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RESEARCH REPORT

A functionalist typology of redundancy

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ABSTRACT

Syntagmatic redundancy involves the multiple expressions of a single meaning within a phrase or clause. It is often claimed to be a linguistic universal that serves to facilitate expressivity, processing, and learnability. However, there is little empirical evidence supporting this theory. This paper combines a typological study of concord, a form of syntagmatic redundancy in which a lexical and a grammatical item with overlapping meanings are expressed in the same phrase or clause, with a functional analysis of concord. The purpose of the study was to find out if redundancy is indeed universal or whether there are cross-linguistic restrictions. The goal of the functional analysis was to provide better understanding of what motivates different forms of redundancy. Reference grammars of a 50-language variety sample were analyzed for the existence and communicative functions of four types of concord. The results show that argument concord and temporal concord are nearly universal, whereas only a subset of languages allow for negative concord and plural concord. Two functional principles are shown to motivate concord: the need to be precise, and the need to emphasize crucial information. These principles lead to distinct types of redundancy: The need to be precise results in accidental redundancy in the case of an obligatory grammatical marker, whereas the need to emphasize information invokes purposeful redundancy. The two types of redundancy are shown to be fundamentally distinct in their communicative nature as well as their characteristic diachronic development.

RESUMO

A redundância sintagmática consiste na expressão múltipla de um único significado dentro de um sintagma ou oração. Defende-se frequentemente que se trata de um universal linguístico que serve para facilitar a

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expressividade, o processamento e a aprendizibilidade. No entanto, há pouca evidência empírica que apoie essa teoria. A concordância é uma forma de redundância sintagmática em que um item lexical e um item gramatical com significados sobrepostos são expressos no mesmo sintagma ou oração. Este artigo conjuga um estudo tipológico da concordância com uma análise funcional do fenómeno. A finalidade do estudo foi descobrir se a redundância é de fato universal ou se existem restrições interlinguísticas. O objetivo da análise funcional é atingir uma melhor compreensão do que motiva as diferentes formas da redundância. Foram analisadas gramáticas de referência de uma amostra de 50 idiomas variados para averiguar a existência e as funções comunicativas de quatro tipos de concordância. Os resultados mostram que a concordância de argumento e a concordância temporal são quase universais, enquanto apenas um subconjunto de línguas permite a concordância negativa e a concordância plural. Mostra-se que dois princípios funcionais motivam a concordância: a necessidade de ser preciso e a necessidade de enfatizar informações cruciais. Esses princípios levam a tipos distintos de redundância: a necessidade de ser preciso resulta em redundância fortuita no caso de um marcador gramatical obrigatório, enquanto a necessidade de enfatizar a informação implica uma redundância propositada. Os dois tipos de redundância mostram-se fundamentalmente distintos em sua natureza comunicativa, bem como em seu desenvolvimento diacrônico característico.

ABSTRACT

Syntagmatische redundantie behelst het uitdrukken van een enkele betekenis in meerdere vormen in één frase of zin. Vaak wordt verondersteld dat dit een linguïstisch universalium is, wat verklaarbaar is aan de hand van de veronderstelde functies van redundantie op het gebied van expressiviteit, verwerking, en leerbaarheid. Er is echter minimaal empirisch bewijs voor deze theorie. Dit paper combineert een typologisch onderzoek naar concordantie, een vorm van syntagmatische redundantie waarbij een lexicaal en een grammaticaal element een overlappende betekenis hebben, met een functionele analyse van concordantie. Het typologische onderzoek had als doel om uit te vinden of redundantie daadwerkelijk universeel is of dat er cross-linguïstische beperkingen zijn; de functionele analyse diende om beter te begrijpen wat het vóórkomen van redundantie motiveert. Referentiegrammatica's van 50 talen zijn doorzocht op het vóórkomen en de eventuele communicatieve functies van vier typen concordantie. De resultaten laten zien dat

argumentconcordantie en temporele concordantie (vrijwel) universeel zijn, terwijl niet alle talen negatieconcordantie en meervoudsconcordantie toestaan. Twee functionele principes verklaren waarom taalgebruikers redundante uitingen doen: de noodzaak om precies te zijn, en de noodzaak om cruciale informatie te benadrukken. Deze principes leiden tot twee verschillende vormen van redundantie: accidentele redundantie ontstaat wanneer een verplichte grammaticale marker gecombineerd wordt met een lexicaal element met een preciezere betekenis, en doelgerichte redundantie ontstaat wanneer een taalgebruiker doelbewust en vrijwillig bepaalde informatie benadrukt. Deze types redundantie zijn fundamenteel verschillend wat betreft hun communicatieve aard en hun karakteristieke diachrone ontwikkeling.

KEYWORDS
Redundancy. Functionalism. Typology.

PALAVRAS-CHAVE
Redundância. Funcionalismo. Tipologia.

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Introduction

A common phenomenon in everyday speech is the repetition of information: Language users may express a single piece of information multiple times within the same phrase or clause. As illustrated in Example 1, information on person and number of the subject argument is expressed both by the independent NP and by pronominal marking on the verb; temporal specification is expressed both by a tense suffix and by a temporal adverb; and information on the plural number of the referent is expressed by a nominal suffix and by a >1 numeral.

Example 1.

Repetition of information in Dutch

De	*drie*	*taalwetenschapper-s*	*voer-den*	*gisteren een*	*diep*	
DEF	three	linguist-PL	carry-PST.3PL	yesterday	INDEF	deep
	gesprek.					
	conversation					

"The three linguists had a deep conversation yesterday."

Such syntagmatic redundancy (terminology follows TRUDGILL, 2011, p. 22) has often been described by linguists as universal and fundamental to the architecture of language. Sadock (2012, p. 225), for example, states that "[r]edundancy is in fact a fundamental feature of the design of language." Nevertheless, some forms of redundancy, such as object-verb agreement, are not at all common in the languages of the world, raising the question of why some types of redundancy are more frequent than others. In any case, the topic has hardly been studied empirically from a typological perspective, perhaps because redundant phenomena are so ubiquitous that cross-linguistic analysis seems like an impossible task. However, it is precisely this perceived ubiquity that makes syntagmatic redundancy such a worthwhile object of (cross-)linguistic investigation.

Studying syntagmatic redundancy from a functionalist perspective is especially relevant because the omnipresence of syntagmatic redundancy in the languages of the world is often attributed to its functionality. Proponents of this view theorize that repeating information serves important communicative and cognitive functions for both speakers and hearers. Syntagmatic redundancy has been claimed to increase the likelihood of successful transmission of messages, as well as to increase saliency, distinctiveness, processability, and learnability of redundantly expressed features (e.g. DAHL, 2004; PETRÉ, forthcoming, among many others). At the same time, it is generally acknowledged in the literature that syntagmatic redundancy has clear communicative disadvantages, as it violates the principles of economy and transparency (e.g. KUSTERS, 2003; DAHL, 2004; SINNEMÄKI 2009; LEUFKENS, 2015). Many linguists believe the non-transparency of redundancy decreases learnability (SLOBIN, 1973; AKSU-KOÇ; SLOBIN, 1985; HENGEVELD; LEUFKENS, 2018), which leads to the question of whether syntagmatic redundancy is ultimately advantageous or disadvantageous to the language learner. This apparent paradox can partly be resolved by distinguishing the learnability of the redundantly marked feature from the learnability of redundancy itself, as will be demonstrated in Section 1. Still, a cross-linguistic investigation of redundant phenomena and their functions is required to get a complete picture of the motivations at play and understand why laguage users employ this way of expressing themselves.

Since a systematic study of all instances of syntagmatic redundancy would indeed be an impossible task, this endeavor is delimited in the current paper to the investigation of four varieties of concord, the overlap in meaning between a lexical and a grammatical marker. The four types of concord are illustrated in Table 1, in which the multiple expressions of a single meaning (given in the third column) are underlined:

Type	Example	Meaning expressed multiple times
Argument concord	she speaks	3SG
Temporal concord	he arrived yesterday	PST
Negative concord	ain't nobody got time	NEG
Plural concord	three linguists	PL

TABLE 1 – Four types of concord

In an explorative typological study, the cross-linguistic attestation of these four types of concord is mapped out. A functional analysis is then carried out, reviewing the communicative effects of the four types of concord in the languages under consideration and reducing them to two underlying functional motivations. This functional analysis leads to the evaluation of claims regarding the supposed functions that redundancy fulfills and provides a better understanding of the competing motivations behind redundancy in different languages. In this way, I demonstrate that a functionalist analysis is able to account for the ubiquity of syntagmatic redundancy, as well as for the variation in types of redundancy present in the languages of the world.

Section 1 addresses claims about redundancy in the literature, both about its universality and its alleged functions, and argues for the relevance of a functionalist account. Section 2 describes the typological study of concord, including its methodology and results. Section 3 presents a functional analysis on the basis of the acquired typological data, which results in the establishment of two functional principles motivating different types of redundancy: accidental and purposeful redundancy. Section 4 looks at the nature of these types and discusses their diachrony. Finally, Section 5 presents conclusions.

1. The universality and functionality of syntagmatic redundancy

The term "redundancy" has been used in the literature to refer to a broad range of phenomena; it is therefore necessary to establish a precise definition and delimitation of its use in this paper. In the current study, "syntagmatic redundancy" involves the use of more than one form relating to a single meaning within the same phrase or clause, as, for example, in the case of agreement between an argument and a verb. This use of redundancy has also been referred to as doubling (BARBIERS *et al.*, 2008), and repetition of information (TRUDGILL, 2009). Redundancy is related to the concept of "degeneracy", which involves the combination of structurally different elements fulfilling the same function. For example, in English, past tense can be expressed by means of ablaut (speak, spoke) or by a suffix (talk, talked), so that two morphological elements express the same meaning (VAN DE VELDE, 2014). In the interpretation of redundancy adhered to in this paper, the term only applies to situations in which the

structurally different elements occur within the same phrase or clause. Hence, redundancy is viewed as a subtype of degeneracy: agreement marking is both a case of degeneracy and of redundancy, while past tense inflection in English is a case of degeneracy but not of redundancy.

Trudgill (2011, p. 22) sets apart syntagmatic from paradigmatic redundancy (also known as semantic or cross-linguistic redundancy), which involves the morphosyntactic expression of features that are not grammatically expressed in other languages and are therefore, in the words of Dahl (2004, p. 55), "cross-linguistically dispensable". An example is tense marking, which is obligatory in English but absent, for example, from Mandarin. The fact that speakers of Mandarin are perfectly able to provide the temporal information expressed by tense in English shows that grammars do not need tense marking to function properly and it is, in that sense, redundant. Paradigmatic redundancy is not the object of investigation in this study: Throughout the paper the term "redundancy" denotes syntagmatic redundancy only. Furthermore, the study deals only with "system-level" redundancy (DAHL, 2004, p. 11), i.e. redundancy that is required or regulated by grammar, as opposed to "user-level" redundancy (*ibidem*) that is purely occasional and does not involve a stable means of expression. Finally, it is important to note that in the common interpretation of the word, redundancy entails complete superfluousness of a redundant item. That is not how it is interpreted in this study. As many linguists have argued, redundancy can have a variety of functions that render it useful and even indispensable to language users and their grammars (see PETRÉ, forthcoming); in fact, the multiple functions of redundancy are exactly what is under investigation here.

It is generally acknowledged that redundancy is a highly frequent phenomenon, both cross-linguistically and within languages. Many linguists, therefore, readily assume that redundancy is a universal feature of language. McWhorter (2009, p. 144), for example, states that "Of course, no language lacks redundancy," and Trudgill (2009, p. 100) writes, "All languages contain redundancy." In fact, empirical evidence for such claims to universality is limited: the only typological investigations being Leufkens (2015) and Hengeveld; Leufkens (2018), who demonstrated that the 30 languages in their combined samples indeed all display some instance of redundancy. The designation "some instance," however requires further explanation: Although some types of redundancy are attested in 100% of the tested languages (e.g. cross-reference), others, such as negative concord and certain forms of agreement[1], are not. Hence, while these studies confirm that redundancy is universal in general terms, such a generalization ignores the fact that languages display large variation as to the types of redundancy they allow and the degree to which they do so.

Assertions to the universality of redundancy often go hand in hand with claims about its alleged functions. Redundancy is said to benefit speakers because it increases the chances that their utterance reaches the hearer even in noisy circumstances (DAHL, 2004, p. 10). This relation between redundancy and communication over a noisy channel is also prominent in information theory (e.g. AYLETT, TURK, 2004; LEVY, 2008; GIBSON *et al.*, 2019). Furthermore, redundancy is said to be

[1] In both Leufkens (2015) and Hengeveld; Leufkens (2018), agreement is not analyzed as redundancy but as an abstract copying operation in which the copied element is semantically empty and therefore not an additional expression of a single meaning. In the current paper I refrain from making this distinction and include agreement under syntagmatic redundancy.

advantageous because it "enhances the saliency of an utterance" (PETRÉ, forthcoming). The hearer, too, supposedly benefits from redundancy: Nichols (2009), Coles-White (2004), and Gibson *et al.* (2019) posit that redundancy facilitates processing, and Petré (forthcoming) argues that it helps hearers in the interpretation of novel constructions. Finally, redundancy is claimed to increase the learnability of the redundantly marked feature. Audring (2014), for example, argues that the acquisition of grammatical gender is facilitated by redundant (i.e. repetitive) marking of gender, as this increases the amount of evidence available to learners that indicates the gender of nouns. The idea that redundant marking of a feature facilitates acquisition of that feature is supported by experimental studies (e.g. KEMPE; BROOKS, 2001; TARABAN, 2004).

Although redundancy has been shown to be advantageous to speakers, hearers, and learners, it also bears distinct disadvantages. First, it is not economical, since more linguistic material is used than what is strictly necessary to convey the communicated meaning (KUSTERS, 2003; DAHL, 2004; TRUDGILL, 2011), at least under the – admittedly, idealized – assumption of a proper reception of the message. This constitutes a disadvantage to speakers, who have to invest more time and energy into their utterance, and to hearers, who have to process more forms while not necessarily gaining more information. Trudgill (2011, p. 41) argues that, for this reason, redundancy is also disadvantageous for language learners: "[L]oss of redundancy reduces the burden for learner speakers." A second drawback of redundancy is its violation of transparency (SINNAMÄKI, 2009; LEUFKENS, 2015; HENGEVELD; LEUFKENS, 2018), defined in this paper as a one-to-one relation between form and meaning.[2] Non-transparency in grammar has been claimed to decrease intelligibility and learnability (SLOBIN, 1973; AKSU-KOÇ; SLOBIN, 1985; KUSTERS, 2003; LEUFKENS, 2015).

The above dichotomy illuminates an intriguing paradox regarding the effect of redundancy on learnability. While, on the one hand, redundancy is contended to make a language learner's life easier by facilitating processability and acquisition, it is at the same time alleged to aggravate precisely those tasks. The contradiction is resolved, in part, by distinguishing between the learnability of redundancy, as such, and the learnability of the redundantly expressed feature: While the acquisition of grammatical gender is facilitated by redundant marking (as argued above), the acquisition of the rules for redundant gender marking itself may still cause a problem for learners. But even when the learnability of the redundantly marked feature is taken out of the equation, redundancy still has contradictory effects on learnability. Consider, for example, creole languages. One might expect that, in a situation of creole emergence, language users will leave out all linguistic material that does not directly add to the core message they want to communicate, i.e. all redundant marking. At the same time, because pressure on intelligibility is so high, one could expect language users to be extra

[2] The one-meaning-one-form principle is known in morphology as isomorphism (RAINER *et al.*, 2014). Studies on the topic often differ in which linguistic phenomena they include as transparent or isomorphic. For example, nominal apposition is considered non-transparent in Hengeveld; Leufkens (2018) because of the two-to-one relation between pragmatic and semantic elements, but could also be argued to be transparent because one of the nouns in an apposition construction contributes additional information, which would render them separate semantic elements. In this paper, I will adhere to the strict interpretation of transparency, and view every overlap in meaning between two elements as an instance of a many-to-one relation. This means that syntagmatic redundancy is non-transparent by definition, regardless of the additional meaning that one of the redundant items may contribute.

repetitive, i.e. increase redundancy, because that will increase their chances of successful delivery of their message. Redundancy thus has functions that are in direct opposition.

The above suggests that, as with universality claims, generalizations about the alleged functions of redundancy may be true in a general sense but obscure the fact that redundancy is able to fulfill many, potentially conflicting functions. While the overall functionality of redundancy explains its universality, not all types of redundancy have the same function(s), or have a function at all, and not all types of redundancy are universal. Understanding the omnipresence of redundancy in languages, as well as the rarity of some forms of redundancy, requires a "non-simplistic" functional explanation, as elaborated by Dik (1986, p. 21):

> A functional explanation of a (synchronic or diachronic) linguistic phenomenon is a statement in which that phenomenon is shown to follow from one or more principles which crucially refer to any of the functional prerequisites imposed on natural languages.

As this quote makes clear, in a functional analysis of redundancy, the presence or absence of redundancy in a grammar will be seen as the outcome of competing motivations (BUTLER, 2003, p. 14), where both intra- and extra-linguistic circumstances may determine the strength of those motivations in a particular language and sociohistorical context. In Section 3, a functional analysis is presented that leads to the description of two functional principles that underly and motivate the use of redundant structures in languages.

2. An explorative typological study of concord

2.1. Defining concord

In order to gain a complete picture of the cross-linguistic attestation of redundancy and the functions that it may fulfill in different languages, a typological study of concord has been carried out. Concord involves the combination, in one phrase or clause, of at least one lexical with at least one grammatical item that share a single semantic element in their meaning.[3] Four types of concord have been investigated:

A. ARGUMENT CONCORD involves the expression of person, number, and/or gender properties of an argument by independent lexical means (e.g. a pronoun, noun, or NP) and grammatical means (e.g. pronominal inflection on the predicate) within the same clause. In Example 2, both the

[3] In the linguistic literature, the term concord often refers to agreement; for example 'nominal concord' involves agreement between a noun and its modifiers (e.g. NORRIS, 2019). The definition adopted here is broader, including a larger range of phenomena than what would normally be classified as concord or agreement. This ensures a broad, inclusive view on the phenomenon, as appropriate in an explorative study that aims to map out linguistic variety rather than zoom in on a specific phenomenon.

pronouns and the verbal prefixes express information on number, person and/or gender of the argument. The second pronoun contributes additional information on the gender of the referent with respect to the second person verbal marker, but this does not take away from the fact that pieces of information (i.e. second person and singular) are expressed twice in one clause.

Example 2.

Argument concord, Abkhaz (HEWITT, 1979, p. 155)

(sarà)	*(barà)*	*(yarà)*	*ø-bə-s-te-yt'*
1SG	2SG.F	3SG	3SG-2SG.IO-1SG-give-PST.PFV

'I gave it to you.'

In the linguistic literature, pronouns are often not seen as lexical elements, but rather as elements with a status somewhere in between lexical and grammatical (see KEIZER, 2007 for a discussion of the lexical/grammatical dichotomy and pronouns as an in between category). For this reason, it may seem unwarranted to label pronouns as lexical elements. However, pronouns are still relatively lexical compared to the other element involved in argument concord, which is pronominal marking on the predicate. A more suitable denomination for pronouns would be 'less grammaticalized units' as opposed to 'more grammaticalized units', but for reasons of space and readability, I will adhere to the label of 'lexical item'.

It has been shown that subject-verb agreement and object-verb agreement are fundamentally different processes, with markers having different diachronic origins and different functions (e.g. HAIG, 2018). Even though both are cases of argument concord, object-verb agreement has been exlcluded from the study in order to avoid conflation of functions and communicative effects.

Not all languages exhibit grammatical marking of argument information at all. For example, Berbice Dutch Creole only expresses arguments by means of (semi-)lexical elements, as illustrated in Example 3.

Example 3.

Argument concord cannot exist because there is no grammatical argument marker, Berbice Dutch Creole (KOUWENBERG, 1994, p. 61)

o	mute,	stati	andaka
3SG	go.PFV	town	other=day

'She went to town the other day.'

This type of language, in which one of the constituent parts of a concord construction is lacking, has been distinguished in this study from languages in which the constituent elements exist, but are not used together in a single phrase or clause. The reason for this is that one of the aims of the study is to establish speakers' motivations for using or avoiding concord. Grouping the two types of

languages together would run the risk of conflating functional motivations to avoid concord with the practical impossibility of using concord.

B. TEMPORAL CONCORD involves the expression of temporal information by means of at least one lexical item (e.g. a temporal adverb) and at least one grammatical item (e.g. tense marking on the predicate) within the same clause. In Example 4, both the temporal adverb and the verbal tense suffix express a past temporal reference. Again, this is a case of multiple expression of meaning in one clause, even though the adverb clearly extends on the temporal information conveyed by the tense marker.

Example 4.

Temporal concord, Korean (SOHN, 1999, p. 362)

Mia	*ka*	*ecey*	*Mikwuk ulo*	*ttena-ss-e.yo*
Mia	NOM	yesterday	America.to	leave-PST-POL

'Mia left for America yesterday.'

In languages that have no tense marking, this type of concord can of course not arise at all. Anologous to argument concord, such languages have been distinguished from languages that do have tense marking, but do not allow it to appear overtly together with a temporal adverb.

C. NEGATIVE CONCORD involves the expression of a single semantic negation by means of at least one lexical item (e.g. a negative quantifier) and at least one grammatical item (e.g. a negative particle or affix) within the same clause. In Example 5, both the negative quantifier and the negating particle express negative polarity, so even though the negative quantifier expands on the meaning of the particle, this classifies as redundancy.

Example 5.

Negative concord, Hungarian (ROUNDS, 2009, p. 130)

Itt	*senki*	*sem*	*beszél*	*magyarul*
here	nobody	not	speak	Hungarian

'No one speaks Hungarian here.'

What has not been counted as negative concord in this study is double negation: constructions in which a lexical and a grammatical negative element do not relate to a single semantic negation, but each relate to separe semantic negations that cancel each other out. This is illustrated in Example 6. The negative quantifier and the grammatical negator each relate to a semantic negation, which results in an affirmative interpretation. The two negative elements do not relate to the same meaning, and therefore, this is not a case of negative concord.

Example 6.

Double negation, Dutch (example based on ZEIJLSTRA, 2004, p. 59)

Niemand	wordt	niet	geraakt	door	deze	film.
nobody	becomes	not	touched	by	this	movie

'Nobody is not touched by this movie.'

Note that for negative concord to exist, it is crucial that both negative elements are able to express a semantic negation by themselves: Only then can we speak of two negating items with an overlapping meaning. This excludes two cases from being labelled 'negative concord'. First, if negation is performed by means of a circumfix, this is not considered negative concord. For example in French, verbs are negated by means of the circumfix *ne* V *pas*, but since both 'ne' and 'pas' only receive their negative value in each other's presence, this cannot be seen as a case of overlapping meanings; rather, this construction combines two incomplete units to form one semantic negation. A second case that has not been considered negative concord in this study occurs in languages that lack a lexical negative element alltogether. In such languages, negative quantification is expressed by combining a grammatical negator with, for example, a Negative Polarity Item (e.g. 'anybody'), or an indefinite (e.g. 'somebody') or interrogative pronoun (e.g. 'who'). Such constructions do not constitute cases of redundancy, as there is only a single expression of semantic negation, while the lexical element has a positive polarity. This is illustrated by Example 7, in which (a) shows that Ngalakan has no inherently negative quantifier, so that there is only one negative element in (b).

Example 7.

Negative concord cannot exist because there is no lexical negative element, Ngalakan (MERLAN, 1983, p. 77)

a) *nu-were-yiʔ* *burun-boʔbo*
M-who-ERG 3SG/3NSG-hit.PST
'Who hit them?'

b) *nu-were-yiʔ* *ŋun-wili-wuniwuni-koro* *nugu-jeñ* *ŋaykaniʔ-gin*
M-who-ERG 3SG/1SG-CMP-give.RED.POT-PRS.NEG M-fish 1SG-GEN
'Nobody will give poor me my fish.'

As with argument concord and temporal concord, a distinction has been made between languages that have the elements to create negative concord (i.e. an inherently negative lexical element and a grammatical negator) but do not exhibit it, such as Dutch (Example 6), and languages that lack the means to create negative concord because there is no inherently negative lexical element, such as Ngalakan (Example 7).

D. PLURAL CONCORD involves the expression of plural number by means of at least one lexical item (a >1 numeral or a quantifier) and at least one grammatical item (a nominal plural marker). In

Example 8, both the numeral and the nominal plural suffix express the plural number of the referent. While the numeral adds information on the precise numerical quantity of the referent, the items still overlap in meaning, and this is, therefore, a case of concord.

Example 8.
Plural concord, Pipil (CAMPBELL, 1995, p. 104)
ne *ye:y* *pipu-tsi-tsín*
the 3 boy-PL-DIM
'the three boys'

In the case of plural concord, too, a distinction has been made between languages that have the constituent elements but do not allow plural concord on the one hand, and languages that lack nominal plural marking alltogether so that plural concord is impossible.

In this paper, concord serves as a test case to examine the cross-linguistic spread and functions of redundancy. Concord is suitable for this purpose because it involves phenomena that are easy to diagnose and that are usually well-described in reference grammars (with the exception of temporal concord, which is not commonly described explicitly, but that is still easy to attest in examples as both tense and temporal adverbs are frequent and well-described phenomena). The four types of concord selected are structurally similar since they all involve a combination of lexical and grammatical items, but still have sufficiently diverse properties to render a comparison between them worthwhile.

2.2. Language sample

A typological study of concord has been carried out on a 50-language variety sample. The sample is copied from Rijkhoff (2002): His cross-linguistic analysis of the Noun Phrase includes an investigation of plural concord[4], so his data could be used directly for the purposes of this study. The sample[5], shown in Table 2, was drawn by Rijkhoff by applying a variety sampling technique (RIJKHOFF *et al.*, 1993; RIJKHOFF; BAKKER, 1998) to the language classification of Ruhlen (1987, 1991). This procedure guarantees both typological and genealogical diversity. Ruhlen's classification is nowadays regarded as partly obsolete (see, for example, CAMPBELL, 1997 for a critique on Ruhlen's Amerind language

[4] Rijkhoff (2002) does not use the term 'plural concord', but he investigates whether there is a nominal plural marker and its behavior in the presence of an attributive numeral.

[5] Rijkhoff's sample originally included 52 languages, but 3 languages (Nahali, Etruscan, Meroitic) were excluded because of a lack of adequate descriptions. However, since some information on Nahali could in fact be found, this language is included in the current study.

family), but within the scope of the study it was not feasible to compose a sample based on a more up to date classification. Moreover, in an explorative study like this, the obsolescence of Ruhlen's classification is not expected to have meaningful consequences for the outcomes. However, representativity of the sample is not warranted.

Sample language	ISO 639-3	Language family	
		RUHLEN, 1991	EBERHARD *et al.*, 2020
Abkhaz	abk	Caucasian	Abkhaz-Adyghe
Alamblak	amp	Indo-Pacific (Sepik-Ramu)	Sepik
Babungo (Vengo)	bav	Niger-Kordofanian (Niger-Congo, Niger-Congo Proper, Central Niger-Congo)	Niger-Congo
Bambara (Bamanankan)	bam	Niger-Kordofanian (Niger-Congo, Mande)	Niger-Congo
Basque	eus	Basque	Basque
Berbice Dutch Creole (Berbice Creole Dutch)	brc	Pidgins and Creoles	Creole
Bukiyip	ape	Indo-Pacific (Torricelli)	Torricelli
Burmese	mya	Sino-Tibetan (Tibeto-Karen)	Sino-Tibetan
Burushaski	bsk	Burushaski	Burushaski
Cayuga	cay	Amerind (Northern Amerind, Almosan-Keresiouan)	Iroquoian
Chinese, Mandarin	cmn	Sino-Tibetan (Sinitic)	Sino-Tibetan
Chukchi	ckt	Chukchi-Kamchatkan	Chukotko-Kamchatkan
Dutch	nld	Indo-Hittite (Indo-European)	Indo-European
Galela	gbi	Indo-Pacific (West-Papuan)	West Papuan
Georgian	kat	Kartvelian	Kartvelian
Gilyak (Nivkh)	niv	Gilyak	Gilyak
Guarani (Guaraní, Paraguayan)	gug	Amerind (Equatorial-Tucanoan)	Tupian
Gude	gde	Afro-Asiatic (Chadic)	Afro-Asiatic
Hittite	hit	Indo-Hittite (Anatolian)	Not listed
Hixkaryána	hix	Amerind (Ge-Pano-Carib)	Cariban
Hmong Njua	hnj	Austric (Miao-Yao)	Hmong-Mien
Hungarian	hun	Uralic-Yukaghir	Uralic
Hurrian	xhu	Hurrian	Not listed
Ika (Arhuaco)	arh	Amerind (Chibcan-Paezan)	Chibchan
Kayardild	gyd	Australian (Pama-Nyungan)	Australian
Ket	ket	Ket	Yeniseian
Kisi (Kisi, Southern)	kss	Niger-Kordofanian (Niger-Congo, Niger-Congo Proper, West Atlantic)	Niger-Congo
Koasati	cku	Amerind (Northern Amerind, Penutian)	Muskogean
Korean	kor	Korean-Japanese-Ainu	Koreanic
Krongo	kgo	Niger-Kordofanian (Kordofanian)	Nilo-Saharan
Lango	laj	Nilo-Saharan (East Sudanic)	Nilo-Saharan
Nahali (Nihali)	nll	Nahali	Nihali
Nama Hottentot (Khoekhoe)	naq	Khoisan	Khoe-Kwadi

Nasioi (Naasioi)	nas	Indo Pacific (East Papuan)	South Bougainville
Ngalakan (Ngalakgan)	nig	Australian (Gunwinygun)	Australian
Ngiti	niy	Nilo-Saharan (Central Sudanic)	Nilo-Saharan
Nung	nut	Austric (Austro-Tai, Daic)	Kra-Dai
Nunggubuyu (Wubuy)		Australian (Nunggubuyu)	Australian
Oromo (Oromo, Borana-Arsi-Guji)	gax	Afro-Asiatic (Cushitic)	Afro-Asiatic
Pipil (Nahuat)	ppl	Amerind (Central Amerind)	Uto-Aztecan
Quechua, Imbabura (Quichua, Imbabura Highland)	qvi	Amerind (Andean)	Quechuan
Samoan	smo	Austric (Austro-Tai, Austronesian, Malayo-Polynesian)	Austronesian
Sarcee (Sarsi)	srs	Sarcee (Na-Dene)	Eyak-Athabaskan
Sumerian	sux	Sumerian	Not listed
Tamil	tam	Elamo-Dravidian	Dravidian
Tsou	tsu	Austric (Austro-Tai, Austronesian, Tsouic)	Austronesian
Turkish	tur	Altaic	Turkic
Vietnamese	vie	Austric (Austroasiatic)	Austro-Asiatic
Wambon	wms	Indo-Pacific (Trans-New Guinea)	Trans-New Guinea
West Greenlandic (Greenlandic)	kal	Eskimo-Aleut	Eskimo-Aleut

TABLE 2 – Language sample[6]

2.3. Results

Data on the occurrence of the four types of concord and on their functions have been collected from reference grammars and, when possible, through consultation with experts and native speakers of the languages involved. A language was scored as exhibiting a certain type of concord if there was evidence that lexical and grammatical items with overlapping meaning were allowed to occur in the same clause or phrase, regardless of the frequency of the construction, morphosyntactic restrictions, or prescriptivist disapproval. If combining a lexical and a grammatical item with overlapping meaning was considered ungrammatical in the language, that type of concord was scored as "non-existent" in that language. This means languages have been scored on the basis of what their grammar allows, rather than on the extent to which speakers of the language actually make use of the opportunities their grammar offers them. Measuring the attestation of concord in the latter way,

[6] Language names in the table follow Rijkhoff (2002), with alternate names used in Ethnologue (EBERHARD *et al.*, 2020) given between brackets. The language family columns provide the family names according to the classifications by Ruhlen and Ethnologue. For languages that belong to the same family in Ruhlen's classification, the names of deeper branches are given between brackets.

i.e. measuring language use rather than the language system, requires a corpus study, which would certainly enrich the findings of the current study but is outside its scope.

As addressed when defining the four types of concord in Section 2.1, languages in the sample did not always possess all the constituent parts of each type of concord. For example, the sample contains languages without grammatical pronominal markers, tense markers, or nominal plural markers, and not all of the languages possess a lexical item that is able to express negation by itself. If a language lacked a constituent element of concord, that type of concord was scored as "not applicable". As explained in Section 2.1, the distinction between non-existent and not applicable was necessary to keep apart two reasons for the absence of concord in a language: the first being that speakers do not want to use it, the second that they cannot use it. Taking the categories together would obscure the functional motivations behind the avoidance of concord constructions.

For some types of concord in some languages, no sufficiently extensive grammar description was available at the time of study, and no expert could be consulted; as a result, some data points have been labelled "no data". The complete dataset, including precise references to grammatical resources, has been published and can be accessed online (LEUFKENS, 2020). Because of the relatively small language sample and the explorative nature of the study, quantitative results have not been tested for their statistical significance.

Table 3 gives an overview of the cross-linguistic attestation of the four types of concord. It shows that both argument concord and temporal concord are attested in all languages investigated, in line with statements that they are universal[7]. However, 7 of the 8 languages that have the means to do so exhibit negative concord (i.e. 88%), and the occurrence of plural concord is restricted even further: 18 of the 44 languages with a nominal plural marker allow for that marker to co-occur with a >1 numeral (i.e. 41%). These results confirm that it is overly simplistic to claim that redundancy is universal. While some types of redundancy approach universality, other forms of multiple expression of information are clearly not permitted in at least some languages. Section 4 will explore the question of why certain types of concord are cross-linguistically more frequent than others.

[7] In the case of temporal concord, at least one counter example exists: Zucchi (2009) shows that in Italian Sign Language, tense marking and lexical temporal items are mutually exclusive. Therefore, strictly speaking, temporal concord cannot be said to be universal (as perhaps no linguistic feature ever can) but on the basis of this study it is safe to say that nearly all languages with tense marking allow for temporal concord.

	Attested	Non-existent	Not applicable	No data	Attested / (50 – not applicable – no data) (%)
Argument concord	35	0	13	2	35/35 (100)
Temporal concord	25	0	7	18	25/25 (100)
Negative concord	7	1	20	22	7/8 (88)
Plural concord	18	26	6	0	18/44 (41)

TABLE 3 – Attestation of concord in sample languages based on data from Leufkens (2020).[8]

The typological study also included the mapping of communicative effects of concord, i.e. the added semantic or pragmatic value of the combination of a lexical and a grammatical item in a language. For example, in pro-drop languages, lexical expression of an argument by means of an explicit pronoun often functions to put emphasis on the argument, contrast it with a potential other referent, as well as having other communicative effects. The study examined the communicative effects of concord in the 50 sample languages to determine which—if any—functions are present. Not all of the functions commonly included in functional linguistics and in the literature on redundancy (see Section 1) were investigated: The typological study and the functional analysis (Section 3) focused on the functions that native speakers can describe and that have been recorded in reference grammars, and did not address higher order cognitive effects (such as facilitation of processing) and communicative effects on the level of the language system (such as regularizing a rule to increase learnability), which would have required a more in-depth analysis and psycholinguistic research.

Table 4 provides an overview of the attested communicative effects per type of concord. This overview clearly shows that argument concord and, to a lesser extent, negative concord perform a number of different functions, whereas plural concord and temporal concord serve only one communicative goal: to lexically expand on the semantics of the grammatical marker (see Section 3). The overt use of an independent argument or a lexical negation in combination with a grammatical marker can also accomplish this goal, and has, in addition, in many languages a range of pragmatic effects, such as emphasizing the argument or the negation, disambiguating the referent, contrasting an argument to another, or assigning information structural value (e.g. marking focus or topic).

Argument concord	Specification, disambiguation, apposition, part of conjunctive NP, reference in quoted speech, emphasis, raised emotion, contrast, focus, topic, topic switch, subject switch, reflexivity
Temporal concord	Specification
Negative concord	Specification, emphasis, raised emotion
Plural concord	Specification

TABLE 4 - Communicative effects of concord (complete data in LEUFKENS, 2020).

[8] The final column of the table indicates how many languages that had the means to exhibit this type of concord (computed by subtracting the number of 'not applicable' and 'no data' languages from 50) did in fact permit concord.

An immediate conclusion that can be drawn from the combination of Tables 3 and 4 is that there is no direct correlation between the number of communicate effects of types of concord, and the frequency of their attestation in the languages of the world. However, the difference in functionality between argument and negative concord on the one hand, and plural and temporal concord on the other, is an interesting finding that has relevance to the understanding of why languages allow for redundancy in the first place. Section 3 examines the motivations for redundancy and establishes two functional principles underlying the four types of concord investigated.

3. Functional analysis

The results from the explorative typological study in Section 2 raise a number of questions. How can we explain that all languages in the sample allow for argument concord and temporal concord, whereas only 88% of the languages allow for negative concord and 41% for plural concord? Why would a grammar allow for multiple expressions of a single meaning in one place, yet restrict it in another? Is this in any way related to the different semantic and pragmatic communicative effects that the various types of concord have been shown to exhibit?

A closer look at argument concord shows that there is no language in the sample that disallows the use of a lexical argument expression in combination with a grammatical argument marker. This might be related to the fact that pronominal markers often offer limited information compared to their lexical counterparts (expressing only person, number, and/or gender of the referent). As such, grammatical marking may not always be sufficient to identify referents unambiguously, making it necessary—or at least helpful—to provide more specific information by means of a lexical item. Hence, redundancy in this case stems from the need to specify the information conveyed by a grammatical marker. This motivation is presented here as Functional Principle 1.

> **Functional Principle 1.**
> Since grammatical markers provide limited information, a lexical item is likely to be added when there is a need to be unambiguous and precise.

Speakers of various languages in the sample indeed mentioned this as the main reason to express a free pronoun when it is optional. For example, language expert Ekaterina Gruzdeva (in personal communication) explains that “since agreement in Nivkh is not completely unambiguous and, without an overt subject, it is often not clear, whom we are talking about, the speaker may choose to use the pronoun.”

Functional Principle 1 may motivate the other three types of concord as well. As with grammatical argument marking, tense marking provides only basic information. Even the most extensive systems distinguish between past, present, and/or future, at most with some degrees of

remoteness, but this is nothing in comparison to the precise temporal information that an adverb can provide. Therefore, it seems logical for language users to want to elaborate on a grammatical tense marker by means of a lexical temporal element that enables them to provide much more precise information. Similarly, although a grammatical negation marker often marks negation only, a lexical negation element is able to provide more information on what is being negated. In the examples "I did not see nothing" and "I did not see nobody," it is the lexical element that specifies whether the argument not being seen refers to a person, or to an object or event. Finally, in the case of plural concord, grammatical plurality markers can, at most, distinguish between an amount of two (dual), three (trial), a few (paucal), or more (plural) referents, while lexical items (numerals) are able to specify an exact quantity.

All four types of concord can be said to follow from Functional Principle 1. However, as noted in Section 2, argument and negative concord have additional pragmatic functions in many languages. First, argument concord functions in many languages as a way to assign pragmatic functions to arguments, such as contrastive or presentational focus, or topic, especially in the case of a topic switch. The use of the lexical item is not only an elaboration on the semantic information provided by the grammatical marker, but also conveys pragmatic information about the role of the argument. Lexical negation markers, too, can be focused, whereas their grammatical counterparts cannot. Second, in many languages both argument and negative concord have the effect of emphasizing the expressed information, i.e. the referent and the negation. But what accounts for the fact that both argument and negative concord convey these additional pragmatic values, whereas temporal and plural concord do not?

The reason that information on arguments and negation is often pragmatically highlighted could very well stem from the fact that such information is much more important for successful communication than information on quantity and time. Reference to arguments is a crucial part of all communicative acts, warranting additional and potentially uneconomic ways of making sure reference (especially to a newly introduced referent) is unambiguous. Negation, too, is of such crucial importance to the proposition brought forward, that it is understandable that language users will use all possible means to convey it, even if that results in inefficiency and non-transparency. The communicative importance of reference and negation leads to the need to somehow signal their relevance, which is exactly what happens when an item is marked for a pragmatic role or if it is emphasized. This leads to a second principle motivating argument concord and negative concord.

Functional Principle 2.
When a piece of information is relatively crucial in the main proposition of the message, the more likely it is that it will be expressed redundantly.

Principle 2 accounts for the omnipresence of argument concord and the high cross-linguistic frequency of negative concord. However, neither of the functional principles can explain why plural concord is relatively infrequent. Section 4 argues that the two functional principles lead to two

distinct types of redundancy and offers an explanation for the asymmetrical attestation of plural and temporal concord.

4. Accidental versus purposeful redundancy

Two functional principles underlie the reason that language users express a single meaning multiple times. Both principles lead to redundancy, but the nature of the resulting redundancies is fundamentally different. Redundancy resulting from Functional Principle 1 is accidental: If the speaker could leave out the grammatical marker, she might do so, but since grammatical markers are often obligatory, the sentence would be ungrammatical if they were omitted. Thus, if the speaker wants to follow Functional Principle 1 but still form a grammatical sentence, she has no other choice than to be redundant. In contrast, Functional Principle 2 leads to purposeful redundancy: The speaker could convey the same message without being redundant, in a perfectly grammatical sentence, but chooses a redundant expression in order to signal the importance of a specific piece of information. Functional Principle 1 leads to unintentional redundancy without pragmatic effect – from a synchronic point of view –, and Functional Principle 2 creates intentional redundancy that adds pragmatic content to the message conveyed.

As argued in Section 3, all four types of concord can be motivated by Functional Principle 1, but only argument concord and negative concord can be motivated by Functional Principle 2. This entails that all types of concord may be cases of accidental redundancy, if they are motivated solely by the need to be precise, i.e. by Principle 1. Argument concord and negative concord are the only types of concord that may be cases of purposeful redundancy, when they are motivated by Functional Principle 2. In other words, while temporal concord and plural concord are cases of accidental redundancy by definition, argument concord and negative concord may be accidental in some cases but purposeful in others.

It is important to note that Functional Principle 1 only leads to accidental redundancy when the grammatical element is obligatory. If it is optional, the speaker may easily avoid redundancy by dropping the grammatical marker in the presence of the lexical item. That speakers indeed actively and consciously avoid accidental redundancy is demonstrated, for example, by Imbabura Quechua. Speakers of that language feel that in combination with a >1 numeral, "the plural marker on the noun is redundant in those cases so they prefer not to use it" (according to linguist Peter Cole in personal communication). If the grammatical marker is obligatorily expressed, accidental redundancy cannot be avoided. Of course, the extent to which grammatical marking is obligatory in a language is a relevant topic of investigation by itself. It is an interesting question why some markers are obligatory while others are optional, and this question, too, could be answered by an analysis of functional motivations. For the current analysis of redundancy, however, I will take the extent to which markers are obligatory as a synchronic fact, leaving a functional explanation for future research.

The occurrence of accidental redundancy is related to the obligatoriness of the grammatical marker. This helps explain the different cross-linguistic frequencies of temporal and plural concord. While temporal concord is (nearly) universal, plural concord was attested in less than half of the languages in the study sample. As we have seen, both of these concord types always involve accidental redundancy, so that their different frequencies cannot be a result of different underlying motivations. The World Atlas of Language Structures (WALS) records 263 languages with nominal plural markers, from which 90 (34%) are expressed optionally (HASPELMATH, 2013). This is a remarkably low percentage compared to past tense markers, which appear to be obligatory in all 134 cases in WALS[9] (DAHL; VELUPILLAI, 2013). The conclusion must be that, in principle, all languages allow for accidental concord. It is (only) the optionality of the grammatical marker that determines whether or not accidental concord actually arises. Since nominal plural marking is often optional, unlike the grammatical marking of tense, plural concord is relatively infrequent as compared to temporal concord.

The separation of the classification of redundancy into accidental and purposeful redundancy is not superficial, but in fact represents a structural division between fundamentally different redundancies. This becomes clear when we look at the characteristic diachronic pathways of the different types of concord. As has been well established, negative concord follows a distinct pathway, better known as Jespersen's cycle (JESPERSEN, 1917). At the first step in the cycle, a lexical negation is introduced alongside an existing grammatical negator to add emphasis, giving rise to negative concord. Over time, the grammatical negator disappears, while the formerly lexical negation grammaticalizes into the new grammatical negator, and the process starts over. A similar pathway could be said to exist for argument marking. In this case, the cycle starts with the introduction of free pronouns alongside pronominal argument marking, leading to argument concord. The pronominal markers disappear over time, while the pronouns grammaticalize into the new grammatical markers, and the cycle may start again. This process is observed in contemporary French (FONSECA-GREBER; WAUGH, 2002), Northern-Italian dialects (e.g. BRANDI; CORDIN, 1989; CARDINALETTI; REPETTI, 2008), and Brazilian Portuguese (KATO, 1999; ZILLES, 2005), among others.

The interesting thing to note here is that both concord types undergoing this cycle involve purposeful redundancy (see PETRÉ, forthcoming, for similar observations). Their diachronic pathways clearly involve a back-and-forth between the introduction of a redundant lexical marker for its desired pragmatic effects and the disappearance of the former grammatical marker for reasons of

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[9] It is interesting to speculate about why plural markers would more often be optional than tense markers. One possibility is that this is a consequence of a fundamental difference between nouns and verbs. Seifert *et al.* (2018) find that nouns take longer to process than verbs and argue that nouns somehow require more conscious planning from speakers. If this is true, it could be the case that the automaticity of the use of verbs makes verbal inflection automatic too, whereas speakers may be more conscious of nominal inflection and better able to leave it out if they feel it is redundant. A second hypothesis is that the difference in optionality between plural and tense marking stems from a difference in predictability. Presumably, it is quite normal to have an expectation of the number of a noun's referent, while it would be unusual to have an expectation of (non-present) tense on the basis of a verb. This would render plural marking unnecessary relatively often in comparison to tense marking. I am grateful to Natalia Levshina for suggesting this alternative hypothesis to me.

economy, and so on and so forth. It is precisely the intention to reach two conflicting communicative goals – being expressive and being economical – that motivates and drives the continuous cycle. To my knowledge, a similar functionally driven cycle has never been attested for temporal concord or plural concord: Tense and nominal plural markers may originate in the grammaticalization of lexical elements and may disappear over time, but those diachronic processes bear no relation to the introduction of lexical elements, nor to any pragmatic effects that lexical elements would introduce or lose over time. While purposeful redundancy reflects a stage in the constant interplay between expressivity and economy, accidental redundancy is something that can always occur when there is an obligatory grammatical marker. Hence, the two types of redundancy reflect two very different communicative processes; a difference that surfaces typologically and diachronically.

Note that purposeful redundancy is only purposeful in part of the diachronic cycle of argument concord and negative concord. Although a lexical negation or argument may be introduced with the purpose of providing emphasis, this highlighting effect is lost over time, when the cycle reaches the point at which both the lexical and the grammatical marker have become obligatory but still exist side-by-side. In that phase of the cycle, argument concord and negative concord are just as accidental as temporal and plural concord: Redundancy only arises from the fact that being non-redundant would result in ungrammaticality. What comes into being with a functional motivation loses that function over time and becomes a grammatical automatism.

5. Conclusions

This paper has presented an explorative typological study and a functional analysis of syntagmatic redundancy. Four types of concord, a variant of redundancy in which a lexical and a grammatical item have overlapping meanings, were studied in a 50-language variety sample. Whereas argument concord and temporal concord were attested in all sampled languages, negative concord was attested in 88% of the languages and plural concord in 41%. Argument and negative concord were shown to have a range of pragmatic co-effects, while temporal and plural concord served the function of specifying the meaning of the grammatical marker only.

On the basis of the typological study, it has been argued that redundancy is motivated by two basic functional principles: first, the need to lexically specify and disambiguate information that is not specified by a grammatical element (Functional Principle 1); and second, the need to emphasize information that is crucial to the proposition conveyed in the message (Functional Principle 2). These principles lead to two different types of redundancy: purposeful redundancy, which reflects the active choice of a language user to highlight certain information because of its importance; and accidental redundancy, which occurs as a by-effect of the use of a lexical item when the semantically overlapping grammatical marker cannot be left out. Purposeful redundancy and accidental redundancy differ fundamentally, not only in their communicative nature but also in their diachronic

behavior. Purposeful redundancy is a stage in a continuous, functionally motivated cycle of language change, whereas accidental redundancy arises wherever there is an obligatory grammatical marker that can be elaborated upon by a lexical item.

The typological study and functional analysis have shown that it is overly simplistic to claim that redundancy is universal because of its functionality. Only some types of redundancy are (near-)universal, and redundancy is not simply functional but may have a range of functions, which are sometimes in conflict with each other. Moreover, while purposeful redundancy is indeed a result of functional motivations, accidental redundancy does not result from a deliberate choice by a language user but is merely a by-effect of the choice to elaborate on an obligatory grammatical marker.

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