

THE INTERPRETATION OF CONSTRUCT-STATE MORPHOLOGY

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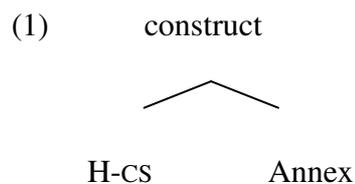
*Dedicated to Jean,
who has taught us that small forms make large generalizations.*

The paper argues that both nouns and adjectives are interpreted as relational in the construct state. Accordingly, relational nouns can all be inflected in the construct state, and so can some sortal nouns which can be coerced to a relational interpretation. Similarly, relational adjectives can all be inflected in the construct state, and so can some predicative adjectives which can be reinterpreted as relational when in construct with a relational annex. The present approach accounts for the non-modifiability of such relational annex, and the restriction of its denotation to intra-individual relations. The latter restriction also accounts for the possible reinterpretation of a possessive affix on the annex of a nominal construct as the possessor of the construct as a whole.

Keywords: state, nominal construct, adjectival construct, inter-individual relation, intra-individual relation

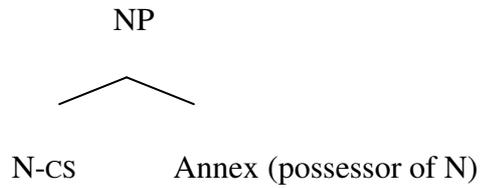
The paper proposes a semantic analysis of the Semitic construct-state morphology. It is based on an analysis of a type of adjectival construct which has received a great deal of attention in the theoretical literature. The paper proposes a new generalization concerning the distribution of adjectival constructs in Hebrew, with extensions to some properties of nominal constructs. The analysis builds on Heller's 2001 work and combines it with Doron and Meir's 2014 distinction between inter-individual and intra-individual relations. The paper provides an explicit semantics for adjectival constructs, unifying them with nominal ones.

The “construct” is a syntactic construction found in Semitic languages, consisting of a “Head” and an “Annex”. The head of the construct is marked by special morphology, called the “construct state” (CS), which is different from the unmarked form (called “absolute state”) of the head:



A “nominal construct” is a construct headed by a noun. It is typically a possessive construction where the head noun is possessee and the annex is possessor:

(2) nominal construct



I only discuss Hebrew examples in this paper. In (3), the noun ‘dress’ whose absolute state form is *simla*, shown in (3a), is shown in its construct-state form (with the suffix *-t*) when it heads the construct in (3b):

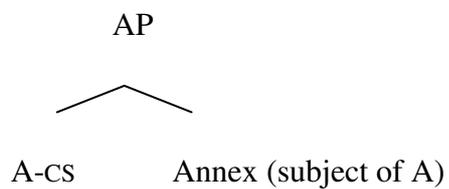
- (3) a. *simla*
 dress
- b. *simlat yalda*
 dress-CS girl
 ‘a girl’s dress’

The nominal construct has generated a host of theoretical issues: Berman 1978, 1988; Borer 1984, 1988, 1996, 1999, 2009; Coffin and Bolotzky 2005; Danon 2001, 2008, 2010; Dobrovie-Sorin 2000, 2003; Doron and Meir 2013, 2014; Englehardt 1998, 2000; Glinert 1989; Faust 2011; Hazout 1991, 1995; Heller 2002; Rothstein 2009; Meir and Doron 2013; Ravid and Schlesinger 1995; Ritter 1988; Siloni 2001, 2003; Shlonsky 2004, and many others.

In the “adjectival construct”, the head is an adjective, as in (4). The annex can be related to the adjective A in various ways, the most interesting one

being *the subject of A*.¹ In this type of adjectival construct, the adjective, for example ‘long’ in (5), forms a complex semantic relation with its annex ‘neck’ on the one hand, and with the noun ‘girl’ modified by the whole construct on the other hand. Additional examples are shown in (6) and (7).

(4) adjectival construct



(5) a. *aruka*

long

b. *arukat cavar*

long-CS neck

‘whose neck is long’

c. *yalda arukat cavar*

girl long-CS neck

‘a girl whose neck is long’

(6) *mirpeset agulat pinot*

balcony round-CS corners

‘a balcony of which the corners are round’

- (7) *xadarim gvohey tiqra*
rooms high-CS ceiling
'rooms of which the ceiling is high'

The adjectival head is restricted to non-suffixed adjectives. Derived adjectives such as *ga'avt-an* 'arrogant', *mamlaxt-i* 'ceremonious', cannot occur in this position (Glinert 1989). I suggest, though I discuss it no further here, that the lack of a CS form for suffixed adjectives may be due to the fact that the adjectival suffix (e.g. *-an* or *-i* here) is attached to a base noun which is already in the CS form (notice the CS suffix *-t* preceding the adjectival suffix).

The annex in adjectival constructs is typically a relational noun (Glinert 1989; Hazout 2000; Siloni 2000, 2002), such as body parts, spatial parts (e.g. 'ceiling' to 'room' in (7) above), but interestingly not kinship terms (Glinert 1989; Siloni 2002). The adjectival head in this construction is not directly interpreted as an attribute of the noun it modifies, but only indirectly, through being predicated of the annex, which itself is a relation taking the modified noun as argument. For example, "long" is not an attribute of the modified noun "girl" in the construct 'long-necked girl' in (5) above, but is predicated of the noun "neck" in annex position. The relation between "long" and "girl" is mediated by the relational annex "neck", which takes "long" as a predicate on the one hand, and "girl" as its argument on the other hand. Though the construct-state adjective functions

as the head of the construct, its annex, too, has head-like properties, since it takes the modified noun as argument. Accordingly, the annex is non-recursive in this construction, and disallows further modification and complementation (Borer 1996). Borer contrasts the ungrammatical (8) and (9) with the ungrammatical *yalda adumat simla/xulca* ‘a girl whose dress/shirt is red’:ⁱⁱ

(8) **yalda adumat simla qcara*
girl red-CS dress short
‘a girl whose short dress is red’

(9) **yalda adumat šarvuley xulca*
girl red-CS sleeves-CS shirt
‘a girl whose shirt’s sleeves are red’

Some accounts (e.g., Kremers 2005) nevertheless analyze construct state adjectives as attributed to the noun they modify. In the above examples, this can be paraphrased as: ‘a girl who is long (of neck)’ in (5), ‘a balcony which is round (of corners)’ in (6) or ‘rooms which are high (of ceiling)’ in (7). Such a paraphrase would be problematic (#‘a boy who is torn of shirt’) for an example like (10):

(10) *yeled qrua' xulca*

boy torn-CS shirt

‘A boy whose shirt is torn’

Among adjectival constructs, as in the case of nominal constructs, it is possible to discern between phrasal constructs, which are fully productive and have compositional meaning, such as the examples above, and idiomatic compounds, such as *qal raglayim* ‘light-legged’ meaning ‘fast’, *kvad mišqal* ‘heavy-weighted’ meaning ‘serious, important’, and *gvah lev* ‘high hearted’ meaning ‘arrogant’.

Our original adjectival construct example is repeated below in (11):

(11) *yalda arukat cavar*

girl long-CS neck

‘a girl whose neck is long’

In the spirit of Doron and Meir (2010), I make the following proposal for the interpretation of adjectival constructs:

(12) Given the head $\text{Adj}_{\langle e,t \rangle}$ and the relational annex $\text{N}_{\langle e,et \rangle}$, the interpretation of the construct $[\text{Adj}_{\text{CS}} \text{N}]$ is as follows:

$[\text{Adj}_{\text{CS}} \text{N}]_{\langle e,t \rangle} \rightsquigarrow \lambda x. \text{Adj}_{\langle e,t \rangle} (\text{ty } \text{N}(x)(y))$

According to this interpretation, the Adj_{CS} “long” in (11), leaving aside its vagueness and domain dependence, in combination with the relational noun “neck”, is interpreted as a property of individuals whose neck is long.

The first point in favour of the interpretation in (12) is that it mirrors the interpretation of the nominal construct proposed by Heller (2002). As in (12), the interpretation given by Heller in (13) relies on the relation N(x)(y):

(13) Given $N_{\langle e,et \rangle}$ and DP_e , the interpretation of the construct $[N_{CS} DP]$ is as follows:

$[N_{CS} DP]_e \sim \lambda y N(DP)(y)$

In Heller's view, a CS noun is interpreted as relational (or more precisely functionalⁱⁱⁱ). The CS head of the construct, which is cohesively attached to the annex, is particularly suited to express a lexical relation (such as “daughter”, “wife”, “colour”) to the annex. This is illustrated in the (a) examples of (14) – (16) below. In contrast, the less cohesive periphrastic possessive construction, where the possessor is separated from the head noun by a preposition (the preposition *šel* ‘of’), as illustrated in the (b) examples of (14) – (16) below, allows for a contextual association between the possessor and the possessee (Rosén 1957; Doron and Meir 2013, 2014):

(14) a. *bnot ha-mora*

girls-CS the-teacher

‘the daughters of the teacher’

b. *ha-banot šel ha-mora*

the-girls of the-teacher

‘the teacher’s girls’ (not necessarily her daughters, maybe her students, or girls associated in any contextually salient way)

(15) a. *ešet ha-cayar*

woman-CS the-artist

‘the wife of the artist’

b. *ha-iša šel ha-cayar*

the-woman of the-artist

‘the artist’s woman’ (not necessarily his wife, could be the woman he painted)

(16) a. *ceva ha-stav*

colour-CS the-autumn

‘the colour of autumn’ (the prevalent colour of nature in that time of year)

b. *ha-ceva šel ha-stav*

the-colour of the-autumn

‘autumn’s colour’ (the colour associated with autumn, e.g. the one in vogue in autumn fashion this year)

The relation denoted by the CS noun can be coerced from a sortal noun by specifying particular qualia relations. This type of relational interpretation was suggested by Heller (2002) following Partee and Borschev (2001, 2003) and Vikner and Jansen (2002), as a means of coercing sortal nouns to a relational interpretation. Thus a noun such as “car”, “gown”, which is basically sortal rather than relational, can be coerced to a relational interpretation which involves one of the qualia relations, such as “use”, “inclusion”, “authorship”, but it cannot be coerced to denote a relation which happens to be salient in the context, such as “betting on”, “placing an order for” etc. The latter can only be expressed by the less cohesive periphrastic possessive construction:

- (17) a. *mexonit ha-šaxen*
 car-CS the-neighbour
 ‘the neighbour’s car’
 (the car he uses)
- b. *ha-mexonit šel ha-šaxen*
 the-car of the-neighbour
 ‘the neighbour’s car’
 (could be the car he bet on)
- (18) a. *glimat ha-me’acev*
 gown-CS the-designer
 ‘the designer’s gown’

(he wears it/ he designed it)

b. *ha-glima šel ha-me'acev*

the-gown of the-designer

'the designer's gown'

(he may have ordered it for his wife)

The present proposal accounts for all the properties of Adj_{CS}:

1. The annex R cannot be modified by adjectives, prepositional phrases and quantifiers (as shown in (8) and (9) above). Our account relies on the relational nature of the annex, whereas these modifiers cannot combine with relational nouns unless those are first shifted to the sortal type <e,t> by existentially quantifying one argument.
2. The annex can nevertheless be complex, e.g. the conjunction of two nouns, as noted by Hazout. Our account relies on the fact that conjunction does not change the type of the conjuncts.

(19) *ha-yalda šxorat ha-se'ar ve ha-eynayim*

the girl black-CS the hair and the eyes

'the girl whose hair and eyes are black' (Hazout 2000)

Moreover, modifiers which apply to the whole AP are possible.

(20) *yalda arukat cavar ad-me'od*

girl long-CS neck very

'a girl whose neck is very long'

3. The relational noun in the annex is moreover interpreted as functional, e.g. "neck" in (11) is not just relational but functional: "long" is predicated of the unique neck of the girl. This is not merely a reflection of world knowledge, as the same uniqueness is assumed in the case of a noun with non-unique sortal denotation such as "dress" in *yalda adumat simla* 'a girl whose dress is red', not 'a girl who has a red dress'. Thus the functional interpretation of the annex is part of the interpretation of the adjectival construct.

4. The present account allows the attested lexical variety of relational nouns in the annex, such as body/ spatial parts, abstract attributes, transitive nominalizations, unlike Siloni (2002) and Rothstein (2012) whose account is limited to annexes denoting a mereological part of the modified noun:

(21) a. *til tlul maslul*

missile steep-CS trajectory

'steep-trajectory missile'

b. *motívim behirey céva*

motifs light-CS color

'light-color motifs'

c. *adam rax dibur / qtan emuna*

person soft-CS speech/ little-CS faith

‘soft-spoken/ skeptical person’

d. *yeynot mufrexey mexir*

wines outlandish-CS price

‘wines with outlandish price’

e. *sxirut qicrat tvax*

rental short-CS term

‘short-term rental’

f. *masax ópti mehir tguva*

screen optic fast-CS response

‘fast-response optical screen’

g. *sixot ramot déreg*

discussions high-CS echelon

‘high-echelon discussions’

h. *ra'ayonot qaley bicúa'*

ideas easy-CS implementation

‘ideas easy to implement’

5. Nevertheless there are lexical restrictions on the annex, which have not been accounted for by previous work. For example, the relation in the annex cannot be a kinship term (Glinert 1989):

- (22) **yalda yefat axot*
 girl pretty-CS sister
 ‘a girl whose sister is pretty’ (Siloni 2002)

I rely on the distinction introduced by Doron and Meir (2014) between inter-individual and intra-individual relations. Inter-individual relations are: kinship (mother, uncle...), socially defined (teacher, student), institutionally defined (captain (of a ship), capital (of a country)), telic/agentive qualia based (car/owner, picture/author). Intra-individual relations include part-whole, intrinsic properties, properties derived as nominalized transitive verbs. Only the latter type of annex is found in adjectival constructs:

- (23) **ha-šaxen šxor ha-mexonit*
 the-neighbour.M black-CS the car
 ‘the neighbour whose car is black’ (Hazout 2000)

- (24) *ha-me'acev šxor ha-glima*
 the-designer black-CS the gown
 ‘the designer whose gown is black’ (the one he wears, *not* one he designed, cf. 18a)

6. The restriction to intra-individual relations found in adjectival constructs may also account for a phenomenon in the realm of the nominal construct

observed by Borer (1984). Borer observed that some constructs, but not others, allow the possessive affix of the annex to be reinterpreted as the possessor of the construct as a whole:

- (25) a. *[signon ktivat]-o šel agnon*
style-CS writing-his of Agnon
'Agnon's style' (though the suffix "-his" is attached to
"writing" and not to "style")
- b. *[curat guf]-o šel ha-dolfin*
curat-CS body-its of the-dolphin
'the dolphin's shape' (though the suffix "-its" is attached to
"body" and not to "shape")

Normally, the possessive suffix of the annex can only be interpreted as the possessor of the annex alone, not of the entire construct:

- (26) a. *signon [mexonit-o šel agnon]*
style-CS car-his of Agnon
'the style of Agnon's car'
(it is the car which is Agnon's, not the car's style)
- b. *mexir [sifriyat-o šel agnon]*
price-CS library-his of Agnon

‘the price of Agnon’s library’

(it is the library which is Agnon’s, not the library’s price)

The difference in structure between (25) and (26) can be further demonstrated by the different options for pronominalization. In (25), the entire construct can be pronominalized by *ze/zot*, as shown in (27a-b), whereas in (26) only the construct-state noun can be pronominalized, as shown in (28a-b):

(27) a. [*signon ktivat*]-o *šel agnon šone mi- ze šel mápu*

style-CS writing-his of Agnon differs from that of Mapu

‘Agnon’s style is different from Mapu’s.’

b. [*curat guf*]-o *šel ha-dolfin šona mi- zot šel ha-livyatan*

shape-CS body-its of the-dolphin differ from that of the-whale

‘The dolphin’s shape is different from the whale’s.’

(28) a. *signon [mexonit-o šel agnon] šone mi- ze *(šel mexonit-o) šel mápu*

style-CS car-his of Agnon differs from that of car-his of Mapu

‘The style of Agnon’s car is different from that of Mapu’s car.’

b. *mexir [sifriyat-o šel agnon] šone mi- ze *(šel sifriyat-o) šel mapu*

price-CS library-his of Agnon differs from that of library-his of Mapu

‘The price of Agnon’s library is different from that of Mapu’s library.’

The different structure of (25) vs. (26) is also attested by an adjective modifying the head of the construct. Such an adjective agrees with the head it modifies in gender and number. In (25), the adjective modifying the head can follow the annex, as shown in (29), but in (26) this is impossible, as shown in (30):

- (29) a. *[signon ktivat]-o ha-meyuxad šel agnon*
 style_{M-CS} writing_{F-his} the-special_M of Agnon
 ‘Agnon’s special style’
- b. *[curat guf]-o ha-xinanit šel ha-dolfin*
 curat_{F-CS} body_{M-its} the-graceful_F of the-dolphin
 ‘The dolphin’s graceful shape’
- (30) a. **signon [mexonit-o ha-meyuxad šel agnon]*
 style_{M-CS} car_{F-his} the-special_M of Agnon
 ‘The special style of Agnon’s car’
- b. **mexir [sifriyat-o ha-gavoha šel agnon]*
 price_{M-CS} library_{F-his} the-high_M of Agnon
 ‘The high price of Agnon’s library’

When inspecting the examples where the possessive pronoun attached to the annex is reinterpreted as the possessor of the whole construct, it becomes

apparent that they too are conditioned by the annex denoting an intra-individual relation. Accordingly, this reinterpretation is possible for all nominal constructs derived from adjectival constructs, since the relation denoted by the annex in adjectival constructs is always intra-individual. I illustrate with the nominalization of (21f):

- (31) *[mehirut tguvat]-o šel ha-masax gdola mi- zo šel ha-miqlédet*
speed-CS response-its of the screen bigger than that of the keyboard
'The reaction speed of the screen is bigger than that of the keyboard.'

As in the case of adjectival constructs, nominal constructs with intra-individual annexes allow the properties of the annex to be inherited by the construct.

To conclude so far, I have proposed an interpretation for the adjectival head of a construct, and have argued that the annex of the adjectival construct is not restricted to denoting a mereological part of the noun modified by the construct. Rather, the annex denotes intra-personal relations, which are more general than the part-whole relation.

The last contribution of this paper is to propose a single interpretation for the CS morpheme, realized as e.g. the exponent *-t* which is found equally in a CS noun such as *simlat* 'dress-CS' in (3) and a CS adjective such as *arukat* 'long-CS' in (5). In (13) above, we adopted the view that in the realm of nouns, the CS morpheme only attaches to a relational noun (or a sortal noun

coerced to a relational interpretation). Let us now assume that this generalization holds of adjectives as well: the CS morpheme only attaches to relational adjectives. This accounts for those adjectives which are basically interpreted as relational, such as “soaked (with)”, “abound (with)” mentioned in footnote i. But it leaves out predicative adjectives such as “red”, “long”, “steep”, etc. I assume that predicative adjectives cannot be coerced to a relational reading. As a result, a derivation with a predicate adjective in the CS form crashes. There is, though, a possible way of rescuing such a derivation. It can be rescued by a rebracketing which combines the CS morpheme with the annex rather than with the adjectival head (in case the annex is a relational noun):^{iv}

- (32) Given the head $\text{Adj}_{\langle e,t \rangle}$ and the relational annex $\text{N}_{\langle e,et \rangle}$, then
- $$[[\text{Adj CS}] \text{N}] \rightarrow [\text{Adj} [\text{CS N}]]$$

Following the rebracketing in (32), the semantics interprets the CS morpheme as attached to N. We can therefore propose a unified interpretation for the CS morpheme on the basis of (13) above, where it combines with a relation (a nominal relation in the case of (13) and (32)):

- (33) Given a relation $\text{R}_{\langle e,et \rangle}$, the interpretation of CS (independent of its direction of attachment to the head) is as follows:
- $$\text{CS} \sim \lambda R \lambda x \lambda y \text{R}(x)(y)$$

We can now combine the interpretations of Adj and [CS N] to derive an AP of type e_t by using the ordinary rule of function composition \circ :

$$\begin{aligned}
 (34) \quad & \text{The interpretation of the function composition of } \text{Adj}_{\langle e, t \rangle} \text{ with} \\
 & \text{[CS N]}_{\langle e, et \rangle} \text{ is as follows:} \\
 & [\text{Adj} \circ [\text{CS N}]]_{\langle e, t \rangle} \rightsquigarrow \lambda z. \text{Adj}_{\langle e, t \rangle} ([\text{CS N}] (z)) \\
 & = \lambda z. \text{Adj}_{\langle e, t \rangle} (1y \text{N}(z)(y))
 \end{aligned}$$

The interpretation we have now derived for the adjectival construct is equivalent to the one we originally proposed in (12) above independently of the interpretation of the nominal construct.

To conclude, it is possible to reduce the interpretation of the adjectival construct to that of the nominal construct, on the basis of a single interpretation of the CS morpheme. The interpretation of the adjectival construct is derived by composing two functions: the ordinary interpretation $\text{Adj}_{\langle e, t \rangle}$ of the adjective, together with the nominal construct interpretation $\text{N}_{\langle e, et \rangle}$ of the adjective's nominal annex N. The composition of the two separate functions $\text{Adj}_{\langle e, t \rangle}$ and $\text{N}_{\langle e, et \rangle}$ within the interpretation of a single adjectival construct accounts for the intra-individual restriction on the relation N, as it enables both Adj and N to be defined on a single domain of discourse where the adjectival construct is defined.

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ⁱ Another type of adjectival construct, where the annex is the complement/adjunct rather than the subject of A, is simpler, and is not discussed in this paper. In this case, A is not a predicative adjective predicated of the annex, but a relational adjective taking the annex as its complement/adjunct:

(i)a *mimxata sfugat dma'ot*
 hankerchief soaked-CS (with) tears
 'a handkerchief soaked with tears'

(ii)a *mišpaxa merubat yeladim*
 family abounding-CS (with) children
 'a family with many children'

The relational adjective in this type of construct, but not in the type discussed in the text, can be expressed in the unmarked absolute form, taking a prepositional complement:

- (i)b *mimxata sfuga be- dma'ot* (ii)b *mišpaxa meruba be- yeladim*
 hankerchief soaked with tears family abounding with children
 'a handkerchief soaked with tears' 'a family with many children'

ii Rothstein 2012 cites examples with a modified annex from a period predating native speakers of Modern Hebrew. In Modern Hebrew, a modified annex is not found in the type of adjectival construct discussed in the present paper, where the annex is the subject of the adjective. This restriction is irrelevant to the type of adjectival construct mentioned in fn. i, where the adjective is relational, and the annex is the complement of the adjective rather than its subject e.g.

- (i)c *mimxata sfugat dma'ot xamot*
 hankerchief soaked-CS (with) tears hot
 'a handkerchief soaked with hot tears'
- (ii)c *mišpaxa merubat yeladim qtanim*
 family abounding-CS (with) children small
 'a family with many small children'

iii Heller considers the relation N_{CS} in (13) as always being *functional*, i.e. as relating a *unique* y to any DP in its domain. For example, the relation "colour" in (16) (which is the interpretation of "colour_{CS}") is functional, i.e. it denotes the unique colour of each individual in its domain. This uniqueness is part of the interpretation of CS nouns, independently of the definiteness of the possessor. Both (i) and (ii) below denote a unique colour. In (iii), though the annex is indefinite, the construct appears within a partitive construction, an environment typical of definite DPs.

- (i) *ceva ha-aron* (ii) *ceva aron*
 colour-CS the-closet colour-CS closet
 'the colour of the closet' 'the colour of a closet'
- (iii) *putru šliš me-ovdey mif'al-šimurim be-xacor*
 fired third from-workers-CS factory-canning in-Hatzor
 'A third of the workers of a canning factory in Hatzor were fired.'

iv The rebracketing is not phonological but morphological, as it attaches the CS morpheme to a relational noun even if this noun is a conjunction of two nouns, or is modified by the definiteness marker *ha-*, as in (19) above.