HEBREW DEFINITENESS MARKING AS POST-SYNTACTIC LOCAL DISLOCATION*

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1 Introduction

Hebrew attributive adjectives agree in definiteness with the nouns they modify in addition to their agreement in gender and number. Previous studies consisted of two types of accounts for the definiteness agreement. The first type of account analyzes the definite marker *ha*- as a D head selecting the adjective it marks for definiteness (similarly to nouns) (e.g. Sichel 2002); the second type of account analyzes the definite marker as a a syntactic definiteness feature inherent to the noun or determiner that spreads to other elements in the DP (e.g. Borer 1996).

In this paper, I present novel data from degree modification of coordinated adjectives. I show that the scope ambiguities and definiteness marking patterns in various structures provide evidence for an analysis whereby definiteness is a syntactic feature that surfaces as the phrasal clitic *ha*- 'the'. In addition, I show that the structure-sensitive, though post-syntactic, morphological operation of LOCAL DISLOCATION generates the correct distribution of the Hebrew definite marker, namely it being a phrasal proclitic occurring at the left-edge of phrases, as well as the intricate pattern of definiteness agreement in Hebrew attributive adjectives.

The structure of this paper is as follows. In Section 2 I present the data from degree modification of coordinated APs. Next, in Section 3, I review previous analyses of definiteness, highlighting their difficulties in accounting for the novel data. I then propose in Section 4 an analysis that is based on insights from previous work, but which introduces certain crucial new elements needed to account for the new data, specifically utilizing the PF operation Local Dislocation to account for the distribution of the definite marker. I conclude in Section 5 that my analysis may be useful to account for patterns of procliticization of definiteness marking in other languages.

2 Data

Hebrew attributive adjectives follow the nouns they modify and must agree with them in definiteness, gender, and number. For example, in (1), the adjective *ktana* 'small' agrees with the singular, feminine noun *dira* 'apartment' in these features. Definiteness marking patterns in

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a different way: When the degree modifier *me?od* 'very' follows the adjective it modifies, the adjective is the element marked for definiteness (1a); when the degree modifier precedes the adjective, the definite marker is affixed to the the degree modifier and not the adjective (1b).

- (1) a. ha-dira ha-ktana (*ha-)me?od the-apartment.FS the-small.FS (*the-)very 'the very small apartment'
 - b. ha-dira ha-me?od (*ha-)ktana the-apartment.FS the-very (*the-)small.FS 'the very small apartment'

Coordinated APs in Hebrew exhibit interactions between definiteness and degree modification. When the degree modifier follows both conjoined adjectives (2), both conjuncts must be marked for definiteness. In addition, the structure receives two readings: a narrow scope reading, in which the degree modifier only modifies the adjective is immediately follows, and a wide scope, in which the degree modifier modifies both conjuncts. When the degree modifier precedes the second conjunct (3), again both conjuncts must be marked for definiteness, but in this configuration only the narrow scope interpretation, in which the degree modifiers modifies the second conjunct only, is possible. When the degree modifier precedes both conjuncts, the possible interpretations depend on the definiteness marking. When only the degree modifier is marked for definiteness and neither adjective is (4), only the wide scope reading is available. When the second conjunct is marked for definiteness (5), the narrow scope, in which the degree modifier modifies the first conjunct only, is the only one available.

- (2) ha-dira ha-ktana ve-*(ha-)yekara me?od the-apartment the-small and-the-expensive very Readings:
 - (i) 'the (very (small and expensive)) apartment'
 - (ii) 'the small and (very expensive) apartment'
- (3) ha-dira ha-ktana ve-*(ha)-me?od yekara the-apartment the-small and-the-very expensive
 Only reading: 'the small and (very expensive) apartment'
- (4) ha-dira ha-me?od ktana ve-yekara the-apartment the-very small and-expensive
 Only reading: 'the (very (small and expensive)) apartment'
- (5) ha-dira ha-me?od ktana ve-ha-yekara the-apartment the-very small and-the-expensive Only reading: 'the (very small) and expensive apartment'

The scope ambiguities in the data in (2-5) can be accounted for structurally, mapping different interpretation to different structural relationships between the adjectives and degree modifier. The pattern of definiteness in this data set suggests that the definite prefix marks phrases in such a way that it determines the scope of degree modification. While the degree modifier takes scope over both adjectives in (4), the definite marker on the second conjunct in (5) prevents the degree modifier from taking scope over the second conjunct, which results in a narrow scope reading. An analysis of the data discussed here, therefore, requires two components: First, the structural relations of degree modifiers and other projections in the DP

must derive the correct scope interactions. Second, the analysis of definiteness marking must account for the phrasal proclitic status of the definite affix *ha*- 'the'.

3 Standard Analyses of Definiteness in Hebrew

In section 1, the definiteness marking on attributive adjective and (in certain configurations) their modifiers was discussed. Previous studies on definiteness marking mainly focus on definiteness marking on nouns rather than on inflectional marking on adjectives and other noun modifiers. Most of these studies involve a D head as the trigger for definiteness on the noun (Siloni, 1997, Fehri, 1999, Danon, 2002, Shlonsky, 2004, Pereltsvaig, 2006), and a few others discuss an alternative whereby the source of definiteness marking is the noun (Borer, 1996, Wintner, 2000). Only few of these studies explicitly discuss the morphosyntactic operations that result in definiteness marking on modifiers, and the only analysis that works out the details of definiteness marking on adjectives and its interaction with pre- and post-adjectival modifiers is Sichel 2002.

Sichel (2002) analyzes the inflectional definite marker (i.e. the one marking modifiers such as adjectives) as a projected D head selecting for an AP. The nominal definite marker (i.e. the one marking nouns) is directly generated at N^0 . When the adjective moves from its base position to the functional head F^0 , the resulting structure is of post-adjectival modification, as shown in (6a). Alternatively, when the whole AP (containing both the degree modifier and the adjective, but not the NP, which has moved to Spec,DP) moves to Spec,F, the resulting structure is of pre-adjectival modification, as shown in (6b). Thus Fischel accounts for the free distribution of degree modifiers by optional internal movement.

(6) a. Post-AP modification as a result of head movement:



b. Pre-AP modification as a result of phrasal movement:



Although the account captures the facts for single and serial adjectives, when coordinated adjectives modified by a degree term are considered, certain structural configurations are not compatible with a functional selection structure and a movement account. Recall the definiteness marking and scope ambiguity facts presented in section 2. An analysis in the spirit of Sichel may easily account for sentences like (4), in which the degree modifier precedes both adjectives, is marked for definiteness, as well as takes wide scope. Such an analysis, however, either fails to account for the other structures discussed or requires a substantial number of stipulations, such as banning the coordination of certain structures with no independent motivation.

For example, structures such as (2), in which the degree modifier follows the definitenessmarked, conjoined adjectives, is ruled out by Sichel's analysis, as in a structure in which the degree modifier takes wide scope over both adjectives (in A conjunction), only the first one is definiteness-mark, yielding an ungrammatical sentence, as illustrated in (3).

(7) A coordinated structure (at the A level) following Sichel's account:



And so, in order to account for a structure such as the one in (5), in which both adjective are marked for definiteness and the degree modifier modifies the first conjunct only, the structure

must involve coordination at D', so both APs can be marked for definiteness. However, a structure in which both adjectives are definiteness-marked, the degree modifier cannot take wide scope over both of them, as degree modifiers are generated at Spec,AP under this analysis, and not at Spec,DP, as shown in (8).

(8) A coordinated structure (at the D' level) following Sichel's account:



In short, the only existing account for the way definiteness marking of adjectives pre- and post-adjectival degree modification are derived is challenged by the data concerning degree modification and definiteness marking in coordinated adjectives.

4 Analysis

In this section I propose an account that draws upon existing analyses the treat definiteness marking of adjectives as a result of an agreement operation, and argue that scope ambiguities can be accounted for by analyzing degree modifiers as adjuncts of APs rather than Deg heads that functionally select them (Abney 1987 et seq.). The distribution of the definite marker on adjectives, I propose, is the morphological realization of a [+DEF] feature, which surfaces as a marker of phrases rather than heads as a result of a post-syntactic operation of Local Dislocation, whereby the definite marker *ha* 'the' dislocated to the left edge of linearized phrases and affixes to coordinated elements by pointwise application.

The analysis I propose is couched in the Minimalist Program (Chomsky, 2000) and Distributed Morphology (Embick and Noyer, 2001). The relevant background assumptions for my analysis are that structures are a result of the successive application of syntactic operations (namely MOVE and MERGE, but possibly ADJOIN) to a collection of lexical items. Each lexical item consists of phonological, semantic and syntactic features. Selectional (subcategorization) features drive the merging of lexical items. The syntactic feature this paper is concerned with is [+DEF]. I argue that this feature is generated in D⁰ and is checked by the operation AGREE that is established between syntactic objects under a c-command relation.

The structural assumptions I am making are illustrated in (9). Unlike analyses in the spirit of Abney (1987), I treat APs and Deg(P)s as adjuncts. The NP moves to Spec,DP, following

previous analyses of the Semitic DP (Ritter 1988 et seq.) Following Fehri (1999), APs are generated in dedicated positions in the functional layer *n*P, in which φ and DEF features are checked via Agree.

(9)



For clarity of presentation, I spell out the lexical entries in each projection, but the actual phonological forms of words are inserted at a later stage, namely Phonological Form (PF), once all syntactic operations are completed. I present in Section 4.1 the set of assumptions relevant for the PF operations responsible for the pattern of definiteness marking.

4.1 Distributed Morphology

The premise behind Distributed Morphology is that there is no centralized lexicon; phonological and semantic information, category, and syntactic features are 'distributed' throughout the grammar. That is, the eventual surface form and ordering of elements in a sentence is a result of interface interactions between the different syntactic, phonological and semantic features, some of which are inherent to the lexical items themselves and some are acquired by them as a result of syntactic and PF operations (Halle and Marantz, 1993).

The procedure is as follows. Syntactic operations manipulate bundles of morphosyntactic features, which lack any morphophonological realization in the syntax. Category, φ , and DEF features are the relevant features for this account. Once the syntactic derivation is complete, the feature bundles are sent to PF where they are given morphophonological content, a process called VOCABULARY INSERTION. To illustrate, a structure like the one in (9) is submitted to PF, and the nodes are filled with morphological information (the lexical items at the terminal nodes). The nodes d^0 and D^0 are each filled with the definite marker *ha*. Then, the structure is linearized, but the hierarchical structure of constituents is still visible to subsequent operations (LINEARIZATION).

After Linearization, LOCAL DISLOCATION may apply. Local Dislocation involves switches in linear order between two nodes, conditioned by precedence relations (Embick and Noyer, 2001, Embick, 2003). The operation is defined in (10). Following Local Dislocation and other operations that may apply in this step, PF derivation finishes with a complete phonological linear representation and prosodic domains are built.

(10) Local Dislocation:

 $X \ast Y \to Y\text{-}X$

The linear order of X and Y can be potentially reversed just in case X is left-adjacent to Y.

Now that the structural and morphological have been outlined, I will now detail how the analysis I propose accounts for the data presented in Section 2.

4.2 Proposed Analysis

The interaction between definiteness marking and possible interpretations of degree modification in coordinated APs I described in Section 2 follows from the internal DP structure I proposed earlier in this section and the morphological operation of Local Dislocation that results in the definite marker dislocating to the left-edge of a linearized constituent (in this case, the AP). I will go over the derivation of single and multiple APs and then turn to coordinated APs to show how the analysis derives the various structures.

4.2.1 Single and Multiple APs

In DPs with one adjective modified by a degree modifier, such as the one in (9), the structure is submitted to PF. Following Vocabulary Insertion and Linearization, the structure is as given in (11a). This linearized structure is the input of Local Dislocation, which moves both definite markers to the left edge of the constituent they mark, as shown in (11b). The final phonological linear representation is given in (11c).

- (11) a. (9) after Vocabulary Insertion and Linearization: $[_{DP} dira * ha [_{nP} yekara * ha]]$
 - b. Local Dislocation:
 [DP ha-dira [nP ha-yekara]]

c. Final phonological representation: ha-dira ha-yekara the-apartment the-expensive 'the expensive apartment'

The main difference between the structure of a DP with a single AP and one with multiple APs is that a structure with multiple APs generates as many nPs (i.e. as many dedicated functional projections) as there are APs, as in (12). The structure is submitted to PF, and after Vocabulary Insertion and Linearization, it looks like the structure in (12a). Subsequently, the three definite markers locally dislocate to the left edges of the respective linearized constituents they are in, resulting in the structure in (12b). The final phonological linear representation is given in (12c).

(12) Syntactic structure of ha-more ha-xaruts ha-kodem 'the previous industrious teacher'



'the previous industrious teacher'

And lastly, degree modifiers are either right- or left-adjoin to APs, as in (13). When a structure with a pre-adjectival degree modifier is linearized, the degree modifier is at the left edge of the linearized AP, as shown in (13a). Local dislocation of the definite marker to the left edge of the AP results in the definite marker preceding the degree modifier, as illustrated in $(13b)^1$.

¹Note that the only grammatical output of Local Dislocation in this case is the order Def-Deg-A but not *Deg-Def-A. This may suggest that Local Dislocation cannot target structures within the entire AP; that is, the structure [AP me?od yekara] 'very expensive' is treated by Local Dislocation as one indivisible unit.

(13) Syntactic structure of *ha-dira ha-me ?od yekara* 'the very expensive apartment':



- a. After Vocabulary Insertion and Linearization: [DP dira * ha [nP me?od * yekara * ha]]
- b. After Local dislocation:
 [DP ha-dira [nP ha-me?od-yekara]]
- c. Final phonological representation: ha-dira ha-me?od yekara the-apartment the-very expensive 'the very expensive apartment'

4.3 Coordinated Adjectives

Having discussed the structures with single and multiple APs, degree-modified or not, I now turn to coordinated adjectives. First, I assume a simple ternary branching structure of coordination for ease of illustration, but a binary structure along the lines of Munn (1993) would be compatible with my analysis. Second, I propose that coordinated structure are linearized as an ordered set; that is, their linearized order mirrors their hierarchical structure, but they are still visible to post-syntactic operations as individual structures, as is depicted in (14).

(14) Coordination structures linearization: $[X] \& [Y] \rightarrow \begin{cases} X \\ Y \end{cases}$

The idea that linearized coordinated structures are an ordered set is important to the analysis of definiteness-marking of coordinated adjectives in Hebrew. Recall that all coordinated adjectives in a definite DP must be marked for definiteness. Once the coordinated APs are linearized, they are all adjacent to a n^0 with a [+DEF] feature, whose exponent is *ha* 'the'. Following Linearization, just in case the definite marker is left-adjacent to a linearized coordinated structured, it affixes pointwise to each conjunct, as illustrated in (15). (See Hankamer 2008 and Kramer 2010 for similar analyses.)

(15) Definite Pointwise Attachment: $def * \begin{cases} X \\ Y \end{cases} \rightarrow \begin{cases} def - X \\ def - Y \end{cases}$

Following Linearization, Local Dislocation of the definite marker, and its pointwise application to each conjunct, *ve* 'and' can affix to the last conjunct (or all non-initial conjuncts,

in special cases). I leave to future research the question of whether *ve* 'and' (or multiple instances thereof) are initially projected in the syntax or whether the affixation of *ve* 'and' to the different conjuncts occurs at PF, following a dedicated pointwise application similar to—but crucially, following—the affixation of *ha* 'the'.

Now that the PF operations relevant to definiteness marking in coordinated APs have been made explicit, we are now in the position to discuss the derivation of the various structures presented in Section 2. First, the structure in (2), in which *me?od* 'very' takes scope over both conjuncts: The wide scope reading is derived from the structure in (16), in which Deg(P) c-commands both conjuncts². This structure is submitted to PF and looks like the structure in (16a) after Vocabulary Insertion and Linearization. Subsequently, Local Dislocation of the definite marker applies, resulting the structure in (16b). After Local Dislocation, the coordinated APs are adjacent to the definite marker, and so it attaches pointwise to each conjunct, as illustrated in (16c). And finally, after *ve* is affixed to the final conjunct, the final structure is as given in (16d)



a. After Vocabulary Insertion and Linearization:

²In order for this account to be complete, the definition of c-command must be adapted to allow adjuncts to c-command other structures contained in the same maximal projection, in this case an AP. Since DegP in the structure in (16) is adjoined to AP, it is not dominated by it, and therefore could not c-command the coordinate APs contained in this same structure. I follow Barbiers (1995) and Svenonius (2002), who redefine c-command so that segments should count as categories (cf. Kayne 1994) for the calculation of c-command relations.

c. After pointwise application of the the definite marker *ha* to the adjacent coordinated APs:

$$[ha-dira] [_{nP} \begin{cases} ha - ktana \\ ha - yekara \end{cases} ve me ?od]$$

d. After ve 'and' is affixed to the final conjunct:

ha-dira ha-ktana ve-ha-yekara me?od the-apartment the-small and-the-expensive very 'The very small and expensive apartment'

Recall that the structure in (2) has another reading in which *me ?od* 'very' takes scope over the second conjunct only. This reading is straightforwardly derived from a structure in which DegP is adjoined lower, to the second conjunct, as in (17). The PF operations applied to this structure, however, yield the same linear surface structure as in (16), as shown in (17a-d)

(17) Syntactic structure of *ha-dira ha-ktana ve-ha-yekara me?od* 'the very small and expensive apartment', the narrow scope reading:



c. After pointwise application of the the definite marker *ha* to the adjacent coordinated APs:

 $[ha-dira] \begin{bmatrix} ha-ktana \\ ha-yekara-meod \end{bmatrix} ve]$

d. After *ve* 'and' is affixed to the final conjunct:
ha-dira ha-ktana ve-ha-yekara me?od
the-apartment the-small and-the-expensive very
'The very small and expensive apartment'

I turn now to (4), in which *me?od* 'very' precedes both conjuncts, is the only element marked for definiteness among the modifiers, and takes wide scope. The wide scope reading is, again, straightforwardly derived from a configuration in which DegP is adjoined higher up in the structure and thus c-commands both AP conjuncts, as in (18). After Linearization (18a), Local Dislocation of the definite marker applies, resulting in it dislocating to the left-edge of the nP (18b). At this point, the definite marker affixes to the adjacent *me?od* (18c). Note that since no coordinated structure is adjacent to the definite marker, there is no pointwise attachment to the adjectives, resulting in no definiteness marking on them and definiteness marking on the degree modifier only (18d).

(18) Syntactic structure of *ha-dira ha-me?od ktana ve-yekara* 'the very small and expensive apartment':



The last structure in question is the one in (5), in which *me?od* 'very' precedes both conjuncts as well (like in 4). In contrast with (4), however, both the degree modifier *me?od* 'very' and the second adjective conjunct are marked for definiteness. The resulting reading is one in which only the adjective that immediately follows the degree modifier is modified by it. Similarly to the other structures discussed, the narrow scope reading can be derived from the structure: The degree modifier adjoins lower in the structure, to the first AP conjunct, as shown in (19). Linearization will lead to a conjunction in which the degree modifier and the first adjective are linearized as one unit, and this unit is the first member of an ordered set, as illustrated in (19a). After Local Dislocation, the definite marker is left-adjacent to the coordinated structure, as in (19b), and subsequently applies pointwise to both conjuncts (19c), yielding the structure in (19d), in which both conjuncts are marked for definiteness.

(19) Syntactic structure of *ha-dira ha-me?od ktana ve-ha-yekara* 'the very small and expensive apartment':



Only reading: 'the (very small) and expensive apartment'

In conclusion, the puzzling data presented in Section 2 is a product of classical structural scope ambiguities (in degree modification) and post-syntactic dislocation of the definite marker.

5 Conclusion

This paper promotes an analysis whereby definiteness marking stems from by a definite feature projected on D^0 . Multiple cases of definiteness marking is accounted for by the syntactic operation Agree whereby D^0 values other projections for the definiteness feature if certain structural relations hold, namely c-command. The observation that the Hebrew definite marker is a phrasal proclitic is derived from PF operations, Local Dislocation in particular. Local Dislocation leads to the dislocation of the definite marker to the left-edge of the constituent it is in. In addition, intricate data from degree modification in coordinated APs and its interaction with definiteness marking motivated me to put forth the proposal to return to an analysis whereby APs and DegPs are adjuncts of—rather than functional heads selecting—the structures they modify.

Cross-linguistic accounts featuring c-command relations between triggers and licensors of definiteness have been proposed for other languages (see Katzir 2011 for Danish, Icelandic, and Greek). Likewise, the role of post-syntactic operations in the distribution of the definite marker (Kramer 2010 in Amharic) and other elements that have the surface form of an affix (Hankamer, 2008) have been explored. This paper is an adaptation of many of the insights enumerated in these studies to the data in Hebrew. An account along the lines of the analysis proposed here, which considers the syntax and morphology in tandem, may prove useful in a cross-linguistic account of definiteness marking and the behaviour of other proclitics as well as their interaction with the syntax-semantics interface.

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