Functional typology and formal comparative syntax

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1. Introduction

Linguistic theory in general, and models of syntax in particular, have to take account of cross-linguistic variation. These days it is hard to find a syntactician who would be opposed to such a claim. Yet, the moment it comes to details, multiple disagreements occur. At the very coarse level, one can recognize and distinguish two main approaches to cross-linguistic variation: formal theory construction, often referred to as formal grammar,[1] and linguistic typology, based on functionalist or usage-based assumptions[2]. The two approaches differ in their basic assumptions, the core questions they ask, and methodology. Noam Chomsky and Joseph Greenberg are two people in the history of modern linguistics who best represent these approaches and the tension between them; see Mairal & Gil (2006), Holmberg (2017), Thomas (2020), for recent comparisons, and in particular, Comrie's chapter in that volume (Comrie 2006) for an explication of the Greenbergian approach.

With respect to basic assumptions, a formal syntactician expects languages to be similar, because they reflect systems and principles assumed to be innate and often referred to under the rubric of *Universal Grammar*. On such an approach, cross-linguistic differences are expectedly predictable. Meanwhile, a functional typologist, who is not committed to the concept of innate grammar, anticipates that some patterns would recur across languages (hence *language universals*) but is also on the lookout for significant variation and diversity, occasionally of the kind that cannot be readily explained. It does not help, as we compare frameworks, that both make heavy use of the English word *universal*: Universal Grammar for formalists, language universals for typologists.

With respect to the interpretation of findings, the two approaches differ in their views on how important the communicative function of language is. Both acknowledge that natural language is subject to different pressures (e.g. processing, random diachronic change), but for syntactic typologists, the communicative function is more important than it is for formal syntacticians, who work hard to separate structure from communicative needs.

Typologists got a head start in the work on language diversity, but over the last several decades, formal syntacticians have also been keen to account for larger samples of languages, engage in

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[1] There are a variety of formal models of grammar; these include Minimalism; unification grammars (in particular HPSG and LFG); Categorial grammar, and context-free grammars. We recognize this variety of formal approaches but for space reasons, we limit our discussion to the contrast between Minimalism and functional typology (functional approaches also vary, as we briefly discuss below).

[2] Other terms for the two approaches have been proposed, for example, *generative* and *traditional typology*, as in Boskovic (2022). Space considerations prevent us from addressing the many differences in terminology, but we hope that the additional references provided throughout the paper will be of help to the reader.

hypothesis-driven fieldwork, and conduct meaningful cross-linguistic comparisons. This may give rise to the hope that the two approaches can finally converge. Still, misconceptions and misunderstandings abound on both sides, and the coveted meeting-point remains distant. Even the journals where the two sides publish remain far apart, with their own topics and parlance; *Syntax, Linguistic Inquiry,* or *Natural Language and Linguistic Theory* for formal syntacticians, *Linguistic Typology*, *Studies in Language,* and *Sprachtypologie und Universalienforschung (STUF)* for functionalists.[3]

The goal of this chapter is to present and analyze the main goals of linguistic typology and to explore its relation to formal comparative syntax. In section 2, we introduce the tenets of linguistic typology and discuss possible reasons for its misrepresentation in the broader field of linguistics. In section 3, we present the main differences between linguistic typology and formal comparative syntax. In section 4, we discuss the basics of the comparative approach to formal syntax. In section 5, we survey studies of word order and case to compare the two approaches.

2. Typology as a subfield and typology as methodology

The term "typology" is widely used in linguistics, mostly to refer to the explanation of linguistic universals through large-scale language comparisons, work with reference grammars, and descriptive linguistic fieldwork. Such a perception reflects the work by Joseph Greenberg, whose seminal work about linguistic universals (Greenberg 1963) is taken to be the prototype of typological research. Nevertheless, as we will show, modern typology is not a replication of Greenberg's work. Its goals and methodologies cannot be reduced to the search for language universals.

The usage of the term "typology" is vague and at times mixes different views of the discipline. In this section, we discuss two conceptions of typology; each comes with its own expectations of the role of typology in linguistics and its own take on possible convergence between typology and formal theory. On one view, typology is an autonomous discipline, based on functionalism and using methods of cross-linguistic comparison. As such, typology is opposed to formal grammar, and the two approaches to language are rather complementary albeit not incompatible. According to the other view, typology is a method of creating language samples and large-scale cross-linguistic comparisons. On this understanding of the term, no theory is implied, and typology is compatible with formal comparative research.

2.1. Typology: A subfield

The term "typology" is a shorthand for functional (traditional) typology, which has established itself as a separate field of inquiry, subsuming functionalism broadly construed (e.g, Givon 1979, 1984, 1990, 2001; Nichols 1984); Radical Construction grammar (Croft 2001), Role and Reference

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[3] Of course, border crossings occur; typologists publish in *NLLT*, and formal linguists, in *Linguistic Typology*, but this is more of an exception than the rule.

Grammar (Foley & Van Valin 1984), Canonical Typology (Brown et al. 2013; Bond 2019; Corbett 2015),[4] and Cognitive linguistics (Langacker 1987; 2008), all of which take as their starting point the communicative function of language, and even more so, tend to adopt the bottom-up approach to grammars, where the desired model or explanation follows empirical data. Accordingly, structural patterns observed in natural language are motivated by the need for effective communication; hence the emphasis on the organization of information and its flow, economy of communication, and avoidance of ambiguity or vagueness (see Croft 2013; Van Valin 2013 for recent overviews).[5]

According to Bickel (2007), the emergence of typology as an autonomous field (as opposed to a method of establishing what is possible in a human language through cross-linguistic comparison) happened in the first decade of the 21 century. It was then that the main goal of typology shifted away from Greenberg-style enumeration of possibilities to explanations of possible patterns, distinguishing systematic patterns from random ones. Frans Plank offers a beautiful characterization of this new typology:

> Typological research commences by identifying differences among languages, as opposed to traits shared universally. Typology's remit then is to determine whether these individual differences are interrelated or independent of each other. (Plank 2001: 1399)

New typology has its own goals and its own theory (Nichols 1992, 2007). Based on linguistic functionalism, it is bottom-up and data-driven, which means that the range of building blocks and operations of language is not fully determined. In that regard, functional typology has inherited the worldview of structuralism, with its emphasis on the apparently unlimited variation and the need to consider language as used in text or discourse.[6]

In explaining patterns observed across languages, typologists do not look for the answer within the grammar alone. Crucially, the functional orientation of typology does not entail rejection of structure; rather, functionalism in typology manifests in the recognition of communicative, social, or processing needs as the reasons for grammars being the way they are (Bresnan 2007). When it comes to linguistic universals, typologists acknowledge that some features are statistically more probable than others in the languages of the world, or may even be found in every natural language, but that universality is due to conditional prevalence, not grammar. The observed distribution of patterns is explained by appeal to diachrony, language contact and areal diffusion, or shared cognitive characteristics of the human mind (Cristofaro 2010; Haspelmath 2014). This attitude is indeed very different from the one held by formalists; formal syntacticians tend to derive universality of certain features from the universal architecture of grammar itself (see more on differences between formal theory and typology in section 3).

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[4] Canonical Typology so far has mainly focused on morphological phenomena, and we won't review it here.

[5] Some frameworks within the functional approach to language place greater emphasis on the typological component than others. The typological orientation is particularly strong in the work by Givon, Nichols, and Foley & Van Valin.

[6] See Thomas (2019) for an overview of structuralism and further references.

Among the basic functionalist assumptions is the idea that abstract concepts or functions (such as situational roles, mood, or connections between information segments) can be applied to all languages, as they arguably reflect human cognition. Abstract concepts are related to abstract construction types, but the way these concepts and constructions are expressed in a particular language may vary. Likewise, we can expect variation in the way languages organize abstract notions mapping them to different forms. Semantic maps have become an effective tool in typology for capturing such variation (Haspelmath 2003; Croft & Poole 2008; Malchukov et al. 2010; Wälchli & Cysouw 2012; Regier et al. 2013; Bickel et al. 2014; Georgakopoulos & Polis 2018, a.o.). Despite the name, semantic maps do not track geographical distribution but rather illustrate the common mapping of form and function, either within a single language or across several languages. In keeping with the notion of prototype and radial categories, another important concept in functionalism (Lakoff 1987; Langacker 1987; 1988), semantic maps are often organized in such a way that those concepts that can be mapped to a single linguistic form are either adjacent to each other or connected through a function that will be also expressed with that form. However, a prototype is not always available, in which case semantic maps capture polysemy through a series of interconnected links (Croft 2003: Ch. 5, 6). The following discussion by Haspelmath is revealing:

> Semantic maps also do not require the identification of a central or prototypical function (or use or sense) of a grammatical item. It has often been suggested in recent years that polysemy networks are organized around a prototypical sense which is surrounded by more peripheral senses... Such analyses are compatible with semantic maps: For instance, one might want to claim that the 'direction' sense of English *to* is the central sense, and that the other functions … should be seen synchronically as extensions from this sense. However, in many other cases the identification of a central, prototypical sense is not straightforward .., and probably it is not a good strategy to look for one single central sense in all cases. The semantic map method is completely neutral in this respect. (Haspelmath 2003: 20)

Since functional typology derives much of its inspiration from the diverse ways in which a particular notion can be expressed, it comes as no surprise that typologists are interested in cross-linguistic variation; it becomes the source of understanding how concepts can be mapped into form. Armed with the ever growing number of good descriptive grammars and supported by progress in information sciences, modern-day typologists have become pioneers in the development of extensive typological databases. Greenberg's universals were based on the "convenience sample" of 36 grammars he had access to in his own library; that modest sample makes his discoveries even more astonishing. Modern typology has made tremendous progress since Greenberg's days and its empirical database is truly impressive. The World Atlas of Language Structures (WALS) is an important example of that progress. WALS is a large digital database with information on language properties, such as inventories of phonemes, case-marking, basic word order, gender systems, etc. For some properties, the number of languages represented exceeds a thousand, something that would have been impossible in Greenberg's day. WALS

allows searches for specific features, language families, countries, macro-areas, etc. The results are represented in forms of a map, which shows the distribution of the features geographically.[7]

2.2. Typology as methodology

Aside from the conception of typology as a theory, the term is also used to denote a method of cross-linguistic comparison. This understanding of typology has two common connotations: the methodology of typological sampling and the need to pay attention to more than one language.

The sample used by Greenberg was one of 'convenience'; whatever grammars were available to him in his library formed the basis for his generalizations. For instance, that convenience sample did not include a single VOS language. Since those days, linguists have made tremendous progress in the art of sampling, and functional typologists have been in the lead in that regard (see Rijkhoff et al. 1993 for a pioneering article, and Bakker 2012; Miestamo et al. 2016, for overviews). The basic idea is to control for various biases: genealogical, areal, and even bibliographic bias (where some languages are described in more detail than others). As linguists incorporate more sophisticated statistical methods in their research, these methods can be applied to sampling as well. For example, one could measure the degree of diversity in a sample or evaluate the degree of similarity in language dyads based on selected structural criteria. The rise of sampling techniques also has a positive effect on database construction (see section 2.1). Sampling has been a useful tool for linguists of all persuasions and has been embraced as such for thirty some years.

It is excessively simplistic to assume that typology always means a comparison between two or more languages (and conversely, that an in-depth study of one language is not a typological enterprise), but the association between a 2+ language sample and typology is popular. The idealization runs as follows: typologists work with large language samples, and formal syntacticians draw generalizations based on one language. A closer look at the actual state of affairs shows that this is a mischaracterization. More and more formal papers use data from several languages, and in fact, quite a few typological studies do not use sampling methodology. Baker and McCloskey (2007) discuss what they call the development of formal theory in the typological direction:

> Of the 27 articles on syntax in these issues [*Linguistic Inquiry* and *Natural Language & Linguistic Theory*, 2006-2007 – PP & MP], the mean number of languages discussed per article was 3.37 (ranging from 1 to 8 languages). We suspect that this is much higher than it would have been 25 years ago. (Baker & McCloskey 2007: 285).

The statistics after 2007 are similar. Of 848 syntactic papers published between 2007 and 2022 in *Linguistic Inquiry* and *Natural Language & Linguistic Theory*, the average number of languages considered is two, but the range is from 1 to 25 and above, with 47% of the articles based on data

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[7] WALS' counterpart on the formal side is TerraLing: another searchable linguistic database that allows users to discover which properties (morphological, syntactic, and semantic) characterize a language, as well as how these properties may relate across languages. The digitization and search functions of TerraLing are less developed than in WALS, but their future comparison may be a fruitful exercise some time down the road.

from a single language. Several formal typological monographs have been published, too (Cinque 2010, 2013b, 2020; Wiltschko 2014), see also an edited volume on linguistic variation in the Minimalist framework (Picallo 2014). Echoing Baker and McCloskey, Nichols points out that

> large samples are not pursued for their own sake. <...> a quick survey of the last few years of *Linguistic Typology* indicates that only two or three articles per year use formal samples. (Nichols 2007: 233).

Again, statistics after 2007 confirm this observation; about 30% of the syntactic articles published in *Linguistic Typology* between 2007 and 2022 are based on data from one language, which is comparable to the number of formal papers that also rely on one language. Hence, the difference in sample size between functional and formal approaches is only apparent.

The decision concerning sample size depends on the initial research question and the nature of phenomena under consideration (consider also the discussion in Bakker 2011). For example, there are only that many V2 languages known, so any work on V2 is limited by what is available. Putting a low and a high limit to a typological sample in the abstract is unrealistic, but one has to keep in mind the tension between an in-depth investigation of one language (or a couple of related languages) and a superficial quantitative study based on a very large sample. In hopes of establishing a "middle way", Baker and McCloskey (2007) propose using a sample larger than what is common for formal studies, but smaller than the samples of large-scale typological studies. This allows researchers to control for each parameter under comparison without sacrificing linguistic diversity. An ideal sample for such a study would consist of "five to ten languages that share a relevant feature but that are genetically and areally unrelated" (Baker & McCloskey 2007: 294). The "middle way" is not seen as the ultimate goal of formal typology, and there is a value in comparing more and more languages as more data becomes available. However, as Baker and McCloskey (2007) show for a range of phenomena, larger-sampled and smaller-sampled studies yield comparable results, which means that the "middle way" may emerge as a reliable methodology for cross-linguistic comparison.

To bring this section to a close, we can state that once typology is understood as a tool, not as a discipline in the sense discussed in section 2.1, such a tool can be effectively used in cross-linguistic comparisons of different kinds.

2.3. Functionalism and formalism together?

If typology is a discipline with its own theory, a question arises whether formal and functional theory can co-exist. To answer this question, let us briefly outline the basic premises of generative grammar. Common to formal approaches is the idea that each and every one of the members of the set of well-formed expressions in natural languages is formally defined by a finite set of rules that operate on features or primitives that are needed to characterize a language. Further still, the necessary properties of language are restricted by optimal formal constraints, which entails that many of the functional explanations so important for typology as an autonomous field (see section 2.1) are considered superfluous.

Both formal theoreticians and functional typologists seek to answer the question what the human language is, and what is possible and impossible in it. At the same time, the position on the convergence between the two approaches is not uniform. While theoretical syntacticians acknowledge the importance of expanding the empirical base on which theoretical models are built, typologists are often opposed to the formalization of grammatical descriptions. To be more precise, they entertain the idea that comparative categories may be rooted in functions, rather than structure (Bickel 2007; Croft 2007; Nichols 2007), all the while still accepting some structural properties, such as the head/dependent-marking distinction (Nichols 1986).

Even though there are flaws in the current state of typology seen by typologists themselves, the agenda in their elimination is not in the direction towards the formal theory. For instance, Lazard (2007) criticizes *Linguistic Typology* for ignoring the vagueness of concepts embedded in the Greenbergian typological tradition. He encourages typologists to think about the methodology of description, requirements of the comparison and relationship to other disciplines, yet he never mentions that findings of formal grammar could be useful in theoretical discussion. Echoing Lazard, Plank (2007) mentions the same range of issues as questions for the future development of typology. He emphasizes that typology drives theoretical knowledge, without assuming that the other direction is possible.

Formal and functional-typological approaches both have their advantages and shortcomings. The formal approach operates with very concrete and well-defined categories, the predictions are rather clear, and the hypotheses are falsifiable (e.g., Chung 2012). However, there is no guarantee that these categories, their definition and the proposed analysis are going to work for a new language. The typological approach, on the other hand, is flexible and is designed to capture cross-linguistic variation. At the same time, there is no guarantee that one can be sure that one deals with the same kind of construction based just on similar functions.

The other side of the coin is the attitude to the interpretation of unattested phenomena, as discussed in (Haspelmath 2008). Here, some radicalism comes from the part of formal theoreticians. The generative counterpart of atomistic functionalism is the view that any unattested phenomenon is necessarily ruled out by Universal Grammar, either as a separate language specific module (Anderson & Lightfoot 2002) or together with general cognitive constraints (Hauser et al. 2002). A less radical approach is that unattested languages are just improbable (Newmeyer 2005). A similar issue – the interpretation of what is judged as unacceptable and how it is affected by extra-linguistic factors – is discussed in (Bresnan 2007). Typologists are more open to unexpected patterns, hence the interest in *rara* and *rarissima* (see Wohlgemuth and Cysouw 2011), and ruling out patterns in a top-down, aprioristic way is not part of their game. Such a view naturally follows from the idea that we simply do not know about all the languages currently spoken let alone those that existed in the past.

If we go back to the question that opened this section, namely, can formal grammar and typology converge, a very general answer is yes: formal and functional explanations are complementary rather than contradictory (Newmeyer 2005: 135; Haspelmath 2014: 504). However, it is important to distinguish between two functionalist points of view, the ones that Newmeyer calls Atomistic Functionalism and Holistic Functionalism (Newmeyer 2005: 174-175). The former assumes that

functional motivations directly determine the properties of grammars, while the latter denies such a direct link. Instead, functional motivations can be manifested in acquisition and usage, but the discrete properties of grammar are determined by other factors. Accordingly, Atomistic Functionalism is incompatible with formal generative theory, but no incompatibility arises between Holistic Functionalism and formal models.

Evidence provided by psycholinguistic experiments and language change, as well as the availability of an unconstrained number of competing functional explanations suggest that Holistic Functionalism might be the right position. Cristofaro (2010) exemplifies Holistic Functionalism with her interpretation of word order correlations. To illustrate, consider the correlation between the VO order and prepositions (the converse correlation, between OV and postpositions, is less robust); consider Hawkins (1983), Dryer 1991, 1997, 2013a. This correlation can be motivated by processing or diachrony. On a processing plane, the head (in this case, the adposition) is indicative of the category of its phrase, and at the same time, creates an expectation of a particular category of its complement. It is easier to process structures where the head and complement are adjacent to each other, and consistency in the placement of heads and complements helps the parser (cf. Hawkins 1994, 2004, 2014, on the latter point).   Processing preferences get incorporated in the grammar, which leads to cross-linguistic correlations and tendencies noted in the literature. On this view, functional principles operate on a global scale but do not necessarily account for particular language-specific synchronic patterns or on-line grammatical choices of speakers.

In sum, functional linguists use typology as their main method of language research, i.e. contemporary typology is functional typology. Formal linguists, on the other hand, build their theory based on a restricted set of languages, many of them well described. At the current stage of linguistic theory, formal typology, a counterpart to the existing functional typology, is what is missing.

3. Differences between functional typology and formal comparative syntax

In this section, we outline the main ideological, conceptual and methodological differences between functional typology and formal investigations of cross-linguistic patterns. The core difference between the two approaches considered here is that the former puts linguistic diversity at the center of their research, while the latter concentrates on universal principles of structure.

This asymmetry in the core questions reflects differences in *underlying assumptions*. Variation, often of the kind that evades explanations, is the functional typologist's main concern. Languages are expected to vary in often unforeseen ways, to the extent that it is impossible to describe and analyze them using the same formal categories (see Nichols 2007). An important challenge of modern typology has to do with relating cross-linguistic variation to geographical, psychological and historical factors (Bickel 2007; Nichols 2007). This means that the line between I-language (abstract mental representation of grammar) and E-language, the externalized language that manifests in usage, is not drawn the way it is in formal linguistics. Further still, the variation across languages challenges the utility of core concepts, for example, subject or imperative (Haspelmath

2008, 2014; Aikhenvald 2010), and even the use of core terms, an issue richly represented in Martin Haspelmath's work (Haspelmath 2010; 2016; 2018).

The main goal of formal theory is to model the underlying structure shared by language types and often obscured by language-specific processes. In this worldview, the features and operations on structures are shared across natural languages.

The difference in basic assumptions is sometimes conflated with the *degree of abstraction*, and here misconceptions abound. In functional typology, surface structure is preeminent (what you see is what you get), and interpretation is part and parcel of that structure. Formal syntax is concerned with the underlying structure and relatedly, with a strict separation between the structure and the interpretive component. Accordingly, explanations for one and the same structure vary depending on the approach. Consider the phenomenon of Object Shift, most extensively studied in Scandinavian languages: definite or pronominal objects appear in a preverbal position; all other objects follow the verb (the details vary across languages but this characterization is sufficient for our purposes).[8]

In formal syntax, Object Shift is motivated by the need for the object to get some feature that it cannot receive in its base position (most commonly case; Vikner 2005); this explains why DPs but not PPs undergo Object Shift and relates the phenomenon to verb movement (Holmberg 1986). In functional approaches, the difference is between two unrelated constructions, one where the object is definite/pronominal, the other where it is indefinite. Definite expressions tend to be more given/topic-like, and such material tends to be placed closer to the left, at least in SVO languages. This explains why shifted objects take wide scope (e.g., Diesing 1996).

We would like to underscore that both approaches operate on a comparable level of abstraction. A commonly-noted difference has to do with invisible/silent elements, which functional approaches tend to avoid, especially in syntax, hence the perception that they are less abstract, but there is much more to abstraction than implicit material. The analyses and explanations differ but that does not mean that the attention to surface effects deprives typology of abstraction on the explanatory plane (see Nichols 2007 for similar observations).

Another point of difference between functional typology and formal linguistics has to do with the *methodology of language investigation* (Croft 2007: 85). This difference is twofold. First, the two approaches view the chicken-and-egg relationship between data and theory differently, and Haspelmath (2014) captures this difference by characterizing functional typology as *non-aprioristic*, and formal syntax as *restrictivist*. Data come first in functional typology, and a theory based on empirical investigation of a large amount of data follows. It is worth noting that this view entails that theory has to be relatively unconstrained, so that it would impose few limitations on what is possible. The goal is to explain what you see, less so to rule out certain patterns in advance. Related to that is the heavy reliance on naturally-occurring data and occasional resistance to ungrammatical items in elicitations. In formal theory, on the other hand, the categorical classification, or theory itself comes first (often based on the investigation of one or two languages). Yet, it is erroneous to think that formal syntacticians expect all languages to show the

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[8] Holmberg 1986; Thráinsson 2001; Vikner 2005, among many others.

exact same behavior. It is important to establish some principles (e.g. conditions on binding, see Chomsky 1980), and then show whether all languages conform or some of them do not show the expected effects (Davis et al. 2015).[9]

Second, the two frameworks differ with respect to the *building blocks of analysis*. Typologists deny the need for a pre-established universal formal classification (Croft 2007; Haspelmath 2007). Instead, functions are supposed to be universal, while the mapping of those functions to formal categories gives rise to linguistic diversity. For example, topicalization of object and passivization are functionally similar in that they give prominence to the argument which would otherwise play second fiddle to the agent of a sentence. Meanwhile, a formal syntactician's goal is to reduce theoretical explanation to operation on a set of formal features and categories. Universality, however, does not deny the presence of variation. Universal categories are defined using particular values, and switching between those values can account for cross-linguistic variation. While there is little discussion regarding the desired formal categories in the field of generative grammar, the discussion of functional categories, or comparative concepts in typology is a lively topic (Haspelmath 2010; 2016; 2018; Beck 2016; Croft 2016; Dahl 2016; Lander & Arkadiev 2016; Rijkhoff 2016; Evans 2020, a. o.).

These differences in methodological considerations are reflected in the range of topics entertained by practitioners of the two approaches. Functional typologists are often inclined to consider structures with a clear functional effect, for example, voice oppositions, argument structure, means of expression of definiteness or possession, word order, or evidentiality. Formal syntacticians are more likely to focus on the building blocks of structure such as noun/verb phrases, demonstratives or operations on segments, such as movement or ellipsis. Case, agreement, information structure, and word order are probably the main areas where the two approaches overlap. For recent typological works on *case*, see Rice & Kabata (2007); Bickel et al. (2008); Arkadiev (2009); Malchukov & Spencer (2009); Creissels & Mounole (2011); Seržant (2016); For formal approaches to case, see Sigurðsson (2008); Rezac et al. (2014); Baker (2015); Levin (2015); Norris (2018); Branan (2022). Typological work on *agreement* is represented by Corbett (2009, 2012); Palancar & Feist (2015); Nichols (2017); Matasović (2018), whereas formal models of agreement can be found in (Haegeman & Lohndal 2010; Coppock & Wechsler 2012; Kramer 2014; Preminger 2014; Haug & Nikitina 2016; Bárány 2021; Bárány & van der Wal 2022; van der Wal 2022). *Information structure*, a lively topic in general, is addressed from a typological perspective by Foley (2007); Brickell & Schnell (2017); Frajzyngier (2018); Reisberg et al. (2018); Chappell & Creissels (2019). For the formal take on information structure, see Neelman et al. (2009); Gécseg & Kiefer (2009); Alboiu et al. (2015); Fominyam & Šimík (2017). A large portion of formal literature on information structure is built around the notion of the Left Periphery within the cartographic approach, see Cinque & Rizzi (2012); Salvesen (2013); Shlonsky (2014); Szűcs et al. (2014); Giorgi (2015), among others. Recent work on *word order typology* is represented by Dryer (2007, 2009); Cysouw (2010); Her (2017); Guzmán Naranjo & Becker (2018); Berg (2020); Gerdes et al. (2021), see also an overview in (Song 2011); for formal approaches to word order,

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[9] We will return to this point in section 5.

see É. Kiss (2008); Cinque (2013a; 2023); Ramchand (2014), and others. Cross-linguistic studies of all these phenomena would benefit from incorporating insights from both sides.

Yet another difference between the functional and formal approach has to do with the *uniqueness of the human language as a phenomenon*, which leads to different explanations of attested patterns. Functional typologists look for answers in cognition and communication in general, as well as in historical processes (diachrony). Relying on the idea of Universal Grammar, formal syntacticians believe that the explanation of possible and impossible has to be derived from the language faculty, which is specific to humans. The difference in explanatory principles is discussed by Haspelmath (2008) from a functional perspective, and by Newmeyer (2005) from a generative perspective.

As an example of differences between functional-typological and formal approaches, consider cross-linguistic variation in possessive constructions. Typological research on possession is concerned with the range of possible ways of expressing possession (Koptjevskaja-Tamm 2002, 2003, 2004; Nichols 2010), whereas generative studies of possessive constructions are mostly concerned with the internal structure of the noun phrase (Szabolcsi 1981; Ritter 1988; Den Dikken 1999; Coene 2003; Alexiadou et al. 2007; Holmberg 2021). Different approaches to the surface phenomena in possessive constructions are also reflected in the terms that typologists and formalists operate with. The former use the terms "internal" vs. "external" possessors and focus on the placement of possessor marking: head-marking, dependent-marking, etc. (Nichols 1986; Koptjevskaja-Tamm 2002; 2003, a.o.), while the latter refer to external possession as "possessor raising", relying on the conception that possessors originate internally to a noun phrase (e.g., Landau 1997, 2010; Deal 2013; 2017; Kishimoto 2013; É. Kiss 2014). Typologists also fixate on the range of possible adnominal relations, starting with kinship (*Peter's mother*) and body parts (*Peter's hand*), and moving on to social relations (*Peter's friend*), material (*ring of gold*), pseudo-partitive (*cup of tea*), and nominalization where the agent corresponds to the possessor (*Columbus' discovery of America*). The core premise is that one and the same possessive construction can be used to express the most prototypical functions such as kinship or part-whole relations but can also be expanded to denote other types of possessive relations. Different languages split the scale in different ways, from using one and the same construction for all types of possessive meanings to having dedicated structures for each individual meaning.

Formal syntacticians start by anticipating certain relationships between the head noun (possessum) and the associated adnominal DP (possessor) as they form a noun phrase. Formal properties of possessive constructions include case assignment to the possessor; the relationship between definiteness and possession of the members of the DP; conditions on extraction of possessors from the DP (Szabolcsi 1983; Corver 2017; Gavruseva 2000; Davis 2021). Unlike the functional approach, there is no expectation of a scale, and the mapping of particular meanings to the possessive structure is viewed as secondary.

4. Formal typology?

Both functional typology and formal comparative syntax have evolved over time, and it is unfortunate that some stereotypes entertained by both sides linger; formal syntacticians paint

typology as superficial linguistics, and functional typologists lament the formalists' lack of commitment to language diversity. We hope to have dispelled the former stereotype in section 3; let us now turn to the latter. Formal syntacticians acknowledge the importance of investigating a larger number of languages to capture the range of human language potential (Baker & McCloskey 2007; Cinque 2007; Davis et al. 2015; Roberts 2019, a.o.). Combining that with in-depth linguistic analysis renders large language samples based only on descriptive grammars untenable. As a remedy, two paths can be followed. First, a greater number of lesser-studied languages should be described in depth, through hypothesis-driven fieldwork, which is an important goal in and of itself. Second, relatively small but diverse samples should be used to arrive at new generalizations. This is the essence of Baker's "middle way" program discussed in section 2. Baker's work on case (Baker 2015) is an example of the "middle way" sampling in action. The book, which advocates the theory of dependent case, is "built on a study of a medium number of languages in a medium amount of detail" (Baker 2015: 10). Baker's sample includes about twenty languages balanced in terms of argument alignment, the criterion that is important in case typology. We discuss some of his findings in section 5.

Since traditionally less accessible languages were studied by missionaries, descriptive linguists and functional typologists, the grammars mostly contain naturally occurring data, and there is little or no negative data or minimal pairs. For this reason, it is almost impossible to falsify linguistic hypotheses based on theoretical considerations, which often rely on what is not allowed in the grammar of a particular language. This leads to the need for a hypothesis-driven approach to fieldwork (Davis et al. 2015). The more languages become available for a comparison in terms of universal categories, the more successful can comparative research in syntax become.

As Davis and colleagues contend, hypothesis-driven fieldwork has much to offer, despite its apparent tendency to import the analysis of one language to another. Research on binding in languages of the Pacific Northwest can serve as an example. The starting point is the expectation that all languages should obey Condition C, which, according to Davis and his colleagues, requires that a pronominal cannot c-command its antecedent (1).

(1)   a. Christine$_i$ said [that she$_i$ would leave tomorrow].

          b. *She$_i$ said [that Christine$_i$ would leave tomorrow].

In order to test this hypothesis, sentences such as (2a, b), similar to their English counterparts, were constructed for elicitation in the Southern Wakashan language Nuu-chah-nulth. In (2b), the pronoun is null, doubled with agreement morphology on the matrix predicate. This null pronominal c-commands *Lucy* in the embedded clause, which should be ruled out by Principle C, yet (2b) is grammatical, just as (2a) (Davis et al. 2015: e192). Thus, the hypothesis-driven approach uncovers a language fact that would have almost no chance to be discovered without an explicit proposal and the collection of carefully-controlled data.[10]

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[10] Nuu-chah-nulth is not the only language with Condition C violations; consider Amiridze (2006) for Georgian, Testelets (2009) for Adyghe, a.o.

(2) a. wawa:ma   Lucy_i [ʔanič   p'ap'ac'aqλi:ɬw'it'as *pro_i* ʔam'i:λik]

         say=3IND   Lucy   [comp=3SBRD bread-make-ASP   tomorrow=FUT]

         'Lucy_i said that she_i will make bread tomorrow.'

     b. wawa:ma   *pro_i* [ʔanič   Lucy_i p'ap'ac'aqλi:ɬw'it'as ʔam' i:λik]

         say=3IND   [comp=3SBRD Lucy   bread-make-ASP   tomorrow=FUT]

         'Lucy_i said that she_i will make bread tomorrow.'

         (lit. 'She_i said that Lucy_i will make bread tomorrow.')

Fortunately, more and more formal linguists do hypothesis driven fieldwork with less studied languages, and more and more data become available for cross-linguistic comparison. In the last 15 years, articles in *Linguistic Inquiry* and *Natural Language & Linguistic Theory* are dedicated to phenomena in languages from different areas and families: the New Guinean languages Yimas and Ulwa; African languages Yąg Dii (Niger-Congo), Tamashek (Berber) and Lubukusu (Bantu); the Austronesian languages Tongan and Fijian; North American languages Tlingit (Na-Dene), St'át'imcets (Salish), Southern Tiwa (Kiowa-Tanoan), Washo, among others.

5. Comparing the two perspectives: Examples of cross-linguistic studies

Word order and case are among two most-studied topics in functional typology and formal grammar. Given the difference in their goals and methods, what looks superficially the same is explored in very different ways. Here we consider examples of cross-linguistic studies that allow us to highlight differences between the two approaches.

5.1. Functional and formal typological studies of word order

Word order has been at the forefront of typological work since its inception, going back to Greenberg's seminal work (1963). For that reason, it represents some of the traditional, early trends in typology, such as methodology of language sampling (Bell 1978, Dryer 1989) and the expansion of language samples (Hawkins 1983; Tomlin 1986; Dryer 1992); see Primus (2001) for discussion. Nowadays, word order is still one of the most frequent topics of typological papers. Together with argument structure, it occupies the fourth place among the topics of the papers published in *Linguistic Typology* between 2007 and 2022, preceded by evidentiality, case and agreement and noun phrase structure.[11]

5.1.1. Traditional word order typology

A number of linguistic properties correlate with basic word orders, and establishing sets of language properties that characterize a particular word-order type remains an important goal.

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[11] The focus has switched, and more recent papers mostly describe a specific language or a language family, contributing to the theory established based on the generalizations made in earlier work on word order.

Traditional typology classified languages based on the ordering of S(ubject), O(bject), and V(erb), where S and O were determined on the basis of notional rather than purely syntactic criteria. This originally led to a six-way distinction: SOV, SVO, VSO, VOS, OVS, and OSV. Dryer (1997) proposed an alternative typology using two parameters: the order of the verb and its subject, and the verb and its object: SV, VS, OV, VO. It is worth noting that the breaking down of the initial six non-decomposable tokens into a system of simpler parameters also demonstrates the general tendency of modern typology to simplify and multiply the parameters of cross-linguistic comparison. It is also desirable to have a classification that would allow typologists to divide languages into natural classes, without a lot of exceptions and subtypes. Decomposing the parameters helps to achieve this goal (Dryer 2013a: 270).

Other linguistic properties that correlate with the basic word order parameter are the order of noun phrase and adposition (see section 3 for discussion); head noun and dependent in the genitive case; head noun and relative clause; verb and an auxiliary, etc. (Dryer 1991). Since typology's goal is to establish cross-linguistic parameters for future language description and comparison, correlating separate parameters of variation so that they could all be brought together under a uniform type is an important research step. For example, matching the basic word order in a clause with the constituent order in smaller domains has led to the distinction between head-final and head-initial languages. It is also valuable to indicate which parameters are more relevant for the comparison, i.e. which parameters play a role and can be checked in most languages.

The results of word-order studies are presented in WALS in the form of maps (see section 2.1), where one can look for languages belonging to different word-order types, using either the six-way (Dryer 2013b) or the two-way classification (Dryer 2013c-d). Other word-order parameters are also available in WALS; and it is possible to make complex inquiries involving combinations of different word order parameters.

5.1.2. Formal approaches to word order

The formal perspective on the basic word order is quite different. A formal linguist is concerned with the underlying structural representation of word order in a speaker's mental grammar. Formal studies of word order normally deal with movement. The main goal is to explain how all attested surface word orders could have been derived from the universal underlying form with a restricted set of available operations. Kayne's (1994) antisymmetry is an influential example of such an approach. The basic idea is that asymmetric c-command determines linear order and linear precedence in particular. This informs a highly specific theory of word order in UG: that in the underlying structure, complement positions must always follow their associated head, and that specifiers and adjoined elements must always precede the phrase that they are sister to. A further result is that the standard X-bar theory is not a primitive component of UG. Rather, X-bar theory expresses a set of antisymmetric properties of phrase structure. All told, phrase structure determines surface order; as a consequence, if two phrases differ in linear order, they must also be structurally different.

Kayne's theory serves as the foundation for a formal word order constraint, claimed to be universal: the Final-over-Final Condition (FOFC) which has received considerable attention

in cross-linguistic (Holmberg 2000; Biberauer et al. 2014; Sheehan et al. 2017, a.o.) and diachronic literature (Biberauer et al. 2009; 2010, a.o.). Relying heavily on the concept of extended projection, researchers formulate FOFC as a syntactic condition that disallows structures where a head-initial phrase is contained in a head-final phrase in the same extended projection/domain. As such, FOFC reflects restrictions on roll-up movement, which follow, in turn, from minimality effects on the spreading of features that drive such movement (Kayne 1994). While the explanatory component of FOFC is consistent with formal syntactic theory, the generalization captured by FOFC is the same as in Greenberg's tetrachoric universals, which correlate logically independent parameters and restrict cross-linguistic patterns to some but not all, combinations of their features (Croft 2003: Ch. 3).

Guglielmo Cinque's work is among the clearest examples of explicit connections between functional and formal typology. Unlike some other researchers, who build or modify existing samples, Cinque takes existing universals of constituent order as a given and derives them from universal conditions on phrase structure (see especially Cinque 2005). In his work on adjectives, Cinque (2010) again engages with functional typology (e.g., Dixon 1982). His language sample is quite impressive but it is largely constructed with an eye on in-depth work, of the hypothesis-driven research type we discussed in section 4. Adjectives are known to be notoriously non-uniform in their properties and placement, and Cinque's solution to this problem lies in distinguishing two types of adjectives: direct modifiers that are merged as phrases in particular specifier positions, and predicates of reduced relative clauses. This distinction allows Cinque to explain the placement of adjectives with respect to head nouns, including those situations where pre- and postnominal modifiers co-occur in the same language. The distinction is also needed to argue against head-movement in earlier analyses of Romance and in favor of phrasal movement. Thus, a comparative investigation of modifiers ends up informing the structure of syntactic theory more generally.

5.1.3. Comparing typological and formal approaches to word order

The difference between a typological and a formal ideology is perfectly exemplified by the discussion of basic word order between Dryer and Newmeyer. Replying to Newmeyer's (2004; 2005) criticism of the theory proposed in (Dryer 1997), Dryer (2013a) argues that his alternative word order typology based on two two-way parameters (order of verb and subject; order of verb and object) is superior to the classical six-way typology because it captures other word order correlations more accurately, and because the resulting natural classes are more coherent. It is worth noting, however, that Dryer's new typology does not distinguish between VOS and VSO languages as well as languages that freely allow for both verb-initial orders, since they are all VS&VO. For Dryer possible differences between VSO, VOS and VSO/VOS languages are secondary:

> The argument for my alternative typology is not that speakers of VSO languages do not have different grammars from speakers of VOS languages or speakers of languages that allow both VSO and VOS. Rather the claim is that the difference between VSO and VOS

> order is not associated with other typological differences, in contrast to the order of object and verb and the order of subject and verb. (Dryer 2013a: 293)

In a formal account, collapsing VSO and VOS may lead to missed generalizations as the derivations of VSO and VOS can differ in a number of ways. To offer just two examples: first, the status of S can vary depending on whether it is subject proper or topic, generated in a higher A-bar position in the CP area. Second, the verb-initial order itself may be due to head-movement, more commonly found in VSO languages, and the movement of the entire verb phrase to a higher specifier, which is more easily correlated with VOS (see Clemens & Polinsky 2017 for different pathways to verb-initiality).

5.2. Functional and formal typology of case marking

When it comes to the syntax of case, typologists are mostly interested in case alignment (Comrie 2013a, b; Iggesen 2013a); differential argument marking (Kittilä 2008a), and morphological case systems, focusing on the number of cases (Iggesen 2013b), or their syncretism (Baerman & Brown 2013). Case is also frequently discussed as an important part of voice alternations (Kittilä 2008b; Shibatani 2009). Typologists also try to connect the position of case markers (preceding or following the cased noun) to the more general issues of word order typology (Dryer 2013a). Formal theoreticians are less concerned with the distribution of possible alignment patterns and rather try to understand the underlying processes of case assignment in general. Both frameworks have paid attention to the relationship between case and agreement, an issue that we will take up below in this section.

5.2.1. Functional typology of case marking

Case alignment is the mapping between the three syntactic functions – subject of a transitive clause (A), object of a transitive clause (P or O) and subject of an intransitive clause (S) – and their morphological forms (Dixon 1994, a.o.). Typologists understand case marking in a broad sense, including both morphological affixes and free-standing adpositions. (For this reason, in recent years, the term *marking* has been replaced by the term *flagging*.) For instance, A and S can receive the same marking, as opposed to P (nominative-accusative alignment). Alternatively, P and S can receive the same marking, as opposed to A (ergative-absolutive alignment). In addition to these two frequent types, languages of the world can mark each role in a distinct way (tripartite) or in the same way (neutral). Some languages encode S either as A or as P, based on the type of the S (split-intransitive).[12] The grammatical (syntactic) functions A, P and S are based on thematic roles, and the set of roles relevant for argument alignment in typology has been extended. For instance, A, P and S only capture two-place predicates; new roles have been added to typologize three-place predicates (Haspelmath 2011). Typology cares about the way different alignments are distributed in languages of the world, about possible language-internal splits, and about semantic roles that determine alignment types. Unlike formal theoreticians might have done in their place, typologists

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[12] See Bickel & Nichols (2008) for an overview of alignment types.

do not make claims about the potential underlying direct links between the roles and their encoding stored in mental grammar.

Elegant functional explanations referring to efficiency of encoding of certain roles and relations (see especially Haspelmath 2021a) cannot be plugged into a formal theory *without additional adaptation*. An explanation based on the efficiency of encoding goes as follows: the more frequent a certain construction is, the more predictable it is; therefore, it needs less marking. As a result, the more prototypical relations are encoded by reduced means (e.g., Bybee 2006). This account is particularly effective as a diachronic explanation and works well whenever paradigmatic choices are available to encode the same meaning. Formal theoreticians, on the other hand, seek to explain how these functional tendencies can be implemented and coded in actual mental grammars, referring to formal features and structure (see also discussion in section 2.3).

Differential object marking (DOM) is a widespread phenomenon (Bossong 1991), which manifests itself with the usage of different encoding strategies for different sets of objects within the same language, based on the properties of objects. The issue of DOM is closely related to the alignment problem, because the main explanation of DOM patterns comes from the idea of efficiency of coding patterns (Comrie 1989; Bossong 1991; Aissen 2003; Seržant & Witzlack-Makarevich 2018, a.o.), see also (Haspelmath 2021a,b) for a discussion of DOM in the context of alignment splits. Oftentimes, the opposition is not between two different cases but rather between presence of case marking and its absence. The main trend in typology of DOM is to determine what factors influence the object marking, i.e. what properties of the objects are relevant: specificity, definiteness, animacy, syntactic category (pronoun vs. common noun), topicality etc.

5.2.2. Formal approaches to case marking

Formal accounts of argument marking in general and DOM in particular, which provide an alternative to the functional explanation, refer to structural configuration and licensing issues. It is fair to say that DOM was introduced to formal linguistics by Aissen's work (2003), which itself used such functional notions as iconicity and economy and which proposed an Optimality-theoretic account of the phenomenon. Subsequent body of DOM research in generative grammar has focused on the licensing of nominals that do not get case marking and pseudo-noun incorporation in particular (Massam 2001; Danon 2006; Levin 2015; van Urk 2020). Another important part of formal DOM research is done within the Dependent Case theory (DCT), in which the marking of the direct object depends on the syntactic configuration of the clause (Baker 2015). DCT does not necessarily contradict the licensing approaches listed above, since smaller nominals do not enter into case competition relations crucial for this theory; however, DCT works are mostly concerned with movement of the arguments, e.g. object raising (e.g., Bhatt & Anagnostopoulou 1996; Baker & Vinokurova 2010, a.o.). For a larger overview of formal approaches to DOM see Bárány & Kalin (2020), who distinguish among morphological, syntactic, and information-structural approaches.

It has also been noted that in different languages, the number of case markers in the nominal paradigm is very different. Setting aside languages with no overt case marking, we find significant variation, ranging from two-case systems (Arkadiev 2008) to large inventories (Daniel &

Ganenkov 2008). In contrast to typologists, formal grammarians as of late have been trying to find limits on this variation. The main idea in the formal circles has been to divide what is traditionally understood as case into cases proper and case-like encoding of constituents by adpositional expressions (Bresnan and Grimshaw 1978; Emonds 1985, 1987; Nikanne 1993; McFadden 2004, 2021; Asbury 2008; Caha 2009; Dékány 2011; Polinsky 2016). See also den Dikken & Dékány (this volume) for discussion.

The restriction on possible case systems can be represented by a case hierarchy in (3) (Blake 1994, 2001). The hierarchy works as all implicational hierarchies do; if there is a case affix, all cases to the left are encoded by affixes as well, while the cases to the right can be expressed by adpositions. The hierarchy reflects a tendency and is not exceptionless (Malchukov and Spencer 2008).

(3) NOM> ERG, ACC > GEN > DAT > LOC > INS, ABL > Others

In addition to accounting for the morphological split between affixes and free-standing adpositions, this hierarchy can be used in the explanation of "syntagmatic relations between individual cases" (Malchukov & Spencer 2008: 654), diachronic development of case systems (Blake 2001), and frequency of individual cases.

Formal approaches to case are mostly concerned with the way nominals receive case, with the two dominant approaches falling into licensing tied to particular structural positions[13] and dependent case theory.[14] Within the latter, the hierarchy of dependent cases in (4) is parallel to the scale in (3):

(4)   unmarked   ⟨ dependent   ⟨ oblique

    NOM/ABS   ACC/ERG   DAT, etc.

Nanosyntax of case (Caha 2009) is probably the closest formal counterpart to functional case hierarchies. To explain case syncretism, he derives the implicational hierarchy of cases similar to the one in (3) by decomposing cases into sets of features; the cases on the right contain the features of the cases on the left. Accordingly, noun phrases bearing the cases to the right contain a larger number of projections, given that each feature in nanosyntax corresponds to its own syntactic node.

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[13] An important distinction in this view is between structural and inherent case (Chomsky 1981; 1986; Vainikka & Maling 1996; Woolford 2006; McFadden 2021), where the two types of cases differ in their licensing conditions. Structural case is assigned based on certain structural positions, while inherent case is assigned based on theta-roles due to requirements of specific heads. Noun phrases in structural and inherent cases show different morphosyntactic properties. The relationship between abstract (syntactic) and morphological case is also relevant in this regard. A considerable body of literature shows that the abstract case, which is needed to license noun phrases, is not in one-to-one correspondence with morphological markers of case (Yip, Maling & Jackendoff 1987, Marantz 1991; McFadden 2004).

[14] See Marantz (1991); Bobaljik (2008); Baker (2015).

In formal models, case licensing and agreement are tightly connected, hence the interest in the convergence/divergence of case and agreement alignment patterns on behalf of formal grammarians.[15] The generalization, going back to Dixon (1994), is as follows:

(5) No language has a nominative-accusative case pattern alongside an ergative-absolutive pattern in agreement

Bobaljik (2008), Baker (2008, 2015), and Legate (2008) propose accounts of this generalization, based on the idea that agreement does not (necessarily) depend on case-marking. In particular, Bobaljik (2008), following Moravcsik's (1974; 1978) account of predicate agreement, proposes that agreement targets the highest accessible NP within a given domain, and the accessibility is determined by the scale in (4). The pleasing result of this explanation is that two morphosyntactic phenomena are kept apart but their connection is modeled in a principled manner, and using the tools characteristic of functional approaches (scales, hierarchies, tetrachoric universals).

6. Conclusions

Functional typology and formal comparative syntax have existed side by side for several decades. The two approaches to comparative study of language differ in a number of respects, and the analyses that emerge from both sides are often difficult to match. This is not surprising if we look at the field more closely. Functional typology does not impose limits on possible correlations that may be found or make predictions about what else one might expect to find. Such a relatively unconstrained approach has both positive and negative consequences. On the positive side, it allows typologists to venture bravely where no one has tread before uncovering new data. One could counter that this leads to open-ended "fishing expeditions" that often fail to distinguish between what is of theoretical importance and what is not, but we believe that functional typology has dealt with this criticism well, by adapting a more rigorous approach to sampling, paradigm construction, and general analysis of the data. Formal theoreticians have a formal theory, its concepts and its methods. Moreover, they have borrowed some achievements of functional typology by addressing a wider array of languages and developing what can be called formal typology--this handbook is a testament to the growing popularity of formal comparative syntax. The similarity between the two typologies is in looking at the "same thing" across a large number of languages. However, given the fundamental differences in formal theoretical and functional typological approaches outlined in section 2, they seem to exist in parallel, complementing each other.

Nowhere do typology and formal comparative syntax differ more than in the nature of explanations for linguistic phenomena, something we discussed briefly in this chapter (see sections 2.1, 2.3, and 5.2.). We refer the reader to Newmeyer's work (1998; 2005), which draws the opposition between external explanations, popular in functional typology, and internal explanations that are common

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[15] See also the discussion on the distinction between argument marking (case marking) and argument indexing (agreement) in typology (Haspelmath 2013; Evans & Fenwick 2013, a.o.).

in formal syntax. The essence of external explanation is in relating linguistic and extralinguistic phenomena as manifestations of the same principles. Thus, external explanation is often defined negatively, as one where a given linguistic phenomenon is linked to a phenomenon or principle that either (i) is not particular to language or (ii) is outside the level of linguistic representation where the phenomenon belongs. On the contrary, the internal explanation is one that exists within the context of a given theory of language, and is based on the principles of that theory. Under this type of explanation, linguistic phenomena are accounted for by principles (i) built into the theory (hence the term 'theory-internal') or (ii) inherent in the level of linguistic representation to which the phenomena belong. External explanations work for cross-linguistic generalizations, but are less effective when applied to individual grammars. Internal explanations, on the other hand, are designed to capture language-specific phenomena, but are not always suitable for cross-linguistic generalizations on a large scale. If we adopt this insightful distinction, one is compelled to agree with Newmeyer that formal and functional explanations of cross-linguistic patterns are complementary, not contradictory (Newmeyer 2005: 135).

Word count: 10,009

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