

deaf language learners face in gleaning information from input. This effort is of great significance to the complete understanding of morphosyntax in acquisition.

In their entirety, the thirty chapters demonstrate how psycholinguistics, as an interdisciplinary field, approaches language production, language comprehension and language acquisition. This handbook is a well-written synthesis of representative studies in psycholinguistics. First, it is highly informative in that it contains a wealth of theoretical studies and empirical research, consequently making it a particularly useful resource and reference. Second, the handbook creates a rich picture of how language works in the human mind and how it is acquired, enabling researchers to quickly understand the state of psycholinguistics in the 21st century. The volume thus proves itself to be a worthwhile read for anyone interested in this area.

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T. Givón, *The story of zero*. Amsterdam & Philadelphia, PA: John Benjamins, 2017. Pp. xii + 414.

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Zero is a particular means of encoding phoric relations, which provides substitution of words or phrases in neighboring clauses to avoid repetition. This phenomenon has long been studied in rhetoric, poetry or narratives in terms of ellipsis or pronouns. *The Story of Zero* is the first monograph that systematically and exclusively explores the use of zero anaphora from a diachronic point of view.

Its author is Thomas (Talmy) Givón,¹ an eminent linguist who is widely regarded as one of the founders of West Coast Functionalism.

The book consists of two parts containing a total of thirteen chapters. Part I (Chapters 1–7) is entitled ‘Natural zero’, and expounds the view that zero anaphora has never been a bizarre phenomenon but rather the most natural means among all possible cohesive devices to warrant discourse coherence. The topic of Part II (Chapters 8–13) is ‘Structural zero’, and is an exploration of the use of zero anaphora in specific syntactic scenarios.

Chapter 1 begins with the relationship between the strands of discourse coherence and discourse structure, specifically the relationship between major referent-coding devices and discourse structure of clause chains. This is illustrated with examples from English, Spanish, Chinese and Japanese, which leads to a universal ‘referential continuity hierarchy’ that ranks from zero anaphora to unstressed anaphoric pronouns, to stressed independent pronouns, and then to full NPs, though assuming a different distribution across languages. For example, zero anaphora is rare in Biblical Hebrew and Spanish, where pronominal agreement is obligatory, while in Japanese and Chinese, where there are no unstressed anaphoric pronouns or pronominal agreement, the use of zero anaphora is extensive, and the frequency of zero anaphora strikes a middle ground in English and Ute (an Uto-Aztecan language, spoken in the western United States and Mexico), where there is little or no cliticization: Ute employs optional unstressed anaphoric pronouns which can cliticize onto any word type, especially clause-initial verbs, and roughly 70% continuous referents are zero-coded. English has no such cliticization.

Chapter 2 proposes the characterization of zero anaphora from a neuro-cognitive viewpoint. The processing of text is a cognitive procedure that stores, activates and identifies the mental information encoded by clause chains. The tracking of the information can be conducted by referential accessibility in a discourse, which can be accounted for by referential continuity such as long-distance NPs, short-distance zero anaphora or pronominal agreement, and by the intermediate independent pronouns or unstressed pronouns. Indefinite NPs, definite NPs, pronominals and zero anaphora have different degrees of activation and are related with permanent lexical semantic memory, long-term episodic memory and working memory, respectively. The story of zero is thus a legend of recurring referents and continuous activation in the working memory.

Chapter 3 is a diachronic study of the relationship between zero anaphora and the historical emergence of pronominal agreement. Synchronically, there is a precise cross-linguistic overlap between the referential continuity hierarchy by means of subjects, objects, indirect objects and oblique objects, and the structural use of zeros, which hints at a high probability that maximal continuity can be

[1] I am grateful to T. Givón for reading through this book review and offering some instructive suggestions that helped me to improve the draft. I remain responsible for any shortcomings.

encoded by zero anaphora, unstressed pronouns or pronominal agreement in subject slots. Diachronically, indefinite NPs are introduced into the discourse as maximally discontinuous by using left dislocation or presentative constructions, and are then 'upgraded' to express higher topicality in terms of definite NPs; these expressions then develop into demonstratives or stressed independent pronouns as intermediate topical devices, and finally into what are functionally the most accessible referential devices: unstressed clitic pronouns, zero anaphora or pronominal agreement. The contraction of paratactic left dislocation into a simple syntactic clause thus results in pronominal agreement substituting zero anaphora.

In Chapter 4, a case study of the distribution of referents in Ute shows that NP is strongly associated with maximal referential or thematic discontinuity. The stressed demonstratives can either be used as independent pronouns standing for a referent that is not too proximate but still assumed to be accessible to the hearer (thus marking intermediate referential discontinuity), or can be placed after the noun and destressed as post-nominal definite articles with clitic status (thus marking referents that are reintroduced into the discourse after a considerable gap of absence, a type of switch reference device). When a non-competitive topical referent has already been introduced into the discourse, for as long as the same referent continues and dominates the discourse for a stretch (typically within the same clause chain), zero anaphora is the default choice for maximal referential continuity and usually occupies the position of subject, eventually attaching to the verb as a pronominal agreement clitic.

Chapter 5 is aimed at proving the naturalness of the use of zero anaphora. As is widely known, bound morphology, phonological reduction, de-stressing and adjacency are universal criteria for cliticization, and the spoken mode can better represent the essence of the competence of language than the written mode. Data from spoken English reveal that 90% of unstressed subject pronouns and 100% of unstressed object pronouns are adjacent to predicates and behave overwhelmingly like verb clitics. Since subjects are more recurrent and topical than objects, the English subjects are more likely to be 'poached' by anaphoric zeros and thus to behave like subjects in classical null-subject languages (e.g. *She took her card and [Ø] came in*). Therefore, English, though a bona-fide configurational language which is assumed to have rigid word order and thus less chance of the use of zeros, has an apparent predilection for *pro*-drop, nominal zero anaphors and unstressed pronominals, just like non-configurational languages such as Chinese or Japanese.

Chapter 6 describes the use of zero anaphora in scattered verbless clauses, which illustrates how closely verbal zero anaphora resembles nominal zero anaphora, cognitively and communicatively. Chafe (1994) claims that verbless clauses are an integral part of the grammar and should be explained accordingly. The distribution of verbless clauses in English, Ute, child language, second language pidgin and Broca's aphasia shows that spoken language outweighs written in terms of the frequency of their occurrence, and that similarly, child language outweighs adult language and non-canonical language (such as pidgin or aphasia) outweighs the canonical; therefore verbal zeros are naturally 'part

and parcel' of pre-grammar or proto-grammar, and the verbless clause is an indispensable developmental stage that bridges the gap between the one-word clause and the simple verbal clause not only in ontogeny but also in phylogeny. Thus, just as nominal zeros, the use of verbal zero anaphora is as well-governed and licensed by predicate antecedents in the directly-preceding clauses, predominantly anaphorically (e.g. *He was wearing, uh, red shorts and white T-shirt. No shoes. . .*).

Chapter 7 ends Part I with an exploration of zeros in cataphora. These are as natural and ubiquitous as anaphora elsewhere, but are rarely discussed. Givón (1990) distinguishes promotional passives (constructions in which the topic-of-passive undergoes full promotion to subjecthood) from non-promotional passives (constructions in which the topic-of-passive does not undergo full promotion, but rather retains some characteristics of the active construction). In the case of promotional passive clauses, the zero-marking of the agent in adjectival-stative passives (e.g. *The window was broken (by Mary)*) is licensed by its predicate-adjective counterpart. The zero-marking of the agent in reflexive passives (e.g. *Mary got (herself) fired*) is accessible from the reinterpretation of the subject, while the zero-agent in the serial-verb adversative passive in (1) below can be explained by its impersonal-agent precursor.

- (1) Ta bei chezhi-le. (Mandarin)
 she PASS fire-PERF
 'She was fired.'

As for non-promotional passives, the plain zero passive (e.g. *Mary was killed by John*) apparently arises from its active counterpart, and nominalized-VP passives like that in (2) can recover their missing agents from the finite use of the VP involved.

- (2) Tøkuavi tøkã-ta-qha. (Ute)
 meat/Ø eat-PASS-ANT
 'The meat was eaten.'

Chapter 8 aims to establish a diachronic typology for the zero arguments in relative clauses, focusing on their evolution as well as the relevant strategies governing their construal. Universally, though non-restrictive clauses resemble parenthetical clauses more, both non-restrictive and restrictive relative clauses abide by the co-reference condition: definite head nouns are anaphorically presupposed and indefinite head nouns cataphorically asserted (213). The chapter examines the diachronic formation of relative clauses in Bambara (a Niger-Congo language spoken in Mali), Hittite (an extinct Indo-European language spoken in Turkey), Hebrew, Ute and German, claiming that the zero expression of the co-reference inside the relative clause is not an isolated phenomenon, but the outcome of the merging of two adjacent clauses with the evolution of language and therefore it is predictable from the corresponding zero anaphora in chained/conjoined main clauses or other paratactic counterparts.

The focus in Chapter 9 is on zero anaphora in verb complements. The zero-marking or pronominalization of the co-referent subject in complement clauses is derived diachronically from their corresponding nominalized verb phrases or arises diachronically from chaining clauses. Based on the analysis of finiteness, a cross-linguistic ‘complementation scale’ is proposed, which shows that the complements of modal-aspectual and manipulation verbs are more likely to be non-finite or nominalized, and in contrast, the complements of perception-cognition-utterance verbs are more likely to be finite. English, as a ‘mid-range’ language where neither modal-aspectual and manipulation verbs nor perception-cognition-utterance verbs prevail, yields a finely graded scale of finiteness in verb complements.

Based on investigations on data from Hebrew, Ute, Latin, Jiwarli (a Pama–Nyungan language spoken in Australia) and English, Chapter 10 is devoted to the discussion of co-reference in adverbial clauses. Diachronic data from Hebrew shows a rheology from finite relative clauses to nominalized VP complements, and eventually to temporal, causal or purpose adverbial clauses. Two adjacent clauses may undergo changes whereby one of them turns into a nominalized VP complement or a relative clause with possibly a head noun modified by a subordinator marking place, reason or purpose, etc., and establishes an analogical bridge by means of some presuppositional or factive semantic features with the other, the main clause. Then the head noun may drop, retaining only the subordinator, driving the VP complements or relative clauses into adverbial clauses. As could be expected from the diachronic source, co-reference in adverbial clauses is always coded by zero anaphora, abiding by the universal communicative principle that seems to govern all zeros: ‘Do not waste coding resources on what is predictable or recurrent’ (278).

Chapter 11 explicates the relationship between reference and clause-chaining by means of a quantitative text-based measure of anaphoric distance. The discourse coherence and continuity are encoded by referential devices forming a hierarchy ranking from zero anaphora, unstressed anaphoric pronouns, stressed independent pronouns to definite NPs and indefinite NPs. Zero anaphora is the most continuous, usually marking the same referent, while indefinite NP is the least continuous, marking switch reference as a reorientation device. There is a strong association between anaphoric referential continuity (accessibility) and cataphoric referential importance (topicality).

Chapter 12 surveys text-based data on non-finite complements such as infinitives or participials in English, Hebrew and Spanish, and finds that the allegedly ill-governed, or ambiguous, zero anaphora phenomena might be possible only in consciously fabricated context-free ‘competence’ situations, which are inconsequential in actual language use. For example, in context, no ambiguity occurs in the sentence *She left him to eat*, which can be interpreted either as ‘She left him so that she could eat her dinner’ or ‘She left him so that he could eat his dinner’. It is apparent that zero anaphors are unexceptionally controlled by antecedents from adjacent clauses, an overwhelming majority of which are subjects. This

reaffirms a key observation made throughout this book, namely that zero anaphora in language plays a central role in contexts of maximal referential continuity in natural discourse.

Chapter 13 is concerned with the relationship between zero anaphora and stranded adpositions. Stranded adpositions occur and case-recoverability problems arise when the original nominals undergo movements, leaving a zero slot or being replaced with pronominals/subordinators as in the case of relative clauses, constituent interrogatives or passives. In 18th-century written English relative clauses and constituent interrogatives, stranded prepositions (Ps) are affixed to interrogative pronouns or subordinators following *where*-P patterns (e.g. *the State where-in they reside*) or P-*whom/which* patterns (e.g. *the school to-which she went*), which is also the case in Standard German, Hebrew, Spanish and Ute. However, after a transitional hybrid period where V-stranded prepositions co-exist with preposition-affixed interrogative pronouns or subordinators, the adpositions are affixed to verbs, precipitating the universal use of verb-stranded prepositions, as illustrated by the bold expression in example (3) from Kinyarwanda (a Niger-Congo language spoken in Rwanda).

- (3) umupaanga umugabo ya-tem-ej-**eesha** igiti (Kinyarwanda)
 saw man 3S-cut-ASP-INSTR tree
 ‘the saw the man cut the tree with’

These stranded prepositions, much like grammaticalized case-markers, which tend to be bound morphemes, cliticize to whatever stressed expressions are adjacent and available.

The present book stands out for its complementary contribution to the study of anaphora in Generative linguistics (Abe 2014), which has long been studied from the perspective of Government and Binding Theory. Givón rejects the Generative methodology completely, and instead motivates the general principles underlying the use of zero anaphora from a communicative functional perspective, placing the phenomenon in diachronic cross-linguistic perspective. Another impressive feature of this book is its substantial use of language samples: the languages explored in this monograph amount to as many as 90 variants from different language families, including different styles or genres. In taking this approach, the author makes a very persuasive case, and offers a methodology that has the potential to explain various phenomena including nominalization, relativization, passivization, cliticization, pronominalization and tense and aspect in a wide range of languages.

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Jeffrey Lidz, William Snyder & Joe Pater (eds.), *The Oxford handbook of developmental linguistics*. Oxford: Oxford University Press, 2016. Pp. xxi + 1005.

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This volume, edited by Jeffrey Lidz, William Snyder and Joe Pater, contains a collection of overviews of different fields of developmental linguistics, which is defined by the editors as the branch of linguistics that focuses on the development of children's acquisition of native languages. The volume contains contributions by 45 leading scholars from across the globe, and constitutes a significant and comprehensive addition to the field of developmental linguistics, covering the core linguistic domains of phonology, morphology, syntax, and semantics/pragmatics in Parts I–IV, as well as computational approaches to learning in Part V, and learning in atypical populations in Part VI. The guiding principle of the book is to relate developmental findings to core generalizations accounted for by linguistic theory.

Chapter 1 offers an introduction by the three editors, which sets out the structure of the book and introduces each part. Parts I–IV constitute the bulk of the volume. Each chapter in these parts focuses on a specific area of grammatical knowledge and follows the same pattern. First an overview of the fundamental generalizations that guide current linguistic analyses is provided, followed by the relevant literature review, which outlines what is currently understood or theorized about children's development with respect to the phenomena under discussion, and, finally, considerations of language learnability are raised.

Part I focuses on children's acquisition of the sound system. In Chapter 2, 'The acquisition of phonological inventories', Ewan Dunbar & William Idsardi begin by introducing two traditional views of phonological inventories from the points of view of linguists and psychologists. The linguistic view focuses on the production of sounds by children, while the psychological view puts more emphasis on infant speech perception. By revisiting the two traditions, the authors present a four-way distinction of the phonological inventory and point out that phonological processing involves receptive, productive and storage systems, with the storage system interacting with both receptive and productive systems. The authors argue that the future of phonological inventory acquisition should focus on cognitive modeling of phoneme acquisition.