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Constructed Languages

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Abstract

Linguistic research focuses primarily on the thousands of naturally occurring languages, but there are also languages that have been consciously created by individuals. There are four main types of these constructed languages. First, so-called philosophical languages were created in the seventeenth century as a way to better capture the reality of the world. Second, many international auxiliary languages were constructed in the late nineteenth and early twentieth centuries as a way to solve practical problems of international communication. Third, many languages have been created in recent decades for the purposes of fiction (e.g., novels, film, television), especially in the realms of science fiction and fantasy, or simply as an enjoyable hobby. Fourth, it is now common to construct languages for use in psycholinguistic experiments. Each of these types of constructed languages presents interesting research questions and deserves increased attention from linguists.

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1. INTRODUCTION

The traditional focus of linguistic research is the thousands of languages that occur naturally, but there are also languages that have been consciously created by individuals. These constructed languages take many different forms and have been invented for a variety of purposes, but most are similar in structure to naturally occurring languages and are intended to be used (or give the appearance of being used) in ways that resemble naturally occurring languages as well.

There are many reasons that linguists might be interested in constructed languages. At a very broad level, these languages force us to look critically at the notion of natural language. If natural languages are those that have arisen naturally in human communities, what are we to make of those that arose in more artificial ways but are nonetheless used by humans in language-like ways? Minimally, one seems forced to conclude that the boundaries of what constitutes a natural language are blurrier than usually supposed. At a narrower level, constructed languages pose analytical puzzles that are similar to those found in other languages. That is, their structure, acquisition, history, and use can be studied, and interesting questions about their proper analysis arise routinely, just as they do for other languages. Finally, there is a tighter connection between the field of linguistics and the history of constructed languages than most linguists realize. To a certain extent, it is the development of linguistics as a science that has made constructed languages possible, in that creating a language from scratch requires knowledge of how languages work. It should thus not be a surprise that many prominent linguists have been involved in constructing languages since early in the twentieth century.

In this article, I review what is known about the linguistic properties of constructed languages. The discussion is organized around the four major historical periods, primarily in Europe, in which these languages have been created in large numbers. The first of these is the seventeenth century, when several languages were invented as a way to better understand the world around us. The second is the latter half of the nineteenth century and the early twentieth century, when scores of languages were created in attempts to solve practical problems of international communication. The third began in the early twentieth century and continues today; in this period, constructed languages have become an important element in works of fiction (including novels, film, and television), and the process of creating them has become a popular hobby. The fourth period is the present day, in which constructed languages play a crucial role in many forms of psycholinguistic experiments.

Constructed languages are also often referred to as invented languages, planned languages, or artificial languages; I am agnostic as to the best choice. The term conlang is also common, though more often in reference to the output of language creation enthusiasts of the third period mentioned above, so I will restrict my own usage accordingly.[1]

2. PHILOSOPHICAL LANGUAGES

Some of the earliest constructed languages that are of linguistic interest are the so-called philosophical languages of the seventeenth century. The goal in this period was less to create a language that would resemble naturally occurring languages and more to create one that would be better, in the sense that it would allow for more precise and valid reasoning and for a truer understanding of the world and everything in it. The most well-known language of this type is the one created

[1] Speakers of Esperanto, from the second period above, sometimes object to the use of conlang as a label for their language, or even find this usage offensive, since it appears to place Esperanto, with its large community of speakers and long history, on the same footing as the project of an occasional hobbyist.

by the Englishman John Wilkins (1614–1672) in his great work *An Essay Towards a Real Character, and a Philosophical Language*. Wilkins attempted to create a hierarchical system of semantic categories that could be used to classify any concept in the universe (for a very accessible introduction, see Okrent 2009). The concept "dog," for instance, is expressed in Wilkins's system as a series of choices in a hierarchy of semantic categories, as in example 1:

(1) special > creature > distributively > substances > animate > species > sensitive > sanguineous > beasts > viviparous > clawed > rapacious > oblong-headed > European > terrestrial > big > docile

"Wolf" is expressed in exactly the same way, except that the very last choice is "wild" rather than "docile." There is also a system for giving phonological expression to these series of choices, so "dog" is realized as *zita* and "wolf" as *zitas*. In this way, the form of the words reflects their meaning, and the close biological relation between dogs and wolves is immediately evident in the phonological form of the words.

For linguists today, Wilkins's language is of interest for two main reasons. First, it represents an early attempt to create a set of universal semantic primitives. The proposed ontology may seem quaint by modern standards, but its comprehensive and explicit nature is impressive. Second, Wilkins's language is an overt attempt to create a lexicon where the relation between a word's form and its meaning is not arbitrary. The notion of Saussurean arbitrariness would not arise until more than two centuries later, but the fact that natural languages are arbitrary in this sense was clearly on Wilkins's mind.

Not surprisingly, Wilkins's work is mainly discussed today in the context of the history of linguistic ideas or the history of philosophy. Subbiondo (1992) and Maat (2004) have written book-length treatments that give good overviews; for discussion of more specific aspects of Wilkins's project, readers are referred to Nate (1996) and Goodall (2021).

3. INTERNATIONAL AUXILIARY LANGUAGES

A very striking surge of interest in constructing languages occurred in the middle of the nineteenth century and continued into the twentieth century. An average of three new constructed languages per year were published in the period between 1850 and 1920, with more than 150 released in the particularly active spurt of 1886 to 1916 (counts based on the abbreviated list in Okrent 2009; for more comprehensive lists, see Couturat & Leau 1903, Drezen 1931, Dulichenko 1990). This surge of activity, centered primarily in Europe, was driven by a desire to create an auxiliary language that could facilitate communication across language barriers. The timing of this sentiment was not an accident, since the increasing ease of international travel and communication (due to railroads, telegraph, international postal service, a growing middle class with the means to travel, etc.) was running up against the fact that there was no recognized lingua franca in the region at the time, even among educated people (see Large 1985, Garvía 2015).

Unlike the earlier philosophical languages, the international languages of this period were intended to be largely indistinguishable from naturally occurring languages, with one exception: Adults should be able to learn them in a short time. Thus, these languages were designed to facilitate L2 acquisition while otherwise conforming to contemporary views of how a typical language was structured. There was some degree of consensus on these issues, so many languages from this period are remarkably similar, as van Oostendorp (2001) has pointed out (see also Gobbo 2017). For instance, virtually all have SVO as their basic word order, have head-initial relative clauses, and have fronted *wh*-phrases. In addition, most of the languages have specific properties designed

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to speed up acquisition, at least in terms of common beliefs of the time about how second languages are acquired. First, these languages are generally completely regular in their morphology. If there is a tense suffix for verbs, for instance, it is the same suffix with the same form for all verbs. Second, the morphology is almost entirely in accord with the "agglutinative ideal," with each affix conveying a single meaning or function, as seen in the Esperanto word *interesiĝantoj* ('interested individuals') in example 2:

(2) interes-iĝ-a-nt-o-j
interest-MIDDLE-PRESENT-ACTOR-NOUN-PLURAL

Third, the vocabulary is typically drawn from major European languages such as English, French, German, and Latin. Many words therefore will be cognates for anyone who has some familiarity with at least one of these languages, and to some extent, the language will be comprehensible even without any prior exposure. This use of source words from European languages often coexists, though, with a conflicting trend to make the lexicon more systematic. In Volapük, for instance, the word *pük* 'language' comes from the English word *speak*, but productive morphological processes may be implemented to create new words that are not cognates with anything in the source language, such as *pükik* 'linguistic' and *nepük* 'silence.' This striving toward systematicity is especially evident, in many of these languages, among the affixes and closed-class lexical items. In the pronominal system in Esperanto, for example, most pronouns are cognates with many European languages (e.g., *mi* 'I,' *vi* 'you,' *ni* 'we'), but unlike in those source languages, the pronouns all have a consistent form (all ending in *-i*).

Finally, the use of European languages as the main source of vocabulary has important consequences for the phonological structure of these languages because for European words to be accommodated, the phonemic inventory and syllable structure must be relatively similar to those of an average European language. This often means that a wide range of syllable-initial and syllable-final consonant clusters is allowed. The inventory of consonants generally follows a typical European pattern (e.g., with the usual voicing contrasts among obstruents), and although vowel inventories are mostly unremarkable (most adopt a five-vowel system), Volapük has an eight-vowel system that looks more overtly European (/i/, /e/, /ɛ/, /u/, /o/, /ɑ/, /y/, /ø/), with a rounding contrast in the front vowels.

The first language that attracted a significant number of learners and speakers was Volapük, initially published in 1879. It has a rich system of inflectional morphology, both for verbs (tense/aspect and voice are marked with prefixes, and person, number, and mood are indicated with suffixes) and for nouns (a four-way case distinction and number are indicated by suffixes). Some examples of inflection with the verb *löf* 'love' are given in examples 3a–c:

(3a) e-löf-ob
PAST-love-1
'I loved'

(3b) o-löf-ob-s
FUT-love-1-PL
'we will love'

(3c) p-u-löf-om-s
PASS-FUT.PERF-love-3-PL
'they will have been loved'

The highly inflected nature of many Volapük words means that cognates are not as recognizable as they might be otherwise. An English speaker could conceivably recognize that *löf* comes from

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English *love* but would almost certainly not draw that connection when seeing words like *elöfob*, *olöfobs*, and *pulöfoms* for the first time. Since this affects most verbs and nouns, written text and speech samples in Volapük are largely incomprehensible even to speakers of the languages from which the vocabulary was drawn.

Esperanto was published a few years later (1887) and is similar to Volapük in many ways, but with less inflection and with more influence from Romance and Latin in its vocabulary. There is only a two-way case distinction and no person/number marking on verbs. Cognates are much easier to recognize, and impressionistically, Esperanto strikes most naive listeners and readers as a Romance language, perhaps with some Germanic and Slavic influences.

Ido, a derivative of Esperanto first published in 1907, aimed to reduce the amount of inflectional morphology still further and generally make the language more readily comprehensible. Case is eliminated, for instance, as is number agreement between nouns and adjectives, and attempts to systematize the lexicon (seen above for Volapük and Esperanto) were greatly reduced. An example of the transition from Esperanto to Ido is given in examples 4a and b:

	Esperanto				
(4a)	La	virino	hav-as	ruĝa-j-n	pomo-j-n.
	the	woman	have-PRES	red-PL-ACC	apple-PL-ACC
	Ido				
(4b)	La	muliero	hav-as	reda	pom-i.
	the	woman	have-PRES	red	apple-PL
	'The woman has red apples.'				

One can see here that both accusative case and number agreement within the noun phrase disappear in Ido and that the word for woman has changed. *Virino* in Esperanto is created through productive morphology but is unlikely to be understood by an outsider, whereas *muliero* in Ido is unanalyzable but is easily understood by many even without prior study. In addition, letters with diacritics (such as *ĝ* in example 4a) are abandoned in written Ido. The result of these changes is that Ido is noticeably more comprehensible to someone familiar with one or more European languages, but at the same time, Esperanto and Ido are mutually intelligible to a large extent, both when spoken and when written.

The trend toward reduced inflectional morphology and increased comprehensibility continued with Novial, introduced in 1928. Most notably, verbal inflection for tense, an important feature of Volapük, Esperanto, and Ido, was discarded in Novial. The verb is always in its base form, and tense is handled by auxiliaries.

In Interlingua, released in its definitive form in 1951, the idea of immediate comprehensibility was emphasized even further, with careful procedures used to choose lexical items that would be maximally recognizable to the greatest number of people. This may be seen in example 5, which would appear to be easier to understand than the Ido equivalent in example 4b (which is in turn easier than the Esperanto equivalent in example 4a):

	Interlingua				
(5)	La	femina	ha	rubie	pomo-s.
	the	woman	have.PRES	red	apple-PL
	'The woman has red apples.'				

This increase in comprehensibility, though, results in a greater reliance on inflectional morphology for verbs (relative to Novial, though not to earlier languages) and a weakening of the idea of morphological regularity (a notable property of all other major languages of the period). This occurs for a simple reason: Comprehensibility stems from similarity to the source languages, and

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those source languages contain significant amounts of inflectional morphology and irregularity. Interlingua returns to the use of affixation to mark tense, for instance, and adopts the verb classes that are characteristic of Romance languages.

Example 6 shows samples of inflectional morphology with the verb "protect" in the five languages discussed here, ranging from Volapük, with its highly inflected forms (first-person singular shown here), to Novial, with no verbal affixation at all, and with Esperanto, Ido, and Interlingua in intermediate positions:

(6)						
	Volapük:	jelön	jelob	äjelob	ojelob	jelolöd
	Esperanto:	protekti	protektas	protektis	protektos	protektu
	Ido:	protektar	protektas	protektis	protektos	protektez
	Novial:	protekte	protekte	did protekte	sal protekte	protekte
	Interlingua:	proteger	protege	protegeva	protegera	protege
		infinitive	**present**	**past**	**future**	**imperative**

3.1. Issues of Linguistic Interest

The international auxiliary languages of the nineteenth and twentieth centuries are the first known examples of constructed languages being acquired by large numbers of people. Of the languages discussed here, Volapük, Esperanto, Ido, and Interlingua have all had significant numbers of speakers, and all except Volapük still do to some extent. These are generally L2 speakers, but many attain high levels of proficiency and can be studied in ways very similar to those used with speakers of naturally occurring languages. Still, one can reasonably ask whether there is any reason to do this—that is, whether these languages are more than just historical curiosities and might help us address broad issues of linguistic interest.

3.1.1. Universals. One way this might be possible is in the area of language universals. The basic grammatical structure of each of these languages was consciously created, typically by a single person, and it is not difficult to imagine that the grammar could contain some property that linguists consider impossible (or at least unlikely) in natural language. The fact that these languages rely on existing languages to such a large extent, for both their lexicon and their structure, may reduce the likelihood of this happening, but still, it seems entirely possible. Conceivably, then, these languages could help us answer the question of what happens when learners are presented with a language that violates a putative language universal.

One case where a situation like this may have arisen is in the system of nominal inflection in Volapük. Nouns in Volapük may contain suffixes for both number and case, and by the affix scope principle (Greenberg 1963, Bybee 1985, Aronoff & Xu 2010), one would expect the case suffix to be more distant from the noun than the number suffix. This is what happens in Esperanto, for instance, as in example 7a, but it is not what happens in Volapük, as in example 7b:

	Esperanto
(7a)	amiko-j-n
	friend-PL-ACC
	Volapük
(7b)	flen-i-s
	friend-ACC-PL

Whether this grammatical quirk impeded acquisition of Volapük is not known, though it is tempting to draw a connection between this property (and perhaps others) on the one hand, and Volapük's reputation as being hard to learn on the other, all of which may have played a role in the

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almost complete collapse of the Volapük speaker community by the mid-twentieth century (for background, see Large 1985).

Another potential place where the structure of the languages of this period might violate language universals concerns areas of the lexicon that have been made highly systematic. For example, many of these languages have a system of "correlatives" that form a regular (and apparently productive) set of pronouns, so that *wh*-words, demonstratives, and existential, universal, and negative quantifier expressions are all formed through regular processes. In Esperanto, for instance, demonstratives are formed with *t-* and temporals with *-iam*, so *tiam* is 'then' (and *kiam* 'when,' *ĉiam* 'always,' *neniam* 'never,' etc.). Proponents of rival languages have sometimes claimed that this system (and that of Volapük, which is similar) is too artificial (Large 1985). Gobbo (2011) asks whether this extreme systematicity in the lexicon goes beyond what would be allowed in naturally occurring languages, and we could ask as well whether such a system is even learnable. Gobbo points out, however, that natural languages are often surprisingly systematic in this domain; the system in Esperanto in fact seems to have been inspired by Lithuanian. Given this, it is perhaps not a surprise that at least anecdotally, people learn systems of this type without any special difficulty.

There are thus no known cases where one of the languages of this period clearly violates a language universal and where we also have reliable data showing how this affects learning of the language. This topic has barely been explored, however, and informative cases may yet come to light (for further discussion, see Lindstedt 2009, Jansen 2012).

3.1.2. Acquisition. Another way that the international auxiliary languages of this period can be of interest is to see them as natural experiments in language learning and use. As discussed earlier, these languages are all relatively similar along many dimensions, but they nonetheless differ among themselves in ways that could be relevant to the concerns of modern linguistics. For example, Esperanto and Interlingua are superficially very similar, and a casual listener or reader could easily take them to be the same language. They differ in their vocabulary, though: Esperanto relies much more on productive morphology to create words and on roots borrowed from smaller languages without any particular regard for international recognizability, and Interlingua consists only of words that are known to be readily recognizable to speakers of major European languages. Some examples of this difference are given in example 8 [*kaj* and *edzo* in Esperanto are derived from Classical Greek and Yiddish (Vilborg 1989–2001), respectively, while the other words are derived through regular morphological processes]:

(8)						
	Esperanto:	kaj	edzo	virino	eliri	registaro
	Interlingua:	e	marito	femina	sortir	governamento
		'and'	'husband'	'woman'	'leave'	'government'

For a speaker of a European language, then, much of the vocabulary of Interlingua can be acquired very quickly (perhaps after a single hearing), whereas the acquisition of Esperanto vocabulary will be a much more extended process. This has potential implications for other aspects of acquisition. Yang (2016) suggests that one reason for L1/L2 differences in language acquisition is that children acquire words one by one, while adults often amass a large vocabulary very quickly, especially in languages with many cognates. The relatively slow vocabulary development of children can facilitate rules becoming productive, in Yang's analysis, even in the face of exceptions, so one might expect that acquirers of Esperanto, including adults, would enjoy a similar advantage, at least relative to acquirers of Interlingua. At first glance, the ability to make rules productive despite the presence of exceptions might not seem to be of much help for an adult learning Esperanto, given that the language appears to be so regular, but in fact, there are probably many cases where learners have to deal with apparent exceptions to rules. For example, changes to the argument

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structure of verbs are always overtly marked morphologically in Esperanto, so knowing how to use a verb means knowing what its default argument structure is. Verbs of cooking, for instance, generally have an external causer argument as the subject, as with *baki* 'to bake' in example 9a. To express the patient as the subject, the verb must be morphologically marked, as in example 9b.

(9a) Ni bak-i-s la pano-n.
we bake-PST-FIN the bread-ACC
'We baked the bread.'

(9b) La pano bak-iĝ-i-s.
the bread bake-MDL-PST-FIN
'The bread baked.'

A verb like *boli* 'to boil,' though, works differently. One can have an external causer as the subject only when the verb has a causative suffix, as in examples 10a and b:

(10a) Ni bol-ig-i-s la akvo-n.
we boil-CAUS-PST-FIN the water-ACC
'We boiled the water.'

(10b) La akvo bol-i-s.
the water boil-PST-FIN
'The water boiled.'

A detailed analysis is clearly beyond the scope of this review, but it is at least conceivable that *boli* is an exception to an otherwise general rule about the argument structure of cooking verbs in Esperanto and that the necessarily more deliberate pace of verb acquisition in the language makes it possible for learners to create a productive rule despite an exception like this. Learners of Interlingua would presumably be less able to create productive rules in analogous cases in that language.

3.2. Relation to Linguistics as a Discipline

The international auxiliary languages of the nineteenth and twentieth centuries are of interest to linguists for another reason: Their development went hand in hand with the development of linguistics as a discipline. As Falk (1995) points out, the structures of Volapük and Esperanto, with their heavy reliance on inflectional morphology, agglutination, and regularity, show clear signs of influence from the ideas of the Neogrammarians and related thinkers in nineteenth-century Europe. René de Saussure, brother of Ferdinand de Saussure (often considered the father of modern linguistics) and an important theorist in his own right (Anderson & de Saussure 2018), was one of the first serious Esperanto grammarians, and his ideas on the morphological properties of words in Esperanto remain influential among Esperanto grammarians today (van Oostendorp 2018).

Among the languages that came later, several prominent linguists played important roles. Otto Jespersen was involved with Ido, was himself the creator of Novial, and later assisted with the development of Interlingua (see, e.g., Jespersen 1928, 1931). Edward Sapir showed a deep and enduring interest in auxiliary languages, and his 1925 memorandum on the matter (Sapir 1925) was cosigned by Leonard Bloomfield and Franz Boas, among others (though they never displayed the same level of interest). Sapir was a major figure in the early development of Interlingua, and André Martinet made important contributions in a later period.

As linguistics became increasingly established and professionalized, interest in international auxiliary languages dropped off and was sometimes even hostile (Collitz 1925), and by the latter half of the twentieth century, most linguists had no involvement with these languages and

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very little awareness of them. This has changed somewhat in recent years, as linguists' interest in constructed languages in general has grown and there has been an increased appreciation of the intertwined histories of international auxiliary languages and linguistics (Falk 1995, 2002; Anderson & de Saussure 2018; van Oostendorp 2018; Punske et al. 2020). Noam Chomsky, who once made a public comment about Esperanto that has sometimes been interpreted as disparaging, has recently stated that this comment was "misinterpreted as disapproval of the language or of projects involving the use of Esperanto in facilitating development of language skills. There never was any such implication, or intention" (from an email to P. Dasgupta intended for public dissemination, December 9, 2021). With his consent, an Esperanto translation of one of his major linguistic works appeared in 2010 (Chomsky 2010).

There is a subdiscipline of linguistics known as interlinguistics that is devoted to language planning applied to auxiliary languages (Jespersen 1931, Schubert 1989, Blanke 2015), but it is fair to say that most linguists have never seen this term and would probably misunderstand it if they did (especially since interlanguage is a common technical term in L2 acquisition). In addition, the main intellectual concerns of the field of interlinguistics only barely overlap with those of mainstream modern linguistics, so the points of contact between linguistics and interlinguistics have not been extensive.

3.3. The Linguistics of Esperanto

Of all the international auxiliary languages, Esperanto is the one that blurs the distinction the most between natural language and constructed language. Although not a linguist, the creator of Esperanto, L.L. Zamenhof, seemed to have an intuitive understanding of what people would need in order to learn the language, so rather than writing detailed grammars, he spent much of his time creating a large corpus of written materials (e.g., translations of major literary works). He also helped foster a tradition of using Esperanto as a spoken language, a custom that the early Volapük movement had a difficult time establishing (Blanke 2009, Large 1985). Zamenhof's use of the language was of course in accord with his own grammatical sketches, which primarily dealt with basic morphological properties, but it was also influenced by his (near-)native Russian, Yiddish, and Polish, and it became the main input for the first generation of Esperanto speakers. Reliable estimates of the current number of speakers of Esperanto are hard to obtain (and depend, among many other things, on how one defines "speaker"), but Lindstedt (2006) estimates that about 100,000 have a relatively high level of conversational proficiency, Wandel (2015) estimates that 2 million people have some significant ability, and *Ethnologue* (Eberhard et al. 2022) places Esperanto in its highest categories in terms of size and vitality—that is, large (more than 1 million speakers) and institutional ("used and sustained by institutions beyond the home and community"). Almost all of these are L2 speakers, but there have been native speakers of Esperanto since early in the twentieth century, and there are approximately 1,000 now (Lindstedt 2006).

Given this base of speakers, including many native speakers, it is perhaps not surprising that linguists have analyzed many aspects of the language, using methods similar to what would be employed for any other language. The classic introduction to this field, by Wells (1978), gives an overview of the structure of the language and is itself written in Esperanto (see also Koutny 2018), but there is also some scholarly work that focuses on more specific aspects of the structure of Esperanto and that is written in English or other languages (see Pereltsvaig 2017).

3.3.1. Phonetics and phonology. As discussed above, Esperanto mainly uses European languages as the source for its vocabulary, so it must be similar to those languages in sound structure to accommodate those words. Wells (1978) gives a useful introduction to the phonetics

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of Esperanto, and van Oostendorp (1999, p. 77) gives a detailed treatment of the syllable structure, concluding that it is "very similar to that of Indo-European languages, more in particular to that of Romance and Germanic languages." This is not surprising, given what we have seen, but he also shows that this is not the whole picture: "[T]here is no system which has exactly the same system as Esperanto. The phonology of Italian comes close, but also this is still different. From a phonological point of view, Esperanto is an autonomous system" (van Oostendorp 1999, p. 77). Other aspects of Esperanto phonology may not be very exciting (e.g., there is little in the way of clear phonological processes), but in van Oostendorp's (1999, p. 52) view, "there is a lot to be learned about the sound structure of Esperanto by applying a modern methodology to it; and there is something to be learned about language in general by studying Esperanto."

3.3.2. Morphology. In the domain of morphology, Esperanto has a rich inflectional system and extensive compounding. Nouns, verbs, adjectives, and most adverbs have characteristic endings, and roots therefore can freely change from one category to another by changing the suffix, as shown in examples 11a–d:

(11a) parolo 'speech, act of speaking' (noun)

(11b) paroli 'to speak' (verb)

(11c) parola 'spoken' (adjective)

(11d) parole 'by means of speech' (adverb)

Prepositions do not have characteristic endings of this type, though they may act as roots and take one of the above endings, as seen in the prepositional phrase in example 12a and the noun phrase in example 12b, where the preposition is used adjectivally:

(12a)	post	la	evento
	after	the	event
(12b)	la	posta	evento
	the	following	event

Some adverbs and prepositions end in *-aŭ* (e.g., *morgaŭ* 'tomorrow,' *antaŭ* 'before'), but this too forms part of the root; it cannot be removed, but the root can take one of the endings in example 11 (e.g., *la morgaŭa evento* 'tomorrow's event,' *la antaŭa evento* 'the previous event'). This ability of words to change syntactic category through affixation leads to interesting questions as to whether roots inherently belong to one category or another, and it is this topic that René de Saussure studied in his early work on Esperanto grammar (for extensive discussion, see van Oostendorp 2018).

Traditional grammars of Esperanto typically contain lists of derivational affixes used to create new words, but despite the terminology, these actually seem to be roots, since they can be used as words independently as long as they have the appropriate syntactic category suffix. The traditional suffix *-et-*, for example, is used to form diminutives (*libro* 'book,' *libreto* 'small book'), but it can also be used as an adjective (*eta* 'small'). Van Oostendorp (2018) provides a useful discussion of this property, including the role it played in battles between proponents of Esperanto and Ido.

On the whole, then, Esperanto is relatively complex morphologically and very different from the Romance languages that it superficially resembles. The noun phrase in example 13 exemplifies some of this complexity:

(13) la ŝanĝ-iĝ-a-nt-a evolu-stato de la ekster-urb-a-j mal-san-ul-ej-o-j
the change-MDL-PRES-PART-ADJ evolution-state of the outside-city-ADJ-PL un-health-people-place-N-PL
'the changing state of development of the hospitals outside the city'

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This phrase shows extensive inflectional morphology and compounding but would be unremarkable to an Esperanto reader.

3.3.3. Syntax. As with the phonology, the syntax of Esperanto appears to be largely what one would expect of a language of European origin (see Comrie 1996, Parkvall 2010). It is generally head-initial, with SVO as the unmarked order, prepositions, and postnominal relative clauses. There is no agreement on the verb, and thematic subjects are always overt.

As one looks through the types of phenomena that typically attract the attention of syntacticians, however, one finds a number of interesting details that could be worth exploring further. For instance, there are no specifically reflexive pronouns outside of third person, as seen in example 14:

(14) Mi / vi / li vidis min / vin / sin (mem).
I you he saw me you 3P.REFL self
'I / you / he saw myself / yourself / himself.'

This same pattern obtains in possessive pronouns; as a result, in third person, there is a distinction between nonreflexive and reflexive possessives (see Jansen 2012).

As mentioned above, changes to a verb's argument structure are always marked morphologically in Esperanto. In addition to passives (as in example 15a), middle structures (as in example 15b) and causative structures (as in example 10a above) are also common:

(15a) La koloro est-i-s ŝanĝ-i-t-a.
the color be-PST-FIN change-PST-PART-ADJ
'The color was changed.'

(15b) La koloro ŝanĝ-iĝ-i-s.
the color change-MDL-PST-FIN
'The color changed.'

Since transitivity alternations of the type *We changed the color / The color changed* are morphologically marked in Esperanto, speakers need to know what the argument structure of the base form is. If the external argument of the base form is a causer, as is true with *ŝanĝi* 'change,' then the middle voice must be used if that argument is not expressed, as in example 15b. With other verbs, however, the base verb already lacks a causer external argument, as is true with *boli* 'boil,' so the middle voice is not needed. If such an argument is added, though, causative morphology is required, as in example 10a. Goodall (2001) attempts to show that even though the division between these two types of verbs often seems arbitrary, it largely falls out from the type of analysis given by Levin & Hovav (1995).

Wh-questions and relative clauses are constructed as would be expected, with filler–gap dependencies in both, as in examples 16 and 17:

(16) Kio-n la knabo vid-is __ ?
what-ACC the boy see-PST
'What did the boy see?'

(17) La virino kiu-n la knabo vid-is __ ĵus alven-is.
the woman REL-ACC the boy see-PST just arrive-PST
'The woman who the boy saw just arrived.'

Long-distance dependencies spanning more than one clause are possible, though impressionistically, they seem less common than in a language like English. The structural constraints on

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filler–gap dependencies that have been the subject of so much research in other languages have barely been explored in Esperanto, though Goodall (1988) shows that the language appears to show the *that*-trace effect (Pesetsky 2017; see also Wennergren 2020 for a discussion of this phenomenon in more traditional terms). If true, this is an intriguing fact since it is in line with analyses predicting that the *that*-trace effect arises specifically in non-null-subject languages. Since Esperanto is clearly not a null-subject language (thematic subjects must be overt, and there is no agreement on the verb), it behaves as predicted, as seen in example 18:

(18) *Kiu vi pens-as ke __ alven-os ĝustatempe?
who you think-PRES C arrive-FUT right.time
'Who do you think that will arrive on time?'

As mentioned above, the basic word order in Esperanto is SVO. However, a number of factors can play a role and produce other possible orders. One such factor is object shift, which is common in Esperanto, though not obligatory. It occasionally occurs with pronouns but is especially common with demonstratives, as in example 19:

(19) Mi dir-is ke mi leg-os la artikolo-n kaj mi **tio-n** **far-is** hieraŭ.
I say-PST C I read-FUT the article-ACC and I that-ACC do-PST yesterday
'I said that I would read the article and I did that yesterday.'

In example 19, the direct object *tion* 'that' is placed to the left of the verb *faris* 'did.' The expected VO order (*faris tion* 'did that') is also possible, but both the OV and VO orders seem equally acceptable.

At a more general level, information-structure notions like "given" and "new" have an important influence on word order in Esperanto, as they do in many languages, with given elements appearing earlier than new elements. An OVS sentence as in example 20, for instance, is a normal answer to a question like *Kiu legis la libron?* 'Who read the book?' but would be very odd as an answer to *Kio okazis?* 'What happened?' or *Kion Petro legis?* 'What did Peter read?':

(20) La libro-n leg-is Petro.
the book-ACC read-PST Peter
'Peter read the book.'

The ready availability of word order changes to meet the needs of information structure may be responsible for the fact that morphological passive forms, as in example 15a above, are less common in Esperanto than they are in a language like English.

In addition, long and complex phrases are often positioned at the ends of sentences. This phenomenon, as in examples 21a and b, is familiar from many other languages:

(21a) Oni don-is al ŝi [bel-ega-n kaj tute neforgesebla-n libro-n].
one give-PST to she beautiful-AUG-ACC and all unforgettable-ACC book-ACC
'One gave to her a beautiful and completely unforgettable book.'

(21b) Ĝuste en tiu momento parol-is [unu el la plej fama-j sciencisto-j
right in that moment speak-PST one of the most famous-PL scientist-PL
de la nacia universitato].
of the national university
'One of the most famous scientists of the national university spoke right at that moment.'

In a sentence like example 21a, the default position for the direct object would be immediately following the verb, but here, it follows the indirect object. Example 21b shows that even though

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subjects normally appear to the left of the verb, they very naturally surface postverbally when they are long and complex.

The three factors affecting word order discussed here—object shift, information structure, and length/complexity—may ultimately be facets of a single phenomenon, but at least at a descriptive level, they help us see under what circumstances deviations from SVO order commonly occur in Esperanto. By far the most comprehensive and well-documented study of this area is Jansen's (2007) (see also Liu 2018, Nagata & Corsetti 2018).

The above paragraphs give an idea of the major syntactic phenomena of Esperanto, but they by no means exhaust the range of possible areas to explore in syntax and adjacent areas. Dankova (1997, 2009, 2015), for example, has studied a number of interesting properties of temporal expressions and the participial system in Esperanto, and Dasgupta has studied degree words (Dasgupta 1989) and idioms (Dasgupta 1993) (see also Dasgupta 2018). Gledhill (2000) provides a useful corpus-based grammar of Esperanto, while Wennergren (2020) provides a very thorough pedagogically oriented grammar.

3.3.4. Acquisition. The fact that Esperanto has a large base of native speakers makes it particularly intriguing to linguists and distinguishes it from all other constructed languages. Nevertheless, the term native speaker obscures some of the nuances behind this phenomenon (as it does in many other cases too; see Cheng et al. 2021, Wiese et al. 2022). First, native speakers of Esperanto are virtually always natively bilingual (or multilingual). This is true for obvious reasons: Even if the child is raised in a household that uses Esperanto exclusively (which is not usually the case), the child will still have extensive exposure to some other language(s) through relatives, neighboring children, the child care and school systems, and the surrounding community in general. Second, native speakers of Esperanto have often had very restricted and/or inconsistent input (Versteegh 1993). It tends to be restricted because they typically hear the language only within the home (as just mentioned)—and even there, only one of the parents typically speaks to the child in Esperanto (almost always the father; see Corsetti 1996)—and it is often inconsistent because the input generally comes from L2 speakers of the language, and as we have seen, Esperanto has extensive inflectional morphology. Given well-known characteristics of L2 speech (e.g., Hopp 2013), it is not uncommon for children to be exposed to inconsistent use of case markers and other aspects of the morphology. Third, native speakers of Esperanto often undergo severe attrition as they enter late adolescence and adulthood. As their involvement with the outside (non-Esperanto-speaking) world grows and the amount of contact with their Esperanto-speaking parent(s) shrinks, they sometimes have almost no exposure to the language for the rest of their lives.

Given the above circumstances, there is great diversity in the linguistic characteristics of native speakers of Esperanto. Those whose contact with the language is limited to a single parent (whose own use of the language may be inconsistent) may have only partial ability to speak once they are adults. On the other hand, those whose upbringing includes regular interaction and social integration with a broad range of other Esperanto speakers, both within and outside of the family, are more likely to exhibit the usual characteristics of a native speaker (e.g., fluency of speech, consistent use of inflectional morphology) and to retain the language throughout life. Many native speakers of Esperanto fit into this latter category, but it is worth keeping in mind that not all do.

This variety among native speakers is not surprising given the variety of circumstances in which they are raised, but it is not always recognized in discussions of the phenomenon. In perhaps the best-known study of native Esperanto, for instance, Bergen (2001) analyzes the speech of several native-speaking children and finds instances of deviation from standard Esperanto in inflectional morphology, but much of this deviation seems plausibly attributable to the reduced and/or inconsistent input mentioned above, since children who have regular access to fuller and

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more consistent input do not generally display the type of deviation he discusses (Lindstedt 2006). Most native speakers of Esperanto are in fact more akin to heritage speakers of other languages (see Polinsky 2018), though they do not appear to have been studied from that perspective.

As for the acquisition process of children learning Esperanto, there has been relatively little work done (though see Corsetti et al. 2004 for a valuable study of overregularization). Within the realm of adult L2 acquisition, there is an extensive literature on L2 pedagogy (e.g., Kováts 2020), as might be expected of a language community whose continued existence depends mostly on new L2 learners, and some work has looked specifically at the language of L2 speakers (e.g., Sherwood 1982, Nagata & Corsetti 2005).

4. LANGUAGES FOR FICTION

The third major phase of language creation began in the twentieth century when J.R.R. Tolkien constructed the Elvish languages for his epic novel *The Lord of the Rings* (Tolkien 1954–1955). Tolkien was a philologist by profession and had the expertise needed to create a language from scratch. Unlike the international auxiliary languages of the time, Tolkien's languages had no practical purpose other than fleshing out and giving depth to the world he was creating in his novel. These languages served as an important proof of concept for two points. First, constructing a language could be an enjoyable exercise in creativity that one might engage in simply for pleasure (Weiner & Marshall 2011). As Tolkien (1983, p. 206) said, "In these invented languages, the pleasure is more keen than it can be even in learning a new language." This idea took some time to take hold among the public, but it led to the conlang movement, starting in the 1990s and still very vigorous today, in which enthusiasts create languages because they enjoy doing so (Schreyer 2021).

Second, Tolkien's languages showed that it is possible to create a language from the ground up in such a way that it would be hard to guess that the language was not naturally occurring. This idea too took time to take hold, but as science fiction and fantasy became very popular genres in film and television in the late twentieth century, constructed languages became an important way to add depth, texture, and a sense of reality to the fictional worlds portrayed. An early example is the language Pakuni (for the *Land of the Lost* television series in the 1970s), created by Victoria Fromkin (Alexander 2014). Later, more well-known examples include Klingon (for the *Star Trek* series), developed by Marc Okrand; Na'vi (for the movie *Avatar*), developed by Paul Frommer; and Dothraki and High Valyrian (for *Game of Thrones*) and Fremen (for the 2021 *Dune* movie), by David Peterson—but there are dozens of others. In films adapted from novels, the languages are sometimes based on a few words and expressions in the novels themselves but then significantly expanded by the language developer. A few of these languages have taken on lives outside of the original film or television series, with many enthusiasts learning them simply for pleasure (as of this writing, for instance, the popular language learning app Duolingo offers courses in Klingon and High Valyrian).

In many ways, the languages created for film and television and the languages created by enthusiasts are of great linguistic interest. They are often constructed with much care and linguistic sophistication, taking advantage of all that we know about the typological diversity of human language (Fromkin, for instance, was a prominent scholar in linguistics, and Okrand, Frommer, and Peterson are all trained linguists), and anyone who is skilled in analyzing the structural properties of naturally occurring languages would find these languages to be an intriguing challenge. Creating a language that actually sounds like a real language is not as simple as it might seem, nor is creating a grammatical system where the phonology, morphology, and syntax, for example, all work well together. Even in their fine-grained details, these languages often look very much like natural languages, and they can be analyzed in the same way.

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On the other hand, there is a sense in which these languages are not of general linguistic interest. For the most part, they are not spoken by anyone to any significant extent (often not even by their creators), so it is not clear that they are instances of human language in the usual sense. Nevertheless, they have received some attention in the literature. Windsor & Stewart (2017) examine the learnability of the Klingon stress system, Gobbo (2011) explores aspects of the structure of Klingon and Na'vi in relation to languages like Volapük and Esperanto, and the online journal *Fiat Lingua* (**https://fiatlingua.org/**) regularly carries descriptions and analyses of languages created by members of the conlang community. In addition, Punske et al. (2020) provide a collection of articles discussing how constructed languages can play an important role in the teaching of linguistics. For those interested in the process of constructing a language from scratch, Peterson (2015) offers an excellent introduction.

5. LANGUAGES FOR PSYCHOLINGUISTIC EXPERIMENTS

The final type of constructed language considered here is those that are used in psycholinguistic experiments. In these experiments, typically, a language is constructed with certain specific properties of interest and then presented to subjects to see what happens when they attempt to learn it. This type of experiment has a long history (Esper 1925, Reber 1967), but it became more well known in the 1990s (e.g., Saffran et al. 1996) and even more so beginning in the 2000s (for a review, see Culbertson & Schuler 2019). Using constructed languages in this way presents a number of advantages to the experimenter since both the structural properties of the language and the nature of the learner's input can be carefully controlled, and children and adults can often both be tested in almost identical ways (e.g., Hudson Kam & Newport 2005).

To give just one example, Schuler et al. (2016) construct two languages to explore the precise conditions in which a process is treated as productive by learners. The languages are in fact simply nouns, with or without a plural marker. In one language, a regular plural marker is used about 75% of the time (and irregular markers the rest of the time), while in the other language, the regular marker is used only about 58% of the time. After learning this language, children use the regular plural marker productively in the first language, but not in the second, while adults appear to do probability matching in both languages. This experiment shows very clearly how the precise specifications can be manipulated for each language (in this case, the proportion of nouns taking the regular plural marker) while leaving everything else the same, and how children and adults can be compared using the same task for both. The results are genuinely interesting and shed light on the topic of productivity in a way that would be very difficult otherwise.

For these types of reasons, then, the use of constructed languages in psycholinguistic experiments has become widespread. From the perspective of a general linguist, though, some aspects of these experiments might seem surprising. One is that the learning environment in which input in the language is provided to subjects often seems different than in natural language learning. A common procedure in these experiments is to have subjects watch a series of pairings between pictures and sentences (or words). This is very passive compared with how languages are learned in the wild and does not incorporate the desirable difficulty that is known to encourage learning in general (Bjork & Bjork 2020). This in turn might cause worry that the task is bringing to the fore cognitive mechanisms beyond (or instead of) those normally used in language acquisition. Nevertheless, Ettlinger et al. (2016) find a positive correlation between performance on an experiment of this type and performance on various indices of L2 learning in a classroom setting, suggesting that the two types of learning engage common mechanisms.

Another notable aspect of the languages constructed for psycholinguistic experiments is that they are typically very simple. Some of them involve isolated words, but even in those in which

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there are full sentences, the basic structure generally has at most a straightforward agreement system or case system. This is understandable, of course, both for reasons of hypothesis testing (the number of variables being manipulated must be limited) and for reasons of practicality (subjects need to learn the language in a reasonable amount of time, often within a single experimental session). Adding to this the fact that the languages are usually phonologically identical to English, one can begin to wonder to what extent the experiment resembles true language learning. Moreover, to the extent that some complexity is present, it does not always seem plausible compared with natural languages. For instance, several experiments use variable word order, such as SOV and OSV, but the orders are presented as if they were fully equivalent, without any discourse or information-structure distinction between the two (Fedzechkina et al. 2012, 2017; Monaghan et al. 2021). This does not seem to be the normal situation in naturally occurring languages, and it makes it hard to predict what the learner's cognitive mechanisms would do as these mechanisms try to figure out, in vain, under what conditions the OSV order (presumably the marked order) is used.

These remarks should not detract from the very valuable experimental work that has been done using constructed languages, including all of the studies cited above. As we learn more and these experiments become more sophisticated, it seems inevitable that the languages will need to be more complex. In that sense, there could be an interesting confluence of interests between those who construct complex languages for pleasure and/or fiction, as described in Section 4 above, and psycholinguists who need complex, made-to-order languages for their experiments. There has been little contact between these two worlds until now, to my knowledge, but perhaps there will need to be in the future.

6. CONCLUSION

Constructed languages have long fascinated the general public, and they are now attracting increasing attention from linguists as well. The intertwined histories of these languages and linguistics deserve to be more widely recognized, and as discussed above, these languages have many properties that could make them intriguing topics for linguistic research.

DISCLOSURE STATEMENT

The author has spoken Esperanto since early adolescence, is a member of the Akademio de Esperanto (a body that oversees the evolution of the language), and is on the board of directors of the Esperantic Studies Foundation (an organization that sponsors research on Esperanto and related topics).

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