

opción

Revista de Antropología, Ciencias de la Comunicación y de la Información, Filosofía,
Linguística y Semiótica, Problemas del Desarrollo, la Ciencia y la Tecnología

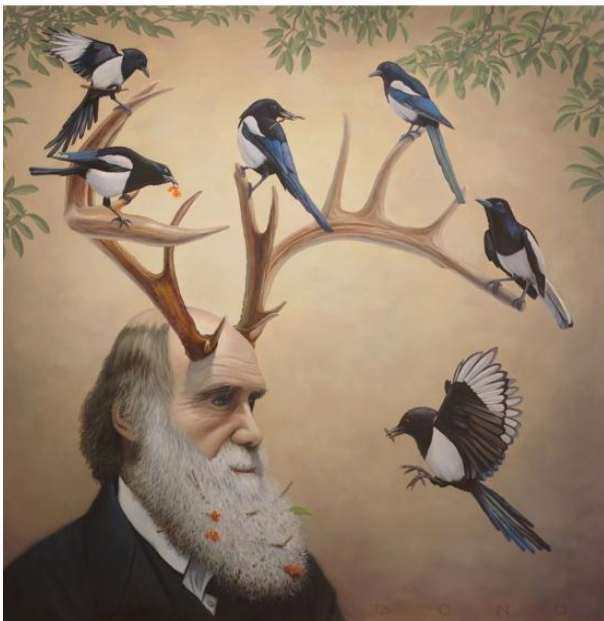
Año 35, 2019, Especial N°

22

Revista de Ciencias Humanas y Sociales

ISSN 1012-1537/ ISSNc: 2477-9385

Depósito Legal pp 198402ZU45



Universidad del Zulia
Facultad Experimental de Ciencias
Departamento de Ciencias Humanas
Maracaibo - Venezuela

Discourse Markers in English & Arabic: A contrastive Study

Ibtisam Abdulkhaliq Majeed; Eman Salih Hmoody

Middle Technical University of Baghdad /Baquba Technical institute

Abstract

Many words which might be claimed to be DMs arise commonly in speech, but no principled grounds exist on which to disclaim DM reputations to comparable objects which might be in large part located in written discourse. The role of the discourse markers which are words or phrases in the linguistic system to make relations between topics in the discourse. They are important but use them when necessary in the informal speech as if we say them a lot make the speech artificial. The grammatical structure has a subject, verb, or object.

Marcadores del discurso en inglés y árabe: un estudio contrastante

Resumen

Muchas palabras que pueden afirmarse que son DM surgen comúnmente en el habla, pero no existen fundamentos de principios para negar la reputación de DM a objetos comparables que podrían estar ubicados en gran parte en el discurso escrito. El papel de los marcadores del discurso que son palabras o frases en el sistema lingüístico para establecer relaciones entre los temas del discurso. Son importantes, pero los utilizan cuando es necesario en el discurso informal, como si los dijéramos mucho, lo hacen artificial. La estructura gramatical tiene un sujeto, verbo u objeto.

Chapter One

Introduction

1.1. The Problem

For spark, the learners of the language can be edited for utilizing non-standard morphology not for utilizing a discourse sign in an adequate place, even the markers are imperfect (Dailey-O'Cain, 2000: 43).

The role of the discourse markers which are words or phrases in the linguistic system to make relations between topics in the discourse(like; then, so). they have a role in pragmatics (Brinton, 1996), the speaker uses it to comment on the information that will be said (such as; like, you know) or in the change of state (Heritage, 1984: 67).

One study of discourse markers has set itself to show how discourse markers are used pragmatically. They may be used for suggesting comment "the most relevant is not adequate". the lexical items are free in semantic content and dependent in local context and sequence of talk(ibid). According to Schiffrin (1987: 76), the discourse has many planes of coherence and structure. There are functions like, Topic changes reformulations, discourse planning, stressing, hedging, and backchanneling. Firstly, the ideational structure has a topic and cohesive relations between ideas and propositions in the discourse. Secondly, the action structure has relations between speech acts. Thirdly, the exchange structure depends on the turn-taking between people. The information state specializes in the knowledge in the interaction. At last, the participation framework studies the relation between hearers and speakers. DMs in ideational functions index incoherence among the discourse ideas. They are all interactional in action (ibid).

Another study has dealt with how DMs are in some features. They can be stressed or disconnected from the context. DMs come from lexical categories (verbs, adverbs,). they can be in the beginning, internal, or the final of the utterance. They also separated from the context syntactically. They don't add anything to the propositional content semantically. So, omitting doesn't affect the meaning. Despite all the aforementioned attempts to deal with discourse markers, it seems that the efforts exerted in this regard are still insufficient. Some aspects of discourse marker in English and Arabic have not been given their due attention. Accordingly, this study has set itself the task to deal with this problem to fill the gaps mentioned above by answering the following questions:

1. What are the types of markers of discourse and their role in English and Arabic languages?
2. What are the effects of contextual clues on discourse markers in Arabic and the English language?

3. What are the similarities and differences in the employment of discourse markers in English and Arabic languages?

1.2. Hypotheses It is hypothesized that:

1. English and Arabic languages include various types of discourse markers used to achieve various functions.
2. The context affects the type and role of markers of discourse in the two languages under study.
3. There are similarities and dissimilarities in the employment of discourse signs in English and Arabic.

1.3. Aims of the study aim at:

1. Identifying the kinds of discourse markers and their corresponding functions in English and Arabic languages.
2. Indicating the effects of contextual clues on discourse markers in Arabic and English language.
3. Showing the similarities and differences in the employment of discourse markers.

1.4. Procedures

1. Introducing a theoretical background for the study of markers.
2. Analyzing certain examples of markers.
3. Comparing the findings arrived at to discover the similarities and dissimilarities in markers.

1.5. Limits This study is limited to a contrastive study.

1.6. Value of the Study Since this study is concerned with contrasting

markers. it is hoped that it would be of value to students of linguistics, and to a contrastive analyst who seeks to state the similarities and differences between the two languages.

Chapter Two Discourse Markers in English

2.1. Introduction This chapter tackles discourse markers in English, their definition, characteristics, types, and functions.

2.2. Discourse Markers:

Definition: in discourse marker is a word or a phrase that affects the managing of structure in discourse. Because of their level of discourse, not utterances or sentences. Deborah (1986: 78) defines discourse markers that words and phrases which refer to discourse. It is also called cue phrases form a various class of words and expressions which signal the structure of discourse. They are derived mainly from the class of adverbials, conjunctions, and prepositional phrases (ibid). What all these classes have in common is that they line to make coherence and cohesion. The main function of DMs refers to textuality. They described as the glue that collects different parts of the sentence together. They are important but use them when necessary in the informal speech as if we say them a lot make the speech artificial. The grammatical structure has a subject, verb, or object. When adding something, we use further, besides in the initial position. When contrasting like on the other hand in the initial position. When making what you say stronger, use on the contrary on the initial position. When expressing an expression like so long as. When saying the result of something is like As a result. When making an unexpected contrast like Even though. Saying why something is the case like since and as.

The problem of it that in languages, whether or not DMs have literal or propositional meaning. There are conflicting views. Fraser (1999: 56), for example, hand, maintains that all DMs, in her corpus, have a core meaning. Whether DMs have a procedural or literal meaning, that meaning is enriched by context. This indicates that DMs are technical terms, i.e. they acquire meaning when used in context. Hence, they are context-dependent items. they are multifunctional. The multifunctionality of discourse markers makes them fertile objects for discourse analysis. Their functions in the discourse of a language do not usually coincide with those signaled by their lexical equivalents in another(ibid). Some points should be clarified about the above quotation. First, it draws attention to the fact that all languages have devices which function as DMs. Recent studies of contemporary Arabic, for example, refer to the frequent recurrence of the coordinating functional 'Wa' at some portions of discourse (i.e. at the beginning

of a sentence, a paragraph, or even chapter). Second, it invites researchers to study DMs in discourse to discover which their realizations are different or similar. Some of the words are not discoursing markers but fillers or expletives.

2.3. Characteristics of Discourse Markers

The following points identify the features that are concerning DMs. These features are discussed to:

1. They are used as connectives

Connectivity is one of the main features of DMs. it means that they are used to relate utterances. Hansen(1997:160) said that the function of DMs is connective. There is unacceptance that DM connectivity should have more than one textual unit. Machler(1994:325) said that there are relations between two textual units. It is used to differentiate between DMs and illocutionary and attitudinal adverbials, primary interjections.

2. They are Optional

Discourse markers are characterized as being optional in two different meanings. they're nearly universally appeared as syntactically optional within the meaning that elimination of a DM does no longer adjust the grammaticality of its host sentence (fraser, 1988: 22).

but DMs also are substantially claimed to be optionally available in the sense that they do now not expand the possibilities for the semantic relationship between the elements they accomplice. Although if a DM is omitted, the relationship it alerts remains to be had to the hearer, even though not explicitly cued(ibid).

4. They are non-truth-conditional

DM does not contribute something to the reality-situations of the proposition expressed with the aid of an utterance (Blakemore, 1988: 67). fraser (1996: 167) takes this to mean that DMs do not affect the truth-situations of sentences, but support has grown for the view that fact-situations pertain no longer to sentences however to mental representations.

5. They make weak clause association

the prevalence of discourse markers is either outdoor the syntactic structure or loosely connected to it (Brinton, 1996: 34).

quirk et al. (1985: 631) classify many forms some other place covered amongst DMs as conjuncts which might be taken into consideration to be clause elements but to have an indifferent function relative to carefully interrelated clause elements such as a problem, complement, and object. al-

though putative DMs are at best, we susceptible clause association is regularly correlated with phonological independence. Likely associated with greater vital clause elements, a few sincerely have their inner syntactic structure (e.g. however) and some capability DMs (e.g. you recognize) are clausal notwithstanding their apparent non-fact conditionality. Although putative DMs are at best susceptible clause association is frequently correlated with phonological independence. weakly associated with higher vital clause components, some have their internal syntactic structure (e.g., however) and some DM capabilities (e.g., you recognize) are explicitly clausal given their apparent non-factual conditionality.

DMs constitutes unbiased tone devices, or to be activated from the primary clause via 'comma intonation'. this is proper of many DMs, as of conjuncts and disjuncts in preferred, irrespective of whether they occur within the clause or at its extremes. although, loss of intonational integration won't be a vital function of DMs. it's far stated that paperwork that proportion the main defining characteristics of DMs described above are intonationally incorporated with the clause.

a few preliminary elements frequently identified as DMs may also be intonationally incorporated with a bunch clause (e.g. so I refused) (Hansen, 1997: 156).

5. they are literal

DMs prototypically introduce the discourse segments they mark. the tendency in the direction of initially should be understood to refer to the location of DMs with regards to the crucial clause factors instead of to the position of the primary phrase in an utterance when you consider that items alleged to be DMs often cluster at utterance onset and somewhere else (Hansen, 1997: 156; cf. Schiffrin, 1987: 31).

6. They are characterized by Morality

many words which might be claimed to be DMs arise commonly in speech, but no principled grounds exist on which to disclaim DM reputations to comparable objects which might be in large part located in written discourse (Brinton, 1996: 33).

association of a specific DM with the written or spoken channel is often tied simplest to the relative formality/informality of the DM (e.g. additionally versus moreover). some DMs may be related to speech because

their meaning presupposes a familiarity with the addressee now not usual of impersonally addressed writing. after all, for instance, encodes that the speaker has grounds for believing that the premise introduced by way of in any case is already accessible to the hearer (Blakemore, 1987: 81).

7. They are characterized by Multi-categorically

There is a perception that dm status is independent of syntactic categorization: an object maintains its non-dm syntactic categorization but does have 'extra duty' as anon-reality-conditional connective loosely connected with clause structure (Brinton, 1996:33).

classes to which extrinsic dm function has been attributed include adverbs (e.g. now, clearly, besides), coordinating and subordinating conjunctions (e.g. and, but, due to the fact), interjections (e.g. oh, gosh, boy), verbs (e.g. say, appearance, see), and clauses (e.g. you spot, I imply, you understand). when dm popularity is seen, alternatively, as a be counted of syntactic categorization, multi categorically is regarded diachronically and DMS are taken to rise from different categories thru historic procedures(ibid).

2.4. Types of discourse markers

Generally speaking, the class of discourse markers divides smartly into 3 number one subclasses: markers which sign aspects of topic exchange; markers which sign the cutting-edge discourse activity (e.g., explaining or clarifying), and markers which sign how the cutting-edge message pertains to an in advance part of the discourse (e.g., that it is parallel to, or contrasts with). they're as follows:

1. Indicators of Topic

Indicators of topic contain two subclasses:

a. Those which signal some sort of topic shift

b. Those which signal a refocusing on the current topic

the phrase of "topic" is difficult. a few researchers write of sentence subject matter, others of utterance topic, even as still others discover the perception of discourse subject matter. what the discourse contributors are "speaking approximately" at any given time, including various subtopics as they arise, explains the notion of the topic (Brinton, 1996: 33).

even though one would possibly anticipate discovering a discourse marker whose characteristic is to sign an initial discourse subject matter, I've

observed none. when an initial topic is conveyed explicitly—and this isn't the case—it appears to be as the result of an explicit inspiration (e.g., “I would like to talk to you nowadays about your recent overall performance, Mr. Johnson”; “allows start with a discussion about on a larger scale, we might assume to discover markers to sign how the speaker intends to border the whole discourse segment, as an instance, “did you listen the one approximately. . . “ signaling that a funny story is to follow. your current performance”)(ibid).

2. Indicators of Activity

the second subclass includes discourse markers that signal the current discourse pastime relative to a few a part of the foregoing discourse. these activities refer to varieties of discourse paintings along with explaining or summarizing, and no longer to the type of message (i.e., the type of illocutionary act) the speaker conveys through the utterance (Brinton, 1996: 53).

seven styles of pastime signs are classified with the aid of pupils who are experts in this regard (ibid):

(a) indicators of rationalization: by using the manner of rationalization, to clarify.

(b) indicators of conceding: admittedly, despite everything, all in all, all the

same, anyhow, anyway, at any fee, except, for all that, anyways/event, of the path, and nonetheless,

(c) signs of rationalization: by the manner of rationalization, if I might also explain, to give an explanation for.

(d) indicators interruption: if I may also interrupt, to break, no longer to interrupt.

(e) indicators of repetition: on the hazard of repeating myself, once more, to copy.

(f) indicators of sequencing: in the end, first, within the first vicinity, finally,

next, on the only/different hand, 2d, to start, to conclude, to maintain, to begin with.

(g) indicators of summarizing: in widespread, in precis, normal, thus far, summarizing, summing up, up to now, to sum up, at this factor(ibid).

3. signs of message relationship

the 1/3 subclass of discourse markers is those which signal the connection of the fundamental message being conveyed with the aid of the modern utterance to a few previous messages. there are 4 groups: parallel; contrasting; elaborative; and inferential ((Blakemore, 1987: 81).

1. parallel markers are the most widespread of these and signal that the contemporary basic message is, in a few ways, parallel to a few factors of the earlier discourse.

parallel discourse markers are also, instead, analogously, and, with the aid of the

equal token, correspondingly, equally, likewise, or, otherwise, similarly, too(ibid).

2. Contrastive markers: all the same, but, contrariwise, conversely, despite, however, I may be wrong but, despite, in comparison, in contrast, instead, never/nonetheless, notwithstanding, on the one/another hand, on the contrary, rather, regardless, still, that said, though, well, yet. Similar to the parallel markers, there seems to be one, more basic contrastive marker: but. even as and signals that there's some kind of parallelism at hand but signals a way of "dissonance"(Hamdan, 1999: 590).

3. Elaborative markers:

populate the 0.33 organization. these markers signal that the modern utterance constitutes an elaboration of an in advance one. covered in this group are the following: above all, also, besides, higher, as an example, for example, similarly (extra), further, in fact, in other phrases, especially, certainly, extra accurately, greater importantly, more precisely, more especially, greater to the factor, furthermore, particularly, on the pinnacle of it all, to cap all of it off, what's greater of those, the markers specifically, certainly, in truth, on top of it all, and to pinnacle it all off signal a more trendy experience of elaboration, (e.g., "he changed into pretty scared. indeed, he changed into scared stupid") (ibid).

while a 2nd subgroup containing better, in particular, greater as it should be, greater importantly, extra precisely, extra specially, extra to the factor has simply the opposite effect, namely, to signal a greater delicate characterization of the sense of the foregoing. a third subgroup containing also, except, similarly (extra), besides, furthermore, what is greater serves to sign one additional component to the present-day topic (e.g., "I don't assume we must cross because of the risk. besides, I don't need to go.")

final subgroup indicators the speaker's intention to have the modern-day message serve as an instance of an in advance point. such markers consist of for instance, for example, in different phrases, particularly (ibid).

4. Inferential markers, which signifies that the contemporary utterance conveys a message that is, in a few experiences, consequential to some component of the foregoing. inferential discourse markers: thus, thus, as a result,

consequently, therefore, on this/that case, of direction, so, then, consequently, for that reason (Fraser, 1999: 56).

Chapter Three

Discourse Markers in Arabic

3.1. Introduction

3.2. there's variety in the terminology of discourse markers in Arabic. one-of-a-kind phrases are used to refer to these expressions like (equipment), (connectives), (debris), and so forth. They join ideas or sentences together and show turns and attitude so controlling the conversation or the context. It wants a higher level of fluency and to comprehend authentic language, so it is important to the formal and informal

king (1992:260) to notice that the Arab scholars studied discourse markers below the belief: (debris of which means). he defines them as words that simplest make sense while joined with others.

khudhair (2001:10) deals with discourse markers under the concept (tools). they display that markers are grammatical equipment that does not have independent meaning, yet they are used to mirror the family members among the elements of the sentence.

Hassan (2006: fifty-four) adds that this gear is of sorts: gear used to hyper-link sentences because the equipment used in interrogation and situation; and gear used to link single gadgets as prepositions and conjunctions. for this reason, Arab grammarians appeared such objects as "characteristic phrases" as an alternative than "conceptual objects" considering they do now not imply lexical meanings, but purposeful meaning.

the have a look at of discourse markers was now not in the variety of Arab grammarians' hobby, particles, however, that are the supply forms of many markers, had been handled considerably of their works. they supplied comprehensive descriptions of those linguistic gadgets categorizing them as a grammatical elegance whose contributors' function in the sentence obstacles. the remedy of debris in traditional Arabic grammar, gully (1995:

121) factors out, demonstrates “a sophisticated method to the observe of language on the time whilst western dictionaries did not comprise detailed information on those “so-referred to as empty paperwork”.

in Arabic grammar, particles are referred to with the term *hurūf* (sg. *harf*) which turned into extended later to *hurūf-u al-ma ānī* ‘debris of meaning’ intending to distinguish this magnificence of phrases from consonants to which the term *hurūf* also applies. to refer to consonants, then again, they prolonged the term *hurūf* into *hurūf-u al-mabānī* ‘elements of the alphabet’(ibid).

that debris has been defined as “phrases that most effective makes feel while joined with others” (king 1992, 260). because of these Arab grammarians considered those objects to be “function words,” in place of conceptual factors and this is why Additionally they stated them through the period *adawāt* (sg. *adāh*) because of this ‘tool’, ‘device’ (ibid).

in their early studies, traditional Arabic grammarians categorized debris in keeping with the grammatical feature they carry out on the subject of adjacent elements in the sentence. the particle was ‘and,’ as an example, is assessed as ‘coordinating conjunction,’ the negative particle *lam* is *harf-u Jamz* ‘jussive particle,’ and the particle *kay* ‘just so’ is ‘subjunctive particle’(ibid).

that is due to the fact the grammar theory of *al- āmil* ‘operator’ in which they have been operating fashioned their remedy of those elements. the primary attention of this principle is the formal shape of the sentence and the grammatical relations combining its constituents. accounting for these grammatical dependencies is important in their paintings as it determines *al-irāb* ‘the case and mood inflection’ of every of the sentence components (amāyrah 1984: 85). in step with this view, particles are divided into *urūf-unāmilah* ‘operative particles’ that have grammatical outcomes on the subsequent factors inside the sentence and *urūf-un hāmilah* ‘inoperative debris’ which serve linking features only while not having any grammatical effect (riding 2005, 409). focusing on the grammatical function of debris is considered a shortcoming in the conventional grammar remedy of those objects (al-batal 1985, 21; kammensjö 2005, 23).

however, this remedy reflects the grammarians’ view of those gadgets as functional linguistic devices that collect that means from context, that’s a sophisticated view of these words that contemporary linguistics helps. besides, it has to be noted that this preoccupation with syntactic function become also observed via a severe hobby within the semantic effect of these elements on their surroundings. “an entire definition of an arf,” carter

(2004: 67) points out, “would encompass its ‘that means’, i.e. the vicinity wherein it is used, e.g. *hal* ‘?’ is for asking questions *istifhām*; *lā* ‘no’ for negating navy; *ya* ‘o’ for calling *nidā*; *we* ‘an3.2. Types of Discourse Markers in Arabic

There are different types of discourse markers in Arabic according to Hamza(:

1. Contrastive markers, e.g. ... etc.
2. Collateral markers, e.g. ... etc.
3. Inferential markers, e.g. ... etc.
4. Topic-change markers, e.g., ... etc.
5. Discourse activity markers, e.g. ... etc.
6. Discourse structure markers, e.g. ... etc.

3.2. The function of Discourse Markers

Discourse markers in Arabic have different functions that vary according to their types and according to the context, these are the following :

1. They have a connective function in that they connect the different parts of the sentence.
2. Some of the discourse markers are used to introduce a subject.
3. Some of the discourse markers are used to mark topic change or to link topics together.
4. ‘*Wa*’ is used more frequently than other markers for the sake of harmony and symmetry. In a few cases, the predicate gives information about the kind of shape. As an example, Tassajara “quarrel”, Takayama “argued”, takataba “corresponded”, tasabaqa “competed”, and “*taqatal*” “fought” is reciprocal predicates which sign mutual sharing, reciprocity, and symmetry, as in the following conjunction in which retailers are conjoined and assigned nominative case:

4. Some discourse markers have a semantic role. For example, *wa* which is usually related to predicates of movement and transition. Such predicates explicit the motion of some entity from one region to some other. “*was*” simply acts as a hyperlink between the predicate and its direction semantic role (al-azzawi, 2008:200)

“the visitor walked along the desolate tract to his village.”

“We walked alongside the seacoast to the cottage.”

Verbs such as Masha “walked”, Sara “went”, sahaba “left”, ja’a “came” express motion, going and coming from one place to another. The distance between the starting point of the motion and the final destination is known as the Path. *Wa* is a linking or relational marker meaning alongside (ibid).

Chapter Four

Similarities and Differences in DMs in English and Arabic

4.1. Similarities

English and Arabic have certain things in common in the area of discourse markers:

1. in both languages, discourse markers are words or expressions that line segments of discourse together to achieve coherence and brotherly love.
2. in both languages, discourse markers are classified into sorts that, though they have got one-of-a-kind names, are nearly comparable.
3. in each language, discourse markers have certain features that all goal discourse brotherly love and coherence.
4. in both languages, the choice of the sort of discourse markers is controlled through the context and the contextual elements.

4.2. Differences

There are differences between Arabic and English in DM:

1. Arabic has more discourse markers than English.
2. Unlike English discourse markers that are semantically controlled, Arabic discourse markers are syntactically controlled.
3. English discourse markers are characterized by their optionality. This means that they can be deleted from the sentence without affecting the meaning. In Arabic, the optionality cannot be applied in every context.

References

- Al Kohlani, F. A. (2010). *The Function of Discourse Markers in Arabic Newspaper Articles*. Ph.D. Dissertation, Georgetown University.
- Blakemore, D. (1996). "Are Apposition Markers Discourse Markers?" *Journal of Linguistics*, Vol. 32, pp. 325-347.
- Brinton, Laurel J. 1996. *Pragmatic markers in English: Grammaticalization and discourse function*. Berlin/New York: Mouton de Gruyter.
- Cantarino, V. (1975). *Syntax of Modern Arabic Prose*. Bloomington: Indiana.
- Carol Lynn, Moder; Aida Martinovic-Zic (2004). *Discourse Across Languages and Cultures*. John Benjamins Publishing Company.
- Fareh, S. (1998). The function of and was in English and Arabic written discourse. *Papers and Studies in Contrastive Linguistics*, 34, 303–312. Retrieved April 10, 2014, from <http://www.ifa.amu.edu.pl/psicl/files/34/>

18Fareh.pdf.

Fraser, B. (1999). "What are DMs?". *Journal of Pragmatics*, Vol. 31, pp. 931-925.

Fries, P.H. (1993). "The Structuring of Information in Written Texts". *Language Sciences*, Vol. 4, No. 4, pp. 461-482.

Gully, Adrian. 1993. The changing face of modern written Arabic: An update. *al-Arabiyya* 26: 19-59.

Hamza, M. (2006). Discourse Markers in Written Arabic. *Teachers' College Researchers Journal*, 1, No. 1, 1-252 Retrieved February 26, 2014, from <http://www.basiceducation.uomosul.edu.iq>.

Halliday, M. & Hasan, R. (1976). *Cohesion in English*. London: Longman.

Hamdan, Ahmad. 2002. *al-"iāb al-ilamī al-arabī. āfāq wa taaddiyāt*. Algeria: Dār Hūma.

Hansen, Maj-Britt Mosegaard. 1997. *Alors and donc in spoken French: A reanalysis*. *Journal of Pragmatics* 28: 153-187.

Khalil, Esam N. 2000. *Grounding in English and Arabic news discourse*. Amsterdam:

John Benjamins Publishing Co.

King, Brian. 1992. On the meaning of empty words. *Semiotics* 89 (1/3): 257-265.

Schiffrin, Deborah (1986), *Discourse markers*, *Studies in interactional sociolinguistics*. Cambridge: Cambridge shire.



**UNIVERSIDAD
DEL ZULIA**

opción

Revista de Ciencias Humanas y Sociales

Año 35, Especial No. 22 (2019)

Esta revista fue editada en formato digital por el personal de la
Oficina de Publicaciones Científicas de la Facultad Experimental de
Ciencias, Universidad del Zulia.
Maracaibo - Venezuela

www.luz.edu.ve

www.serbi.luz.edu.ve

produccioncientifica.luz.edu.ve