

## THE ADJECTIVAL CONSTRUCT IN ARABIC

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## Abstract

We propose an analysis of the adjectival construct in Arabic in LFG, building on previous work in LFG on a Welsh construction which shows several similarities to the Arabic (Mittendorf and Sadler, 2008) and work on the MSA and cognate Hebrew constructions by Hazout (2000); Kremers (2005); Siloni (2002); Heller (2002) and Kim (2002). The construction involves an adjective occurring with an immediately following definite nominal, which denotes a property, part or quality of the noun that the adjective modifies (in attributive use) or is predicated of (in predicative constructions). The major characteristics of this construction are that the post-adjectival nominal serves to delimit the respect in which the adjective denotes a property of the external nominal, and the adjectival head and the GEN complement are subject to a very strict adjacency requirement. We present a syntactic analysis, showing that the construction is formed in the syntax rather than the morphology, and sketch out a proposal as to how the semantics of the construction might be captured.

## 1 Introduction

We propose an analysis of the adjectival construct in Arabic in LFG, building on previous work in LFG on a Welsh construction which shows several similarities to the Arabic (Mittendorf and Sadler, 2008) and work on the Modern Standard Arabic MSA and cognate Hebrew constructions by Hazout (2000); Kremers (2005); Siloni (2002); Heller (2002) and Kim (2002).<sup>1</sup>

## 2 The Adjectival Construct

The adjectival construct consists minimally of an adjective or participle in construct with a noun which specifies the degree or manner of the property expressed by the adjective: an example appears in boldface in (1). It is traditionally described as *ʔdaafa ǧayr ḥaqīqīyya* or the false construct phrase. It is found in both Modern Standard Arabic (MSA) and in the Arabic vernaculars, although all the work that we are aware of concerning this construction discusses its MSA instantiation (basically Kremers (2005) and passing references in the literature on Hebrew.).

- (1) *imraʔ-at-un*     **ǧamīl-at-u**     **-l-waǧh-i**  
woman-F-NOM beautiful-F-NOM the-face-GEN  
a woman with a beautiful face (Kremers, 2005)

It has the external distribution of an AP, occurring both attributively as in (1) and (2) and predicatively, shown in (3) and (4).

- (2) *bayt-un*     **katīr-u**     **-l-'abwāb-i**  
house-NOM.INDEF many-NOM the-doors-GEN  
a house with many doors (Kremers, 2005)

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<sup>1</sup>We are grateful to Tracy Holloway King and the audience at LFG09 for comments and suggestions and to members of the Essex Arabic Syntax Workshop for discussion of contemporary work on MSA and the Arabic vernaculars.

<sup>1</sup>Examples are taken from these sources but normalised to a single transliteration system, DIN 31635.

- (3) *'anta* <sup>c</sup>**azīm-u** **-l-ḥazz-i**  
 you great-NOM the-fortune-GEN  
 You are very lucky.

(Kremers, 2005)

- (4) *kāna* **huwlandiy-a** **l-ʔaṣl-i**  
 was dutch-ACC the-origin-GEN  
 He was of Dutch origin.

(Ryding, 2005, 254)

The ‘inner’ N is obligatorily definite in MSA (and this is one aspect in which the construction differs from both its Hebrew and Welsh counterparts). In addition, the ‘inner’ N appears in GEN case in MSA (one area of difference between MSA and the vernaculars is that case marking is absent in the latter). A striking characteristic of the construction is that nothing can intervene between the Adj head and the GEN complement. As shown in (5), adjectival modifiers such as intensifiers normally come directly after the adjective they modify. However, if that adjective is itself in construction with a genitive complement, that complement obligatorily separates the adjectival head from its modifier, as illustrated by the grammaticality contrast between (6) and (7).

- (5) *ḡamīl-un* *ḡiddan*  
 beautiful-NOM very  
 very beautiful

- (6) *imraʔ-at-un* **ḡamīl-at-u** **-l-wajh-i** *ḡiddan*  
 woman-F-NOM beautiful-F-NOM the-face-GEN very  
 a woman with a very beautiful face

- (7) *\*imraʔ-at-un* **ḡamīl-at-u** *ḡiddan* **-l-wajh-i**  
 woman-F-NOM beautiful-F-NOM very the-face-GEN  
 a woman with a very beautiful face

The adjective in attributive use agrees with the head noun in CASE, NUM and GEN, which is the expected behaviour for adjectives in MSA. So for example, (8) is a noun phrase headed by a definite FSG noun which is itself modified by an adjective *l-barlamāniyyat-u* and the adjectival construct *l-wāsiʕ-at-u l-naḡūd-i*. In each modifier the adjective agrees with the head noun in CASE, NUM and GEN. (9) is headed by a FSG indefinite noun, which is modified by an adjectival construct *mutawassiṭ-u l-ḥaḡm-i* in which the adjective agrees with the head noun in CASE, NUM and GEN.

- (8) *al-laḡnat-u* *l-barlamāniyyat-u* **l-wāsiʕ-at-u** **l-naḡūd-i**  
 the-committee.FSG-NOM the-parliamentary.FSG-NOM the-wide.FSG-NOM the-influence-GEN  
 the widely influential parliamentary committee (Ryding, 2005, 254)

- (9) *qidr-un* **mutawassiṭ-u** **l-ḥaḡm-i**  
 pot.FSG-NOM.INDEF medium.FSG-NOM the-size-GEN  
 a medium-sized pot (Ryding, 2005, 254)

The examples above also show the adjectival construct showing definiteness agreement (alongside other attributive adjectives). However it differs in one respect in its agreement behaviour, in that it cannot show indefinite agreement (nunation) with an indefinite nominal head.

- (10) *\*imra<sup>?</sup>-at-u-n*                      **ḡamīl-at-u-n**                      **-l-wajh-i**  
 woman-F-NOM-INDEF beautiful-F-NOM-INDEF the-face-GEN  
 a woman with a beautiful face (Kremers, 2005, 3)

Unlike compounds, the construction is productive and gives rise to compositionally predictable meanings. Furthermore, the sort of evidence that may be interpreted to support a morphological analysis for the adjectival construct in Hebrew (see Hazout (2000)), or in favour of a special prosodic status (see Siloni (2002)) is absent in MSA.

The construction expresses a particular relation between the two nouns. It typically occurs modifying a head noun within an NP “with the genitive noun specifying in which respect the adjective applies to the noun that it is predicated of” (Kremers, 2005). A descriptive grammar observes: “This kind of phrase is used to describe a distinctive quality of an item, equivalent to hyphenated expressions in English such as *fair-haired*, *long-legged*, *many-sided*” (Ryding, 2005, 254).

The adjectival construction can occur predicated or (or modifier to) the full range of NPs:

- (11) *Kul-u*                      *raḡul-in*                      **ṭawīl-u**                      **l-ša<sup>c</sup>r-i**  
 every-NOM man-GEN tall-NOM the-hair-GEN  
 every man long the-hair (every long-haired man)

- (12) *al-raḡul-u*                      **ṭawīl-u**                      **l-ša<sup>c</sup>r-i**  
 the-man-NOM tall-NOM the-hair-GEN  
 the man long the hair

- (13) *la raḡul-a*                      **ṭawīl-u**                      **l-ša<sup>c</sup>r-i**  
 no man-ACC tall-NOM the-hair-GEN  
 no man long the hair

- (14) *ṭalāt-u*                      *riḡāl-in*                      **ṭawāl-u**                      **l-ša<sup>c</sup>r-i**  
 three-NOM men-GEN tall-NOM the-hair-GEN  
 three man long the hair

- (15) *al-kaṭīr-u*                      *min al-riḡāl-i*                      **ṭawāl-u**                      **l-ša<sup>c</sup>r-i**  
 the-many-NOM from the-man-GEN tall-NOM the-hair-GEN  
 many men long the hair

Traditional and contemporary descriptions and analyses observe a number of key similarities with the construct state construction which, unlike the adjectival construct, has received a good deal of theoretical attention (Ritter, 1988, 1991; Benmamoun, 2000; Kremers, 2003; Falk, 2007). In a nominal

construct state a nominal head is in close construction with a following NP. These similarities between the adjectival construct and the nominal construct state have motivated a number of analyses extending the approach from the latter to the former. In the MSA nominal construct state construction, the head noun is modified by an NP showing GEN case in MSA (the vernaculars have lost case marking), and has no formal definiteness marking (neither *-n* nor *al-*) unlike other nouns (a special construct form of both adjectives and nouns exists in Hebrew). The head and the construct argument (GEN complement) are inseparable: modifiers of the head appear after the construct NP (as with (6)).

- (16) *sayyār-at-u -l-rağul-i -l-ḥamrā'-u*  
 car-F-NOM the-man-GEN the-red-NOM  
 the man's red car

### 3 Previous Approaches and Related Work

In this section we describe what we take to be related constructions in Semitic and Celtic and briefly outline the analyses provided in the literature of these constructions. As noted above, there is not much work done on the Arabic adjectival construct itself (but see Kremers (2005)), but there has been significantly more work on the cognate Hebrew construction including Hazout (2000); Siloni (2002) and Kim (2002). The Hebrew construction, illustrated in (17) uses a special construct form of the adjective, *yefat* in the following examples.

- (17) *yalda yefat mar'e nixnesa la-xeder.*  
 girl.FSG beautiful.FSG look.MSG entered to.the-room  
 A good looking girl entered the room. (Siloni, 2002, Hebrew)

Adjectival constructs do not show definiteness agreement with the external noun, rather the inner noun reflects the definiteness feature of the external noun:

- (18) *ha-yalda (\*ha-)yefat \*(ha-)mar'e nixnesa la-xeder.*  
 girl.FSG the-beautiful.FSG the-look.MSG entered to.the-room  
 The good looking girl entered the room. (Siloni, 2002, Hebrew)

#### 3.1 Characteristics of Siloni's Approach

A key proposal in Siloni (2002) is that the construction is limited to inalienable nouns, and is found most typically (but not exclusively) with body parts. The claim is that alienable nouns are not found in this construction. However since parts of wholes can appear in the construction Siloni argues that they function as "extended inalienables", giving the following examples.

- (19) *xadarim gvohey tikra*  
 rooms high ceiling  
 high-ceiling rooms

- (20) *sira gvohat toren*  
 boat high mast  
 a high-mast boat

The basic idea is that adjectives have an open slot, which is saturated by the noun that they are predicated of or modify. In the construct construction, the empty slot is filled by the internal genitive. This would mean that an adjective in a construct construction would not be able to modify an external head noun. There has to be a slot for this to fill in the argument structure (thematic grid) of the adjective. The proposal (an assumption also shared by Hazout (2000)) is that this slot is in fact the possessor argument of the internal genitive argument. That is, “the particularity of inalienable nouns which qualifies them (and them only) to form adjectival constructs” is that they have a lexical possessor. In defence of this view, Siloni notes that with these (inalienable) nouns the possessor can only be missing in generic contexts, as in the following example:

- (21) *be-mitkan ze ha-roš zakuk le-hagana meyuxedet.*  
 in-installation this the-head requires to-protection special  
 In this installation the head requires a special protection (Siloni, 2002, Hebrew)

The idea (and the formal details of the treatment are not made clear) is that in the syntax “the inalienable noun and the adjectival head form a complex predicate ... which is saturated by the external noun”. Hence, if alienable nouns do not have a possessor slot, then it will follow that they do not occur in the construction.

Since kinship terms are excluded from the construction (and these are arguably inalienable), Siloni must also point out ways in which the behaviour of kinship nouns is different from that of body part nouns, in order to maintain the assumption about lexical possessors. She notes that unlike body parts, you cannot have an external possessor (SUBJ or DAT) with a kinship noun, only an internal possessor, in Hebrew, and the possessorless kinship noun is also not permitted in a generic context (contrast with (21) above).

The characteristics taken to be typical of inalienable constructions are as follows.

*The distributivity effect*

- (22) *ha-rofe badak lahem 'et ha-roš*  
 the-doctor examined to.them ACC the-head  
 The doctor examined their heads. (Siloni, 2002)

*The singular constraint:* parts which you have only one of are obligatorily singular, irrespective of the number of the external possessor in such constructions. Compare (22) to the examples below.

- (23) a. *ha-yeladim herimum 'et ha-yadayim*  
 the-children raised ACC the-hands  
 The children raised their hands.  
 b. *\*ha-rofe badak lahem 'et ha-rašim*  
 the-doctor examined to.them ACC the-heads  
 The doctor examined their heads. (Siloni, 2002)

*Limitation to restrictive modifiers only*

(24) a. \**ha-rofe badak lo 'et ha-roš ha-pacu'a*  
 the-doctor examined to.him ACC the-head the-wounded  
 The doctor examined his wounded head.

b. \**ha-rofe badak la 'et ha-yad ha-švura*  
 the-doctor examined to.her ACC the-head the-broken  
 The doctor examined her broken hand.

(Siloni, 2002)

These constraints do not show up when the possessor is DP internal, since it is not the case that only lexical possessors are permitted in this construction, hence compare (25) to (22).

(25) *hi badka 'et ha-rašim šel ha-yeladim.*  
 she examined ACC the-heads of the-children  
 She examined the children's heads.

(Siloni, 2002)

These constraints also operate in the adjectival construct:

(26) *ne'arim 'arukey xotem/\*xotamim hištafju ba-taxrut*  
 guys long nose/\*noses participated in.the-context  
 Long-nosed guys participated in the contest.

(Siloni, 2002)

Beyond this, there are further restrictions on the form of the Hebrew adjectival construct (some, but not all of which are shared by the MSA construction). No form of modification, either restrictive or appositive, is permitted in the Hebrew adjectival construct. Moreover the inalienable noun (internal complement) cannot take an *of*-complement and cannot itself take the form of a construct state construction. Siloni proposes that these restrictions follow from the fact that the genitive complement does not project a full referential DP.<sup>2</sup> The article which appears on the complement nominal is argued to be the concordial article which would normally have appeared on the adjective, but cannot because heads of constructs never occur with an article.

### 3.2 Kim

Kim (2002) also proposes a complex predicate analysis, a proposal which largely accepts the syntactic assumptions of the analysis presented in Siloni (2002) and supplements it by providing further specification of the semantics associated with the construction, in order to account for the restriction to inalienable nouns.

The semantic translation that she gives for the construct adjective is as a function which maps a two-place predicate into a one-place predicate.

(27) *pretty*.CS  $\lambda R_{\langle eet \rangle} \lambda x$  [*pretty*( $\iota y$  [R(x)(y)])]

<sup>2</sup>An allied assumption is that the presence of full functional material would prevent the formation of a complex predicate.

This combines with the two place noun *eyes* (the assumption being that there is an internal argument denoting the possessor, and an external argument denoting the referent).

(28) *eyes*  $\lambda u \lambda v$  [*eyes*( $u$ )( $v$ )]

The result of applying the construct state adjective to the nominal is as given in (29).

(29) *pretty.CS eyes*  $\lambda x$  [*pretty*( $\iota y$  [*eyes*( $x$ )( $y$ ))]

This predicts also that any modification which does not impinge on the argument structure of the inner noun will in fact be grammatical.

On the remaining properties (the uninterruptibility of the ADJ N combination, the placement of the definiteness affix on the noun rather than the adjective), Kim follows Siloni (2002) in ascribing these to the prosody of Hebrew. Modifiers of the adjective appear “postposed” because the adjective is prosodically defective and gets stress via the complement, so nothing can intervene.

On the question of how and why the construction is limited to cases of inalienable possession, Kim is wary of following Siloni (2002) in attributing this to the need for a lexically specified possessor. In her account, in principle anything which can be appropriately typeshifted could in principle occur in the construction, but then essentially the idea is that they are filtered out by the syntax (the assumption being that the possessor slot of an inalienable is anaphoric while that of an “unrestricted” possessor is a pronominal (Koenig, 1999)). So you can produce the semantics but it is impossible to make, for example, “girl” the antecedent of the pronominal and thus the binding constraints would fail.<sup>3</sup>

### 3.3 Kremers

Kremers (2005) points out several empirical problems with the the analysis offered in Siloni (2002) and Kim (2002) (and by extension, the rather similar analysis of Hazout (2000)). They all take the construction as some form of complex adjective which is syntactically formed, with the inner nominal some type of inalienable noun which is the subject of the adjectival complex predicate. The external or head noun is taken to satisfy the possessor argument slot of the inner noun, which must be assumed to become an argument of the adjective by some sort of merger during the (syntactic) process of complex predicate formation. In fact, no details of the operation of complex predicate formation are given in Siloni (2002) and Kremers’s observation that the process whereby “an argument of the genitive complement becomes the external argument of the adjectival construct” (Kremers, 2005) is opaque is certainly one we can agree with.<sup>4</sup> He points out a number of further problems with the assumption that the inner nominal is the external argument of the entire construction. First, if this were the case, then the adjective should agree with this argument, whereas in fact, as we have seen, in attributive use the adjective shows concord with the external noun which it modifies. Second, the fact that the construction occurs predicatively is also incompatible with taking the genitive complement as its external argument, because the nominal it is predicated of fills this role. Finally, Kremers (2005)

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<sup>3</sup>The question arises as to how to deal with the fact that kinship terms are excluded without stipulating that kinship terms are somehow alienable. Kim speculated that there may be some sort of ‘part-of’ requirement, or that alternatively it may be that what the construct state adjective wants is a property (rather than an entity) and a kinship term “inherently denotes an entity”. This question is left open.

<sup>4</sup>Hazout (2000) sees this process to be a side effect of compound formation in the morphology.



notes that there are several problems with the assumption that the construction should be explained in terms of the occurrence of lexical possessors: kinship nouns also have lexical possessors, yet cannot occur in the construction (a restriction which Kim does take account of), while on the other hand, in MSA the use of alienably possessed complements is widespread. These considerations would suggest that the existence of a lexically specified possessor is not the main issue.

Kremer's alternative proposal is that the genitive (or inner) argument is not an external argument of the adjective but names some property or inherent part of the head noun and fulfills an internal thematic role of the adjectival head. He takes this role to be the *attribute* role of Higginbotham (1985). The genitive case which occurs in this construction (and a number of others in MSA) is a structural case that is assigned to an internal argument (and that internal argument can bear a wide range of thematic roles).

### 3.4 Welsh Genitive of Respect

In previous LFG work, Mittendorf and Sadler (2008) discuss a construction occurring in Welsh (and the other Celtic languages) which shows several resemblances to the Arabic construct adjectives. This is the construction illustrated in (30) - (33).

(30) *dyn uchel ei gloch*  
 man.MSG high.MSG his bell.FSG  
 a loud-mouthed man

(31) *merch fyr ei thymor*  
 girl.FSG short.MSG POSS.3SG temper.FSG  
 a short-tempered girl

(32) *Mawr eu dawn yw'r gwŷr*  
 big.MSG their talent.FSG is the men.MSG  
 Hugely talented are the men.

(33) *Mae'r ferch yn fyr ei thymor.*  
 is-the girl PRED short.MSG her temper.FSG  
 The girl is short-tempered.

The Welsh adjectival in-respect-of construct is a construction that is headed by the A and contains a (definite) NP: the AP can appear in syntactic environments that exclude definite NPs, showing that the construction is headed by the adjective not the NP. As the examples above show, the syntax of the inner NP differs in Welsh in that it contains an obligatory (possessor) clitic pronoun, which is obligatorily anaphoric to the head noun (in attributive use) and the SUBJ function in predicative use. In attributive position, the adjectival construct shows initial consonant mutation properties typical of APs, but it has slightly unusual agreement properties in that the A itself does not agree with either the head N or the following N. In terms of constituent structure, the NP appears (almost immediately) post-head in direct argument position, and in fact can be separated from the head adjective only by one of a small class of intensifying modifiers. Finally, the core of the relationship between the post-A

NP and the external N is one of inalienable possession: “The thing or quality denoted by the [post-A NP] pertains to or is a part of the person or object denoted by [the SUBJ or head N], the latter being represented by the poss[essive] pronoun” (Mac Cana, 1966, p. 91). Mittendorf and Sadler (2008) deal primarily with the morphosyntax of this construction and do not discuss in detail the semantic relations which must hold between the inner and outer nominals in the construction, but here too there are significant crosslinguistic similarities.

Mittendorf and Sadler (2008) propose that the attributive construction is analysed along the lines of (34) (for (31) and the predicative construction as shown in (35) for (33)).<sup>5</sup>

$$(34) \left[ \begin{array}{l} \text{PRED} \quad \text{GIRL}_i \\ \text{ADJ} \left\{ \left[ \begin{array}{l} \text{PRED} \quad \text{SHORT} < \text{OBJ} > \\ \text{OBJ} \left[ \begin{array}{l} \text{PRED} \quad \text{TEMPER} < \text{POSS} > \\ \text{POSS} \quad \left[ \text{PRED} \quad \text{PRO}_i \right] \end{array} \right] \end{array} \right] \right\} \end{array} \right]$$

$$(35) \left[ \begin{array}{l} \text{PRED} \quad \text{SHORT} < \text{SUBJ OBJ} > \\ \text{SUBJ} \quad \left[ \text{PRED} \quad \text{GIRL}_i \right] \\ \text{OBJ} \quad \left[ \begin{array}{l} \text{PRED} \quad \text{TEMPER} < \text{POSS} > \\ \text{POSS} \quad \left[ \text{PRED} \quad \text{PRO}_i \right] \end{array} \right] \end{array} \right]$$

In Welsh, only the default form of the adjective MSG permits this construction, by lexically selecting an OBJ.<sup>6</sup>

$$(36) \text{ a. } \textit{byr} \quad \left\{ \begin{array}{l} (\uparrow \text{PRED}) = \text{SHORT} \\ | (\uparrow \text{PRED}) = \text{SHORT} < \text{OBJ} > \\ | (\uparrow \text{PRED}) = \text{SHORT} < \text{SUBJ} > \\ | (\uparrow \text{PRED}) = \text{SHORT} < \text{SUBJ OBJ} > \end{array} \right\}$$

*no GEND/NUM constraints*

$$\text{ b. } \textit{ber} \quad \left\{ \begin{array}{l} (\uparrow \text{PRED}) = \text{SHORT} \\ ((\text{ADJ} \in \uparrow) \text{GEND}) =_c \text{F} \\ ((\text{ADJ} \in \uparrow) \text{NUM}) =_c \text{SG} \end{array} \right.$$

They assume that the ‘special’ occurrence of the grammatical function OBJ in lexical entries such as (36 a) would be associated with a particular semantics introducing the *respect/quality* property, but they do not formulate this. The linkage between the NP-internal bound pronoun and the modified head N/SUBJ can be established in the c-structure as shown in (37).<sup>7</sup>

$$(37) \text{ AP} \longrightarrow \text{A}' \left( \begin{array}{c} \text{NP} \\ (\uparrow \text{OBJ}) = \downarrow \\ ((\downarrow \text{POSS})_\sigma \text{SIND}) = ((\{\uparrow \text{SUBJ} \mid \text{ADJ} \in \uparrow\})_\sigma \text{SIND}) \end{array} \right)$$

<sup>5</sup>The function associated with the complement noun is given here as OBJ, but could as well be OBJ<sub>θ</sub>: the important point is that it is both a direct function and not the SUBJ.

<sup>6</sup>In the examples above, *fyr* is the soft mutated form of *byr*.

<sup>7</sup>The attribute SIND indicates the semantic INDEX in the semantic structure.

## 4 Analysis

Returning now to the Arabic data, there is good evidence in MSA that the construction is formed in the productive syntax (not in the lexicon/morphology). The inner NP (denoting the dimension in which the quality in question holds) is accessible to regular syntax, shown by the fact that this argument can be coordinated, as in (38), and that it can be syntactically modified, as in (39).

- (38) *Dahla rağul-un aswād-u l-šacr-i wa l-cāynayin-i*  
come.3SGM.PAST man-NOM black-NOM the-hair-GEN and the-eye.DUAL-GEN  
A man black of hair and eyes came (A man with black hair and eyes came).

- (39) *bayt-un kaṭīr-u -l-ābwāb-i -l-ḥdar-i*  
house-NOM many-NOM the-door.PL-GEN the-green-GEN  
a house with many green doors.

This means that the inner nominal is neither a non-projecting word nor part of a morphological construction. Neither is it the case that the construct adjective is prosodically defective: the adjective which occurs in this construction is not a special form, but a regular adjective in all respect. Therefore, our conclusion is that the construction is simply and straightforwardly a product of the general phrase structure of Arabic. Arabic phrase structure must permit an (optional) GEN complement immediately adjacent to an adjectival head. We take it that there is good evidence that GEN is indeed a structural case in MSA (it is the case found on prepositional objects, for example).

### 4.1 External Behaviour of Adjectival Construct

As shown in (3), an adjectival construct may have the normal distribution of predicate adjectives. Attributively, it has the normal distribution of an AP modifier: it co-occurs with other NP nominal modifiers (as a modifier, it is unusual only in showing defective definiteness concord NP internally).

(40a) is stylistically preferred over (40b). Similarly (41a) is better than (41b) for the same reason. Both are, however, acceptable and thus we assume both are to be permitted alongside other orderings of nominal modifiers by the c-structure constraints.

- (40) a. *al-rağul-u l-muthaqqaf-u l-ṭawīl-u l-qāmat-i*  
the-man-NOM the-cultured-NOM the-tall-NOM the-height-GEN  
the cultured, tall man (Ryding, 2005, 222)
- b. *al-rağul-u l-ṭawīl-u l-qāmat-i l-muthaqqaf-u*  
the-man-NOM the-tall-NOM the-height-GEN the-cultured-NOM  
the cultured, tall man
- (41) a. *imra<sup>?</sup>-at-un ṭawīl-at-un ġamīl-at-u -l-wağh-i*  
woman-F-NOM.INDEF tall-F-NOM.INDEF beautiful-F-NOM the-face-GEN  
a tall woman with a beautiful face

- b. *imra<sup>?</sup>-at-un*                      *ḡamīl̄-at-u*                      *-l-waḡh-i*                      *ṭawīl̄-at-un*  
 woman-F-NOM.INDEF beautiful-F-NOM the-face-GEN tall-F-NOM.INDEF  
 a tall woman with a beautiful face (a tall beautiful-faced woman)

Note that examples such as (40a) show that the head N and the adjectival construct are not required to be linearly adjacent (or form a small construction, for example). The following rule then generates the adjectival construct alongside any other AP modifiers of the NP.

$$(42) \quad \text{NP} \rightarrow \text{N} \quad \text{AP}^* \\ \uparrow = \downarrow \quad \downarrow \in (\uparrow \text{ADJ})$$

## 4.2 Internal Structure of AP

The main question that this construction raises is that of the syntactic status of the post-adjectival NP. The “inner” NP immediately follows the adjectival head, suggesting it is a subcategorised (direct) argument of the adjective. The existence of the predicative use of the construction suggests that the GEN argument is not SUBJ (see Kremers (2005) and Mittendorf and Sadler (2008) on Welsh on this point). We propose that adjectives assign GEN case to their direct internal argument (adjectives may also take other types of complements in Arabic, including prepositional and verbal complements). Adjectives would not be alone in assigning a structural GEN case, as we find GEN marking the direct complements of prepositions, numbers, and (some) quantifiers, and also in the nominal CS construction.

These observations motivate the following rule. The construct NP is immediately posthead and maps to a direct argument. Here we call this OBJ but note that it could well be OBJ<sub>θ</sub>. Since it is restricted essentially to attribute or quality, then this may well be more appropriate but we do not pursue that here. The requirement that the construct nominal must be syntactically definite is captured by the constraining equation.

$$(43) \quad \text{A}' \rightarrow \text{A} \quad \text{NP} \quad \text{PP}^* \\ \uparrow = \downarrow \quad (\uparrow \text{OBJ}) = \downarrow \quad (\uparrow \text{OBL}) = \downarrow \\ (\downarrow \text{DEF}) =_c +$$

## 4.3 F-structure

Consider now the f-structure that follows from this proposal, shown for both attributive and predicative examples below. Adjectives (or more specifically, a subclass of adjectives) may (optionally) subcategorise for an object, which will be subject to a particular interpretation in the semantics.

- (44) *imra<sup>?</sup>-at-un*                      *ḡamīl̄-at-u*                      *-l-waḡh-i*  
 woman-F-NOM beautiful-F-NOM the-face-GEN  
 a woman with a beautiful face (Kremers, 2005)

$$(45) \quad \left[ \begin{array}{cc} \text{PRED} & \text{WOMAN} \\ \text{ADJ} & \left\{ \begin{array}{l} \left[ \begin{array}{cc} \text{PRED} & \text{BEAUTIFUL} < \text{OBJ} > \\ \text{OBJ} & \left[ \begin{array}{cc} \text{PRED} & \text{FACE} \\ \text{DEF} & + \end{array} \right] \end{array} \right] \end{array} \right\} \end{array} \right]$$

- (46) *kāna huwlandiy-u l-ʔaʃl-i*  
 was.3SGM dutch-NOM the-origin-GEN  
 He was of Dutch origin.

adapted from (Ryding, 2005, 254)

- (47) 
$$\left[ \begin{array}{l} \text{PRED BE} \\ \text{TENSE PAST} \\ \text{SUBJ 1: [ PRED PRO ]} \\ \\ \text{XCOMP} \left[ \begin{array}{l} \text{PRED DUTCH < SUBJ, OBJ >} \\ \text{SUBJ 1:} \\ \text{OBJ} \left[ \begin{array}{l} \text{PRED ORIGIN} \\ \text{DEF +} \end{array} \right] \end{array} \right] \end{array} \right]$$

In terms of its f-structure, a construct adjective is also special in one further aspect which is that in attributive use it does not show agreement in indefiniteness (nunation). Otherwise, it exhibits normal NP internal concord in CASE, DEF, GEND and NUM. So as this following example shows, when it occurs with other AP modifiers of an indefinite nominal head, it will be the only one to fail to show full indefiniteness agreement. In (48), the head of the nominal within which the adjectival construct agrees is itself INDEF and GEN (it is GEN because it is the structural complement of the numeral *ʔawwal-u*). The adjective *rafi<sup>c</sup>-i* is defective in showing GEN but not nunation, the marker of indefiniteness. The standard agreement pattern is as shown in (49).

- (48) *huwa ʔawwal-u mas ʔuul-in ʔamriikiyy-in rafii<sup>c</sup>-i l-mustawaa*  
 he first-NOM official-GEN.INDEF american-GEN.INDEF high-GEN the-level-?  
*ya-zuur-u l-bahrayn-a.*  
 3S?-visit-NOM the-bahrain-ACC  
 He is the first high-level American official to visit Bahrain. (Ryding, 2005, 222)

- (49) a. *bayt-u-n ǧamiḻ-u-n*  
 house-NOM-INDEF beautiful-NOM-INDEF  
 a beautiful house (Kremers, 2003, 167)
- b. *al-bayt-u -l-ǧamiḻ-u*  
 the-house-NOM the-beautiful-NOM  
 the beautiful house (Kremers, 2003, 167)
- c. *al-riḡal-u -l-ṭiwāl-u*  
 the-men-NOM the-tall.PL-NOM  
 the tall men (Kremers, 2003, 58)
- d. *al-nisā-u -l-ṭawīl-āt-u*  
 the-women-NOM the-tall-F.PL-NOM  
 the tall women (Kremers, 2003, 58)

If all adjectives and nouns in MSA are fully specified for GNCD, then definiteness agreement is handled along the lines of CASE and PNG agreement. The templates in (50) and (51) hence show the agreement information for MPL.NOM.DEF and MPL.NOM.INDEF adjectives respectively.<sup>8</sup>

(50) MPL-DEF-NOM-ADJ  $\equiv$  ((ADJ  $\in$   $\uparrow$ ) DET) = DEF  
 ((ADJ  $\in$   $\uparrow$ ) CASE) = NOM  
 ((ADJ  $\in$   $\uparrow$ ) CONC GEND) = MASC  
 ((ADJ  $\in$   $\uparrow$ ) CONC NUM) = PLUR

(51) MPL-INDEF-NOM-ADJ  $\equiv$  ((ADJ  $\in$   $\uparrow$ ) DET) = INDEF  
 ((ADJ  $\in$   $\uparrow$ ) CASE) = NOM  
 ((ADJ  $\in$   $\uparrow$ ) CONC GEND) = MASC  
 ((ADJ  $\in$   $\uparrow$ ) CONC NUM) = PLUR

The lack of nunation on indefinite adjectives within this particular construction may then be handled lexically by specifying that only the definite and the bare adjective (without *tanwiin*) permit the CS construction.<sup>9</sup>

(52) *-l-tiwāl-u* {(( $\uparrow$  PRED) = ‘TALL’ | ( $\uparrow$  PRED) = ‘TALL (< SUBJ >’) }  
 @MPL-DEF-NOM-ADJ

(53) *tiwāl-un* ( $\uparrow$  PRED) = ‘TALL’  
 @MPL-INDEF-NOM-ADJ

(54) *tiwāl-u* {(( $\uparrow$  PRED) = ‘TALL’ | ( $\uparrow$  PRED) = ‘TALL (< SUBJ >’) }  
 @MPL-INDEF-NOM-ADJ

## 5 Semantics of the Construction: Some Initial Thoughts

As pointed out in connection with the Welsh examples (55) and (56) in Mittendorf and Sadler (2008), the Arabic examples (57) and (58) also indicate that the adjective does not apply directly to the head noun, but is restricted in its interpretation to the dimension indicated by the inner nominal.

(55) *merch dal byr ei thymr*  
 girl tall short her temper  
 a tall short-tempered girl

Welsh

(56) *menyw lân frwnt ei thafod*  
 woman clean dirty her tongue  
 a clean foul-mouthed woman

Welsh

<sup>8</sup>We follow King and Dalrymple (2004) in distinguishing INDEX and CONCORD (agreement) features, and express NP internal agreement in MSA in terms of CONCORD features.

<sup>9</sup>This does not, of course, explain this curious restriction, but it does capture it. It seems to be some sort of low level matter of realization more than anything else.

(57) *imra<sup>?</sup>t-un nazīfat-un waṣḥat-u l-sān-i*  
 woman-NOM.INDEF clean-NOM.INDEF dirty-NOM the-tongue-GEN  
 a clean foul-mouthed woman

(58) *imra<sup>?</sup>t-un ṭwīlat-un qasīrat-u l-naẓar-i*  
 woman-NOM.INDEF tall.FSG-NOM.INDEF short.FSG-NOM the-sight-GEN  
 a tall woman short of sight

## 5.1 Treating the Inner NP as a Property

Given that the inner or complement nominal cannot be referred to in the following text, a possibility is that it corresponds semantically to a property rather than a full generalized quantifier: the idea is that the property denoted by this nominal serves to restrict the interpretation of the adjective to the appropriate dimension. The semantics for an attributive adjective would be as in (59), repeated in more convenient shorthand form in (60) (see Dalrymple (2001) for an accessible introduction to glue semantics in LFG).<sup>10</sup>

(59) *ḡamil-at-u* (↑ PRED) = ‘BEAUTIFUL (< >)’  
 $\lambda P. \lambda x. \text{beautiful}(x) \wedge P(x)$ :  
 $[ ((\text{ADJ} \in \uparrow)_\sigma \text{VAR}) \multimap ((\text{ADJ} \in \uparrow)_\sigma \text{RESTR}) ] \multimap$   
 $[ ((\text{ADJ} \in \uparrow)_\sigma \text{VAR}) \multimap ((\text{ADJ} \in \uparrow)_\sigma \text{RESTR}) ]$

(60) *ḡamil-at-u*  $\lambda P. \lambda x. \text{beautiful}(x) \wedge P(x)$ :  
 $[ v \multimap r ] \multimap [ v \multimap r ]$

(61) *imra<sup>?</sup>-at-un*  $\lambda X. \text{woman}(X) : [ v \multimap r ]$

The idea is that the phrase *ḡamil-at-u -l-waḡh-i* ‘beautiful the-hair’ would also be a function from N meanings to N meanings: *ḡamilatu* consumes the meaning of *-l-waḡhi* to produce this meaning. (62) gives the meaning constructor associated with the GEN form *waḡhi* ‘face’ and (63) a preliminary formulation of the meaning constructor for a construct state adjective as a function from an OBJ meaning to a function from properties to properties (N meanings to N meanings). The meaning constructor in (63) would consume that in (62) to produce the meaning constructor shown in (64). Glue constructors are abbreviated as above.

(62) *waḡh-i*  $\lambda x. \text{face}(x) : [ v \multimap r ]$

(63) *ḡamil-at-u(CS)*  $\lambda Q \lambda P \lambda x. \exists y [ \text{part-of}(y, x) \wedge P(x) \wedge Q(y) \wedge \text{beautiful}(y) ]$ :  
 $(\uparrow \text{OBJ})_\sigma \multimap [ [ v \multimap r ] \multimap [ v \multimap r ] ]$

(64) *ḡamil-at-u -l-waḡh-i*  $\lambda P \lambda x. \exists y [ \text{part-of}(y, x) \wedge P(x) \wedge \text{face}(y) \wedge \text{beautiful}(y) ]$ :  
 $[ v \multimap r ] \multimap [ v \multimap r ]$

<sup>10</sup>We abstract away from recursive modification for simplicity of exposition.

The derivation of *imra<sup>2</sup>-at-un ġamil-at-u -l-waġh-i* ‘woman beautiful of face’ is shown in the proof below. The meaning constructor for the construct state adjective consumes that of its direct complement, producing a function from properties to properties (that is, an adjectival meaning). This can then combine with the nominal meaning associated with the head noun, and then finally with the determiner.<sup>11</sup>

There are many details here which need further consideration. We have here specified that the ‘part-of’ restriction comes from the adjective in construction, and that the adjective is looking to combine with something which has a nominal, rather than an NP, meaning. So here we are assuming that we associate a simple property meaning with the definite form of a noun, in addition to any other meanings, possibly restricted to this construction. An alternative would be to associate the definite/indefinite marked noun with a pair of meaning constructors, one for the nominal core of its meaning and one corresponding to the determiner, and then have the construction (or the construct adjective itself) consume (i.e. dispose of) the determiner meaning.

$$\begin{array}{c}
\lambda Q \lambda P \lambda x. \exists y [P(x) \wedge Q(y) \wedge \text{beautiful}(y) \wedge \text{part-of}(y, x)] : \\
(\uparrow OBJ)_\sigma \multimap ((v \multimap r) \multimap (v \multimap r)) \qquad \lambda x. \text{face}(x) : v \multimap r \\
\hline
\lambda P \lambda x. \exists y [P(x) \wedge \lambda x. \text{face}(x)(y) \wedge \text{beautiful}(y) \wedge \text{part-of}(y, x)] : \\
((v \multimap r) \multimap (v \multimap r)) \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \multimap \varepsilon \\
\hline
\lambda P \lambda x. \exists y [P(x) \wedge \text{face}(y) \wedge \text{beautiful}(y) \wedge \text{part-of}(y, x)] :: \\
((v \multimap r) \multimap (v \multimap r)) \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \Rightarrow \beta \\
\hline
\lambda x. \exists y [\lambda x. \text{woman}(x)(x) \wedge \text{face}(y) \wedge \text{beautiful}(y) \wedge \text{part-of}(y, x)] : \\
(v \multimap r) \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \multimap \varepsilon \\
\hline
\lambda x. \exists y [\text{woman}(x) \wedge \text{face}(y) \wedge \text{beautiful}(y) \wedge \text{part-of}(y, x)] : (v \multimap r) \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \Rightarrow \beta
\end{array}$$

## 5.2 An alternative semantics

In the above approach, the entire ‘constructional burden’ was essentially located in the lexical entry for the adjective itself which occurs in the construct state. Such a view might be at least partly motivated by the fact that in cognate languages, such as Hebrew, as we have seen, a special form of the adjective is required in this construction, and equally, it is natural that the special subcategorisation properties of adjectives in this construction are associated with a special meaning constructor. It is at least plausible however that more of the specifications are actually associated directly with the construction itself, alongside the constraint that the direct complement is definite, or that the NP complement itself plays a more important role, introducing some sort of possession relation, with its meaning modelled on that of *whose book* (Dalrymple, 2001, p421) (recall that the direct complement NP must denote a property or quality associated with the head noun or NP that the construction is predicated of). On this alternative view, then, the meaning constructor associated with the complement nominal might be along the lines shown in (65). The construct adjective introduces two meaning constructors (similar to the approach taken to attributive adjectives to permit recursive modification in Dalrymple (2001)).

$$(65) \text{-l-waġh-i} \quad \lambda Q. \lambda x. \text{the}(f, \text{face}(f) \wedge \text{poss}(x, f) \wedge Q(f)) : [v_\sigma \multimap r_\sigma] \multimap [c_\sigma \multimap d_\sigma]$$

<sup>11</sup>We have assumed here, to simplify the presentation, that the head noun is associated with a nominal rather than an NP meaning, despite the fact that definiteness/indefiniteness is morphologically marked in Arabic.



$$(66) \text{ ġamil-at-u } \lambda b.\text{beautiful}(b) : v \multimap r \\ \lambda P.\lambda Q.P(x) \wedge Q(x) : [c \multimap d] \multimap [[v \multimap r] \multimap [v \multimap r]]$$

We now apply **-l-waġh-i** to the basic meaning constructor for **ġamil-at-u** and then apply the second constructor of **ġamil-at-u** to the result. This gives us a function from  $[[v \multimap r] \multimap [v \multimap r]]$  (a set of properties).

$$\frac{\frac{\lambda Q \lambda x.\text{the}[f, \text{face}(f) \wedge \text{poss}(x, f) \wedge Q(f)] : (v \multimap r) \multimap (c \multimap d) \quad \lambda b.\text{beautiful}(b) : v \multimap r}{\lambda x.\text{the}[\text{face}(f) \wedge \text{poss}(x, f) \wedge (\lambda b.\text{beautiful}(b))(f)] : (c \multimap d)} \multimap_{\mathcal{E}}}{\lambda x.\text{the}[\text{face}(f) \wedge \text{poss}(x, f) \wedge \text{beautiful}(f)] : (c \multimap d)} \Rightarrow_{\beta} \quad \lambda P \lambda Q.P(z) \wedge Q(z) :}{\lambda Q[\lambda x.\text{the}(\text{face}(f) \wedge \text{poss}(x, f) \wedge \text{beautiful}(f))](z) \wedge Q(z)} \multimap_{\mathcal{E}}}{\lambda Q[\lambda x.\text{the}(\text{face}(f) \wedge \text{poss}(z, f) \wedge \text{beautiful}(f))] \wedge Q(z) : (v \multimap r) \multimap (v \multimap r)} \Rightarrow_{\beta}$$

## 6 Conclusion and Further Work

In this paper we have presented the main characteristics of the adjectival construct construction as it occurs in MSA. The construction shows a number of important similarities both to the better known nominal construct state construction in Semitic and also to the Celtic adjectival construction (so-called genitive of respect), for which a syntactic analysis in LFG is presented in Mittendorf and Sadler (2008). That paper argues that the Celtic construction should be recognised as a case in which adjectives appear with their own direct complements, and here we adopt essentially that approach to the Arabic data. Among the syntactic differences between the Arabic and the Welsh construction, however, is the fact that the complement NP is obligatorily morphologically definite in MSA while it occurs with an obligatory possessive pronominal clitic/inflection in Welsh. As a first step toward providing an account of the semantics of this family of constructions in LFG we present some preliminary thoughts as to how it might be formalized using glue. Building on this preliminary sketch will be one focus of our future work on the construction. We also do not yet have a sufficient understanding of how this construction relates to a number of subtly different adjectival constructions in MSA, nor of what the facts are in the Arabic vernaculars, both of which are topics which require further research.

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