The American University in Cairo

School of Humanities and Social Sciences

The Acquisition of Morphosyntactic Agreement in the

Interlanguage System of AFL Learners in Ghana

A Thesis Submitted to

The Teaching Arabic as a Foreign

Language Department

The Arabic Language Institute

In partial fulfillment of the

Requirements for the Degree of Master of Arts

By

Alhassan Abdur-Rahim Husein

December, 2012

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To my parents

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ABSTRACT

Despite the relevance of agreement structures in constructing the interlanguage (IL) system of the L2 learner, not much research has been conducted in this area on Arabic language learners. This study investigated the acquisition of morphosyntactic agreement structures by Arabic as Foreign Language (AFL) learners in Ghana, using the Processability Theory (PT) formulated in Pienemann (1998, 2005). The theory predicts cross-linguistic developmental routes for the acquisition of grammatical structures. A cross-sectional study was performed in order to test the theory. Data were elicited from 15 participants from the University of Ghana, Legon using Grammaticality Judgment Task and Elicited Production Task. Five Arabic morphosyntactic agreement structures at the phrasal, inter-phrasal and subordinate clause processing procedure stages of Pienemann's implicational hierarchy were tested. The data collected were analysed by using distributional analysis, a pre-defined emergence criterion and implicational scaling. The results of the study suggest that: (1) acquisition of agreement structures by AFL learners in Ghana seems to develop, *generaly,* according to PT's predictions; (2) there is enough evidence for the stability of developmental stages. In effect, that seems to confirm the cross-linguistic plausibility of the theory and (3) no significant differences were found in the acquisition of the Noun Predicative Adjective (an inter-phrasal structure) among all the participants. These findings were discussed in the light of L1 transfer and variation and processing constraints. The study highlights the importance of teaching L2 learners structures that they are cognitively and developmentally ready to process so that the entire teaching practice would be beneficial. Otherwise, learners IL development becomes stagnated, teaching becomes ineffective and precious classroom time is wasted, eventually.

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List of Abbreviations

CA: Contrastive Analysis

CAH: Contrastive Analysis Hypothesis

ESL: English as Second Language

f.:   Feminine

IL: Interlanguage

L1:   Native Language/ First Language

L2:   Second Language

LAD: Language Acquisition Device

LFG: Lexical Functional Grammar

m.:   Masculine

MDH: Markedness Differential
           Hypothesis

MT: Monitor Theory

N aAdj: Noun Attributive Adjective

N PAdj: Noun Predicative Adjective

NPAH: Noun Phrase Accessibility
            Hierarchy

NUM: Number

p.:   Plural

PT: Processability Theory

s.:   Singular

SCH: Structural Conformity Hypothesis

SLA: Second Language Acquisition

SLL: Second Language Learning

SVO: Subject-verb order

TL: Target Language

TU: Typological Universal

UG: Universal Grammar

VSO: Verb-subject order

Chapter 1: Introduction

1.1 Background

The fields of psychology and linguistic have had a strong impact on studies about SLA. Consequently, different theoretical opinions are opined on how second language is acquired. Mitchell and Myles (2004) in the introductory discussion to their book maintained that, this has led to a situation where no single comprehensive view can be held to explain how second language is acquired. For instance, the leading theoretical explanation for second language learning (SLL) during the early days of second language research in the 1950s was behaviourism. This was largely influenced by psychologists like Bloomfield and Skinner. Thereafter, Behaviourism came under attack from Chomsky with his innatist view about first language (L1) learning. This brought about the birth of Error Analysis that came to take the place of Contrastive Analysis. With the growing interest in second language research, the focus shifted from analysing only learner errors to understanding the whole linguistic system of the second language learner. That again led to another area of studies known as interlanguage, a term coined by Selinker in 1972. By this time, Chomsky's Universal Grammar (UG), the second language Morpheme order studies by Dulay and Burt (1975), Krashen's (1985) Monitor Theory, etc. have all provided strong theoretical foundations about SLL, although within a specific realm that tend to describe the competence and the underlying linguistic knowledge of the second language learner. This came to be known as the innatist/nativist perspective.

Whereas the innatist account about SLL was largely concerned with what the learner knows about language, another area of research that spawned out in the past few decades is the attempt to account for the "formal and functional properties of language and the mental processes involved" (Ellis, 1994, p.348). This is referred to as the cognitive account of SLA. In

the view of McLaughlin (1987), learning is a cognitive process and therefore researchers working within the cognitive theory rely on cognitive psychology to explain the process of SLA that in turn makes the theory 'derivative'. Mitchell and Myles (2004) thus observed that, it is from our understanding of how the brain process and learn information that we stand to have a better outlook of the language acquisition process. Within the cognitivist perspective, however, several frameworks exist to explain the mental processes involved in L2 acquisition and how L2 production is attained. Those frameworks could be classified under two groups, namely processing approaches and the constructionist approaches (Mitchell & Myles 2004). The present study falls within the Processing approaches framework, and according to Braidi (1999), they (i.e. processing approaches) seek to describe the ways and means of storing and accessing rules that are embedded within structures of a language. Typical processing approaches include VanPattern's (1996) Input Processing Model, the Multidimensional Model (Meisel, Clahsen and Pienemann, 1981) and the Processability Theory (Pienemann, 1998).

1.2 Statement of the Problem

Research in the acquisition order of second language (L2) provides an effective tool for pedagogical efficiency in that it offers theoretical underpinnings for the ordering of second language teaching. Indeed, the knowledge of acquisition order is one of the key areas of research in SLA. According to Lakshmanan & Selinker (2001), "two major goals of second language acquisition (SLA) research are: (1) to determine the second language learner's L2 grammatical knowledge (i.e. interlanguage competence); and (2) to explain how it develops over time from initial state to an end state, often a fossilized state" (p. 393). It is this second goal of SLA research that the present study is concerned about. Interestingly, however, researchers in the field of SLA have different outlook about how L2 develops among foreign language learners.

Giving that there are different perspectives on how second language develops among learners; the present study proposes to use the Processability Theory (PT) formulated in Pienemann (1998) to study the production of morphosyntactic agreement structures. PT is a theory of development of L2 grammatical structures that sees language development as "the acquisition of procedural skills[1] needed for the processing of the language" (Pienemann, 2005, p. 198). Pienemann maintains that so long as the order in which language develops in learner is spelled out, structural outcomes associated with each level of development can equally be outlined. Thus, PT predicts structures which can be processed by the learner at a given level of development. However, for those structural forms to be processed, the learner needs to have the required processing resources for the structures in question. This is especially important because the L2 learner is constrained by the architecture of language processing of which part of it is the procedural skills. The concept of language processor is rooted within the Lexical-Functional Grammar (LFG)[2] theory of grammar and its main principle of feature unification. The language processor checks whether the annotated features of different parts (of a phrase or sentence) are compatible. This checking operation is called feature unification" (Baten, 2011, p.462). Thus, on the bases of the ability of the language processor to make feature unification, PT made predictions about L2 developmental routes.

Findings of research studies in languages other than Arabic have generally validated PT predictions. In the domain of Arabic language, however, research findings have provided mixed results (Alhawary, 2003, 2009; Mansouri, 2000, 2005; Nielson, 1997). PT predictions need further testing in the field of Arabic as Foreign Language (AFL) learning, using different participants from different environment which hitherto has not been tested, so that PT's claim of

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[1] Procedural skills refer various language skills and strategies available to the L2 learner for automatic and unconscious use (Ellis, 2008).
[2] Discussed under page 45

typological plausibility is further verified. For this reason, this study aims to investigate the acquisition order of Arabic morphosyntactic agreement structures by Arabic as Foreign Language (AFL) learners in Ghana. The knowledge of how agreement structures develop among L2 learners provides language instructors a strong tool in strategizing their teaching priorities because most meanings cannot be accurately expressed if this linguistic phenomenon (i.e. agreement structures) is lacking in any IL system. Accordingly, Pienemann (1988) and Mansouri (2000) considered the acquisition of agreement structures as mark of real development on the IL continuum. It is therefore the aim of this study to investigate the acquisition of agreement structures and their development in the IL system of L2 learners in Ghana.

In as much as the present focus on language development and acquisition has shifted from the mere unearthing of the order of acquisition (like the Morpheme order studies of Dulay and Burt, 1973) to the explanation of the order of acquisition (Pienemann, 2005), the choice of PT as a framework for the present study cannot be overemphasized. The choice of this framework was guided by the fact that it addresses issues of learners' language development as well as its application, which are crucial for both theoretical and pedagogical considerations (Baten, 2011). Developmentally, the theory explains sequences of L2 language development and provides, as well, strong predictive framework for the acquisition of linguistic structures across languages within the interlanguage (IL) development process. A good theory, according to VanPatten and Williams (2007), not only observes a phenomenon but also makes predictions and generalizations. Pedagogically, PT has established that learners would not be able to produce structures that they are not developmentally ready for. In essence, if teaching is to benefit IL development then the focus must be on structures that learners are cognitively ready to process.

Thus, unlike other Second Language Acquisition (SLA) perspectives, this theory blends between the processes of IL development and makes prediction across languages. These features make the theory comprehensive and attractive for use in the present study.

1.3 Justification of the Problem

Morphosyntactic agreement structures are some of the linguistic forms in Arabic that AFL learners have to acquire early on in their interlanguage developmental process. Moreover, agreement systems play a central role in IL development of L2 learners. Given that Modern Standard Arabic is typically verb-first language and is typologically distant from languages in which a lot of PT studies have been tested, Mansouri (2000) maintains that this may have a wide range of implications for the cross linguistic claims of PT. Boeckx (2006) argues that agreement plays a vital role in conveying meaning in linguistic structures. This function of conveying meaning becomes even more crucial considering that Arabic agreement rules are more complex than other agreement rules found in other languages like French and Spanish (Habash, 2010; Holes, 2004 as cited in Alkuhlani & Habash 2011).

Most studies about Arabic agreement structures (like Aoun, Benmamoun, & Sportiche (1994); Fassi Fehri, 1984; Mohammad 1990, 2000) have focused on presenting agreement as a theoretical construction and a phenomenon that exist in MSA, by using the generative or minimalist approaches of Chomsky. In contrast, not much investigation has been conducted on the development and acquisition of Arabic agreement structures among AFL learners. To this end, this study investigates the acquisition and the processing of morphosyntactic agreement structures among AFL learners and its relation to the development of their IL system.

Certainly, as VanPatten and Williams (2007) argue, learners' speech, and for that matter acquisition of morphosynctatic agreement structures, follows a certain predictable path as well as

predictable stages. The Processability Theory (Pienemann 1998, 2005) is one of those language theories that have been designed to predict those developmental paths in recent times, as against other acquisition approaches that have been met with much criticism like the morpheme order studies and the Markedness Theory (Burt & Dulay, 1980; Ellis, 1985 as cited in Nielson, 1997). Additionally, PT has been able to present issues of cognitive constrains that accompany the IL system and the developmental sequences involved in the acquisition of linguistic structures. It does so through the study of morphological and syntactic language production of the second language learner.

More importantly, predictions made by the theory have borne out in many studies carried out in different languages like English (Mackey, 1995, 1999), Scandinavian languages (Glahn, E., Håkansson, G., Hammarberg, B., Holmen, A., Hvenekilde, A., & Lund, K., 2001; Pienemann and Hakansson, 1999), Italian (Di Biase & Kawaguchi, 2002), Japanese (Di Biase & Kawaguchi) and German (Baten, 2011). In contrast, not enough studies have been conducted in Arabic. Alhawary (2003, 2009), Mansouri (2000, 2005) and Nielson (1997) are some of the few studies already conducted. Apart from Alhawary's studies, all other Arabic studies that have tested PT have generally validated the implicational hierarchy hypothesized by the theory. In all his investigations, Alhawary has invalidated PT's predictions. In fact, he has been one of the vocal critics of PT's claims and predictions.

Apart from the scanty nature of studies conducted in Arabic, to the best of my knowledge, no study has been conducted to investigate PT's predictions in an environment outside Europe and the USA, where Arabic is equally learned as foreign language. Besides, those few Arabic studies that tested PT predictions have provided mixed results. It is on this basis that this study seeks to test some predictions of the PT by studying morphosyntactic agreement

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structures produced by AFL learners in Ghana. Invariably, this will contribute to the needed

body of research evidence in Arabic L2 within the PT framework. It is also hoped that more

evidence will be provided about the typological plausibility of PT or otherwise through the

present study.

1.4 Research Questions

The present study attempts to answer the following research questions:

(1) What is the path of development for morphosyntactic agreement structures among AFL

learners in Ghana?

(2) Do the morphosyntactic agreement structures investigated emerge as predicted by the

Processability Theory?

(3) Do results provide evidence for the stability of developmental stages?

1.5 Definition of Terms

This section provides definition and operationalization, where necessary, of key terms as

used in the present study.

1.5.1 Acquisition

Acquisition refers to the process by which a learner learns a language and how the

linguistic system of the language in question is internalized (VanPatten & Benati, 2010). Here,

no recourse is made to the distinction between acquisition and learning as captured in Krashen's

Monitor Theory.

1.5.2 Agreement

Agreement refers to where words in a phrase or clause show feature unification. That is

they conform to each other in terms of reflecting the others feature (Ryding, 2005). For this

study, five agreement structures have been considered namely, Noun Attribute Adjective, Noun

Predicative Adjective, Subject Verb Order, Verb Subject Order and Embedded Adjectival Clause

in Relativization. Nominal morphological features, involving gender and number, are those considered for this study.

1.5.3 Emergence

Emergence refers to the first systematic appearance of a linguistic structure in learner's IL system (Pienemann, 1998). In operationalizing emergence of a structure in this study, an emergence criterion was adopted which says, a structure is considered as emerged if there is a rule application in the production of at least two minimal pairs (i.e. four tokens), of any of the target forms, within lexically and morphologically varied contexts.

1.5.4 Implicational Scaling

It refers to a method of showing the order of acquisition of agreement structures that have been investigated. . It is also called the Guttman procedure. Implicational scaling according to Mansouri (2000) establishes hierarchy of acquisition sequences. For this study, the presence of linguistic structure being investigated in the learners data is represented with the symbol (+) and its absence is represented with the symbol (-).

1.5.5 Morphosyntactic

The word morphosyntactic is the adjective of morphosyntax. It is the combination of morphology and syntax because of their close relationship. According to Crystal (2005): "morphosyntactic is a term used in linguistics to refer to grammatical categories or properties for whose definition criteria of morphology and syntax both apply" (p. 302). Arabic structures being investigated in this study have both the element of morphology (like number) and syntax (like word order). Hence, their description as mophosyntactic structures.

1.6 Chapter Outline of the Study

The present thesis is structured in five chapters. Chapter 1 begins with introduction where I provide an overview of the topic under investigation. The rational and aim of the study have also been explained. The justification for the study and its significance are rightly situated within SLA studies.

In chapter 2, relevant literatures are reviewed. I take the view that having a broad understanding of previous SLA models and theories will help in understanding current trends in SLA research. For this, I have provided some historical preview of SLA research, laying more emphasis on some of the most relevant acquisition models and theories. I have reviewed aspects of behaviourism, innatist and cognitivist perspectives about SLA. A detailed account of the Processability Theory was looked at as well. Studies conducted in Arabic and other languages have been reviewed. Accordingly, that provided strong basis in discussing acquisition of agreement structures using the PT framework.

In chapter 3, I have explained the research design employed in answering the research questions. Issues I discussed in the design are data collection, data analysis and procedures, who my participants are as well as instruments I designed for collecting the data. The target structures under investigation have also been explained in detail under this chapter.

In chapter 4, I present the results of this study based on the analysis conducted. The results are presented in relation to PT processing stages as represented by each group of participants. A summary has also been provided for each group.

Chapter 5 is the last chapter. It discusses the results of the study in light of the research questions posited. A summary, based on the findings of the study vis-à-vis PT claims, has been provided. Again, pedagogical implications of the study and its limitations have been discussed

under this chapter. Finally, I suggest areas for further research that may corroborate the findings

of the present study.

Chapter 2: Literature Review

2.0 Introduction

The field of Second Language Acquisition (SLA) is inundated with different perspectives, models and theories of how second language is acquired. In order to understand the historical perspective of research in SLA, this review looks at some of the approaches to SLA and their underlying models and theories. It looks at the behaviourist, the innatist and the cognitivist/developmental perspectives of SLA. In addition, the PT on which this study is based upon is revisited. Studies conducted testing the theory are reviewed in more detail with the view of providing a framework under which the present study is being conducted. Other approaches such as those that deal with social factors, interaction, role of the output etc. have not considered here not because they do not play any role in acquisition but rather they do not fit within the specificity of research questions for the present study.

2.1 The Behaviourist Perspective

Behaviourism as a theory of language learning has its root from behavioural psychology. It became very influential in the 1950s and the 1960s. One of the best-known proponents of this theory was B.F. Skinner (Lightbown & Spada, 2006). According to the behaviourist view, language learning is like formation of habits which depends on stimulus and response. When the language produced by the learner receives positive reinforcement, in the form of encouragement or otherwise, the learner continues to practise the pattern until it becomes a habit (Braidi, 1999; Lightbown & Spada 2006; Mitchell & Myles 2004).

Thus, the behaviourist assumed that the process of learning a second language (L2) might either be helped or inhibited by habits already formed in the L1. In other words, learning becomes easy if structures in both the L1 and L2 are similar. Otherwise, learning becomes difficult. According to this view then, language teaching needs to focus on difficult structures

rather than the easy. (Mitchell & Myles 2004). Because of this, structural linguists embarked on comparing and contrasting the native and the target languages in order to predict structures that are different and therefore difficult in the L2. That gave rise to the Contrastive Analysis (CA) approach to language acquisition. In the preface to his book, Lado wrote:

> The plan of the book rests on the assumption that we can predict and describe the patterns that will cause difficulty in learning, and those that will not cause difficulty, by comparing systematically the language and culture to be learned with the native language and culture of the student (Lado, 1957, p. vii, cited in Braidi, 1999).

The behaviourist perspective led to the audio-lingual method of language teaching where the learning process was organized in the form of dialogue, repetition and memorization of materials with little or no grammar activities (Ommagio, 2000).

However, the behaviourist perspective of how language is learned and their predictions were fiercely challenged by writers like Piaget and Chomsky, especially with the latter's review of Skinner's 'Verbal Behaviour' in 1957. Chomsky argued among other things that children do not imitate language around them but rather create their own language because of certain innate mechanism that guides them in doing so. McLaughlin (1987) argued that the behaviourist predictions were not based on any experimental study. Besides, the Contrastive Analysis Hypothesis (CAH) cannot explain child language behaviour, let alone adult second language learning. Kellerman (1986) in his study about developmental constraints of the L2 lexicon also realized that learners, based on their intuitions, may or may not transfer certain patterns of their L1 to L2. Lightbown (2006) also explained that L2 learners at times do not transfer the patterns of their Ll to the target language even when there are similarities between the two.

Following the criticism concerning behaviourism and the inadequacy of the predictions of the CAH about language acquisition, researchers, by the 1970s, instead became interested in the language produced by learners. This gave rise to another area of language research known as 'Error Analysis'. That is "the systematic investigation of second language learners' errors" (Mitchell & Myles 2004, P. 38). Corder (1967) in his well-cited article about learners' errors explained that learners' errors are reflections of learners understanding of the rules of the target language. As such, errors should be looked at as a system on its own rather than being viewed as sign of bad habit. Unlike CA, Error Analysis aimed at describing learners' errors in order to find out their sources. Analysis of learners' errors by researchers like Dulay & Burt (1973) pointed to the fact that most errors cannot be attributed to their L1 (cited in Mitchell & Myles 2004).

Despite the new development, researchers (e.g. Schachter & Celce-Murcia, 1977, as cited in Braidi, 1999) argue that learners' language will be understood better if the correct use of structures are analysed as well but not the errors only. Besides, error analysis could only account for the nature and frequency of learners' error but not learners' non-errors. They also explained that identifying the source of error was another difficulty that needed to be overcome. Learners' errors may be as the result of interference of the L1, intra-lingual, or developmental. With these criticisms, the focus moved towards understanding and analysis of learners' language as a system on its own.

The learners' language as system governed by a set of internalized rules was described by Selinker (1972) as interlanguage (IL). According to Selinker, the language produced by the learner, that is IL, is a system that results from the learner's approximation of the target language and evolves over time as the learner is exposed to more input. Although IL evolves with time, Selinker (1974) maintained that learners may permanently maintain the non-native linguistic

structure in their developing system and he referred to this as fossilization. Adjemian (1976) also

described IL as a natural language in that it develops as all other languages do but it is also

constrained by the linguistic system. However, the fact that learners' L1 is able to influence the

IL makes it dissimilar from other natural languages. The IL approach consequently focused on

comparing and contrasting the rules that constrained the L2 system in order to make predictions

for the stages of development of the L2.

Thus, with the new shift in analysing learners' language as rule-governed, internalized

and evolving system, and coupled with Chomsky's views about language, the innatist/nativist

perspective assumed new influence on the directions of SLA research.

2.2 The Innatist / Nativist Perspective

As seen above, the rejection of the behaviourist views about language learning was

mainly guided by Chomsky's argument that language learners are endowed with innate faculty

that guides them in their language development. The innatists argue that although children and

adult second language learners are exposed to limited input, they are eventually able to construct

their own language. This presupposes that they are endowed with innate and universal properties

which guide them in their language/interlanguage construction. This section looks at the main

language development approaches that have been guided by the innatist perspective. It will

consider the Universal Grammar (UG), the Typological Universals (TU) and Krashen's Monitor

Theory (MT).

2.2.1 Universal Grammar (UG) Approach

The Universal Grammar (UG) was proposed by Chomsky to explain how language is

acquired by children and to describe the linguistic competence of native speakers (White, 2007).

As Chomsky (1980) explained, "universal grammar is taken to be the set of properties,

conditions, or whatever, that constitute the initial state of the language learner, hence the basis on which knowledge of language develops" (cited in McLaughlin, 1897, p. 91). Chomsky's underlying argument is that "there must be some innate core of abstract knowledge about language form, which pre-specifies a framework for all natural human languages. This core of knowledge is currently known as Universal Grammar" (Mitchell & Myles, 2004, p. 12). Chomsky's primary concern was to explain the innate knowledge of language in children that allows them to acquire the language in their environment with little input and less effort during the critical period. The 'logical problem' argument put forward by Chomsky was that children are biologically capable of learning language in the face of inadequate input due to the genetically UG blueprint in their minds. He also argues that all human languages are similar due to an inherited universal principles and parameters that characterize languages (Lightbown, 2006; Mitchell & Myles, 2004).

According to Ellis (1994), UG consists of principles and parameters. It refers to 'general properties of language' like the phrase structure principle where 'a language has the heads on the same side in all its phrases'. Mitchell and Myles (2004) explained further that "principles are unvarying and apply to all natural languages; in contrast, parameters possess a limited number of open values which characterize differences between languages" (p. 54). The principles and parameters, according to UG provide explanation why children learn their first languages in such a short period and in an effortless manner.

Although the focus of UG was initially to account for the underlying innate knowledge about first language, researchers in the field of SLA have equally applied the UG framework in trying to understand IL and adult second language acquisition. This was possible because second language is considered as a natural language as a first language is. Adjemian (1976) in his

Interlanguage Structural Conformity Hypothesis thus says, "The universal generalizations that holds for the primary languages also hold for interlanguages" (cited in Ellis, 1994, p. 417). Besides, L2 learners are equally faced with the 'poverty of stimulus' argument where they also have to construct their grammar based on an inadequate input they are exposed to from the class or the environment. In this regard, Larsen-Freeman and Long (1991) posit that ''UG consists of a set of such innate, abstract, linguistic principles, which govern what is possible in human languages, thereby helping to alleviate the learning problem created by poverty of the stimulus'' (p. 230). Lightbown (2006) explained further that developmental sequences for both L1 and L2 acquisition have been found to be similar for many linguistic structures like morphemes, negation, questions, etc. Invariably, second language learners, unlike first language learners, are already cognitively matured and have knowledge of a first language prior to learning a second language. It has also been argued that L2 learners do not go about acquiring second language as does L1 learners. Consequently, SLA research abounds with arguments and mixed findings about the extent of the accessibility of UG features to L2 learners. In the light of these contradicting opinions, this review considers the following UG related propositions, that:

- L2 learners are constrained by Universal Grammar parameters as L1 learners are (full access);
- L2 learners are not constrained by Universal Grammar properties (no access), and
- L2 learners can access only part of the Universal Grammar properties of the L2 (partial access).

The proponents of full access by L2 learners to the UG include Cook (2003) and White (2003). White argued that L2 learners are constrained by parameters of Universal Grammar based on her study of native Mandarin Chinese speakers acquiring *wh-* movement in L2 English.

She pointed out that parameters can be reset in order to allow for UG implication in L2 acquisition. White also reviewed several studies (including that of Monalbetti 1984, Perez-Lerous and Glass 1997, 1999 and Kanno 1997, 1998b) which suggest that L2 learners are also constrained by UG principles and parameters.

On the order side of the argument, Bley-Vroman (1989) and others like Clahsen and Muysken (1986, 1989) argued that second language learners do not have direct access to the UG features as available to native speakers. Bley-Vroman generally based his argument on the Fundamental Difference Hypothesis to reject claims of UG availability to L2 learners. He explained that lack of success in adult second language learning, correlation of age and proficiency, the usefulness of negative evidence to adult learners, but not to L1 learners, etc. are all indications that UG is not available to L2 learners. Instead, the adult L2 learner depends on his/her native language and other general 'problem–solving strategies' to form the abstract knowledge of the target language grammar. In their study of the acquisition of German word order, agreement and negation, Clahsen and Muysken (1989) also found that there are differences in acquisition between L1 and L2 learners and those differences can be attributed to the fact that UG principles and parameters are available to L1 learners, but not L2 learners.

The partial access view seeks to explain that L2 learners have access to principles and parameters of UG through their L1. It is only parameters that have been activated in the L1 that are accessible to L2 learners if those parameters are also available in the L2 (Mitchell & Myles, 2004). Admittedly, as Meisel (2000) puts it "this would not count as an instance of access to UG" (p. 133). In other words, they cannot reset parameters to the L2 values if those parameters are not available to them in their L1. Schachter (1996) (as cited in Mitchell & Myles, 2004) is also in favour of the partial access view. In her study of *wh*-movement for adult Korean L1

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learners of English (English allows for *wh*-movement, while Korean does not), she found that her participants were unable to identify problems associated with *wh*-movement. She suggested that because the UG principle has not been activated in their L1, they could not access it in the course of learning the L2 English. However, for child second language learners, Schachter argues that the critical period of learning, or the Window of Opportunity as she calls it, provides them the opportunity to activate principles and reset parameters that are not available for them in their L1.

The above views provide a predictive framework about the eventual nature of learners' IL. Based on one's view about UG access in the target language, a strong prediction could be made on what could trigger the acquisition of L2 structures through activating or resetting of principles and parameters. Unlike the CA, researchers working within the Universal Grammar approach have been able to provide evidence for the type of input necessary for learning. For the adult L2 learner, the role of negative input (error correction) as well as explicit instruction is as necessary as positive input. When the L2 learner requires negative input to construct the grammar, UG studies have predicted possibility of transfer (Braidi, 1999; Gass & Selinker, 2001). The UG, although initially a linguistic theory, nevertheless the field of second language research continues to make use of its framework in order to describe the abstract knowledge and competence of the second language learner.

One major criticisms of the theory according to Braidi (1999) is the fact that it views L2 acquisition narrowly. It focuses at the grammar, morphosyntactic structures especially, at the expense of other equally important acquisition factors, like the affective and the sociolinguistic components of language learning. Its use of advanced learners to ascertain data for grammaticality judgment tests has also come under criticism. Notwithstanding those criticisms, the UG has provided enough grounds for the understanding of second language acquisition, i.e.

the L2 learner's knowledge of language and the underlying linguistic competence and behaviour. (Mitchell & Myles, 2004).

2.2.2 Typological Universals

H. Greenberg initiated the typological universals (TU) approach to research in SLA in 1966. Many others have continued it since then (McLaughlin, 1987; Ellis, 1994; Braidi, 1999). According to Ellis (1994), typological universals refer to "the cross-linguistic comparison of a wide range of languages drawn from different language families in order to discover what features they have in common" (p. 415). McLaughlin (1987) pointed out that one of the main differences between the typological universals and universal grammar is that while the former is data-driven, the latter is theory-driven. In view of that, the TU considers various features of human languages in order to provide a universal description of their grammars, like 'languages with verb-subject-object order have prepositions'. On the other hand, the UG theorizes property of language and test that property against other languages in an effort to explain principles that constrain human languages, like the structure-dependency principle which states that "language is organized in such a way that it crucially depends on the structural relationships between elements in a sentence" (Mitchell & Myles, 2004, p. 62). Thus, TU consists of rules that relate to a particular language but UG consists of general principles that relate to all languages.

As mentioned earlier, typological approaches study cross-linguistic features of various languages and therefore provide the possibility to characterize which features of human languages are common and which of them vary. Essentially, as Ellis (1994) maintained, the former is of paramount importance to the field of SLA research. In effect, researchers (including McLaughlin, 1987; Braid, 1999, etc.) have identified four types of typological universals. These are: (1) absolute universals, (2) universal tendencies, (3) non-implicational universals and (4)

implicational universals. Absolute universals refer to those features of language that are common among all languages and are without exceptions. In contrast, universal tendencies are those with exceptions. Equally, non-implicational universals relates to the presence of features of language, which are not dependent on the presence of others. Implicational universals are of the logical type 'if p then q' statements. That is, the presence of a feature of a language depends on the presence of another feature. According to McLaughlin (1987):

> Non- implicational and implicational universals may be absolute universals or tendencies. That all languages have vowels is an absolute non-implicational universal: there do not seem to be exceptions. That all languages have nasal consonants is non-implicational tendency, because some Salishan languages have no nasal consonants. Similarly, the statement 'if a language has VSO as its basic word order, it has prepositions' is an absolute implicational universal. In contrast, the statement 'if a language is SOV basic word order, it will have prepositions' is an implicational tendency, because Persian is SOV with prepositions rather postpositions. (p.84)

The typological universals approach provides a firm ground to make predictions about the ease of acquisition of language features. With its implicational universal typology, a hierarchy of language features can be described as more marked than other features as in the Noun Phrase Accessibility Hierarchy (NPAH) espoused by Comrie & Keenan (1979). According to Ellis (1994), the NPAH refers to the diverse functional occurrences of pronouns in relative clauses. The pronoun may function as the subject of its clause, as direct object, etc. Comrie & Keenan (1979) in their cross-linguistic study of various languages found that languages allow different forms of noun phrase 'accessible to relativization' and thus postulated the following universal implicational hierarchy: Subject > direct object > indirect object > object

of preposition > genitive > object of comparative. What this universal points at is that subject

relative clause is available in all languages and that if a language has relative clause higher on

the hierarchy it will necessarily have a relative clause to its left. For instance, if a language has

indirect object relative clause, it will also have direct object and subject relative clauses.

Furthermore, the hierarchy implies that relativization becomes difficult as one moves to a higher

level of the hierarchy. Thus, the higher the position of a function on the hierarchy, the more

marked it is in relation to a lower function. For instance, relativization of indirect object relative

clause is considered to be more marked than relativization of subject relative clause in a sentence

(Gass & Selinker, 2001). A point worthy of note as McLaughlin (1987) explains is that, it is not

necessary for languages to exhibit all positions on the hierarchy. Accordingly, each point defines

a cut-off point and some languages may not be able to relativize on a lower position on the

hierarchy.

As with relativization, the NPAH also makes prediction about retention or deletion of

pronoun that the relative marker represents (Braidi, 1999). Whiles English does not allow for

pronoun retention in all positions of the NPAH (e.g. the woman that *she* spokes to me …),

Keenan & Comrie (1977) found that Arabic allows for pronoun retention on all positions except

in subject relativization. Again, if a language allows for retention at a higher position it follows

that a lower position on the hierarchy also allows for the same. Keenan & Comrie pointed out

that more marked positions on the hierarchy exhibit pronoun retention.

Importantly, the concept of markedness has been used by Eckman to make predictions

about areas in the TL that would be difficult to the L2 learner. Unlike the CA, where it is

assumed that learners should have difficulty where there are differences between their L1 and TL

structures, Eckman's Markedness Differential Hypothesis (MDH) proposes that TL features that

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would be difficult for the L2 learner rather depend on a set of factors. TL structures should be difficult if there are differences between the L1 and the TL and depending on the relative markedness of the structure (McLaughlin (1987). The MDH states that:

> The areas of difficulty that an L2 learner will have can be predicted based on comparison between the NL and the TL such that:
>
> (a) those areas of the TL that are different from the NL and are relatively more marked than in the NL will be difficult;
>
> (b) the degree of difficulty associated with those aspects of the TL that are different and more marked than in the NL corresponds to the relative degree of markedness associated with those aspects;
>
> (c) those areas of the TL that are different from the first language but are not more marked than in the NL will not be difficult. (Eckman, 1985, as cited in Braidi, 1999; McLaughlin, 1987).

In explaining what makes a feature marked or unmarked, Greenberg (1966) and others have provided that simplicity/complexity, frequency and distribution are the criteria to be considered (cited in Braidi, 1999). In Arabic for example, singular nouns are considered unmarked compared to plural nouns because singular is less complex. In terms of frequency, trilateral verbs occur in texts more than quadrilaterals do. Thus, trilaterals are considered unmarked relatively. For the distribution criterion, it is a well-known fact that duals occur in less languages than plurals. Arabic exhibits dual number and is therefore more marked than the plural.

If typological universals constrain native languages as seen above, it is necessarily assumed that they will also constrain interlanguages and influence acquisition of L2 grammatical

structures as well. This is not far-fetched because interlanguages are also natural languages as argued by Adjemian (1976). While research findings on the role of typological universals in L2 acquisition are somewhat conflicting, several findings from studies on acquisition of relative clauses seem to suggest that typological universals do play a role in L2 acquisition. Gass (1979) studied the acquisition of various relative clause structures in English with 17 participants from diverse backgrounds, including Arabic. Gass collected data from sentence-combining task, grammaticality judgment task and free composition task. The results suggest that learners follow the predictions of the NPAH. Gass also found that participants of languages that retain pronoun (resumptive pronoun), like Arabic and Persian, were more likely to retain pronoun in relative clause sentences like, "the lecturer that I met *him* is the head of the Arabic section". On the contrary, participants who delete resumptive pronouns in their L1 (like French and Italian) were less likely to make errors of the above. Hyltenstam (1984) carried another study on resumptive pronouns. The study looked at the use of presumptive pronouns by Swedish L2 learners from Spanish, Finnish, Persian and Greek background. Spanish and Finnish do not retain pronoun while Persian and Greek do. These four languages also manifest different accessibility to relativization on the NPAH hierarchy. Hyltenstam used picture elicitation task to collect data from 45 participants on the production of relative clauses. The result of the study was consistent with the predictions of the accessibility hierarchy. While all learners manifested evidence of pronoun retention because retention is unmarked cross-linguistically, the degree at which the resumptive pronoun retention occurred varied based on the marked position of the grammatical function on the hierarchy. Those languages that allow for retention produced more copies of retention than those that do not allow. Other experimental studies like that of Gass (1982) and Eckman (1988) looked at the effect of instruction on the ability of learners to generalize from a

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more marked structure to a less marked structure. Results from both studies provided positive evidence on the ability of learners to make generalization of relative clause formation to a lower function on the hierarchy.

The import of the above studies is that there seems to be interaction between learners L1 and the TL. However, the extent of that interaction or transfer seems to manifest not only out of differences between the L1 and L2 but also out of the relative markedness of the structure on the hierarchy. Besides, studies based on typological universals seem to suggest that teaching a more marked structure will eventually lead to the acquisition of a less marked structure. Certainly, typological universals provide another view on how language is acquired as well as the effect of instruction on language acquisition. In effect, Braidi (1999) concluded that universals, especially those that originate from cognition, like typological hierarchies discussed above, have provided many explanations on L2 acquisition.

2.2.3 Krashen's Monitor Theory

Krashen's Monitor Theory (MT) is one of SLA theories that has sort to provide another explanation on how adult second language is acquired based on the nativist ideas. The theory has its origin from Chomsky's universal approach to language acquisition. Like the UG, Krashen's MT fundamental claim is that acquisition is handled because of an innate endowment (Larsen-Freeman & Long, 1991). This claim makes it akin to the nativist/innatist view of language acquisition as described earlier. The monitor theory started as a model of language acquisition in the 1970s and ended up as a theory by 1985 with a number of hypotheses that described how second language is acquired. The hypotheses are: (1) the Acquisition-Learning Hypothesis, (2) the Monitor Hypothesis, (3) the Natural Order Hypothesis, (4) the Input Hypothesis and (5) the

Affective Filter Hypothesis. These hypotheses are explained briefly followed by criticism levelled against the theory.

First, the Acquisition-Learning Hypothesis attempts to differentiate between acquisition and learning. According to Krashen (1985), Acquisition refers to the subconscious developing of knowledge of language in the form of natural interaction and communication. Learning on the other hand refers to the conscious process of knowing about the form and the rules of language in a formalized environment like the classroom. In Krashen's view, acquisition brings about communication and learning provides the system that makes sure utterances are correct (Gss & Selinker, 2001).

While the distinction between the natural and classroom environment in developing knowledge of language is well acknowledged by researchers, Krashen has been criticized for his dichotomy between conscious and subconscious processes in the two language developing environments. Mitchell and Myles (2004) argued that there is no any process for verifying learners language production whether it is due to conscious or subconscious processes. Besides, Krashen's claim that there is no interface between learned and acquired knowledge has also come under considerable criticism from McLaughlin (1987) and others. In Bialystok's (1978) 'explicit and implicit' theory of second language learning, Ellis (1994) maintains that it is similar to the Acquisition-Learning Hypothesis and both are based on conscious or subconscious representation of knowledge. However, Bialystok's theory argues for an interface between explicit and implicit knowledge. Ellis further explains that "formal practicing enables explicit knowledge to become implicit, while inferencing allows explicit knowledge to be derived from implicit" (p. 357). These criticisms notwithstanding, the Acquisition-Learning Hypothesis has provided many explanations to language instructors for a number of language development

variations among learners. It has provided explanation about why learners for instance may know a simple rule but may not be able to apply it, mainly because they have only learned the rule but not acquired it (Mitchell and Myles, 2004).

Second, he Monitor Hypothesis explains the relationship between acquisition and learning as contrasted by Krashen. According to Krashen (1982), learning acts as an editor to what has been unconsciously acquired. On the other hand, communication is initiated as a result of acquisition but learning comes into play only by monitoring and correcting utterances and language forms that are produced by the learner in order to improve accuracy. Implicitly, Krashen seems to suggest that emphasis should rather be placed on communicating rather than rule learning in the teaching of second language. Explaining further, McLaughlin (1987) pointed out that "thus the Monitor is thought to alter the output of the acquired system before or after the utterance is initiated entirely by the acquired system" (p. 24).

McLaughlin (1987), as one of the fiercest critics of MT, argues that second language learners rarely use Monitor in normal language utterances and that it plays no role in language competence as seems to be suggested by Krashen. Besides, McLaughlin maintains that learning (as expounded by Krashen) transcends the monitoring role and can lead to comprehension as well. One other criticism of the MT is that it has failed to provide evidence of Monitor use in production. It is actually difficult to determine whether the rules used in utterances are as the result of learner's conscious or unconscious knowledge of the target language. This according to McLaughlin makes the MT untestable. Again, Krashen's reliance on the notion of Monitor to explain individual differences among adult second language learners has been unsuccessful.

Krashen claims that there are Monitor over-users, under-users and optimal users. Monitor over-users rely much on rules during language production and that makes their utterances less

fluent while under-users are more fluent because of their least attention to rules and they do not seem to care much about errors in their production. There are other second language users who rely on rules as and where necessary and these are the optimal users of Monitor. These positions as expounded by Krashen sounds convincing. However, it seems very difficult to provide any empirical evidence as to the source of the use of rule whether that is the result of learning or acquisition. In fact, he himself could not provide much evidence to support that (Larsen-Freeman & Long, 1991; McLaughlin, 1987; Mitchell & Myles, 2004).

Third, the Natural Order Hypothesis, Krashen (1985) states that:

We acquire rules of language in a predictable order, some rules tending to come early and others late. This does not appear to be determined solely by formal simplicity and there is evidence that it is independent of the order in which rules are taught in language classes.

(as cited in Mitchell & Myles (2004), p.47)

Krashen's Natural Order Hypothesis seems to have been influenced by the 'morpheme order' studies embarked upon by Dulay and Burt (1974) and others. Dulay and Burt used the Bilingual Syntax Measure to elicit data on the use of morphemes by children from different L1 background learning English as second language. The study shows that children's speech tested provided evidence of order of acquisition for morphemes (McLaughlin 1987; Gass & Selinker, 2001).

The Natural Order Hypothesis has often been criticized of the fact that the Morpheme studies which Krashen relied upon in formulating the hypothesis 'did not measure sequence of acquisition but rather accuracy (or difficulty) of use in obligatory contexts'. In addition to the methodological arguments raised against the morpheme order studies, Gass and Selinker (2001) explained that some tests revealed different trend in accuracy order. Krashen relied on the

Monitor concept to explain those inconsistencies, though. As a corollary to the MT however, Gass and Selinker again maintain that using the concept of Monitor to explain those inconsistencies renders the hypothesis vacuous and circular, and therefore difficult to verify.

On the contrast, both McLaughlin (1987) and Mitchell & Myles (2004) argue that a weak version of the Natural Order Hypothesis could be accepted. The weak version claims that staged and natural order in learning things exist, but not always. Studies (like those reviewed by Ellis, 2008, pp. 91-102) on the acquisition of syntactic structures like interrogatives, negative structures, etc. provide strong empirical evidence to this claim. Ellis (2008) in summarizing his write-up on 'developmental patterns: order and sequence' says 'acquisitional sequences are not completely rigid' (p. 111). He explains that learners L1 and even research limitations on investigated developmental patterns may all have influence on developmental order.

Fourth, based on the claims of the Natural Order Hypothesis, where Krashen assumes that learning always follow a natural developmental order, Krashen formulates another hypothesis, the Input Hypothesis, to explain how IL development progresses from a stage to another. According to Krashen (1985), "humans acquire language in only one way – by understanding messages, or by receiving comprehensible input. … We move from i, our current level, to $i + 1$, the next level along the natural order, by understanding input containing $i + 1$" (as cited in McLaughlin, 1987, p. 36). The i refers to the current competence level of the language learner whiles the $+1$ refers to language forms and structures a step above the learner's current competence level. By receiving comprehensible input, i.e. input just one step ahead of the current competence level of the language learner ($i + 1$), Krashen assumes that second language will be acquired. To Krashen, if enough comprehensible input is provided, information about grammar will be inevitably available to the second language learner and any attempt to deliberately teach

it would be futile. Besides, speaking is as of a result of acquisition and it emerges due to the built up of competence which has been provided through comprehensible input. Consequently, Krashen (1982) argues that comprehensible input and the level of the affective filter (to be discussed next) act as the real sources of second language acquisition and IL development.

Evidently, and as Krashen himself maintains, the Input Hypothesis encapsulate the whole MT claims about second language acquisition. That said, the Input Hypothesis has been criticized on the grounds that it failed to provide evidence on how to determine both the levels *i* and *i + 1*. Besides, what constitute enough input has not been made clear buy the hypothesis (Gass & Selinker, 2001). Furthermore, the hypothesis makes claim that acquisition is attained if comprehensible input is received, and comprehensible input would have been provided so as long as acquisition takes place. This according to Mitchell and Myles (2004) makes the hypothesis circular and not testable.

To conclude this part, Krashen's Input Hypothesis suggests that second language acquisition is hinged more upon comprehensible input and the affective filter. However, McLaughlin (1987) argued that the formulation of MT was based on Chomsky's nativist approach to language acquisition and therefore, de-emphasizing the role of internal systems (which Chomsky referred to as "Language Acquisition Device") involved in language acquisition seems odd. In contrast to McLaughlin's claim, this study found that Krashen's MT arguments is largely grounded around the 'poverty of stimulus' and the innate endowment propositions. In fact, Krashen (1985) wrote, "input is the essential ingredient … [but] there is a significant contribution of the internal language processor (Chomsky's Language Device: LAD)" (P.3). Krashen could however be criticized for not making this point central in the formulation of the Input Hypothesis.

Finally, the fact that adult second language learner could still be provided with comprehensible input but acquisition may not take place is accounted for by Krashen's Affective Filter Hypothesis. The Affective Filter is "that part of the internal processing system that subconsciously screens incoming language based on what psychologist call 'affect': the learner's motives, needs, attitudes and emotional states" (Krashen, 1982, p. 46). Krashen suggests that affective variables like motivation, anxiety, confidence, etc. facilitate or inhibit acquisition. If the Affective Filter is high, he maintains that input does not reach the LAD and consequently, there would not be build-up of competence in order for acquisition to occur. Similarly, if the Affective Filter is low, comprehensible input received reaches the LAD and competence is acquired. To Krashen, in addition to the concept of the Comprehensible Input, this accounts for the differences among individuals in second language acquisition. Again, it explains why children perform better than adults in language acquisition.

In as much as level of the affective filter may have some influence on the extent of the input that reaches the LAD, McLaughlin (1987) posits that evidence (like McLaughlin, 1984; 1985) exist to show that it is not always unidirectional. In fact, practical classroom situations have provided evidence that causative correlation does not always exist between individual affect and competence in language acquisition. It is not always true that individuals with high affect are bad language learners and vice versa. The Affective Filter is also criticized because it has not provided any real explanation on how the filtering mechanism works among language learners. Mitchell and Myles (2004) thus described the hypothesis as 'vague and atheoretical'

In conclusion, it is important to mention that MT has received a lot of criticism not because it is unappealing but because it failed heuristically to stand the standard of a good theory. Arguments put forward by Krashen in support of the hypotheses were found to be

untestable and contain no empirical evidences. Notwithstanding those criticisms, Krashen's MT is credited with stimulating various SLA research projects and thereby enhancing our understanding of how second language is acquired. In explaining the relevant role MT has played in theorizing how second language is acquired, Larsen-Freeman and Long (1991) concluded that the theory served its purpose by compelling its critics to pursue research projects that sought to provide alternative to Krashen's claims. Furthermore, Krashen's ideas were instrumental in designing pedagogical instructions that moved language teaching from the behaviourist emphasis on memorization and route learning to context-based and communicative language teaching (Lightbown & Spada, 2006). It is not surprising therefore, that Krashen's Monitor Theory, even today, continues to have considerable influence on language learning and acquisition as well SLA theory and research (VanPatten, 2007). Nonetheless, in the light of certain inadequacies associated with MT and the nativist approach to second language acquisition in general, alternative psychological theories exist to explain those shortfalls. The next section considers the cognitivist perspective about SLA.

2.3 The Cognitivist Perspective

The cognitivist perspective about language acquisition views acquisition as a 'mental process' where knowledge about the TL is constructed and eventually manifests in the form of communication (Ellis, 1998). According to this perspective, SLA is better understood if we are able to comprehend first, how the human brain goes about learning new information (Mitchell & Myles 2004). In fact, cognitivist perspective about SLA is 'derivative', in that it heavily relies on findings from cognitive psychology to explain processes involved in language acquisition (McLaughlin, 1987).

In order to have a clear view of the cognitivist approaches, some few words on how it contrasts with the nativist view are in order. As pointed out earlier in Chomsky's UG concept, the nativist views about IL acquisition make a dichotomy between competence and performance. It also relates IL development to an innate mechanism, i.e. the LAD. In addition, its account of the IL system focuses on the characterization of linguistic and abstract representation of learners' knowledge. In contrast, the cognitivist account of language acquisition does not separate between the abstract knowledge of the TL (i.e. competence) in the mind and how second language users access it (i.e. performance). For the cognitivist, learning second language involves a mental process where rules and structures are mastered using different learning strategies. Additionally, it is also similar to learning any other knowledge involving the use of cognition, like awareness, memory, information processing, etc. (Ellis, 2008; Lightbown & Spada, 2006; Mitchell & Myles, 2004).

In the light of the above, cognitive theories aim at describing how the knowledge of second language develops through communication and secondly, to explain the general acquisition processes involved in IL development. Based on this, Mitchell and Myles (2004) broadly identify two types of cognitive-based approaches to second language acquisition namely, the constructionist and the processing approaches. While there are several models related to each of the two approaches, this study will be concerned with processing approaches as exemplified in Van Patten's (1996) Input Processing theory, Clashen, Meisel and Pieneman's (1981) Multidimensional Model and finally, the Processabilty Theory (PT) by Pienemann (1998) which is discussed in detail.

While the reason for reviewing the PT is obvious, the inclusion of other approaches for review is informed by the fact that they also fall under what Braidi (1999) categorized as

cognitive processing approaches (i.e. approaches that describe methods involved in storing knowledge of rules for linguistic structures and ways in which those rules are retrieved by the language learner). The other processing approaches are included for review because together they provide a broader view and a theoretical underpinning for processing approaches as well as a foundation for discussing the PT which this study rests upon. Reviewing the Multidimensional Model is of particular importance because it was the precedent to the Processability Theory.

2.3.1 Input Processing Theory

The role of input in SLA is one that has been acknowledged, albeit in diverse complexities, by all language acquisition models and theories (Braidi, 1999; Ellis, 1994; Gass, 1997). Input in second language acquisition has been looked at from different dimensions. Krashen, for instance, in his concept of comprehensible input discussed the type of input necessary for acquisition. Other researchers like Susan Gass looked at it from the social interactionist perspective in her 'Input, Interaction Model'. This section considers how the second language learner processes input in the light of VanPatten's Input Processing Theory (1996).

According to VanPatten (1996), input is the "language that the learner hears or sees that is used to communicate a message" (p.6). In the view of VanPatten, acquisition cannot occur if learners do not comprehend input. So, for learners to comprehend input which eventually turns in to intake (intake is 'the process of assimilating linguistic material' Gass, 1997, p.5), learners normally make form-meaning connection when processing information. The act of processing information (i.e. the input) according to VanPatten follows three processes namely; (1) processes that convert input to intake, (2) processes that make use of the intake in the course of developing and restructuring the IL system and (3) processes that are needed so that the developing

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linguistic system is used in communication. VanPatten (2007) made it clear that his input

processing model does not account for all aspect of language acquisition. His main concern in

articulating the model is to provide answers to the processes involved in how learners make form

– meaning connections. As a result, the theory focuses on how input is transformed to intake and

not the latter two processes mentioned above.

Describing his input processing theory, VanPatten (2007) explains that the adult second

language learner first focuses on meaning in processing linguistic information. In so doing,

second language learners pay attention to content lexical words first because of the arduous

cognitive processing involved in comprehending meaning and second, because their cognitive

capacity to process those information is limited and is not as developed as native speakers. Thus,

they cannot attend to form and meaning simultaneously because of their cognitive processing

constrains. They can only process input for meaning first before attending to form. VanPatten

calls this as the 'primacy of content words principle'. Then after, when lexical contents are

comprehended, learners can then turn their attention to non-content lexical items (like inflections

and grammatical markers) for semantic information. VanPatten referred to this notion as 'the

lexical preference principle'.

Another equally important construct of the theory is what VanPatten referred to as

parsing or the 'sentence-level aspects of input processing'. Here, the construct interprets how the

learner assigns grammatical roles to the different units of a sentence in order to arrive at a

meaning (Braidi, 1999). VanPatten describes this as the ''the microsecond-by-microsecond

computation of the syntactic structure of …sentence'' (VanPatten, 2007, p. 120). VanPattern

maintains that if a sentence is correctly structured, parsing becomes successful and sentence is

understood. Otherwise, the parsing becomes unsuccessful and the learner will not understand the sentence.

Given that learners pay more attention to meaning than form, it is most likely, Skehan, (1998) posits, that other useful information attached to the form of the input will not be extracted. In his experimental study, VanPatten (1990) predicted that if learners attend to meaning before form then it holds that learners whose attention is directed towards lexical content stand to have higher level of comprehension than those who are instructed in tasks that focus on form rather than meaning. In an experiment, VanPatten provided a listening comprehension text to two groups of learners: control and experimental group. The control group was made to listen to the text without any pre-task. The experimental group was divided in to subgroups, with each given instructional task like listening to lexical items and others given instruction on definite article or paying attention to morphological markers. The result of the study confirmed VanPatten's prediction. The study found that the group whose attention was directed to lexical content had a higher comprehension of the text item than the other groups.

In another that study that investigated the effect of instruction on paying attention to form, VanPatten and Cadierno (1993) used different instructional approaches to study L2 acquisition of Spanish word order (Spanish allows for both VSO and SVO word orders) and direct object pronouns. A progressive input processing instruction with focus on meaningful grammatical forms was used for the experimental group while the traditional grammar rule instruction method with emphasis on production and practice was used for the control group. The aim of the study was to find out the effect of the different methods on learner comprehension and production of sentences. VanPatten and Cadierno found that the experimental group performed significantly better than the control group in the comprehension test. In the production test

however, the study did not find much difference between the two groups, though the experimental group again performed better than the control group. The pedagogical implication of this finding is that input processing instruction strategies can be used to focus learner attention to form when that is a goal in itself.

To conclude this part of the discussion, these studies and others (like that of DeKeyser & Sokalski; Doughty, 1991) seem to suggest that using pedagogical interventions in the form of structured input processing instruction that focuses on particular grammatical forms can help in developing the IL system of second language learners. Skehan (1998) also explains that using proper input processing strategies, learners may find clues in the input so that they can make effective form-meaning connection in their comprehension.

Although the input processing model has provided the framework for acquiring grammatical forms, the difficulty with the model is that it has failed to show how those forms can be integrated in a successful functional communication that aids the developing IL system. In other words, it focuses on how input transforms to intake only. However, VanPatten (2007) clearly acknowledges this shortcoming. He explains that his input processing model is not a complete account of the process of SLA. Instead, it focuses on a particular part of acquisition which does not imply that he rejects other features involved in language acquisition. The Multidimensional Model is another processing model that looks at how speech is processed by learners and accounts for IL developmental sequences.

2.3.2 The Multidimensional Model

The Multidimensional Model was developed as a result of the Zweitsprachenwerb

Italienischer und Spanischer Arbeiter (ZISA) project by Meisel, Clahsen and Pienemann (1981).

The project studied the acquisition of German word order structure by speakers of Spanish and

Italian as first language. The project integrated both cross-sectional and a two-year longitudinal

design together by studying samples of speech from 45 and 12 adult learners respectively (Ellis,

1994; Larsen-Freeman & Long, 1991). The model is multidimensional because it focuses on two

different developmental areas. These are IL developmental sequences and variation in second

language development.

Meisel, et al., (1981) found that adult learners traverse through five stages of

development in acquiring grammatical structures and that those stages are generalizable to other

languages. Ellis (2008) thus described the model as 'comprehensive' because of its predictive

framework and its attempt to explain learner variability in language acquisition. The original

German word order study by Meisel, et al., (1981) predicted the following five stages:

X: Canonical order (SVO); X+1: Adverb preposing (ADV); X+2: Verb Separation (SEP); X+3:

Inversion (INV); X+4: Verb-end (V –END). Given its predictive framework, Pienemann and

Johnston (1986) were able to apply the model in English as Second Language (ESL)

environment. The ESL developmental sequence (table 1) is used here instead of the German for

the purpose of simplification.

The model as represented by the developmental sequences explains that the learner

begins IL development with formulaic language and chunk forms and in limited language

situations. The second language learner is able to produce SVO language forms according to

meaning which are largely un-syntactic. At stage two however, the learner is able to vary and

manipulate language to some extent in order to express meanings in more diverse situation. This stage is pre-syntactic but indicates a qualitative improvement in terms of mapping meaning unto form. The learner can move a structure, like an adverb from an initial position to the final position. Stage 3 and 4 indicate the advent of syntactic knowledge where the learner is able to move structures internally and not constrained by initial and final movement. This is indicated by the ability to manipulate verbs internally. Stage 4 is however more complex because of the ability to move sentence structures to a less salient position. Finally, stage 5 indicates ability to deal with complex internal structures, like main clauses, as in the English adverb – verbal phrase word order. In all, the processing of a structure depends on its position in the sentence. Structures at initial or final positions are easier to process than structures in the middle (Lightbown & Spada, 2006).

The model depended on experimental psycholinguistic (not data from the ZISA project) to provide explanation on the acquisition of the German word order sequences using the following three speech processing strategies:

(1) Canonical Order Strategy (COS): mapping of surface meaning unto syntactic form. Essentially chunk forms and learner cannot move any structure to another position.

(2) Initializing/Finalizing Strategy (IFS): this strategy allows for the movement of element to and from initial and final positions. No other movement or reordering is allowed.

(3) Subordinate Clause Strategy (SCS): here movement of an element within main clause is possible but not in a subordinate clause.

Table 1: Developmental Sequence for Acquisition of ESL

Stage	Main Features (English)	Examples
1.	Single words; formulae	My name is …
2.	SVO; plural marking	I eat rice.
3.	'Do'- fronting; adverb preposing;	Do you understand me?
	Neg. + V	Yesterday I go to school.
		She no coming today.
4.	Pseudo-inversion; yes/no	Where is my purse?
	inversion; V + to + V	Have you car? I want to go.
5.	3rd pers. –s; do -2nd	He works in a factory.
		He did not understand
6.	Question-tag; adverb- VP	He is polish, isn't he? I can always go.

(From Johnston and Pienemann, 1986 as cited in Ellis, 1994, p.105)

According to Larsen-Freeman and Long (1991), the independence of the source of explanation provides strong bases for predicting new data and this is always preferable. Unlike other processing models, Ellis (2008) wrote that the significance of the Multidimensional model lies in the fact that it provides a cognitive explanatory framework on why learners traverse through those processing constraints.

The above strategies are hierarchical, in that the learner cannot use the SCS strategy, for instance, unless the IFS strategy has been attained. Thus, learners are constrained in their IL development at any point of their acquisition. In other to move from a stage to another, they need what Larsen-Freeman and Long (1991) identified as 'shredding of strategies'. That is, overcoming a strategy before moving to another higher developmental strategy. The processing

constrains as provided above manifest in to a number of developmental sequence in the acquisition of grammatical features by IL learners. These constrains according to the model are universal and applies to all second language learning situation and structures, not just word order (Larsen-Freeman and Long, 1991).

In addition to developmental sequences, the model also accounts for variation in language development among IL learners. Meisel, et al. (1981) explain that language learners exhibit variation in their acquisition within a stage. All learners go through the same sequences, even though there are differences in terms of applying a rule, say inversion, accurately within a stage. Again, the study found that learners exhibit varying degrees of progression in acquiring language features. Reasons for this variation may be attributed to learners' orientation in terms of either 'favouring accuracy, or a predominantly simplifying one, favouring communicative effectiveness' (Larsen-Freeman and Long, 1991, p.280).

Notwithstanding its strengths and informative role, the Multidimensional Model is not without some limitations. Ellis (2008) asserts that in as much as the model provides explanation on how speech processing constrains defines the build-up of grammatical forms, the model does not describe how comprehension of those grammatical structures interact with production. Larsen-Freeman and Long (1991) also argued that given the processing constrains, there is no much information about how grammatical structures are acquired and whether there is any kind of innate knowledge underlying learners comprehension of structures. Besides, the model has not been able to set *a priori* what constitutes formulaic chunk structures. This is important, in that it insulates the model from being disconfirmed. For example, if a learner produces a structure of the stage X+4 while the processing constrains of the stage X+2 has not been overcome, under what circumstance could that be related to formulaic chunk or a disconfirmation of the model?

Ellis (2008) concluded that no solution on how to deal with this problem has been provided by the model. The above 'loopholes' could be addressed through more empirical studies of chunk forms and by setting variational limits as suggested by Larsen-Freeman and Long.

In an attempt to solve some of these drawbacks, Pienemann (1998, 2005) developed his PT that also accounts for language acquisition from the speech processing perspective. The following section provides general overview of the PT framework. Studies conducted under the framework for Arabic and other languages are reviewed.

2.4 Processability Theory

Processability Theory is a psycholinguistic metric that describes developmental sequences across languages (Pienemann, 2011). The theory argues, among other things, that the learner would produce only linguistic structures he/she can understand and that which can be handled by the state of his/her language processor. Pienemann argues that:

"the task of acquiring a language includes the acquisition of the procedural skills needed for the processing of the language. It follows from this that the sequence in which the target language (TL) unfolds in the learner is determined by the sequence in which processing routines develop which are needed to handle the TL's components" (Pienemann, 1998, p. 1)

According to Pienemann, it is our understanding of the nature of the language processor that avails us the opportunity to make predictions about how linguistic structures develop across languages. "Once we can spell out the sequence in which language processing routines develop in the learner, we can delineate those grammars that are processable at different points of development" (Pienemann, 2005, p.2). However, the fact that the language processor is psychologically constrained in terms of memory and its operative capacity for language generation, the language learner can produce only linguistic forms that are available to him at a

given period. In other words, developmental sequences are as the result of psychological

constrains in the processing of linguistic forms. Thus, on the bases of Levelt's (1989) approach

to language production (that language processing is incremental) and Kempen and Hoenkamp's

(1987) Lexical-Functional Grammar (LFG) about exchange of grammatical information within

constituents, Pienemann (1998) devised a hierarchy of processing procedures for the acquisition

of syntax and morphology as in table 2.

The hierarchy is implicational such that each preceding procedure is a prerequisite for the

next procedure. For instance, a category procedure (level 2) is needed and must be activated

before the functioning of phrasal procedures (level 3) (Pienemann, 1998). These procedures

"cannot be skipped even through formal instruction" (Pienemann, 1998, p. 250). This implies

that AFL learners would have to acquire agreement structures in a predictable order (Nielson

(1997).

Table 2: Implicational Hierarchy of Processing Procedures

		Developmental Stages				
Levels	**Processing procedures**	**t1**	**t2**	**t3**	**t4**	**t5**
5	subordinate clause procedure	-	-	-	-	+
4	S-procedure (S: subject)	-	-	-	+	+
3	phrasal procedures	-	-	+	+	+
2	category procedures	-	+	+	+	+
1	Word/ lemma access	+	+	+	+	+

Note: t = time, (+) = structure has emerged, (-) structure has not emerged
Source: from Pienemann (1998, p.8), with adaptation.

To explain the above processes, briefly, word/ lemma access refers to storing word in the lexicon without attaching/annotating any grammatical function to it. That is storing them in formulaic forms. The category procedure however implies assigning grammatical category like morphological markers to the lexical items. Here the L2 learner can identify the plural -*s* and can form the past –*ed*. In phrasal procedure, the learner can identify language features between the head phrase and its modifiers. Hence, the L2 learner can produce phrasal morphemes correctly, like '*a book'* and not '*a books'*. Once phrasal procedures have been acquired, the S-procedure follows. Here, the learner begins to assign grammatical information between phrases (exchange of information). Thus, subject verb agreement can be produced at this level. At the final stage, i.e. the subordinate clause procedure, the learner is able to identify embedded statements within a sentence and can identify main clause from subordinate clause (Pieneman, 1998). Pienemann refers to the exchange of grammatical information within these processes as 'feature unification'

Pienemann also claims that teaching any of the above stages is constrained by its processability. So, he hypothesized that when a stage is skipped "the hierarchy will be cut off in the learner grammar at the point of the missing processing procedures" (p. 7). Eventually, the L2 learner will exhibit developmental gaps in his/her acquisition of grammatical structures. For this, instruction has to focus on the next stage in order to be beneficial.

In establishing the above hierarchy, Pienemann (1998) made recourse to the principles of "exchange of grammatical information" and "perceptual salience". At the initial stage of acquisition, the lexicon of the L2 learner is not developed enough to be able to transfer grammatical information between structures because it is at the stage of "controlled processing" where mental operations need some attention without interference as explained by McLaughlin (1987) in his *controlled* and *automatic* information processing procedures. For this, Pienemenn

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(1998) predicts that, "structures involving no exchange of grammatical information between constituents can be processed before structures that do require such information exchange" (p. 76). Perceptual salience on the other hand is a cognitive strategy available to learners that allow them to identify "endpoint positions (beginning and end) in any sequence of events (which are) more salient than internal positions" (Pienemann, 1992, as cited in Nielson 1997). As a result of both the exchange of grammatical information and the cognitive perceptual salience principles, Pienemann was able to provide structural outcomes for target language as in table 3. The structural outcomes are TL specific and so in order to arrive at Arabic structural outcomes for the processing procedures, there is the need to rely upon the Lexical-Functional Grammar (LFG) analysis of grammatical structures and the concept of feature unifications.

2.4.1 A Brief Sketch of Lexical-Functional Grammar (LFG)

In order to make claims for the universal applicability of the PT processing hierarchy procedure, in relation to the grammatical structures of individual languages, Pienemann adopted the notion of grammatical information exchange as captured in the LFG (Bresnan, 1982, 2001) framework to formalize his predictions for language processing procedures. The LFG is a theory of grammar which according to Pienemann (2011) has proven to be typologically plausible. Its main characteristic is feature unification which ensures that agreement relations as well as different parts of a sentence do fit together.

LFG has three parts: (a) argument structure, (b) functional structure and (c) constituent structure. "Argument structure represents information about the arguments selected by a predicate. Functional structure represents grammatical information that is invariant across languages. In contrast, constituent structure is language specific" (Pienemann, Di Biase, Kawaguchi & Hakansson, 2005, p. 260).

Table 3: Prediction of Structural Outcomes for Processing Procedures

Level	Processing procedures	Structural outcome
5	Sub-clause procedure	main and subordinate clause
4	S- procedure	inter-phrasal info. exchange
3	Phrasal procedure	phrasal info. exchange
2	Category procedure	lexical morphemes
1	Word/ lemma access	words/ formulaic

Source: (Pienemann, 1998, p.9).

Argument structure consists of predicates and their arguments - specifying *who does what to whom.* This component is related to the lexicon. Functional structure specifies the grammatical function of constituents. Constituent structure specifies the internal structure of sentences. To account for the structure of a sentence, all three levels have to be mapped on to one another. In figure 1 for example (Peter sees a dog), the Experiencer (an argument of the predicate "see") is mapped unto the grammatical function Subject in f-structure. In other words, this mapping of a- and f-structure describes an active sentence. (Pienemann, 2011, p. 53)

2.4.2 Implementing of Processing Constraints in LFG

In line with the concept of feature unification (i.e. exchange of grammatical information between constituents), Pienemann (2011) maintains that each point of unification is related to a hierarchy of processability. For instance, in figure 1, the unification of the feature NUM in the NP (a dog) occurred within the NP only. Pieneman thus called this type of grammatical exchange of information as *phrasal.* Where exchange of grammatical information occurs 'across constituent boundaries', Pienemann called this information exchange *inter-phrasal.* For instance,

in *Peter sees* …, the affixation of the affix *s* (*in see-s*) was as the result of matching two separate constituents, namely the NPsubj (Peter) and the VP (see) for NUM. and PERS. Finally, in instances where grammatical information is part of the lexical entry, like the past tense marker –*ed*, Pienemann referred to that morpheme as *lexical* in that no features are matched in a phrase or across phrases.

2.4.3 Predictions for Arabic Hierarchy Processing Procedures

The developmental route of AFL learners does not need to be the same as other languages because of typological distance. Pienemann (1998) explained that to avoid misapplication of the theory, the processability hierarchy has to be applied to a new target language based on the Lexical-Functional Grammar (LFG) that was adopted by Pienemann to explain grammatical information exchange between constituent structures. Pienemann (2011) maintains that "the application of the full processability hierarchy to the syntax and morphology of specific languages will, of course, involve more detail analysis of the LFG formalism" (p. 131). LFG analysis for Arabic structures is beyond the scope of this present study, though. Suffice to say, however, that LFG is a theory of grammar that depends on grammatical information exchange (agreement marking) to ensure that different constituents of a sentence can be unified together (Pienemann, 1998). For example, "in the phrase 'a dog' the lexical entries 'a' and 'dog' are both annotated with the feature NUM(BER), and in both cases this feature has the value 'singular'. For the noun phrase to be grammatically acceptable, the two features have to be matched. This matching process is called unification" (Pienemann, 1998, p.97). Alhawary (2003), Mansouri (2005) and others have provided an expanded LFG analysis of Arabic syntactic and morphological structures and the outcome of those analyses (which this study relied upon) is shown in table 4.

Figure1. Three parallel components of LFG
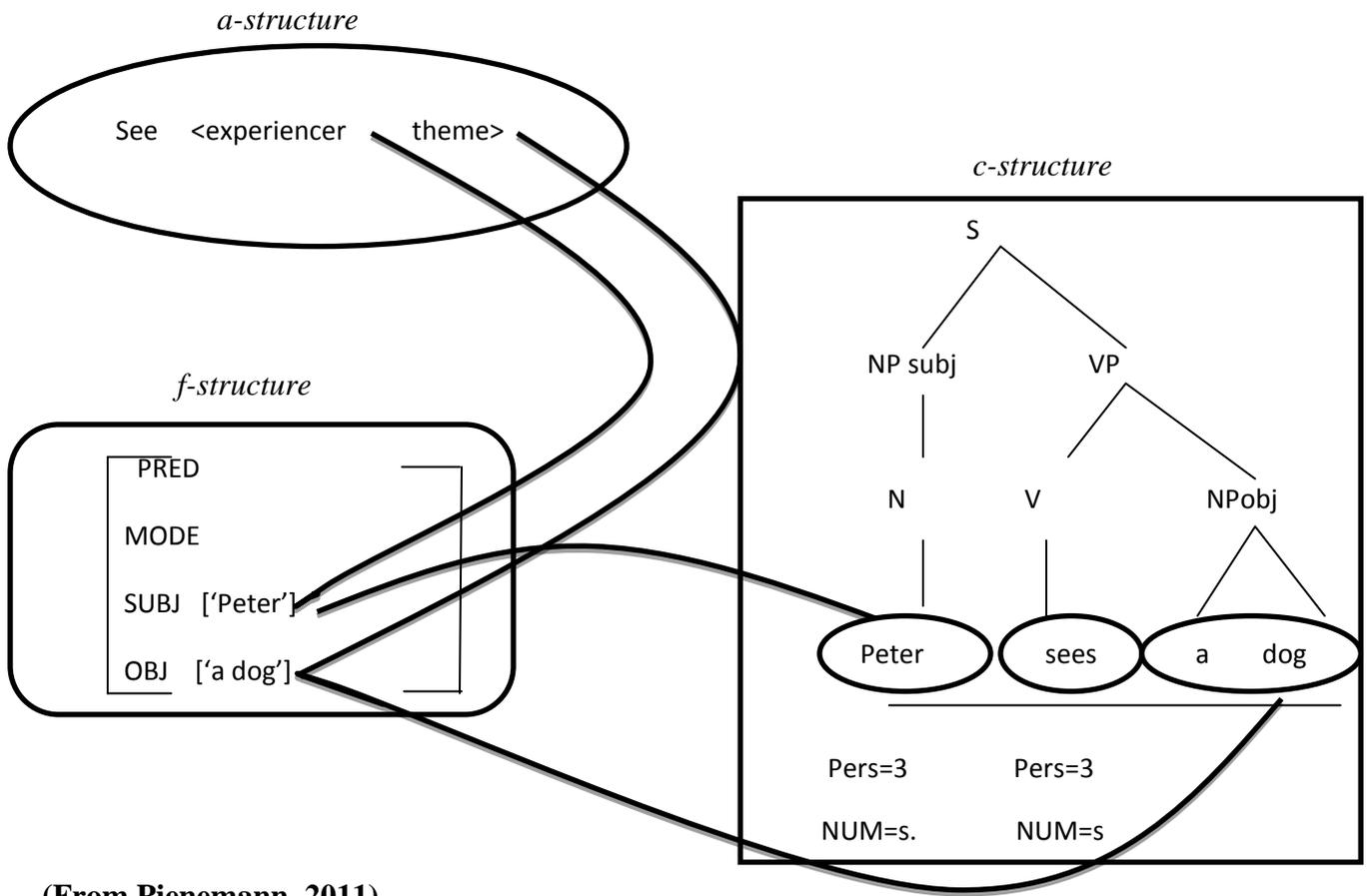
(From Pienemann, 2011)

The predictions for Arabic morphosyntactic structures are based on the fact that different structures requiring different information exchange are processed at different levels in that "the learner cannot acquire what he/she cannot process". Besides, the developmental routes are in tandem with automated processing procedures that argues that processing speed is not invariant with linguistic complexity. In other weeds, the complexity of a structure is not a determinant factor for processing procedures (Pienemann, 1998; Mansouri, 2000).

The categorization of structural outcomes for Arabic as those in table 3 summarizes Arabic agreement structural outcomes predicted, mainly, in Alhawary (2003); Al Shatter (2010); Husseinali (2006); Nielson (1997) and Mansouri (2005).

Table 4: PT Developmental Route of Arabic Morphosyntactic Agreement Structures

Stage	Processing Procedures	Information Exchange	Arabic Morphosyntax Structures
5	Subordinate clause procedure	Inter-clausal (or distinction between main and subordinate clauses)	• Relativisation (Embedded Adjectival Clause [AdjCls]) • ʾan + verbal complement (Vcomp) • embedded ?anna + clausal complement(EmbdCls)
4	S- procedure	Interphrasal (exchange of info. between constituents and from internal to salient constituent)	• VS(O) agreement • SV(O) • N + Predicative Adj.
3	Phrasal procedure	Phrasal(exchange of info. within constituents)	• Dem-al-N • N-Adj
2	Category procedure	Lexical (no info. exchange)	• N-t (semantic gender) • V-affix
1	Words/ lemma	none	undifferentiated words

2.4.4 Non-Arabic Empirical Studies

Various investigations have been conducted in different languages, including Arabic (like Alhawary, 2003; Mansouri, 2000; Nielson, 1997), that tested the plausibility of PT and its predictions for the acquisition of L2 grammatical structures. Di Biase and kawaguchi (2002) studied the plausibility of PT in the IL development of Italian and Japanese second language learners. In order to do this, they proposed to demonstrate that "predictions that can be derived from the general architecture of the theory for specific languages will be borne out by empirical observations". This according to Di Biase and kawaguchi will be achieved by analysing data produced by participants.

Data were collected from a cross-sectional study from six university students of English L1 learners of Italian L2 at the beginner, intermediate and advanced levels. Four Italian morphological and syntactic structures (*-i* plural marking on nouns; *-to* past marking on verbs;

NP agreement [plural –*i*]; Topic- Object agreement) were studied at the lexical, phrasal and interphrasal levels of information exchange. The Japanese study on the other hand had a mix of longitudinal case study and cross-sectional study design containing nine students. Five Japanese morphosyntactic structures (verbal inflection; V- *te* [complementizer] V; passive; causative; benefactive) were also tested at the same levels of information exchange as the Italian structures. Data elicitation included freeform conversation and interviews. For both languages, a structure is deemed to have been acquired if a learner applies a rule more than once in a lexically and structurally different environment.

Through the distributional analysis of students data, Di Biase and Kawaguchi (2002) were able to provide an implicational hierarchy indicating that their participants (in both languages) acquired lexical > phrasal > inter-phrasal structures in that sequence. This implies that their initial proposition is borne out. In essence, the fact that the PT developmental sequence has been confirmed also provides evidence for the typological validity of PT claims.

Zhang (2005) in a longitudinal study expanding one academic year investigated the L2 development of five Chinese grammatical morphemes (the progressive marker *zhengzai-*, the experiential marker-*guo*, the possessive marker-*de*, the classifier, and the relative clause marker *de*.) representing the lexical, phrasal and inter-phrasal levels on the PT hierarchy. Data were collected at different times during the school year. The participants where three university students from English L1 background who were learning Chinese as an L2. Using distributional analysis and the emergence criterion of three tokens in lexically varied contexts, Zhang found two of her participants (Kate and Dave) to have similar developmental route consistent with PT predictions. In the case of the third participant (Sharon), the study found that two different morphemes at the lexical and phrasal levels of the hierarchy where rather acquired during the

same period. Again, a lexical morpheme was found to have developed later than a phrasal morpheme.

Zhang concluded that the fact Sharon did not show 'developmental distinction' in two routes is not an invalidation of the developmental sequence (see page 170). This interpretation is a little bit problematic in that, Zhang has earlier ruled out the possibility of formulaic chunk in Sharon's lexical and Phrasal morphemes. For this, the study could better be described as inconclusive or there is the need to collect more data on Sharon, since Zhang herself has reported that tokens produced by the participant (in the *-de* and *classifier* morphemes) were less than the criterion (three tokens in lexically varied contexts) she has set. Besides, these two morphemes were also not specifically targeted during the elicitation sessions and this may had affected Sharon's production.

Dyson (2009) tested the PT prediction that "morphological acquisition is the driving force in ESL development". If PT is correct, Dyson hypothesized that data produced by his participants should show evidence of morphological properties at the same time as, or before, syntactic properties. Oral data were collected from two adolescent Chinese speaking ESL learners in six sessions of communication tasks involving interviews over one academic year. Following Pienemann's (1998) emergence criterion and in order to neutralize the effect of formulaic chunks, Dyson adopted Mansouri's (2005) approach to the criterion: the existence of *two* tokens with different lexical items and different structural/ morphological forms. The structures so produced were compared to different context or linguistic situation in which they were used.

After analysing the production data as compared to PT predictions of ESL developmental stages, Dyson (2009) found contradicting evidences. While there is evidence to support his hypothesis, he also found counter evidence that may invalidate the hypothesis that morphology

drives stage development. The study found syntax to have developed before morphology at stages three and four for both participants. At stage two however, both participants acquired syntax and morphology at the same time as predicted by PT. Dyson posits that while there has been inconsistency in the prediction about the role of morphology, both syntax and morphology were acquired in the predicted sequences but not as PT suggested that morphology emerges before syntax.

In as much as I agree with Dyson's (2009) conclusion, it is important to point out that his operationalization of the emergence criteria for the ESL structures he investigated was not consistent. Dyson decided to use Mansouri's (2005) operationalization of emergence (as stated above) for some structures and a different criterion for other structures (like the *S+Aux+V*, and *Wh-Fronting* structures) with the reason that these latter forms cannot be compared to the contexts in which they were produced. For these latter structures, he decided that acquisition is defined as "one productive token of structure in the presence of *four* (emphasis mine) different lexical and/or structural/ morphological contrasts" (p. 363). Obviously, that has the potential to produce different results when it comes to analysis. It is therefore not surprising to find that some developmental stages have been acquired either earlier or later than PT predictions, probably due to the inconsistencies of the emergence criterion used.

Baten (2011) tested a hypothetical sequence for German case acquisition derived from the PT framework in order to establish whether developmental routes predicted by PT occur in German morphology. Baten performed a cross-sectional study by collecting data from 704 Flemish L2 learners of German. The participants at the time of the study were pupils from several secondary schools at the 10th, 11th and 12th grade. The data was elicited through "fill-in-the-blank-exercises". According to Baten, the research design was chosen so that German case contexts can

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be supplied in the exercises which normally recur very little in spontaneous speech. Furthermore, the exercises were time constrained in order to allow for unconscious and automatic processing as suggested by PT. Baten used accuracy rates (i.e. proportion of case use in a different case contexts) followed by analysis of the distribution of case use in different case contexts.

Baten (2011) reported that the study suggests the existence of developmental routes consistent with those proposed by PT. The study indicated that lexical morphemes appeared first followed by phrasal and then finally the inter-phrasal morphemes. However, the study could not reveal any information about intra-stage variation, which according to Baten is relevant to the fourth stage (inter-phrasal level) of the PT hierarchy. Although no explicit reason was provided, it is my conviction that this could still have been accounted for by further analysing the cases supplied by participants for each grade. Variation in terms of appearance of cases within each grade level may suggest intra-stage variation. However, as explained by Baten himself, the main purpose of the study was to provide "a first impetus to research on German morphology" as hypothesized by PT. Consequently, the need for further research regarding limitations for the present study is appropriate, Baten noted.

The above review attempted to provide some selective views about studies conducted in languages other than Arabic and their findings, ranging from Chinese, German, Italian and Japanese. While these studies have looked at different dimensions of PT all in the attempt to test PT plausibility, importantly, most of these studies have provided strong evidence for the typological plausibility of PT, though with some observations. The next section reviews studies conducted to test the PT plausibility for the Arabic language.

2.4.5 Arabic PT Empirical Studies

Nielson (1997) tested PT predictions of acquisition procedures by comparing those procedures to predictions she made about acquisition order of agreement procedures in Arabic based on the PT framework. Her focus was at stages 3 (x+2) and four (x+3) of the processing procedures were Pienemann (1998) argued that there is information exchange between (i.e. phrasal) and across (i.e. inter-phrasal) constituent structures respectively. Structures she investigated at these levels were *idafa*, Demonstrative NP, *al-*Noun+ *al-* adj. and subject-verb agreement. Different oral tasks, including interviews and role-play were used to collect data for the longitudinal study which lasted for over one year. The participants were two adult Danish learners of L2 Arabic. Following Pienemann (1988), Nielson adopted the "systematic emergence criterion" (i.e. the first systematic use of a rule to indicate initial point of acquisition) to analyse her data. Instances of correct use of rule were related to the overall number of use. In order to get rid of formulaic chunks, instances of use of a structure have to be five or more.

Nielson (1997) found that predictions made by PT that phrasal morphology is acquired before inter-phrasal morphology is borne out in that structures she categorized under x+2 were acquired before those of x+3. However, the study also found that exchange of information within constituent does not occur earlier than information exchange across constituents as indicated by the Processabilty Theory.

However, a close look at figure 5.3 (p.85) of the study shows that *al-*noun; *al-*adj. and *Dem.* NP have been classified as x+3 structures which are not (see Alhawary 2003; Al shatter 2011; etc.). In fact, they are part of the x+2 stage and therefore the claim by Nielson about the order of occurrence of exchange of information within or across phrases cannot be justified. Again, based on empirical evidence provided by Nielson (1997) in p.68, it is clear that the number of instances

in which both the *idafa* and Dem. Pronoun occurred were comparatively low throughout the data collection sessions. In essence, making deduction out of this small data relative to the subject-verb agreement data (p.73-74) that has more occurrences makes Nielson's argument unsustainable. The speech produced by the two participant in respect to the two structures (*idafa* and Dem. Pronoun) is therefore not enough to invalidate one of the main explanatory frameworks of the theory, i.e. information exchange between or across phrases.

Mansouri (2000) investigated whether the processing of Arabic morphosyntactic structures by Arabic as L2 learners would follow the same developmental sequences reported in Pienemann (1998) and in other cross-linguistic SLA studies. Mansouri elicited two oral data samples from four L1 students (two each at the beginner and intermediate levels) in a cross-sectional quasi-longitudinal study that extended for over one academic year. Further, the data were analysed using both distributional analysis and implicational scaling incorporated within the general PT framework. In Mansouri (2002), acquisition occurs if a learner is able to produce a structure for at least five times in lexically and grammatically different contexts. Mansouri provides mixed findings in relation to syntactic and morphological structures he investigated. For Syntax, the findings pointed to similarities between Arabic developmental procedures and those predicted by PT. However, the acquisition of Arabic IL morphology showed violations of PT predicted developmental routes. Despite these violations, Mansouri maintains that the validity of PT as a universal predictive framework should not be called into question because "structural properties of morphology in non-cognate languages do not lend themselves to plausible processing mechanisms as do syntactic properties" (p. 195). If this argument is to be taken, then the universality of the theory has to be questioned instead but not the contrary.

Arguably, certain categorization of structures may have led to those violations realized in the data. For instance, Mansouri categorized inter-phrasal agreement (S-V), regular plurals and dual number as inter-phrasal structures (S-procedure), were exchange of information between constituents and from internal to salient constituent positions occurs. While this is true for S-V agreement, the same cannot be said for regular plurals and Dual- Number. Exchange of information for these two structures is within the phrase, which makes them phrasal procedure structures (stage three), and not S- procedure (stage 4). See Husseinali (2006).

Mansouri (2000) has argued:

The data reveals a few instances of inter-learner variability which raise a number of theoretical questions… This type of variation can potentially undermine the validity of the universal claim that there is a definite and fixed order of acquisition stages across all learners regardless of their first language (L1). (p.175)

Ironically, it is not clear why Mansouri makes this claim against the theory. The fact that there is inter-learner variability within a stage does not undermine the validity of PT universal claim. The theory allows for variations in the ultimate attainment of accuracy among learners within the same developmental stage. In fact, Pienemann (1998) referred to those variations as 'developmental trailers' and that the fact that the learner has reached a stage is not a prediction that all structures within that stage have to emerge in tandem. What is important, according to Pienemann, is not inter-learner variability but to "determine how the concept of stages in language development can be falsified" (p.151). He argues that developmental conflict in the form of inter-learner variations arises because of the "structural independence of individual grammatical rules" (p.247). In other words, two or more structures may be classified under the same processing procedure although they may belong to discrete morphological categories. For

instance, both subject-verb agreement and Noun+ predicative Adjective are categorized under the inter-phrasal procedure (stage four) in Arabic. However, these two different grammatical structures are prerequisite for the processing of stage five. Braidi (1999) also puts it succinctly that learner orientation towards the TL also accounts for this variability. In essence, variations that are not of developmental stages type do not invalidate PT universal claims.

In another study, Mansouri (2005) provided a typological account of stage three (phrasal agreement) and stage four (inter-phrasal agreement) developmental features for Arabic IL morphology and also attempted to establish developmental routes for Arabic agreement structures from the PT perspective. Data were elicited from two English-speaking learners of Arabic through eight spontaneous oral interview conducted over four school semesters. For this study, Mansouri defines emergence as the production of at least one minimal pair of a given structure in a morphologically and lexically variable contexts. After establishing prediction for Arabic agreement structures, Mansouri reported that overall, learners' production data were in line with PT predictions, in that phrasal morphology emerged before inter-phrasal morphology. This is despite the fact that a structure like *idafa* (a phrasal structure) was produced later than S-V agreement (inter-phrasal structure) at time 1 in George's data (see tables 3 and 4, Mansouri, 2005, pp. 141-142.

Unlike Mansouri (2000), a significant shift in Mansouri (2005) is the attempt to provide a viable explanation for intra-stage sequencing or what seems to be 'developmental gap' (i.e. intra-stage skipping) observed from learners' data. Mansouri (2005) observed that the sequencing of structures within a stage (for instance in the phrasal stage where you have structures like: N-Adj. (Natural Gender and Number); N-Pron-Adj.; N-N (*Idafa*); Card-N-Adj.) can be accounted for through a combination of explanatory tools like language-specific typological features and

morpheme types. In other words, "not all structures within a given stage share exactly the same typological features in terms of form-function relationships. Therefore, it is not imperative that all structures within such a developmental sequence emerge before the next stage emerges" (Mansouri, 2005, pp. 146-147).

Alhawary (2003) is one of such studies that tested the predictions of PT. He collected data from nine American English speakers of Arabic as an L2 in a longitudinal study. The target structures for the study were noun-adjective (N-A) and subject-verb (S-V) agreement predicted to be processable at stage three (phrasal procedure) and four (S-procedure) respectively. The study focused on gender (masculine and feminine) and number (singular) agreement features. Apart from Pienemann's emergence criterion, Alhawary (2003) also applied the 90% correct acquisition criterion (i.e. 90% of obligatory context produced by participants must be correct in order to be judged as acquired).

Based on the two criteria used for the analysis, Alhawary found that for most of his participants (six out of nine), S-V agreement emerged earlier than N-A agreement contrary to PT processing constraint. For this, he concluded that his Arabic data does not support the processing stages of PT hierarchy. While this is a crucial finding, unfortunately no explanation was provided about why the other three participants had their N-A agreement emerging before S-V agreement, which also support PT, albeit a relatively lower number. Alhawary instead focused on why more of the participants acquired N-A agreement late by speculating among other things that while PT's underlying rationale may be valid, its provision for processing procedures may not. For this, Alhawary suggested that other processing factors like L1 transfer has to be factored in when accounting for the processing of grammatical morphemes.

In a related study, Alhawary (2009) investigated processing claims made by PT. In particular, he investigated whether demonstrative-predicate (gender agreement) and verbal-agreement (third person singular), which are stage four structures according to PT, emerge at the same stage as predicted by PT. Data for the study were collected in a longitudinal study from eight English L1 and one French L1 students learning Arabic as L2 in the course of one school year. Another set of cross-sectional data were collected from 27 and 26 English L1 and French L1 speakers respectively learning Arabic as L2. The cross-sectional participants were placed in groups according to their placement in their home institutions as mentioned by Alhawary. Target structures were elicited through oral production of forms in one-on-one interview sessions at different times during the school year. For evidence of rule application, Alhawary (2009) adopted two-minimal token emergence criterion when demonstrative pronouns (masculine and feminine) are used with contrasting predicate features in both structures. In the case of verbal agreement, the occurrence of the same lexical verb in the third person singular for both masculine and feminine indicates rule application and emergence of the structure for that matter. In addition to these criteria, Alhawarry corroborated his evidence by applying the 90% accuracy criterion as in Alhawary (2003).

The findings of the longitudinal data show that the target structures emerged during the same period in the IL system of five students (i.e. at week 10 for Beth, Adam, Viola and Jeff and week 8 for Ann). For the other four students however, the structures emerged at different times (i.e. either demonstrative-predicate agreement emerging before verbal agreement or vice-versa). For the cross-sectional data, the findings produced by Alhawary was only about contrasting group performance in each of the two structures and no analysis was provided whatsoever about the time of emergence of the structures as was the case in the longitudinal group.

From the empirical evidence provided by the study, (see for example Table 4. P. 376), the longitudinal data cannot be said to have provided a robust evidence against PT claims because for 55.6% (5/9) of the students, the structures (demonstrative-predicate agreement and verbal agreement) emerged during the same period while for 44.4 % (4/9) the structures emerged otherwise. Besides, it was the inter-phrasal procedure stage only that was tested. The differences observed could be explained as an instance of intra-stage variability which the theory has accounted for. In other words, a strong case would have been made if the stage was compared to another higher or lower processing procedure. Alhawary explained that variation in the frequency of structure production, in the cross-sectional data between the French and English participants, could be as a result of L1 transfer. This is a good point to make considering the argument about full access to L1 parameters, as explained under Universal Grammar (UG) Approach above. Besides, the syllabus learning objectives for both the French and the English participants as analysed by Alhawary in pages 384-385 seem to suggest interplay between learners L1 and the TL. However, Pienemann, Di Biase, Kawaguchi & Hakanson (2005) maintain that the interplay between L1 and the TL is constrained by the language processor and therefore L1 transfer is possible only "when the IL has developed the necessary processing prerequisites" (p.85). It is important to refer to the point that Alhawary has been the main critic of PT and its claims, especially about the interplay between L1 transfer and processing constraints.

Al Shatter (2011) also looked at the relationship between classroom instruction and developmental stages of Arabic L2 as predicted by the Processability Theory. As part of the PT hierarchy, Pienemann (1998) argues that "stages of acquisition cannot be skipped through formal instruction and that instruction will be beneficial if it focusses on structures from the next stage"

(p. 13). Data were collected from nine students learning Arabic as L2 in interview sessions over two teaching semesters. Structures at all stages of the hierarchy (see Al Shatter, 2011, p.133) were elicited and accordingly analysed through distributional analysis and implicational scaling. In terms of the PT hierarchy, Al Shatter reported that the emergence of Arabic L2 structures in the students' data is in line with the developmental routes predicted by the theory. Comparing the sequential order of Arabic learning objectives in the syllabus of the students home institution to their IL developmental order (as observed from the data), he found that learners were not able to produce structures that they are not developmentally ready for. In essence, if teaching is to benefit IL development then the focus must be on structures that learners are cognitively ready to process.

This section has thus far reviewed a brief history of SLA and different perspectives introduced in SLA research. It has reviewed the behaviourist, the innatist, the universalist and typological perspectives about language acquisition. Besides, language learning models, like the input processing and multidimensional models have all been reviewed. The PT framework, which forms the basis for the present study, has been reviewed as well. Studies in Arabic and typologically distant languages have also been reviewed. Generally, the studies reviewed have shown that PT framework is a viable instrument that provides effective theoretical underpinning for pedagogical considerations in language learning and teaching. Besides, it provides strong explanatory and predictive framework about development of grammatical structures among L2 learners. For this, it is the aim of the present study to further test the cross-linguistic plausibility of PT using different environment that hitherto has not been employed.

Chapter 3: Research Design

3.0 Introduction

This chapter describes participants for the study and the processes and instruments used for collecting data for the study. In addition, processes used in analysing the data are described. The acquisition criterion, which is a pivotal issue in Processability Theory, has been discussed in addition to the target structures designated for investigation. These processes provide information for answering of research questions posited in this study.

3.1 Participants

A convenience sample of 15 participants volunteered to participate in the study. Convenience sampling involves "using participants who are chosen because they are conveniently available for use in a study" (Perry, 2011, p. 251). According to Perry, convenience sample provides qualitative information and it fulfils the purpose of a study as well. Cross-sectional studies that tested the PT like Bruno & Kawaguchi (2002) used participants between six and nine. Bruno Di Biase used six participants and Satomi Kawaguchi used nine participants in testing the plausibility of PT in Italian and Japanese languages, respectively.

The participants were chosen from among University of Ghana students who are learning Arabic. These learners have little or no exposure to Arabic prior to joining the university. The University has been offering Arabic as a foreign language since 1964 through the Department of Modern Languages, Arabic Section. Courses offered at the section include Elementary Arabic 1&2, Intermediate Arabic, Structure and Usage of Arabic Language, Conversational Arabic 1&2, Modern Arabic Short Story, Readings and Essay Writing: Text-Based Oral, etc. The syllabus for learning Arabic language and grammar at the institution is designed around Elementary Modern Standard Arabic by Abboud & McCarus (1983). Mainly, the grammar-translation method is used

in teaching Arabic at the section with little communicative language use. At both the third and fourth year, learners are introduced to more advanced Arabic courses, like classical and modern Arabic literature, including Arabic short story. At the end of the third year, the best five students are offered 'travel abroad' scholarship by the Government of Ghana to pursue further their Arabic studies at the Ain Shams University in Egypt for one-academic year.

Learners who have had at least one year of studying Arabic were invited to participate in the study. These participants were grouped according to their placement in the institution. Five students were considered each from the second, third and fourth year levels based on the recommendation of their instructors. These levels are similar to Arabic beginner, mid-intermediate and high intermediate levels based on ACTFL guidelines. For the purpose of this study, they were classified as group one, two and three, respectively. Admittedly, compartmentalizing participants as groups for the purposes of investigating their interlanguage poses a challenge in uncovering individual variation as far as language acquisition is concerned. The ideal situation would have been to follow each learner's language production over a period. This stands to be one of the limitations of the study. As a result, it will be necessary to conduct a further test that will depend on oral longitudinal data. The participants' demographic information is provided in table 5.

3.2 Data Collection Procedure and Measures

This study is drawn from a cross-sectional procedure in order to test cross-linguistic plausibility of PT developmental routes. It examines Arabic agreement structures produced by participants through elicitation tasks. The study used two types of data eliciting procedures that seek, primarily, to assess the receptive and productive performances of participants in the linguistic structures (discussed below) that are being investigated. Larsen-Freeman and Long

(1991) argue that gathering spontaneous data for the purpose of second language research may lead to some inconsistences in the findings of the researcher because learners may be hesitant in producing target-like language structures. Though data elicited through designed instruments also have its own challenges, this study collected data at the start of the 2012/2013 academic year using two different types of data elicitation instruments. These are the Grammaticality Judgment Task (GJT) and Elicited Production Task (EPT). Materials designed for both elicitation techniques were piloted before actual elicitation sessions. Consequently, average time needed for both tests was established. Some words were also vowelized in order to avoid misinterpretation of their meanings. I explain below the two elicitation instruments used for the present study.

3.3 Grammaticality Judgment Task (GJT)

In this task, sentences involving both correct and wrong usage of agreement structures were provided to the participants and were asked to judge their grammaticality. The aim of the task is to judge participants' receptive knowledge of target agreement structures. Schachter & Diffley (1976) argue that grammaticality judgment indicates how the learner performs in the target structure. Carnie (2001) posits that GJTs are scientifically viable elicitation instruments.

The GJT instrument contains 40 Arabic phrases/sentences, 20 are grammatical and the other 20 are ungrammatical breaching Arabic agreement rules. Each target structure investigated is represented with four correct and another four incorrect sentences. Participants were asked to judge a phrase/sentence as correct (√) or incorrect (**x**). Based on the prior piloting, the task was designed to last for 20 minutes with an average time of 30 seconds for a question so that participants make choices according to their first intuition and to allow for automatic processing,

similar to reaction time experiments which Pienemann describes as "a valid basis for a test of PT" (Pienemann, 2007, p.147). GJT is attached as appendix B.

3.4 Elicited Production Task (EPT)

The second elicitation instrument is the EPT. It assessed participants' performance in the target structures under investigation. The task contains 20 incomplete phrase/sentences that required

Table 5: Demographics Information of Participants.

Name	Sex	Level	Age	Programme
Surea	F	100	19	Arabic & Economics
Muhim	M	100	21	Arabic & Economics
Ibzia	F	100	21	Arabic & Economics
Euase	F	100	21	Arabic & Psychology
Kpice	F	200	21	Arabic & Info. Studies
Ummed	M	300	22	Arabic & Psychology
Zazah	F	300	21	Arabic & Info. Studies
Ajman	F	300	20	Arabic & Info. Studies
Abkpo	F	300	21	Arabic & Psychology
Absir	M	300	22	Arabic & Psychology
Ilidu	F	400	23	Arabic & Geography
Rieem	M	400	24	Arabic & English
Elbbi	F	400	23	Arabic & Pol. Science
Akeed	M	400	23	Arabic & Geography
Maade)	F	400	21	Arabic & Linguistics

 *Note: All names are pseudonyms.

participants to produce the agreement structures that are being investigated. Four questions were assigned to each of the five target forms. A word was provided at the end of each sentence and a participant has to conjugate that word so that it will properly fit the gap provided. Questions were set in ways that reveal participants ability to produce correct Arabic agreement structures. Bialystok (1982) used completion task as part of the elicitation instruments for the study 'on the relationship between knowing and using linguistic forms'. While GJT aims at measuring participants' *knowledge of ungrammaticality* of Arabic agreement structures (Munnich et al, 1994), the purpose of the EPTs is to assess participants' *knowledge of grammaticality* of Arabic agreement structures. EPT task attached as appendix C.

The GJT and EPT elicitation instruments were administered to each group of participants on separate days at the start of their normal Arabic class and in the presence of their instructors. The investigator was also present during all the sessions in order to provide any clarification to the participants. Participants started with the GJT then followed by the EPT. All attempts were made to make sure each participant answers his/her questions separately and according to his/her intuition without any assistance from others in the class.

3.5 Data Analysis

In analysing the data for developmental routes, Pienemann (1998) suggested two important procedures that account for acquisition of grammatical structures. These are the distributional analysis and implicational scaling. In the following sections, I provide a brief outline about the two procedures.

3.5.1 Distributional Analysis

Pienemann (1998) argues that what is necessary in analysing IL is to determine which functional contexts are related to a given TL rule. In other words, distributional analysis is a

linguistic analysis of the context in which learners produce a given grammatical structure. It shows the presence or absence of grammatical structures under investigation in the data produced by learners. Pienemann states that, distributional analysis "is nothing more than a refined analysis of suppliance in predefined contexts, except that the definition of all contexts is clearly spelled out and does not have to coincide with the target language" (Pienemann, 1998, P. 140).

The rationale behind the use of distributional analysis instead of frequency counts of grammatical structures in obligatory contexts (as used morpheme order studies) is that, the latter is less informative in that it does not account for learners IL as a continuum. Instead, it tends to relate learners' language to the TL norms without considering the evolving nature of IL. In contrast, as mentioned by Mansouri (2000), distributional analysis captures the 'continuity factor' in learners IL development by providing a description of the linguistic context in which learners produced their IL grammatical structures. It also illustrates which particular lexical item is related to learners evolving IL rule. Eventually, by using distributional analysis, a meaningful judgment can be made as to which structures produced by learners are as a result of formulaic chunks or the result of productive use.

3.5.2 Implicational Scaling

Implicational scaling, also referred to as the Guttman procedure, is used in interlanguage studies to account for evidence about how L2 learners gradually acquire grammatical features of language for a given period of time (Hatch & Lazaraton, 1991). According to Decamp (1971):

An implicational scale consists of sets of binary relations between linguistic features and other linguistic variables selected and arrayed in such a way that they result in a triangular matrix which looks like the following:

F1	F2	F3	F4	F5	features/ varieties
1	1	1	1	1	V1
1	1	1	**1**	0	V2
1	1	1	0	0	V3
1	1	0	0	0	V4
1	0	0	0	0	V5
0	0	0	0	0	V6

Note: 1 implies the linguistic feature has been
acquired, while 0 means it has not been acquired.

If the value of any square in the matrix (i.e.,VxF) is 1 then the value of any square above

or the left is also 1, whereas a value of 0 implies that the value of any square below or to

the right is also 0. (as cited in Mansouri, 2000, p.127)

Here, it is assumed that if a learner is able to produce a higher level grammatical feature, say at

the point V2xF4 (in the matrix), then implicationally, he/she should be able to produce lower

level features to left of V2xF4, which are less complex. In an ideal situation, the reverse function

is not true, though. Consequently, implicational scale provides SL researchers a useful tool to

indicate relations between developmental routes as well prerequisites for a higher linguistic

structure in a given TL (Mansouri, 200).

3.5.3 Procedures for Analysis of Participants' Data

Distributional analysis and Implicational scaling were performed on the data collected in line

with PT requirement for accounting for IL development in the target structures. Pienemann

(1998) explains that "a dynamic description of interlanguage development should be based on a

finely-grained distributional analysis" (p.139). While distributional analysis provides the

opportunity 'to capture the developmental nature of the learners' language', implicational scaling establishes hierarchy of acquisition sequences (Mansouri, 2000). Structures that have been predicted to be acquired at each stage of the Arabic hierarchy are searched and counted for in each of the participants' data. The frequency of target structures produced and their representative percentage are then calculated for each participant based on the two data elicitation instruments. In other words, figures and ratios are provided in order to show the number of linguistic contexts provided in the elicitation instruments and evidence of rule application of target agreement structures. This is followed by qualitative description of the presence or absence of a structure in the IL of each group of participants based on the acquisition/emergence criterion discussed below. First, the data for group one is analysed then followed by the second and third groups of participants in that order. Studies that tested the PT also used distributional analysis and implicational scaling to analyse their data (see Alhawary, 2003; Di Biase & Kawaguchi, 2002; Mansouri, 2005; Pienemann, 1998; Zhang, 2005; etc.)

Pienemann (1988) explains that 'quantitative observation' of target forms should fall under four categories, namely;

(1) no evidence; i.e. no linguistic contexts;

(2) insufficient evidence; i.e. very small number of contexts;

(3) evidence for non-application; i.e. non-application in the presence of contexts for rule x;

(4) evidence for rule application; i.e. examples of rule application in the presence of contexts (p.146).

According to Pienemann (1998), it is only type (3) and (4) observations that provide reliable information about the state of the IL grammar of the learner. Type (1) and (2) observations are inconclusive. Thus, evidence of rule application (acquired) in the present study is represented by

the (+) symbol while non-application of rule (not acquired) is represented by the (-) symbol. The symbol (/) is used to indicate zero suppliance of rule.

3.6 Acquisition Criteria

Studies in SLA tend to equate acquisition to the mastery of the structure under investigation by aiming at accuracy and orientation towards the target language. Cazden (1968), for instance, in the study on acquisition of noun and verb inflections defined her acquisition criteria as 'the first speech sample of three such that in all three the inflection is supplied in at least 90 percent of the contexts in which it clearly required' (p. 435). Ellis (1988) in formulating his acquisition criterion targeted 75 percent correct usage of a structure. Others have also provided accuracy levels ranging from 60 to 80 percent (Anderson, 1978; Dulay and Burt, 1974). Impliedly, the process of IL development is not accounted for because non-target structures are dismissed outrightly. Pienemann (1998) pointed out this fact and maintained that relating acquisition to accuracy levels does not account for the point at which the structure first emerges in the IL system of the learner.

Due to this methodological constraint, in properly accounting for IL development, Pienemann and others call for an emergence criterion that will instead account for the first appearance of the target form in the learner's language (e.g. Bardovi-Harlig, 2000; Meisel et al. 1981; Pienemann 1998). In line with PT therefore, the acquisition criterion to be applied in this study will be the emergence criterion. Pienemann explained that:

> From a speech processing point of view, emergence can be understood as the point in time at which certain skills have, in principle, been attained or at which certain operations can, in principle, be carried out. From a descriptive viewpoint, one can say that this is the beginning of an acquisition process. (Pienemann, 1998 p.138)

In applying the emergence criterion, i.e. the first systematic appearance of a structure, several

researchers who have tested the plausibility of the theory have operationalized it in different

ways in order to "reduce the chance of mistaking a possible monomorphemic chunk for a

productive occurrence … that had no internal structure in the learner's L2 grammatical structure"

(Zhang, 2004 p. 451). Zhang (2004) viewed the structure she investigated (-de [ADJ]) to have

emerged if *four tokens* are produced and two of them at least vary lexically. However, Zhang

(2005) adopted a different criterion, that "a form is considered to have emerged if there was a

minimum of *three tokens* in lexically varied contexts" (p. 166). In Mansouri (2000), the

production of five tokens of a structure was considered acquisition while one to four times was

categorized as emerging. Mansouri (2005) however adopted a different interpretation of

Pienemann's emergence criterion. He considered emergence to be the production of at least one

minimal pair of a structure in a morphologically and lexically variable contexts. Alhawary

(2009) considered evidence of emergence of a structure to be the production of a minimum of

two tokens of the given structure. However, to qualify as an acquired structure, it should be at an

accuracy level of 90 percent. Huseinali (2006) considered a structure to have been acquired if it

is produced at least two times with an accuracy rate of 80 percent or more. A structure is

considered emerging if it is produced two times with an accuracy rate that ranges between 60%

and 80%. If a structure is produced at least two times but the rate of accuracy is below 60%, the

structure is considered not acquired. If a structure is produced only once, regardless of the rate of

accuracy, or did not appear at all in the learners data it is considered as undetermined. Glahn et al

(2001) in testing the PT on Scandinavian languages adopted three criteria in analysing the data.

That is single occurrence, 50% use of structure and 80% use of structure. Glahn et al (2001)

maintained that "adopting single emergence criteria may be too unreliable, and that application

of a number of criteria in the analysis of data may provide more reliable results" (p. 413).

From the above discussion, it follows that any study on acquisition of grammatical

structures should not consider the first emergence of a structure only but an appropriate accuracy

level must also be considered in order to characterize learners' production as acquired. This

practice ensures that formulaic chunks are gotten rid of. Obviously, both strategies are important

so that L2 learner's IL development can be properly described as a continuum that begins with

emergence and continues to the target- like structure. The present study adopts both frequency

counts and accuracy levels in judging the emergence/acquisition of target forms under

investigation. A structure is considered as emerged if there is a rule application in the production

of at least two minimal pairs (i.e. four tokens) of any of the target forms within lexically and

morphologically varied contexts. Besides, percentage levels as those used by Husseinali (2006)

are adopted with some modification in order to match the present study. Because this is a cross-

sectional study with a fewer number of students, corpus obtained was not as much as it would

have been in a longitudinal study and therefore arguing for higher percentage levels may

wrongly overlook emergence of student's IL system. Table 6 explains the emergence /acquisition

paradigm adopted for the study.

3.7 Target Structures

The present study investigated the acquisition of agreement structures. It considered the

exchange of information at that phrasal, the inter-phrasal and the inter-clausal levels of the PT

hierarchy. Specifically, the study investigated the emergence/acquisition of the following Arabic

agreement structures: Noun attributive Adjective (NaAdj); Noun predicative Adj. (NpAdj);

Verb-subject order (VSO); Subject verb order (SVO) and Relativisation. Nominal morphology

involving features of gender (masculine and feminine) and number (singular and plural) are those considered in the present study. The permutation of gender and number with the target structures provided us with twenty different morphosyntactic agreement structures for investigation as illustrated in table7.

For the GJT, questions 1-8 represent the N aAdj. structure, questions 9-16 represent the N pAdj structure, questions 17-24 represent the SVO structure, questions 25-32 represent the VSO structure and finally, questions 33-40 represent the embedded relativasation clause structure. For the EPT however, questions 9, 10, 15 and 16 represent the N Aadj. structure, questions 4, 7, 8 and 14 represent the N pAdj. structure, questions 2, 3, 11, and 13 represent the SVO structure, questions 1, 5, 6 and 12 represent the VSO structure and questions 17, 18, 19 and 20 represent the embedded relativasation clause structure.

3.8 Description of Target Structures

The description for the target structures here is based on Modern Standard Arabic (MSA) agreement order. This is not intended to be comprehensive as it focuses on only agreement structures and features that are principally related to this study. According to Fassi Fehri (1988), "two expressions are said to agree if some of their features match by virtue of a linking relationship" (p.129). The present study investigated five different morphosyntactic agreement structures which Arabic learners are introduced to at their early stages of learning Arabic (Nielson, 1997). These structures are (1) Noun attributive Adj. (N aAdj.) (2) Verb subject order [VS (O) 3 pers.], (3) Noun predicative Adj. (N pAdj.), (4) Subject verb order [SV (O) 3 pers.] and (5) Relativisation: Embedded Adj. clause (Embd AdjCls). These agreement structures are categorized under the phrasal, inter-phrasal and inter-clausal agreement structures of the PT processing procedure hierarchy. A brief description for each of these structures follows below.

Table 6: Emergence/Acquisition Paradigm for the Present Study

Target forms	Accuracy	Frequency	Acquisition/Emergence	Symbol
• Relativisation: Embedded Adj. clause (Embd AdjCls) • VS(O) • Noun predicative Adj. (N pAdj.) • SV(O) • Noun attributive Adj. (N aAdj.)	60% or more	At least two minimal pair	acquired	+
	Below 50%	At least one minimal pair	Not acquired	-
	n/a	not appeared at all/ not answered	undetermined	( )

3.8.1 Phrasal Agreement

Phrasal agreement structures are those that involve unification/matching of diacritic features between the head of a phrase and its attributive adjective (Pienemann, 1998). In MSA, features that unify the head phrase and its adjective include definiteness, gender, number and case (Ryding, 2005). This study looks at N aAdj. phrasal agreement. Unlike English, the position of adjective in N aAdj. structures is essentially post-nominal. Agreement features considered here are gender (masculine and feminine) and number (singular and plural only).

These two inflectional features were chosen for the present study because Arabic learners tend to employ them often, rather than other cues, as part of their strategies in trying to comprehend sentences. Taman (1993) in investigating the Competition Model (Mac Whinney & Bates, 1989) and its application on the processing of Arabic linguistic structures found that Arabic learners favoured the gender cue in mapping form-function relations.

Table 7: Target Structures and Agreement Features Investigated

Stage	Information exchange	Structure	Agreement feature
5	Inter-clausal	• Relativisation: Embedded Adj. clause (Embd AdjCls)	ms; mp; fs; fp
4	Inter- phrasal	• Verb subject order [VS(O) 3 pers.]	ms; mp; fs; fp
		• Noun predicative Adj. (N pAdj.)	ms; mp; fs; fp
		• Subject verb order [SV(O) 3 pers]	ms; mp; fs; fp
3	Phrasal	• Noun attributive Adj. (N aAdj.)	ms; mp; fs; fp

m=masculine; f= feminine; s=singular; p= plural

The following are illustrations of some N aAdj. phrases used in the task:

1. *Taalib-u-n*   *jadiid-u-n*

    student (m.s.)   new (m.s.)

    'new (male) student'

2. *mudarris-at-u-n*   *muHtaram-at-u-n*

    teacher (f.s.)   respectable (f.s.)

    'a respectable female teacher'

3. ** mudarris-aat-u-n*   *naashiT-at-un*

    teachers (f.p.)   active (f. s.)

    active teachers (female)

(Note: examples 1, 2 and 3 are numbered as 4, 6 and 8 respectively in the GJT)

Structures (1) and (2) are correct because, there is agreement between the head phrase and the adjective in both gender and number. Due to the fact feature matching occurred within the N aAdj. phrase, PT classifies this structure under the stage three level of the phrasal processing procedure. However, structure (3) above is grammatically wrong in Arabic because of lack of feature agreement between *mudarrisaat-u-n* (female plural noun) and *naashitat-un* (female singular adjective) in number. There is no proper information exchange between the head phrase and its modifier.

3.8.2 Inter-Phrasal Agreement

Inter-phrasal agreement structures are those that exhibit information exchange across phrases. Here the learner is able to join phrases together to form sentences once the phrasal procedure has been completed. This study considers three different inter-phrasal structures, namely Subject verb order [SV (O) 3 pers.]; Noun predicative Adj. (N pAdj.) and Verb subject order [VS (O) 3 pers.].

3.8.2.1 Subject- Verb Agreement

In SVO syntactic structures, the verb agrees with the subject in number, gender and person (Bolotin, 1995). For the purposes of this study however, it is only the third person that is considered in addition to the morphological features introduced above. The following are examples of S-V agreement structures

4. *al-Taalib-u*   *yudhaakir-u*   *al-dars-a*

 the- student (m. s.)   revises (3 m.s.)   the- lesson

'the student is revising the lesson'

5. *al- umm-u*   *tunaZZif-u*   *al-bayt-a*

 the- mother (f.s.)   cleaning (3 f.s.)   the- house

'mother is cleaning the house'

6.* *kof-ii*   *taskun-u*   *fii akr-aa*

Kofi (m.s.)   lives (3 f. s.)   in Accra

'Kofi lives in Accra'

(Note: examples 4, 5 and 6 are numbered as 22, 18 and 23 respectively in the GJT)

3.8.2.2 Noun Predicative Adjective Agreement

Noun Predicative Adjective or Equational sentences have two constituent phrases without a copular lexical verb (Alhawary, 2009). The first phrase is known in traditional Arabic grammar as *mubtadaɔ* while the second phrase is known as *xabar*. Normally, the *mubtadaɔ* and the *xabar* occur in the definite and indefinite forms respectively. Besides, the two constituent phrases must agree in number, gender and case (Ryding, 2005). For the purposes of this study, however, it is only gender and number that has been considered. The following examples illustrate noun-predicative agreement.

7. *al-Taqs-u*   *Haarr-u-n*

the- whether (def, m. s.)   hot (indef. m. s.)

'The weather is hot'

8. *al-ummuh-aat-u*   *laTiif-aat-u-n*

 the- mothers   soft-hearted

'Mothers are soft-hearted'

9. **al-madras-at-u*   *maftuuH-u-n*

 the- school (def. f. s.)   opened (def. m. s.)

'The school is opened'

(Note: examples 7, 8 and 9 are numbered as 14, 10 and 15 respectively in the GJT)

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3.8.2.3 Verb - Subject Agreement

In VSO Arabic structures, the verb agrees with the subject with respect to gender and person features but not number (Aoun et al 1994; Bolotin, 1995). Because of this agreement asymmetry, all morphological features considered in this study (i.e. m. f. s. p.) shall apply for both constituents (verbal phrase and noun phrase) except the plural feature in the case of the verbal phrase. The following are some illustration of the V-S agreement structures.

10. *yashrab-u*   *al-Taalib-u*   *al-maaʾa*

 drinking   the- student   the- water

'the student is drinking water'

11. *yaftaH-u*   *al-awlaad-u*   *al-baaba*

opening   the- children   the- door

'the children are opening the door'

12. **yaTbux-u*   *al-marʾat-u*   *al-Taᶜaam-a*

 cooking   the- woman   the- food

'the woman is cooking food'

(Note: examples10, 11 and 12 are numbered as 29, 31 and 30 respectively in the GJT)

With the exception of examples (6), (9) and (12) above, the rest are grammatically correct inter-phrasal agreement structures, where exchange of information/agreement occurs across two constituent phrases. That is between *mubtadaʾ* and *khabar* in the case of N *p*Adj. or between subject and verb in the case of S-V and V-S word order agreement. These structures are thus classified under the stage four level 'S'- processing procedure.

3.8.3 Inter-Clausal Agreement

Mansouri (2005) posits that relativisation is indicative of inter-clausal agreement. In Arabic, relative clauses (*al-Sila*) are either definite or indefinite. The former modifies a definite antecedent by using a relative pronoun while the relative pronoun is dropped in the latter. Relative pronouns include: (1) *alladhii* (m. s.) (2) *allatii* (f. s.) (3) *alladhiina* (m. p.) and (4) *allaatii or allawaatii* (f. p.). They are inflected for both gender and number and the verb in the relative clause has to agree with both the relative pronoun and the antecedent. E.g. *al–rajulu alladhii jaaꞌa al-yawm* (the man who came today). For the purpose of this study, it is the embedded relative clause only that has been considered. This is because the indefinite clause requires higher grammatical aptitude which participants have not been introduced to.

In cases where the relative clause refers to an object of verb or preposition in the main clause, there should be matching of information between the embedded relative clause and the main clause through a pronoun affix known as al- ^{c}*aaꞌid* or the resumptive pronoun. (Ryding, 2005; Husseinali, 2006). The following examples illustrate information exchange between the embedded relative clause and the main clause.

13. *jaaꞌa   al-mudarris-u   alladhii   raꞌaitu-hu   ꞌamsi*

 Came   the- teacher (m.s.)   who (m.s)   saw (1pers.) – him   yesterday

‘the teacher whom I saw yesterday came’

14. *waSal-a   al-laaꞌibuuna alladhiina   karrama-hum   al-raꞌiis*

 arrived   the- players (m.p.)   who (m.p.)   honoured- (3pers. p.) the- president

‘the players who were honoured by the president have arrived’

15. * *haaꞌulaa-i   al-Tullab-u   humu alladhii   yujiiduu   al-^{c}arabiyya-ta*

 These (3 pers.)   students (m.p.)   who (m.s.)   know   the- Arabic

‘These are the students who know Arabic’

(Note: examples 13, 14 and 15 are numbered as 34, 40 and 37 respectively in the GJT)

Examples (13) and (14) show (i) feature matching between the embedded relative clause and the main clause and (ii) agreement matching between the relative pronoun and the resumptive pronoun. This is feature unification across clauses and therefore falls under the stage five subordinate processing procedure. Mansouri (2005) described this as referential coherence. On the other hand, structure (15) is ungrammatical in that there is no feature matching between the main clause and the sub-ordinate clause. While the antecedent (*zumalaa-u-n*) is masc. plural, the relative pronoun of the subordinate clause (*alladhii*) is masc. singular.

Thus far, we have provided a brief description of five morphosyntactic agreement structures that have been predicted to be acquired at the phrasal procedure stage, S-procedure stage and sub-ordinate clause stage of PT's processing procedures stages. These processing levels were selected for study because that is where exchange/matching of information and, for that matter, agreement occurs within the hierarchy. Once again, it is important to clarify that the categorization of the above structural outcomes are largely guided by LFG analysis for Arabic IL morphosyntactic structures conducted mainly by Alhawary (2009), Husseinali (2006) and Mansouri (2005).

Chapter 4: Results

4.0 Introduction

This chapter presents the results of the study as posited in the study questions. To recap, the study aimed to investigate (1) the path of development for morphosyntactic agreement structures among AFL learners in Ghana, (2) predictions made by PT about the emergence morphosyntactic structures and (3) whether or not there is evidence for the stability of developmental stages. In answering these questions, a distribution table containing the developmental chart for each group of participants in relation to target structures investigated has been provided. Second, the developmental routes of all the participants are pulled together in order to show the processing hierarchy charted by the participants and the implicational scaling realized thereof as a result of the analysed data. This is followed by a graphical representation of the summary of learners' scores in all the target structures that have been investigated.

4.1 Analysis of Results

4.1.1 Analysis of Group 1 Data

These are the level 200 students who have had two semesters of learning Arabic at the university. The names used are pseudonyms and their age ranges between 18 and 21 years. Table 8 shows development of the target structures investigated for this group of participants. Each of the columns contains the instances of correct use of a structure by a participant for both the GJT and the EPT against the lexically and morphologically variant tokens provided in the tasks (eight for GJT and four for EPT). The ratio of the correct use of a given structure to the total tokens of the given structure (for both tasks) is quantified in percentage indicating the accuracy level. The (+) or (-) symbol shows that the structure has been acquired or not acquired respectively.

Table 8: Development of Target Structures in Group 1

Stage	Structure	Surea		Muhim		Ibzia		Euase		Kpice	
3	N aAdj.	5/8 ; 2/4 58%	+	6/8 ; 3/4 75%	+	3/8 ; 1/4 33%	-	4/8 ; 1/4 42%	-	4/8 ; 2/4 50%	+
4	SVO	3/8 ; 0/4 25%	-	3/8 ; 0/4 25%	-	4/8 ; 0/4 33%	-	3/8 ; 0/4 25%	-	5/8 ; 0/4 42%	-
	N pAdj.	6/8 ; 2/4 67%	+	7/8 ; 1/4 67%	+	5/8 ; 1/4 50%	+	6/8 ; 1/4 58%	+	5/8 ; 1/4 50%	+
	VSO	4/8 ; 1/4 42%	-	4/8 ; 0/4 33%	-	4/8 ; 1/4 42%	-	2/8 ; 2/4 33%	-	5/8 ; 0/4 42%	-
3	Relativisation	3/8 ; 0/4 25%	-	4/8 ; 1/4 42%	-	6/8 ; 0.5/4 54%	+	3/8 ; 0.5/4 29%	-	3/8 ; 0/4 25%	-

Note: In each of the boxes that contain figures (table 8-10), the first figure represents a fraction of the correct use of a structure (tokens) over the total available contexts in the GJT task. The second figure represents the correct production of a structure (tokens) over the total available contexts in the EPT task. The third figure (i.e. the percentage) represents the ratio between the sum of correct application of rule and the sum of the contexts for both tasks.

Table 8 shows that three out of the five learners in this group have acquired N aAdj. structure which is a third stage agreement structure. Within the inter-phrasal structures however, it was only the N pAdj. that has been acquired and none of the participants has acquired the SVO and VSO structures. There is an intra-stage skipping here in that although learners did not acquire SVO structures they were able to acquire the N pAdj structure. It is also revealing to note that even though some learners attained the 50% accuracy level threshold, none of them was able to hit more than 70% level in all the instances of correct use of structures at both the phrasal and inter-phrasal agreement structure stages. Again, the data shows that all learners scored zero in the

EPT for the SVO structure. In other words, none of the group 1 participants was able to produce a correct SVO structure in the production task. However, some were able to identify whether an SVO structure is grammatical or not in the GJT, albeit at a low frequency level between 25% and 42%. I provide below instances of correct and wrong use of some structures by the participants in this group.

16. *Taalib-u-n*   *jadiid-u-n* (4 in GJT; Surea)

17. **al-dars-u*   ***Tuul-u-n*** (8 in EPT; Euase)

18. **tazuur-u*   ***al-mudiir-u***   *al-jaami ͨa-ta al-yawm* (5 in EPT; Muhim)

19.**al-Taalib-at-u*   ***al-safar-at***   *ilaa briTaaniyaa ams* (11in EPT; Kpice)

Example 16 indicates the ability of Surea to process the N aAdj. structure which involves the exchange of grammatical information of gender between the noun and its modifier. Case was not a variable in this context so the sentence would have still been considered as evidence of acquisition if the learner for instance had said *jadiid-a-n*. This according to Mansouri (2005) is to avoid analysing the data from the traditional error analysis point of view instead of "a systematic developmental analysis of inter-language" (p. 143).

Examples 17, 18 and 19 are ungrammatical because (1) the required structures and (2) the rule for producing the structures are missing in all the examples. These two rules are the existential evidence that need to be satisfied for a structure to count as acquired (Mansouri, 2005, p.143). In example 17, an inter-phrasal agreement structure, Euase instead of using a predicative adjective *Tawiil-u-n* used *Tuul-u-n*, a noun, and thus there was wrong mapping of information between the two phrases. In example 18, Muhim failed to realize that in VSO sentences, the gender of the subject (i.e. *mudiir*) has to agree with the pre-verb, which in this case should have been *mudiir-at-u.* Once again, the use of definite *al* would not have constituted rule violation, as

definiteness was not a variable in the study. *aT-Taalib-at-u as-safar-at* in example 19 is not instance of wrong usage of the SVO agreement structure. Here, we can speculate that Kpice has the rule at the back of her mind but she wrongly applied it. She knows that the verb must be feminine because the preceding noun (*aT-Taalib-at-u*) is feminine with *-at* (*taa marbuuTa*) ending. However, instead of using verbal feminine gender marker (by saying *tusaafir-u*) in order to maintain feature unification, she instead said السفرت.

There was no evidence for the acquisition of relativisation from group 1 data with the exception of Ibzia. This is quite understandable in that relativisation requires a higher processing mechanism and so long as the learners in this group have not been able to produce structures at a lower processing level, it is only logical that they cannot do so for a higher stage five structure. Looking closely at the scores of Ibzia for relativization in both tests (6/8; 0.5/4); she seems to have performed very well in the GJT than the EPT. The reason for this irregularity cannot be practically traced from her data. However, it can be speculated that it was not due to her ability to process the stage 5 structure. Further review of her data shows that even in the only relative pronoun she produced, the required resumptive pronoun was not provided in the relative clause.

4.1.2 Analysis of Group 2 Data

These participants are in the third year at the university and have studied Arabic for 4 semesters. It is predicted that this group can process stage four structures in addition to the stage three structure. Table 9 illustrates the development of target structures in the group.

The distributional table above shows that all learners, with the exception of Akpo, have acquired the stage three agreement structure, i.e. the N aAdj. agreement structure. In fact, three out of the four students attained a 75% accuracy level out of the two tasks. Abkpo however appears to have a problem in producing structures at all the processing stages. She scored zero in

production task for the N aAdj. structure as well as the other structures. Even with the grammaticality test, her scores were actually minimal; between 17% and 25% for three of the structures, i.e. SVO, VSO and Relativisation.

Table 9: Development of Target Structures in Group 2

Stage	Structure	Ummed		Zazah		Ajman		Abkpo		Absir	
3	N aAdj.	6/8 ; 3/4 75%	+	5/8 ; 4/4 75%	+	3/8 ; 3/4 50%	+	5/8 ; 0/4 42%	-	6/8 ; 3/4 75%	+
4	SVO	8/8 ; 1/4 75%	+	5/8 ; 0/4 42%	-	4/8 ; 0/4 33%	-	3/8 0/4 ; 25%	-	6/8 ; 0/4 50%	+
	N pAdj.	7/8 ; 3/4 83%	+	7/8 ; 2/4 75%	+	5/8 ; 1/4 50%	+	6/8 ; 0/4 50%	+	4/8 ; 2/4 50%	+
	VSO	4/8 ; 1/4 42%	-	5/8 ; 1/4 50%	+	6/8 ; 3/4 75%	+	3/8 ; 0/4 25%	-	3/8 ; 1/4 33%	-
5	Relativisation	4/8 ; 3/4 58%	+	5/8 ;3.5/4 71%	+	4/8 ; 1.5/4 46%	-	2/8 ; 0/4 17%	-	3/8 ;3.5/4 54%	+

At stage four, all learners were able to acquire the N pAdj. structure. For the SVO and VSO structures however, the data shows that two learners have shown evidence of acquisition of those structures. We provide below a detailed description of some incorrect phrases/sentences produced by learners within the stage four processing procedure.

20. *al-ummuhaat-u **mashghuuluun-a** bi al-ᶜmal (4 in EPT; Absir)

21. *al-jaamiᶜa-tu **waasiᶜaat-u-n** (14 in EPT; Ajman)

22. *al-nisaa-ʔu **taTbuxu** al- Tʔaam-a (13 in EPT; Zazah)

23. *ʔaraad-a al-Taalibat-u Ziyaarat-a Hadiiqa-ta Aburi (1 in EPT; Abkpo)

Examples 20 – 21 are instances of wrong application of rule by group two participants. In example 20, learner Absir used the masculine plural *mashghuuluuna* instead of the feminine plural *mashghuulaatun*. The wrong use of the word brought about mismatch of information between the NP (*al-ummuhaat-u)* and its pAdj. in the N pAdj. structure. The learner clearly understands that he needs a plural in order to have a correct mapping of agreement between the two constituents of the equational sentence. However, he failed to realize that it is a feminine plural, but not a masculine plural, that will provide the needed agreement unification. For Ajman, her use of *waasiᶜaatun* instead of *waasiᶜatun* also rendered the structure ungrammatical. In other words, instead of using a singular form to match the NP, *al-jaamiᶜatu,* she rather used a plural. Although, her data show evidence for the emergence of N pAdj. agreement structure, it is not surprising to find that this particular token has been wrongly constructed because IL, as explained earlier, is a continuum where learners backslide and at times reconstruct their grammar. Moreover, the emergence criterion and the accuracy level adopted for this study do not theoretically imply that the learner has to produce all the lexically and morphologically variant tokens within a given structure.

Examples 22 and 23 also illustrate misapplication of rule and for that matter agreement mismatching between the NP and the VP of the stage four SVO structure. The verb in sentence 22 (i.e. *taTbuxu*) does not agree with the NP (*al-nisaa-ʔu*) in number. It is quite possible that the learner assumed that the NP is singular fem. word and thus in order to have feature unification the verb should be singular fem. as well. This rule misapplication could also be traced to the nature of the NP: a plural whose singular is lexically different from the plural. The singular is in fact *imraʔ (or marʔa).* In that sense, for correct feature unification, the sentence should read *al-*

nisaa-ʾu yaTbuxna al-Tʾaam-a. Sentence 23 should also read *ʾaraad-at al-Taalibat-u* instead of *araad-a* because Arabic VSO word order must agree with the subject in gender but not number. Akpo's data (25%) however shows no evidence of the acquisition of this rule and therefore could not process it correctly.

Interestingly, table 9 seems to suggest that four out of the five learners show evidence of the acquisition of an embedded Adjectival clause agreement structure, which is at the stage five processing procedure. Individually, they seem to have performed well in both tasks with exception of Ajman who scored 37.5% in the EPT. However, the mean score for the four participants in both tasks is 61.75% that may indicate evidence for the acquisition of the embedded clause relativization agreement structure.

4.1.3 Analysis of Group 3 Data

Group four participants have had a six-semester of Arabic studies as at the time of data collection. Participants in this group major or combine Arabic studies with other programmes like Sociology, Political Science, etc. The group consists of two males and three females. Table 10 illustrates their developmental route as per target structures investigated.

These participants being relatively more advanced than the earlier two groups exhibited evidence of emergence of target structures across all the three developmental stages. All participants in this group show evidence of acquisition of the stage three N aAdj. structure with a higher accuracy level. With the stage four structures, all participants have equally acquired those structures, namely the SVO, N p.Adj. and VSO agreement structures. However, Maade and Elbbi seem to be lacking in the SVO and the VSO structures respectively. Referring to Maade's data once again, in sentence 3 she did not provide any answer and in others, she provided NPs (like *al-safar-at* and *Tabxutu* in sentences 11 and 13 respectively) which are contextually wrong.

She did not also supply the required features. Accordingly, she seems to lack in the processing of this structure. Her data, though, suggest evidence for the acquisition of the other two structures within the stage three procedure.

Table 10: Development of Target Structures in Group 3

Stage	Structure	Ilidu		Rieem		Elbbi		Akeed		Maade	
3	N aAdj.	6/8 ; 4/4 83%	+	7/8 ; 3/4 83%	+	5/8 ; 2/4 58%	+	7/8 ; 4/4 92%	+	4/8 ; 3/4 58%	+
4	SVO	6/8 ; 1/4 58%	+	8/8 ; 3/4 92%	+	7/8 ; 0/4 58%	+	8/8 ; 0/4 67%	+	4/8 ; 1/4 42%	-
	N pAdj.	6/8 ; 4/4 83%	+	8/8 ; 4/4 100%	+	5/8 ; 3/4 67%	+	8/8 ; 4/4 100%	+	6/8 ; 2/4 67%	+
	VSO	7/8 ; 3/4 83%	+	6/8 ; 3/4 75%	+	3/8 ; 1/4 33%	-	8/8 ; 3/4 92%	+	5/8 ; 2/4 58%	+
5	Relativisation	8/8 ; 2.5/4 88%	+	6/8 ;3.5/4 79%	+	4/8 ; 0/4 33%	-	6/8 ; 4/4 83%	+	4/8 ; 2/4 50%	+

The following examples from Elbbi's data show incoherence between the two phrasal constituents of the VSO agreement structure.

24. *tazuur-u mudiir-u al-jaami^c ata al-Tullaab al-yawm (5 in EPT)*

25. *tata^c allamu al-Tullab-u al-lughata al-^c rabiyya (6 in EPT)*

Example 24 indicates feature (gender) mismatch between the phrases *tazuur-u* and *mudiir-u al-jaami- ^c at.* Again, example 25 shows Elbbi failed to map the feminine feature in *tata^c allamu* unto

the subject. The subject should also be feminine, say *al-Taalibaat* instead of the masculine *al-Tullab*. This is also another indication of intra-stage variability as seen in Maade's data.

Group 3 also provides evidence of the acquisition of relativization, specifically the embedded adjectival relative clause. Though Elbbi has provided enough tokens, according to the pre-defined criterion (at least four tokens), the accuracy level fell below the 50% percent threshold and thus she cannot be considered to have provided enough evidence for the production of the structure. Maade provided six tokens with a 50% percent accuracy level. In contrast, the rest of the participants provided both a higher frequency and accuracy levels. That is between 79% and 88%. I provide below a descriptive analysis of some wrongly structured relative clauses.

26.* *jaaʾa al-awlaadu alladhiina ʾudarrisu-**huu** al-lughata al-ᶜrabiyya* (18 in EPT; Maade)

27. ** taᶜarraftu alaa al-Taalibaat-i **alladhii** addabat … al-mudarrisa*   (17 in EPT; Elbbi)

Example 26 exhibits feature mismatch between the relative pronoun *alladhiina* and the resumptive pronoun *huu,* which is actually object of the verb *ʾudarrisu* with the referent being the antecedent *al-awlaadu* (masc. plural). The correct resumptive pronoun in this case should be *hum* (masc. plural) and not *huu* (masc. singular). Example 27 lacks both the correct relative and resumptive pronouns. The head noun of the relative clause (*al-Taalibaat-i*) is fem. plural that requires *allaatii* (fem. plural), but the learner supplied *alladhii* (masc. singular) and did not provide resumptive pronoun at all. The sentence should read as *taᶜarraftu alaa al-Taalibaat-i* **allaatii** *addabat-**hunna** al-mudarrisa*

In summary, data from group one generally provided evidence for acquisition of the stage three N aAdj. structure as well as the N pAdj. structure, which is an inter-phrasal structure. Data from group two provided evidence of their acquisition of the phrasal structure. Most learners also

exhibited evidence of acquiring the stage three inter-phrasal structures. The data also shows

some have acquired the embedded adjectival relativize clause structure. Finally, table 9 also

provides evidence for the acquisition of the three processing procedures (phrasal, inter-phrasal

and inter-clausal) under investigation by group three.

In the immediate section that follows, I provide an implicational matrix displaying the

performance of all the three groups in the acquisition of the structures under investigation. This

is followed by analysis of the orderliness of the processing stages or lack of it thereof.

Table 11: Implicational Scaling of Morphosyntactic Structures for all Participants

Structure	Surea	Muhim	Ibzia	Euase	Kpice	Ajman	Akpo	Ummed	Zazah	Absir	Ilidu	Rieem	Elbbi	Akeed	Maade
	Group One					Group Two					Group Three				
Relativ	-	-	-	-	-	-	-	+	+	+	+	+	-	+	+
VSO	-	-	-	-	-	+	-	-	+	-	+	+	-	+	+
SVO	-	-	-	-	-	-	-	+	-	+	+	+	+	+	-
NpAdj.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
NaAdj.	+	+	-	-	+	+	-	+	+	+	+	+	+	+	+

In order to determine the developmental route of the participants as per the target

structures, their performances (acquired/ not acquired) were pulled together and that provided the

scalogram in table 11 above. In the following analysis, a summary of the scalogram, discussing

participants' developmental route, is provided. This is organized according to the three

developmental stages being investigated.

Stage 3 Structure: With the exception of three learners (two in group one and one in group two) all learners seem to have acquired the stage three N aAdj. structure. There is also a strong evidence of correlation among the learners at this stage in that, the number of non-acquirers of the NaAdj. structure reduced as the level of learners moves up from level 200 (group one) to level 400 (group three). In other words, with time, learners ability to process the N aAdj. structure became better. Furthermore, all participants showed evidence for the acquisition of the N pAdj. in their interlanguage. Ideally, this was not expected for group one participants. Possible explanation for this seeming abnormality will be provided in the discussion section.

Stage 4 Structures: To recap once again, matching of grammatical information occurs between and across constituent structures at the stage four procedure. For this study, three structures within this stage were considered. These are SVO, NpAdj. and VSO Arabic agreement structures. Evidence from learners' data showed that all the three groups acquired the N pAdj. structure, albeit at different accuracy levels as shown in tables 8, 9 and 10 above. The PT processing hierarchy, though, predicts only group two and three to acquire this structure and not group one. Two learners in group two and all but one student in group three seem to have acquired the SVO structure. The same number of learners also acquired the VSO structure, though different learners acquired it within the group two. Acquisition of these two stage four structures seems to have been in line with PT predictions.

Stage 5 Structure: The embedded adjectival relative clause structure was the only structure tested at this stage. Data from learners indicate that none among the group one acquired this structure as predicted by PT. All group four learners showed evidence of acquiring this stage five structure. In all, seven out of the 15 learners acquired embedded adjectival relative clause structure.

With only 10 errors (here, errors refer to cases where learners missed structures they were expected to acquire or acquired structures they were not expected to acquire. That is minuses to the right of the implicational line and pluses to the left of the line) occurring in the scalogram out of 75 items, the scale seems to be fairly implicational. In other words, pulling all the groups together, the elicited data seem to show rather a fair order of acquisition for the morphosynctatic structures investigated. In fact, the coefficient of scalability (C_{scal}) is 0.55 out of the conventional 0.60 scalability figure (Hatch & Lazaraton, 1991). A difference of 0.05 (~ 8.3%). Both Table 12 and figure 2 provide a summary statistics and a visual graph of structure acquisition by each group respectively.

Table 12: Summary of Rule Application According to Groups

	N aAdj.	SVO	N pAdj.	VSO	Relativisation
	sum of correct use / sum of obligatory occurrences				
Group one (n = 5)	30/60 (50%)	18/60 (30%)	37/60 (62%)	23/60 (38%)	21/60 (35%)
Group two (n = 5)	38/60 (63%)	27/60 (45%)	37/60 (62%)	27/60 (45%)	29.5/60 (49%)
Group three (n = 5)	45/60 (75%)	38/60 (63%)	50/60 (83%)	41/60 (68%)	40/60 (67%)

Figure 2: Graphical Representation of Scores by Groups
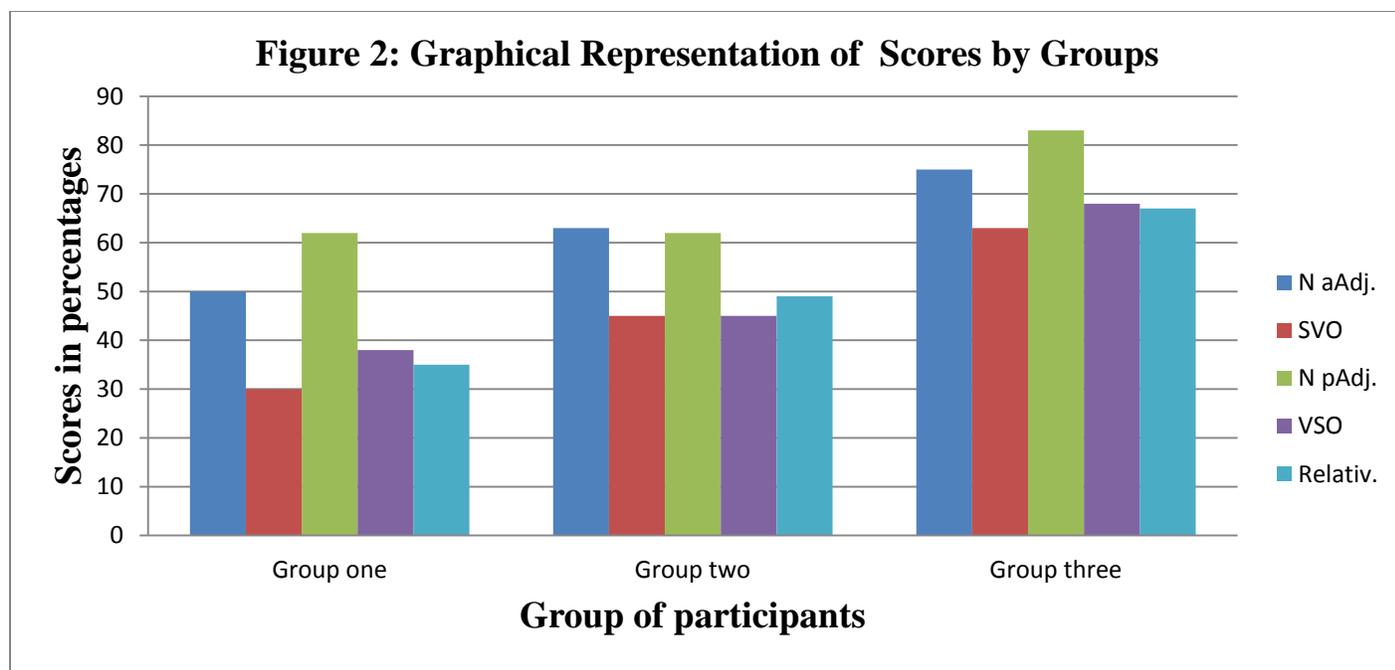
Table 12 and figure 2 illustrate an overview for the acquisition of target structures by learners.

The two illustrations show that:

1. All the three groups acquired the NaAdj. structure, scoring $\geq$ 50 % threshold of the pre-

defined acquisition criterion.

2. There is no evidence of acquisition of SVO and VSO structures by group two. All groups

acquired the N pAdj. structure.

3. Only group three acquired the stage three relativisation structure.

<center>**Chapter 5: Discussion and Conclusion**</center>

5.0 Introduction

In this final chapter, answer to the research questions is provided based on the results of the study. Pedagogical implications of the study as well as its limitations are also discussed. Suggestions for further research are provided as well as a general conclusion that summarises the entire study and the findings thereof.

5.1 Discussion of Results

5.1.1 Discussion of Results in Relation to Research Question 1

What is the path of development for morphosyntactic agreement structures among AFL learners in Ghana?

As a recap, Pienemann (1988) predicted that the acquisition of morphosyntactic structures follows the following implicational processing procedures: word / lemma access > category procedure > phrasal procedure > sentence procedure >subordinate clause procedure. (The symbol > implies 'is more accessible than'). The present study investigated processing procedures at the third, fourth and fifth levels, namely the phrasal procedure, the sentence (inter-phrasal) procedure and the subordinate clause procedure. These three levels were considered for the study because agreement structures, the topic of the present research, fall within those procedures only.

The results of the present study show that on a whole, learners acquired the stage three structure prior to the stage four structures. In order words, learners' data showed a hierarchy between the phrasal and the inter-phrasal processing procedures. Looking at the graphical presentation (i.e. fig. 2) as well, it is clear that, unlike group 1 and 2, group 3 participants acquired all the structures. Relativization was more accessible to this group than group two and

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to the second group than group one. The implication is that although some group two participants acquired the relative structure at an earlier stage, generally, the frequency of their acquisition is lower than that of group three. Thus, the present study seems to reveal the following developmental route for agreement structures by AFL learners in Ghana: phrasal procedure > S-procedure > subordinate clause procedure. In other words, structures at the phrasal procedure stage are more accessible than those at the subject procedure level, which in turn are also more accessible than those at the subordinate clause stage.

Concerning the N pAdj. structure, group one appeared to have acquired it as well, though. However, group three showed a higher accuracy level. Secondly, within the S- procedure stage, all learners showed higher accuracy levels for the acquisition of the N pAdj. structure than the other two structures, i.e. SVO and VSO word order. This phenomenon poses no challenge to the PT framework. Pienemann argues that grammatical rules are structurally independent within a given processing procedure. Besides, the emergence of a structure, say the N pAdj. structure does not necessarily imply that all other structures with similar information exchange procedure have to emerge, necessarily, prior to the emergence of a higher level processing procedure structure. As noted by Ellis (2008), learners do not acquire *all* features related to a particular stage before they move on to a higher stage. As far as relativization is concerned, group three was the only group to have exhibited a strong evidence for the acquisition of Embd AdjCls. This was expected because the subordinate clause procedure (i.e. where the relativization structure is located) involves a relatively higher exchange information process. The learner should be able to differentiate between the main clause and the embedded relative subordinate clause.

This finding is in line with Nielson (1997) concerning her first research question. Nielson found that participants in her study acquired x+2 (i.e. stage 3) structures before x+3 (stage 4) structures. It also corroborates Mansouri (2000, 2005) findings.

In summary, learners' data showed processing of agreement structures by AFL learners in Ghana cumulatively proceed in the following hierarchy: **phrasal procedure > S- procedure > subordinate clause procedure**.

5.1.2 Discussion of Results in Relation to Research Question 2

Do the morphosyntactic structures investigated emerge as predicted by the Processability Theory?

Pienemann (1998) proposed five language processing procedures, which are implicationally ordered as follows: (1) word/lemma access, (2) category procedure, (3) phrasal procedure, (4) S- procedure, and (5) subordinate clause procedure (p.80). Pienemann further explains that the implicational nature of the processing procedures implies that each level is a prerequisite for the functioning of the following level. Because the present study investigated IL agreement structures, our focus is limited to structural outcomes at the phrasal procedure, the S-procedure, and the subordinate clause procedure levels. This, as stated earlier, is because Arabic agreement structures are situated within these three levels only.

As far as the second question is concerned, the above findings conformed *broadly* to the predictions of the developmental route for acquisition of Arabic L2 morphosyntactic structures based on Pienemann's (1998) processability hierarchy. This is not without some discrepancies, though. Table 12 shows that all the three groups (level 200, 300 and 400) acquired the stage three structure. Group 3 acquired all the structures but not group one and two. Besides, the data showed an incremental development in terms of accuracy levels for each of the structures within

the groups. In other words, cumulatively, group two performed well than group one and group three performed better than group two.

On the other hand, the participants' data point to an outcome which, on the surface, seems to be inconsistent with the general PT framework. The data provided evidence for the emergence of the N pAdj. structure, which is an S-procedure structure, across all groups. Ideally, PT predicts this to emerge among group two and three but not group one. This may look like evidence of inter-stage variability, which PT hypothesizes to be unfeasible in the processing procedures. A further examination of the data, (see fig. 2), reveals that the data of both group 2 and 3 also showed higher accuracy levels for the N pAdj. structure. In effect, this study would like to speculate that there seem to be other factors other than processing constrains which led to that development.

One possible explanation for this development is to characterize the N pAdj. structure as less marked in the IL system of the participants. The Structural Conformity Hypothesis (SCH) forms the basis for this assertion. According to Ellis (2008), SCH claim "learners will perform better on less marked structures relative to more marked structures irrespective of any L1-L2 differences". One of the key issues underlying the SCH proposition is that interlanguages are linguistically similar to primary languages, and thus both exhibit similar universal generalizations. Therefore, it holds that, less marked linguistic structures are produced more frequently and accurately than more marked structures. As Ellis (2008) puts it, "learners find it easier to acquire typologically unmarked structures than typologically marked structures" (p.578). In the case of this study, the N pAdj. structure seems to be both frequent and unmarked and that lead to its earlier acquisition in the case of group one but developed incrementally among group three. Findings emanating from the Noun Phrase Accessibility Hierarchy (NPAH)

framework (e.g. Doughty, 1991; Gass, 1994 as cited in Braidi, 1999) also lend support to the fact that unmarked positions/structures tend to be acquired earlier than marked positions.

Another plausible explanation is to look at the emergence of the N pAdj. structure from the incremental processing point of view. One of the basic premises of PT framework is that language processing is incremental. The point here is, as explained by Pienemann (2005); a higher grammatical structure can be constructed while structural outputs for the current processor are still incomplete. In the light of this declaration, we can confidently claim that group one was able to produce the N pAdj. structure because their processing ability is able to identify "a small section of the current processing event rather than having the complete event displayed" (Pienemann, 2005, p.5). In other words, they were able to identify information exchange that occurs within the N pAdj. structure but not the inter-phrasal processing procedure as a whole. Recall, the N pAdj. structure is only part of three structures that constitute structural outcomes of the inter-phrasal processing stage.

All along, I have been cautious to trace, categorically, the performance of participants in the N pAdj. structure to cross-linguistic influence for two reasons, first, because of lack of empirical evidence from the data to support that claim and second, due to PT's own theoretical position on L1 transfer in language processing. PT maintains that "L1 transfer is constrained by the processability of the given structure" (Pienemann, Di Biase, Kawaguchi & Hakansson, 2005, p. 90). In other words, L1 transfer is 'developmentally constrained' in that, L2 learners can transfer features of L1 if and only if those structures can be processed by the learners' current processing ability. Based on that, the nature of the learners initial L2 cannot be necessarily related to the state of his/her final L1 (i.e. cannot be based on the Full Transfer/ Full Access Hypothesis). Based on his findings, Huseinali (2006) also hypothesized that the role of L1 in the

IL system of SLL is not automatic. In contrast, however, Alhawary (2009a) considered inter-

stage variability in the data of his participants as evidence of L1 transfer by relying prominently

on the Full Transfer/ Full Access Hypothesis. To Alhawary, developmental paths and for that

matter acquisition of grammatical structures are not explained on the basis of processing

constraints only, but by other factors like the Full Transfer/Full Access Hypothesis as well. The

Full Transfer/Full Access Hypothesis is one of different UG related constructs that seeks to

explain the role of L1 in activating UG parameters of the TL. According to the Full Transfer/Full

Access Hypothesis, "the entirety of L1 grammar is the L2 initial state, with full access to

Universal Grammar through the L1 grammatical system" (Schwarts & Sprouse, 1996, p. 41, as

cited in Pienemann, 2005).

From the above explanations about the behaviour of the N pAdj. structure in the IL

system of the participants, it is apparent that what seems to be stage variation in the acquisition

of N pAdj. does not affect the overall processing hierarchy. Much so if one looks at the summary

in table 12 where no significant gaps (i.e. stage variability) seem to exist in the emergence of

structural outcomes investigated. By implication, therefore, the results of the present study

conform broadly to predictions of the acquisition of Arabic morphosyntactic developmental

route based on the PT framework.

5.1.3 Discussion of Results in Relation to Research Question 3

Do results provide evidence for the stability of developmental stages?

To answer this question, it will be instructive to put forward first some basic theoretical

issues related to variation and processing constraints. PT has often been accused of not

differentiating *a priori* between developmental and variational features (Larsen-Freeman and

Long, 1991, p.285). Developmental features refer to those aspects of language (e.g. agreement

structures) which are acquired sequentially, irrespective of input or teaching intervention. Variational features, on the other hand, refer to language features that can be acquired in the learners' IL system at any point of the acquisition process (Lightbown & Spada, 2006). Ellis (2008) posits that "unless there is a clear method for identifying such formulas before the analysis proceeds, the theory runs the danger of becoming unfalsifiable" (p. 464). Pienemann (2005), however, maintains that PT provides predictions about developmental stages that are verifiable. It does so "by defining those classes of grammars that are processable at each stage" (P. 49). Furthermore, he maintains what is important is not fluctuation in learner IL system, but whether stages of development are stable across tasks.

Thus, in answering the third question, "Do results provide evidence for the stability of developmental stages?" the essence is to determine whether the emerged developmental stages were stable enough which will in effect confirm the cross-linguistic plausibility of the theory. Analysis of participants' data show that there was no incident of a lower group acquiring some structural outcomes and the next group not acquiring them. Instead, what we saw is a case of cumulative development in terms of the acquisition of structures. Hence, the answer to the third question is that developmental stages, as per the present study, are *generally* stable. The incident of group one acquiring the N pAdj. structure made us to qualify the stability of the stages as general, though I have provided certain explanations as to what may have accounted for that. Besides, what appeared was not the case of an absolute stage variation, in that group two also acquired it at a 62% accuracy level as group one, but the accuracy level increased well enough among group three. In other words, there was stabilisation in the IL system of group two as far as the N pAdj. structure is concerned. Group three was however able to increase its performance through restructuring as a result of more access to N pAdjs. by virtue of their proficiency level.

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McLaughlin explains that "as more learning occurs, internalized, cognitive representations are restructured" (McLaughlin, 1987, p. 136). More importantly, McLaughlin argues that, characteristically, restructuring takes place in the later stages of learning. This is the case of group three as far as the N pAdj. structure is concerned.

Further, the apparent intra-stage variation in the data, where for instance the inter-phrasal structures (see fig. 2) were not acquired sequentially (i.e. SVO → N p.Adj.→ VSO), does not count as counter evidence to the claim of stage stability. Pienemann (1998) maintains that those fluctuations are a result of different morphological marking that each feature within a processing procedure exhibits. Accordingly, what is important is 'falsifying' stage stability but not intra-stage fluctuations or learner variability.

5.2 Pedagogical Implications for AFL

The implications of the present study for AFL pedagogy is discussed in relation to the Teachability Hypothesis, a subset of the Processability Theory. The hypothesis provides among other things that "stages of acquisition cannot be skipped through formal instruction" (Pienemann, 1998, p. 250). In fact, as Pienemann argues, learners can only learn what they can process. Consequently, any attempt to teach a higher processing order for which learners' processing architecture is not ready for shall lead to developmental gaps. Simply put, one can learn only what he/she can process. Nonetheless, the approach employed in introducing linguistic structures to learners could either speed up or derail the processing of those structures. In grammar-translation method class, as in the case of participants for the present study, it is likely that learners' ability to process linguistic structures could be derailed due to concerns about accuracy that prevents them from expressing their thoughts. In fact, it is through *creating with the language,* as in the communicative language approach, that learners will have the opportunity

to speed up the processing of linguistic structures due to the principle of contextualization embedded within such an approach. (Ommagio, 2000). Notwithstanding any method employed, the findings of the present study have general implications in a number of areas concerned with Arabic teaching and learning so long as learners acquire agreement structures in a defined order. These implications include course and syllabus designing, classroom instruction and AFL testing.

In the area of course and syllabus designing, the findings of this study appear to be more useful to the product-oriented (synthetic) type of syllabi. Here, the linguistic content of the syllabus is organized around difficulty, or otherwise, of grammatical units (Nunan, 1988). Syllabus design according to Nunan is "concerned essentially with the selection and grading of content" (p. 5). To the Arabic language syllabus designer, therefore, the knowledge of the different stages that are associated with the emergence of agreement structures shall help in sequencing those structures within the syllabus appropriately. In effect, precious class time would have been used positively instead of teaching items that learners cannot process and thus cannot be acquired because of developmental constraints. As Ellis (2008a) explains, "learning difficulty and the sequence of acquisition are determined by the nature of the processing procedure required to produce a specific grammatical feature" (p. 10)

As far as classroom instruction is concerned, the findings of the present study reveal that, linguistic structures that entail less processing activity should be introduced first and followed gradually by those structures requiring more processing nodes. For instance, the N aAdj. agreement structure should be introduced prior to the introduction of VSO word order because exchange of grammatical information in the latter requires more space in the working memory of the learner. Learners therefore cannot attend to the meaning and form of the VSO word order

while at the same time struggling to process the N aAdj. structure, due to the limited capacity of the working memory. Explaining how input is processed in the working memory, VanPatten (1996) says, "learners process input for meaning before they process it for form" (p. 14).

Furthermore, it is appropriate that teachers of AFL recycle and reinforce the teaching of inter-phrasal structures because the inter-phrasal processing procedure requires a mix of grammatical information exchange strategies (within and across constituents). As a result, processing of structures may lead to inter- learner variability as evident in learners' data (see fig. 2). By recycling and providing more activities in those structures (i.e. SVO, N pAdj. and VSO), learner inter variability would be reduced considerably. Alhawary (2009) provided evidence for the positive effect of recycling of grammatical structures during instruction in his study of present tense negation with *laa*, which was acquired more easily than past tense negation with *maa*. The reason is that, the latter was not recycled consistently during classroom instruction.

Finally, in the field of language testing, Eliis (2008a) maintains that current approaches to language testing favours models of testing that are based on communicative competence and on real-life related activities. Both approaches test what learners can do with language and not what they know about language. That is, they test learners' functional ability only without examining their linguistic competence. What is needed, according to Ellis, is a test that matches developmental stages with proficiency levels. In other words, Arabic language testers should consider testing learners' knowledge of Arabic by means of assessing their ability to process grammatical structures as those investigated in this study as well as testing their proficiency levels through performance-based testing. Such test would have incorporated both procedural knowledge (i.e. knowledge of language that has been automatized and thus used unconsciously), which Pienemann employs in explaining language processing, as well as learners' performance

in that language. Besides, the knowledge of high-level or low-level procedure, such as those identified in this study, helps the Arabic language interviewer/tester to avoid misidentifying the correct level of the interviewee (Alhawary, 2009). Largely, the presence or absence of a grammatical structure in the interviewee's speech shall determine his/her developmental stage.

5.3 Limitations of the Study

As with any investigation, the present study is not without limitations. The first limitation has to do with nature of the data collected. Pienemann favoured the use of longitudinal design and a naturally occurring data in order to investigate IL developmental route. This study, however, used cross-sectional design and elicited intuitional and productive data instead, primarily due to time constraints. Other studies (e.g. Baten, 2011, Ellis, 2008a), though, also used cross-sectional design and non-oral data in studying the Processability Theory. The main concerns of Pienemann are that data elicited for testing PT plausibility should be based on automatic language processing. In order to ameliorate the effect of conscious processing therefore, it is important to mention that time constraint was factored in to the data collecting instruments for the present study. This was intended to have some aspect of automaticity and unconsciousness in the elicited data as suggested in Baten (2011).

Another limitation has to do with the number of stages investigated in this study. The study investigated three stages instead of the five developmental stages predicted by the Processability Theory. The study was limited to the three stages, namely the phrasal procedure, S-procedure and subordinate clause because of the domain of the investigation (i.e. agreement structures). As mentioned earlier, agreement structures entail the exchange of grammatical information either within or across constituent structures. This aspect of feature unification or

exchange of grammatical information is situated only within those three stages and not within the word and category procedure (i.e. the first and second stages).

Finally, participants were not required to provide an explanation or an alternative to structures they indicated as wrong in the GJT. Asking participants to provide an explanation for marking a structure grammatical or ungrammatical would have provided further evidence and more insight concerning their ability in the processing of structures investigated.

5.4 Recommendations for Future Research

Future research about the plausibility of PT has to consider, as many as possible, morphological and syntactic structures within all the five processability processing stages. As it stands, most studies that had tested the plausibility of PT in Arabic tend to rely on very few structures and that might have led to the present mixed findings as far as Arabic is concerned.

More research is needed to corroborate the findings of the present study. However, in order to overcome the challenges of the design for the present study, future research should aim at eliciting oral communicative data within a longitudinal setup. This will resolve some of the observations made by Pienemann concerning the most suitable data for use in testing PT plausibility.

Finally, future studies should also consider investigating the Teachability Hypothesis. It remains one of the least researched areas in the general PT framework, especially in Arabic. This will provide direct pedagogical evidence about the effect of instruction vis-à-vis learners' level on the IL continuum. So far, Al Shatter (2011) seems to be the only study that has investigated the hypothesis as far as Arabic is concerned.

5.5 Conclusion

The aim of this study is to investigate the acquisition of Arabic morphosyntactic agreement structures in the IL system of AFL learners in Ghana. The PT was used as a framework for the study; because of its explanatory and predictive power about how syntactic and morphological structures are acquired. Five morphosyntactic Arabic agreement structures were investigated. These are the N aAdj., SVO, N pAdj., VSO and Embedded Adj. clause. The gender and number inflectional features were the only considered in the present study. These structures represent three developmental stages on the PT implicational hierarchy, namely the phrasal procedure, the inter-phrasal procedure and the sub-ordinate clause.

In order to attain the aim of the present study, an investigation was conducted through the collection of cross-sectional data over a six-day period (including piloting). Participants for the study were students from the University of Ghana, Legon pursuing Arabic language studies at level 200, 300 and 400. GJT and EPT elicitation instruments were used to collect those data. The data were then coded and analysed by using three processes as required by PT. These processes are (1) performing of distributional analysis, (2) application of pre-defined emergence criterion and (3) implicational scaling.

Overall, the present study has produced a number of results that are generally in conformity with PT predictions. First, the data for the present study revealed that phrasal structure was the first to be acquired in participants' IL system. This was followed by the inter-phrasal stage structures and then the subordinate clause. Second, while the observed developmental route among the participants seems to be in congruence with PT predictions, the data also produced some outliers, which in my view is not enough to invalidate the processability hierarchy. The study showed that N pAdj. structure emerged among the first group, although

that was predicted to emerge among the second and the third groups. Arguably, that does not seem to affect the predictions of the theory, because it was not an instant of group one acquiring it and others not. In other words, it was not an explicit case of inter-stage variability. Concerning the stability of those developmental stages, the study has concluded that the emerged developmental stages are generally stable. This observation was made due to the absence of inter stage variability, although within stages, i.e. at the inter-phrasal procedure stage, there seems to be some learner variability. The findings mentioned above were discussed in the light of L1 transfer, the Structural Conformity Hypothesis and variation and processing constraints.

While the study conforms, generally, to PT predictions, the behaviour of the N pAdj. structure in the IL system of all participants is considered as a relevant discovery. Apart from the fact that it emerged within the first group, the accuracy level for this particular structure for all participants seems to suggest that another factor other than processing constraints is involved in the processing architecture of Arabic L2 learners in Ghana. This is a tentative conclusion, though. More research is needed in the way and manner this structure is processed among AFL learners in Ghana. If further studies are to confirm the findings in respect to the N pAdj., that will constitute a major problem to the claim of cross-linguistic plausibility of Pienemann's Processability Theory.

Appendix A: Consent Form

THE AMERICAN UNIVERSITY IN CAIRO

Documentation of Informed Consent for Participation in Research Study

Project Title: *The Acquisition of Morphosyntactic Agreement in the Interlanguage System of*

  AFL Learners in Ghana

Principal Investigator: *Alhassan A.Husein (01115053688 or 0244605260)*

*You are being asked to participate in a research study. The purpose of the research is to investigate the acquisition of Arabic agreement structures by AFL learners in Ghana, and the findings may be published, presented, or both. The expected duration of your participation is fifty minutes.

The procedures of the research will be as follows: you will be given two tasks. The first contains forty sentences and you are required to provide your judgment about their grammaticality. In the second task, you will be asked to fill in the gaps only as per the words provided at the end of each sentence.

*There *will not be* certain risks or discomforts associated with this research.

*There *will not be* monetary benefits to you from this research.

*The information you provide for purposes of this research *is confidential.*

Questions about the research, my rights, should be directed to Alhassan A. Husein at 01115053688 or 0244605260.

*Participation in this study is voluntary. Refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled. You may discontinue participation at any time without penalty or the loss of benefits to which you are otherwise entitled.

Signature   _____

Printed Name   _____

Date   _____

THE AMERICAN UNIVERSITY IN CAIRO
ARABIC LANGUAGE INSTITUTE
TAFL DEPARTMENT

Read the following phrase/ sentences carefully and provide your judgment about their grammaticality. If you find any phrase / sentence to be grammatically unacceptable, put the sign (**x**) in front of it and (**✓**) if it is **acceptable**. Please complete all the forty judgment tasks.

Time allowed: 20 minutes (30 seconds on average per phrase/ sentence)

1) أسلوب ميسر   ……………

2) الأولاد الكبير   ……………

3) الرجال الأوفياء   ……………

4) طالب جديد   ……………

5) القلم الكثيرون   ……………

6) مدرسة محترمة   ……………

7) كتابة جيد   ……………

8) مدرسات ناشطة   ……………

9) الأطفال ضعفاء   ……………

10) الأمهات لطيفات   ……………

11) البنات مجتهدة   ……………

12) الجامعة مؤسسة للتعليم   ……………

13) الجواب صحيحة ....

14) الطقس حار ....

15) المدرسة مفتوح ....

16) الدفاتر جديد ....

17) المحاضرون يشرفون على الامتحانات ....

18) الأم تنظف البيت ....

19) الرجال يذهب إلى المكتب ....

20) الجامعة يفتح أبوابها للطلاب الجدد ....

21) السيدات يقرؤون الكتاب ....

22) الطالب يذاكر الدرس ....

23) الطالبات يكتبن الدرس ....

24) كوفي تسكن في أكرا ....

25) تأكل السيدات الطعام ....

26) تأكلن النساء الفطور ....

27) تتعلم البنت القيادة ....

28) تنظف الطالب الغرفة ....

29) يشرب الطالب الماء ....

30) يطبخ المرأة الطعام ....

31) يفتح الأولاد الباب ....

32) يقرؤون الطلاب الدرس ....

33) أنا من الطالبات الذين كرمتهم الجامعة هذا العام ....

34) جاء المدرس الذي رأيته أمس ....

35) سافرت الطالبات اللاتي أعرفهن ....

36) لا أعرف الطالبة التي غابت ....

37) هؤلاء الطلاب هم الذي يجيدو العربية ....

38) هذا هو الكتاب الذي طلبت ....

39) هذا الحديقة هي التي زرناه ....

40) وصل اللاعبون الذين فازوا بالجائزة ....

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ARABIC LANGUAGE INSTITUTE

TAFL DEPARTMENT

Fill in the following blank spaces by using the appropriate form of the word in brackets at the end of each phrase/ sentence in order to form a complete sentence.

(أراد)   1) –––––– الطالبات زيارة حديقة أبوري غدا

(النجاح)   2) الأخت –––––– في الاختبار

(زيارة)   3) أصدقائي –––– المسرح في الأسبوع الماضي

(مشغول)   4) الأمهات––––––– بالعمل

(مدير)   5) تزور ––––– الجامعة الطلاب اليوم

(الطالب)   6) تتعلم –––––– اللغة العربية في ليغون

(أستاذ)   7) د. يوسف ود. بشير ود. حسيني ––––– في قسم العربية

(طول)   8) الدرس ––––– جدا

(مقبلة)   9) شهر –––––

(محترم)   10) طالبات ––––––

(السفر)   11) الطالبة ––––– إلى بريطانيا أمس

12) نجح ----- في اختبارهم لمادة اللغة العربية   (طالب)

13) النساء ----- الطعام   (طبخ)

14) الجامعة ------   (واسع)

15) طالبة ------   (مجتهد)

16) طلاب ------   (أجنبي)

Complete the following sentences using the appropriate relative pronoun

(.i.e اللاتي, الذين, التي, الذي) and resumptive pronoun (ضمير الصلة) where needed.

17) تعرفت على الطالبات ---- أدبت (   ) المدرسة

18) جاء الأولاد ---- أُدرس (   ) اللغة العربية

19) ما هي الموضوعات --- شرح (   ) لكم الأستاذ؟

20) تم إغلاق المكان --- نراجع في (   )

Appendix D: Transliteration of Symbols

ArabicSymbol	Transliteration	Phonetic Description
FatHa (short vowel)	a	short front/ black low
ا (long vowel)	aa	long front/ back low
Damma (short vowel)	u	short high back rounded
و (long vowel)	uu	long high back rounded
kasra (short vowel)	i	short high front unrounded
ي (long vowel)	ii	long high front unrounded
ء (Hamza)	'	voiceless glottal stop
ب	b	voiced bilabial stop
ت	t	voiceless alveolar stop
ث	th	voiceless inter-dental fricative
ج	j	voiced palate-alveolar fricative
ح	H	voiceless pharyngeal fricative
خ	x	voiceless velar fricative
د	d	voiced alveolar stop
ذ	dh	voiced inter-dental fricative
ر	r	voiced alveolar trill
ز	z	voiced alveolar fricative
س	s	voiceless alveolar fricative
ش	sh	voiceless palato-alveolar fricative

ص	S	voiceless alveolar fricative emphatic
ض	D	voiced alveolar stop emphatic
ط	T	voiceless alveolar stop emphatic
ظ	Z	voiced inter-dental fricative emphatic
ع	c	voiced pharyngeal fricative
غ	gh	voiced velar fricative
ف	f	voiceless labio-dental fricative
ق	q	voiceless uvular stop
ك	k	voiceless velar stop
ل	l	voiced alveolar lateral
م	m	voiced bilabial nasal
ن	n	voiced alveolar nasal
هـ	h	voiceless glottal fricative
و	w	voiced bilabial velar glide
ي	y	voiced palatal glide
يَ	yy	geminate of y
وَ	ww	geminate of w

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