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What is a system?
What is a function?
A study in contrasts and convergences

Elissa Asp

Everything having to do with languages as systems needs to be approached, we are convinced, with a view to examining the limitations of arbitrariness.1

(de Saussure 1986: 131)

Introduction

Ferdinand de Saussure (1857–1913) articulated some of the key concepts that framed linguistics in the twentieth century. Among his contributions was the distinction between syntagmatic and paradigmatic (or ‘associative’) relations (de Saussure 1986). Syntagmatic relations have to do with combinatorial possibilities – with constituency (one unit composed of one or more others) – but also (and perhaps more significantly in de Saussure’s formulations) with aspects of serial order and dependencies between items that allow, signify or constrain constituency. Serial order involves both permissible and impossible sequences that are language particular. For example, in English, except in a few loan words, the phoneme /s/ can precede, but not follow, a voiceless stop /t/ in a syllable onset (/st/ but not */ts/); articles precede, rather than follow, nouns with which they are in construction (a miracle not *miracle a); verbs precede their complements in unmarked orders (Sam eats squid not *Sam squid eats), and so on.

Viewed synchronically, such serial ordering for canonical syntags is largely arbitrary, although historical and comparative linguistics may provide accounts of when – and sometimes even why – a language has acquired a feature and what the allowable range of orderings is. Dependency relations, on the other hand, may be motivated by semantic features. For example, differences between prototypical intransitives (laugh, collapse, sneeze) and transitives (tickle, exclude, slice) are grounded in the participant roles associated with the meaning of the verbs. Similarly, features such as number and grammatical gender may be construed as motivated insofar as they index structural relations, although grammatical gender is referentially arbitrary, while number is motivated. And, again, languages vary in terms of whether and how such relations are expressed. These different types of syntagmatic relation may appear between items that are present in a construction.
In contrast, de Saussure (1986: 122) describes paradigmatic relations in terms of **absence**. What is present in a syntagm gets part of its **value** from its associates or ‘mnemonic group’, which may include not only morphosyntactic associates such as the inflectional paradigms for verbs or declensions of nouns, but also items related via semantic, lexical, phonological or phonetic features. Consider the following example.

(1) Sam slept through an afternoon

In example (1), the value of any particular item is partially determined by the absent items with which it is in contrast: the referent *Sam* versus relevant other participants; past not present tense; contrasts for semantic features of *sleep* versus, for instance, *doze*; and so on for the other selections. This value is partial since selection and interpretation may also be affected by items copresent in a syntagm. For example, simple past tense verbs may be ambiguous between habitual and single-instance interpretations. Features of an accompanying time adjunct can push interpretation towards one of these. So a partial paraphrase of example (1) with singular indefinite *an is on some occasion Sam did this*, but *the* in the same environment leaves the interpretation ambiguous. Thus the selection of items present in a syntagm can be seen as functionally motivated not only by contrast with their absent associates, but also by the syntagmatic environments in which they appear. For de Saussure, these axes – the syntagmatic and the paradigmatic; the arbitrary and motivated – were the central linguistic relations to be accounted for.

Curiously, although all linguistic models recognise paradigmatic contrasts to some extent, most frame grammars in terms of syntagmatic structures. This focus may follow from the cognitive salience of structural units. It may also follow from twentieth-century developments that foregrounded the importance of structure over meaning and, in work deriving from Chomsky’s research, the associated characterisation of syntax as the autonomous generative component of language, which had the effect of limiting paradigmatic relations to only those contrastive features necessary to define grammatical classes and structural potentials — although these are turning out to be rather many. In contrast, systemic functional linguistic (SFL) models treat paradigmatic relations as defining for language, and so focus extensively on formalising paradigmatic options in particular languages as **systems** and **system networks**. This reflects the largely European and British intellectual traditions in which SFL developed, which give prominence to the **functions of language**.

Interest in the uses or functions of language has a history in the Western tradition that dates back to antiquity insofar as classical and later scholars were concerned with language use in logic, rhetoric and poetry, as well as with ontological questions bearing, broadly, on relationships between language, thought and reality. Distinctions between language function and language form, and debates about the relative importance of each, appear equally ancient and persist in modern linguistics, marking differences that shape theoretical discussion insofar as linguists identify models as either primarily formal or functional.

This chapter outlines, first, what systems and functions are, and sketches their development in SFL. It then briefly explores approaches to systems and functions in recent work in the minimalist program (MP). Arguably, SFL occupies the functional and paradigmatic extremity of functional-formal and paradigmatic-syntagmatic axes, while MP occupies the other. Despite the contrastive positioning of models, there are points of convergence that suggest that systems and functions are among the ways in which the arbitrariness of language is limited.
Definitions and contexts

What is a system, broadly speaking?

In its broadest sense, the term ‘system’ refers to the relationships between any collection of elements (concrete or abstract; living or not; designed or natural) that are interconnected with each other such that changing some part of the system, for instance by removal or addition of items, affects the system as a whole or some part of it. Systems are open insofar as they may gain or lose elements through interaction with their environments. Such gains or losses change the internal structure, function and/or output of the system. If change results in continued existence and/or improved performance of the system, it is adaptive; otherwise, we see system failures of one sort and another. Systems are closed if they have finite elements (they neither lose nor gain elements – matter in physical systems), but interact with environments in other ways, such as the addition or loss of heat in closed physical systems. Closed systems are isolated if they do not interact with their environment at all, although genuine isolation appears to be hypothetical or approximate, rather than a real state in the physical world (Kolesnikov et al. 2001: 136). Systems in these broad senses include not only natural physical and biological systems, but also natural and designed social and semiotic systems, and are studied in specific disciplines ranging from thermodynamics and biology to sociology, psychology and cybernetics, and, following von Bertalanffy (1968), in general systems theory.

What is a system in SFL?

The notion that language may be characterised by systems takes both forms in SFL. On the one hand, language is defined as a large, open, dynamic system network, evolving and adapting in response to environmental demands (the uses speakers make of it) and also shaping the environments with which it interacts. In SFL, the primary environments of interest have been social (language as a social semiotic), instantial (discourse in interaction) and ontogenetic (language as both instrument and result of primary and secondary socialisation processes in development). There has also been a resurgence of interest in the origin of language and its relationships to human evolution. Halliday (1995), for example, proposes that the emergence of language provides the basis for evolving human consciousness and cognition.

On the other hand, the characterisation of systems in particular languages in SFL conventionally begins with closed systems as representations of grammatical phenomena and, although the closed systems of the grammar have often been contrasted with open set relations of the lexicon, early on Halliday (1961) described ‘the grammarian’s dream’ as the extension of system networks to encompass the lexicon as ‘most delicate’ grammar. Investigation into the possibility of realising the grammarian’s dream has periodically been taken up, for example by Hasan (1987), Tucker (1998), Neale (2002), Fawcett (2014) and Matthiessen (2014).

Grammatical systems are closed insofar as the number of options is finite and relatively small, though not necessarily binary. All systems are specified for environments. In early scale and category models (such as Halliday 1961; Gregory 2009 [1966]), these environments were grammatical construction types such as nominal/verbal group, major/minor clause and so on in a constituent hierarchy or rank scale. For instance, in English, the
nominal group is the environment for a system (NUMBER) contrasting count and non-count nouns; major clause is the environment for the system (MOOD) that specifies clause types as indicative or imperative and so on. One or more features of such syntagmatic environments constitute entry condition(s) for systems: clauses must have the feature +major (that is, +verb) for mood options to be available, while the feature +nominal is the entry condition for a system of number. The choices in a system are referred to as its ‘terms’: singular/plural are terms in the count system. Since some choices are dependent on others, a term in one system (such as count) can function as an entry condition for another. Movement from left to right through a system leads to finer classification and is referred to as ‘increasing the delicacy of descriptions’. The choice between terms in a system is mutually exclusive and obligatory insofar as one cannot, for example, choose a count noun and not select either singular or plural in a system that includes these options and no others. In systems in which selection of some feature is optional (such as +/- modality), the system-network will include negative (−modal) and positive (+-modal) options.

Thus a simple system for the number feature in modern English might look like Figure 3.1a, in which the environment is specified for nominal groups and the (square) brackets (that is, [ and ]) indicate a mutually exclusive ‘or’ relation. In more elaborated system networks, some systems may be conjunct, while others are hierarchically ordered. Figure 3.1b represents both situations. Modern English personal pronouns may be represented as involving conjunctive systems of case and person. Selections from both systems must be made. If first or third person are selected, there is a further option of number, while selection of third-person singular opens up options for gender. Braces (curly brackets – that is, { and }) are conventionally used for conjunct systems. The right brace in Figure 3.1b indicates that selection of gender is available as a choice for personal pronouns only with the features singular and third person. These thus form a

Figure 3.1 (a) A simple number system; (b) A consolidated personal pronoun system
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A conjunct entry condition for gender. A disjunct entry condition – ‘if a or b, then c or d’ – would simply substitute a bracket (‘or’) for the brace (‘and’).

In early scale and category models, systems were used for conventional morphosyntactic features of classes of units and their output was a feature (such as singular) or a bundle of features such as those for personal pronouns. The features (or feature bundles) were conceptualised as abstract ‘formal items/exponents’ related to other categories by the scale of exponence, or later realisation rules (for example Halliday 1961, 1968). In a system like that for personal pronouns, the ultimate exponents define single item subclasses whose realisations are words. In other cases, such as the number system or the mood system, exponents may have more distributed realisations. A feature such as plural in the nominal group might be overtly realised on a head noun or a determiner (or both) or not at all. From 1966 onward, Halliday argued that linguistic systems are ‘deeper’ semantic characterisations of meaning potential. One interpretation of this is that the systems are exclusively semantic and related to syntax and phonology by realisation rules. The Cardiff Grammar (CG) has explicitly developed this approach, as we shall see later in the chapter. However, Halliday himself has actually continued to work with distributed systems, primarily, although not exclusively, in lexicogrammar and phonology. The change, in the late 1960s, was that the syntactic systems became extensively semanticised and ultimately Halliday relabelled this stratum (between phonology and semantics) as ‘lexicogrammar’.

Three further features are necessary to complete this sketch of systems in SFL. First, the options in systems characterising the grammar of a language will ideally be weighted for probability of occurrence. For instance, Halliday and James (2005 [1993]) estimated the probability of selecting positive versus negative in a polarity system as approximately 0.9:0.1, whereas in the tense system simple past versus simple present are equiprobable at 0.5:0.5. Halliday (2013) observes that such probabilities are inherent features of semiotic systems, links them to entropy in information theory (Shannon and Weaver 1949), and further points out that probability distributions have implications for language learning and theories of markedness. For example, with the caveat that probability distributions will vary somewhat with text types, the selection of a 0.1 option in a low-entropy system will be more marked than its 0.9 alternative and none of the terms in an equiprobable system will appear marked. With respect to language learning, Halliday (2013) points to the association of probabilities with frequency of occurrence and its importance for acquisition, with more probable (hence more frequently encountered) constructions being acquired first. He also suggests that a bimodal system, in which terms are either equiprobable (0.5:0.5) or maximally skewed (0.1:0.9), might be easier to learn than one in which skewness is more variably distributed. He does not pursue this particular line, but the implications for English systems of polarity and tense are, obviously, that positive will be acquired before either tense or negation, but also that the markedness of negation – and perhaps also its affective salience – relative to the unmarked status of past/present may provide it with an ‘acquisitional advantage’. If other grammatical systems turn out to be either equiprobable or maximally skewed, one might hypothesise, and indeed empirically test, feature-systems acquisition stages based on probability distributions in children’s input.

Second, systems and system networks are conceptualised as representations of choices available to speakers. Halliday (1966, 1970, 2013) states that system networks are abstract formal representations of semiotic potential relevant at the level of a population, emphasising the idea that speakers make choices from them not as predictive of the behaviour of individuals on any specific occasion nor to suggest conscious choice on the part of speakers, but to foreground language function as the primary object of interest. Halliday (1966, 1995, 2013)
normally qualifies statements about unconscious choice to the effect that choices may be brought to conscious awareness and consciously made, should circumstances demand it. Thus choice and choosing characterise speakers as agents of their discourse, consciously choosing this or that from an explicitly known array of options, only exceptionally. However, the choices themselves are often referred to as processes for which systems are procedural algorithms guiding production, perhaps especially in computationally implemented models for text production (for example Fawcett 2013; O’Donnell 2013), but also generally as reflected in the habit of describing hierarchic systemic structure as temporal, sequential selection: one chooses this and then that. That there is some ambivalence around the status of systems as abstract representations of potential or as procedural algorithms, and around the notion of choice as involving conscious agents or not, is evidenced in the papers directly addressing aspects of these questions in Fontaine, Bartlett and O’Grady (2013).

Third, and relatedly, SFL models posit intrinsic functionality: that linguistic systems naturally cluster into networks whose boundaries are specified by broad metafunctions common to all natural languages. Specifically, the expectation is for significant interdependence amongst systems serving the same function such that choices within a function are more likely to be mutually or hierarchically constraining, whereas choices from different functions are relatively independent of each other. Similarly, change in a system, through addition or deletion of terms for instance, may affect the value of terms in systems localised to the same function, but not the value of terms in systems localised to other functions (Halliday 1968). From the point of view of systems theory, this is exactly what one should expect, so it may not seem particularly novel or insightful. However, it means that the systems in SFL are functionally localised – the metafunctions constituting another dimension of the environment for system networks – and motivated by use in context. This in turn opens the way to using systems not only as an interpretative linguistic base for discourse analyses ranging from instance to genre – work in which SFL linguists have extensively engaged – but also invites predictions about language acquisition, historical change, language typology and potential neural instantiations of language that deserve investigation. Exploration of these points and the metafunctional hypothesis necessarily refers to the conceptualisation of language functions, so we turn now to these.

What is a language function, broadly speaking?

If one asks ‘what is language?”, a common sort of response is that it is a system for communication – that is, a definition that refers to a global function or purpose (and to system). If one presses for more specific characterisations, one may get, among other possibilities, lists of functions or uses. We use language to express thoughts and emotions, to tell stories and jokes, to index identity, to get others to do things, to engage in social interactions (‘we were just talking’), to make poems, to think, and so on. These examples foreground two of three senses in which language is broadly understood as ‘functional’: it is construed as an instrument (variously of thought, emotion, communication and contact) and as action (storytelling, lying, joking, gossiping and so on). The third sense is related to the notion of language as systems – the contrasts internal to languages that are the bases for value. Collectively, these three perspectives on language function as instrument, action and system inform both common sense and theoretical models of language in some measure.

In addition to the pervasive influence of de Saussure, early-to-mid-twentieth-century European and British thinking about language reflected different dimensions of these broad functions. Among these, Carl Bühler’s (1934) organon model was explicitly instrumental.
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Modelled on Plato’s discussion in *Cratylus* of the function of language as an *organum* (tool) for communication, Bühler (1990 [1934]: 35) proposed expressive, representative and conative functions, which he described as ‘largely independent variable semantic relations’ that configured in complex language signs. The representative function had to do with ‘objects and states of affairs’ (a modification of Plato’s ‘things’) and as symbolic, in the sense that the associations of phonological form and representation are arbitrary (Bühler 1990 [1934]: 37). The expressive function indexically marked states in the speaker and the conative function as the appeal (or signal) to the addressee. The three functions are presented as simultaneously configured in speech events, and although Bühler says that the representational function takes precedence, he argues that the expressive and conative functions are equally important insofar as they warrant language in the first instance. The organon model was influential in part because it projected the roles of addressee into the signifying process, not merely as senders and receivers of messages nor as automata reacting to external stimuli, but as the source of conative and expressive functions that shape and motivate discourse.

Among many contributions, Prague school linguists developed functional characterisations of information structure. Of particular importance was Mathesius’ work beginning in the 1920s on prosodic and syntactic variations that signal speakers’ presentation of information as given or new, and as marked or unmarked for thematic prominence (for example Firbas 1964; Vachek 1966; Mathesius 1975). Bühler’s organon model complemented Prague school theories of information structure insofar as the former’s notion of the complex sign as simultaneously symbolic (representational and arbitrary), indexical (of the speaker’s state) and signalling (shaped with the addressee in mind) is consonant with the distinctions made between the unmarked form of a sentence and its coherent organisation in discourse, from the speaker’s perspective, into Theme (a message starting point, typically given information) and Rheme (the message highlight, new information), and the various syntactic and prosodic options for markedness. Thus Prague school linguists developed Bühler’s functional insights through characterisations of language-internal resources for message organisation and its discourse consequences.

Focus on language as action was a primary preoccupation of early-to-mid-twentieth-century British scholars. For instance, anthropologist Malinowski (1923) coined the terms ‘context of situation’ and ‘phatic communion’ to name factors relevant to conceptualisation of language function as a mode of action. He made two main points about context of situation.

1 Speech situations affect language use and function to such an extent that achieving coherent equivalence for translations requires not only access to a language, but also ethnographic description relating the context of situation to its ‘context of culture’ and to the pragmatic and interactional features of the situation in which speech is embedded.

2 Observation of language use in many contexts of situation suggests that it is not primarily an instrument for the expression of complex thought, but a mode of action for coordinating joint activities.

Malinowski (1923) argues that phatic communion – that is, talking about nothing in particular to establish and maintain social contact – is a special case of this second, more general, actional character of language. Phatic communion differs only because it is not an adjunct to other activities; rather, it is the social activity. In the philosophy of language, Wittgenstein (1953) developed related arguments that word meaning is defined by use(s) in context(s).
And Austin (1962) presented his theory of speech acts in the late 1950s – arguing that every utterance performs an action the interpretation of which requires inferential work on the part of addressees.

British linguist J.R. Firth was a major figure in this milieu, as professor of phonetics at University College London (1928–44) and later holding the chair in general linguistics at the School of Oriental and African Studies (1944–56). The approach to language that he initiated, the ‘London school’, informed many aspects of Halliday and colleagues’ work in developing SFL, and shared much with European and British functionalism. Firth (1957a: 137–67) adopted and adapted Malinowski’s insights on the importance of context in accounting for text meaning and textual variation, and on the nature of language as primarily a mode of action rather than reflection. Wittgenstein’s insights on the contextual determination of word meanings influenced Firth’s elaboration of the idea of collocation – that is, the mutual expectancy of words co-occurring in texts – as a way of investigating the meaning of individual words, stylistic patterns and restricted languages (Firth 1957b: 181). Collocation anticipates probabilistic and concordance studies in corpus linguistics, while the idea of restricted languages evolved in later work into functional varieties or registers associated with specialised fields and contexts of situation (for example Gregory 1967; Halliday and Hasan 1980). Continental influences, especially of de Saussure and Hjelmslev, were evident in Firth’s insistence on the importance of systemic contrast and syntagmatic colligation (Firth 1955), and the relational and stratified character of language (Firth 1957b). He argued for a polysystemic approach to the analysis of language (or preferably varieties within a language), with systems dispersed through the different levels (from context to phonetics) (Firth 1957b). In common with other functionalists of his time, he believed that the proper object of linguistic inquiry is text and the goal is to elucidate meaning (for example Firth 1955). Where he differed from Bühler and Prague school linguists was in his anti-mentalist stance, for example thinking it inappropriate to ‘regard language as “expressive” or “communicative”’ because that would ‘imply that it is an instrument of inner mental states’ which (to paraphrase him) we do not understand and cannot observe (Firth 1957b: 169). Instead, he argues that we should approach meaning with a ‘thoroughgoing contextual technique’ that ‘does not emphasise the relation between the terms of a historical process or of a mental process, but the interrelations of the terms – set up as constituents of the situation itself’ (Firth 1957b: 170). What he seems to have envisioned, given the dispersion of meaning into systems of contrasts in different levels, is an account of meaning in text that referred to systemic values (contrastive features), which, correlated with each other and with features of the context of situation, would cumulatively characterise meaning. If one were to transport Firth – unchanged in his views, but willing to engage with the neurosciences – into the present, he might be advocating for parallel distributed, bottom-up competition models in which ‘meaning’ is an emergent property.

The functional aspect that transformed ‘systemic linguistics’ to systemic-functional linguistics emerged out of the confluence of these European and British traditions, and understandably inherits much from them. The ‘scale and category’ models of the 1960s elaborated and synthesised many of Firth’s proposals, and (saliently) were polysystemic and functional insofar as they formalised features such as transitivity, mood, voice and so on as syntactic systems with structural outputs (for example Halliday 1961, 2002 [1964]; Gregory 2009 [1966]). The first shift away from this ‘distributed systems’ approach was Halliday’s (1966) paper ‘Some notes on “Deep Grammar”’ in which he proposed that system networks represent ‘underlying’ paradigmatic specifications of feature contrasts for surface syntagmatic structures. Theoretically, structural representations could then be relatively simple,
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since they would not be required to do all of the work of relating (deep/semantic) paradigmatic feature selections to surface structures. The paper and the project can be read as an explicit alternative to Chomsky’s approach to characterising relations between different, but related, syntagms as structural transformations.

What is a language function in SFL?

Sydney Grammar

Halliday seems to have first used the term ‘metafunction’ in 1973 – but the ideas appeared somewhat earlier. Influenced by Prague school work on theme and information and semantic structure (for example Firbas 1964, 1966; Vachek 1966), Halliday (1967a, 1967b, 1968, 1969a, 1969b, 1970) made explicit arguments for the metafunctional hypothesis. As noted earlier, the hypothesis is that the systems of a language naturally cluster into system networks that correspond to four broad language functions common to all languages. Languages have an experiential function: they allow the representation of experience in terms of events, states and relations, the participants in them and the circumstances in which they are embedded, as well as the logical relations between events and states in that experience. Halliday (1968: 209) associates this with the representational function in Bühler and semantic structure in Prague school work. Experiential and logical functions were later labelled as two components of an ideational function (Halliday 2002 [1979]). Drawing on Bühler’s and Malinowski’s insights, Halliday also posited an interpersonal function: languages are used as social action, to get or offer information or goods, to direct the behaviour of others, and to enact attitudes, evaluations and so on. And, influenced by the Prague school, natural languages have a discourse (later, textual) function: they allow information to be organised in terms of speakers’ assessments of focus and newsworthiness, and as related or not to prior discourse, to extra-textual context(s) or as anticipatory of upcoming news. The metafunctional hypothesis thus claims intrinsic functionality reflected not only in systemic contrasts, but also in the clustering of systems into functionally bounded networks that answer to demands of language use. These broad functions reflect components of contexts of situation conceptualised in terms of fields of experience that the language must represent and in which talk is embedded, the tenor that speakers take in relation to addressees and the mode of communication (as spoken, written, signed, spontaneous or not, and so on) (Gregory 1967; Halliday and Hasan 1980; Martin 1992).

Illustrated from the perspective of the clause in English, the experiential function is represented in the transitivity network in systems of process type and agency, the interpersonal function in the mood system and the textual function in the Theme system. These systems are posited as conjointly, rather than hierarchically, organised, with feature selections from systems in different functions contributing to different aspects of clause structure. The logical function accounts for structural recursion in terms of hypotactic and paratactic relations. These different functional selections contribute layers of different structural types to the clause that are conflated with each other such that any clause simultaneously configures selections from all functions.4

The different layers of structural representation are said to be functional in the sense that they represent feature selections from systems localised to different metafunctions that are relatively independent of each other, show dependencies between systems within metafunctions, are simultaneous and are contextually motivated. Metafunctional independence is evidenced in the relative freedom with which selections from systems such as mood and...
Transitivity may be made, interdependence in the interaction of interpersonal systems such as mood and modality, and the ‘relative’ quality of independence of systems located in different metafunctions in the interaction of systems such as transitivity and voice or theme and mood. The structures also exhibit some unusual properties from formalist perspectives. These include that clauses are not ‘headed’ (but groups are) and there is no movement nor are there any empty constituents. Each of these points reflects a position that contrasts with (some) other functional models and/or formal models, and is relevant in comparisons of other approaches to systems and functions. Not all of them can be addressed in this brief chapter, but they are worth keeping in mind.

Cardiff Grammar

The Cardiff Grammar (CG) developed by Fawcett and colleagues shares SFL assumptions about the systemic and intrinsically functional character of language. However, it is useful to highlight some of the key differences here in considering systems and functions. Fawcett (2013) has pursued a research agenda that respects Halliday’s (1966) arguments for treating systems as the generative semantic base, weighting them for probability and relating strata via realisation rules. The work has also been informed by Fawcett’s explicit rejection of the ‘anti-mentalist’ stance that Halliday seems to have inherited from Firth and by the research task of developing a computationally implemented text generation system. The result is a model that locates all systems in the semantics as algorithms (not choices) guiding production, with realisation rules relating features to syntax and phonology. The semantic systems are organised not into metafunctions, but into eight ‘strands of meaning’. In addition to experiential, interpersonal, logical and thematic networks, there are strands for negativity, validity, affect and information. This organisation sidesteps some of the complexity involved in including, for instance, affect, validity and mood in a single interpersonal network, while also avoiding ‘forced choice’ assignment of metafunctionally ambiguous (polarity) or heterogeneous (validity) strands to one or another metafunction. The Cardiff Grammar also differs in not positing systems as simultaneous (for example experiential and interpersonal selections precede textual selections). This is partly driven by the pragmatics of computer implementation, but Fawcett (forthcoming) also argues that it is functionally motivated insofar as message organisation presupposes something to organise. The semantic systems are in turn related to higher order conceptual and discourse planning components wherein ‘choices’ are actually made (Fawcett 2013). Conceptually, this organisation means that the syntax and phonology are outputs of the semantics in CG. The syntax itself is represented in flat, relationally labelled, constituent-like structures. Like the Sydney Grammar, clauses are not headed (but groups are), and since the grammar is organised realisationally, the syntax involves no movement; nor are any empty positions associated with movement, although null subjects are recognised in imperatives and non-finite clauses. The move away from simultaneous systems for the clause and the metafunctional hypothesis makes CG computationally tractable and demonstrates that it is possible to write a generative grammar along SFL lines.

What roles do systems and functions play in the minimalist program?

The MP is robustly ‘formalist’ and arguably ‘anti-functional’ in many senses, so it may seem odd to ask what role(s) systems and functions play within it. However, recent work in MP suggests that, in fact, systemic contrasts and intrinsic functions are an inescapable part of
language – to which one is inexorably led regardless of where or with what assumptions one starts. In the following, I briefly make the case for this observation. The research goals of MP are directed towards discovery of universal grammar (UG), assumed to be a generative procedure that makes language possible. Its focus is formal syntax, which in MP is generated by a bottom-up process (Merge) that selects pairs of lexical items defined by their formal contrastive features, combines them into sets and labels them with one of the terms in the set or a shared feature (Chomsky 1995). The features are checked by a matching process. Merge can apply to its own output, so is said to be recursive.

In MP, clause representations comprise a lexical layer consisting of a ‘bare phrase structure’ (the VP, a verb and its arguments) and a functional layer of phrases headed by features such as tense, agreement, aspects, voice and also, since the work of Rizzi (1997) and Cinque (1999), overtly textual (Topic and Focus) and interpersonal features associated with speech function, mood and modalities. Cinque and Rizzi (2008) hypothesise a version of UG in which every morphosyntactic feature will correspond to a functional head that is ordered in a universal structural hierarchy. They call this the ‘cartographic’ approach to syntax. They estimate that there may be some 400 features in the world’s languages, although not all languages will express all features and differences in orders will arise through movement (or adjustment of the hierarchy). They observe that the features and their orders arise at least in part from semantics and say in closing:

Syntax is organized to express meaning, but does not dissolve into the mere organization of meaningful units: UG expresses the possible items of the functional lexicon and the way in which they are organized into hierarchies, tailored on the needs of the expression of meanings, but not reducing to them.

Cinque and Rizzi 2008: 53

Note that the cartographic approach proposes that UG has a rich functional structure built on contrastive features that correspond to metafunctional components.

Two recent studies challenge the cartographic approach to UG. In a study comparing Holkomelem, Blackfoot and English, Ritter and Wiltschko (2009) make an argument in favour of hierarchically ordered universal functions, but against fixed content for functional categories. Specifically, they argue for a universal function (inflection phrase) that serves to deictically ground reported events to the utterance event. In English, tense serves this function. However, in Holkomelem and Blackfoot (respectively), location and person do. Here, notice that UG is being set up as defining functional structures with cross-linguistically variable instantiations. Cowper and Hall (2014) take things a bound further in asking, ‘Where do features come from?’ Their delightfully de Saussurean response is that ‘the ability to search for systematic contrast in the linguistic input, by correlating differences at various levels, is the only mechanism required to account for the abstract building blocks that make up . . . the formal features of grammatical systems’ (Cowper and Hall 2014: 17). Universal functions (which they do assume) arise from interpersonal and experiential functions (the conceptual–intentional interface) – such as the need to express speech functions, to deictically ground propositions, to express relations between processes and participants and the aspectual character of events – and from the articulatory–perceptual interface as both a resource for the development of phonological contrasts, for instance, and a source of constraints imposed by the requirements of serial or spatial ordering. Notice where we have arrived: this is a version of UG grounded in universal (experiential, interpersonal, textual and logical) functions that languages must serve one way or another, plus Merge and ‘the ability to posit formal
features from correlated categorical differences’ (Cowper and Hall 2014: 17) – a surprisingly systemic, or at least paradigmatic, and functional view.

To be sure, the representation and conception of language, and the goals, of MP differ from SFL in many fundamental ways. In MP, functions are conceptualised as ‘atomic’ morphosyntactic particles, akin to phonological features (such as +/−voice, +/−coronal), which head binary constituent structures, over which movement is ubiquitous; SFL avoids movement by grounding the grammar in paradigmatic contrasts and allowing realisation rules to specify structure. The ‘bottom-up’ conception of functions in MP contrasts with the global perspective provided by the metafunctional hypothesis. The lexicogrammatical divide is still assumed in MP and there is no evidence of any interest in using functionally informed descriptions of natural language texts as resources for the wide range of applications at which SFL linguists have excelled. Moreover, Chomsky (2005, 2013) regularly states that language is not for communication, is likely not evolved and is ill adapted for expression, and suggests instead that it is better conceptualised as ‘an instrument of thought’. The latter claim – by which he means that Merge made thought possible (for example Chomsky 2005) – curiously positions him in parallel with Halliday and Matthiessen (1999) insofar as they also see language as central for thought. However, they see interaction in social contexts as the ground for phylogenetic and ontogenetic development of language, whereas for Chomsky these too appear as incidental by-products of Merge. Chomsky (2005, 2013) further speculates that language (UG) may be a ‘perfect’ system – closed, with no redundancy, and isolated. The ‘isolated’ status is an inference from his arguments against gradual evolution from older domain general neurocognitive systems and associated attempts to detach UG from cultural and neurobiological environments. These positions are, of course, antithetical to SFL (and many other functionalist) conceptions of language and languages.

Prospects for systems and functions

Looking at the treatments of function and system in SFL and MP not only provides some scaffolding for seeing the theoretical contrasts listed above, but also highlights some convergence amongst models with very different theoretical objects and goals, suggesting that system, and the contrasts that systems formalise, and function, both global metafunctions and the atomic features realising them, are not ways of seeing language, but central to it, whatever one’s interests and preoccupations. The evidence of convergence also suggests areas in which theoretically motivated research, debate and fruitful interaction may be warranted. An obvious target is more typological and historical work exploiting the metafunctional hypothesis as a means of investigating differences that make a difference, particularly insofar as it suggests where to expect (or not) interactions amongst functional features. Another obvious target is experimental corpus work in language acquisition to empirically test feature-systems acquisition stages based on probability distributions in children’s input.

There should also be empirical investigations into neural bases for intrinsic functionality, including experimental testing of the trifunctional hypothesis, and into how selection processes are neurally supported, using functional imaging and neuropsychological testing. Additionally, the fact that system networks with simultaneous entry conditions are computationally intractable because of the complexities of the interactions (Fawcett, forthcoming) does not necessarily mean that they are cognitively intractable. Indeed, the metafunctional hypothesis suggests that, where there are significant interactions (and hence computational complexity), we should expect that the systems belong to the same functional domain.
What is a system? What is a function?

Identifying the neural networks that support metafunctions (or not) and selection processes would be significant first steps in addressing these questions. This kind of research promises different lines of evidence for thinking about our models. Such evidence would arguably have a bearing on what we take as central linguistic functions, whether we see choice as only extrinsic (in action systems) and systems as only semantic, as saturating linguistic processing or as limited to binary choices in local syntactic domains. Evidence that helps us to think about these kinds of questions should contribute to our understanding not only of the roles of systems and functions in a particular class of descriptions and models, but also of language, its relationships to contexts and the limits of the arbitrary.

Notes

1 Permission to reproduce the quote granted by Cricket Media.
2 See Berry, this volume, for more detail on realisation rules.
3 See also Fawcett, this volume.
5 See Fawcett, this volume.

References


What is a system? What is a function?


