

Introduction

Are unaccusatives verbal or non-verbal predicates? Baker (2003) suggests that they are non-verbal predicates and they are decomposed syntactically into a functional predicate and an adjective. However I argue in this paper that unaccusatives really involve verbal predicates and not functional predicates. I discuss three types of predicates: verbal predicate, functional adjectival predicate, and adjectival predicate. The evidence that can conclusively distinguish the type of predicate follows from tense and aspect morphological markings. Furthermore, I argue that a Minimalist analysis (Chomsky, 1995, 2002) can exactly explain the asymmetric unaccusative behavior in Arabic¹. That's, it simultaneously explains the phonological presence of the verbal predicate of the unaccusative on one hand and the absence of that predicate on another hand by means of satisfying the requirements of the two interface structures: phonological form (PF) and logical form (LF).

The organization of this paper is as follows. The first section describes the unaccusative structure in Arabic: its properties and the syntactic arguments associated with such structure. The second section presents Baker's analysis (2003) of unaccusatives. The third section illustrates the Arabic unaccusative data. The fourth section deals with the Minimalist analysis of the unaccusative, functional adjectival predicate, and adjectival predicate in Arabic. I show how the Minimalist analysis accounts for the puzzling unaccusative facts in Arabic.

1. The Arabic unaccusatives

Perlmutter (1987) proposed that intransitive verbs can be of two basic types: *unergative* and *unaccusative*. Unaccusative is underlyingly a transitive verb whose only noun functions as an object of a transitive verb (Ouhalla, 1999: 213). As for unergative verbs, they behave like *regular* intransitive

¹ The Arabic form that I refer to is the Modern Standard Arabic (MSA) that is used formally in the media and education.

verbs, so they have a subject with no object. Let us consider some examples of unaccusative and unergative verbs:

- (1) a. The stone fell. (unaccusative)
b. The boy runs. (unergative)

According to Burzio (1986), when a verb loses its ability to assign a theta-role to its subject, the verb can no longer assign accusative case to the object. Hence it is called *unaccusative* (Ouhalla, 1999: 213). In (1), *stone* and *boy* start in the object position. Since the verbs *fell* and *runs* do not have a subject, the nouns cannot get case in the object position in accordance with Burzio's Generalization. Therefore, the objects are forced to move to the subject position where they can get case.

Arabic has a set of unaccusative verbs. Consider the following examples:

- (2) a. *kasara* ʔalyyun al-miftaaħa.

broke-3sm Ali-nom the-key-acc²

Ali broke the key.

- b. *inkasara*³ al-miftaaħu.

broke-3sm the-key-nom

The key broke.

If we compare the two examples in (2), we observe that the subject of the intransitive verb *inkasara* corresponds to the object of the transitive verb *kasara* (Mahmoud, 1991: 122). The intransitive verb in (2b) has the same characteristics of the unaccusative verb. But how can we define the Arabic

² The abbreviations used are as follows: nom=nominative case, obj=objective case, gen=genitive, 3=third, s=singular, m=male, f=female, p=plural, 1=first person, 2=second person, 3=third person, prep=preposition.

³ Even though the verb is not marked morphologically for number in VSO order, the verb is in the default third person singular.

unaccusative? Is there a syntactic and semantic characterization of it? Mohmoud (1991) gives numerous examples of Arabic unaccusatives. He argues that they are associated with a change of state⁴ or position. Here are some examples of the unaccusatives in Arabic⁵:

- (3) a. *ibayyadda*⁶ ‘became white’ ابيضّ
 b. *iḥtaraq* ‘became burned’ احترق
 c. *tabaxxara* ‘became evaporated’ تبخّر
 d. *tawassaʕa* ‘became wide’ توسّع

Li (1993: 496-497), following Grimshaw (1990), assumes that unaccusatives involve a change of state and that unaccusatives are associated with an object. In the remainder of this section, I give evidence supporting the unaccusative analysis of the examples in (3) and other similar ones. I provide two pieces of evidence drawn from resultatives and agent adverbs.

1.1 Resultatives

One of the tests that are used in the literature to determine the verb nature is resultatives. Let us examine the following examples:

- (4) a. *saqta* I-waladu mariidan.

fell-3sm the-boy-nom sick-acc

The boy fell sick.

⁴ A state is a kind of the aspectual information specifying an indefinite period of time. For example, verbs conveying emotions or feelings like *love*, *fear* involve time that has no definite end. See Vendler, (1967) for more details.

⁵ Mahmoud, 1991:131-132. Some examples in (3) are drawn from Mahmoud’s lists in p.131-132 and two examples, *abayyadda* and *tawassaʕa* have been added.

⁶ It is worth observing that *abayyadda* is the unaccusative form that is used intransitively while *bayyada* is the causative counterpart that is used transitively. The focus of this paper is on unaccusatives and not causatives; hence, *ibayyadda* is used.

b. *ibayyaddat* *ʕaynaahu* *ħaziinan*.

became white-3sf eyes-his-nom sad-acc

His eyes became white due to sadness.

The adjectives *marriidan* and *ħaziinan* are predicated of the nouns *Iwaladu* and *ʕaynaahu* in (4a) and (4b) respectively. The adjectives modify or describe the result or the effect on their preceding nouns. In other words, the adjectives can be thought as a means of *delimiting* the stative event of the unaccusative, which is otherwise non-ending (Tenny, 1987: 43). The verbs like those in (4) involve non-agent participants *Iwaladu* and *ʕaynaahu* which start inside the AP and then moves to the subject position. Such participants cannot control the action; hence they are assigned a *theme* theta-role. Li (2005: 91) gives tests that can be used to verify the unaccusative nature of verbs like those in (4):

(5) a. The eyes became white.

b. ?What the eyes did was become white.

The use of the pseudo-cleft sentence (5b) illustrates that the *eyes* cannot control the action as indicated by the marginality of the sentence. The theme *eyes* is instead affected by the action. As a result, Li (following other linguists like Grimshaw (1990) for example) assumes that unaccusatives are associated only with a State event (Li, 2005: 94):

(6) Unaccusative

Event

State

The unaccusatives involve a state event, e.g. become white. The state event is linked with the theme participant, e.g. eyes. According to Li, a modifier can access or modify the state if they operate on

the same level. Thus, the adjectives in (4) access the state event of the unaccusative verbs and as a consequence modify the non-agent participants.⁷

Now let us apply resultatives to unergatives:

(7) a. *rakada I-waladu mariidan.

ran-3sm the-boy-nom sick-acc

*The boy ran sick.

b. *sabaħa Sami ħaziinan.

Swam-3sm Sami saad-acc

*Sami swam sad.

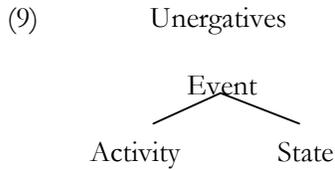
Before analyzing the ungrammaticality of (5), let us first examine if the verbs in (7) show a different syntactic behavior than unaccusatives. To illustrate, let us analyze the verb *sabaħa* in (7b):

(8) a. Sami turned saabiħan.

b. What Sami did was turned saabiħan.

Li (2005: 93) uses the predicate *turned* to distinguish unergatives from unaccusatives that involve a *become* state predicate. As the pseudo-cleft sentence in (8b) shows, Sami controls the action of swimming and therefore Sami is an agent. As a result, the event structure of unergatives is different from unaccusatives (Li, 2005: 95):

⁷ A reviewer indicates however that the adjectives in (4) describe the cause and not the result and thus the resultatives are the verbs and not the adjectives. Here an explanation is needed to clear such confusion. As explained above, the unaccusative verbs in (4) have a state or a result event structure that only deals with the result of the action. For instance, the unaccusative verb, i.e. *ibayyaddat* in (4b), involves an event structure that includes only the result of the action or the state in accordance with what is adopted in the literature Li (2005) and Grimshaw (1990) among others. Now, the adjectives in (4) modify the state event (or the result of the action) since the adjectives operate on the same state level of the state event. That is why these adjectives modify the theme argument that is associated with the state event of the verb. Because the event structure of the unaccusative verb deals only with the result of the action (become white, for example), there is no cause of the action implied in the unaccusative structure. The cause of the action might have been expressed had there been an activity event for the unaccusative but there is none. Therefore the adjectives in (4), modifying the result or state of the action, provide the reason or the cause for the state event structure.



The event structure of the unergatives verbs consists of an activity and a state event. The activity event is needed because there is an agent argument that is a participant of that activity branch. So the agent initiates the actions and the modifiers, as Li (2005: 95) observes that modifiers can only access the activity event and thus modify the agent and not the opaque state. Along this reasoning, the adjective modifiers in (7) cannot modify the opaque state. The adjective modifiers can only access the activity event but the modifiers and the activity event are incompatible. That is, they operate on two different levels: an activity level and state level.⁸

Furthermore, the adjectives cannot be predicated of the subjects as the asterisks indicate. Simpson (1983: 143-157), following Halliday (1976), suggests that *process* verbs do not allow resultatives. The verbs in (7) represent such verb type that focuses on the manner rather than the result of the action. The behavior of resultatives in Arabic confirms the observations that Simpson made on resultatives in English.

Therefore, the use of resultatives with the verbs in (4) strongly suggests that these verbs are unaccusatives and their nouns are underlying objects that were moved to the subject position.

⁸ A reviewer provides an unergative verb that he assumes to be similar to the examples in (7):
 sabaħa r-rajulu farahan.
 Swam the man happily.

Assuming that the sentence is good, even though the native speakers I consulted do not like the example, the modifier *faraban* can only access the agent argument. The possible acceptable meaning is that the man swam while he was happy. So he was happy prior and during the swimming event. In other words, the modifier describes the man's manner while performing the action. Such happiness will not have resulted due to the modification of the internal state event (i.e. being *saabiħ*). In other words, he is not happy because of swimming event. The usage of the language cannot logically associates happiness with the swimming event, so that when somebody is happy he swims. Nor can *faraban* be the cause of swimming event as the reviewer implies. So no one swims because he is happy. Therefore, the adverb above example behaves as expected of modifiers in unergatives verbs. Namely, it accesses the activity event and not the internal state event.

1.2 Agent adverbs

Unlike unergatives, unaccusatives have no agent. Let us consider the following examples:

(10) a. *saqata I-waladu biħaḏarin.

fell-3sm the-boy-nom prep-careful-gen

The boy fell carefully.

b. rakaḏa I-waladu biħaḏarin.

ran-3sm the-boy-nom prep-careful-gen

The boy ran carefully.

Dowty (1979: 55) proposed several diagnostic tests for stative verbs. The verb in (10a) is unaccusative because *Iwaladu* has no control over the action. The sentence is interpreted in the sense that the boy was walking and suddenly he fell unintentionally. Unlike the case in (10b), (10a) is bad since the adverb refers to an agent controlling the action, which is not available. Therefore the subject of the verb *saqata* is an object and not an agent, whereas the subject of *rakaḏa* is an agent.

This observation is confirmed by pseudo-cleft sentences:

(11) a. *ma faʕala I-waladu ʔannahu saqata.

what did-3sm the-boy-nom that-he-acc fell-3sm

*What the boy did is fall.

b. ma faʕala I-waladu ʔannahu rakaḏa

what did-3sm the-boy-nom that-he-acc ran-3sm

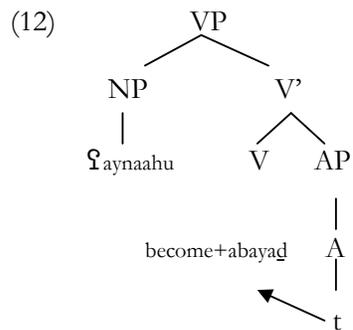
What the boy did is run.

The pseudo-cleft test shows that the unaccusative cannot have an agent while the unergative has an agent controlling the action. Finally the imperative (Pustejovsky, 1991: 51) can apply to the unergative but not to the unaccusative adding yet another piece of evidence of the difference between the two verb types.

2. Baker's Analysis of unaccusatives

Baker (2003: 62- 90) proposes that unaccusatives, like *ibayyaddat* in (4b), are decomposed in syntax as

become and **AP** according to the following tree diagram (irrelevant details are omitted):



Baker observes that the theme thematic-role is assigned in two different ways: verbs assign it inside the VP while the adjective assigns the theme outside the VP. This threatens his Uniformity of Theta Assignment Hypothesis (UTAH) (Baker, 1988:43). Thus he attempts to maintain UTAH by assuming that not only unaccusatives but also unergatives and all transitive verbs for that reason to be all decomposed syntactically into *be/functional* predicate and its complement AP as in the structure (12). The theme assignment will be unified for verbs and adjectives by being assigned in the spec of *become* (Baker, 2003: 82-88). He basically translates lexical semantics concepts into syntax. More specifically the concept that a verb has two event structures: one for CAUSE and another one for STATE, which in turn divides into BECOME and AP.

To illustrate, the derivation of unaccusative verbs looks like the following. An unaccusative verb like *ibayyadda* is derived by means of projecting two predicates in syntax: *become* and *AP* as (12) shows.

The adjective (*abyad*) moves from the A position to *conflate* (or incorporate) with the predicate *become*.

Baker assumes that the predicate *become* has no rich descriptive content. When the adjective conflates with the functional predicate, the two are lexicalized together and turned into *ibayyadda*. The

unaccusative then becomes lexical and thus acquires a descriptive content.

3. The Data

Below I provide data that challenge Baker's analysis. Then I explain the shortcomings that the data illustrates and argue that his analysis cannot be maintained. This paves the way to discuss the unaccusative and compare it with functional adjectival predicate and adjectival predicate. The aim of this paper is to reach an analysis that accounts for these different kinds of predicates.

(13) Unaccusative

a. Tense

absolute- *yamraḍu* Moḥammadun.

become sick-3sm Moaḥammad-nom

Mohammad becomes sick.

Past- *marida* Moḥammadun.

became sick-3sm Moḥammad-nom

Moḥammad became sick.

Future- sayamraḍu Moḥammadun.

will become sick-3sm Moḥammad-nom

Moḥammad will become sick.

b. Aspect

Negative- lan yamraḍa Moḥammadun.

not become sick-3sm-acc Moḥammad-nom

Moḥammad will not become sick.

habitual- Ťindma yamraḍu Moḥammadun, yaŤaxuḍu Ťijaazatan.

when become sick-3sm Moḥammad-nom take-3sm-nom a holiday-acc

When Moḥammad becomes sick, he takes a sick leave.

(14) Functional adjectival predicate (become+AP)

a. Tense

Past- kaana θ-θalju ḌaaŤiban.

Was-3sm the-snow-nom melting-acc

Snow was melting.

Future- sayakuunu θ-θalju ḌaaŤiban.

will-become-3sm-nom the-snow-nom melting-acc

Snow will be melting.

b. Aspect

Negative- lan yakuuna θ-θalju ḏaaʔiban.

Not become-3sm-acc the-snow-nom melting-acc

Snow will not be melting.

habitual- ʕindma ya kuuna θ-θalju ḏaaʔiban, yataḥḥasanu l-taqasu.

Not become-3sm-acc the-snow-nom melting-acc become improved-3sf-nom the weather-nom

When snow is melting, the weather becomes better.

(15) Adjectival predicate (AP)

θ-θalju ḏaaʔibun.

the-snow-3sm-nom melting-3sm-nom

Snow is melting.

The data⁹ above point out to problems in Baker's analysis of unaccusatives. I will refer to three problems:

⁹ Although the Arabic data is the focus of the paper, the analysis proposed here is carried over to Hebrew as it exactly shows the same characteristics as those of Arabic data. Below is the Hebrew data (Borer, 1991: 128-129):

- i. Unaccusative:
Ha-nasi he9eSir.
The president became rich.
- ii. Functional adjectival predicate:
Ha- nasi haya 9aSir.
The president was rich.
- iii. Adjectival predicate (Dr. Ibraheem Dibieki, personal communication):
Ha-nasi 9aSir.
The president rich.

*Ha- nasi hu 9aSir.
The president is rich.

First, Baker uses *conflation* (2003: 85-88) strategy to try to relate otherwise two unrelated syntactic structures: the unaccusatives and the underlying functional adjectival predicate, *become+AP*. According to Baker's analysis, the unaccusative in (13) of the data is a result of the conflation of the AP *marīd* with *become* forming *marīda*. But one may wonder logically: why does not the conflation strategy apply to the predicate adjective phrase *kaana Ḍaa ʔiban* in (14)? Baker's analysis makes us assume that whenever there is a syntactic functional adjectival predicate, the conflation rule will replace this functional predicate with a lexical word provided that the language has the appropriate replacement. Now does Arabic have the appropriate lexical replacement for *kaana Ḍaa ʔiban*? Of course, there is *Ḍaaba*? But nonetheless such replacement or conflation does not apply because if it did apply, we will expect the native speaker of Arabic not to pronounce the functional adjectival predicate syntactically. The fact that functional adjectival predicate may be used without necessarily using the replacement *Ḍaaba* is an evidence that the unaccusative and the underlying functional adjectival predicate are two different syntactic structures that conflation can never unite together or replace one another.¹⁰

Second, Baker assumes that the functional predicate *become* has no descriptive content. As it conflates with *AP*, it becomes lexical and hence picks up a descriptive content (Baker, 2003: 87-88). But if we look to the functional predicates *kaana*, *yakuuna*, *sayakuunu* in (11) of the data, we observe that, contra to Baker's claim, these predicates represent essential aspectual semantic information. In

¹⁰ A reviewer observes that the lack of conflation of adjective does not lead directly to the conclusion that Baker's analysis (2003) is untenable given that Arabic uses different strategies in unaccusative constructions. Nonetheless, the goal of this paper is to propose an account for the different unaccusative constructions of Arabic. Following this line of thinking, the suggestion that conflation or incorporation applies in some constructions of the unaccusative but not in others will not predict or even explain the different syntactic, morphological, and semantic aspects associated with the different unaccusative structure types as will be discussed below. I argue that the minimal analysis (MP) explains the Arabic unaccusative structure. More specifically, I argue that the unaccusative verb is not derived from an adjective because of its violation to the minimalist economic conditions as discussed in section (4). Instead, I argue that the unaccusative verb simply involves a verbal predicate in accordance with the minimalist conditions. Furthermore, the MP explains why functional adjectival predicate (*become+AP*) in (14) involves a lexical predicate while the adjectival predicate in (15) does not as a result of different PF and LF conditions.

fact, the phonetically realized functional predicates like what we have in (14) and the empty predicate in (15) signal aspectual and tense information as will be clear in the next section. It is fair to say that Baker's analysis of an underlying functional adjectival predicate from which the unaccusative is derived cannot handle the syntactically realized adjectival predicate and be able to predict how it is used.¹¹

Third, the claim that a predicate in *AP* is represented syntactically cannot explain the empty predicate in (15). Further discussion is given in the next section.

4. A minimalist analysis

I show in this section how the Minimalist program (MP) can explain the data in section (3). First, I briefly discuss the basic ideas of MP. Then I introduce the minimalist analysis of the data.

4.1 The Minimalist program (MP)

The MP attempts to explain language by means of an *optimal* theory with fewer rules as possible. The goal is to have very general economy principles (Chomsky, 1995). This program assumes that language is a result of a complex interaction between an internal mental system, i.e. language faculty, and two external systems. The sensorimotor system controls the articulatory-perceptual interface (A-P) of language or what is considered to be the phonological form (PF). The other system is the conceptual-intentional (C-I) that is responsible for thought, intension, and conception. The C-I

¹¹ A reviewer indicates that *kaana* in Arabic has no semantic content and that the aspectual meaning comes from the imperative form that is projected independently of the projection where the predicate is realized. However such claim cannot be substantiated since the predicate signals different aspectual meanings that cannot be otherwise explained. Namely, the analysis of *kaana* devoid of semantics will not explain the semantic and the morphological differences between the functional adjectival predicate in (14) and the adjectival predicate in (15). Fehri (1993: 155-156) proposes a visibility rule of the predicate based on the meaning that it signals. Namely, the copula is realized phonetically if it is specified as past (*kaana*), otherwise the predicate is null. Hence, the predicate (whether lexical or empty) signals a crucial aspectual meaning. Now, the question of how and where this aspectual meaning is checked is however another matter. We can assume that the tense is checked in *I* by means of the movement of the lexical predicate *kaana* pre-spell-out. As for null predicate, the tense is checked after spell-out as explained in details in section (4).

interface represents the linguistic logical form (LF). Language can be thought of as an "instruction" or an information system accessible and legible by the two external systems (Chomsky, 1995: p. 219, 2000: p.93-95, 2002: p.108).

Language has two basic elements: a lexicon and a computational system. The computational system selects lexical items from the lexicon and constructs linguistic expressions by means of *merging* categories together. Linguistic expressions should satisfy PF and LF conditions. The derivation *converges* by containing interpretable features only (i.e. semantic features) in LF. Otherwise, the derivation *crashes*. PF and LF conditions are checked in the derivation.

PF features, such as case and agreement, are realized phonetically. These kinds of feature may be *strong* or *weak*. Weak PF features are checked by *covert* movement at LF. Once PF features are checked, they are eliminated. Strong PF features, however, are checked by overt movement pre-spell-out. Semantic features - such as categorial features like V and N, ϕ -features of the noun – are interpreted at LF. When features are interpreted, the derivation is convergent. Convergence determines the optimal derivation from among convergent derivations based on *global* economy principles like Shortest Derivation Requirement and Procrastinate (Chomsky, 1995: 227-228). Global economy refers to the idea that the most economical derivation is chosen from convergent derivations based on the one that involves shorter derivation and procrastinate LF movement.

Collins (1997) tends to eliminate the redundancies of *global* economy. Instead of comparing derivations, the derivation is evaluated *locally*. In local economy, convergence is only one way to have an optimal derivation. Other ways include semantic interpretation and compliance with only two economy principles: *last resort* and *minimality* (Collins, 1997: 130).

4.2 A Minimalist analysis of the unaccusative

The language faculty generates *structural descriptions* (i.e. expressions or structures) each with phonetic and semantic properties. These properties are *instructions* that are legible by the articulatory-perceptual interface and the conceptual-intentional interface (Chomsky, 1995: 219). The computational system constructs derivations that should satisfy PF and LF conditions by respecting *local economy* principles as will be explained below. I discuss the conditions of PF and LF of the unaccusative and explain how the structure is licensed.

4.2.1 The Phonological representation

The phonological and morphological representation of the unaccusative structure is established by means of two strategies: integration and movement. I explain both of them below.

4.2.1.1 Integration

The computational system selects lexical items from the lexicon and integrates them into structures.

Collins (1997) argues that lexical items are merged together due to the *integration* condition:

(16) Every category (except the root) must be contained in another category (Collins, 1997: 66).

Constituents merge together so that they are syntactically dominated by another category. In other words, the motivation of merge is the syntactic integration of constituents. Let us consider the following example:

(17) yamraḍu Moḥammadun.

become sick-3sm Moḥammad-nom

Moḥammad becomes sick.

The unaccusative *yamradu* is selected from the lexicon or more accurately copied out of the lexicon and *Moħammadun* is also copied out of the lexicon (Collins, 1997: 90-91). *yamradu* integrates with the NP *Moħammadun* to form a VP constituent. In accordance to (16), the unaccusative is contained with the VP category that dominates it. The integration relation between merged structures is represented syntactically in terms of dominance reflected by Kayne's (1994) Linear Correspondence Axiom (LCA) (Collins, 1997: 67).

Now let us examine how Baker's analysis works in MP. Baker argues that the unaccusative is derived out of the conflation of a predicate *become* and an AP. The MP derivation of the unaccusative may involve the following operations:

- (18)
- a. copy of a predicate *become*
 - b. copy of an adjective *mariid*
 - c. merger of *become* and *mariid* forming a functional predicate AP
 - d. AP $\longrightarrow \emptyset$
 - e. copy of the verb *yamradu*
 - f. copy of the NP *Moħammad*
 - g. merger of *yamradu* and *Moħammad* forming a VP

As the derivation in (18) shows, the unaccusative starts out with copies of two lexical units; the predicate and the adjective merge forming an AP. As conflation applies, the AP is deleted as in (18d). The deleted AP is replaced by a lexical verb (18e). Then the verb integrates with the NP forming a VP (18g). However this analysis has serious problems. To begin with, the derivational steps (18a, b, c, d) do not have any logical relation to (18e, f, g). Why do we have an AP in the first place and then

replace it with a verb? Does language have to do that? From an MP point of view, this is a costly process and hence does not comply with the economical principles constraining the grammatical derivations. We may be able to remove the logical tension in (18) and furthermore account for the derivation of the unaccusative structure more economically with fewer derivational steps. This can be achieved by considering only the derivational steps (18 e, f, g) and deleting the other steps. We arrive at this conclusion from two different perspectives of minimal theory. On the one hand, let us assume for the sake of argument that the derivational steps in (18) lead to a convergent structure despite the logical problems that we have already referred to. Still (15) will be ruled out based on Kitahara's (1995) Shortest Derivation Requirement given in (19)

(19) Shortest Derivation Requirement (SDR):

Minimize the number of operations necessary for convergence.

Chomsky (1995: 227) indicates that the "Application of the operation OP to Σ^{12} is barred if this set contains a more optimal derivation in which OP does not apply to Σ ." The derivational steps (18 e, f, g) lead to a convergent structure and involve a minimal number of operations for the derivation of the unaccusative; thus this shorter derivation is more optimal than the longer derivation involving many other operations (18 a, b, c, d). As a result, the longer derivation in (18) is barred in favor of shorter derivation involving just (18 e, f, g). This process is called *global* economy since it selects the optimal derivations based on the minimal number of operations from convergent derivations.

Moreover, the derivations in (18 a, b, c, d) are ruled out from a *local* economy of Minimal theory (Collins, 1997). The optimal derivation is not determined by comparing convergent derivations. But rather the two basic conditions (Last resort and Minimality) are judged locally in each step in the derivation. I am going to adopt local economy framework because it is more constrained and

¹² Σ is a structure (like the unaccusative) that is formed by the computational system and is associated with phonetic and semantic properties.

superior to global economy on empirical and conceptual grounds. The decomposition of the unaccusative into an AP in syntax violates the economy principles *Last resort* and *Minimality*. These economy principles are general enough to apply in merge and move. In this section, I explain how they apply to merge leaving the case of movement for the next section. Let us first define *Minimality* (Collins, 1997: 129).

- (20) An operation (satisfying Last Resort) may apply only if there is no smaller operation OP' (satisfying Last Resort).

This principle is similar in spirit to Chomsky's generalization that an operation is barred if there is a more optimal derivation. Minimality as defined in (20) captures the basic idea of SDR in (19) without having to compare convergent derivation against each other. We instead judge the derivation locally. An operation containing minimal number of derivations is optimal and minimal. Accordingly, the unaccusative only involves minimal derivational steps (18 e, f, g) while the longer derivational steps in (18 a, b, c, d, e, f, g) are ruled out based on minimality.

Moreover the longer derivations of the unaccusative violate *Last Resort*. This principle is defined below (Collins, 1997: 67).

- (21) An operation OP involving α may apply only if some property of α is satisfied.

The merge operation applies if and only if a property of a structure (unaccusative) is satisfied. The property which merge satisfies is integration as defined in (16) above. The integration property of the functional adjectival predicate is not respected because this predicate is not contained syntactically in the category VP. In other words, the functional predicate is not dominated syntactically by the VP: the maximal projection of the unaccusative. But instead, what we observe syntactically is that the unaccusative verb merges with a theme to form a VP. That is why Baker (2003) suggests the conflation of the functional adjectival predicate into a lexical verb. Baker uses the conflation strategy to explain the integration of the unaccusative in a VP category. But if the functional predicate cannot

be motivated by the syntactic integration property, it cannot show up phonetically which is indeed the case.

The unaccusative morphological structure is built by *merge*, which is in turn motivated by *integration*.

So aspect is marked on the unaccusative as a result of integration property. Let us consider the following examples in (13b) repeated below for convenience:

(22) a (Negative) *lan* *yamraḍa* Moḥammadun.

not become sick-3sm-acc Moḥammad-nom

Mohammad will not become sick.

b. (habitual) *ʔindma yamraḍu* Moḥammadun, *yaaʔxuḍu* ʔijaazatan.

when become sick-3sm Moḥammad-nom take-3sm-nom a holiday-acc

When Mohammad becomes sick, he takes a sick leave.

The negative particle *lan* in (22a) is merged to the VP in order to satisfy the integration property of the unaccusative to form a negative phrase. The habitual aspect is marked by the prefix *ya-* and is marked directly on the verb.

Concluding this section, we can say that not only local but also global economy minimalist theories eliminate a functional adjectival predicate analysis of the unaccusative. Local minimal theory explains the unaccusative structure by means of simple economy rules like *last resort* and *minimality*. The unaccusative structure is a result of merge that is motivated by the integration property requiring the verb to integrate with other syntactic constituents. Merge is controlled by minimality that produces the unaccusative structure with the smallest number of operations.

4.2.1.2 Movement

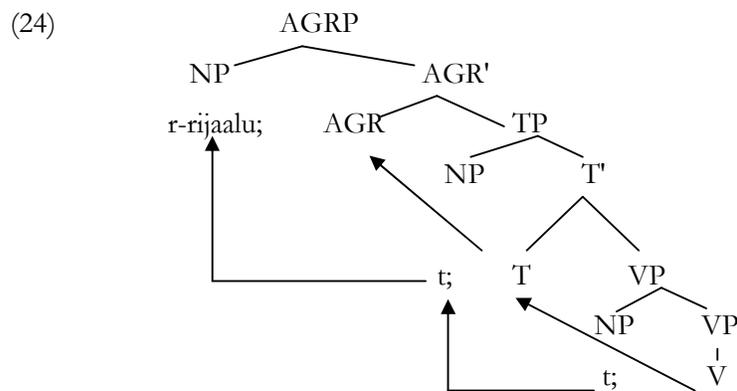
Movement is a last resort strategy for satisfying PF conditions¹³. It is an *overt* process involving moving a lexical item pre-spell-out because of *strong* features that need to be checked. Strong features require the overt movement of not just the features but also the phonological matrix (lexical item) in order for feature checking to apply (Collins, 1997: 117). If however a strong feature of a lexical item is not moved pre-spell-out, the derivation crashes since an uninterpretable feature is not checked and deleted. In this section, we will distinguish between two basic types for feature checking of the unaccusative structure: asymmetric and symmetric feature checking that are involved in theme and the verb movement. There is a difference in movement between the verb and the subject in Arabic. The verb always moves overtly before spell-out. The subject however may move depending on the word order type. Let us first begin with a SVO order. The theme of the unaccusative verb moves pre-spell-out to please different types of strong features. To illustrate these types of features, let us examine the following example:

(23) r-rijaalu yamraḍuun.

the men-nom become sick-3pm

The men become sick.

The sentence (23) has the following tree diagram in (24):



¹³ Movement is strategy to satisfy not only PF conditions but also LF conditions as discussed in section (4.2.2) below.

The theme moves from the spec of VP to the spec of TP to check case and the Extended Projection Principle (EPP) feature that requires a phrase to have subject. The case and the EPP features delete while D feature of the NP remains. The theme finally moves to the spec of AGRP to check the EPP. The theme also checks the person, number, and gender features. The EPP feature is strong demanding the overt movement of *arrijaalu*. This feature is checked against the determiner feature (D) of *arrijaalu*. The EPP is deleted being uninterpretable while D feature is not deleted because it is an interpretable feature¹⁴. The NP features person, number, and gender have semantic content; hence, they are interpretable at LF and therefore they are not deleted. The feature checking relation is considered to be asymmetric if one uninterpretable feature deletes (EPP) while the interpretable feature (D) remains. As for the verb, it moves to T to check tense and aspect¹⁵. The tense feature of the verb (past, non-past) and the aspect features of verb (negation, habitual) are checked against the tense and aspect features of T. The uninterpretable tense and aspect features of the T are deleted while the interpretable tense and aspect features of the verb are not deleted. This is a case of asymmetric checking.

Finally the verb moves to the AGR position to check the strong person, gender, and number agreement¹⁶. The verb agrees with *arrijaalu* and the verb checks 3rd person, plural and masculine features. The verb \emptyset features (person, number, and gender) and the AGR features in AGR are uninterpretable since they have no semantic interpretation. Therefore they are all deleted after being checked. This is a case of symmetric checking (Collins, 1997: 20-22).

¹⁴ The D feature is interpretable because it is a categorical feature of DPs. See Chomsky, 1995, p. 217 and Collins, (1997), p. 20-22.

¹⁵ Whether the aspect features are checked in the T projection or in another functional projection does not affect the main argument of this paper. The basic idea is that aspect, negation for instance, is checked overtly by moving the verb to either T or Neg in the sense of Benmamoun (1992) or ASP in the sense of Hendrick (1991). I will not decide among these functional projections as it is outside the paper's focus.

¹⁶ I adopt a reviewer's suggestion that tense morphemes are projected higher in Arabic than agreement morphemes. Since this topic goes beyond the scope of the paper and does not have any implication on the analysis adopted in this paper, I will not discuss it further.

Pollock (1989) postulates that inflections are projected syntactically into two functional projections: TP and AGRP. I assume following Pollock that the movement of both the theme and the unaccusative verb apply cyclically to TP and then to AGRP as illustrated in (24). Why is not there just a one-step movement? If the verb in (24) moves in one step to AGRP, the trace will be antecedent-governed not by the verb but by the closer intervening head AGR in violation of ECP. The T head forms a minimal domain blocking the verb movement. Therefore the successive movement is enforced due to *minimality* condition in (20) repeated in (25).

- (25) An operation (satisfying Last Resort) may apply only if there is no smaller operation OP' (satisfying Last Resort).

An operation (i.e. movement) is triggered by Last Resort because movement is required, as we explained above, so that the strong features are checked off before spell-out. Movement targets the smallest domain whereby there is no smaller domain that may be targeted by movement. In other words, "minimality chooses the shortest path of movement." (Collins, 1997: 77)

As for the VSO order, it is identical to SVO in cyclic verb movement to TP and AGRP. The theme, however, does not move out of VP. Let us consider this example:

- (26) yamraḍu r-rijaalu.
 become sick-3sm the men-nom
 The men become sick.

The theme does not move to the spec of TP to check case but remains in spec of VP and receive the nominative case from the verb. Koopman and Sportiche (1991) suggest that nominative case in Arabic is assigned in two ways: the NP moves to get case under spec-head agreement (in SVO) or the NP gets case under government of the verb (in VSO). Since the theme does not move to the

spec of AGRP, there is no total agreement as we find in SVO between the theme and the verb. The verb is assigned the default 3rd person singular agreement features.

In conclusion, movement, as the case in integration, is controlled by two economy principles *Last Resort* and *Minimality*. Movement is a strategy that language uses to satisfy phonological conditions by means of checking strong features before spell-out in smaller (local) domains. The checking of such features produces inflectional morphemes such as tense, aspect, agreement, and case.

4.2.2 The Logical form representation

LF is the level where there are only interpretable features in accordance with Full Interpretation (FI) (Chomsky, 1995). All uninterpretable features have already been checked off at PF and deleted. If however a uninterpretable feature is not deleted, the derivation crashes at PF and LF since this violates FI. The acceptable logical form of a syntactic structure is established by three ways: respecting FI, semantic interpretation, and compliance with economy principles (Collins, 1997: 129-130).

Now let us examine how the logical representation of unaccusative is derived. Starting first with a SVO order, the sentence in (23) checks the interpretable features of the theme and the unaccusative verb. As we explained above by means of the tree diagram (24), *rrijaalu* checks the EPP feature by the overt successive movement to spec of TP and the spec of AGRP. *rrijaalu* checks case in spec of TP and then it deletes pre-spell-out. Then, it checks the EPP feature and the gender, person, and number features in the spec of AGRP. At LF, the determiner feature of the theme is interpreted because it is a formal feature specifying the category of the NP. Other interpretable features of the NP *rrijaalu* at LF include its \emptyset features (person, number, and gender). The theme theta-role of the NP is interpreted at LF. As for the unaccusative, it moves to T to check the tense and aspect features. Then the verb moves overtly to AGR to check the uninterpretable agreement features of

person, number, and gender; then they are deleted. At LF, the tense and aspect of the verb are interpreted.

On the other hand, the VSO order differs from SVO in the lack of the theme movement before spell-out. As we explained in example (26), the theme *rrijaalu* does not move. Features are checked in LF differently from those features at PF (Chomsky, 1995: 262 and Collins, 1997: 117-120). Features at PF are strong requiring overt movement prior to spell-out. This overt movement does not only move the feature that requires checking in PF (EPP for example) but also requires the movement of the phonological matrix too. Therefore the overt movement involves a *pied-piping* movement: moving the feature and the phonological matrix. So the lexical item as a whole is moved. Movement in LF, however, employs a different procedure for a different type of features. LF features are weak since they are not checked until LF unlike the case in strong features. Only the \emptyset features of the NP move with no pied-piping of the lexical item (Chomsky, 1995: 265). As a result, Last Resort dictates that the case feature of *rrijaalu* moves covertly to the spec of TP so that it can be checked and then deleted given that case is uninterpretable. Moreover, the third person plural masculine features (not the phonological matrix *rrijaalu*) move covertly to the spec of AGRP¹⁷. These features move due to the Last Resort principle because there is no way to check them unless by means of covert movement to the spec of AGRP. If however the features do not move, an unacceptable LF representation is created. The thematic relationship between the NP and the unaccusative verb is interpreted at LF and therefore assigned. Thematic role is assigned not by means of feature checking but by means of interpretation (Collins, 1997: 69-70). Therefore thematic-roles interpretation is one of the important ways of deriving an acceptable LF representation.

¹⁷ The unaccusative verb in (26) agrees with the masculine and third singular person features of *arrijaalu*. The verb characteristically in VSO sentences shows partial agreement in gender and person whereas the verb agrees totally with the subject in all features in a SVO pattern.

In summary, an acceptable PF-LF pair of an unaccusative structure is derived by three important ways: respecting FI, semantic interpretation, and compliance with economy principles.

4.3 Functional adjectival predicate

In this section, I discuss how the functional predicate is formed syntactically as *become+AP*. I explain the PF and LF conditions of the data in (14) above and how this structure is constrained.

4.3.1 The Phonological form representation

The phonological and morphological representation of the functional adjective predicate is established by means of two strategies: integration and movement. I explain both of them below.

4.3.1.1 Integration

The computational system selects lexical items from the lexicon and integrates them into syntactic structures. Lexical items are merged together because they need to be integrated into bigger syntactic categories as determined by the integration condition in (16). For instance, consider the following example:

- (27) *kaana* θ - θ alju *Ǿaaʔiban*.
was the-snow-nom melting-acc
Snow was melting.

The computational system selects the predicate *kaana* and *Ǿaaʔiban* and integrate them together forming a functional adjective predicate in syntax. The Last Resort economy principle requires that the functional predicate and the adjective be dominated by a functional adjective predicate. If, however, there is no integration, there will be an unacceptable PF structure since there will be a violation of the Last resort principle and hence a violation of the integration condition. The

functional adjectival predicate continues to integrate with T forming a TP and integrate with the AGR forming an AGRP.

Baker's analysis of conflating the AP into a lexical verb fails to account for the functional predicate and the adjective in (27). Although the adjective *Ǿaaʔiban*, has a verb counterpart *Ǿaaba*, the adjective does not conflate; thus it jeopardizes Baker's proposal. In fact, conflation never takes place due to Minimality condition defined in (20) above. Namely, minimality predicts that a merger operation containing minimal number of derivations is optimal and minimal. Thus the merger of *kaana* and the adjective is optimal since it contains the minimalist operations possible. The formation of the other tense and aspect specifications of the functional adjective predicate data in (14), is similarly controlled by the economy principles that we explained for (27).

In conclusion, the structure of the functional adjective predicate is constrained by *last resort* and *minimality* economy rules.¹⁸

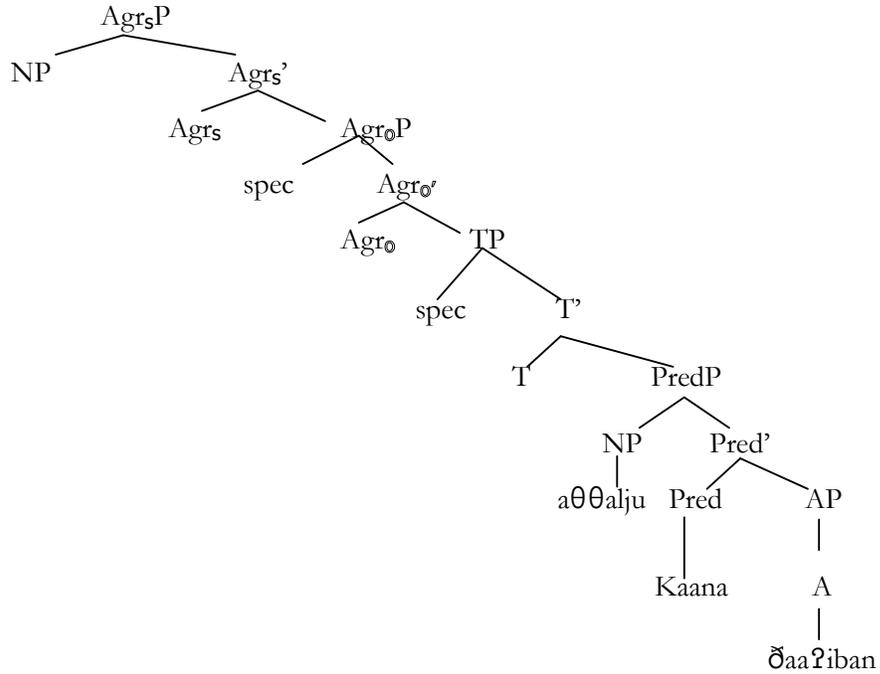
4.3.1.2 Movement

Movement is motivated by Last resort to satisfy PF conditions of the functional adjectival predicate. It is performed pre-spell-out to check strong features by means of overt movement of not just the features but also the phonological matrix (Collins, 1997, p.117). To illustrate, (27) has the following tree diagram¹⁹:

¹⁸ For more details on structure integration, see Collins (1997: 65-73).

¹⁹ Chomsky (1988) and (1992) proposes two agreement projections for: one for the subject and the other is for object. I adopt such analysis and assume that the features of subject of the predicate *kaana* are checked at the spec of Agr_SP while its object features are checked at the spec of Agr_OP.

(28)



The sentence in (27) has a VSO order where the predicate precedes the subject²⁰. As a result, (27) shows all the typical characteristics of a VSO order. The predicate moves pre-spell-out to T to check tense and aspect features against the tense and aspect features of T. Since the tense and aspect features of the predicate are interpretable, they are not deleted while those of T are deleted given that they are uninterpretable. This is an asymmetric checking relationship. Then the predicate *kaana* moves overtly to Agr₅ and gets the default 3rd person masculine agreement features. The functional predicate checks its strong gender and person features against those of Agr₅. The predicate features delete since they are uninterpretable making the checking relation symmetric. As for *θθalju* and *ḏaaʔiban*, they do not move until LF to check their *weak* case and \emptyset features. *θθalju* moves at LF to

²⁰ A reviewer believes that *θθalju* in (27) is in the spec of Adj and gets an experiencer theta-role from the Adj since *kaana* cannot theta mark the subject because it is voided from meaning. Consequently, the reviewer argues that there is no motivation for the projection of the null predicate in adjectival predicate in (32). I assume that *kaana* has a semantic content for the reasons explained in footnote (11). As a consequence, it has been observed that the Arabic functional predicate assigns theta roles to their arguments, see Eid (1991:58-59) and Baker (2003). For instance, Baker (2003: 48-49) suggests that the copula in a functional adjectival predicate theta marks the subject whether the copula is lexical or null.

check the nominative case at the spec of Agr_SP, whereas *Ǿaa Piban* moves to the spec of Agr₀P to check the objective case²¹.

A SVO order, where V is lexical or functional, has a total subject-verb agreement:

- (29) r-rijaal-u kaanu marǿa.
the-men-nom were-3pm sick-3pm-acc
The men were sick.

The same features checking processes apply with regard to the predicate as the case in a VSO order. Unlike the case in a VSO order, the theme *rijaalu* moves overtly to the spec of TP to check the nominative case and EPP requiring TP to have a subject. Both of these features are eliminated after being checked. The theme *rijaalu* then moves to the spec of Agr_S pre-spell-out to check its strong \emptyset features and the EPP feature requiring that Agr_SP have a subject syntactically. The \emptyset features are not deleted because they are interpretable. But the EPP feature is deleted after being checked since it is uninterpretable.

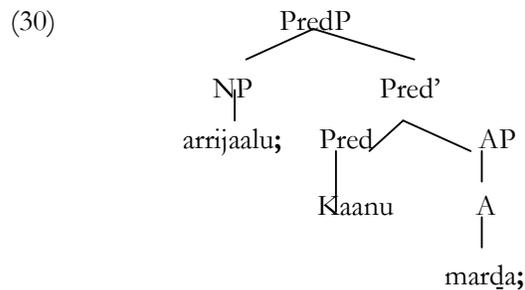
²¹ A reviewer assumes that there is no accusative case available in (27) where both the subject and the object carry the nominative case. The reviewer may be referring to Fehri's analysis (1993: 87, appendix 2) in which Fehri proposes that a copular sentence (e.g. rrajulu mariidun) is similar to a nominal sentence in having *I(nflection)* heading a copular sentence. So the copular sentence contains an *I* head that includes T and AGR just like the verbal sentence. According to Fehri's analysis, the [-past] T feature fails to surface while the [+past] T feature forces the copula to surface. However, Fehri indicates that the issue is not settled as there are other proposals that analyze the copular and nominal sentences in Arabic in terms of small clause analysis in which there is a copula and adjectival complement. For instance, Fehri (1993: 89, appendix 2) refers to the small analysis clause of Mouchaweb (1986) and Rapaport (1987) analysis for Hebrew. Moreover, Fehri observes that a nominal predicate or an adjectival predicate receives a morphological objective case when the copula surfaces (as in (27)) that cannot be accounted by the *Inflection* analysis of the predicate. Therefore, Fehri concludes that further research is needed to determine the nature of the morphological visibility of the copula keeping in mind the presence of the copula (whether lexical or null). The analysis in this paper is just an attempt to accomplish such goal.

4.3.2 The Logical form representation

LF is the level where weak features are checked and deleted if they are not interpretable while interpretable features are visible as required by FI. Not only an acceptable LF is a result of FI but also a byproduct of economy principles too.

For instance, (27) as represented in (28) checks all the strong features (agreement of the verb and the tense and aspect features of T) in overt syntax. The tense and aspect of the verb are interpreted and thus are not deleted. At LF, weak features move as a result of Last resort in order to be checked. As they move covertly, the movement is constrained by minimality since only features move with no phonological matrix. To illustrate, the nominative case of *θθalju* is weak and so it is moved covertly to the spec of T to be checked and then it is deleted because it is uninterpretable. Furthermore, the 3rd person, singular and masculine features of *θθalju* are *weak* and they move to the spec of *Agr_SP* to be checked. These features are not deleted because they are interpretable. As for *Ǿaa ʔiban*, its weak features of case and \emptyset features move in LF to the spec of *Agr_oP* to be checked. The Case feature is deleted but the person, number and gender features of *Ǿaa ʔiban* are interpretable and hence not deleted.

Finally the thematic roles are interpreted at LF. Let us consider the following tree diagram in (30).



The predicate *kannu* assigns a theme role to *marða*; the predicate also assigns another theme role to *arrijaalu*. This is exactly identical to what Eid proposed for *kaana* (1991: 58-59). At LF, both theme

roles are interpretable and have the same referent with the same \emptyset features. This is represented by means of coindexation.

4.4 Adjectival predicate (AP)

In this final section, I examine the phonological and logical form representation of AP. More specifically, I show how AP differs from the unaccusative and the functional adjective predicate.

4.4.1 The Phonological form representation

The phonological and morphological representation of AP, like the previous two predicate types, is established by means of two strategies: integration and movement.

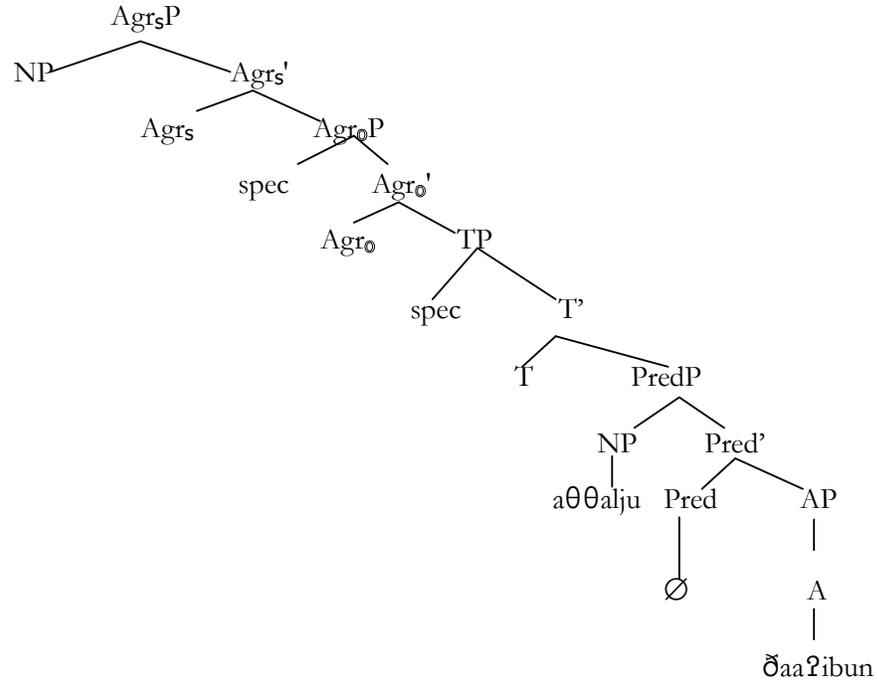
4.4.1.1 Integration

The computational system selects lexical items and merges them as required by the integration condition in (16). The integration represents the phonological shape that is a direct result of FI and economy principles. To illustrate, we can examine the following example:

- (31) θ - θ alju $\check{\theta}$ aa $\check{\theta}$ ibun.
the-snow-3sm-nom melting-3sm-nom
Snow is melting.

The computational system selects an adjective *$\check{\theta}$ aa $\check{\theta}$ ibun* and a null predicate with no phonological features and integrate them together forming an adjectival predicate in syntax. The null functional predicate is not selected in PF but in LF. This follows from what Chomsky suggests (1995: 232) that \emptyset selection applies to covert component, i.e. LF. Chomsky states that “Selection of a lexical item must be overt, unless the lexical item has no phonological features. In this case lexical item can be selected covertly and merged.” The tree diagram of (31) is the following:

(32)



The AP integrates with the \emptyset predicate to form *Pred'*. *pred'* in turn integrates with the NP forming *PredP*. The integration of the \emptyset predicate and AP follows from economy principles: last resort and minimality. If there is a functional predicate with phonological content in (31), this will violate last resort that requires a null predicate to merge with AP. Hence we will end up with a bad sentence. Arab scholars explain that the functional predicate (*yakuun*) is omitted and it is implied (Tawfiq, 1981 and al-Maxzuumi, 1964) for semantic reasons that will be explained below.

On the other hand, minimality predicts that a merger operation containing minimal number of derivations is optimal and minimal. Accordingly, an adjectival predicate phrase is made more minimal and thus optimal if it just involves a process of merging a null predicate with an AP rather than merging a functional predicate with phonetic content with AP.

4.4.1.2 Movement and LF

As we explained above, an acceptable PF-LF pair of a syntactic structure is derived by three important ways: respecting FI, semantic interpretation, and compliance with economy principles.

The sentence in (31) does not involve any overt movement. Therefore all features have to wait to LF to be checked. At LF, the tense feature of the null functional predicate moves to T to be checked while the nominative case feature of *θθalju* moves to spec of T for checking. The tense feature is not deleted since it is interpretable while the case feature gets deleted.

Movement of features is again constrained by last resort and minimality. The null predicate also checks its 3rd person, singular, masculine features by moving such features to Agr₀. According to FI, the features are deleted given that they are uninterpretable. At the same time, the ∅ and the case features of *Ǿaa ʔibun* move to the spec Agr₀ to be checked. These features agree with the features of the head Agr₀. The ∅ features of *Ǿaa ʔibun* are interpretable and so they are not deleted while the case feature is deleted. *Ǿaa ʔibun* gets the nominative case since the functional predicate is not realized phonetically, because the complement would get the objective case if the predicate *kaan* surfaced as in (26). Then the null predicate's 3rd person, singular, masculine features move to Agr_S to be checked. At the same time, the ∅ features of *θθalju* move to the spec of Agr_S to be checked.

There is a total agreement between the ∅ features of *θθalju* and those of the predicate. The features of the null predicates are deleted while those of *θθalju* are kept since they are interpretable. Last resort imposes that weak features, whether interpretable or not, move to be checked otherwise the derivation crashes. Even though ∅ features of *θθalju*, for example, are interpretable in LF and should be acceptable from FI point of view, the ∅ features have to move covertly as last resort dictates so that these features are checked. Covert movement of features is also controlled by minimality since covert movement only involves features and not the phonological matrix making this type of movement minimal and optimal. Arab scholars observe that the functional predicate referring to the present tense should not be realized phonetically because the present tense is already

implied by the absence the predicate and there is no need to have the predicate realized syntactically since this will be semantically vacuous. Local economy theory predicts that the predicate in (31) is selected covertly and the weak present feature is checked at LF. But as for the predicates referring to the past or future tenses, the minimal theory predicts that they should be selected phonetically; hence their features are checked overtly.

Finally, the theta-role is interpreted at LF. The predicate assigns a theme role to *Ḍaa ʔibun* and it also assigns a theme role to *θθalju*. Both theme roles are interpreted as a referent with the same \emptyset features. This is represented by means of coindexation.

5. Conclusion

We can say that local economy predicts the type of the predicate whether it is lexical (unaccusative) or functional (the functional predicate adjective) on the one hand. On the other hand, the theory can also explain the absence of the predicate (Adjectival predicate phrase) or the presence of the predicate whether lexical or functional. Local economy can explain these different structures by means of last resort and minimality principles imposing different PF and LF conditions on these structures.

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