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Discourse construction at 4-5 years of age: Language specificities and 'cognitive functional' constraints

Introduction

The present cross-linguistic study continues the investigation of first language (L1) acquisition and development, and tends to verify the hypothesis formulated in previous studies (Hirzalla, 2005, 2007). It aims to reconsider the interaction between cognitive determinant and typological specificities in the construction of discourse at the age of 4-5, and to show that, contrary to what is usually defended, the discourse of this acquisitional stage is not impermeable to language specificities. The study analyses two types of spatial discourse: static, elicited by the task of picture description, and dynamic, elicited by the task of describing successive images[1], both produced orally in French and Jordanian Arabic L1 by children of 4-5 years of age[2].

Developmental cross-linguistic studies in L1 acquisition and comparative studies, which address L1 to second language (L2) acquisition, come frequently to the conclusion that:

a. in L1 the capacity to produce a coherent/cohesive discourse is not attested before the age of 7-8 or even 10-11,
b. the analysis of developmental process reveals identifiable and similar sequences at the ages of 4-5, 7-8, 10-11 in all the languages which were explored.

The majority of current research defends actually that children at the age of 4-5 seem to have difficulty in organising a complex flow of information across discourse. They produce separate utterances without linking them together, do not mark the distinction between given/new information, and in spatial description particularly, tend to encode spatial configurations by deictic expressions. These characteristics are usually interpreted as the manifestation of cognitive development of the child. Some studies however (particularly Berman and Slobin, 1994) defend that linguistic determinant appears in this age mostly at utterance-level.

In our previous studies and in the present one, we assume that:

1. Although the above mentioned characteristics are attested at the age of 4-5 (except the production of deictic expressions which is, we believe, highly related to methodological conditions, see section 1.4), they do not represent the total distinguishing discursive traits.
2. In interaction with cognitive determinants, linguistic specificities take part in the way children distribute spatial information in descriptive utterances and in the way they organise the discourse.

[1] This task was used in the comparative researches of Hendriks and Hickmann (cf. Hendriks, 1998; Hendriks & Hickmann, 1998; Hickmann & Hendriks, 1999).

[2] The discourse produced at the age of 4-5 is usually analysed in a cross-linguistic developmental (cross-sectional) perspective (in comparison with the productions of the age of 7-8 and 10-11). In this study, only the characteristics of the discourse at the age of 4-5 will be presented since the main question concerns this acquisitional level (for a detailed developmental analysis in French and Arabic, see Hirzalla (2005), and for other languages, see the researches of Hendriks and Hickmann).

This postulate is based on a cross-linguistic analysis of French and Jordanian Arabic. These two languages represent important divergences in the referential nature of locative expressions (transitive vs. intransitive) and in the criteria which determine the transitive/intransitive use of the expressions which function in both ways. This difference affects the type of referential maintenance in the discourse. In addition, French and Arabic differ in the constraints they impose on the descriptive utterance structure and also in their pronoun systems.

The comparison between the two types of discourse produced at the age of 4-5 in both languages points out some similarities, but also multiple differences which can not be explained by non-linguistic cognitive factors, and question again the results of the prior studies.

We agree, as it was claimed, that what we call in this study and previously a 'cognitive functional' constraint has a real impact on the production of the discourse at this age, but we assume that language specificities constitute a determining factor as well. The two ways of constructing discourse show that children seem to be sensitive to the constraints that the language they acquire imposes on the organising principles of both utterance and discourse[3].

1. Theoretical background and frame of analysis

1.1 Spatial location

Spatial location relates at least two entities, and involves essentially the notion of *region* (see Klein, 1986). In *there is a boy in front of the shop*, the entity *boy* is localised in the region of the *shop*; this region is specified by the locative expression *in front of* and established by an extension of the sagittal axis of the entity *shop* into the exterior space. We will follow here the terminology of the European Science Foundation project (ESF, cf. Perdue, 1993) and call the entity to be localised *Theme* (Th), and the second which serves as a point of reference *Relatum* (Rel), respectively *figure* and *ground* according to Talmy (1985).

In the expression of spatial location, languages make the distinction between, at least, three categories (cf. Talmy, 1975, 1983, 1985):

1. Static location: the Th is static and localised in the region of the Rel (*There is a cat in the garden* or *The cat is in the garden*).
2. Dynamic location: the Th moves in the region of the Rel without going beyond its boundaries (*The cat runs in the garden*).
3. Change of location: the Th goes beyond the boundaries of the region of the Rel (*the cat goes out of the garden*).

Space is usually evoked by its double structure: topological and dimensional projective. In consequence, two types of spatial relations are distinguished: topological which concerns the relations of inclusion/ exclusion and of neighbourhood, and projective ordering into three dimensions: vertical, lateral and sagittal. The expression of lateral and sagittal spatial relations depends on the position and the orientation of the speaker. It is established in function of the *origo* (see Bühler, 1934) which represents the prominent place. The *origo* can be the speaker (or the addressee) or the Rel itself.

[3] The cross-linguistic developmental researches of Bowerman have pointed out that children of 2 years of age or even before show evident sensitivity to language-specific aspects of the system they learn.

1. 2 The construction of discourse: linguistic and pragmatic factors

In the construction of any discourse, the speaker produces grammatically well-formed utterances and regulates the flow of information across them according to pragmatic universal principles. The co-ordination between utterance-level and discourse-level implies grammatical knowledge and the mastery of referential constraints. It points out two fundamental characteristics of a language: multifunctionality and context-dependency.

Multifunctionality refers to the complex way languages map the relations of form/function. As for context-dependency, it concerns referential operations which govern the discourse realisation. These operations consist in relating an expression either to an extralinguistic referent (deictic process) or to a referent already introduced in the discourse (anaphoric process).

The distinction between these two processes does not mean that referential expressions are either deictic or anaphoric (cf. Kleiber, 1994, 2000). The majority can indeed be employed in both ways. In *Mary couldn't come*. *She is ill*, *she* refers to *Mary* and ensures an anaphoric function. But in *She is so sweat,* produced in the case of a visually accessible referent to speaker and to addressee, *she* does not imply an already mentioned referent, but the one present in the immediate visual context. Conversely, *here*, deictic in principle, can ensure an anaphoric function when the name of a place is mentioned in a novel or a story, then maintained by the expression *here*.

Referential processes depend thereby on the principle of mutual/non mutual knowledge which constitutes one of the most important determinant in realising the discursive unity. In the two tasks we study here, the referents are not presented in a shared visual context since our methodology establishes a condition of non mutual knowledge (see section 1.4). Therefore, the coherence/cohesion of the discourse should be built mainly by anaphoric process.

In this case, the speaker considers in a permanent, and unconscious, way the status of information. In other words, he or she evaluates what is already known by the addressee and what is not. The dynamic character of discourse relies on an evolving representation which ends up with the change of informational status of referents.

A referent which is presented for the first time in the discourse is new; it implies appropriate linguistic material. If it is maintained or reintroduced, it becomes known and consequently will be re-presented with another type of linguistic means.

In addition to linguistic and pragmatic constraints, the type of the discourse intervenes in the selection and the segmentation of the information to be transmitted. Such constraints are explained in next section.

1.3 Discourse construction and linguistic production

In this study, we adopt the model of discourse analysis proposed by Klein and von Stutterheim (1991). This model relates utterance structure to discourse structure, and considers the discourse as an organised unity which answers a specific question named the *quaestio*. The quaestio can be implicit or explicit, and imposes constraints on the way

information is selected, linearised and mapped into the referential domains: space, time, entities, events and modality.

According to this model, the information is divided into *foreground* and *background*. The first structure contains utterances that answer directly the question; the second contains those which are not relevant. Furthermore, the development of the information in one referential domain across the utterances, namely the *referential movement*, is explained by four main operations: (1) the introduction of a new referent (2) the maintenance of this referent in the following utterance or utterances (3) the reintroduction of a referent; this operation can be considered as a maintenance which operates by distance (4) the rupture and change where a new referent is presented.

In the picture description, the main body of information is arranged around two referential domains: space and entities. The quaestio of this complex task can be defined as "where is what in L?" (cf. Carroll and von Stutterheim, 1993), L is the total space of the picture. Each descriptive utterance answers "what is in L1?", "what is in L2?", .. "what is in Ln?", L1, L2, …, Ln are the sub-spaces of L. To realise the description, the speaker/informant divides the whole space L in L1, L2, … Ln, and localises a Th (or several Th) in each of them.

The division of the picture indicates the way the task of description is conceptualised, and consequently spatial information is organised. This operation implies different strategies that Carroll and von Stutterheim (1993) call *frames*, and group in three basic types. The g*lobal frame* consists in dividing the complex configuration under description (the picture) into defined sections. The concepts used to realise this division are the dimensional axes specially lateral and sagittal or the inclusion. Thus, global frame can be expressed by *on the left/right of the picture*, *in the foreground/background* or *in the middle*. In this frame, the expressions like *above/under the picture* or *beside the picture* can not be used. Therefore, the selection of locative expressions is constrained by the frame which allows transmitting spatial information.

The second frame is called *point-to-point*. In this strategy, the locations are expressed by regions of space which are associated to entities: *beside the shop*, *in front of the building*, etc. Notice that locative expressions such as *under, above* or *beside* which can not be used in global frame function in point-to-point frame. As for the third frame, called *linear*, it is based on the concept of tour. The speaker plays the role of fictive observer who moves in the space under description. This strategy involves the verbs of movement: *when I go to the left I see a building*.

In the narrative task, the quaestio can be interpreted by "What happened to P in T/L ?", where P is the protagonist, T is the temporal interval, and L the spatial interval. Referential domains which build this type of discourse are entities, events, time and space. The realisation of this task will consist also in dividing T/L in T/L1, T/L2, ... and in relating each of them to an event relative to P (or to several P).

Unlike picture description, in which the informant can be free in what spatial interval he/she describes first, since spatial intervals are simultaneous, in narrative task the informant is constrained to follow the chronological order imposed by the events which are presented in the successive sequences.

Another crucial difference between these two types of discourse concerns the linearization of spatial concepts. In French as in Arabic, the speaker who describes a picture can introduce the expression of the Th before this of Rel, and inversely, according of course to the constraints that language imposes on utterance structure (in Arabic, if the Th is presented first, it should be preceded by the existential, cf. 3.1). He/she can therefore describe a spatial configuration by the translation equivalent of *There is a woman in front of the shop* or *In front of the shop there is a woman*.

In dynamic location, the expression of the Th, which is the protagonist in motion actually, is introduced often always before the expression of the Rel (*The cat climbs onto the tree*, but not *Onto the tree the cat climbs*). A French-speaking informant can however produce, in some spatial configurations, a more elaborated descriptive utterance as *dans le pré court un cheval* (which is the translation equivalent of *in the meadow runs a horse*). In this way, he/she introduces the information relative to the Rel before this relative to the Th in movement. But, this informational schema is used mostly in written language or in the objective to speak a well elaborated language. In Arabic on the contrary, such schema appears in the ordinary speaking and responds to special constraints (see section 3.1).

The model of the quaestio accentuates the way a complex verbal task is conceptualised, and joins the point of view of Levelt (1989) which relates linguistic production to the underlying cognitive procedure. Levelt proposes that the production of a message passes by three identifiable successive operations: the conceptualisation, the linguistic formulation and the articulation.

According to this point of view, the speaker (roughly) starts by elaborating a conceptual structure which represents the *preverbal massage*. The elaboration of such structure implies the consideration of communicative objectives, mutual/non mutual knowledge and the context. The speaker then 'translates in words' the conceptualised informational structure through grammatical and phonological encoding. The internal preverbal massage is expressed and transmit by the third operation of articulation.

As we already mentioned, the conceptualisation of the discursive task of picture description and of narrative implies the division of the total space in sub-spaces, and the total time of narrative in temporal intervals (according to events which take place in spatial intervals). For each L1, or T/L1, a sub-conceptual structure is elaborated, then 'put' in linguistic form. And since it is the discourse realisation that is concerned here, *discourse representation* (cf. Klein, 2007) will imply a specific arrangement of the information to be transmitted. In other words, sub-conceptual/linguistic structures will be linked together according to discursive rules.

1.4 Method and data

The central methodological questions which should be viewed in this type of study are the following: What verbal task is the most adapted to the subject of investigation ? How to ensure a context of non mutual knowledge, crucial in the expression of spatial reference, and consequently to encourage children to make explicit spatial relations without using deictics? And finally how to avoid the risk of repetition of different tasks with the same informant ?

In order to ensure the production of two types of spatial discourse: static and dynamic, we asked to children to describe a picture (see Appendix 1) and to tell a story on the basis of image sequences (see Appendix 2).

The picture we propose here was first used in the studies of Carroll and von Stutterheim (1993, 1997). It represents a place with multiple entities (persons, cars, buildings, ...). The complexity of such spatial configuration should allow the expression of different spatial concepts.

In narrative task, we adopt the two stories: the cat and the horse, used in several studies of Hickmann and Hendriks (cf. Hendriks and Hickmann, 1998 ; Hendriks,1998). The first story contains six sequences which present several actions of a cat; the second is composed of five sequences which present a change of location of a horse. In both cases, there is a principal animate protagonist which creates different actions, and other referents: animate which move also, and inanimate which serve in localising the animate protagonists.

The question of non mutual knowledge represents a primordial condition which determines the production of locative expressions, and to avoid deictic expressions. Hickmann (2000) has stressed the importance of this point in collecting the discourse of the children. As we mentioned in the introduction, current research attest that children at the age of 4-5 produce deictic expressions in spatial description. We have confronted two methodological contexts adopted in a spatial description task proposed to French- and Arabic-speaking children of the age of 4-5 (cf. Hirzalla, 2005, 2008). The first context establishes, although indirectly, a common field of vision by the fact that two researchers participate in collecting data: the first researcher is near to the child/informant; he gives the instruction, and asks the child to describe the picture to the other researcher who remains farther away. The second context ensures total absence of common field of vision by the fact that the child deals with only one researcher who gives the instruction and maintains a distance during the description. The comparison shows that children produce deictic expressions only in the first context.

In the two tasks proposed in the present study, one researcher/addressee is in front of the child during the registration. In the picture description, the instruction was the translation equivalent of 'describe this picture to me, I do not know it, I will close my eyes and listen to you'. To avoid mutual knowledge in the cat and the horse story, the instruction was the translation equivalent of 'Tell me the story in these images. I do not know them. I close my eyes and listen to you'. In this way, the two main protagonists (cat and horse) are not pre-introduced.

Finally, in order to prevent the repetition of different tasks with the same informant, we proposed each task to three different groups in each language. In French as in Arabic, two groups have described the picture (10 informants each). The cat-story was presented to two different groups (5 informants each), and the horse-story was proposed to two other groups (5 informants each).

2. Language acquisition [4]

Language acquisition is one of the fields which have been studied in different branches of science. But careful and specific investigations of this complex and fascinating question date back only to the end of the19th century, and have considerably evolved during the last decades. In the 1950s, the innatism of Chomsky radically changed the idea about how

[4] An exhaustive analysis of the emergence and the development of L1 is exposed in the research of Hirzalla (2005). In this section, we present a summary.

language is learned, and pointed out the insufficiency of the theoretical view of the behaviourism which was very influential in this period.

Since the claim of the major role of *innate predispositions* in learning a language, and the confrontation of this theory with the conception of Piaget, language acquisition is investigated in close relation with conceptual development. Several studies have been conducted with the intention of answering to three interdependent questions (cf. Kail, 2000): the exact nature of the innate predispositions, the mechanisms which take place in language acquisition and, taken as a whole, the interaction between innate structures and linguistic input.

Chomsky has considered the innate predispositions in terms of *universal grammar* (UG) which constitutes the initial capacities of children, and helps them in noticing and acquiring their L1. This conception admits the importance of verbal interactions in the process, but attributes to this factor the simple role of 'trigger'. On the contrary, Piaget has suggested that the innate predispositions do not contain preexisting grammatical knowledge, rather cognitive functional mechanisms which take place in language acquisition.

The idea of innate predispositions has been largely accepted, but its explanation in terms of UG or of cognitive functional basis was not so persuasive. Some studies insist that the theory of Chomsky does not explain the way children discover the grammatical structures of their language on the basis of UG. Others, particularly Karmiloff Smith (1992), criticises the approach of Piaget in that it minimises the role of language in the conceptual development of the child, and does not consider this human capacity as a subject of cognitive analysis. In this context, several studies have argued that initial capacities can be seen as *bootstrapping*.

The *semantic bootstrapping* of Pinker (1987) represents the continuity of the *learnability theory* (1984), and defends the idea that in addition to innate predispositions, the treatment of information implies perceptive representations and preliminary semantic knowledge. According to Pinker, children use their non-linguistic knowledge, and interpret the indications coming from objects and events to accede to meanings. By this procedure, they understand words without having grammatical knowledge; the perceptible meanings lead them to deduct the appropriate syntactic rules.

On the opposite side, the *syntactic bootstrapping* (cf. Landau and Gleitman, 1985) proposes that the access to meaning implies syntactic structures. The child rests on the syntactic context of words; he can understand the meaning of a verb, for example, thanks to its syntactic environment. By studying the case of blind children, Landau and Gleitman confirm that in addition to the physical environment, the structure of language itself contributes considerably in the acquisitional process.

Moreover, Gleitman (1990) shows that in his acquisitional task, the child leans on his perceptual ability and also on the capacity to formulate and to test hypothesis about the function of the language he is acquiring. In his perceptual and conceptual activities, the predispositions help relating objects or events to words, and to treat the input by specific operations such as abstracting or classifying. For Gleitman, language acquisition and development involve both syntactic and semantic bootstrapping.

The *prosodic bootstrapping*, proposed by Jusczyk and al. (1992), claims that children segment and extract the components of utterances thanks to prosody. The accentuation, the

rhythm and the phonetic constitute a real support to establish syntactic borders in a flow of words.

As for the mechanisms which take place in the acquisitional task, the innatist position defends the idea that language acquisition is a *domain-specific process* whereas for Piaget it is a *domain-general process*, determined by the same cognitive principles which define all types of acquisition. Although these two approaches seem conflicting, Karmiloff Smith (1992) claims that they can be considered as complementary. The first approach contributes in explaining language acquisition in initial stages whereas domain-general offers best opportunity to trace language development in more advanced stages.

Furthermore, the constructivism of Piaget, which makes part of a wide range of theories called *interactionnist*, has been confronted with the socio-cognitivism conception of Vygotsky. For Piaget actually, language develops, as other skills, through the interaction with the physical environment. Vygotsky, and Bruner also, argue on the contrary that the significant interactions which lead to the emergence and the development of language, and the development of thought too, are those children have with their social environment.

The global question of the interplay between innate predispositions and the linguistic input represents the origin of exhaustive discussions and controversies. To investigate the complex interaction between cognitive and linguistic factors, cross-linguistic developmental (cross-sectional) comparisons have been devised. This new orientation has been inspired by the systematic qualitative piagetian methodology. Piaget has actually analysed the child language through its own systematicity and not as deficient in comparison with adult language, and adopted the expression of space to study the relation between language and thought.

Several cross-linguistic developmental studies began to propose therefore descriptive spatial tasks to children of different languages. The main question they ask is: do children of different languages produce and express the same (or similar) spatial concepts in the same order (in other words, do meanings arise from non-linguistic cognitive process which is common to all the children of all languages, which means that the concepts are already constructed but should be only identified and subject of intake through the input) ? or do they express and develop different concepts (in other words, do they construct concepts through the language they are acquiring)?

Two opposite positions attempt to answer this question (cf. Johnston, 1985):

a. The position which claims that cognitive development is the main factor able to explain language acquisition.
b. The position which insists that conceptual capacity and language acquisition are determined by the linguistic input.

These two points of view revive the two conceptions of *linguistic relativity* of Boas, and also Piaget, and *linguistic determinism* of Whorf. The studies of Sobin and Bowerman have respectively represented these two positions. Slobin (1973), who has analysed the productions of children in 40 languages, claims that there are universal mechanisms that he calls *operating principles*, which take place in the construction of linguistic hypotheses. He considers that the order of developing semantic notions is similar in all languages. According to this idea, children do not start their acquisitional task equipped with preexisting knowledge, but with universal mechanisms activated in the treatment of the linguistic input.

In this perspective, Johnston and Slobin (1979) have analysed the production and the development of locative expressions by children between 2 and 4;8 years of age in English, Italian, Serbo-croate and Turkish L1. This cross-linguistic study has focused on developmental sequences through the interaction between conceptual development and the complexity of the forms that encode spatial concepts.

Johnston and Slobin point out that the developmental order is shared by all the children regardless of formal means of their language, and that the complexity of locative expressions plays only a minor role in the attested acquisitional order. They conclude that the cognitive development of the child is the principle factor which determines the acquisition of L1. This point of view is maintained by Slobin (1985) who insists that there is a universal cognitive semantic basis *Basic Child Grammar* which constitutes the initial result of interaction between operating principles and the linguistic input.

The hypothesis of common conceptual development across languages has created a new dynamism in the domain of language acquisition. It was relatively adapted and accepted by some studies but radically criticised and rejected by others. Miller and Johnson-Laird (1976), Olson and Bialystock (1983), for example, do not contest the existence of prelinguistic spatial system, but state that cognitive/perceptive development anticipates and prepares the acquisition of spatial morphemes.

On the other hand, Bowerman (1985) criticises the idea of universal semantic basis, and insists that adopting the predispositions of the child to explain L1 acquisition is certainly helpful, but insufficient to explore the complexity of such process. Her cross-linguistic developmental studies (cf. Bowerman and Choi, 1991; Choi and Bowerman, 1994) have been conducted in this perspective. The first one has focused on the expression of motion by children between 14 and 20 months in English and Korean L1. The second has analysed the expression of motion caused by manipulation of objects by children of different ages (2 to 2;5, 2;6 to 2;11 and 3 to 3;5) in English, Korean and Dutch L1. Bowerman states that in these two experiences the productions point out the influence of the input, and that children seem to be very sensitive to patterns of their language. This does not mean that they do not make errors, but their errors can be explained by an overgeneralization or by the complexity of the input.

The two opposite positions of Slobin and Bowerman take a more interactionnist dimension in recent studies. Slobin (2001) re-evaluates the operating principles, and argues that some of them are universal, but others are particularly inherent to the language itself (*typological bootstrapping*). Bowerman (cf. Bowerman and Choi, 2001) claims that perceptual/conceptual predisposition takes part in language acquisition, provided that its influence is considered in interaction with the linguistic input.

Such an interactionnist position is adopted by other studies which have admitted the qualitatively different influence of linguistic and non-linguistic knowledge. Gopnik (1980), for example, explains that the linguistic input allows, through an operation of visual/cognitive and linguistic connection, to understand spatial configurations. When children hear expressions like *up* or *down*, they can relate them to their perceptual and practice understanding. The main question here is not which factor (cognitive or linguistic) predominates but the correlation between *input* and *intake*. According to Gopnik, only

expressions which encode already perceived and understood concepts are supposed to be subject of an intake.

Mandler (1999) also claims that cognitive development and the linguistic input take part together in the elaboration of the spatial system. In pre-linguistic stages, visual spatial information are translated in *images-schemas* which will allow the acquisition of different forms. The expression *in*, for example, will apply to a pre-established concept of inclusion.

For Clark (1973), understanding the structuration of space implies its division into two sub-structures: the one elaborated through the initial predispositions *P-space* (perceptual space), and the other elaborated on the basis of language *L-space* (linguistic expression of space). Clark claims that P-space and L-space are related by a strong *correlation*, and that despite the universal character of P-space, languages/cultures do not encode it in the same way.

2.1 The construction of discourse in L1

Over the last 30 years, several studies have proposed to explore the construction and development of discourse in L1. Although these studies diverge in their methodology, they focus on the perspective of interaction between linguistic and cognitive factors. Some of them analyse the discursive capacity in different languages across the same ages, others focalise on different ages in the same language. Some propose spatial discourse, others adopt narratives elicited by successive images.

Berman and Slobin (1994) analyse the cohesion of narrative discourse, elicited by the 'Frog story', produced by children in English, German, Hebrew and Turkish L1. The cross-linguistic comparison shows that the linguistic specificities appear in the focalisation on the salient aspects of the language, whereas cognitive factors determine the cohesion of discourse which increases across the ages. Before 8 or 10 years, children have a difficulty planning the flow of information. The evolution attested beyond 8 years is characterised by making explicit temporal and causal relations, which contributes in building the cohesion of the discourse.

Karmiloff and Karmiloff-Smith (2003) study also the cohesion of narratives produced by English and French-speaking children about 4-5, 6-7 and 8-9 years. These young informants are asked to tell a story of two protagonists presented in six images. The authors observe that 4-5 children start their narrative by a definite NP or a pronoun to refer to one of the main protagonists. They also employ deictic expressions and describe the successive continuous images as separated. Children of 6-7 mark the status of referents, but use the *thematic subject* as informational strategy. They in this way attribute to the principal protagonist the role of subject in all the utterances, and maintain it by anaphoric pronouns. Around 8-9 years informants in both languages employ developed referential means, and produce consequently a more coherent/cohesive discourse.

As for monolingual perspective, Ehrich (1982) investigates the description of places produced by children in Dutch L1, and Weissenborn (1986) analyses the description of itinerary produced by children in German L1. These two studies state that the capacity to construct organized discourse begins around 10 years old. Before this age, children produce deictic spatial expressions, and do not present the information in an organised unity.

In addition to developmental studies, others have studied the construction of discourse in a comparative way. Slobin (1993) compares the characteristics of the discourse produced at *basic variety* in L2 and at *Basic child grammar* in L1. He observes that in both cases learners simplify their productions, although the apparent similarity does not refer to the same origin. At basic variety, the simplification can be explained by the complexity of linguistic means in L2, whereas children, who have a more riche repertoire, have a difficulty with the organising principles of the discourse.

Comparative studies of Hendriks and Hickmann (cf. Hendriks 1998; Hendriks and Hickmann, 1998; Hickmann and Hendriks, 1999) analyse the expression and the development of spatial reference in narrative task in different L1 and L2. They adopt the horse and the cat story that we use in the present research. The authors claim that adults and children do not master the multifunctionality of linguistic means. The analysis of the interaction between cognitive and linguistic factors points out that the distinction between new vs. known information is not marked before 7 years, whereas adults master this principle even in initial acquisitionnal stages in L2, and elaborate a cohesive/coherent unity by using simple or idiosyncratic means despite their rudimentary repertoire (prototypic treatment).

3. French and Jordanian Arabic: cross-linguistic differences

The way languages structure space has opened an important field of investigation in cognitive linguistics. The studies of Talmy (1983, 1985, 2000) shed light on concepts which are grammatically specified within different languages, and show that such concepts represent a criterion which determines the selection of information in different conceptual domains.

Multiple studies point out that the universality of the category of space does not mean that languages express the same spatial concepts, and does not mean either that different languages express the same concepts in the same way (cf. Clark, 1973; Becker, 1997; Jackendoff, 1999; Bowerman, 1999). Although entities which are similar in geometry and in function are common to all speakers, the treatment of the visual input and the schematisation of spatial relations imply specific linguistic means.

The next section outlines summarily the cross-linguistic differences between French and Arabic which have an impact on how spatial information is distributed in utterance-level, and on how discursive cohesion is built.

3.1 Utterance structure: introducing referents

Utterance structure in oral French is SV(O); Arabic provides SV(O) and VS(O)[5]. The common schema SV does not function in the same way. In Arabic, it can not start with the information which encodes a new referent. On the contrary, a French informant can rely on the context and present the Th in the head of descriptive utterances (contextual ellipsis). Consequently, Arabic informants begin their descriptive utterances either with the expression of the Rel, or with the existential (equivalent of *there is*), or with a connector (equivalent of *and*). These cross-linguistic variations affect the organisation of the descriptive utterance in French and in Arabic

[5] Arabic is often evoked as the reference of VS(O). Fassi Fehri (1981, 1982), who analysis standard Arabic, defends this idea and considers SV as a result of topicalisation of the original schema. We have argued that the alternation of VS and SV depends on the informational status of the subject and on discursive context.

(1) French: Th + copula/locative* + Rel
Rel + existential/locative* + Th (* locative refers to the pronominal verb *se trouve* translation equivalent to *is found*, *is situated*)
Existential + Th + Rel (or existential + Rel + Th)

(2) Arabic: Rel + existential + Th
Existential + Th + Rel (or existential + Rel + Th)
Connector + Th + Rel

The schema

(3) Th (known referent) + V + Rel

is acceptable in both languages, and can be used in re-localising an already localised referent. However, one difference is to be noted. In French, as in English, this construction implies the copula *Le garçon est devant le magasin* (translation equivalent of *The boy is in front of the shop*), whereas in Arabic the copula is obligatorily omitted in affirmative present constructions. Only an active or a passive participle which encodes the posture (translation equivalent of *sitting, standing, situated*, etc.) can be placed between the Th and the Rel.

The two sets of schema (1) and (2) confirm that French and Arabic employ diverse organising principles in their descriptive utterances. However, a cross-linguistic comparison of the construction of spatial discourse produced by adults (Hirzalla, 2005) shows that French informants regularly use schemas based on the copula and on the presentation of the Th in the beginning, e.g., *une femme est à droite* (translation equivalent of *a woman is on the left*). Arabic informants prefer, in contrast, introducing the expression of the Rel in the head of the utterance, and use frequently existential constructions in which the Rel is introduced before the Th.

Furthermore, Arabic-speaking natives produce frequently complex descriptive utterances which take the schemas

(4) definite NP + PP (with attached anaphoric pronoun) + (exist.) + indefinite NP
Rel (entity) Rel (region) Th

Ex. The shop in front of it (there is) a boy

(5) Exist. + indefinite NP1 + PP (with attached pronoun) + indefinite NP2
Th1 Th 1 becomes Rel region Th 2

Ex. There is a shop in front of it a boy

In (4), an already known referent is reintroduced; subsequently a locative expression which delimits the region relative to this referent (by a suffixed anaphoric pronoun) is used, and a new referent is presented. Here, the reintroduction does not aim to re-localise an already known referent, but to convert it into Rel. This schema which begins with the Rel entity then states the Rel region is unlikely in French.

As for schema (5), it contains a double location: a referent is presented as a Th, and converted into Rel to localise a new Th. In French this strategy is possible but it implies the following syntactic/informational schema

(6) (Exist.) + indefinite NP1 + connector + indefinite NP2 + PP
Th 1 Th2 Th 1 becomes Rel (intransitive locative expression)

Ex. There is a shop and a woman inside

The difference between 5 and 6 is not based on the position of the locative expression, but on its referential nature. It is possible to present PP after NP2 in Arabic (schema 5), and inversely to present PP before NP2 in French (schema 6)[6]. But the locative expression used is almost always intransitive in French and always transitive suffixed by an anaphoric pronoun in Arabic. French can however use a demonstrative pronoun to make explicit the reference (i.e. *il y a un magasin et une femme devant celui-ci*, translation equivalent to *there is a shop and a woman in front off* + demonstrative pronoun which refers to the *shop*).

The informational distribution of the schema 4 can also be used in dynamic location in spoken Arabic, as for example *fi alsaha bimshi hsan* (translation equivalent to *in the garden walks a horse*) in which the Rel is expressed before the Th.

As we explained (cf. section 3.1), in current oral French, dynamic location implies in general the presentation of the Th before the Rel; in more developed level of language and in written or poetic register however, the Rel can be introduced first as in *Dans la pré court un cheval*, translation equivalent to *In the meadow runs a horse*.

Another cross-linguistic difference concerns the construction of complex utterances. In Arabic, explicit use of relative pronoun is determined by the informational status of the referent; if the referent is specified, the relative pronoun appears explicitly in the construction; otherwise, it is obligatory omitted. In French, relative pronouns are explicit in both cases.

3.2 Locative expressions

Locative expressions in French and Arabic represent two types of difference: quantitative and referential. Quantitative differences are limited to the expressions which encode the sagittal axis such as *au premier/deuxième plan* (translation equivalent to *in the first/background*), which do not have 'equivalents' in Arabic. These expressions permit dividing the space under description (the picture) into two sagittal levels, and accentuate the presentation of a three-dimensional configuration in a bi-dimensional form.

Referential differences are more important and concern the transitivity/intransitivity of locative expressions. In French, the majority can be used transitively (as prepositions) or intransitively (as adverbs). However the transitive/intransitive use of some locative expressions is determined by a ± human and ± animate Rel (and also the Th), and by the visual accessibility of the Th. In Arabic, a grand number of locative expressions is transitive; intransitive use of those which function in both ways is highly constrained by the criterion of visual accessibility of the Th, by the geometric dimensions of the Rel, and in some cases, on the criterion of ± human/ ± animate Rel. Nevertheless, 'equivalent' locative expressions do not respond to the same constraints in their transitive/intransitive function in both languages (see section 4.1).

[6] Frequently the PP appears at the end of this type of descriptive schemas in French.

It is important to note also that the term *fi* has two functions in spoken Jordanian Arabic. It is the translation equivalent of the existential *there is* and of the transitive locative expression *in*.

3.3 Referential features: operation of the maintenance of referent

Referential divergences of locative expressions affect the organisation of spatial information in descriptive utterances and across the discourse. In French, referential maintenance is mostly implicit whereas in Arabic it is almost often explicit, which means that speakers have to use anaphoric items to refer to the Rel. As shown in the schemas (4) and (5) above, attached pronouns suffix transitive locative expressions in order to ensure the maintenance.

On the other hand, the relative pronoun *où* in French (translation equivalent of *where*) does not have an 'equivalent' in Jordanian Arabic (only standard Arabic provides *haithu* as 'equivalent' to *where* in its relative function). This difference is not simply quantitative, it intervenes in the type of referential continuity. In French, *où* ensures implicitly the exact maintenance of the spatial interval already mentioned (in some descriptions however, *où* can be followed by a locative expression which encodes another spatial interval in respect to the one expressed by *où*, i.e. *où derrière*, translation equivalent of *where behind*). Implicit referential maintenance is illustrated in the next example

(8) Il y a un arrêt de bus
There is a bus station
où il y a des gens
where there is people

In Arabic, the speaker is obliged to mark the continuity by the means of an attached pronoun suffixed to a locative expression

(9) fi mahatet bas
There is station bus
fiha nas
in it people

Furthermore, maintaining an indefinite NP by personal pronouns (for animate and inanimate referents) in the discourse is evident in French, but in Arabic, it is not. This cross-linguistic difference is particularly salient in the dynamic spatial discourse that we study here. In the cat and the horse story, French-speaking informants present the referent by a NP in the first utterance; subsequently they pass to a personal pronoun in the next (*il* (equivalent to *he*) used with animate/inanimate masculine referents). Arabic-speaking informants start by introducing a new referent in an existential construction, followed often by a 'return' to the schema VS which encodes the subject in the verbal morphology. Otherwise, they keep the schema SV but maintain the referent by a definite NP.

4. The construction of discourse at 4-5 of age in French and Arabic L1

4.1 Static spatial discourse (picture description)

The analysis of the discourse produced at the age of 4-5 in French and in Arabic reveals common traits, and as we defended in the introduction, the influence of language specificities

and constraints. As it is frequently underlined by current developmental research, children of both languages produce minimal utterances

(10)[7] FL1: une maison
a house
(11) AL1 fi biout
there is houses

This type of utterance does not contain locative expressions, since it expresses only 'what' is on the picture and omits 'where'. It represents 40% in French and 28% in Arabic.

Children introduce also some new referents as already known. In the two following examples, *tree* is presented for the first time in the discourse

(12) FL1: un vélo à côté de l'arbre
a bike beside the tree
(13) AL1: alshajara bjanbha baskalate
the tree beside it bike

Unlike the first type of utterance, in (12) and (13) the relation between the Th and the Rel is encoded by a locative expression. This strategy is attested in 13% of the discourse in French, and in 10% in Arabic.

But although these two common strategies can be referred to by the cognitive development at this age, cross-linguistics differences underlie the realisation of the syntactic/informational schemas. (10) contains only the indefinite NP which encodes the Th, whereas (11) begins with the existential followed by the NP.

The two examples (12) and (13) describe the same configuration and adopt the same strategy, but do not employ the same informational/syntactic organisation. In French, the utterance begins with the information relative to the Th, then introduces the locative expression which delimits the region of the Rel entity; in Arabic, the utterance begins with the information relative to the Rel entity, followed by a locative expression suffixed by an anaphoric pronoun and form thereby the Rel region, then presents the Th.

Cross-linguistic divergences shape also, and above all, the structure of the complex descriptive schemas that children produce frequently. In 47% of their discourse, French-speaking children adopt this organising principle and employ either intransitive locative expressions, such as

(14) FL1: un immeuble et une cheminée au dessus (intransitive)
a building and a cheminy on the top
(15) FL1: un immeuble et des colonnes dessus (intransitive)
a building and columns on the top

or intransitively some locative expressions which can function as prepositions and as adverbs

(16) FL1: un magasin et une fille à l'intérieur (locative expression used

[7] FL1 = French first language; AL1 = Arabic first language.

a shop and a girl inside intransitively)

(17) FL1: un magasin et des garçons qui jouent devant (locative expression used
a shop and boys who play in front off intransitively)

(18) FL1: il y a une rue et un immeuble à côté (locative expression used
there is a street and a building beside intransitively)

The inanimate Rel in (17) and (18) (*a shop* and *a street*) determines the intransitive function of the two locative expressions. Inversely, with an animate Rel, speakers can theoretically have the choice between a transitive and an intransitive use of the two concerned expressions. However, even with an animate Rel, French prefers not to refer explicitly, by a pronominal element, to a Rel mentioned in the same utterance, and keeps consequently an implicit referential maintenance. In addition, children encode spatial relations of part/whole by *avec* (with)

(19) FL1: une maison avec des fenêtres
a house with windows

(20) FL1: un immeuble avec une cheminée
a building with a chimney

(21) FL1: une rue avec des voitures
a street with cars

In 63% of their discourse, Arabic-speaking children encode complex locations principally by transitive locative expressions. As for the expressions which function in both ways, they are used in respect to the two criteria: visual accessibility of the Th and geometric dimensions of the Rel

(22) AL1: fi bank aleh sit (transitive locative expression)
there is seat on it woman

(23) AL1: fi mahal jowah bint (locative expression used transitively)
there is shop in it girl

(24) AL1: fi nas fokhom arma (locative expression used transitively)
there is people above them notice

(25) AL1: fi share' janbo amara (transitive locative expression)
there is street beside it building

(26) AL1: fi share'
there is street
fi rasif
there is pavement
alshare' fih sayyarat (transitive locative expression)
the street in it cars

(27) AL1: fi saha
there is place
fi amarat
there is buildings
alsaha fiha shajar (transitive locative expression)
the place in it trees

(28) AL1: fi bait fih shababik (transitive locative expression)
there is house in it windows

(29) AL1: fi amara
there is building

fi share'
there is street
fi mahallat
there is shops
alamara uddamha sayyarat (locative expression used transitively)
the building in front of it cars

The two sets of examples confirm that the same descriptive strategy is not realised by the same syntactic/informational structure. In French, Th1 is introduced, without being localised, before Th2, then a locative expression which delimits the region of Th1 is produced

Th 1 – Th 2 – Rel (region of Th1 serves in localising Th 2)

In Arabic, the first referent Th1 is not localised neither. It is converted into Rel to localise Th2 which is introduced at the end of the descriptive utterance

Exist. – Th 1 – Rel (region of Th 1 serves in localising Th2) – Th 2

The examples 26, 27 and 29 do not follow this schema. They are based on the reintroduction of an already mentioned referent. This operation is not attested in French since the schema: NP definite + PP (anaphoric pronoun attached to a locative expression) + (exist.) + NP indefinite, is not acceptable.

In (26) precisely, referential reintroduction implies another constraint. Both (26) and (21) describe the same spatial configuration. In the French utterance *une rue avec des voitures* (a street with cars), *avec* (with) encodes a spatial relation of part/whole. In Arabic, *maa* (with) does not; it can be used to express a relation of accompaniment between two human or non human referents. Consequently, an Arabic-speaking informant produces two successive utterances: *fi share'* (there is street) and *alshare' fih sayyarat* (the street in it cars) to describe this spatial configuration. He/she can also produce a complex schema *fi share' fih sayyarat* (there is a street in it cars).

To recapitulate, in comparison with French, all the descriptive utterances produced in Arabic are based on an explicit referential maintenance. In (22), *aleh* is composed of *ala* (on) and a suffixed pronoun; there is no intransitive expression which encodes such spatial configuration. In French, the two expressions *sur* (transitive) and *dessus/au dessus* (intransitive) encode a spatial relation on the vertical axis. However the same spatial configuration presented in Arabic can not be encoded by the intransitive expression since the Th is a human referent. The speaker employs in this case the transitive expression in a construction like *il y a une dame (assise) sur un banc* (there is a lady (sitting) on a seat) or *une dame est (assise) sur un banc* (a lady is (sitting) on a seat), which, unlike the Arabic utterance, present the Th before the Rel.

In (23), *jowah* is composed of *jowa* (in/inside) and a suffixed anaphoric pronoun. This locative expression functions transitively or intransitively, but in this example, it can function only transitively since the localised Th is visually accessible. In the example (16) in French, the 'equivalent' expression *à l'intérieur* functions in both ways, and contrary to the utterance in Arabic, it is used intransitively although the referent Th is visually accessible.

In the example (24), the suffixed locative expression *fokhom* (over them) is used transitively. It can be used intransitively with a geometrically complex Rel (and in some cases, with a non visible Th). In (25), (26), (27) and (28), the used locative expressions suffixed by anaphoric pronouns are transitive.

In the last example (29), *alamara uddamha sayyarat* (*the building in front of it cars*), *uddam* is used transitively. It can function in both ways, but when used intransitively like in *alamara uddam sayyarat* (translation equivalent to *the building in front off cars*), the descriptive utterance refers to another spatial configuration. In the first case *alamara* (building) is the Rel whereas in the second case it is the Th.

Despite the influence of cross-linguistic divergences, all the descriptive utterances produced in both languages employ exclusively a point-to-point strategy and never a global strategy. Children relate in this way an entity Th to a region of another entity Rel, and never to the spatial intervals of the picture under description like in *On the left of the picture there is a shop*.

On the other hand, children of both languages consider each spatial configuration, or complex configuration, separately. In one utterance, two or three referents are related; the next utterance relates two or three others. In consequence, referential maintenance applies only on each descriptive utterance, and never on successive utterances. In other words, except in the examples (26), (27) and (29) in Arabic, in which the complex location is based on the reintroduction, referential movement across utterances implies principally the operation of change.

Furthermore, in both languages children encode the same spatial concepts: proximity, inclusion, sagittal and vertical axis, and never spatial relations on lateral axis.

The next table summarises the characteristics of the produced discourse in French and Arabic

Table 1 The characteristics of static discourse produced at the age of 4-5 in French and Arabic

Group	New referent presented as given	Conceptual strategy	Spatial relations	Descriptive utterances structure	Locative expressions	Referential maintenance in complex location	Anaphoric means used in explicit reference
French-speaking	13 % locative schema **1**	Point-to-point	Proximity Inclusion Sagittal Vertical	Minimal (not locative) **2** Complex locative schema **3**	Intransitive	Implicit reserved to one utterance	
Arabic-speaking	10 % locative schema **1**	Point-to-point	Proximity Inclusion Sagittal Vertical	Minimal (not locative) **2** Complex locative schema **3 / 3***	Transitive	Explicit reserved to one utterance	Attached pronouns suffixed to locative expressions

1 In French, the schema begins with the Th; in Arabic, with the Rel (see examples 12 and 13).
2 In French, the utterance contains only the indefinite NP which encodes the Th; in Arabic, the utterance begins with the existential followed by the NP which encodes the Th (see examples 10 and 11).
3 In French: Th 1 – Th 2 – intransitive locative expression (Rel) ; in Arabic: exist.-Th 1– locative expression suffixed by anaphoric pronoun (Rel) – Th 2 (see examples 14-18 in French, 22-25 and 28 in Arabic)
3 * Only in Arabic, referential reintroduction is attested (sequences 26, 27 and 29).

4.2 Dynamic spatial discourse (the cat and the horse story)

According to their referential/informational function, descriptive utterances can be divided into two major types:

1. Introduction can be:
   a. Introduction/location (IL): this type of utterances contains a static location as in *there is a bird on the tree*. It takes two different organisations in French and in Arabic (see examples 30 and 31 below). Rarely, the utterance serves only in introducing a referent without localising it (i.e. there is a bird).
   b. Introduction/action (IA): here the Th is introduced in an existential construction; the relative clause contains a dynamic spatial predicate as in *there is a horse which runs,* but the Rel is kept implicit. In Arabic, the relative pronoun is omitted since the referent is not specified.
   c. Introduction/location/action (IAL): contrary to the precedent type, the Rel is explicitly expressed, as in *there is a horse which runs in front off a fence*.
2. Maintenance consists in representing a known referent as for example *the horse falls down* or *the cat runs away*. The predicate in these two examples is spatial dynamic. In other cases such as in *the bird and the cow help the horse* the predicate is not spatial. This type of utterance will be coded by MA (maintenance/action), M*A will be used if a new referent is presented as already known.

In the cat-story, children introduce the referent *bird* in the first utterance and localise it with respect to the *tree* (Introduction/location). Although this operation is realised almost often by an existential construction, it represents an important difference in the informational/syntactic schema and in the referential status of *tree*

(30) FL1: il y a un oiseau sur l'arbre (IL)
there is a bird on the tree
(31) AL1: fi shajara aleha asfour (IL)
there is tree on it bird

In (30) the Th (a bird) is introduced first, and localised relatively to the Rel (the tree), whereas in (31) the Rel is presented before the Th in the complex schema: Existential → Th 1 → region of Th1 = Rel → Th 2, frequently used in static location discourse.

This informational organisation in Arabic has an incidence on the referential status of the *tree*. Contrary to French, it is presented correctly as new in the discourse. In fact, introducing the Rel before the Th leads to express it by an indefinite NP. An utterance like *fi alshajara aleha asfour* translation equivalent of *there is the tree on it bird*), in which the Rel is encoded by a definite NP, is not acceptable. In general, the schema: Existential + definite NP is used in another interactional context.

In addition, the same informational organisation, which presents the two referents as new, like *il y a un arbre et un oiseau dessus* (translation equivalent of *there is a tree and a bird* + intransitive locative expression that encodes a spatial relation on the vertical axis) is not acceptable in French. Only in the case of non human referents, this schema can be used (i.e. *il y a une table et des livres dessus*, translation equivalent of *there is a table and books* + intransitive locative expression).

In one French description, the referent *bird* is introduced by: NP definite + copula + PP, and both *bird* and *tree* are presented as given information

(32) FL1: l'oiseau est sur l'arbre (IL)
the bird is on the tree

In their following utterances, all the informants describe the movement of the *bird* (maintenance/action); then they introduce successively the *cat* and the *dog*. In French, these two referents are presented by definite NP in the head of the utterances

(33) FL1: il vole (MA)
it flies
le chat monte sur l'arbre (M*A) (M* = introduction of a new referent
the cat climbs on the tree by a definite NP)
le chien descend le chat (M*A)
the dog takes down the cat
il court (MA)
it runs

In Arabic on the contrary, *cat* and *dog* are introduced as new information in existential constructions

(34) AL1: alasfout tar (MA)
the bird flied
fi bisse ijat wa tilat ala alshajara (IA)
there is cat came and climbed on the tree
fi kalb shafha wa nazzalha (IA)
there is dog saw it and took it down
albisse harbat wa alkalb lihikha (MA)
The cat escaped and the dog followed it

The fourth image is sometimes described by the complex schema

(35) AL1: alshajara tilat aleha bisse (IL)
the tree went up on it cat

or as referentially related to the previous utterance

(36) AL1: alshajara tahtha bisse (IL)
the tree down it cat
albisse tilat ala alshajara (MA)
the cat went up on the tree

The next table summarises the differences between French and Arabic productions

Table 2 Informational/referential function of descriptive utterances produced at the age of 4-5 in French and in Arabic (cat story)

Group	1st image	2nd image	3rd & 4th images	5th image	6th image
French-speaking	IL (bird, tree)	MA (bird)	M*A (cat)	M*A (cat, dog)	MA (cat, dog)
Arabic-speaking	IL (bird, tree)	MA (bird)	IA (cat)	IA (cat, dog)	MA (cat, dog)

The table shows that children focalise on the *bird* only in the beginning of their discourse (1st and 2nd image). Then they consider exclusively the interaction between the *cat* and the *dog*; the *bird* is completely neglected although it appears again in the last two images.

In sum, cross-linguistic differences shape the discourse in two aspects. First of all, they intervene in the way informational status of referents is marked. Contrary to French, the frequent use of existential constructions and of complex schema in Arabic justifies the presentation of *cat* and *dog* as new information. Secondly and as a consequence of the complex schema, cross-linguistic divergences lead to two different orders. In French, the Th is always presented before the Rel. In Arabic, the Rel can be presented in the head of the utterance.

In the horse-story, French-speaking children introduce the main protagonist as a new information in the first utterance. In some utterances, the movement of the horse is mentioned

(37) FL1: il y a un cheval (I) / il y a un cheval qui court (IA)
there is a horse there is a horse which runs

One description introduces the horse as a given information

(38) FL1: le chevel court (M*A)
the horse runs

Arabic-speaking children introduce the *horse* also by existential constructions

(39) AL1: fi hsan birkod IA
there is horse runs

They produce complex schemas which present an explicit Rel before the Th (*horse*)

(40) AL1: fi hadika bimshi fiha hsan IAL
there is garden walks in it horse
fi hadika fiha hsan IL
there is garden in it horse

In their following utterances, the majority of French informants maintain the *horse* by a personal pronoun (example 41 presents three successive utterances). The *cow* is introduced as already known in the last utterance (example 42)

(41) FL1: il arrête (MA)/ il saute (MA) / il tombe (MA)
it stops it jambs it falls down
(42) FL1: la vache vient elle aide le cheval (M*A)
the cow comes it helps the horse

By this informational organisation, the main protagonist keeps the role of subject in all the utterances (strategy of *thematic subject* according to Karmiloff and Karmiloff-Smith, 2003, see section 2.1).

In Arabic, the second utterance introduces the *cow* relatively to the *horse* in complex schemas

(43) AL1: alhsan uddamo bakara (IL)
the horse in front of it cow
alhsan uddamo fi bakara (IL)
the horse in front off it there is cow
laka uddamo bakara (IL)
it found in front of it cow

Afterwards, children express the successive actions accomplished by the *horse*, which means that they apply the strategy of thematic subject (example 44); in the last utterance, they reintroduce the *cow* relatively to the *horse* (examples 45 and 46)

(44) AL1: alhsan nat (MA)
the horse jumped
wike' (MA)
it fell down
(45) AL1 : albakara ijat janbo (MA)
the cow came beside it
(46) AL1 : albakara rahat janb alhsan
the cow went beside the horse

Table 3 presents a total view of informational/referential function of the produced utterances in the two languages

Table 3 Informational/referential function of descriptive utterances produced at the age of 4-5 in French and in Arabic (Horse story)

Group	1st image	2nd image	3rd image	4th image	5th image
French-speaking	I/IA (horse)	MA (horse)	MA (horse)	MA (horse)	M*A (horse, cow)
Arabic-speaking	IA/IL (horse, meadow)	MA (horse), IL (horse, cow)	MA (horse)	MA (horse)	MA (horse, cow)

This type of referential movement can be explained by the nature of the story. Unlike the cat-story in which the main protagonist changes across the images, the *horse* is the main actor in all the images.

The other animate referent *cow* is not presented in the same way. Only in Arabic, it is localised with respect to the *horse* from the beginning, then reintroduced at the end. The *bird*, visible in all the images except in the second, is not mentioned neither in French nor in Arabic. As for inanimate referents: *meadow* and *fence*, only the total space *meadow* (referred

to by the translation equivalent of *garden*) is used as Rel which localises the *horse* in some utterances in Arabic. The *fence* does not play any locative role in the descriptions.

The major difference between the discourse in French and in Arabic is obvious in two points. First of all, the use of complex schemas based on maintenance (the 1st and 2nd utterance of example 43) leads to mark correctly the referential status of the protagonist *cow*. Secondly, French-speaking children maintain the referent *horse* by a personal pronoun whereas Arabic-speaking children use a definite NP, or produce verbal constructions.

The organisation of the discourse can be summarised by the following referential movement

In French: introduction of *horse* → maintenance (by personal pronoun)→ maintenance (by personal pronoun) → maintenance (by personal pronoun)→ maintenance (by personal pronoun)/introduction of *cow* (as new information).
In Arabic: introduction and location of *horse* (complex location) → localisation of *cow* relatively to *horse* (complex location) → maintenance of horse (definite NP)→ maintenance of horse (by definite NP or by the schema SV) → maintenance of horse/reintroduction of *cow* (the cow is presented as a given referent Th, localised relatively to the *horse* which is maintained by a suffixed pronoun to a locative expression, see example 45, or by a definite NP as in example 46).

Conclusion

The cross-linguistic analysis shows that the construction of discourse in French and in Arabic is similar in some aspects, and significantly different in others. Similarities can be explained by a cognitive functional constraint which underlies the way children treat a complex verbal task that implies the co-ordination between utterance-level and discourse-level. Divergences can not be explained by this constraint and involve language specificities.

In the static spatial discourse, children seem to have a difficulty in considering the space of the picture as a set of associated sub-configurations. Consequently, each spatial configuration is described as an independent unity which is not related to the whole space. This simplified partial conceptual structure is realised mainly by a point-to-point strategy. Thus, referential maintenance is attested almost always at utterance-level and not at discourse-level.

However, the impact of Arabic specificities orients towards the operation of referential reintroduction that children apply in some continuous descriptive sequences.

Cognitive functional constraint takes part also in the way informational status of referents is marked. In the two languages, children present some new referents as known information, and produce regularly minimal utterances which make explicit ‘what’ they see on the picture and keep implicit ‘where’.

These common tendencies, regularly emphasised in developmental research, do not mask the linguistic determinant. Syntactic/informational structure of minimal utterances and of utterances which present referents as already known, is the result of French and Arabic specificities. In minimal utterances, French-speaking children produce only the expression of the Th whereas Arabic-speaking children starts always with the existential, since in their language a non specified referent is not accepted in the head of the utterance.

In the utterances which present new referents as already known, French informants introduce the Th first; Arabic informants on the contrary introduce the Rel first and adopt the strategy of complex location.

In addition, linguistic constraints underlie strikingly the structure of complex schemas, which represent the major discursive strategy. The two groups employ different organising principles which affect the word order and the referential maintenance. In French, the Rel is always introduced at the end of the utterance; in Arabic, it is always after Th1.

We also noted that children of this age employ transitively and intransitively locative expressions in respect to the specific constraints that determine their function in each language.

In dynamic spatial discourse, the cognitive functional constraint influences the way children consider, introduce and maintain the protagonists. In the first story, they localise the *bird* and describe its movement only in the beginning; then they focalise exclusively on the interaction between the *cat* and the *dog*. In the horse-story, the main protagonist is introduced and maintained in all the utterances; the *cow* also takes part in the story. But the other referents specially in the horse-story: the *bird*, the *fence*, are not mentioned (only the *meadow* is used to localise the *horse* in Arabic utterances). In the two dynamic discourse, the attested referential movement implies also the character of the presented story.

Cross-linguistic divergences determine how the four referents: *tree*, *bird*, *cat*, *dog* are introduced and how their informational status is defined. In Arabic, the use of complex schema (which begins with the existential and presents the Rel *tree* before the Th *bird*) leads automatically to mark these both referents as new information. The same informational organisational is not acceptable in French, and the use of similar complex locative schemas is highly constrained by the character animate/inanimate of the referents.

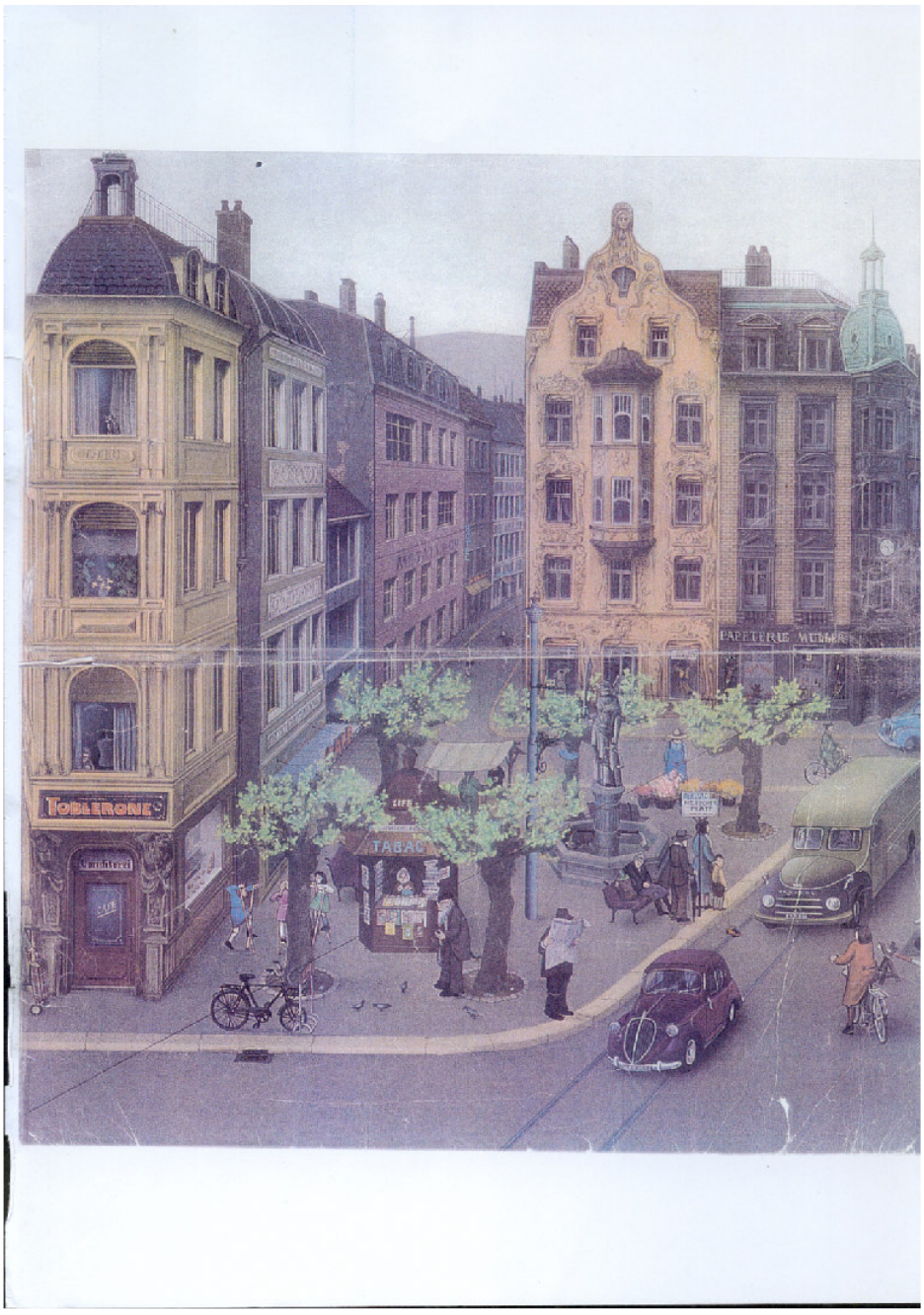
Furthermore, the presentation of the two referents *cat* and *dog* as new information is again the consequence of frequent use of existential constructions in Arabic. French-speaking children adopt the schema: NP definite + V/Copula + PP/O which, unlike the existential construction, does not imply obligatorily an indefinite NP in the beginning.

In the horse-story, cross-linguistic divergences shape the operation of referential maintenance. In French, children produce a personal pronoun to refer to the *horse*. In Arabic, they produce a definite NP or verbal constructions. On the other hand, the use of complex schemas which begin with a definite NP (Rel) leads to introduce correctly the second protagonist *cow*.

To summarise, some discursive traits seem to be more elaborated in the productions in Arabic, in particular referential reintroduction which organises some descriptive sequences, and the correct definition of informational status of referents. However, there is no reason to interpret these traits by a cognitive constraint. Our cross-linguistic analysis points out that Arabic orients, through its specific schemas, towards an explicit referential maintenance and also towards referential reintroduction. In addition, the way children define the informational status of referents is influenced by the difference between the schema based on the existential, that Arabic uses frequently, and the locative strategy that French adopts regularly.

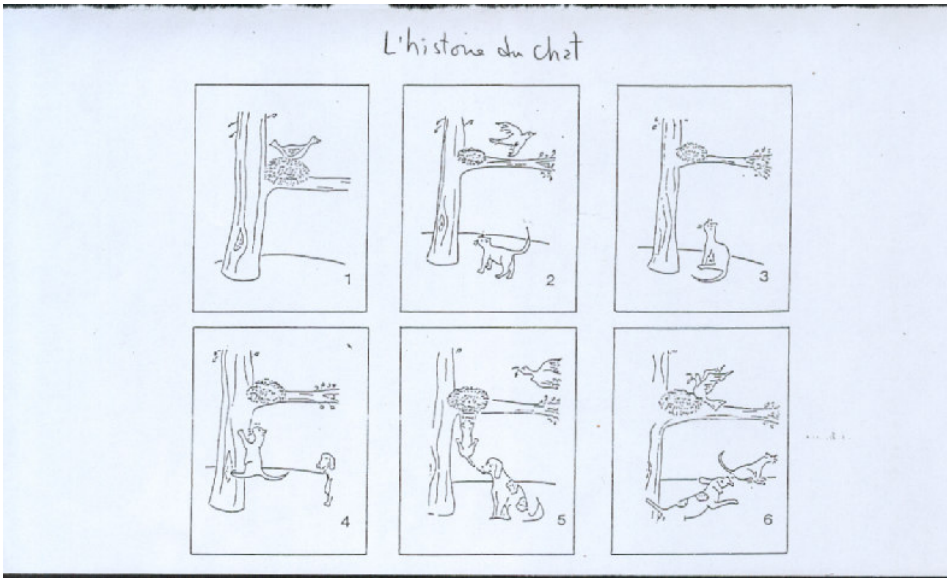
Although the two types of discourse produced in both languages evoke a similar conceptual structure, the translation of this structure in organising principles is highly dependant on language specificities. A cross-sectional comparison which confronts the discourse produced at this age with the discourse produced by children of 7-8 and 10-11 years in the same language reveals important differences. At the age of 4-5, children simplify the verbal task and over-generalise the use of complex schemas. However, despite these differences which refer to the cognitive constraint, cross-linguistic divergences underlie the significant differences attested in the discourse of the same age in French and Arabic. In other words, discursive construction at the age of 4-5 represents, as in all acquisitional levels, a complex interaction between linguistic and non linguistic factors.

Appendices 1

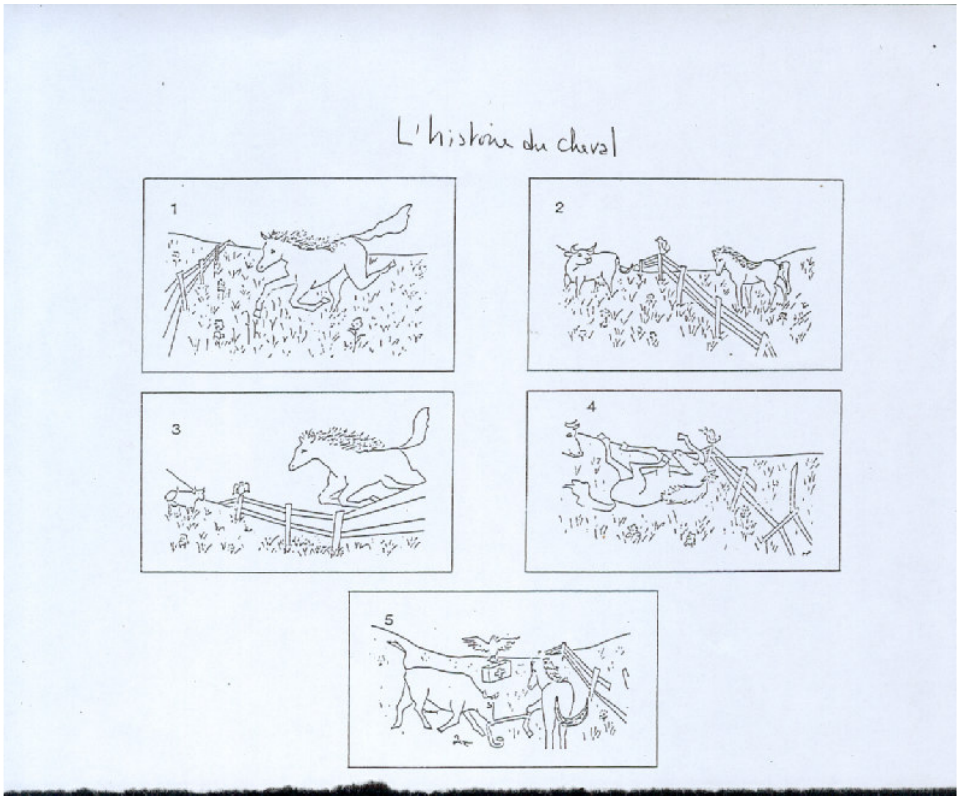


Appendices 2

The cat-story



The horse-story



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