions'

The sub-principle governs the placement of locative expressions in relation to the verb in terms of PTS. Locative phrases tend to appear before the verb when indicating the location where an action takes place, whereas they are generally placed after the verb if they describe the location an entity assumes following the completion of an action (Li, Thompson 1981). The error in (9a) is caused, for instance, by the post-verbal placement of the locative

phrase *zai Beijing* 在北京 [in Beijing]: in terms of temporal sequence, the subject and their companions had to be already in Beijing before they could go to listen to the concert (*qu ting-le yi ge yinyuehui* 去听了一个音乐会).

- (9) a. \*我跟我家和我朋友去听了一个音乐会在北京。  
*Wo gen wo jia he wo pengyou qu ting-le yi ge yinyuehui zai Beijing.*  
 a'. 我跟我家人和朋友在北京去听了一个音乐会。  
*Wo gen wo jia he wo pengyou zai Beijing qu ting-le yi ge yinyuehui.*  
 Con la mia famiglia e gli amici sono andato ad ascoltare un concerto a Pechino.  
 I went with my family and friends to listen to a concert in Beijing.

Similarly, the ungrammaticality in (10a) is due to a violation of the sub-principle: in terms of temporal sequence, the subject *wo* 我 [I] should already be in the study room (*zai shufang li* 在书房里) before beginning to study (*xuexi* 学习).

- (10) a. \*我很喜欢学习在书房里边。  
*Wo hen xihuan xuexi zai shufang libian.*  
 a'. 我很喜欢在书书房里边学习。  
*Wo hen xihuan zai shufang libian xuexi.*  
 Mi piace molto studiare nello studio.  
 I really enjoy studying in the study room.

Post-verbal placement errors of prepositional phrases indicate a fundamental difference in conceptualization from Italian, which typically positions such locative expressions as adjuncts at the end of unmarked sentences, as shown in translations (9a') and (10a'). Conversely, this latter consideration accounts for the lack of word order errors that might fall under a hypothetical 'V + Place' classification.

### 6.3 Sub-principle 3, 'Temporal Expressions'

This sub-principle governs the placement of nominal phrases containing temporal expressions in relation to the verb in terms of PTS. Drawing from Jiang's classification, the sub-principle has been divided into two types, respectively 'Time + V' (3.1) and 'V + Time' (3.2). The first type prescribes that nominal phrases containing expressions of time tend to be ordered before the verb as they represent a temporal state that precedes (or coincides with) the start of the action expressed by the verb. The second type indicates that nominal phrases containing expressions indicating a duration of time tend to be placed post-verbally, as only after an action begins can its temporal extent be calculated. The error in (11a) is due to the incorrect placement of the punctual time expression *jinnian* 今年 [this year] in relation to the action *qu Zhongguo* 去中国 [go to China]. In terms of PTS, the temporal expression must precede the action here, as it represents a temporal state prior to the possibility of the action being carried out. As seen in translations (11a'), Italian's placement of punctual time expressions does not strictly adhere to the PTS. These adverbials can be placed after the verb and often are, even though this positioning is not invariable.

- (11) a. \*我很想去中国今年，去年我去英国了。  
*Wo hen xiang qu Zhongguo jinnian, qunian wo qu Yingguo le.*  
 a'. 今年我很想去中国，去年我去了英国。  
*Jinnian wo hen xiang qu Zhongguo, qunian wo qu-le Yingguo.*  
 Vorrei davvero andare in Cina quest'anno, lo scorso anno sono andato nel Regno Unito.  
 I would really like to go to China this year; last year I went to the United Kingdom.

The error in (12a) is caused by the incorrect placement of the temporal expression indicating duration *liang ge xingqi* 两个星期 [two weeks] in relation to the action *qu Beijing* 去北京 [go to Beijing].

- (12) a. \*我是两个星期去北京的。  
*Wo shi liang ge xingqi qu Beijing de.*  
 a'. 我去了两个星期北京。  
*Wo qu-le liang ge xingqi Beijing.*  
 a". Sono andato a Pechino per due settimane.  
 I went to Beijing for two weeks.  
 a"". È da due settimane che sono (andato) a Pechino.  
 It's been two weeks since I arrived in Beijing.  
 b. 我是两个星期(以)前去北京的。  
*Wo shi liang ge xingqi (yi)qian qu Beijing de.*

In terms of PTS, only after 'arriving in Beijing' can the duration of the stay initiated by the action begin to be calculated. The error in question has therefore been classified as a violation of the 'V + Time' subtype of the sub-principle. Even in unmarked Italian, duration expressions tend to be placed post-verbally, as in Mandarin Chinese, as shown by the translation in (12a"). However, preverbal placement of the duration is also permitted, as in the cleft sentence in (12a ""). The communicative intent of the learner who made the error, considering the use of the emphatic construction *shi...de* 是...的, was likely to mirror the word order of the cleft sentence in (12a ""). This construction, however, is not allowed in Mandarin Chinese unless the duration is transformed into a punctual time expression, for example by adding an expression such as *(yi)qian* (以)前 [before], as shown in (12b).

#### 6.4 Sub-principle 4, 'Recipient/Beneficiary'

The sub-principle predicts that the positioning of the recipient or beneficiary of an action, i.e., "a party, usually a person, for whom a service is performed or an act is intended" (Ho 1993, 158), tends to occupy a preverbal position in terms of PTS. In this work, as intended (although not explicitly) in the studies of Jiang (2009) and Ho (1993), the constituent identified with this label is always the indirect object of the verb, optionally introduced by a preposition such as *gei* 给, *dui* 对, or *xiang* 向. Jiang, taking up what was argued by Ho (1993, 158), states that in Chinese the unmarked order ("the most natural word order," in Jiang's words) provides that prepositional phrases introducing the recipient are gener-

ally placed before the verb. In terms of PTS, this order would be motivated for Jiang by the fact that the one who performs the action has already conceptualized towards whom/what to direct it. The error in (13a) is due to the positioning of the prepositional phrase introducing the recipient *gei wo* 给我 [to me] after the action *gua hao* 挂号 [to register]. Its preverbal positioning is dictated by the PTS as the subject has already conceptualized towards whom to direct the action before its execution, which would not have taken place otherwise without the definition of a beneficiary.

- (13) a. \*他去挂号给我。  
*Ta qu gua hao gei wo.*  
 a'. 他去给我挂号。  
*Ta qu gei wo gua hao.*  
 È andato a registrar mi.  
 He went to sign me up.

The same logic applies to the error in (14a), in which the recipient *wo mama* 我妈妈 [my mother] has been inserted in a post-verbal position, without being preceded by a preposition. These instances also reveal errors likely attributable to a divergent conceptualization of recipient expression. As illustrated by translations (13a') and (14a'), unmarked Italian sentences generally position the recipient/beneficiary either as a post-verbal prepositional adjunct or as a clitic pronoun morphologically integrated into the verb, without regard for temporal linearity. This differs from MC, where *gei* retains its verbal origin.

- (14) a. \*我买了我妈妈一件旗袍,我买了我爸爸一件衬衫红的。  
*Wo mai-le wo mama yi jian qipao, wo mai-le wo baba yi jian chenshan hong de.*  
 a'. 我给妈妈买了一件旗袍。  
*Wo gei wo mama mai-le yi jian qipao, wo gei wo baba mai-le yi jian hong chenshan.*  
 Ho comprato a mia mamma un *qipao*, a mio papà ho comprato una *camicia rossa*.  
 I bought a *qipao* for my mom, and I bought a red shirt for my dad.

### 6.5 Sub-principle 5, 'Other Verbal Modifiers'

This sub-principle governs the placement of various types of verbal modifiers in terms of PTS when not already regulated by the previous PTS sub-principles. It has been further divided into two types, 'Adverbial + Verb' (5.1) and 'Verb + Complement' (5.2). The name of this subdivision is based on the terminology generally used in the English-language literature on Chinese, which calls pre-verbal verbal modifiers "adverbials" and post-verbal ones "complements" (Ho 1993; Lu, Wu 2009). These are two types that collect errors in the placement of verbal modifiers not already discussed in the previous sub-principles. Regarding this sub-principle, Jiang (2009, 93) states that adverbials denote "the manner of the verb, which the agent knows or decides before the action of the verb" while com-

plements denote “a condition that results from the action of the verb.” More specifically, regarding the first type into which the author subdivides the sub-principle, ‘Adv + V’, Jiang (2009, 172) states that “an adverb precedes a V where the adverb functions as an adverbial indicating the manner of the verb.” The errors in (15a) and (16a) have been classified as a violation of the type ‘Adverbial + V’. In (15a), the error is due to the post-verbal placement of the adverbial of instrument *yong diannaoyong* 用电脑 [with the computer]. In terms of PTS, on the other hand, the use of the computer by the topic precedes the action expressed by the verb *liao tianr* 聊天儿 [to chat].

- (15) a. \*我也在家有爱好，比如看电视和跟我朋友聊天儿用电脑。  
*Wo ye zai jia you aihao, biru kan dianshi he gen pengyou liao tianr yong diannaoyong.*
- a'. 我也有在家的爱好，比如看电视和跟我朋友用电脑聊天儿。  
*Wo ye you zai jia de aihao, biru kan dianshi he gen wo pengyou yong diannaoyong liao tianr.*  
 Ho anche hobbies ‘casalinghi’, come ad esempio guardare la tv o parlare con gli amici al computer.  
 I also have some ‘homey’ hobbies, like watching TV or chatting with friends online.

The error in (16a) is caused by the post-verbal placement of the prepositional phrase *gen baba, mama he meimei* 跟爸爸、妈妈和妹妹 [with my father, my mother, and my younger sister]. In terms of temporal sequence, the topic must logically already be in the company of the other participants before performing the action expressed by the predicate *chi zhongfan* 吃中饭 [to have lunch]. All the errors listed above can be attributed to conceptual differences in expressing circumstantial information. Translations (15a') and (16a') illustrate how, in Italian, the unmarked order facilitates the post-verbal introduction of the adverbials – the source of the three ungrammaticalities – via a prepositional adjunct. In contrast, in Mandarin Chinese (MC), prepositions *gen* and *yong* maintain their verbal origins and thus follow a temporal sequence.

- (16) a. \*我常常吃中饭跟我爸爸，我妈妈，妹妹。  
*Wo changchang chi zhongfan gen wo baba, wo mama, meimei.*
- a'. 我常常跟我爸爸、妈妈和妹妹吃中饭。  
*Wo changchang gen wo baba, mama he meimei chi zhongfan.*  
 Spesso pranzo con mio papà, mia mamma e mia sorella.  
 I often have lunch with my dad, mom, and sister.

Errors classified under the second subtype of the sub-principle, ‘Complement + V’, can be attributed to the preverbal placement of various constituents that are part of a complement and should be placed post-verbally, unless already classified by previous entries in the taxonomy. The ungrammaticality in (17a) is due to the insertion of the negation adverb *bu* 不 before the head verb of the complement *lai* 来 [to come]. The adverb *bu* cannot occupy the preverbal position because the action expressed by the verb has already occurred, and

the adverb therefore has scope only over the resultative complement *tai wan* 太晚 [too late] and not over its head. In terms of temporal sequence, it is only possible to express an evaluation of the result expressed by the verb after its completion.

- (17) a. \*我们不来得太晚了。  
*Women bu lai de tai wan le.*  
 a'. 我们来得不太玩。  
*Women lai de bu tai wan.*  
 Non siamo arrivati con troppo ritardo.  
 We didn't arrive too late.

The translation in (17a') highlights instead how the negation adverb *non* [not], differently from MC, can exert its scope over the entire predicate, including the head verb *venire* [to come]. This constitutes an additional fundamental conceptual divergence, given that MC adheres to a pattern consistent with serial verb constructions and temporal sequencing even in instances involving a degree complement, as just observed.

#### 6.6 Sub-principle 6, 'Subsidiary Relations'

The sub-principle regulates in terms of PTS the unmarked order of the complex sentence whereby the subordinate clause precedes the main clause: the subordinate clause is conceptualized prior to the main clause on a temporal plane, serving as a starting point or precondition for the event or circumstances presented in the latter (Ho 1993, 159). It should be noted that most of the errors classified under this category were mostly caused by sentences considered inappropriate as part of a written production, jointly with the context in which they were uttered. They could, on the other hand, be grammatical if uttered during oral production, or if functional principles relating to the notion of information focus compete with the PTS in defining the order of the constituents. In this regard, Loar (2011, 214) states that: "when the speaker wants to emphasize the reason as an information focus, or when the speaker mentions it as an afterthought, the adverbial clause of reason introduced by *yinwei* [because] may be positioned finally." The error in (18a) is caused by the precedence of the main clause *zuotian wo bu qichuang* 昨天我不起床 [I did not get up yesterday] over the causal subordinate *yinwei wo bu shufu* 因为我不舒服 [because I was feeling sick]. In terms of PTS, the main clause anticipates the subordinate clause as the state of discomfort of the subject precedes temporally the consequence, the failure to get out of bed.

- (18) a. #昨天我不起床因为我不舒服。  
*Zuotian wo bu qi chuang yinwei wo bu shufu.*  
 a'. 因为不舒服，昨天我没起床。  
*Yinwei bu shufu, zuotian wo mei qi chuang.*  
 Ieri non mi sono alzato perché non mi sentivo bene.  
 I didn't get up yesterday because I was feeling sick.

The error in (19a) is caused by the precedence of the main clause *wo bu neng kan shu* 我不能看书 [I can't read] over the conditional subordinate *ruguo you hen duo renao* 如果有很多热闹 (meaning intended by the learner: *ruguo hen chao* 如果很吵 [if it's too noisy]). In terms of PTS, the main clause is contingent on the fulfillment of the subordinate clause and therefore follows it in terms of temporal sequence. Thus, being able to read is a result dependent on the condition expressed by the subordinate clause.

- (19) a. #我不能看书如果有很多热闹。  
*Wo bu neng kan shu ruguo you hen duo renao.*  
 a'. 如果很吵，我不能看书。  
*Ruguo hen chao, wo bu neng kan shu.*  
 Non riesco a leggere se c'è troppo chiasso.  
 I can't read if it's too noisy.

As highlighted by translations (18a') and (19a'), Italian's unmarked order allows the main clause to precede the subordinate clause. This arrangement, driven by factors such as focus or emphasis, consequently does not always adhere to the PTS. It therefore appears that information structure in Italian is able to override the PTS with greater flexibility, which leads to divergences in the conceptualization of subordinate clauses. In summary, the analysis across these sub-principles reveals consistent patterns of deviation from the PTS. While a full-scale investigation into their causes is beyond the scope of this paper, the frequent alignment of these error structures with common Italian syntax is notable. This suggests that the conceptualization of event sequences, as encoded by word order, is a significant area of difficulty. The utility of the PTS, therefore, lies not just in identifying errors, but in providing a coherent, cognitive-based framework to explain *why* these specific structures are problematic for Italian learners, offering a clear target for pedagogical intervention.

### 7. Absolute and Relative Error Frequencies

Table 3 presents the relative frequency error rates (normalized per 1,000 characters) for each sub-principle and their respective subtypes, where applicable, while the absolute frequencies are shown in parentheses. In general, there is a statistically significant decrease in PTS violations between the third year and the other years of study (with LT1  $p = 0.002$ ; with LT2  $p = 0.001$ )<sup>8</sup>.

<sup>8</sup> The p-value has been determined by a log-likelihood test (1<sup>st</sup> y – 3<sup>rd</sup> y: LL = 9.14; 2<sup>nd</sup> y – 3<sup>rd</sup> y: LL = 18.75). The p-value for testing whether there are significant differences between years of study was set, as per convention, at  $p < 0.05$  (5% significance level). The LL value is considered statistically significant at the 95% confidence interval if it exceeds 3.84.

Table 3 - *Absolute and Relative Frequencies of PTS and its Sub-principles*

<i>Sub-principle</i>	<i>Type</i>	<i>1st y</i>	<i>2nd y</i>	<i>3rd y</i>	<i>Total</i>
1 Action Series	1.1 VO Relations	2.70 (3)	7.18 (16)	2.01 (6)	<b>3.95 (25)</b>
	1.2 Action Direction	0.00 (0)	2.69 (6)	0.67 (2)	<b>1.26 (8)</b>
	1.3 Aspectual Particles	6.30 (7)	15.70 (35)	1.00 (3)	<b>7.11 (45)</b>
<b>Total</b>		<b>9.00 (10)</b>	<b>25.57 (57)</b>	<b>3.68 (11)</b>	<b>12.33 (78)</b>
2 Locative Expressions		5.40 (6)	4.04 (9)	2.34 (7)	<b>3.48 (22)</b>
3 Temporal Expressions	3.1 Time + V	6.30 (7)	5.83 (13)	1.34 (4)	<b>3.79 (24)</b>
	3.2 V + Time	0.00 (0)	2.69 (6)	1.00 (3)	<b>1.42 (9)</b>
	<b>Total</b>	<b>6.30 (7)</b>	<b>8.52 (19)</b>	<b>2.34 (7)</b>	<b>5.22 (33)</b>
4 Beneficiary		11.70 (13)	2.69 (6)	1.34 (4)	<b>3.64 (23)</b>
5 Others Verbal Modifiers	5.1 Adverbial + V	7.20 (8)	4.49 (10)	3.68 (11)	<b>4.58 (29)</b>
	5.2 V + Complement	0.00 (0)	2.24 (5)	1.34 (4)	<b>1.42 (9)</b>
	<b>Total</b>	<b>7.20 (8)</b>	<b>6.73 (15)</b>	<b>5.02 (15)</b>	<b>6.01 (38)</b>
6 Subsidiary Relations		14.40 (16)	10.32 (23)	17.74 (53)	<b>14.54 (92)</b>
<b>Total</b>		<b>54.02 (60)</b>	<b>57.88 (129)</b>	<b>32.47 (97)</b>	<b>45.20 (286)</b>

Regarding the first sub-principle, it is noteworthy that the relative frequency increases considerably in the second year (25.57), compared to the first (9.00) and third year (3.68). The relative weight of the frequency connected to the sub-principle type 'Aspect particles' is the main cause of this difference (15.70). This type regulates the order of the aspect particles *le* and *quo*, a grammatical topic introduced extensively only during the second year of study. The frequency for this type decreases significantly for the third year of study (1.00), indicating that learners have acquired greater accuracy in the use of aspect particles or tend to generally avoid using them in written compositions due to their perceived difficulty. In general, it is evident that 'Action Series' is the second most violated sub-principle of the PTS, with a total rate of 12.33. The relative frequency rates referring to the sub-principle 'Locative expressions' remain fairly constant over the three years of study (LT1 = 5.40; LT2 = 4.04; LT3 = 2.34). As already discussed, this principle has not been divided into different types regarding the pre or post-verbal placement of locative expressions, since no errors were found in the word order resulting from the incorrect preverbal placement of a locative expression to be inserted in a post-verbal position. In essence, this principle therefore regulates only the incorrect post-verbal placement of locative expressions in instances where a preverbal insertion is required. The use of preverbal locative expressions is introduced in the first year of language study, and it is therefore not surprising that the highest relative rate is connected to this year of study. Regarding the third sub-principle of the PTS, 'Temporal expressions', the rates for the first type decrease progressively with increasing

linguistic competence of the learners (LT1 = 6.30; LT2 = 5.83; LT3 = 1.34). On the other hand, the second type has no entries for the first year of study (0.00) and decreases for the third year (1.00) compared to the second (2.69). The rates reflect the fact that the errors classified under this type pertain mainly to the placement of duration expressions, introduced extensively only from the second year onwards. The rate of relative frequencies of the fourth sub-principle 'Beneficiary' decreases drastically from the first year of study, indicating a rapid acquisition of the syntactic regularities it governs (LT1 = 11.70; LT2 = 2.69; LT3 = 1.34). No significant variations are observed for years of study in the rates connected to the fifth sub-principle, 'Other verbal modifiers' (LT1 = 7.20; LT2 = 6.73; LT3 = 5.02), which show a decreasing trend with increasing linguistic competence of the learners. The first type of this sub-principle is the most frequently violated in the total count of the three years of study (4.58 > 1.42). This result is conditioned by the lack of errors classifiable through the second type for the first year. Complements were introduced in class only from the second year onwards, and this absence is therefore due to their lack of use in written production. The sixth and last sub-principle, 'Subsidiary relations', turns out to be the most violated among the PTS sub-principles, with an overall rate of 14.54. It should be remembered, however, that this sub-principle does not regulate true ungrammaticalities in word order but rather the construction of sentences considered inappropriate for a written composition. The rates for years of study report alternating values, decreasing for the second year and increasing again for the third (LT1 = 14.40; LT2 = 10.32; LT3 = 17.74), showing that learners continue to have acquisition difficulties regarding the regularities in word order governed by the sub-principle. Notably, this sub-principle is the only one among the six to record a higher relative frequency in the third year compared to the first two years of study. This difference is also statistically significant compared to the frequencies of the second year ( $p = 0.025 < 0.05$ )<sup>9</sup>. This is in stark contrast with the decreasing rate of PTS violations in the third year. A possible justification for this increase can be found by considering that with increasing lexical and linguistic competence in general, the learner is led to use a greater number of complex propositions in the composition of the written text, thus tending to be less conservative in the structuring of the content.

### 8. *Conclusions*

This study employed the Principle of Temporal Sequence (PTS) to interpret word order errors from native Italian learners of MC. It was argued that these errors can be viewed as violations of the PTS, which in turn offered a semantic motivation for their occurrence and showcased the principle's explanatory value. The iconic nature of language, of which the strict adherence to the PTS is one of the most evident manifestations, has highlighted the differences in the strategies of structuring meaning in word order patterns constituted by linguistically comparable entities in temporal terms. The results, although limited by the level of linguistic competence of the learners from whom the error corpus was drawn,

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<sup>9</sup> The p-value was determined by a log-likelihood test (LL = 5.01).

have shown that almost half (45.54%) of these errors can be illustrated as violations of the PTS. These findings, from a quantitative point of view, are in line with those collected by Jiang (see section 4). This suggests that Italian, like English, is subject to conceptualization differences that can significantly impact the grammatical accuracy of the learner in written production. Furthermore, the results of the study support the application of PTS as a useful tool for pedagogical and language teaching purposes for teaching Chinese as a second language. The motivational power of the PTS, if explicitly taught and integrated in teaching materials, would equip the learner with a fundamental metalinguistic competence, aiding in the understanding and retention of a wide range of linguistic regularities (see also the suggestions in Hu 2022; Morbiato 2019; Jiang 2009; 2017; and especially the proposals in Tucci 2023). The statistical analysis of the frequency of errors for years of study suggests that, overall, an explicit illustration of the PTS is strongly recommended starting from the first year of language study. Nevertheless, further studies in the language classroom are needed to empirically test the actual acquisition effectiveness of a teaching approach based on the PTS.

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