

# Toward an Economic Principled Polysemy Model

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**Abstract**—Polysemy is one of the complex semantic phenomena that have been tackled by many scholars from different points of view. Different models have been suggested about how the polysemous words are represented in the mental lexicon. One of these sophisticated models is proposed by Tyler and Evans (2003). It seems that this model has some problems that this paper is directed to solve. The paper is based on two questions: (1) what are the main aspects of the polysemous network of meanings regarding the central meaning and its extensions? (2) How the polysemous network of meanings is structured? Therefore, the main aims of this study are to diagnose the weaknesses of the model and to provide another modified model. The new model is applied to one of the most complicated spatial prepositions of Arabic, *alla*.

**Index Terms**—polysemy, semantic network, spatial preposition, central sense

## I. INTRODUCTION

Polysemy is one of the semantic phenomena that received great attention from different scholars like Brugman (1981), Leech (1981), Nerlich and Clarke (1997, 2003), Fillmore and Atkins (2000) and others. The sophisticated treatment of polysemy is found within the frame work of cognitive linguistics. Unlike the traditional view of polysemy as a merely linguistic phenomenon, cognitive linguistics looks at it as a conceptual phenomenon. The development of the polysemy studies has gone hand in hand with the development of lexical semantics within cognitive linguistics pioneered by Lakoff (1987, 1990). According to him, words are conceptual categories or as he calls radial categories and these categories are members of highly complex networks of other categories. In other words, meanings of the lexical items as networks of senses, one of these senses is central to or the prototype of the network. Langaker (1991) has also some contributions to the study of polysemy.

This paper is based on one of the most sophisticated studies on polysemy within cognitive linguistics by Tyler and Evans (2003), *The Principled Polysemy Model*. It seems that this model has some shortcomings and redundancies that motivate the current study. The research questions of this paper are two: first, what are the main aspects of the polysemous network of meanings regarding the central meaning and its extensions? Second, how the polysemous network of meanings is structured? Therefore, the aims of this research are to evaluate the model and to suggest a modified model. In the next section the paper evaluates the model critically to modify it in section 3. This section suggests a more economic model of polysemy. In the fourth section, the new model will be applied to one of the most complex spatial prepositions of Arabic, *alla*. In applying Tyler and Evan's model to the preposition *alla*, 32 senses will be gotten.

## II. EVALUATION OF THE PRINCIPLED POLYSEMY MODEL

This approach is proposed by Tyler and Evans (2003) within the framework of cognitive linguistics. It represents a real and sophisticated attempt to deal with polysemy as a conceptual phenomenon. It posits an objective mechanism for analyzing semantic networks. In this approach, polysemous word is viewed as a semantic network of interrelated senses. Within this network, there is a central sense which is the basis for the other related peripheral senses. Tyler and Evans posit two methodologies to achieve two goals. The first goal is to specify what should be accounted as a distinct sense (polysemy) which is stored in the semantic memory. This sense is differentiated from those which are constructed 'on line', depending on the context and are not stored in the semantic memory. The second goal is to establish the semantic network of the obtained senses by determining which one is the central or the prototypical senses and arrange the others in relations with the central, some of them are more central than the other. There is a kind of disagreement among the cognitive semanticists, regarding the prototypical sense. Some points in this sophisticated modal, however, are questionable and we will come across them in the next discussion.

The first methodology is devoted for distinguishing between senses. It consists of two criteria, as they are postulated in (Tyler & Evans, 2003):

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1. for a sense to count as distinct, it must involve a meaning that is not purely spatial in nature, and/or a spatial configuration holding between the TR and LM that is distinct from the other senses conventionally associated with that preposition; and
2. there must also be instances of the sense that are context-independent: instances in which the distinct sense could not be inferred from another sense and the context in which it occurs (p. 43).

The first criterion is clear and can be easily applied, but the second is not. The expression ‘context-independent’ cannot be settled by mentioning some instances that have the same sense, although it is important to mention such instances. The question that has to be raised here, regardless of the number of instances, is the intended sense inherited in the preposition itself or in the encyclopedic knowledge of the surrounding words? Let us invoke some examples from Tyler and Evans (2003) to make this objection clearer. In applying their modal to the English spatial preposition *over*, they distinguish between the sense of *over* in (1) and (2). According to them, the configuration of TR and LM in the two is different, as in Figure 1.

- (1) a. The helicopter hovered over the ocean.  
b. The hummingbird hovered over the flower.
- (2) a. Joan nailed a board over the hole in the ceiling.  
b. Joan nailed a board over the hole in the wall.

In (1), *over* represents the central sense, while it shows the sense of covering in (2). However, the sense of covering is not derived from *over*, but from our general knowledge that is related to the words *hole* and *board*, in which the board covers the hole. The preposition *over*, in (2), refers only to the relationship between LM and TR in which the latter is in a position higher than the former, not to the covering sense. Therefore, no distinct sense is obtained.

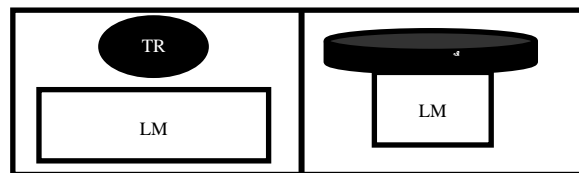


Figure 1. Covering and Central Senses of *Over*

Let us take other examples, from Tyler and Evans (2003, p. 83), for more elaboration. They consider that the sentences in (3) carry a distinct sense, *above-and-beyond* sense. They claim that *over* includes, in addition to the proto-scene, the sense of moving the TR beyond the LM, the target. However, this addition to the central sense is not valid because it is not derived from *over* itself, but from our general knowledge that is related to the surrounding words. In (3), *over* comes to encode a very specific point in which the TR (the arrow in (3a) and the ball in (3b)) is in a position higher than the LM (the target in (3a) and the cup in (3b)), as in Figure 2.

- (3) a. The arrow flew over the target and landed in the woods.  
b. Lissa just tapped the golf ball, but it still rolled over the cup.

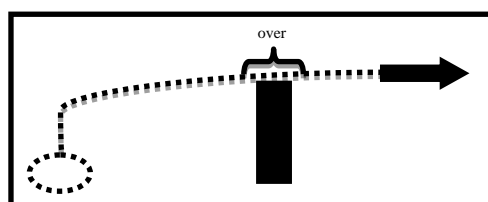


Figure 2. The Sense *Above-and-Beyond* of *Over*

Another point has to be raised regarding the clearness of the relationship between the central sense and the new sense. This point is related to a controversial area concerning the ambiguity of the boundary between polysemy and homonymy. In Tyler and Evans’ model, this problem represents a challenge needs a decisive criterion. In (4), the relationship between the central sense (TR is higher than LM) and the additional sense (completion sense) is not clear. Therefore, it is not obvious that such sense is a member of the semantic network of the polysemous word *over*, although so far relation can subjectively constructed.

- (4) a. The cat’s jump is over.  
b. Time is over.

The second methodology is designed to achieve the goal of establishing the semantic network by determining the central sense and the related peripheral senses. This methodology includes four criteria for determining the proto-sense, as mentioned by Evans and Green (2006, pp. 344-5) in their own words:

1. earliest attested meaning;
2. predominance in the semantic network;
3. relations to other prepositions;
4. ease of predicting sense extensions.

The first criterion is related to etymology and tracing back the first meaning of the polysemous word, and this meaning will be the central one. This step seems to be plausible, but it has some weaknesses. The most prominent one is its subjectivity which is derived from its dependence on history of words. It is difficult to assert that the original sense of a word in an etymological dictionary is correct. Moreover, language is in a continuous changing, and the original sense may be subordinated by new ones. The second criterion is a fundamental one. It postulates that the central sense is that which has the largest number of direct relations with the other senses in the network. However, the central sense must have relations with all the other senses. The sense that has no relation with the proto-sense is not a member of the semantic network of a polysemous word. This point can be used as a criterion in distinguishing between polysemy and homonymy.

The third criterion is about the relationship between the studied preposition with other related ones. It is stated that the proto-sense of a spatial preposition has to distinguish it from the other related prepositions which form a contrast set. In other words, the proto-sense should be included within a contrast set. In the case of *over*, it has relationship with *above*, *under* and *below* in which each of them encodes a subspace of the vertical dimension, as in the Figure 3. The diagram shows that *over* and *under* encode the physical subspaces that are nearer to the LM, while *above* and *below* refer to the subspaces that are in the extremist ends of the vertical axis. They are away from the LM. The sense that distinguishes *over* from *above*, *under* and *below* is claimed to be the central. It is that in which TR is located in a position higher than LM but close to it.

However, the problem of this criterion is the interchangeably uses of *over* and *above* in English or their equivalent prepositions in Arabic, *alā* and *fawqa*. The two can be used to designate the same region in the vertical axis, especially in Arabic, they are synonymies in many positions. This means that there are two senses of *over* involved in the contrast set, which one is the central? The last criterion postulates that the primary sense is the easiest predicted one. In the case of *over*, most of the speakers agree that the sense of *over* in which TR is higher than LM is the first sense comes to mind. This step, depending on the speaker's intuition, is very crucial in determining the proto-sense.

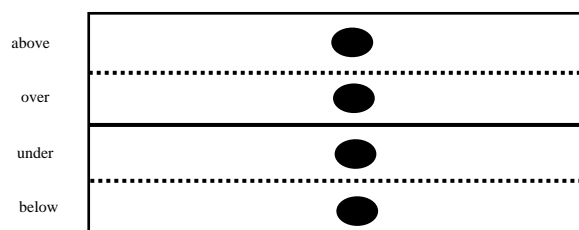


Figure 3. Division of the Vertical Axis Into Subspaces by Prepositions (Evans & Green, 2006, pp. 344-345)

### III. AN ECONOMIC PRINCIPLED POLYSEMY MODEL

This is not a new model; it is Tyler and Evans' model with some modifications. It is described as being economic because it reduces the number of the semantic network members. It adopts the two methodologies of the Principled Polysemy to achieve the two goals with some modifications.

#### A. Methodology for Distinguishing Senses

This methodology consists of four criteria for establishing a distinct sense:

1. A sense is considered as distinct if it refers to a different configuration of TR and LM or to a non-spatial or metaphorical use of the physical configuration of TR and LM. For instance, in (5), the two sentences have the sense that is conventionally related to *over*, the two have the same arrangement of TR and LM. But, in (6), the sense is distinct because the relationship between the abstract TR and LM is not spatial and this relationship between such TR and LM gives a different sense, the sense of *control*.

- (5) a. John put his hand over his mouth to stop himself from laughing.  
b. The left his keys over the table.

(6) America has great power over the world.

2. The relationship between the distinct sense and the sense that is conventionally associated with the preposition must be clear to some extent. The distinct sense in (6) designates a relationship between TR (America) and LM (the world) in which the TR (controller) is metaphorically higher than the LM (which is controlled). But, in (7), the distinct sense has no clear relationship with the conventional sense of *over*. Therefore, it is out of the semantic network of *over*. It may be related to *over* by another relationship, not polysemy. The previous criterion is restricted by this criterion.

- (7) a. Game is over.  
b. I am so happy to hear that the problem is over.

3. The distinct sense has to be supported by some instances to make clear that it is context-independent. The sense must not be derived from the other senses in context. It must be found in the speaker's repertoire as an independent and separate sense. The sense in (6) has to be supported by other instance to be considered as a different sense, as in (8). However, this criterion is limited by the next one.

(8) He cannot oppose those who are over him.

4. Giving instances is not enough to account for a sense as distinct, the sense has to be inherited in the spatial preposition itself, not derived from the encyclopedic knowledge associated with other words or senses. In (9), the sense of transferring from one side to the other is not derived from *over*, but from our general knowledge about *jumping* and *climbing* in relation with *fence* and *wall*. The preposition *over* comes to encode a static relationship between TR and LM in a specific point or region within a dynamic process, as in Figure 4.

(9) a. My horse jumped over the highest fence.

b. The boy climbed over the wall.

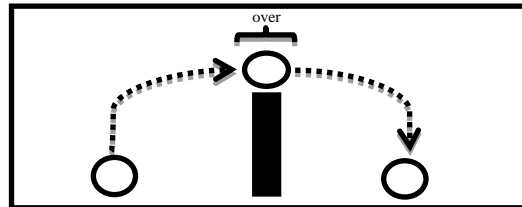


Figure 4. The Transfer Sense

However, a criterion is needed to determine whether a particular sense is inherited in the preposition or derived from the adjacent senses. The suggested criterion postulates that the general use of a preposition, say *over*, is to encode a particular static relationship between two entities. The distinct sense is inherited in the preposition only when the meaning cannot be understood by the neighbor words or our general knowledge associated with these words. For instance, the sense of control in (8) cannot be grasped only by *over*, the sense of transfer in (9a) can be understood by our general knowledge about a situation involves *jumping* and *fence*. The only contribution of *over* in this sentence is its reference to the relationship in which the TR (the horse) is higher than the LM (the fence).

Sometimes, the metonymic relationship causes some ambiguity as in (10). There is a sense of *approximant* in the two examples (10a and b), but this sense is not derived from the Arabic spatial preposition *alla*. It is thought that it is derived from the preposition because of the metonymic relation (whole to part). The word *almāçida* (the dining table) in (10a) stands for the omitted word *alkursi* (chair) on which Zaid sat down, as in (11a). (10b) and (11b) come in the same vein. Therefore, the preposition *alla* encodes its default sense in which *Zaid is on the chair* and *The boy on the river edge*. However, in (12), the metonymic relationship is not clear and the sense of spatial nearness is cannot be derived from the adjacent words. There are two competed interpretations in (12a), the students might be sat on the top of the wall or at it. Therefore, it contains a distinct sense of *neighboring*.

(10) جلس زيد على المائدة.

*Jalasa Zaidun alla almāçida*

Zaid sat down **on the dining table**

b. كان الطفل واقف على النهر يرى انعكاس وجهه.

*kan altiflu wakian alla alnahri yara inçicas wajhah*

The boy was stood **on the river** to see his face reflection

(11) a. جلس زيد على كرسي المائدة.

*Jalasa Zaidun alla kursi almāçida*

Zaid sat down **on the chair** of the dining table

b. كان الطفل واقف على حافة النهر يرى انعكاس وجهه.

*kan altiflu wakian alla hafat alnahri yara inçicas wajhah*

The boy was stood **on the river edge** to see his face reflection

(12) a. جلس التلاميذ على الجدار.

*Jalasa altalameeth alla aljidar*

The students sat **leaning on** the wall

b. تركت الرجل على الباب.

*Taraktu alrajula alla albab*

I left the man **at** the door

#### B. Methodology for Establishing the Central Senses

There are two related central senses have to be determined, one is deeper than the other, the surface one. These senses have to be discussed together because of their highly relatedness.

##### 1. The Deep Central Sense (DCS)

a. DCS has the minimal features of the whole meaning which undergrounds the related preposition in the contrast set.

b. It is found in all the senses of the semantic network. It puts the boundary between polysemy and hyponymy.

##### 2. The Surface Central Sense (SCS)

a. It has relationships with the majority of the other senses. Most of the metaphorical senses are derived from it.

b. The concrete sense is more central than the abstract or metaphorical ones. The concrete sense is related to the physical environment.

c. As it is found in Tyler and Evans' model, the central sense encodes a specific area in contrast with the other related prepositions, as in Figure 3.

d. SCS is more predictable and default because it designates the most prominent configuration in our visual environment. In other words, it describes configuration of the most prominent physical things in our daily experience. For instance, the preposition *in* commonly encodes the configuration of physical entities in which one is a container and the second is the contained entity, as in Figure 5.

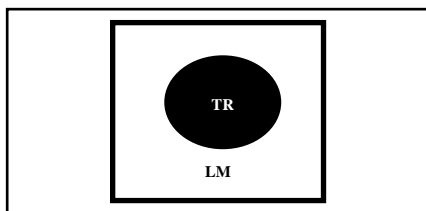


Figure 5. The Most Prominent Configuration of *In*

#### IV. THE CASE OF ARABIC SPATIAL PREPOSITION *ALLA*

##### A. Finding Members of *Alla* Network

##### 1. The Vertical Non-spatial Configuration

##### a. The *control* sense

It has a vertical non-spatial configuration of TR and LM in which the controller is metaphorically higher than the controlled thing or person, as in the following examples:

(13) كان محمد **على** البلاد عندما غزانا الاعداء

*kan Mohammad **alla** (ameer) albilad indema gaza alçadaaç albilad*  
Mohammad was the prince when the the enemies attacked the country.

(14) جعل ابنه **على** الشركة عندما احس بدنو اجله

*Haçla ibnahu **alla** alsharica indama çhasa bi iqtirab ajalahu*  
When he felt close to death he nominated his son the manager of the company

(15) انتقم من جميع خصومه عندما اصبح **على** الحكم

*Intaqama min jameeç kusumahu indama asbaha **alla** albilad*  
He avenged all his adversaries when he became the ruler

In the two instances, the control sense cannot be understood from the other surrounding words. It is carried only by *alla*.

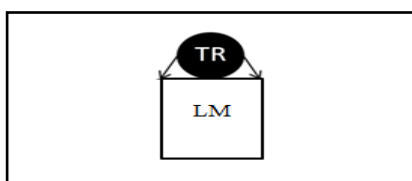


Figure 6. The Control Sense

##### b. The *State* Sense

This is a metaphorical configuration in which the person (TR) who holds on a positive or negative habit or trait is high than that habit or trait (LM) vertically, as in Figure 7. In the examples (16), (17) and (18), the holding on sense cannot be derived from the adjacent words.

(16) خرج من البيت **على** عجلة

*karage min albeit **alla** aujalah*  
He left the house quickly

(17) لقد كنت **على** سفر

*laqad kuntu **alla** safar*  
I have traveled

(18) كانت صحته **على** ما يرام مؤخرا

*Kanat sihatahu **alla** maiuram muçkaran*  
His health was fine recently

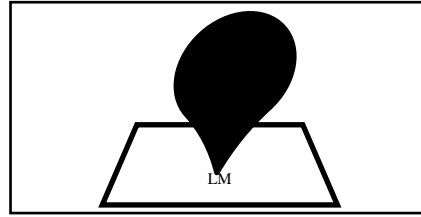


Figure 7. The State Sense

#### c. The Sense of Time

In this metaphorical use of *alla*, the action (TR) is vertically higher than the period (LM) it happens within. This metaphorical relationship is clear as in the Figure 8. The following examples show this sense:

- (19) كانت الحادثة **على** عهد النظام السابق  
*kant alhaditha **alla** zamen alnidam alsabiq*  
 The accident happened at the era of the former regime
- (20) سنكون في محطة القطار **على** الموعد  
*Sanakon fi mahatat alqitar **alla** almau'ced*  
 We will in the train station on time
- (21) لم تكن **على** ايامنا كل هذه التقنيات  
*Lem takun **alla** aiamuna kula hathehi altiqaniat*  
 These technologies were not found at that time

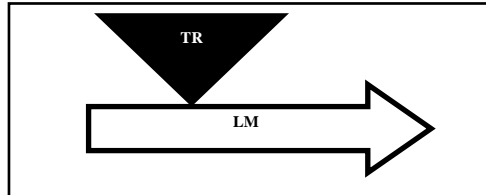


Figure 8. The Sense of Time

#### d. The Sense of Responsibility

*Alla* is used with responsibility in which the LM is the person who is responsible to do the something, the responsibility (TR), as in Figure 9. The instances in (22) (23) and (24) represent this sense clearly.

- (22) عليكم الذهاب الى المدرسة مبكرا  
*allicom althahab illa almadrasa mubakeran*  
 You have to go to the school early
- (23) عليك تقديم اوراقك كاملة من اجل الحصول على الوظيفة  
*Allik takdeem kul awraqaq min ajl alhusul alla alwadifa*  
 You have to apply all your documents to get the job
- (24) انتهى من العمل يومان وبقي علينا خمسة  
*Intaha yauman wa baqia **allaina** kamsa mina alçmal*  
 Two work days have been ended and we still have five to finish

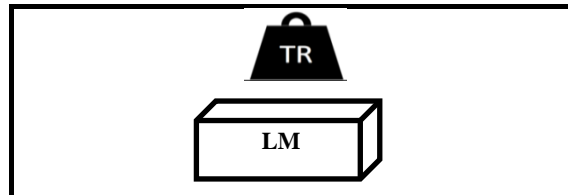


Figure 9. The Sense of Responsibility

#### e. The Sense of Pretension

Arabic uses the preposition *alla* to indicate that someone acts as if he is someone else; has a trait that he actually has not; or does something that he really does not. The pretender (TR) is metaphorically higher than the act (LM) he pretends to do. He does that as if he rides the role he plays, as in Figure 10. The following examples show this sense:

- (25) يتحدث زيد **على** انه هو المدير  
*yatahadath Zaid **alla** çnahu hua almudeer*  
 Zaid is talking as if he is the boss
- (26) يتصرف الرئيس **على** أنه هو من فاز بالانتخابات  
*yatasaraf alrçees **alla** çnahu hu man faza fi alintikabat*  
 The president behaves as if he won the election

- (27) مثل امام القاضي على انه هو الشاهد  
*Mathula amam alqadi **alla** çnahu hua alshahid*  
 He attended the judge as if he is the witness

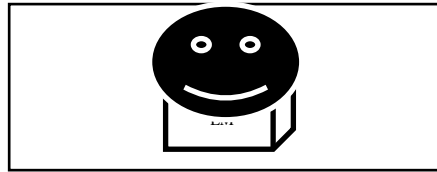


Figure 10. The Sense of Pretension

#### f. The Preference Sense

In this metaphorical sense the preferred thing (TR) is vertically higher than the other thing (LM), as in Figure 11. The preposition *alla* has the role of determining which entity is *more* preferable, like in the next examples:

- (28) يفضل احمد كرة القدم على جميع الرياضات الاخرى  
*yufadil Ahmed kurat algadam **alla** jamea alriadat alaukra*  
 Ahmed prefer football over the other sports
- (29) يفضل زيد السفر الى تركيا على روسيا.  
*yufadil Zaid alsافر illa turkia **alla** rusia*  
 Zaid prefers the travel to Turkey over Russia.
- (30) لا ترفع احد على احد فالجميع عمل بنفس الجهد.  
*lā terfa çhadun **alla** ahad faljameeçu qama bi nafce alçmal*  
 Do not prefer one over another; all of them worked hard.

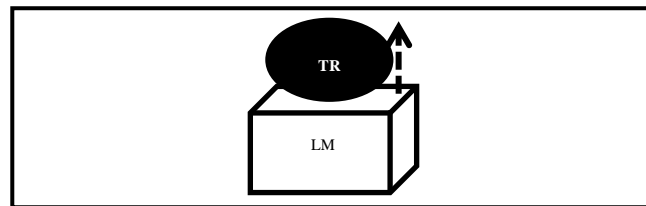


Figure 11. The Preference Sense

#### g. The Sense of Adoption

*Alla*, sometimes, comes in the sense that somebody (TR) adopts something or follows an idea or an ideology (LM). The adopter or follower is over adopted or the followed thing, as in Figure 12. The sense of adoption cannot be grasped without the preposition *alla*, as in the next instances:

- (31) الناس على دين ملوكهم.  
*alnasu **alla** deeni mulokihim*  
 People follow their king's dogma.
- (32) لقد مات الرجل على الاسلام.  
*laqad mata alrajulu **alla** alislam*  
 The man died as a Muslim.
- (33) لست على شيء ان لم تتبعني.  
*Lesta **alla** shiç in lem tayabiçni*  
 You adopt nothing if you do not follow my dogma.

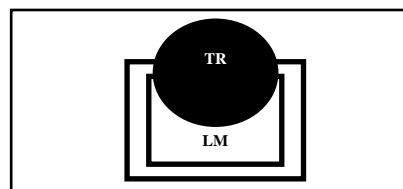


Figure 12. The Sense of Adoption

#### h. The Sense of Reason

The preposition *alla*, sometimes, indicates that something (TR) happens as a result of because of something else (LM). The result is imagined metaphorically as higher than the reason, as in Figure 13. It is clear that this sense is inherited in the preposition *alla*, as in the following examples:

- (34) الحمد لله على ما صنع  
*Alhamdu lilah **alla** ma sanaç*  
 Thanks for Allah due to what he did

- (35) قبحك الله **على** ما ارتكبت من جرائم  
*gabahak Allah **alla** ma irtakabta min jaraçim*  
 Allah may make your face ugly because of your crimes
- (36) هل تم تكريم العاملين **على** نجاح المشروع  
*Hel tema tekreem alaamleen alla nejahy almashruç*  
 Do the employees have been honored for the project's success

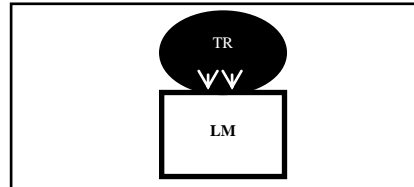
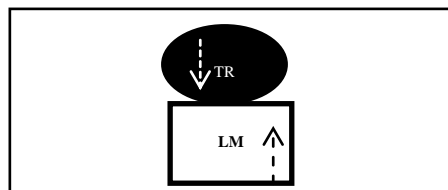


Figure 13. The Sense of Reason

#### i. The *Conditional* Sense

Alla is used here to refer that an action occurrence is conditioned by another action accordance; the first action is governed by the second. Therefore, metaphorically, the second action (TR) is higher than the first one (LM), as in Figure (14). This sense cannot be gotten from the other words of the sentence, as it is shown by the next examples:

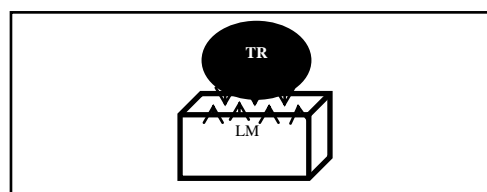
- (37) اجبتهم **على** ان يمدوني بالسلاح  
*Ajabtuhum **alla** an yamuduni balsilah*  
 I will be with them if they support me with weapon
- (38) صالحتهم **على** ثلاثة ملايين  
*Salahtuhum **alla** thalathat malaiin*  
 I will make peace with them if they pay me three million
- (39) ادت المفاوضات الى وقف الحرب **على** ان يتم نزع سلاح الميليشيات  
*Adat almufawadatu ila waqifi alharba **alla** an yatuma naziç silah almilishiat*  
 Negotiations have led the stop of the war if the militias being disarmed

Figure 14. The *Conditional* Sense

#### j. The Sense of *Although*

One of *alla* uses is to indicate that something happens although something else resists or prevents it. So, the first action is metaphorically higher than the second, as in the Figure 15. The sense completely grasped through the preposition *alla*, as in the following instances:

- (40) اعذبه **على** كبر سنة  
*çuçthibuhu **alla** kiber sinih*  
 I will torture him although his old age.
- (41) تحمل مشاق العمل **على** ضعف بنيته  
*tahamal mashaq alamal **alla** daçf byniatih*  
 He endured the hard work in spite of his week body
- (42) هل سيأتينا **على** كل ما ارتكبتنا بحقه من مساوئ؟  
*Hel se yaçtina **alla** kul ma irtakebna bi hekihi min masawç*  
 Will he come to us in spite of what we have done against him?

Figure 15. The Sense of *Although*

#### k. The Sense of *By*

*Alla* is used to show that something happens by virtue of something else. It is metaphorically stated that second thing or action, the medium (TR), carries the second thing or action (LM), as in the Figure 16. This sense is completely conveyed by *alla*, as in the next examples:

- (43) جاءنا الخبر على الهاتف  
*jaçna alkabaru alla alhatif*  
 We have conveyed by the phone
- (44) جاءتك جميع الملفات على الفلاش  
*jaçet jameeçalmalafat alla alfilash*  
 All the files have been transmitted to you by the flash-ram
- (45) اذاعوا خبر اعتقال الرئيس السابق على التلفاز  
*Adaçu kabara içtical alraçees alsabiq alla altilfaz*  
 They broadcast the news of the former president's arrest on television

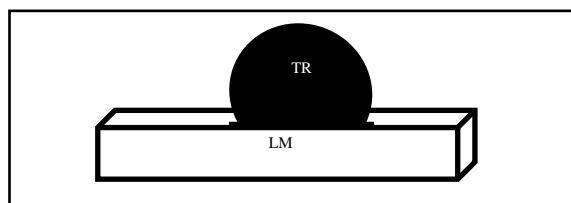


Figure 16. The Sense of *By*

### 1. The Sense of *Dependence*

*Alla* is used sometimes in the sense of dependence. The entity (TR) that depends on another entity (LM) will be higher than it, as if the TR rides the LM, as in Figure 17. The next examples show that the sense of dependence inherited in *alla*.

- (46) الاقتصاد العراقي متوقف على النفط  
*Aliqtisad al-Iraqi mutawakif allaalnaft*  
 The Iraqi economy depends only on the patrol
- (47) الحياة لا تتوقف على احد  
*Alhiat la tatawagaf alla ahad*  
 Life does not depend on one
- (48) بقيت معيشته على هذا المرتب القليل لمدة عامين  
*Baqiat meçishatahu alla hada almuratabi alqaleel limudati çamain*  
 He lived depending on this little salary for two years

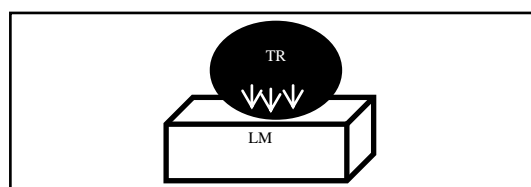


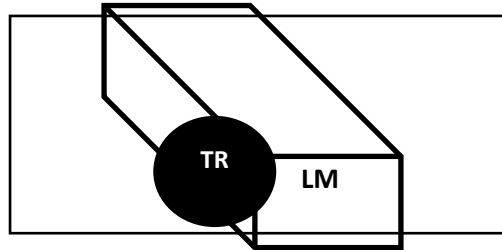
Figure 17. The Sense of *Dependence*

### 2. The Horizontal Configuration

#### a. The *Neighboring* Sense

The speakers of Arabic use *alla* to encode the relationship in which something is near to something else. The thing that is appeared in the front (TR) for the viewer is metaphorically higher than the other (LM), as in Figure 18. Look at the following examples:

- (49) رأيت الرجل واقف على الباب منتظر ان يفتحوا له  
*Raçitu alrajula waqifun alla albab muntadiran an yuftaha lah*  
 I saw the man standing at the door waiting someone to open
- (50) ركنت سيارتي على حائط المدرسة  
*Rakantu siarati alla jidati almadrassa*  
 I parked my car beside the school wall
- (51) لم أرى علي عندما دخلت على القوم مجلسهم  
*Lem çra Ali indama dekaltu alla alkaumi majlisahum*  
 I did not see Ali when I came near to those people

Figure 18. The *Neighboring* Sense

### 3. The Non-Cluster

#### a. The Examining sense

*Alla* conveys the sense of examining by referring to a metaphorical relationship between the examiner and the examined subject in which the former (TR) is higher than latter (LM), as in the Figure 19. It seems that this sense cannot be gotten by the other words. However, there is also sense of focus in (52), (53) and (54) but it is derived from the surrounding words rather than the preposition *alla*.

(52) وقف الباحث على جميع تفاصيل النظرية

*Wagafa albahith alla jameeç tafaseel alnadaria*

The researcher investigated the theory in details

(53) عكف على حل المسألة

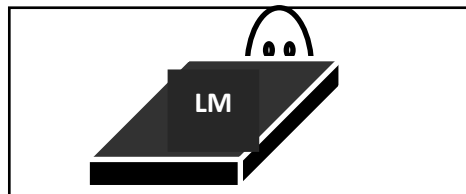
*Akafa alla hal almasçalah*

He focused on solving the issue

(54) قضى ليلته على مستندات الشركة يدقق فيها

*Qatha lailatahu alla mustanadati alsharica yudaqiqu fiha*

He spent the night checking the company's documents

Figure 19. The *Examining* Sense

#### b. The Sense of Orientation

The preposition *alla* can have the sense of orientation, *toward* or *at*. It encodes the relationship between two entities, one of them is the object or the patient of the verb and the second is the target at which the object is directed, it is the noun in the prepositional phrase. Some intransitive verbs like *look* in (55) should be reform as being transitive. The verb *look* (*yataferaju*) in (55) means that *the person directs his sight toward the inscriptions*. The noun *sight* is the implicit object of the verb *look*. Since the object is the directed entity, it is seen as being higher than the entity it is directed toward. In this non-cluster configuration, the object is the TR and the second entity is the LM, as in the Figure 20. The following examples reflect that the sense of *at* or *toward* is carried by *alla*.

(55) ظل الرجل يتفرج على النقوش التي على الحائط طول النهار

*Dela alrajulu yataferaju alla alnuqūsh alati alla alhaaçit tool allail*

The man kept looking at the inscriptions on the wall all day long

(56) استمر الاولاد برمي الحجارة على النافذة حتى كسروها

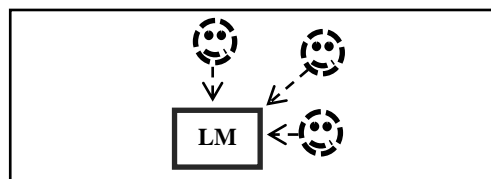
*Istemera alaulad bi rami alhijara alla alnafitha heta kasaruha*

The boys continued to throw stones at the window until they broke it

(57) استمر اطلاق النار على شمال المدينة حتى الصباح

*Istamara itlaqu alnari alla shemali almadinati heta alsabah*

Shooting continued toward the north of the city until morning

Figure 20. The Sense of *At*

#### c. The Sense of Against

The preposition *alla* is used sometimes in the sense of “against” in which the attacker or the doer (TR) is metaphorically higher than the person or thing that is attacked (LM), as in Figure 21. See the next examples:

- (58) اعلنت امريكا الحرب على العراق  
*çalanat America alharba alla al Iraq*  
 America announced the war against Iraq
- (59) خرجت المظاهرات على الحكومة بسبب سوء الاوضاع المعيشية  
*Karagat almudaharat alla alhukuma bisabab suç alçudaa almaçishiah*  
 The marches started against the government because of the bad living
- (60) انتقضت السباع على فريستها بسرعة فائقة  
*Inqadat alsibaç alla farisatiha bi surçatin fāçika*  
 The lions assaulted the prey swiftly

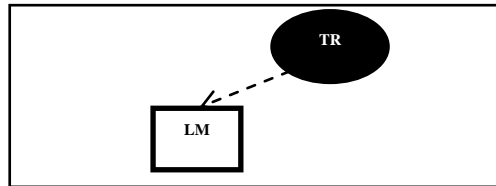


Figure 21. The Sense of *Against*

#### d. The sense of *About*

The sense of “about” can be revealed by using *alla* in which two actions are found, one precedes the other. The first action is explained or described by the second action. This happens usually when someone comments, explains or describes, on another action. The action of comment or explanation (TR) is metaphorically higher than the explained action (LM), the configuration can be completely or not completely vertical as in Figure 22. The sense of “about” is only gotten by *alla*, as in the (61), (62) and (63):

- (61) علق المدرب على نتائج المباراة  
*Allaka almudarib alla nataçige almubarat*  
 The coach has commented about the match results
- (62) لم يعلق الرئيس على امكانية اجراء انتخابات مبكرة  
*lam yuçliku ahraçees alla imkaniat ijraç intikabat mubakira*  
 The president never commented about holding early election
- (63) اجاب وزير الخارجية على جميع الاسئلة في المؤتمر الصحفي  
*Ajaba wazeeru alkarijiahi alla jameeç alasçilahi fi almuçtamar alsuhafi*  
 The foreign minister answered all the questions at the press conference

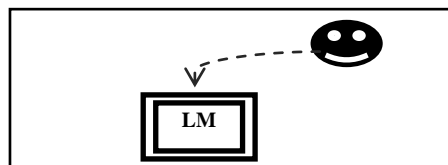


Figure 22. The Sense of *About*

### B. Establishing the Semantic Network of *Alla*

The proposed criteria of the previous section will be applied here in order to establish the semantic network of *alla* by determining the central and peripheral senses as follow:

#### 1. The Deep Central Sense of *Alla*

a. The spatial preposition *alla* overlaps with the other related preposition *fawq*, as in Figure 23. In many times these two prepositions can be used interchangeably, as in (64). The source of their overlapping is the shared minimal abstract sense which represents the minimal feature of the whole meaning in which there is something (TR) higher than something else (LM). This sense or the minimal feature of the whole meaning does not refer any kind of configuration whether vertical or horizontal.

- (64) وضع محمد الكأس على/فوق الطاولة  
*Wadaça Muhammadun alkaçsa alla/fawq altawiala*  
 Muhammad put the glass on the table

b. It is so clear that this minimal sense presents in all senses that have been distinguished in the previous section.

#### 2. The Surface Central Sense (SCS)

a. The previous sections have shown up that the preposition *alla* has 17 distinct senses. Among of them 12 senses have the vertical configuration in which TR is higher than and located in contact with the top of the LM. Therefore, this configuration represents the SCS of *alla*.

b. Among these vertical senses, the central is the concrete one. In the same time the other concrete configuration in the neighboring sense is more central than the examining sense because it is physical. The abstract configuration of the examining sense is derived from the physical neighboring sense, as in Figure 23.

c. The vertical physical configuration, in which TR and LM in contact, reflects the meaning of *alla* compared with the other related preposition in the vertical contrast set. It encodes the area of the vertical axis in relation with the other spatial prepositions that classify the vertical axis. These prepositions are *fawk* (above), *taht* (under) and *asfal* (below) in addition to *alla* (over), as in Figure 23.

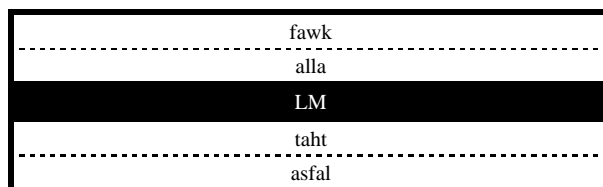


Figure 23. The Vertical Contrast Set of Arabic Prepositions

d. The vertical physical configuration, in which the TR is in direct contact with the LM top, has the greatest number of representations in our daily experience. It is common and encodes the relationship between the most prominent entities in our life.

## V. CONCLUSIONS AND RESULTS

On the basis of the previous qualitative analysis, the study reaches the following results: first, the model of principled polysemy, proposed by Tyler and Evans (2003), is subjective in some of its methodological criteria. Some of the established criteria are mercurial in which they are not decisive and can lead to different results. Second, the semantic network according to this model includes some redundant members or contains invalid ones. Third, the proposed model is more economic and it gets rid of all the redundancies in the semantic network. Fourth, this model explains the overlapping between the related prepositions and give a clear criterion that draw clear boundaries of the network. Fifth, this criterion can be used as a tool to distinguish between polysemy and homonymy. This distinction is so important in establishing the semantic network and excluding the invalid embedded senses. Sixth, the semantic network of Arabic polysemous spatial preposition *alla*, which is extensively complex, includes only 17 distinct senses. There are two central senses, the deep and the surface. The former is the underground sense of the two related spatial prepositions, *alla* and *fawq*. It represents the minimal feature of the whole meaning in which the TR is higher than the LM without giving any attention to the type of TR/LM arrangement. The latter is the vertical configuration of TR and LM in which the former is located with contact on the top of the latter.

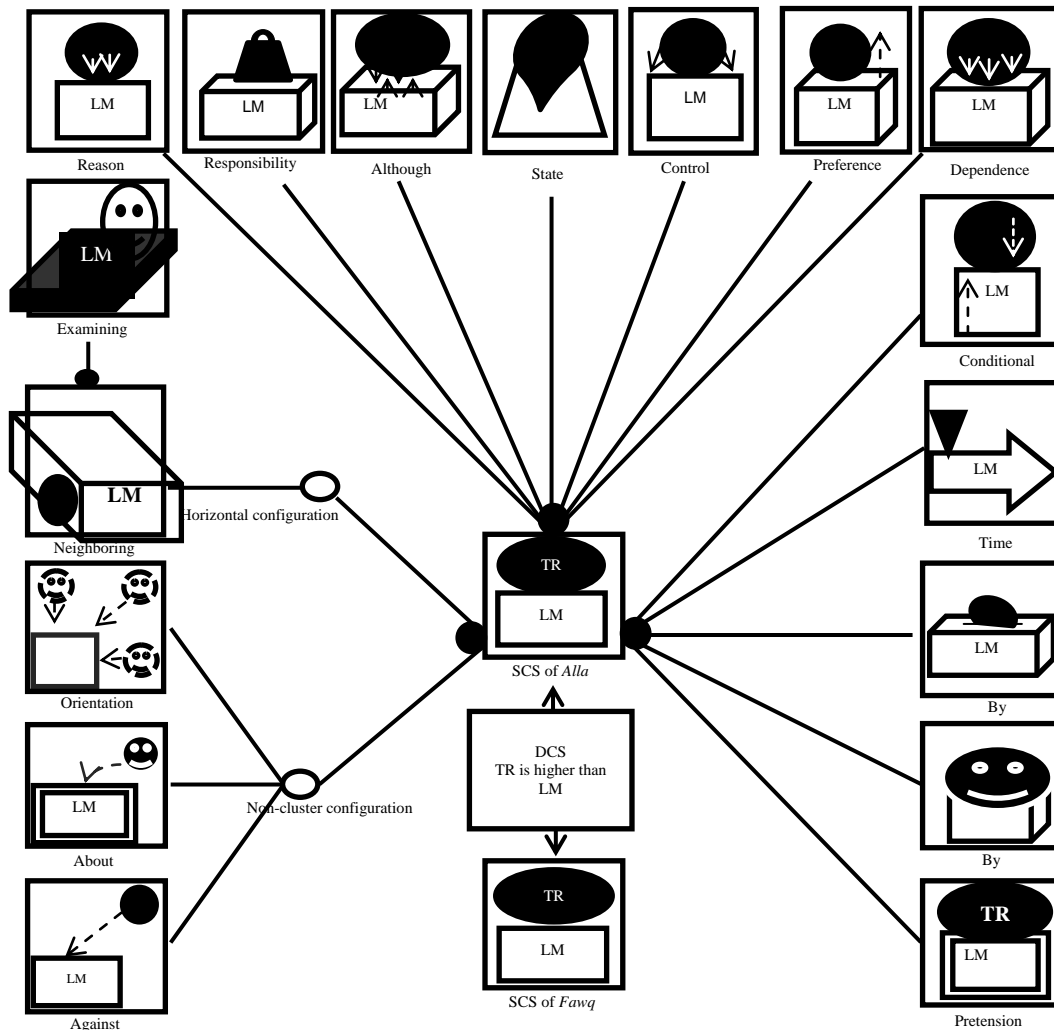


Figure 24. The Semantic Net Work of the Arabic Spatial Preposition Alla

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