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Implications of Schema Theory on Teaching EFL and ESL Reading comprehension: the Role o Pre-Reading Activities

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Abstract
A great many research studies related to schema theory have made it unambiguously clear that the readers' background knowledge is vitally crucial in reading comprehension. Used as an umbrella term, background knowledge subsumes a set of schemata and sub-schemata (including cultural content, linguistic formal as well as strategic) that readers use to get an accurate understanding of the content of any material they set out to read. However, one of the major problems underlying comprehension instruction at various proficiency levels in Morocco is that rarely do teachers take the role of background knowledge into account. It is not a common practice among Moroccan high school teachers when it comes to teaching reading to provide EFL readers with enough explicit information or prior instruction assistance to allow them easier comprehension of the reading material in the textbooks used. It is unfortunate that this is still the case at a time when it is increasingly becoming obvious that for foreign language learners, one of the basic implications of schema theory is that comprehension rests as much on the availability as well as the activation of readers' relevant schemata. This paper highlights the need for prior instruction in the form of pre-reading activities that have earned some empirical support as practical teaching tools that facilitate ESL and EFL readers' easy activation, construction and access of existing background knowledge and hence easier, better and above all more enjoyable and accurate comprehension.

INTRODUCTION

Be it the case of an L1, EFL or ESL context, it seems that achieving a native like proficiency in the target language requires an excellent mastery of the four major language skills, namely speaking, writing, listening and reading. Out of the four skills, however, reading has been observed to be the most complex and somewhat elusive to both learn and teach. This is so mainly because it is related to human cognition that cannot be directly observed. That said, the purpose of this chapter is to provide a general theoretical framework for the present study. It will particularly attempt to provide a brief account of the development of the conception of reading comprehension as well as a brief description of the various theories that emerged to explain its intricacies and illusive nature.

Until very recently, the prevalent misconception of reading comprehension has been that the reader processes the reading material in a linear fashion moving from the printed letters (signs) to sounds and then their aural comprehension (Goodman 1973). This view, however, has been rejected as a

controversial one especially after the advent of the psycholinguistic approach to reading and schema theory. Frank Smith (1973) for instance advanced two basic reasons to prove that the above conception of reading is debatable. The First was that given the fact that the amount of information that one can receive process and retain in memory is very limited, the reader is therefore required to be highly selective in terms of the number of cues and clues that he or she processes to reconstruct the intended meaning of any reading text. The second reason is related to empirical research by Smith (1988) who observed that "*reading is only incidentally visual."* This means that as readers we tend to bring more to the reading passage than we take from it. In other words, while it appears that we rely on the cues and stimuli provided in the text to identify the writer's intended meaning, it seems that these make sense only in the light of our prior knowledge also described as existing schemata in our memory.

One of the most prevalent definitions of reading comes from the psycholinguistic viewpoint by Goodman (1970: 260) who postulates that

> *Reading is a selective process. It involves partial use of variable minimal language cues selected from perceptual input on the basis of the reader's expectations. As this partial information is processed, tentative decisions [or hypotheses] are made to be confirmed, rejected or refined as reading progresses.*

This definition appears, in a sense, to sum up the major principles as well as the most practical implications of schema theory to reading comprehension instruction. This is particularly so with regards to the characteristics of proficient or fluent readers, the intricacies involved in the very complex act of reading and above all the role of background knowledge in meaning construction and retention then subsequently recall and retrieval.

1. Theoretical Background on Schema Theory

By way of introduction, it is only fair to say that outlining the theoretical framework underlying this paper necessitates attempting first to briefly trace the historical development of schema theory then identify the types of schematic knowledge discussed in the literature before eventually providing a detailed account of their perceived role in and relevance to better reading comprehension instruction. This section will then proceed to sketch a tentative definition of reading comprehension and discuss ways in which schema theory relates to pre-reading activities and their role in facilitating reading comprehension. The implications and applications of the theoretical principles and premises of schema theory to the teaching and learning of reading are also amply elaborated upon. Finally, because it is at the heart of the present study, the role of using a whole class discussion in general and as a pr-reading activity in particular will be the main concern of the last section

1.1. Schema Theory and Related Theories

Schema theory is generally described as a model of human knowledge in that it accounts for the way knowledge structures are stored and organised in the human mind (Rumelhart, 1980b; Pearson and Stephen 1994). Schema theory is particularly based on the belief that "*every act of comprehension involves one's prior knowledge of the world as well*" (Anderson et al. in Carrell and Eisterhold 1983:73). This implies that as readers, our ability to develop a coherent interpretation of any text or discourse is a result of the constant interactive process of "*combining textual information with the information [we] bring to a text*" (Widdowson in Grabe 1988:56). Schema theory is inspired to a great extent by the psycholinguistic approach to reading which underlines the role of background knowledge in any endeavour to assign meaning to reading texts.

The history of schema theory is said to date back to the early decades of the 20th century and more precisely to the *Gestalt psychology movement in Germany (Wertgeimer, 1921; Koffka, 1935; Kohler, 1947)*, itself based on the belief that all mental organisations are essentially dynamic. Furthermore, *Gestalt psychology* was equally inspired by the twin beliefs that " *the whole is not necessarily the sum total of its constituent parts"* (Anderson and Pearson 1984) and the fact that "*mental organisations are essentially dynamic".* This was meant to refer to the fact that the tendency towards coherent organisation of whatever new text or phenomenon we happen to encounter is a spontaneous process that takes place without resorting to external elements. Thus, the notion of schema theory serves to provide not only an account of how knowledge is stored and represented in the human mind but also how we make sense of, and project meaning on, any new experience.

In the same vein, Bartlett (1930) is said to be the first *psycholinguist* to have utilised the concept 'schema' to describe "*an active organisation of past experiences and reactions" (Bartlett 1930)* This definition implies that schemata subsume our higher knowledge structures, which in turn serve the purposes of facilitating understanding, recall and retention of newly acquired information, concepts and knowledge. While this seems of great importance as to the nature of schema theory, Bartlett failed to describe how schemata function or how they are used, indeed he himself admitted this arguing "I *wish I knew how it was done"* (Bartlett, 1930).

Also somewhat related to the notion of schema theory was David Ausubel's theory of *Advance Organisers*. Back in the early 1960s, Ausubel (who is another major figure in the field a cognitive learning) advanced his theory of advance organisers emphasizing the paramount importance of prior knowledge in facilitating both meaning reconstruction and subsequent recall and retention of newly acquired information. Ausubel suggests that advance organisers serve as cognitive pegs that relate new ideas to existing prior knowledge in memory (1960). Pertinently enough, he described advance organisers as

> "*A statement written in abstract, inclusive term deliberately introduced before a text and intended to provide a conceptual bridge between what the reader already knows and the propositions in the text that is hoped he will understand" (cited in Pearson and Anderson 1984: 41)*

Advance organisers seem thus to be some sort of cognitive pegs that function as tools to anchor new ideas to existing ones in memory. They also help facilitate their storage in human cognitive structures (memory). Finally, as it has often been noticed, Ausubel's theory of advance organisers, albeit not directly related to schema theory, sheds light on how the latter seem to function and/or operate. In fact, both have been observed to have the same facilitative effect in the learning process in general and in the reading comprehension in particular. (Mayer 1979 and Arcsine 1980)

Just like the theory of advance organiser, a variety of other theories which have a lot in common with schema theory as well as its implications to learning have been identified. Research in the field of computer science and artificial intelligence are said to have contributed a great deal to the development of schema theory. Upon looking into the very complex act of how our minds process information, some researchers ended up using such new concepts as script and frame theories (e.g. going to restaurant or riding a bus scripts) that a computer needs to make sense of a given situation.

Both Concepts of Script (Schank and Abelson, 1977) and Frame (Minsky, 1975) have been described as highly instrumental in shaping our conception of how prior knowledge facilitates to a great extent the act of processing new information in reading texts. Minsky used the term Frames to refer to the knowledge structures that shape readers' expectations as to a variety of situations whether they happen to be typical or particular. More precisely, they represent, in Minsky (1975) terms, "*remembered framework to be adopted to fit reality by changing details as necessary."* Following the same line of research, Schank and Anderson (1977) introduced the theory of Script to refer the typical *sequence of events* in a given situation. It is particularly used to refer to "*the memory structures that a person has encoding to his general knowledge of a certain situation and/or action routine"* (Bower 1988).

Thus, it follows from the above that Schemata, Advance Organizers, Frames and Scripts are all different concepts that describe the same phenomenon; namely, the intricacies involved in meaning storage (learning) or meaning reconstruction (understanding). They seem particularly to reflect in one way or another what goes on in our mind when the process of perception, comprehension and subsequent recall and retention of information is underway. It is especially important to note that they do not represent some sort of competing theories. In fact, they are considered more of "*alternative metaphors for the description of how knowledge of the world is organised in the human memory and also how it is activated in the process of discourse understanding" (*Halliday and Hassan 1976 *238)*

1.2. Defining the concept of Schema from a psycholinguistic point of view

Of the many attempts that have been undertaken in the literature to define the term schema, that of Anderson (1984) appears to sum up its major aspects and salient characteristics when he points out that schemata refer to

> "*Cognitive constructs or configurations of knowledge, when placed over events, bring them into alignment with familiar patterns of experience and beliefs. They therefore serve as devices for categorising and arranging information so that it can be accurately interpreted and retained."(Quoted in Valdes 1990: 27)*

This implies that schemata stand for knowledge structures that are stored and represented in memory (Rumelhart1980; Pearson and Anderson 1994). They serve the purpose of assigning meaning to, and/or making sense of, events, actions, objects, situations, and experiences we run into in our daily life. Worth mentioning in this regard, however, is the fact that our schematic knowledge involves also knowledge of the very network of relationship that obtains among the various component parts or slots of a given schema (Rumelhart 1980; Pearson and Stephenson 1994). Hence a reason perhaps why it is not enough in the process of schema instantiations (i.e. the process of filling the slots, or our schema variables with ideas and information met in a reading text) to know only which information to put in which slot or container of a schema. One needs to have a clear idea as to the kind of relationship (*interactions*) that obtain between the slots/ variables of the relevant schema as well.

Additionally, Schemata are also defined as being essentially "*abstract knowledge structures" (Bartlett 1932).* They are described as being abstract in that they sum up what is common among a variety of situations or cases which, in turn, are dissimilar in many particulars. Similarly, they are referred to as '*knowledge structures'* because they also subsume the very relationships that exists among their constituent parts or variables.

Thus, based on the above, one can define the concept of schemata as *abstract models of human knowledge* as they are represented in memory. It is also safe to conclude that it is precisely thanks to our schemata that we manage to bridge the gap between newly acquired information in a reading text and our existing knowledge in memory. Our schemata or knowledge structures, however, tend to differ depending on the nature of prior knowledge they represent in memory. This difference is also a natural result of the variety underlying our accumulated experience in the form of content, cultural, linguistic and/or domain specific background knowledge. This obviously evokes the idea of types of schemata that are prominent and frequently discussed in the literature.

2. Types of Schemata

The clear cut distinction drawn among types of schemata is often contingent on the type of knowledge structures they represent in memory. Thus, while readers' *mental stores* are all termed 'schemata' (Bartlett in Cook 1997:86) the latter are, however, divided into two main types as far as reading is concerned: '*content schemata'* or background knowledge of the world and *'formal schemata'* which describe background knowledge of rhetorical structure or organisational patterns underlying the reading text at hand (Carrell 1983a). Schemata are defined as data or knowledge structures that represent general concepts that are stored in memory. This implies that schemata represent our knowledge structures about all sorts of

concepts, situations, objects and actions (see Frames and Scripts bellow). They generally constitute a kind of theoretical framework that serves among other things to facilitate our perception, recall and retention of new information encountered in reading passages. According to (Rumelhart 1980; Anderson and Pearson 1984) the other types of schemata include:

- **Content or Domain** specific schemata –which describe the subject matter/area of the reading text
- **Cultural schemata-**the extent to which cultural elements of the reading text are about the native or the target culture the student is still trying to come to terms with.
- **Linguistic schemata**- refer to low order decoding features like vocabulary grammar and syntax of the reading passage
- **Rhetorical /formal** schemata –organizational patterns describe how the ideas are developed and how topics are approach.
- **Strategic schemata**- describe appropriate reading strategies the readers avail themselves of and are known to help facilitate reading comprehension when mobilised adequately by the reader

In addition to the above, there is yet another crucial type of schematic knowledge without which knowledge of all the above would be useless. This describes the schematic network representing the relations that obtain among the component parts of a given schema itself. Thus, as mentioned earlier on, a schema contains as part of its specification the system of interrelations that hold among its constituent elements also known as slots. Also related to the type of schemata is their internal structure organised in a hierarchical fashion so that the more general schemata are said to be at the top and the more specific are located at the base. This hierarchy is particularly apparent in Rumelhart's (1980) definition of the notion of schema as

> *A network of schemata and sub-schemata each of which carries out its assigned task of evaluating its goodness of fit whenever activated. These sub-schemata represent the conceptual constituents of concept being represented (Rumelhart 1980:38-39)*

Thus, following Rumelhart, it seems that schemata represent variation and diversity in terms of the aspects of knowledge they represent and also the way in which they represent it in our cognitive structures. Going back to reading comprehension, the above implies that various kinds of schemata are called upon to interpret process and later on retrieve different types of knowledge and information that would otherwise render a reading text inaccessible and meaningless. In addition to the formal and content schemata discussed above, a variety of other schemata have been identified in the literature. This is done following the major aspect of knowledge being mostly represented in each type. For instance, one can talk about such sub-content schemata as 'domain specific' or 'cultural schemata'. While the first describes the readers' prior knowledge about the domain or topic of the text, the second has to do with the cultural elements incorporated in the reading text.

Thus, just like formal schemata, cultural and domain specific schemata do equally have a vital role to play in the process of meaning construction or reading comprehension. This amounts to saying that partial availability or total absence of any of the above mentioned schemata is bound to bring about different degrees of lack of comprehension. It also amounts to saying that readers equipped with the relevant schemata, be they content, formal or domain specific, are more prone to effortlessly process and reconstruct the meaning of the text at the ideational level much better than readers who are short of such schemata. In other words, readers who are poorly and/or partially equipped with, for example schemata of the organisational or cultural patterns of the reading text in the target language are liable to finding the text inaccessible and therefore may end up with a distorted understanding of it. In the same vein, and also related to the types of schemata, is Rumelhart's difference between two distinct levels in our schematic knowledge*: high level schemata and low level schemata.* While the first describes our prior knowledge about the topic of the reading passage, the world and the general context surrounding the text, the second has to do with our existing knowledge with regards to linguistic aspects (letters, sounds, and graphic symbols in the text etc.) As a matter of fact, it seems that both levels reflect in a sense two kinds of information processing mechanisms referred to in the literature as bottom up or 'data driven' and top down or 'conceptually driven' processes respectively. (Rumelhart1980; Anderson and Pearson 1985).

That said, it follows that attaining complete comprehension involves, as a matter of course, operating the two levels of processing. Both the top down and the bottom up levels tend to come into play during any endeavour of meaning reconstruction. In fact, knowledge or schematic structures govern readers' attempts to reconstruct meaning from the print in the page while at the same time, the ideational and linguistic input (information) retrieved from the reading text tend to shape in one way or another their existing knowledge. And this eventually implies that the process of meaning construction or comprehension is by-directional resulting simultaneously from both levels of text processing (Stanovich, 1980; Rumelhart, 1977a; McClelland and Rumelhart, 1981; Kintsch and van Dijk 1978)

Talking about the various types of schemata may in a sense account for some instances of failure to achieve comprehension. The tendency of some EFL readers to misinterpret the meaning of reading passages is at times the natural result of the discrepancy between what the writer assumes the reader knows and what the latter actually activates as prior knowledge to process the text at hand. In other words, differences in content (ideas, culture, and information) or linguistic (such as vocabulary and grammar) or formal (such as rhetorical patterns macro organisational aspect of the text) schemata between the writer and the reader sometimes tempts the latter to resort to impertinent schemata which in turn lead to various degrees of misinterpretation and eventually poor reading comprehension. This being, the following section will try to provide a brief account of the many ways in which schemata and comprehension are related.

2.1. The role of schemata operate in reading comprehension

In the process of reading, Anderson et al. (quoted in Hudson; 1982:187) observed that "*comprehension of a message entails drawing information from both the text and the internal schemata until sets are reconciled as a single schema or message.*" This in fact, seems to highlight one of the basic assumptions underlying the notion of schema theory. Each time we are faced with a new piece of information, relevant schemata come immediately into play (or are activated) to help process this information and make sense of it. Thus, what is usually described as comprehension refers in fact to the very cognitive act of reconstructing the meaning of the text by the process of slots- instantiation (schema) using ideas from both the reading text at hand as well as the ideas already existing in our cognitive structure until complete comprehension is achieved. As a matter of fact, one cannot talk about comprehending a text until after all the information in the passage are pieced together as one complete massage that goes hand in glove with the component parts of the readers' schematic knowledge and matches perfectly with the intended message of the author.

Attempts to highlight the strong kinship between comprehension and schemata have been empirically illustrated by a number of reading researchers and specialists. A case in a point is a set of experiments carried out by Carrel and Eisterhold (1988). They provided their subjects with a reading passage highlighting a "*story of a policeman*" that held up his hand and stopped the car. The researchers asked the students to read the story and see what they can make of it. Following their research findings, this story has, significantly enough, been observed to have been assigned two basically different interpretations depending on which schemata was activated by the readers. The first interpretation, which was also said to have the most likelihood, is that of a traffic officer waving to the car driver to stop. Hence, the role of schemata in this instance is extremely apparent in that the meaning is implied by the writer and inferred by the subjects rather than explicitly stated in the story. The second interpretation is related to the schema of the *superman* who "*held up his hand and stopped the car without a driver"*. However, this second interpretation, although credible was described as most unlikely. For not only does the first interpretation sound far more logical, credible and above all highly familiar the second sounds a bit farfetched. The fact that the second interpretation is regarded as farfetched while the first highly familiar can be accounted for by the fact that we bring more the reading texts than we actually get from them. Or as Clarke and Silberstein Point out:

> *More information is contributed by the reader than the print on the page. That is, readers understand what they read because they are able to take the stimulus beyond its graphic representation and assign it membership at the level appropriate group of concepts already stored in their memories (schemata)...The reader brings to the task a formidable amount of information and ideas, attitudes and beliefs. This knowledge coupled with the ability to make linguistic predictions, determine the expectations the reader will develop as he/she reads. (1977: 136-137)*

Thus, viewed from the perspective of schema theory, reading comprehension is mostly governed by "*...the principle that every input is mapped against some existing schema and that all aspects of that schema must be compatible with the input information*" (Anderson et al. 1977, 369) before accurate comprehension can be attained.

Functions of schemata

In much the same way there are various types of schemata,, Wilson and Anderson (1986) have identified their various functions as well. They claim that there are *six main functions of schemata*, which seem to really highlight how instrumental they are in the reading comprehension. They argue that schemata especially do play a crucial role in:

- *Organising the information they represent*
- *Helping the reader determine the important aspects of a text (the maxim of relevance)*
- *Enabling the reader make inferences to complete the meaning of the text (inferential elaboration)*
- *Enabling the reader to recall the appropriate information by allowing them orderly searches in memory.*
- *Allowing the reader write summaries which include the relevant propositions.*
- *Helping the reader make hypotheses to recall a text (inferential construction)*

Also in the same line of reasoning, and according to Rumelthart (1980:45) who is another major advocate of schema theory, schemata do have *four basic functions* in the process of reading comprehension. The first of these has to do with perception and /or–recognition; meaning that we tend to recognise individual parts only in the light of the whole and that new information tends to make sense only when mapped against our existing knowledge structures. The second function has to do with comprehension. That is one could be said to have understood a given text or discourse only when they managed to find a configuration of schemata which account appropriately for every single piece of information that appears in the reading text. The third role is related to recall. It has been observed, and rightly so, that what we tend to remember from a reading text will definitely depend on the kind of schemata activated / brought to bear while reading and interpreting the text. Hence, also a reason why, as Rumelthart (Ibid. 49) stated, " *we [tend to] remember our interpretation of an event or text rather than the text or event itself ".* The forth and final function has to do with the way our existing schemata pave the way for the development and assimilation of new schemata. Our schematic knowledge serves as cognitive pegs which help interpret and retain whatever new information we happen to meet in the reading text (Ausubel, 1960: 267)

However, while the above appears to stress the advantages and the various functions of schemata in reading comprehension, it is not without relevance to point out that, ironically enough, our schematic knowledge can at times interfere with our interpretation of the reading text and thus make its processing

difficult or time consuming. This is especially so when the schema activated first hinders alternative interpretations.

Schema Theory and Related Theories: Focus on Advance Organizers Scripts and Frames

Having outlined the main types as well as the main functions of schema theory with a especial reference to the vital role of prior knowledge structures in reading comprehension, it is the purpose of this following part to discuss and stress further how schemata help in meaning construction. That is, in what way does our schematic knowledge of both form and content coupled with our knowledge of the linguistic and cultural aspects of the reading text (language) play a facilitative role in the process of assigning meaning to, and assimilating, newly acquired information.

As a matter of fact, failure to comprehend a text may be attributed to a variety of factors Rumelhart (1984: 18). First and foremost, readers may lack or have only a poor schema available to them during text processing. The second reason is that readers at times do have the relevant schemata but the text fails to provide enough cues or clues and details to allow its easy processing. Finally, but most importantly, readers sometimes approach the reading text using inappropriate or irrelevant schemata. It is interesting how readers who fall into this trap are often misled into a different but highly plausible interpretation of the text. But oftentimes when this happens, the reader may be said to have understood the meaning of the text but not necessarily that intended by the author. Thus, as Aebersold and Field (1997) observed "if *the topic... is outside of their [the readers knowledge] experience or base of knowledge, they are adrift on an unknown sea."* (41)

Therefore, one of the obvious implications of this mismatch between the readers' schemata and the text implies that comprehension is as much a matter of having appropriate to the appropriate schematic knowledge as it is that of activating and having access to that knowledge in the first place. This again brings us back to the role of pre-reading activities as an effective means to stir up students' prior knowledge and activate their schemata before asking them to embark in a given reading comprehension passage to get its authors' intended meaning. The question that begs to be asked now is how do schemata facilitate reading comprehension?

Availability and accessibility of relevant schemata before reading comprehension are said to be a prerequisite for perception as well as meaning construction, which comes as no surprise if we know that (Barlett1932; Rumelhart and Ortony 1977; Rumelhart 1980,)

> *Schema theory, has as one of its fundamental tenets that text, any text either spoken or written does not by itself carry meaning…the text only provides directions for listeners or readers as to how they should retrieve or construct meaning from their own previously acquired knowledge.*

This amounts to saying that meaning is not inherent in the reading text per se; no text has a built in meaning. Rather, it only means whatever the reader determines it means depending here again on his schematic or existing knowledge structures. For this reason, what is usually referred to as comprehension describes merely the very act of relating the textual material to one's own background knowledge; for as (Anderson et al 1977: 369) points out "*every act of comprehension involves one's knowledge of the world as well"*.

That said, it seems therefore clear that readers constantly resort to their prior knowledge in the form of relevant schemata to reconstruct meaningful and appropriate interpretations of the text being processed. This is especially so if we know that pretty much of the meaning retrieved from any text is actually not in the text as such. It is usually in the very interaction between the reader's prior knowledge structures and the clues or cues identified in text at hand (Rumelhart 1977). In fact, this seems in a sense to account for some instances where non-comprehension occurs. Usually, lack or partial comprehension come, as has been pointed out earlier on, as a natural result of some sort of discrepancy between what the writer presupposes and/or assumes the reader knows and what the latter actually knows. For, as it was pointed out by (Rumelhart, 1980) "the *more the reader's world and the writers' world are remote the more procedures are needed for the gaps to be bridged and communication to take place"* between the two.

2.2. Limitation of Schema Theory and Related Theories

Problems related to schema theory applications and implications to the teaching of EFL reading are especially associated with the use of pre-reading activities. For despite the frequent use and the widespread popularity of pre-reading activities in both EFL and ESL reading classes, there may be limits to their use as they do not always function as it is claimed in empirical research findings. A case in point includes Carrell & Wallace's (in Carrell 1988a: 105-6) research conclusions which turned out to be incongruent with the generally agreed upon applications of schema theory. More precisely, it was found that providing prior context for students failed to improve recall even for advanced ESL readers. This was interpreted as implying that their schemata were not activated. It also meant that readers are at times tempted to overuse the top down processing at the expense of the bottom up mechanism which is equally acknowledged as a significant component in meaning construction. Therefore, as Hudson (1982:186) observed, it appears that by encouraging students to use the good reader strategy of "touching as few bases as necessary," they might "apply meaning to a text regardless of the degree to which they successfully utilise syntactic, semantic or discourse constraints."

Reading comprehension has widely been described as a "*psycholinguistic guessing game*" (Goodman in Carrell and Eisterhold 1983:74) in which fluent and/or good "*readers minimise dependence on visual details".* This is achieved by having recourse to background knowledge to make predictions and then check them against the reading text to be either confirmed or rejected as more and more data unveils (Goodman 1975:12). However, an overview of the literature appears to reveal that

the psycholinguistic approach to reading is not without its limitations. A strong emphasis on the schema theoretic approach to reading is thought to have given the misleading message to reading teachers that ESL reading is "*mostly just a matter of providing [learners] with the right background knowledge and encouraging them to make full use of that knowledge in decoding texts*" (Eskey 1988:97). It is now recognised that "*language is [also] a major problem in second language reading"* as well.

3. Models of Reading Comprehension

Thus, going back to the limitations, it seems that most of the criticisms levelled at the psycholinguistic approach to reading came from the proponents of Bottom up model to reading (Gough, 1985; LaBerge and Samuel's, 1985).

3.1. Top down Approach to Reading Comprehension

The top down approach to reading is based on the belief that the latter is more of a perceptual than a conceptual process. It especially assumes that reading comprehension involves the ability to reconstruct the meaning of every single word in the reading text. More than that context or prior knowledge (as was claimed by the psycholinguistic approach) has only a minor or no effect on our ability to retrieve the meaning of reading texts (Cornaire, 1991: 22). Looked at from the perspective of the Bottom-up model, reading is described as a primarily visual kind of processing in which readers start from such smallest segments as letters, words and phrases before being able to identify such larger segments as sentences or utterances and eventually the whole meaning of text being processed. Reading, according this model, is a rather unidirectional process and meaning is basically text bound.

3.2 Bottom up Approach to Reading Comprehension

Also, contrarily to the claims advanced by the advocates of the psycholinguistic approach as to the role of prior knowledge, the bottom up model assumes that word identification is central to any reading comprehension (Gough: 1985). Meaning reconstruction, in other words, depends mainly on one's ability to recognise the content of the words in the text and not on their background knowledge or the general context surrounding the words. Besides, research findings by Stanovich (1992) and Pollatsek (1989) appear to put into question the previous claims advanced by the psycholinguistic model. For it was empirically proved that most words are fixated (recognised) and identified during the reading process, which contradicts Goodman's (1975) assumption that reading is a selective process or, as he famously put it," *a psycholinguistic game.*" Furthermore, it has been observed that even skilled readers have been said to rely on text far more than on context or prior knowledge to decode the meaning of the reading passages.

3.3. Interactive Model

Contrary to the main claims of both the psycholinguistic (conceptually driven) and the bottom up (data driven) approaches to reading above, both in fact have been criticised by the proponents of the

interactive model (Rumelhart: 1977 and Stanovich: 1980) as being biased in favour of either the text (bottom up) or context and prior knowledge (psycholinguistic model) when it comes to reading comprehension. "*the meaning of the text"* from an interactive perspective, "*does not reside in the reading material itself but in the very interaction that takes place between the readers' prior knowledge and the text"* Anderson and Pearson (1984). Thus, the interactive model, as is implied by its appellation, acknowledges the constant interaction between, and the contribution of both the bottom up and the top down levels of processing. This especially seems to make a lot of sense since relying on the text alone or context per se will by no means be of much help in reading comprehension. Meaning construction therefore is the function of the very interaction between the text and the reader's prior knowledge. The text merely provides needed stimuli and enough clues that readers tend to interpret in the light of their prior knowledge structures of the language, the text, the culture, the world and/or subject matter of the reading material at hand.

Similarly, Eskey (1988) argues sceptically that the psycholinguistic model (or schema theory) presupposes and even overemphasises the primacy of the top down processing skills. Alternatively, he advocates the interactive model, which posits that there is a constantly simultaneous interaction between top down and bottom up processing in the reading process "*each source of information contributing to a comprehensive reconstruction of the meaning of the text"*. (94) Eskey goes on to say that the psycholinguistic model tends to emphasise such higher-level skills as the prediction of meaning by means of context clues or certain kind of background knowledge. This, however, is obviously done at the expense of such lower level skills as the rapid and accurate identification of lexical and grammatical forms underlined by the bottom up model. He claims that in L2 reading "*good reading is more of a language structured affair than the guessing game metaphor seems to imply*" (Eskey 1988:94).

Thus, the current study concurs with Eskey claim that the assumptions underlying the psycholinguistic model are relevant only when it comes to skilful and fluent readers for whom the *perception and decoding processes* have become automatic mechanisms. This is not the case, however, where ESL or EFL readers are concerned in that being less proficient in the target language; they will find the psycholinguistic principles only partially pertinent. These readers cannot be expected to apply high level or top down strategies as claimed by the psycholinguistic model while they have not yet developed that '*automatcity*' in decoding which is necessary for them to simultaneously think about and interpret what they are reading. Hence, the obvious conclusion appears to be that "*knowledge of the language must be an integral part of whatever background knowledge that is required for the full comprehension of that text*" Eskey (1988: 96)

The implications of Eskey's point of view to reading instruction suggests that reading teachers are not only expected to provide L2 readers with the right background knowledge for any text they must read, but also keep in mind that "*language is [equally] a major problem in second language reading and that even educated guessing at meaning is not substitute to accurate decoding"* (Eskey 1988; 97). ESL

readers, in other words, need in addition to a rich background knowledge "*a massive receptive vocabulary that is rapidly, accurately and automatically accessed*" before the can make sense of what they read (Grabe 1988: 63). By means of reconciliation, Carrell (1988b: 244) suggests a 'parallel' approach in which both levels of processing mechanisms are reconciled and in which both vocabulary and schemata are developed by *"pre-teaching vocabulary and background knowledge concurrently for sets of passages to be read at some later time"*

4. Implications and Applications of Schema Theory to Classroom Reading Instruction

Schema theory appears to have a number of implications as well as applications to the teaching of reading and particularly so where difficult reading texts or culturally bound materials in an ESL or EFL contexts are concerned. The following section will therefore attempt to outline the basic instances of the implications of schema theory to better reading instructional strategies and will especially emphasise ways in which theory translates to practice and classroom procedures when it comes to teaching reading

As has been implied previously, "*some [EFL or ESL] students' apparent reading problems may be problems of insufficient background knowledge"*(Carrell 1988b: 245) or total lack of relevant schemata related to the reading at a hand. Hence, as a first implication, it seems that with regards to reading problems that are thought to be topic-related, 'narrow reading' within the student's area of knowledge or interest may help them improve their reading skill by providing them with ample opportunities to acquire appropriate schemata that can render the reading text more accessible for students (Carrell and Eisterhold 1983:86). Similarly, when schema deficiencies happen to be highly culture-specific, it would be extremely useful to replace them with less culturally loaded texts or texts that are developed from the readers' own experiences and cultural background (Carrell 1988:85).

On the other hand, it has been suggested that "*every culture-specific interference problem dealt with in the classroom presents an opportunity to build new culture-specific schemata that will be available to the EFL/ESL student outside the classroom*." Carrell and Eisterhold (1983:89). Thus, as another straightforward implications, one can argue that instead of pre-teaching every single piece of information or unfamiliar or culturally loaded vocabulary in a reading text, it would seem more suitable to prepare students by "*helping them build background knowledge on the topic prior to reading, through appropriate pre-reading activities"* like previewing , pre-questioning of whole class discussion (Carrell 1988b: 245).

Basing their observations on the findings of empirical research related to schema theory, authorities in the field of reading comprehension have identified a variety of ways in which relevant schemata may be constructed or activated prior to reading (Stevens, 1982; Hudson, 1982; Johnson, 1982; Langer 1984; Taglieber et. al 1988). These include, in addition to the above, involving students in demonstrations, real-life experiences, discussions, role-plays, text previewing, introduction and discussion of key concepts or vocabulary, lectures, visual aids, and key-words/key-concepts association activities explanations of content

or key words. More examples of such contextualisation procedures include other activities like, for instance, showing pictures related to a given topic (say smoking, a trip etc) before asking the students to read a text about it. Another example may be simply having students discuss the main themes underlying the text they are about to read etc.

However, it is worth mentioning in this regards that reading comprehension problems do not always necessarily result from schema deficiencies. The latter are at times available but because they are not activated during text processing lack or non-comprehension takes place as a result. Therefore, reading teachers need to make sure that students' relevant schemata are activated prior to any actual reading in their reading classes (Carrell 1988a: 105). For some of those readers at times come equipped with enough prior knowledge but because their schemata remain inactivated while reading they tend to distort the meaning conveyed in the text or simply fail to get the gist of it. Thus, the implication in Carrell's terms remains to be that "*pre-reading activities must accomplish both goals: building new background knowledge as well as activating existing background knowledge"* (1988b: 248)

Talking about the role of prior instruction in reading comprehension, it seems that the facilitative effect of a number of pre-reading activities has been empirically supported and therefore widely used in both EFL and ESL reading classes. Particularly practical and popular in the literature are pre-reading activities that involve, questioning, previewing, providing a pictorial context and/or using 'brainstorming' technique find out what students bring to the reading text as prior knowledge. More specifically, it describes the case where learners generate information on a given topic based on their own experience and knowledge base before setting out to read the text (Aebersold and Field 1997: 71). Previews, however, involves providing the students with introductory account of the reading text coupled with definitions or explanations of some key concepts that are liable to impede comprehension prior to reading (Graves and Cook 1980).

Conclusion

That schemata play such a highly crucial role in reading appears in a sense to attest to the value of carefully using appropriate pre-reading activities to achieving comprehension especially of culturally loaded or domain specific texts. This reminds us also of the previously mentioned fact that not all pre-reading activities prevalent in the literature do have the same facilitative value in reading comprehension. This again evokes the importance of having teachers make informed choices and decisions about the effective use of pre-reading activities, lest their facilitative effect turns into a hindrance that would impede attaining full comprehension instead of facilitating it. In fact this provides a further argument in favour of attempting to explore the facilitative potential of some pre-reading activities like vocabulary pre-teaching, video showing, providing a pictorial context or whole class discussion to activate students prior knowledge.

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