ENCYCLOPEDIA OF HEBREW LANGUAGE AND LINGUISTICS

Volume 3
P–Z

General Editor
Geoffrey Khan

Associate Editors
Shmuel Bolokzy
Steven E. Fassberg
Gary A. Rendsburg
Aaron D. Rubin
Ora R. Schwarzwald
Tamar Zewi

BRILL

LEIDEN • BOSTON
2013

Table of Contents

Volume One

Volume Two

Volume Three

Volume Four

ISBN 978-90-04-17642-3

Ben Yehuda, Eliezer. 1908–1958. *A complete dictionary of ancient and modern Hebrew* (in Hebrew). 17 vols. Jerusalem / New York: Yoselof.

Girdlestone, Robert B. 1897 (1978). *Synonyms of the Old Testament*. Grand Rapids, Michigan: Eerdmans.

Harris, Roy. 1973. *Synonymy and linguistic analysis*. Oxford: Blackwell.

Peretz, Isaac. 1965. "Milim nirdafot". *Sefer Ya'ir*, ed. by Eliyahu Weinstein, Mordchai Zer-Kavod, and Yehuda Raday, 63–95. Haifa: X̱ugim Secondary School.

Rabin, Chaim and Zvi Raday. 1974. *Thesaurus of the Hebrew language in dictionary form* (in Hebrew). 2 Vols. Jerusalem: Kiryat Sefer.

Sagiv, Yonathan. 2010. "Šeḥiṭa še-hi mešiḵa ve-ohel še-hu iša: Kivun x̱adaš la-paršanut ha-milulit šel Lešon X̱azal u-mniʿeha". *Judicial Studies Institute Journal* 9:1–15.

Scharfstein, Tzvi. 1964. *Oṣar ha-milim ve-ha-nivim*, 3rd edition. New York: Shilo.

Sovran, Tamar. 1994. *Semantic fields* (in Hebrew). Jerusalem: Magnes.

Spiegel, Shalom. 1935. "Midraš ha-nirdafim bi-lšonenu". *Lĕšonénu* 7:11–46.

Stutchkoff, Nahum. 1968. *Thesaurus of the Hebrew language* (in Hebrew). New York: Schulzinger Bros.

Avihai Shivtiel
(Emeritus, University of Leeds)

Syntactic-Semantic Interface in Hebrew

The syntax-semantics interface is concerned with the relationship between two kinds of recursive procedures, namely, the procedures that generate sentences in a given language and the procedures that assign meaning to those sentences. This entry reviews this complex relationship in light of research in generative linguistic theory.

Natural language often challenges speakers to derive salient differences in meaning from superficially similar expressions. For example, sentence (1) implies that Danny will do his homework himself, while in (2), Danny's teacher will do his homework for him.

(1) דני הבטיח למורה לעשות את שיעורי הבית שלו
dani hivṭiax̱ la-mora laʿaśot
Danny promised to.the-teacher to.do
ʾet šiʿure ha-bayit šelo
ACC lessons the-house his
'Danny promised the teacher to do his homework'.

(2) דני שכנע את המורה לעשות את שיעורי הבית שלו
dani šixneaʿ ʾet ha-mora laʿaśot
Danny convinced ACC the-teacher to.do
ʾet šiʿure ha-bayit šelo
ACC lessons the-house his
'Danny convinced the teacher to do his homework'.

How are these types of distinct interpretations computed? Every natural-language sentence is associated with a hierarchical structure, often diagrammed as a 'syntactic tree'. A central idea of 'generative syntax' is that the structure of the sentence is produced by a recursive procedure, 'Merge', which composes linguistic structure into more complex structure (Chomsky 1995:226). Within generative linguistic theory recursion is a key ingredient in understanding the human linguistic capacity to produce and comprehend a potentially infinite number of sentences with finite means. Semantics is concerned with understanding the meaning of such sentences. The 'semantic competence' of speakers may be understood as the ability, when presented with an utterance and a situation, to tell whether the sentence, in that situation, is true or false (Cresswell 1987). Semanticists are therefore concerned with understanding how the 'truth conditions' of sentences are computed by speakers (Tarski 1944). To deal with the recursive nature of syntax, semanticists have offered a variety of hypotheses about the recursive procedures that assign meaning to a sentence based on the meaning of its parts. Hypotheses concerning the syntax-semantics interface are thus concerned with the relationship between the recursive procedures of syntax and the recursive procedures of semantics.

In the model of this relationship proposed by Heim and Kratzer (1998) (which is one of the most widely accepted proposals), syntactic rules derive a hierarchical constituent structure called 'Logical Form' for each sentence and compositional semantic interpretation rules operate directly on that structure. The 'principle of compositionality', suggested by Frege (1879), is the idea that the meaning of a sentence is derived from the meanings of its parts and the syntactic operations that combine these parts.

A major point of controversy is how strictly compositionality applies. In some theories there is a complete homomorphism between syntax and semantics. Under this 'strong' interpretation of compositionality, the meanings of sentences are *fully* determined by the meanings of their constituents and how they are combined (Montague 1970; Fodor and Lepore 2002). Alternative theories allow for semantic rules that do not correspond to any syntactic process. In these theories each syntactic step still corresponds to a semantic step, but there is an additional inventory of purely semantic rules that serve to change the meaning of a constituent to 'fit' that of another (Partee and Rooth 1983; Hendriks 1988; Jacobson 1999; Barker 2002).

1. Means of Semantic Composition

Although syntax and semantics are autonomous recursive procedures, the structures generated by the two procedures are mostly isomorphic: a phrase that forms a syntactic constituent usually forms a semantic constituent as well (Partee 1975:213 and others). In the Heim-Kratzer model, there are three common semantic processes that serve to derive the interpretation of a syntactically complex phrase from the interpretation of its parts.

Functional application (FA). The task of a theory of semantic interpretation is to characterize how elements in a syntactic string relate to one another. This depends on how the meanings of the elementary building blocks (the lexical items that form the *terminal nodes* of a syntactic tree) are conceptualized. Functional application (FA)—so called because it applies a function to its arguments—is one way to interpret a branching constituent produced in the syntax. FA applies when the relationship between two syntactic elements is one of 'selection', such that one element denotes a function that selects another element as an argument.

A typical instance is the selectional relation between a verb and its complements, known as 'predication' (alternatively: 'θ-marking' [i.e., theta-marking] or 'thematic role assignment'). One basic property of predication is the 'θ-criterion' (Chomsky 1981:36), which requires that there exist a one-to-one relation between potential argument positions of a predicate and actually supplied arguments. For example, the verb הרס *haras* 'destroyed' in (3a) must contain a single nominal in its subject position; (3b) shows that two nominals are too many and (3c) shows that none is not enough. (3d) shows that 'destroy' must occur in the context of a Noun Phrase (NP) that can be interpreted as its object.

(3a) דני הרס את ארמון החול
dani haras ʾet ʾarmon ha-x̱ol
Danny destroyed ACC castle the-sand
'Danny destroyed the sand castle'.

(3b) *דני יוסי הרס את ארמון החול
**dani yosi haras ʾet ʾarmon ha-x̱ol*

(3c) *הרס את ארמון החול
**haras ʾet ʾarmon ha-x̱ol*

(3d) *דני הרס
**dani haras*

The relationship between the verb and the NPs in (3) is a basic semantic question. The observed one-to-one correspondence has motivated an analysis of verbs as mathematical functions. Crucially, an *n*-ary mathematical function requires exactly *n* arguments and is mapped to exactly one result, rendering the one-to-one property of predication predictable. So, for example, the meaning of the Verb Phrase (VP) 'destroyed the sand castle' is a function that takes one argument and returns either True or False as a result, depending on whether the sentence is true or false.

The phrase 'destroyed the sand castle' is itself semantically complex, involving one further predication relation. Consequently the semantic analysis of such a VP requires higher-order functions such as those explored in the works of Schönenfinkel (1924) and Curry (1930): a function whose result is itself a function. A transitive verb like 'destroy' is thus a function that, after applying to one argument (the object), yields as its result a function that can be combined with the subject, returning a truth value.

In order to define and apply functions to one another, the literature on semantics has adopted 'lambda calculus', first introduced by Church in the 1930s (1936; 1941). The format of a lambda expression is

(4) λ [parameter] . [body of the function]

where the parameter defines the kinds of arguments on which the functions operates (e.g., numbers or individuals), and the body of the function gives the rules for computing the function's value. Thus, the function that takes an individual and returns its mother is given in (5):

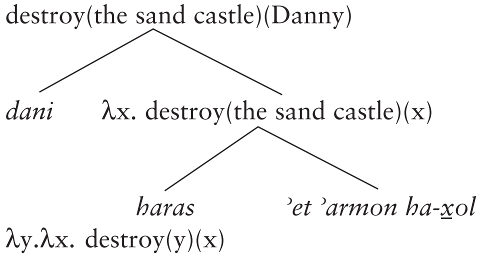
(5) λx. mother-of(x)

In lambda notation, the denotation of 'destroy' can be given as follows:

(6) λy.λx. destroy(y)(x)
(where 'destroy(y)(x)' means 'x destroys y')

Every time a function is applied to its syntactic sister, the denotation of the sister replaces the variable in the function, and the corresponding lambda term is erased to indicate saturation of the argument. The tree diagram in (7) below illustrates this derivation process for sentence (3a). For the sake of simplicity, את *ʾet* is assumed to be an accusative marker that does not contribute any semantic meaning.

(7)
Tree 1: Functional application


destroy(the sand castle)(Danny)
dani
λx. destroy(the sand castle)(x)
haras
λy.λx. destroy(y)(x)
ʾet ʾarmon ha-x̱ol

FA is not limited to verb-complement and subject-VP combinations. It has been argued to apply in such cases as an adjective and a noun joined by a copula as in (8), and two nouns joined by a copula, as in (9). The copula is regarded as semantically empty (i.e., a purely formal element) and the adjective in (8) is assumed to be a function from individuals to truth values, mapping exactly the blond individuals onto True (see Rothstein 1983).

(8) דינה היא בלונדינית
dina *hi* *blondinit*
Dina copula blond
'Dina is blond'.

(9) דינה היא ילדה
dina *hi* *yalda*
Dina copula girl
'Dina is a girl'.

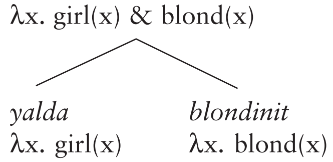
Predicate modification (PM). A second way of interpreting a branching constituent is Predicate Modification. The denotation of such a constituent is derived by intersecting the denotations of the two constituents it dominates. This method goes back to Quine (1960).

PM is used to interpret modified verbs and nouns. For example, the adjective 'blond' in (10) below presumably does not stand in a predicate-argument relation with either 'Dina' or 'girl', and thus cannot be straightforwardly analyzed using FA.

(10) דינה היא ילדה בלונדינית
dina *hi* *yalda* *blondinit*
Dina copula girl blond
'Dina is a blond girl'.

The predicate 'blond girl' is true of all individuals who are girls and are blond. This meaning is derived systematically from the meanings of 'blond' and 'girl,' by intersecting the two predicates. The tree diagram below graphically illustrates how the meaning of (10) is derived using PM:

(11)
Tree 2: Predicate modification



Predicate abstraction (PA). Predicate (lambda) abstraction is the operation that converts a formula into a predicate by binding a free variable within the formula to a lambda operator (Church 1941:5). PA is useful in the analysis of relative clauses, which have the surface syntax of sentences, but function semantically as modifiers (Quine 1960:110f.). By converting the formula into a predicate, it becomes possible to combine it with other predicates in the sentence, as is required, for example, in the case of example (12) below. Example (12) is true only in the case that Dina is a girl and Danny loves her (=Dina). If the meaning of the relative clause in (12) is the same as that of a regular sentence, then that meaning would be a truth value, which cannot be combined with the meaning of the predicate 'girl' using PM. The relative clause must first be converted into a predicate using PA, and only then combined with 'girl' using PM.

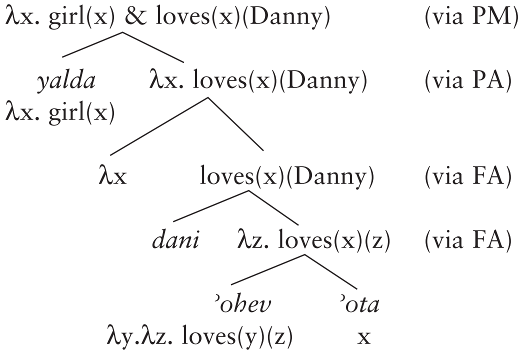
(12) דינה היא ילדה שאותה דני אוהב
dina *hi* *yalda* *še-ʾota(h)*
Dina copula girl that-ACC.her
dani *ʾohev*
Danny loves
'Dina is a girl whom Danny loves'.

Syntacticians have argued that the relative pronoun in (12) is related in some way to an argument position of the verb in the relative clause. In the following, it is assumed that this relationship is established by syntactic movement of the relative pronoun to an initial position of the relative clause, as in (13):

(13) who$_x$ Danny loves x

The tree diagram below illustrates how predicate abstraction is applied to the VP in example (12). For the sake of simplicity, as in the case of the copula and the accusative marker, the relative pronoun is assumed to be semantically empty:

(14)
Tree 3: Predicate abstraction



2. Syntax-Semantics Mismatches

Pro-drop languages. When the semantics of verbs is considered in more detail, it turns out that the view that predication in syntax and functional application in semantics are in a one-to-one correspondence calls for an expansion of the theory. In Hebrew, pronominal arguments of a verb need not be realized overtly in some cases. Rather, in such cases, the sentence seems to consist only of a verb plus agreement morphology, and an (optional) object.

(15) אכלתי עוגה
ʾaxalti *ʿuga*
ate.1CS cake
'I ate a/some cake'.

Clearly, this verb-based expression constitutes a full-fledged saturated sentence with truth conditions. However, the תי- *-ti* suffix is not a pronominal argument of the verb, as can be inferred from the fact that (15) has the same truth conditions and meaning as (16). Rather, תי- *-ti* simply marks agreement morphology on the verb. Thus, according to this type of syntactic analysis, the verb in (15) has no apparent argument to take as its subject, posing a problem for the account of predication as functional application.

(16) אני אכלתי עוגה
ʾani *ʾaxalti* *ʿuga*
I ate.1CS cake
'I ate a/some cake'.

One common solution to this problem is to assume that in Hebrew, as in many other languages, pronominal arguments may (in some cases, must) not be realized overtly. Rather, they are realized by a null (unpronounced) element called 'pro', whose denotation is resolved using the discourse content and the agreement features on the verb. Languages that allow this syntactic configuration are thus termed 'pro-drop languages' (e.g., Taraldsen 1978; Chomsky 1982; Rizzi 1986). Adopting this hypothesis allows for the preservation of the one-to-one correspondence between syntax and semantics and the derivation of truth conditions for sentences such as (15) using FA in the usual way.

Resumptive pronouns. A resumptive pronoun is a pronoun in a relative clause which occupies a position in that clause from which an element (the 'head' of the clause) has been extracted and which refers to that same element. In Hebrew, resumptive pronouns may not appear in the highest subject position of the relative clause (17a); they freely alternate with gaps in direct object positions (17b); and they are obligatory in oblique object positions (17c) (Shlonsky 1992:444–445).

(17a) האיש ש-(*הוא) אוהב את רינה
ha-ʾiš *še-(*hu)* *ʾohev* *ʾet* *rina*
the-man that-he loves acc Rina
'The man who loves Rina'.

(17b) האיש שראיתי (אותו)
ha-ʾiš *še-raʾiti* *(ʾoto)*
the-man that-saw.1cs acc.him
'The man whom I saw'.

(17c) האיש שחשבתי על-*(יו)
ha-ʾiš *še-x̱ašavti* *ʿal-*(av)*
the-man that-thought.1cs about-him
'The man whom I thought about'.

Sentences in which resumptive pronouns and gaps freely alternate seem in many cases to have semantically equivalent meanings, as can be seen from the comparison of (18a) and (18b) below. As in the pro-drop case, here too the semantics must deal with a difficulty for the theory of one-to-one correspondence between syntax and semantics, caused in this case by the optional extra argument of the verb.

(18a) השיר שאני אוהב
ha-šir *še-ʾani* *ʾohev*
the-song that-I like

(18b) השיר שאני אוהב אותו
ha-šir *še-ʾani* *ʾohev* *ʾoto*
the-song that-I like acc.it
both: 'The song which I like'.

One approach to resumptive pronouns is to view them as essentially the same as gaps. In such an approach, the pronoun is simply the overt filler of the gap created by the movement of the head of the relative clause (see McCloskey 2006 for an overview). Proponents of this approach can thus argue that resumptive pronouns do not contribute new information not already available in the gapped construction. The distribution of resumptive pronouns is restricted solely by syntactic considerations, and they are in effect invisible to the semantics. Therefore, semantics need not deal with any additional argument, and the one-to-one correspondence of syntax and semantics can be maintained.

Despite the appeal of this approach, cases exist in which the presence of a resumptive pronoun does bear on the meaning of the sentence. Example (19a) is ambiguous between a 'de-re' reading (i) (i.e., referring to a specific referent) and a 'de-dicto' reading (ii) (i.e., referring to a class). In (19b), the presence of the resumptive pronoun disambiguates the sentence in favor of the referential de-re reading, and the de-dicto reading is unavailable (Doron 1982:26–27).

(19a) דן לא ימצא את האישה שהוא מחפש
dan *lo* *yimṣa* *ʾet* *ha-ʾiša*
Dan not will.find acc the.woman
še *hu* *meẖapeś*
that he looks.for
(i) 'Dan will not find the [specific, existing] woman he is looking for'.
(ii) 'Dan will not find the woman he is looking for [who may not exist]'.

(19b) דן לא ימצא את האישה שהוא מחפש אותה.
dan *lo* *yimṣa* *ʾet* *ha-ʾiša*
Dan not will.find acc the.woman
še *hu* *meẖapeś* *ʾota*
that he looks.for acc.her
'Dan will not find the [specific, existing] woman he is looking for'.

It appears, then, that resumptive pronouns do indeed inform the semantics, and therefore cannot be ignored in its computation. The desideratum is a theory which will allow the resumptive pronoun to be kept available to the semantics, but at the same time block it from counting as an extra argument of the predicate.

References

Barker, Chris. 2002. "Continuations and the nature of quantification". *Natural Language Semantics* 10:211–242.

Chomsky, Noam. 1981. *Lectures on government and binding*. Dordrecht: Foris.

——. 1982. *Some concepts and consequences of the theory of government and binding*. Cambridge, Massachusetts: MIT Press.

——. 1995. *The minimalist program*. Cambridge, Massachusetts: MIT Press.

Church, Alonzo. 1936. "An unsolvable problem of elementary number theory". *American Journal of Mathematics* 58:345–363.

——. 1941. *The calculi of lambda conversion*. Princeton, New Jersey: Princeton University Press.

Cresswell, Max J. 1978. "Semantic Competence". *Meaning and translation: Philosophical and linguistic approaches*, ed. by Franz Guenthner and M. Guenthner-Reutter, 9–27. London: Duckworth.

Curry, Haskell B. 1930. "Grundlagen der kombinatorischen Logik". *American Journal of Mathematics* 50:509–536.

Doron, Edit. 1982. "On the syntax and semantics of resumptive pronouns". *Texas Linguistics Forum* 19:1–48.

Frege, Gottlob. 1879. *Begriffsschrift: Eine der arithmetischen nachgebildete Formelsprache des reinen Denkens*. Halle: Neubert.

Fodor, Jerry A. and Ernie Lepore. 2002. *The compositionality papers*. Oxford: Clarendon.

Heim, Irene and Angelika Kratzer. 1998. *Semantics in generative grammar*. Oxford: Blackwell.

Hendriks, Herman. 1988. “Type change in semantics: The scope of quantification and coordination”. *Categories, polymorphism and unification*, ed. by Ewan Klein and Johan van Benthem, 96–119. Edinburgh: University of Edinburgh Centre for Cognitive Science.

Jackendoff, Ray. 2002. *Foundations of language*. New York: Oxford University Press.

Jacobson, Pauline. 1999. “Towards a variable-free semantics”. *Linguistics and Philosophy* 22:117–184.

May, Robert. 1977. “The grammar of quantification”. PhD dissertation, MIT.

McCloskey, Jim. 2006. “Resumption”. *The Blackwell companion to syntax*, ed. by Martin Everaert and Henk van Riemsdijk, 94–117. Oxford: Blackwell.

Montague, Richard. 1970. “Universal grammar”. *Theoria* 36:373–398.

——. 1974. “The proper treatment of quantification in ordinary English”. *Formal philosophy: Selected papers of Richard Montague*, ed. by Richmond Thomason, 247–270. New Haven, Connecticut: Yale University Press.

Partee, Barbara H. 1975. “Montague grammar and transformational grammar”. *Linguistic Inquiry* 6:203–300.

Partee, Barbara H. and Mats Rooth. 1983. “Generalized conjunction and type ambiguity”. *Meaning, use, and interpretation of language*, ed. by Rainer Bäuerle, Christoph Schwarze, and Armin von Stechow, 361–383. Berlin: de Gruyter.

Pylkkänen, Liina and Brian McElree. 2006. “The syntax-semantics interface: On-line composition of sentence meaning”. *Handbook of psycholinguistics*, 2nd edition, ed. by Matthew Traxler and Morton A. Gernsbacher, 537–577. New York: Elsevier.

Quine, Willard. 1960. *Word and object: Studies in communication*. Cambridge, Massachusetts: MIT Press.

Reinhart, Tanya. 1983. *Anaphora and semantic interpretation*. London: Croom Helm.

——. 1992. “Wh-in-situ: An apparent paradox”. *Proceedings of the 8th Amsterdam colloquium*, ed. by Paul Dekker and Martin Stokhof, 483–492. Amsterdam: University of Amsterdam.

Rizzi, Luigi. 1982. *Issues in Italian syntax*. Dordrecht: Foris.

——. 1986. “Null objects in Italian and the theory of *pro*”. *Linguistic Inquiry* 17:501–557.

Rothstein, Susan. 1983. “The syntactic forms of predication”. PhD dissertation, MIT.

Sauerland, Uli and Armin von Stechow. 2001. “The syntax-semantics interface”. *International encyclopedia of the social and behavioural sciences*, ed. by Neil Smelser and Paul Baltes, 15412–15418. Oxford: Pergamon.

Schönenfinkel, Moses. 1924. “Über die Bausteine der mathematischen Logik”. *Mathematischen Annalen* 92:305–316.

Shlonsky, Ur. 1992. “Resumptive pronouns as a last resort”. *Linguistic Inquiry* 23:443–468.

Taraldsen, Knut Tarald. 1978. “On the nominative island condition, vacuous application and the that-trace filter”. Unpublished manuscript. Bloomington: Indiana University Linguistics Club.

Tarski, Alfred. 1944. “The semantic conception of truth”. *Philosophy and Phenomenological Research* 4:341–375.

Hadas Kotek
(Massachusetts Institute of Technology)

Syntax: Biblical Hebrew

1. Introduction

In the following survey the syntactic structure of Biblical Hebrew is primarily presented through a description of the realization of the three basic grammatical relations, the attributive, the predicative, and the objective. These syntactic relations are clearly reflected in the Semitic case system, which marks the different syntactic status of attributes, subjects/predicates, and objects/adverbials by three distinct vowels: i, u, and a, respectively (Goldenberg 1998b). From this case system only vestiges have survived in Biblical Hebrew. Phrases like חַיְתוֹ־אֶ֫רֶץ *ḥayṯō ʾɛrɛṣ* ‘beasts of the earth’ (Gen. 1.24), הַהֹפְכִי הַצּוּר *ha-hōp̄ḵī haṣ-ṣūr* ‘who turns the rock’, לְמַעְיְנוֹ־מָ֫יִם *lə-maʿyənō-mā̊yim* ‘into a pool of water’ (Ps. 114.8) display superfluous final vowels attached to the first noun, which are widely recognized as remnants of an earlier case system (for example, GKC 248–254; Waltke and O’Connor 1990:127–128; Joüon and Muraoka 2006:259–262; Williams 2007:10).

The division into three basic syntactic relations is also reflected in the Semitic pronominal system, including Biblical Hebrew, which has three distinct paradigms: independent pronouns (אֲנִי *ʾănī* / אָנֹכִי *ʾā̊nōḵī* ‘I’, אַתָּה *ʾattā̊* ‘you [ms]’, אַתְּ *ʾat* ‘you [fs]’, הוּא *hū* ‘he’, הִוא/הִיא *hī* ‘she’, נַחְנוּ/אֲנַחְנוּ *ʾănaḥnū/naḥnū* ‘we’, אַתֶּם *ʾattɛm* ‘you [mpl]’, אַתֵּן *ʾattēn* / *ʾattēnā̊* ‘you [fpl]’, הֵם *hēm* / *hēm* ‘they [mpl]’, הֵנָּה *hēnnā̊* ‘they [fpl]’) for subjects/predicates; possessive suffixes (בִּגְדִי *biḡḏī* ‘my garment’, בִּגְדוֹ *biḡḏō* ‘his garment’, etc.) for attributes; and object suffixes (שְׁמָרַנִי *šəmā̊ranī*, יִשְׁמְרֵנִי, *yišmərēnī* ‘He watched/watches/will watch me,’ שְׁמָרוֹ *šəmā̊rō*, יִשְׁמְרֵהוּ *yišmərēhū* / יִשְׁמְרֶנּוּ, *yišmərɛnnū* ‘He watched/watches/will watch him,’ etc.), distinct