Verbal Morphology in Arabic:

A Cognitive Linguistics Approach

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by

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Abstract

This paper proposes a reanalysis of Arabic verbal morphology categories by presenting a construction grammar treatment in line with Schneider's (2010) treatment of Hebrew verbal morphology. This treatment brings the oft-referenced semantic generalizations of the canonical verb forms in line with broader mappings between form and meaning commensurate with a cognitive linguistics-based understanding of event semantics. I propose that the variation of meaning amongst the different derivational verb templates is a bottom up problem that originates with the polysemy inherent to the root due to its association with a broader frame. The verbal template structures meaning within this root-based polysemy by invoking inherited structure in the root frame from more abstract frames that it inherits due to its event structure. Therefore, the definition of Arabic verbal templates, is to identify a relation that results from participant selection. The meaning of the produced word is determined by the ways in which those participants relate.

Introduction

Roots are a common unit of linguistic analysis across the world's languages. The relationships between words that carry these base forms are the basis of contemporary theories of derivational morphology. But perhaps these morphological relations have something to reveal about meaning within the broader context of modern semantic theories. These roots and their related families are structured in a way that mirrors how concepts are built and navigated in the mind. Therefore, the purpose of this paper is to analyze the polysemy of the root within the context of a verbal derivational system.

This paper will take the root system of Arabic and the derivational system of verb formation as a case study. Though other root systems are semantically productive, Semitic languages are particularly so. They therefore provide insight into the way that morphologically related words form highly polysemous semantic spaces, accessible by the whole set of morphologically related words. They also provide an insight into the inherited structure that exists in very built up semantic spaces, as the variance of meaning present in the breadth of senses of a singular root is a result of the way morphological form points at meaningful relationships within the frame. This inheritance structure is one dimension of semantic relationship in the process of constructing root-based polysemy. Root based morphology interrelates the overall semantic content associated with a root and the frames which structure it. I will provide an account of how specific Arabic verbs acquire meaning by invoking the participant roles inherited from higher order event frames during the derivation process.

The result of this study will be a more systematic method for analyzing how verbal morphology contributes to the construction of meaning. In my analysis, I will construct a semantic mechanism for the derivational work done by several Arabic verb forms. This mechanism has the capacity to be broadened to account for the wider variation present in the whole verbal system, and perhaps, in further studies, to other aspects of the templatic derivational system of Arabic as well.

Despite the wide aims of this paper, the language analyzed will be limited to Modern Standard Arabic. This is due to the greater range of semantic productivity of morphological constructions in this data. It is also due to the greater clarity of meaning in works collected from a large range of textual sources and summarized in dictionaries such as Hans Wehr's *The*

Dictionary of Modern Written Arabic. A fuller account of verbal morphology in Arabic would take steps to account for the variance present in different regional Arabics, and what parts of this system have been reproduced in those, versus which have been left behind or weakened.

Background

Arabic Morphology

The derivational morphology that most Arabic words are based on is a result of the root-and-pattern system. A root is combined with a derivational morpheme to form a word which then exists as a phonological and semantic object (Ryding, 2005).

The existence of roots in Semitic languages generally, while a common analytical approach, is not entirely a settled matter. While Prunet (2006) collects a large amount of argumentation for the cognitive existence of the root others have provided arguments against (Benmamoun, 1999; Boudelaa & Wilson, 2001). Specifically, those against root-based conceptions believe in something more like an extension model. Instead of there being a central root which carries the most holistic and complete semantic sense of every related word, there is instead an extension from core words towards different use cases of that word's concept (Davis and Tsujimura, 2018). In this method of argumentation, the root is a mirage that arises from the morphological processes of abstraction. While I agree more with the preponderance of the literature that presupposes the existence of the root as a cognitive entity, this method does nothing to diminish the analytical utility of the root. Though some words related to an individual root engender semantic drift, the vast majority of words related to a single root maintain a semantic closeness (Ryding, 2005). This analysis is backed up by Davis and Tsujimura

(2018) who attest that the semantic content of at least two verbal patterns, the causative and the reciprocal, can be conceived of equivalently as either a transformation achieved through a root and pattern/templatic morphology, or as some infixal process to a base verb.

Morphologically, these roots are generally composed of three consonants (triliteral). What counts as a consonant and the result of consonant doubling in the root phonologically complicates this picture. Additionally, 4 consonant (quadriliteral) roots do exist, but their derivational morphologies are very different. The classical analysis of how these roots become words is via a series of '*awzaan* (lit. weights) or patterns. Each pattern is made up of dummy consonants which can be replaced by the consonants of the roots (Ryding, 2005). McCarthy (1981) created a contemporary analysis of this view to put it into the broader context of morphophonological theory. He first proposed a templatic morphology analysis, creating a CV tier that functionally mirrored the classical system of dummy consonants, also extending this analysis to account for the tier-based way that an Arabic verb is formed from a root, a syllabic CV structure and a vowel harmony, observe *kattab* in figure 1. He later updated this analysis to account for a broader theory of prosodic morphology that more systematically accounts for the phonological realities of cross-linguistic word formation, including Arabic (McCarthy & Prince, 1990). The phonological and suprasegmental insights of this theory of prosodic morphology are not necessary for this analysis of the semantic qualities of these CV templates ('awzaan) despite its invaluable empirical insights, so will be elided.

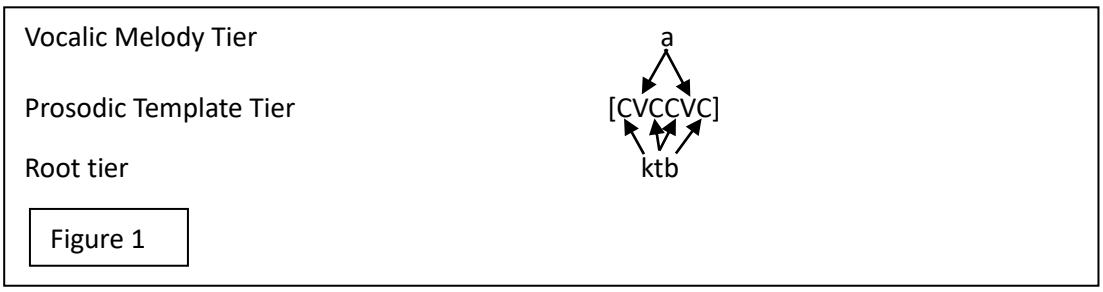

Figure 1

There are ten commonly attested triliteral *'awzaan* of Arabic verbs. The analysis of this paper is focused on four of them, form I form II, form III, and form V. These forms have in common that they are used on a wide variety of roots. While heuristic definitions exist, the analysis here seeks to formalize those definitions via cognitive linguistic theory, focusing on the relationship between semantic effect and participant selection. I will use CV-structure templates (table 1) to describe them, considering caveats mentioned previously concerning phonological complications and the existence of the root. The functions are approximations (Wehr, 1979), and the broad semantic labels are reproduced elsewhere in the literature (Davis & Tsujimura, 2018).

Wazan (form)	Template with past inflection (3sg.m)	Template with present inflection (3sg.m)	Approximate function of template	With root q-r-b	q-r-b meaning
I	*CvCvCv*	*yaCCvC*	Base	*qaruba*	*was near*
II	CvCCvCv	*yvCvCCvC*	Causative	*qarruba*	*brought close*
III	CvvCvCv	*yvCvvCvC*	Reciprocal	*qaaraba*	*became close (to someone)*
V	*tvCvCCvCv*	*yvtvCvCCvC*	Reflexive Causative	*taqarraba*	*approached*

Table 1

The form I *wazan* is thought of as expressing the base verb. That is, its transformational function is no transformation. Form II is the causative, and form V is the reflexive version of the causative. Form III is the one of these with the most internal complexity. It has been called the plural (Benmamoun, 2016) as well as the reciprocal (Ryding, 2005). A full analysis of the semantic complexity of this *wazan* can be found in Danks (2010). We will explore a little bit of form III semantic complexity in the analysis section of this paper, but only cursorily.

Construction Grammar

Construction grammar is the theory that posits that language consists of different linguistic patterns, called constructions, which create meaning via the application of constructions to base level linguistic units. In typical English construction grammar analysis this maps words to meaning by applying sentential level constructions to those words. However, a wide variety of work has been done to apply construction grammar to morphological constructions, including theories such as construction morphology (CxM) and embodied construction grammar (ECG). The analysis of constructions adopted in this paper will adopt insights developed by these theories and will treat morphological transformations, especially that of Arabic templatic morphology, as constructions.

CxM allows for a systematic mapping of semantic generalities encoded by a specific morphological transformation to a morphophonological transformation of a word (Booij, 2010). An example is English deverbal *-er*. The CxM encoding of this morpheme is a phonological, syntactic and semantic triple (figure 2) mapping [-ər] to a noun to a meaning “the one who does x” (Davis and Tsujimura, 2018). This triple forms a basis for the cognitive object associated with a morphological construction.

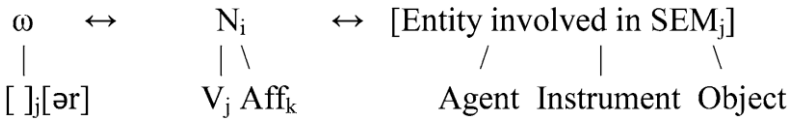

Figure 2

We can see in figure 2 a breakdown of the way the triple is mapped, the final phonological, syntactic and semantic roles on the top row, and the constructional basis for each of these derivations on the bottom. In fact, in the semantic labelling, we see the exact kind of participant relation breakdown I think is crucial to the understanding of Arabic verbs. However, when Davis and Tsujimura propose a similar kind of triple for Arabic templates, they effectively create the schematic for the effective derivation of the phonological, syntactic elements of this triple, but the semantic labels they use are the same general function words that do not expand past the traditional sense of Arabic verb constructions. Crucially, they don't identify, in the same way that figure 2 expands on deverbal *-er*, the exact entities that are in relation in the implied event created by this kind of derivation.

ECG resolves semantic generalities by associating semantic meanings of constructions with manipulations of schemas or frames. It proposes that schemas are built on an inheritance hierarchy where increasingly abstract schemas are inherited by more developed schemas that result in the specific schema associated with an individual token or collection of tokens (Bergen & Chang, 2005). Constructions therefore allow for the implementation of these schemas into each other and the derivation of meaningful content from the drawing of elements of one into the other.

Schneider (2010) analyzes Hebrew by constructing an inheritance schema for the base semantic form, the root. He then provides the constructions that allow for the abstractions of

the root by building up from base constructions (e.g. the causative) to the specific construction associated with a base in Hebrew (e.g. Hif'il binyaanim). Because the base construction for all Hebrew morphological constructions contains information for the root, the derived construction contains instructions for the incorporation of the root into the templatic structure. It thereby incorporates the inheritance of the root into the final structure as well, containing all the meaning of a given verbal derivation. Schneider proposes this model as an alternative to Mandelblit's (1997) usage of a blending schema to account for the same transformation. However, I prefer to use Schneider's insight to develop a more broad construction grammar analysis using blending to achieve a more developed analysis of verb forms in Arabic.

One important model for this study is Zawada (2007) and her analysis of English verbal polysemy with respect to the zero-morphology transformation between nouns and verbs. Her method involves the conceptual integration (blending) of constructions into base schemas to achieve syntactic category reanalysis. Zawada suggests that the transformation is performed via the English canonical word-order construction. That is, there is an English construction associated with actions called the transitive construction (NP_1 V NP_2), and this construction assigns the role of agent to NP_1, and the role of patient to NP_2. Therefore a noun may be able to take the place of a verb if it can be understood relative to strong underlying world knowledge. So, in the example *He porched the newspaper,* our understanding of *porch* to mean that something is made to land on a porch, is derived from an underlying frame of a newspaper delivery boy who throws newspapers onto porches. This extension of porch is only possible because the action of throwing is a source-path-goal schema activation, and in this case the porch acts as a goal. Therefore, the goal activates the whole schema, which is of course

necessarily present in the frame of a throwing action, as well as the more specific frame created by world knowledge of “having a paper route”. In general, the construction that metonymically substitutes goal for source-path-goal action, has the effect of creating a manner verb from the action present in the frame evoked. Therefore, the transitive construction carries a schematic action application meaning. It selects the participants of the action as well as the action itself. The action is underspecified in the relevant lexical token, but the frame, relations between entities in the frame, supplies the semantic meaning of this action.

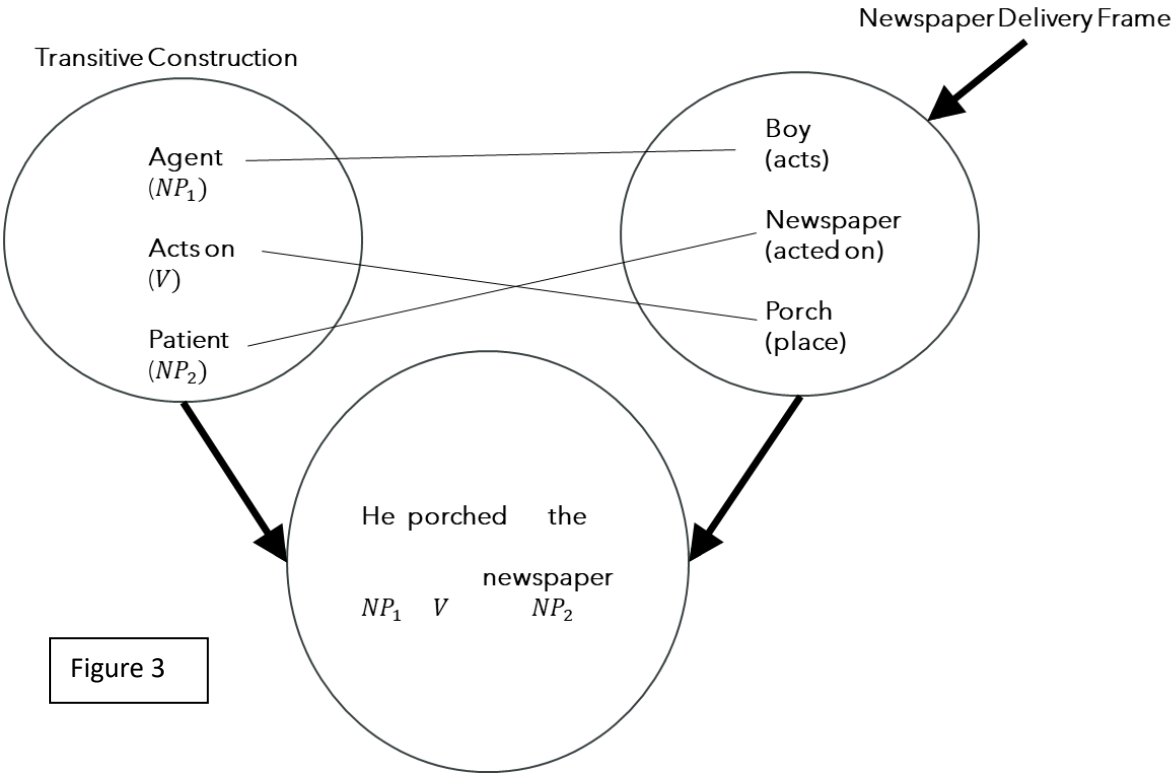

Figure 3

Therefore this paper will attempt to combine Zawada’s conceptual integration method of defining the syntactic roles associated with specific construction implementation with participant mapping provided for by schema inheritance hierarchies. This creates meaning in the Arabic verb by expanding the derived frame of a base token (root). This creates an analogy

to a phonological, syntactic, semantic triple in CxM, thereby defining Arabic verbal constructions via this system of mapping. This then also allows for participant selection for the derived verb via other morphological and sentential constructions.

There is some attention that should be paid to sentential level meaning in Arabic. I want to focus on my analysis of participant roles and their effect on the meaning in a derived word. However, on the level of a full utterance, certain entities from the utterance must fill these frame roles, not just abstract entities from the specific frame. These must be conveyed by some kind of construction which assigns general roles. However, Arabic constructions can be more difficult to model due to several features including case (Modern Standard Arabic), relatively free word order, and pro-drop. This makes the specification of one canonical transitive construction difficult. For sake of argument, we will call the Arabic transitive construction V NP_1 NP_2, regardless of the actual word order of a given sentence. The assertion is that this construction essentially performs some similar functions to the English transitive, though not word-formation (Ryding, 2005).

An Analysis of Arabic Verb Forms

Form I

Form I verbs will, in general, contain all possible extensions of the base verb via normal lexical polysemy or extended metaphorical polysemy. Verbs in form I are a kind of default reading of the base frame. So, if the frame associated with a root contains a participant that has inherited the qualities of the agent role, then the form I verb will select that role to be filled by the agent in the sentence construction. See (1)

(1) *darasa* *ar-rajalu* *al-adaba*
Study.formI.3sg.m.PST the.man the.literature
The man studied literature.

The frame of studying specifies two main entities, a student, and some object of study, i.e. material. This student has inherited qualities of the agent role, as it specifies an animate entity. If we assume, as Zawada does for English, that the sentential level transitive construction assigns an agent role in Arabic as well, the NP_1 of the sentence, *the man*, fills the slot of agent, and therefore student in the study frame. If this is the case, the analytical utility of the form I *wazan* appears suspect. Yes, an analysis can be constructed where form I acts as a passthrough filter, but why presume so? The semantic contribution of the *wazan* is unclear, as the role of student is already present in the base frame of the root. But, this appearance of redundancy relies on identifying that one core relationship of *study*, that of student and material, with the whole of the frame, including those less highlighted entities. But that's not the case. These participant roles must be, via some mechanism, selected.

I am lead to conclude that the purpose of the *wazan* is to choose the thematic roles to be highlighted. Again this work could be done by a theorized sentential level construction, but the variety of roles we will see associated with sentential level entities calls the analysis to place less emphasis there. So, it's the form I *wazan* that selects the most basic process framework from the root frame. The transitivity of the constructed word relies directly on the transitivity of the base frame. We can see what a derivation of this type looks like in figure 4.

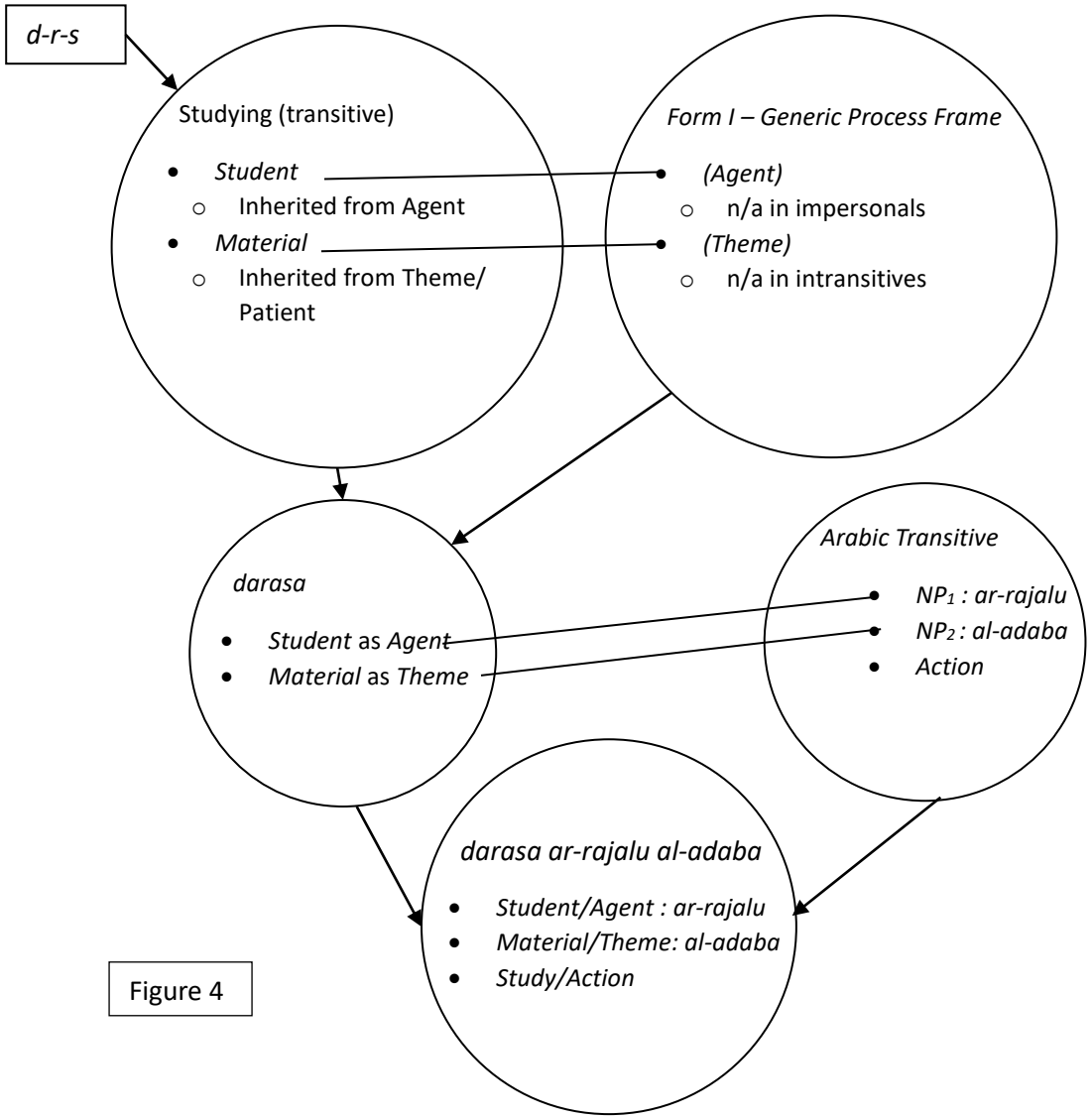
d-r-s
Studying (transitive)
Student
Inherited from Agent
Material
Inherited from Theme/ Patient
Form I – Generic Process Frame
(Agent)
n/a in impersonals
(Theme)
n/a in intransitives
darasa
Student as Agent
Material as Theme
Arabic Transitive
NP1 : ar-rajalu
NP2 : al-adaba
Action
darasa ar-rajalu al-adaba
Student/Agent : ar-rajalu
Material/Theme: al-adaba
Study/Action

Figure 4

The bare relational sentential construction relates two entities and these entities are fixed to the narrow roles of student and material, chosen by the transitive version of the form I *wazan*. This iterated blend produces the meaning inherent in the sentence.

This analysis does get a bit complicated for form I, as the form I construction can be applied to intransitives and even impersonal verbs without trouble. Consider (2)

(2) *dˁaħakat* *al-bintu*
LAUGH.formI.3sg.f.PST the.girl
The girl laughed
yumtˁir
RAIN.formI.3sg.m.PRES
It is raining

These examples do tell us that even if our analysis is correct and the form I *wazan* is the main argument introducer, it can fail to find arguments and still apply a derivation to the root. This, we will see, is not the case for further *ʻawzaan*. However, missing argument roles does make the analysis of the form I *wazan* as the base transitive frame more contentious. In fact, the transitivity seems to derive from the root, and form I just highlights the fact of the process inherent to the frame. The kind of process that the core root communicates is what becomes exponed in the integration. The inherent participant flexibility of the construction is partially what allows for the semantic flexibility of this form. Additionally, it will be commensurate with our other analyses, which have stronger independent motivations. A conceptual object that matches those at the same level of morphological processing goes alongside a line of reasoning stating that a linguistically expressed part of an utterance must contain an associated meaning.

Form III

The ‘*awzaan* have a more clear sense when defined contrastively, for instance, the form III *wazan* may be said to denote the reciprocal form of the verb. Compared to the form I default reading, this form introduces participant structure to the argument. In English this is the kind of transformation that would require a prepositional construction, a *with X* phrase. In Arabic, this equivalent prepositional phrase exists. We observe the alternation in (3).

(3) *darasat* *Mala al-adaba* *(ma? Oskaar)*
STUDY.formI.3sg.f.PST Mala the.literature (with Oscar)
Mala studied literature (with Oscar)

tudaarisu *Mala Oskaar*
STUDY.formIII.3sg.f.PRES Mala Oscar
Mala is studying with Oscar

These examples show a prototypical sense of the form III *wazan*. In this case, the transitive construction relates two entities, but instead of one being an agent and the other being a patient/theme, the second entity becomes a participant in the event, crucially they are coequal as a participant. There is a reversibility to the situation. Though Mala is the best at fulfilling our category of agent because she is the entity that has a relationship with the other entity (therefore the one we are discussing in the utterance), Oscar shares qualities with Mala. He is participating in his own action of *study* where he takes the main role as student. We could say that in the base frame of *study*, an event may or may not involve other participants, but that when integrated with the form III *wazan*, the verb form requires other participants. An analysis could look like figure 5.

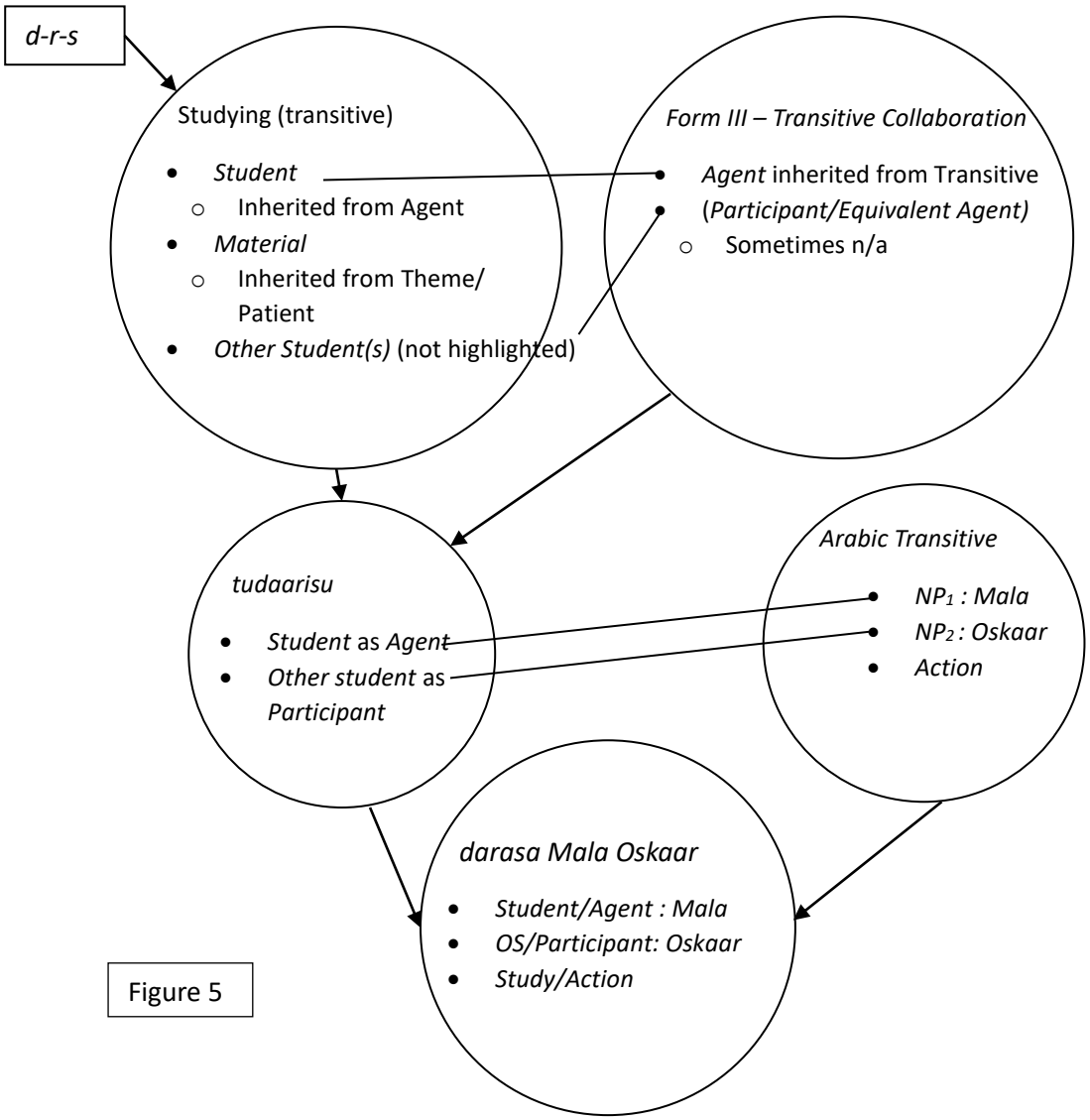

Figure 5

The underspecification of the transitive sentential construction works well here precisely because it only assigns a minimal importance hierarchy to the entities. Otherwise they have a flat relationship, and the object noun is allowed to take on agency, especially if the role in the *wazan* dictates it. In fact, we may extend our analysis to (4).

(4) *Rami ħaadaϴa* *Alice (fi siyaasati)*
Rami HAPPEN.formIII.3sg.m.PST Alice (in politics)
Rami talked with Alice about politics

In this case, we see how certain root frames can be drawn out by different ‘*awzaan*. The base frame of this root *happen* is an intransitive word that also doesn’t have an agent. The subject of a *happen* event is a theme. However, in this case the form III *wazan* affects the base frame and expands its focus. Importantly, the form III frame requires an agent. The extension of the frame that happens here has to do with the fact that things that happen form a basis of discussion, and this discussion is an action which may be said to have participants.

All ‘*awzaan* have complications and deviations from canonical forms. This is especially true of form III verbs. While they generally introduce the frame element of the participant (i.e. another, equivalent, agent), they don’t have to. In some cases, the form III verb is optionally transitive, thereby not specifying a necessarily collaborative event. In some cases the form III verb is not transitive at all. Though most root frames which do not have participant structure become blocked by lacking the correct inheritance, sometimes the form III verb captures an essentially similar translation to the form I verb of the same root. If there is a difference it could be said that it’s more agentive in the form 3 configuration. Perhaps this speaks to not only the added role of participant from the *wazan*, but additionally the agent role. That the subject noun of a form III verb sentence is animate, holds narrative perspective and controls the action (at least partially) may be an even more complete part of the definition, as it occurs even within the exceptions.

Despite these complications, collaborative participant structure is the canonical extension of these base frames and overall form the basis of the form III definition.

Form II and V

Form II is the causative. In English it is expressed by the construction *x made y do z*. Though we may think of it as introducing a new frame of coercion to any such statement, we may recognize the causative as a kind of basic extension of any process. Because human world models generally take for granted a notion of cause and effect, all frames inherit this structure as well. This allows for statements such as *My father made me do my chores*, but also *The rain made him late for his appointment*. The English causative therefore doesn't discriminate between animate and inanimate causes. This is in contrast to the form II *wazan*. See (5).

(5) *al-ʿistaaðu ʔallama al-bint (al-ʔarabiya)*
the.teacher KNOW.formII.3sg.m.PST the.girl (the.arabic)
The teacher taught the girl (Arabic)

Form II introduces a causal agent to the utterance. This invokes the causal structure inherited by all event frames, but specifically requires this cause to be an animate force. The inherently transitive nature of the form II *wazan*, like the form III *wazan*, imposes an agentive quality on the first noun (the one agreed with by the verb). The possibility of a ditransitive structure here exists due to the way the causative takes on the whole frame of knowing as an argument. Whereas form III displaces the theme of an underlyingly transitive frame, form II incorporates this transitivity. It contains both the causal agent, as well as the agent of the subframe. Additionally, the stative *know* frame, becomes progressive due to the highlighting form II does of the causal aspect of the event inheritance.

It is instructive to look at a form II example in the context of a form V example. There is a noticeable similarity between the CV skeletons of these two forms, they differ only by an initial

ta-. This *ta*- is often thought to communicate the reflexive, as it is used in the form VI *wazan* as well. However, whereas the reflexive creates a lot of ambiguity in interpretation in the form VI verb, it is relatively straightforward in the form V example, see (6).

(6) *al-bintu taʔallamat al-ʔarabiya*
the.girl KNOW.formV.3sg.f.PST the.arabic
The girl learned Arabic

al-bintu taʔalam al-ʔarabiya
the.girl KNOW.formI.3sg.f.PRES the.arabic
The girl knows Arabic

The alternation in (6*) allows us to see that the form V verb carried on a progressive sense compared to the form I verb, just as we observed happening in form II, implying an evocation of causal phenomena. Moreover it is very easy to see how learning can be construed as the internal process by which one comes to know something (as opposed to the external process, which is via teaching). What does this strong relationship with form II then imply about form V? It implies that form V inherits the structure of form II, but with an added implication that the causal agent and the frame agent refer to the same entity. This means they are coreferenced by the same noun, and therefore the form V verb can no longer be put into a ditransitive. It has no more arguments available. We can see a full derivation in figures 6 & 7.

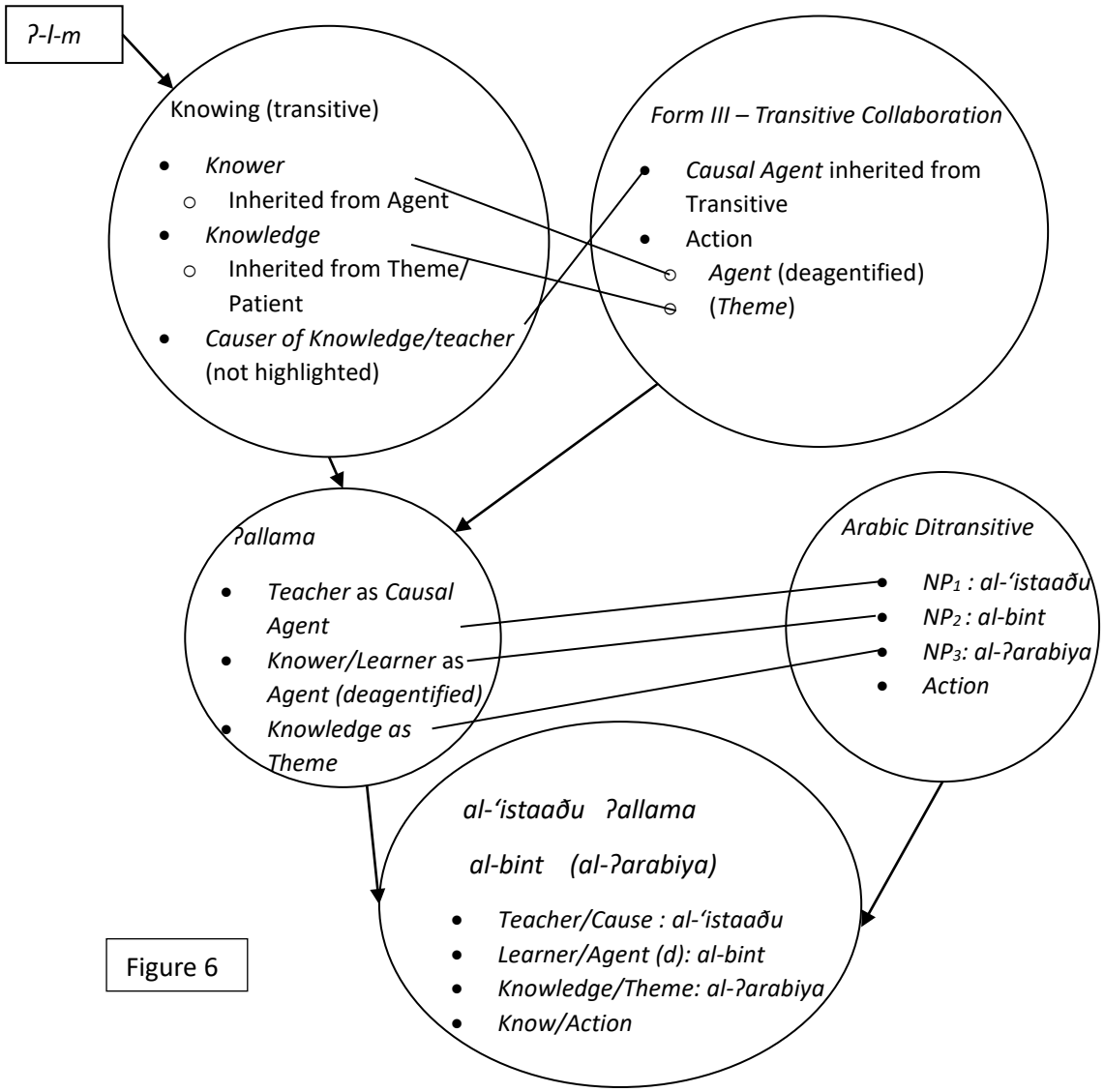
ʔ-l-m
Knowing (transitive)
Knower
Inherited from Agent
Knowledge
Inherited from Theme/ Patient
Causer of Knowledge/teacher (not highlighted)
Form III – Transitive Collaboration
Causal Agent inherited from Transitive
Action
Agent (deagentified)
(Theme)
ʔallama
Teacher as Causal Agent
Knower/Learner as Agent (deagentified)
Knowledge as Theme
Arabic Ditransitive
NP1 : al-ʿistaaðu
NP2 : al-bint
NP3: al-ʔarabiya
Action
al-ʿistaaðu ʔallama
al-bint (al-ʔarabiya)
Teacher/Cause : al-ʿistaaðu
Learner/Agent (d): al-bint
Knowledge/Theme: al-ʔarabiya
Know/Action

Figure 6

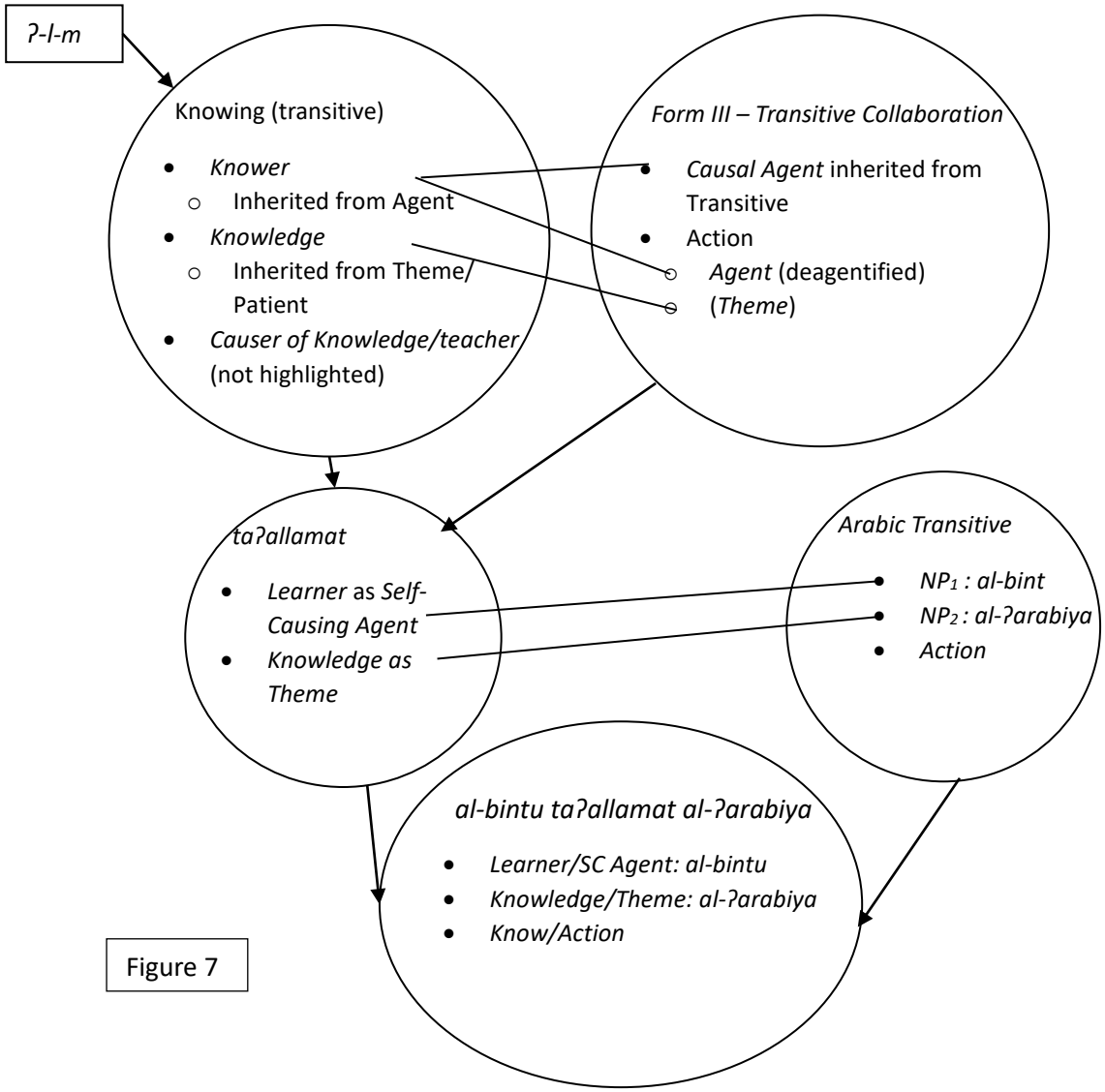

Figure 7

Examples from Subject and Object Nouns

This section will look at how subject and object nouns, *ism faaʔil* and *ism mafʔoul* respectively. These nouns are are morphologically dependent upon derivations from their individual verb template. Therefore their meaning is related to not just their root's underlying frame, but also the specific *wazan* they are derived from. These subject and object nouns

depend, partially, on the subject and object characterization performed by the imposition of these ‘*awzaan* and but carry important role generalizations from the agent and patient roles derived from the root frame. Table 2 presents a broad generalization arrived at through semantic groupings of these noun classes done in Ryding 2005.

These meanings of these derived nouns (i.e. the frame participants they identify) pattern in a slightly complicated way, but their behavior is compatible with the analysis done this far. Crucially, the subject noun patterns consistently with the agent, whether that is a derived agent, as a result of the form II transformation, or as a result of the base semantic space. On the other hand, the object noun does not simply take the derived object of the templatic transformation. Instead, as we see in the frame III derivation, the form III object noun resists expressing the derived object when that object is not a theme or patient, to the extent

Table 2	*Faaʔil*	*Mafʔoul*
Form I	Agent	Patient/Theme
Form II	Causative Agent	Agent (d), Patient, and other
Form III	Agent	N/A

that Ryding could not find enough instances of it to even give a few examples.

This picture is complicated by the object noun of form II, which is irregular. However, this also makes sense. A deagentified causal actor could, in some cases, be figured as the patient of a causal event, but wholistically is still affecting the development of a situation. In contrast this object noun sometimes refers to the entity affected by the initial caused action (the base

patient/theme), or in some cases, something affected by the action. This is highly compatible with the analysis developed here, as the derived object is chosen because of their relational capacity in the base frame rather than a specific action mechanism that groups all derived syntactic positions.

Conclusion

The conclusions presented here are that participant selection accounts for the ways in which the structure of semantic frames is understood and that participant selection provides an account of the Arabic data. However, there is no reason to think these conclusions should be solely limited to Modern Standard Arabic, other regional Arabics or even semitic languages as a whole. The exact mechanism presented by this paper is strongly associated with the generalizations drawn out of strong root systems. However, this technique relies on the fact that underlying concepts and world knowledge (i.e. schemas) have a radial structure. Those concepts are not simply limited to a narrow denotation, but contain within them many of the semantic extensions that we have to make in order to understand closely related events and concepts. In the same way that constructions associated with canonical word order in English can help figure the work done by morphological constructions in Arabic, perhaps the mechanisms of root analysis in Semitic languages may give us scholastic insight into the ways in which words and meanings can become grouped in other languages.

In conclusion, I have shown that Arabic Verbal Polysemy of the root is largely due to the participant selection that is done by constructions associated with individual roots. These constructions highlight roles in a frame by evoking and pointing at inherited structure and

evoking in the speaker/hearer the relationships detailed by these participant interactions. Lastly, the underspecification of meaning that is an underlying theme present in the traditional, generalization-based theory of templatic morphology, these constructions take a wide range of semantic variability as a precondition. Therefore, we are left with a more parsimonious analysis that can easily be expanded.

In terms of future directions for this research, it was noted before that this research is incomplete without an extension of this analysis to the regional Arabics that are actually spoken in the Middle East and North Africa. Additionally, this analysis is incomplete from the perspective of the other verb forms. This is especially the case for the verb forms which can be said to be compositional. Though elided in this paper, the relationship between form II and form V likely has a compositional component (analyzed by McCarthy as being introduced at the *t*-morpheme tier). These all represent directions I'd like to take in the future, or would be happy to see someone else take.

References

Benmamoun, E. (2016). Verbal and nominal plurals and the syntax-morphology interface. *Perspectives on Arabic linguistics XXVII*, 59-74.

Bergen, B. K., & Chang, N. (2005). Embodied construction grammar in simulation-based language understanding. *Construction Grammars: Cognitive grounding and theoretical extensions*. John Benjamins.

Booij, G. (2010). Construction morphology. *Language and linguistics compass*, 4(7), 543-555.

Boudelaa, S., & Marslen-Wilson, W. D. (2001). Morphological units in the Arabic mental lexicon. *Cognition*, *81*(1), 65-92.

Danks, W. (2011). The Arabic verb: Form and meaning in the vowel-lengthening patterns (Vol. 63). John Benjamins Publishing.

Davis, S., & Tsujimura, N. (2018). Arabic nonconcatenative morphology in construction morphology. *The construction of words: Advances in Construction Morphology*, 315-339.

Mandelblit, N. (1997). Grammatical blending: Creative and schematic aspects in sentence processing and translation. University of California, San Diego.

McCarthy, J. J. (1981). A prosodic theory of nonconcatenative morphology. *Linguistic inquiry*, 12(3), 373-418.

McCarthy, J., & Prince, A. (1990). Prosodic morphology and templatic morphology. In *Perspectives on Arabic linguistics II: papers from the second annual symposium on Arabic linguistics* (pp. 1-54). Amsterdam: John Benjamins Pub. Co..

Prunet, J. F. (2006). External evidence and the Semitic root. *Morphology*, 16(1), 41-67.

Ryding, K. C. (2005*). A reference grammar of modern standard Arabic*. Cambridge university press.

Schneider, N. (2010). Computational cognitive morphosemantics: Modeling morphological compositionality in Hebrew verbs with Embodied Construction Grammar*. In Annual Meeting of the Berkeley Linguistics Society* (Vol. 36, No. 1, pp. 353-367).

Wehr, H. (1979). *A dictionary of modern written Arabic*. Otto Harrassowitz Verlag.

Zawada, B. (2007). Conceptual integration and intercategorial polysemy*. Language Matters,* 38(1), 150-175.