

THE DEVELOPMENT OF CASE MORPHOLOGY AND SENTENTIAL WORD ORDER IN  
ARABIC AS A SECOND LANGUAGE: A PROCESSABILITY PERSPECTIVE

by

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## ABSTRACT

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Processability theory argues that the development of interlanguage syntactic and morphological structures is guided by general principles, which make up a “language processor”. These principles develop gradually and are implicationaly ordered. The theory claims that interlanguage syntactic and morphological structures develop in the order the principles responsible for their production become available to the learner (Pienemann, 1998; Pienemann et al., 2005). This study used these principles as reflected in processing procedures and mapping principles to investigate the acquisition of Modern Standard Arabic case morphology and sentential word order. The goal of using these principles was to hypothesize a developmental route for case morphology and declarative sentence development and then test the predictions empirically.

With regard to sentential word order, several structures with different mapping principles were selected. The investigation included canonical word order, AdjunctTopic + canonical word order (e.g., CLLD), and non-canonical word order (e.g., passive, causatives, subordinate clauses, and OVS). Each structure represents a unique way of mapping the three structures of grammar (argument, function, constituent). At the morphological level, several case morphemes involving different levels of feature unification were selected. The investigation included nominative and accusative case in SVO word order, genitive case on noun phrases within prepositional phrases

and construct state, accusative case on [ʔanna]-subject, and nominative and accusative case in OVS word order. Each morphological structure requires the activation of a different processing procedure.

This cross-sectional study collected data from 21 adult learners of Modern Standard Arabic as an L2. Participants performed three communicative tasks: an interview, picture description, and elicited imitation. Emergence criteria were adopted to judge the emergence status of the structures investigated in their interlanguage. The results showed that sentential word order developed from basic word order that manifested default argument-function-constituent structure mapping to structures that manifested different degrees of divergence from such mapping. With regard to case morphology, case markers developed from mere parts of lexical items to markers of positions and to markers of grammatical functions. Therefore, the observed developmental route for L2 learners of Modern Standard Arabic confirmed the hypothesized developmental route.

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بكل الحب والتقدير  
هذه الرسالة أهديتها إلى والديّ وزوجتي وابني ياسر  
والحمد لله أولاً وآخراً

With all my love and appreciation  
To my parents, my wife, and my son Yasser  
And thanks be to Allah

## TABLE OF CONTENTS

List of Figures .....	ix
List of Tables .....	x
List of Abbreviations .....	xiii
Acknowledgments.....	xv
Chapter 1 .....	1
1.1 Rationale of the Study.....	3
1.2 Research Objective .....	4
1.3 Outline of the Study .....	6
Chapter 2.....	7
2.1 Introduction.....	7
2.2 Processability Theory (1998).....	7
2.3 Processability Theory (2005).....	11
2.4 Processability Theory and Case Markers.....	18
2.5 L2 Studies .....	31
2.5.1 Studies on MSA as an L2.....	31
2.5.2 L2 Syntactic Studies .....	35
2.6 Chapter Summary .....	38
Chapter 3.....	39
3.1 Introduction.....	39
3.2 Sentential Word Order .....	39
3.2.1 Default Mapping Sentences .....	39
3.2.1.1 Single Clause .....	39
3.2.1.2 Double Clauses .....	42
3.2.2 XP-Default Mapping Sentences.....	44
3.2.3 Non-Default Mapping Sentences.....	46
3.2.3.1 Non-Default Argument to Function Mapping Sentences .....	46
3.2.3.2 Complex Argument to Function Mapping Sentences.....	48
3.2.3.3 Non-Default Constituent to Function Mapping Sentences .....	50
3.3 Case Markers .....	51
3.4 Research Questions and Hypotheses .....	55
3.4.1 Research Questions.....	55
3.4.2 Hypotheses.....	56
3.5 Chapter Summary .....	56

Chapter 4.....	58
4.1 Introduction.....	58
4.2 Research Questions and Hypotheses .....	58
4.2.1 Research Questions .....	58
4.2.2 Hypotheses.....	58
4.3 Participants.....	59
4.4 Data Collection .....	61
4.4.1 Interview .....	61
4.4.2 Picture Description Task.....	62
4.4.3 Elicited Imitation Task.....	63
4.5 Procedures.....	64
4.5.1 Interview .....	65
4.5.2 Picture Description Task.....	65
4.5.3 Elicited Imitation Task.....	67
4.5.4 Data Management .....	67
4.6 Data Analysis .....	68
Chapter 5.....	72
5.1 Introduction.....	72
5.2 Sentential Word Order Results .....	74
5.2.1 Beginner Results .....	74
5.2.2 Low-Intermediate Results .....	84
5.2.3 High-Intermediate Results .....	100
5.2.4 Advanced Level Results .....	121
5.3 Case Morphology Results.....	141
5.3.1 Group 1 .....	142
5.3.2 Group 2 .....	145
5.3.3 Group 3 .....	152
Chapter 6.....	160
6.1 Introduction.....	160
6.2 Research Questions.....	160
6.3 Sentential Word Order Discussion.....	160
6.3.1 Hypothesis 1.....	163
6.3.1.1 Sentential Word Order Intra-Stages.....	169
6.3.2 Hypothesis 2.....	173
6.4 Case Morphology Discussion .....	174
6.4.1 Hypothesis 3.....	175
6.4.1.1 Case Morphology Intra-Stages .....	182
6.4.2 Hypothesis 4.....	185

Chapter 7 .....	189
7.1 Overview .....	189
7.2 Summary of the Study .....	189
7.3 Significance of the Findings .....	192
7.4 Limitations and Suggestions for Future Research .....	193
References .....	195
Appendix A: Questionnaire .....	201
Appendix B: Interview Questions.....	202
Appendix C: Picture Description Task .....	203
Appendix D: Elicited Imitation Task .....	207
Curriculum Vitae .....	212

## LIST OF FIGURES

Figure 2.1. a-f-c mapping in LFG (Pienemann et al., 2005, p. 200).....	12
Figure 3.1. Linear mapping (Pienemann et al., 2005, p. 228) .....	42
Figure 5.1. Types of mapping principles found in the beginner-level data .....	83
Figure 5.2. Types of mapping principles found in the low-intermediate level data .....	98
Figure 5.3. Types of mapping principles found in high-intermediate data.....	119
Figure 5.4. Types of mapping principles found in the advanced-level data .....	138

## LIST OF TABLES

Table 2.1 Hypothetical Hierarchy of Processing Procedures .....	10
Table 2.2 Turkish Learner of German as an L2 .....	11
Table 2.3 Russian Learner of German as an L2.....	11
Table 2.4 Lexical Mapping Hypothesis .....	15
Table 2.5 Syntactic Development Based on the Lexical Mapping Hypothesis .....	17
Table 2.6 Syntactic Development Based on the Prominence Hypothesis .....	18
Table 2.7 Developmental Stages for Functional L2 German Case Development .....	21
Table 2.8 Hypothesized Developmental Stages for Russian Case .....	24
Table 2.9 Hypothesized Developmental Stages for Serbian Case .....	27
Table 2.10 Ergative Case Developmental Sequence .....	29
Table 2.11 Predictions for Arabic Agreement Structures as Proposed in Al Shattar (2010).....	33
Table 2.12 Development of Agreement within the Seven Structures as Proposed in Oulhaj (2015) .....	34
Table 2.13 Summary of Arabic L2 Morphosyntactic Development.....	35
Table 2.14 Development of Syntactic Structures in Chinese as an L2 .....	37
Table 3.1 Relative Pronouns in MSA .....	43
Table 3.2 Targeted Syntactic Structures .....	51
Table 3.3 Case-Marking Paradigm in Arabic .....	54
Table 3.4 Targeted Case Morphemes .....	55
Table 4.1 Participant Background Information .....	60
Table 4.2 Sentential Word Order Results for Participant X .....	68
Table 4.3 Case Morphology Results for Participant X.....	68

Table 5.1 Targeted Syntactic Structures .....	72
Table 5.2 Targeted Case Morphemes .....	73
Table 5.3 Beginner Language Background .....	74
Table 5.4 Beginner-Level Sentential Word Order Results .....	75
Table 5.5 Beginner-Level Sentential Word Order Implicational Sequence .....	83
Table 5.6 Low-Intermediate Learners' Language Background .....	85
Table 5.7 Low-Intermediate Level Sentential Word Order Results .....	85
Table 5.8 Low-Intermediate Level Sentential Word Order Implicational Sequence .....	99
Table 5.9 High-Intermediate Learners' Language Background .....	100
Table 5.10 High-Intermediate Level Sentential Word Order Results.....	101
Table 5.11 High-Intermediate Level Sentential Word Order Implicational Sequence.....	120
Table 5.12 Advanced Learners' Language Background.....	121
Table 5.13 Advanced Level Sentential Word Order Results .....	122
Table 5.14 Advanced-Level Sentential Word Order Implicational Sequence.....	139
Table 5.15 Sentential Word Order Results .....	140
Table 5.16 Sentential Word Order Implicational Sequence .....	141
Table 5.17 Group 1 Case Morphology Results.....	142
Table 5.18 Group 1 Case Morphology Implicational Sequence.....	144
Table 5.19 Group 2 Case Morphology Results.....	145
Table 5.20 Group 2 Case Morphology Implicational Sequence.....	151
Table 5.21 Group 3 Case Morphology Results.....	152
Table 5.22 Group 3 Case Morphology Implicational Sequence.....	158
Table 5.23 Case Morphology Results.....	159

Table 5.24 Case Morphology Implicational Sequence .....	159
Table 6.1 Set Implicational Hierarchy .....	164
Table 6.2 IL with Set A Structures .....	165
Table 6.3 IL with Set A and B Structures .....	166
Table 6.4 IL with Set A, B, and C Structures .....	167
Table 6.5 IL with Set A, B, C and D Structures .....	168
Table 6.6 IL with Set A, B, C, D and E Structures .....	169
Table 6.7 Syntactic Intra-Stage 1 .....	171
Table 6.8 Syntactic Intra-Stage 2 .....	172
Table 6.9 Stage 2 L2 Acquisition of Chinese Syntax .....	172
Table 6.10 Ditransitive Argument Order .....	173
Table 6.11 Ditransitive Argument Order .....	173
Table 6.12 All Nominative Stage .....	178
Table 6.13 Positional Case Marking Stage .....	180
Table 6.14 Phrasal Case Marking Stage .....	180
Table 6.15 Inter-Phrasal Case Marking Stage .....	181
Table 6.16 TL Reconstruction Implicational Hierarchy .....	182
Table 6.17 Case Morphology Intra-Stage 1 .....	183
Table 6.18 Case Morphology Intra-Stage 2 .....	183
Table 6.19 Highest Sentential Word Order and Case Morphology Reached by Each Participant .....	186

## LIST OF ABBREVIATIONS

1P	1st person
2P	2nd person
3P	3rd person
Acc	Accusative case
Caus	Causative
Comp	Complementizer
CLLD	Clitic left dislocation
Def	Definite article
Du	Dual number
EIT	Elicited Imitation Task
Em	Embedding
F	Feminine
Fut	Future marker
Gen	Genitive case
Imper	Imperfective
Indef	Indefinite article
IL	Interlanguage
LFG	Lexical Functional Grammar
M	Masculine
MSA	Modern Standard Arabic
Nom	Nominative
ORWOR	Object relative clause without resumption

ORWR	Object relative clause with resumption
PT	Processability theory
Sg	Singular
SR	Subject Relative Clause
XP	Phrase of any type
Prep	Preposition
Pl	Plural
Vless	Verbless sentences / equational sentences

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## **Chapter 1**

### **Introduction**

In the field of second language acquisition, a major goal is to describe how second language (L2) learners go about acquiring a totally new language that might have little in common with their first language (L1). Researchers have sought to understand the mental representation of the L2, known as “competence,” as well as its development over time. The field has achieved tremendous success in this regard and has moved on to explaining why learners of different L2s follow similar patterns in their acquisition process. This study is situated within the latter context as it investigates the development of Modern Standard Arabic (MSA) case morphology and sentential word order by L2 learners with processability theory (PT) as the study framework.

According to PT, language acquisition involves developing a “language processor” specialized for the target language (Pienemann, 1998, 2005, 2011). At the initial stage of acquisition, the language processor is constrained since it needs to develop specialized skills to handle the target language. With regard to morphological structures, the language processor is made up of a set of hierarchal computational or procedural skills that develop gradually. When a procedural skill is developed, it enables the developing processor to unify features (handle the processing load) within a given stage e.g., phrasal, inter-phrasal, or inter-clausal. Processing loads govern how such skills develop as they increase relative to the number of features and hierarchal distance between the items involved in the feature unification process. Since the production of some morphological structures requires feature unification across different syntactic levels, their emergence in production data should follow the development of the procedural skills that initiate the feature unification responsible for their production. Therefore,

for L2 learners, the development of morphological structures in their interlanguage (IL) should follow the development of the procedural skills that make up their L2 processor.

In terms of syntactic development, PT argues that syntactic output at the initial stage after the word or lemma stage is constrained by the processing loads involved. Processing loads on the syntactic level are measured by how a sentence's three structures of grammar are mapped to each other (Di Biase & Bettoni, 2015; Pienemann et al., 2005). For L2 learners, this means that the sentential word order in their IL initial stage should be constrained to default mapping sentences as stated in the unmarked alignment hypothesis (Pienemann et al., 2005). The development from this initial stage should follow the topic hypothesis and lexical mapping hypothesis (Pienemann et al., 2005) and their revised versions, the prominence hypothesis and lexical mapping hypothesis (Di Biase & Bettoni, 2015).

Processability theory provides a framework that has been successful in predicting and justifying why learners' language skills develop the way they do. PT has been applied to quite a few languages—such as Japanese (Kawaguchi, 2000, 2010); German (Pienemann, 1998); English (Charters et al., 2011; Dyson, 2009; Eguchi & Sugiura, 2015; Pienemann, 1998); Italian and Japanese (Di Biase & Kawaguchi, 2002; Kawaguchi, 2000; Yamaguchi & Kawaguchi, 2016); Italian (Bettoni & Ginelli, 2015); Chinese (Zhang, 2001, 2007); Danish, Norwegian, and Swedish (Glahn et al., 2001); and Arabic (Alhawary, 1999; Al Shattar, 2010; Mansouri, 2005; Oulhaj, 2015)—and has provided an accurate description of how and why learners of these languages develop the way they do. However, when it was first proposed, this theory had little to say about the development of syntactic structures. The extension proposed by Pienemann et al. (2005) claimed to account for a wide range of syntactic structures, offering a unified framework to understand the development of IL morphology and syntax. Thus, the aforementioned research

can be divided into two waves. The development of L2 morphological structures was the main goal of the first wave since it was conducted after Pienemann (1998). Once the idea of mapping principles came out in Pienemann et al. (2005), while morphology development remained of interest, the focus has shifted to investigate the development of L2 syntactic structures.

Theories are continuously tested against new empirical data to allow for a better understanding of the developmental routes that emerge in L2 acquisition and why they appear rather than others. This process allows these theories to be refined to account for irregularities. Another goal of this research is to contribute to L2 pedagogy, as understanding how and why acquisitional routes develop helps in course design and classroom instruction.

### **1.1 Rationale of the Study**

The research on MSA employing PT is not sufficiently comprehensive to test PT predictions or inform language pedagogy. First, all but one of the MSA studies using PT examined the acquisition of morphological aspects (Alhawary, 1999; Al Shattar, 2010; Mansouri, 2005; Oulhaj, 2015). They only differ in the types of morphemes investigated. For example, Alhawari (1999) examined a subset of phrasal and inter-phrasal agreement morphemes, namely the singular masculine and feminine in noun-adjective agreement and the third person singular masculine and feminine in subject-verb agreement. Mansouri (2005) focused on three levels of agreement: modifier + noun, subject + verb, and relativizer + head noun. Mansouri (1999) diverged from this trend by looking into the acquisition of a limited number of syntactic structures since PT at that time could not allow for an extensive syntactic investigation.

Second, all of these studies were conducted in a foreign language (FL) context, i.e., where Arabic was not spoken natively. Alhawary (1999) and Oulhaj (2015) were conducted in the United States, while Al Shattar (2010) and Mansouri (2005) were conducted in Australia.

However, this does not suggest that conducting similar studies in an L2 context would result in different development but rather that language context differences (i.e., FL vs. L2) results in differences in the rate of acquisition and lexicon size (Håkansson & Norrby, 2010). This coupled with the limited number of participants, ranging from two (e.g., Alshattar, 2010) to 10 (e.g., Alhawari, 1999), often led to a lack of production or no evidence of certain structures, especially those belonging to higher stages, limiting the implications of the data.

Third, they were all based on the original 1998 version of PT, which neglected L2 syntactic development. The 2005 extension proposed by Pienemann et al. (2005) has since incorporated discourse functions and lexical mapping theory, through which different levels of the grammar are mapped, namely argument, function, and constituent structures. This has allowed for a wide range of complex syntactic structures to be accounted for and incorporated into the PT developmental hierarchy. They also reformulated how syntactic structures are generally accounted for within PT; instead of two sets of principles to account for two different syntactic structures, the extension provides one unified set.

## **1.2 Research Objective**

This study sought to provide a new testing ground for PT and to overcome shortcomings in the literature on acquiring MSA as an L2. Thus, it investigated MSA acquisition in contexts where it is spoken alongside other varieties of Arabic, specifically Hijazi Arabic, by using PT assumptions about processing procedures (Pienemann, 1998) and mapping principles (Di Biase & Bettoni, 2015; Pienemann et al., 2005) in order to hypothesize a developmental route for case markers and declarative sentence word order. With this in mind, the study aimed to address the following research questions:

1. Do the developmental routes for the acquisition of declarative sentence word order obey the principles of PT?
2. With ditransitive verbs, does the NP-PP sequence emerge before NP-NP? If not, what is the observed IL pattern?
3. Do the observed developmental routes for the acquisition of case markers conform to the principles of PT?
4. Does free word order occur only if functional case marking has emerged?

Since the goal was to test PT predictions with regard to these questions, the type of mapping principles and level of feature unification involved dictated the selection of structures. Structures with identical mapping principles would not test the validity of the framework. Therefore, with regard to sentential word order, several structures with different mapping principles were selected. The investigation included canonical word order, AdjunctTopic + canonical word order (e.g., CLLD), and non-canonical word order (e.g., passive, causatives, subordinate clauses, and OVS). Each structure represents a unique way of mapping the three structures of grammar (argument, function, constituent).

At the morphological level, several case morphemes involving different levels of feature unification were selected. The investigation included nominative and accusative case in SVO word order, genitive case on noun phrases within prepositional phrases and construct state, accusative case on [?anna]-subject, and nominative and accusative case in OVS word order. Each morphological structure requires the activation of a different processing procedure.

The researcher first formulated predictions based on PT developmental hierarchy of processing procedures and mapping principles. These predictions were then tested against cross-sectional empirical data collected from 21 participants with varying L1 backgrounds studying

MSA as an L2 at the Islamic University in Medina. Several tasks were developed for this purpose, including an interview, picture description task, and elicited imitation task.

### **1.3 Outline of the Study**

This study is organized as follows. Chapter 2 provides the theoretical framework of the study. It presents both proposals of PT with regard to the hierarchal development of processing procedures and mapping principles and what they entail for L2 morphological and syntactic development (Di Biase & Bettoni, 2015; Pienemann, 1998; Pienemann et al., 2005). This is followed by a presentation of relevant literature within PT on the acquisition of Arabic and other languages.

Chapter 3 presents the target syntactic and morphological structures of this study. With regard to sentential word order, it lists the types of target constructions and what mapping they theoretically involve in terms of argument-function-constituent structure mapping. It then lists the target case markers, notes how they get assigned to nouns, and identifies what level of feature unification they theoretically involve. Afterward, the chapter discusses the developmental hypotheses for this study and the PT rationale in constructing them.

Chapter 4 goes over the study design, describing the target learners, how the tasks were designed, and how the collected data were coded and analyzed. Chapter 5 presents the results of the three tasks with regard to sentential word order and case morphology. Chapter 6 discusses the hypotheses in light of the results of the empirical study. Finally, Chapter 7 summarizes the study, discusses the significance of the findings, and suggests directions for future research.

## **Chapter 2**

### **Theoretical Framework**

#### **2.1 Introduction**

This chapter presents the PT framework. Section 2.2 discusses the computational skills or processing procedures that PT argues to be of high relevance in the production of L2 morphological structures. Section 2.3 presents PT premises with regard to the gradual development of different mapping principles in L2 IL which it argues dictate syntactic development, namely the unmarked alignment hypothesis, topic hypothesis, lexical mapping hypothesis (Pienemann et al., 2005), prominence hypothesis, and lexical mapping hypothesis (Di Biase & Bettoni, 2015). Section 2.4 presents the use of both processing procedure proposals and mapping principles to account for IL case marker development. Section 2.5 reviews studies conducted within a PT framework.

#### **2.2 Processability Theory (1998)**

The first version of PT looked at language acquisition from a relatively new angle. It claimed that thinking of language learning as analogous to problem-solving would ignore the fact that such a process is carried out by a “human mind that operates within human psychological constraints” (Pienemann et al., 2005, p. 1). Therefore, PT takes into consideration such constraints and claims this process is “further constrained by the architecture of human language processing” (p. 1). The language processor, which is viewed as a set of computational routines or procedural skills, is claimed to develop gradually in language learners. PT proposes a convincing module in which language acquisition is viewed as the result of the gradual development of these procedural skills. It follows that structures of the target language (TL) will only be produced when the necessary procedural skills involved in their production are acquired.

As a result, the way the IL develops should be governed by the development of these procedural skills.

PT utilizes the notion of feature unification embedded in Levelt's (1989) model of language generation to measure learner development. In language production, the appearance of certain forms and morphemes depends on other parts of the sentence. For example, the use of the demonstrative pronoun "this" or "these" depends on the number feature of the modified noun, as shown in (1a-b), while the appearance of the morpheme (-s) on the main verb depends on the person and number of the subject, as in (1c).

1. a. this book / these books
- b. \*this books / \*these book
- c. he eats / \*he eat

Feature unification within or across constituents ensures different parts of phrases or sentences fit together (Pienemann et al., 2005). According to PT, a beginning language learner is incapable of performing this process due to having a deficient lexicon. Based on the notion of feature unification, PT proposes that the acquisition of processing devices, which form a hierarchy in language generation, will be in the following order:

- Word/lemma
- Category procedure (lexical category)
- Phrasal procedures (head)
- S-procedure and Word Order Rules
- Matrix/subordinate clause (p. 13)

Processing loads increase as the hierarchal distance increases between items in the feature unification process. The proposed hierarchy is based on the assumption that learners have to start

from scratch when acquiring an L2. First, they build up an L2 lexicon. Then, at the category level, a phase where the category of lexical items is realized, lexical morphemes are added based on the lexical category of the word (e.g., tense to V and gender to N). Although learners are still incapable of unifying features within or across constituent boundaries because their L2 language processor cannot yet store information, they start producing sentences that conform to direct mapping between conceptual structure and surface forms through a simplified S-procedure. In the next stage, modifiers are added and feature unification on a phrase level boundary is achieved. In other words, the language processor at this stage is able to store information from different parts of the phrase and check whether they fit together via feature unification (e.g., these books / this book). In the next stage, they gain the ability to store and unify features across phrase boundaries, which results in the ability to unify features across the noun phrase and verb phrase, leading to subject-verb agreement, as in the third person singular in English. At the final stage, learners gain the ability to unify features across clause boundaries.

The hierarchy makes it impossible for a learner to skip a stage since each lower stage is a prerequisite for the next stage (Pienemann, 1998). A category of a lexical item cannot be realized if the L2 lexicon is empty. Phrasal procedures cannot be executed if the grammatical category of the lexical items is not yet realized. The matrix/subordinate clause procedure, which requires feature unification across clauses, cannot be performed if feature unification across phrases (S-procedure) is not already achieved. The latter cannot be executed if information exchange at the phrasal level is not yet achieved. Thus, the development of processing procedures and the structures they entail in an L2 learner should follow the route described in Table 2.1, taken from Pienemann et al. (2005, p. 13).

Table 2.1

*Hypothetical Hierarchy of Processing Procedures*

	t <sub>1</sub>	t <sub>2</sub>	t <sub>3</sub>	t <sub>4</sub>	t <sub>5</sub>
S'-procedure (EmbeddedS)	-	-	-	-	+
S-procedure	-	simplified	simplified	inter-phrasal information exchange	inter-phrasal information exchange
Phrasal procedure (head)	-	-	phrasal information exchange	phrasal information exchange	phrasal information exchange
category procedure (lex. categ.)	-	lexical morphemes	lexical morphemes	lexical morphemes	lexical morphemes
word/lemma	+	+	+	+	+

Another important claim of PT regarding L2 acquisition is that since learners have to develop procedural skills specialized to handle L2 structures, transfer from L1 to L2 is developmentally moderated. As opposed to the full access/full transfer module (Schwartz & Sprouse, 1996), which claims the initial state of the L2 is the final state of the L1, the L1 formulator or L1 procedural skills will not be utilized in the course of L2 acquisition since they were not developed for that purpose. As a result, L2 learners have to reconstruct procedural skills specialized to handle L2 structures.

This means that transfer from L1 to L2, if attempted, would happen if the structures to be transferred could be handled by the L2 processor (Håkansson et al., 2002). However, this does not mean L2 learners would not benefit from structural similarities between their L1 and L2. This was shown in Haberzettl's study (as cited in Pienemann et al., 2005; Pienemann & Kessler, 2011). Even though Turkish and Russian native speakers followed the same route in their acquisition of German as an L2, Turkish learners benefited from structural similarities in word order constellations between their L1 and L2; they almost showed categorical acquisition, as

opposed to the gradual acquisition apparent in Russian learners' data, as illustrated in Tables 2.2 and 2.3, taken from Pienemann and Kessler (2011, p. 81).

The developmental path proposed in Table 2.1 is claimed to account for the acquisition of morphology and syntax of canonical word order. As a result, it was tested on a sufficient number of typologically distant languages to assess its universality. For relevancy purposes, Section 2.5.1 presents studies on Arabic as an L2.

Table 2.2

*Turkish Learner of German as an L2*

Structure	Session 15	Session 16	Session 17	Session 18	Session 19
XVYV	100	100	99	98	100
*XVVY	0	0	1	2	0

Table 2.3

*Russian Learner of German as an L2*

Structure	Session 3	Session 5	Session 8	Session 10
XVYV	0	20	42	97
*XVVY	100	80	58	3

**2.3 Processability Theory (2005)**

The main goal of Pienemann et al.'s (2005) extension to PT was to expand the scope of the theory regarding syntactic L2 development; identify what caused structures like topicalization, raising, the passive, and causatives to be acquired later than canonical word order; and incorporate them into the processability hierarchy. This extension argues that, although successful in accounting for non-linearity in information exchange as seen in subject verb

agreement, feature unification cannot capture some aspects of linguistic non-linearity as exhibited in topicalization, raising, the passive, and causatives.

Linguistic non-linearity can be caused by different ways of mapping between the three structures of grammar (argument, function, and constituent structures), as exemplified in lexical functional grammar. Argument structure includes information about the number and type of arguments required by the predicate, and constituent structure presents surface syntactic structures. Both have to be linked through functional structure that encodes grammatical functions of constituents like subject and object, as shown in Figure 2.1.

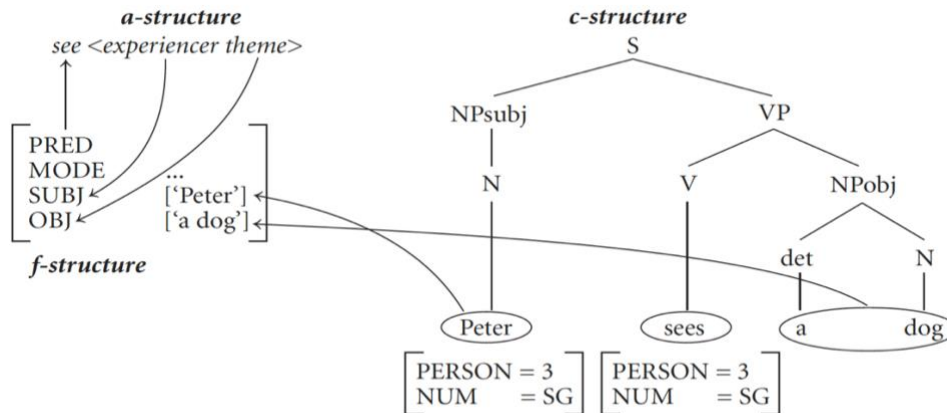


Figure 2.1. a-f-c mapping in LFG (Pienemann et al., 2005, p. 200).

The mapping between these three structures is not always linear, as exhibited in (2) (Pienemann et al., 2005). For some discourse-pragmatic reasons, sentences are expected to depart from canonical word order. Fronting to focus or topic position leads to non-linearity between constituent and functional structure, as shown in (2b). Likewise, expressing the passive results in promoting the theme to link to subject function and suppressing the agent altogether, which leads to non-linearity in the mapping between argument and functional structure, as shown in (2c).



deal with non-linearity in the mapping between the three structures, they will be limited to the default mapping shown in (2a) as stated in the unmarked alignment hypothesis since it does not require any information exchange between the three structures of grammar. Pienemann et al. (2005) described this hypothesis as follows:

In second language acquisition learners will initially organise syntax by mapping the most prominent semantic role available onto the subject (i.e. the most prominent grammatical role). The structural expression of the subject, in turn, will occupy the most prominent linear position in c-structure, namely the initial position. (p. 229)

The development from this initial stage requires the L2 processor to develop the ability to handle non-linearity in mapping, which can exhibit itself either between constituent and function structures, as in (2b), or between argument and function structures, as in (2c). Therefore, PT makes two developmental hypotheses that intend to capture L2 syntactic development after the default mapping stage argued for in the unmarked alignment hypothesis.

Starting with constituent to functional structure mapping, since non-linearity here is caused by fronting adjuncts or core arguments, i.e., non-subject, PT's first developmental hypothesis, the topic hypothesis, depicts the development of "syntacticized" discourse functions.

The topic hypothesis was defined by Pienemann et al. (2005) as follows:

In second language acquisition learners will initially not differentiate between SUBJ and TOP. The addition of an XP to a canonical string will trigger a differentiation of TOP and SUBJ which first extends to non-arguments and successively to arguments thus causing further structural consequences. (p. 239)

Moving to argument to function structure mapping, cases like the passive or causatives represent a clear departure from linear mapping between these two structures. With the passive, non-linear mapping is caused by the suppression of an argument role as in (2c), while with causatives, it is caused by the complex association of two argument roles to one grammatical function as in (2d). PT's second hypothesis, the lexical mapping hypothesis, predicts L2

development in mappings between argument and function structures. The lexical mapping hypothesis is outlined in Table 2.4, taken from Pienemann et al. (2005, p. 240).

Table 2.4

*Lexical Mapping Hypothesis*

a- to f- structure mapping	Structural outcomes
Non-default, complex mapping.	Complex predicates e.g. Causative (in Romance languages, Japanese, <sup>15</sup> etc.), raising, light verbs.
↑	↑
Non-default mapping. (single clause)	Passive Exceptional verbs
↑	↑
Default mapping, i.e. Most prominent thematic role is mapped onto SUBJ.	Canonical Order

These two hypotheses state the constraints that L2 learners need to overcome by developing abilities to process non-default mapping to be able to free their syntax from what the default mapping principle is imposing. Taking this all together, L2 learners develop a language processor from scratch that is specialized to handle the target language. A set of hierarchal procedural skills and mapping principles constitute the language processor. For morphological structures, a gradual acquisition of the proposed procedural skills enables the L2 processor to unify features within or across syntactic constituents. The result of attaining feature unification at a certain syntactic stage (phrasal, inter-phrasal, or inter clausal) is the acquisition of the corresponding morphological structure shown in Table 2.1, given that they have a one-to-one form-function relationship. On the syntactic side of development, the L2 processor at the initial stage is limited to default mapping, as stated in the unmarked alignment hypothesis, since the mapping between the three structures of grammar is linear. Such mapping will dictate syntactic structures until L2 learners develop mechanisms to deal with non-linearity in the mapping

between the three structures. The development from default mapping is depicted in the topic hypothesis and lexical mapping hypothesis. This explains why structures that involve non-linear or non-default mapping are higher in the PT hierarchy.

Di Biase and Bettoni (2015) claim that both of these hypotheses need to be restated to account for additional facts and avoid some implied predictions that are not always true. As a result, the unmarked alignment hypothesis is abandoned since it assumes that at the initial stage of L2 development, default c-f mapping necessarily entails default a-f mapping. This is not a desirable outcome because L2 learners might, under certain pragmatic pressure, map the theme to the subject which is mapped to the most prominent position in c-structure. This results in non-default mapping between a-f structures but canonical mapping between c-f structures, leading to confusing interpretations, as shown in (3).

3.     \*a. the lettuce eat the goat  
       b. the goat eats the lettuce (p. 71)

Their alternative is the lexical mapping hypothesis:

Second language acquirers will initially map the highest available role in the thematic hierarchy (e.g., agent, experiencer) onto minimally specified SUBJ/TOP. We call this default mapping. Next, they learn to add further arguments mapped onto grammatical functions (GFs) differentiating them from SUBJ (and OBJ, if present). They may also learn some exceptional verbs at this second stage. Finally, they learn to impose their own perspective on events, that is, to direct the listener's attention to a particular thematic role lower in the hierarchy by promoting it to SUBJ, and defocus the highest role by mapping it onto a GF other than SUBJ, or suppress it altogether. At this last stage learners may add further role information regarding causality, benefit, or adversity. They may also add to their lexicon particular subsets of Vs, such as unaccusatives, as well as further intrinsically exceptional Vs requiring their own mapping schema. (p. 68)

Their alternative, lexical mapping hypothesis, combined some of the assumptions in Pienemann et al.'s (2005) unmarked alignment hypothesis with the lexical mapping hypothesis. While it still argues for direct argument to function structure mapping at the IL initial stage, it refrains from predicting anything with regard to constituent to function structure mapping. This is left to the

prominence hypothesis, which is presented next. This is to allow for cases in which L2 learners map something other than the agent-subject to initial position.

In addition, their lexical mapping hypothesis argues that the development from default to non-default mapping takes place in two steps instead of one. Once agent-subject and theme/patient-object mapping is in place, the next step is to add locative goals to oblique function to the right of the canonical string before any non-default mapping takes place. The developmental route presented in Table 2.5 was taken from Di Biase and Bettoni (2015, p. 68).

Table 2.5

*Syntactic Development Based on the Lexical Mapping Hypothesis*

STAGE	CONSTRUCTIONS
NONDEFAULT MAPPING	unaccusatives, passives, causatives, exceptional verb constructions, etc.
DEFAULT MAPPING AND ADDITIONAL ARGUMENTS	agent/experiencer mapped on SUBJ, patient/theme mapped on OBJ, and other members of the a-structure hierarchy, such as goals and locatives, mapped on OBL
DEFAULT MAPPING	agent/experiencer mapped on SUBJ and patient/theme mapped on OBJ
LEMMA ACCESS	single words formulas

The other modification Di Biase and Bettoni (2015) proposed is to recast the TOPIC hypothesis as the prominence hypothesis. Instead of only accounting for topic, now it explicitly includes focus function alongside topic:

In second language acquisition learners will initially not differentiate between grammatical functions (GFs) and discourse functions (DFs), for example, between SUBJ and TOP. Differentiation begins when an element such as an XP, or other lexical material, is added to the canonical string in a position of prominence in c-structure, that is, the first in the sentence. This element may be TOP in declaratives or FOC in interrogatives leaving, crucially, the canonical string unaltered. At the next stage, learners will be able to construct noncanonical strings assigning prominence to any constituent in an unequivocal way. (p. 63)

This hypothesis, as represented in Table 2.6, has similar predictions as the topic hypothesis except it adds focus alongside topic in IL development beyond the initial stage (Di Biase & Bettoni, 2015, p. 63).

Table 2.6

*Syntactic Development Based on the Prominence Hypothesis*

STAGE	STRUCTURES
NONCANONICAL WORD ORDER	TOP <sub>XP</sub> marked orders FOC <sub>XP</sub> marked orders
XP <sub>DF</sub> CANONICAL WORD ORDER	TOP <sub>XP</sub> SVO / SOV / ... FOC <sub>WH-</sub> SVO / SOV / ...
CANONICAL WORD ORDER	SVO / SOV / ... [QUE <sup>P</sup> SVO / SOV / ... ]
LEMMA ACCESS	single words; formulas [QUE <sup>P</sup> single words; formulas]
QUE <sup>P</sup> = the QUE feature is realized by prosody alone	

## 2.4 Processability Theory and Case Markers

PT in its original and extended versions does not make specific claims regarding the development of case markers the way it does for word order (Pienamann et al., 2005) or feature unification reflected in morphology (Pienamann, 1998). Most PT studies are concerned with the development of the hypothesized processing procedures and the ability to exchange information within c-structure as reflected in phrasal, inter-phrasal, and inter-clausal morphemes or the ability to exchange information across the three structures as reflected in word order. In other words, most studies within PT framework, especially on the morphological side of L2 development, do not aim to uncover how certain morphemes develop but rather how the processes responsible for their production develop.

Case markers represent an exception to this general tendency. Recently, PT was taken a step further by Baten (2011, 2013) on German, Artoni and Magnani (2015) and Artoni et al. (2013) on Russian, Di Biase et al. (2015) on Serbian, and Baten and Verbeke (2015) on Hindi to claim that even though not explicitly stated within its hierarchy, PT can account for case marker development in L2 acquisition. Based on the hierarchy of processing procedures and what they predict about learners' ability to unify information (see Table 1), case assignment that takes place within phrasal boundaries, as in (4a-b), is expected to emerge when L2 learners can handle phrasal information exchange. Functional case assignment, as in (5a), is expected to appear when S-procedure is developed, which entails learners' ability to unify information across phrases.

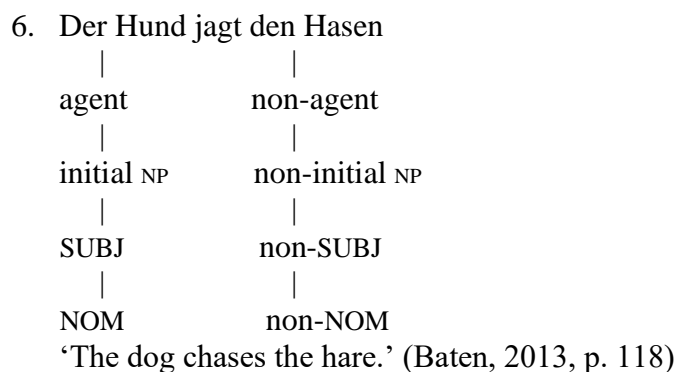
4. a. fi al-bajt-i  
at Def-home.M.Sg-Gen  
"At home"  
b. kitab-u a-razul-i  
book.m.s-Nom Def-man-Gen  
"The book of the man"
5. a. al-kitab-a qaraʔa ar-razul-u  
Def-book.M.Sg-Acc read.Past Def-man-Nom  
"The book the man read"

However, the abovementioned studies claimed that case markers could appear even before information exchange was operable according to the extended version of PT. Based on how mapping between argument-function-constituent structures developed in various L2s, they sought to show how case markers developed from being a mere part of lexical items to a marker of position that arguments occupy and later to a final stage in which case markers mark the function of arguments rather than marking their position. In what follows, I briefly outline the claims and results of each study.

Baten (2011, 2013) was the first to pursue this line of inquiry with German, which distinguishes four cases: nominative, accusative, dative, and genitive. He argued that since PT

claims that what an L2 learner will initially produce requires no information exchange, and since pronouns, nouns, and determiners in German are stored in their nominative form, lemma access (which requires no information exchange) will always yield nominative case forms in all contexts, including when other case forms are required. This claim was in line with other studies on the acquisition of case markers by L1 (Klinge, 1990) and L2 (Meisel, 1986) learners of German.

However, PT claims that learners in this stage are not yet capable of forming sentences. Such IL patterns are expected to take place once the category procedure is achieved. Therefore, Baten (2011, 2013) divided the category procedure stage into two sub-stages. The pattern above was claimed to take place in the first sub-stage. In the second, he argued that a direct mapping between the three structures was assumed by PT, and one could also assume a mapping between nominative case and initial position on the one hand and non-nominative and non-initial position on the other. He drew support for this claim from an optimality theory treatment of word order (e.g., Lee, 2001) in which subject as a grammatical function is considered less marked than non-subject, nominative case is less marked than oblique case, and initial position is less marked than non-initial position. Consequently, in the second sub-stage of the category procedure of development, the mappings in (6) were hypothesized.



Such mapping has consequences on the developing IL. It expects that non-default case forms, e.g., accusative and dative, would emerge even before feature unification could be handled by L2 learners (Baten, 2011, 2013). Baten claimed that the emergence of non-default case markers come about in two steps. In the first, a general non-default case is used in opposition to the nominative case, while in the second, a distinction within the oblique case markers emerges, e.g., accusative vs dative. Once a distinction emerged within the oblique cases, learners were claimed to have achieved position case marking, which means that such markers mark the position of arguments rather than their functions. Following this stage would be the activation of S-procedure, which entails inter-phrasal information exchange and the departure from default mapping between the three structures, leading L2 learners of German to use case markers to mark functions regardless of the arguments' position. The developmental stages for the acquisition of German case are depicted in Table 2.7 (from Baten, 2013, p. 138).

Table 2.7

*Developmental Stages for Functional L2 German Case Development*

Stage	Word Order	Case Development
S-procedure	OVS (TOP = OBJ)	Possibility of functional case assignment
Phrasal procedure	TOP + canonical word order (TOP = ADJ)	All nominative or position case marking
Category procedure II	Canonical word order (e.g., SVO, SV, SV OBL)	All nominative or position marking
Category procedure I	Canonical word order (e.g., SVO, SV, SV OBL)	All nominative

Baten (2013) conducted a longitudinal study, collecting data from 11 Dutch native speakers learning German as an L2 who represented three different levels of proficiency. The results suggested a developmental schedule along the lines suggested in Table 2.7. When sentences followed canonical word order, two groups stood out from the start of data collection.

The first used nominative case markers in all contexts, e.g., subject and object, as shown in (7a), while the second relied on the principle of direct mapping suggested in (6), in which initial arguments are associated with nominative case while non-initial arguments are associated with a general non-nominative case, e.g., accusative, as shown in (7b). These two patterns were taken as evidence of the proposed all nominative stage and of the position marking stage, respectively.

7. a. euh er macht ganz **\*der spiegel kaputt**  
 euh he breaks entire **the-nom mirror**  
 (correct: den Spiegel ‘the-acc mirror’) (Baten, 2013, p. 179)
- b. und euh er wacht wart en wart aber euh **\*den sohn kommt nicht zurück**  
 and euh **he-nom** waits waits and waits but euh **the-acc** son comes not back  
 (correct: der Sohn ‘the NOM son’). (Baten, 2013, p. 171)

However, when canonical word order was disturbed, as in OVS structures, two patterns emerged. In the first, nominative case was assigned to both the post-verbal subject and the pre-verbal object, as in (8a). The second showed that despite the arguments’ position, functional case marking was maintained in that nominative case was assigned to post-verbal subjects and accusative case was assigned to pre-verbal objects, as in (8b).

8. a. er lasst **\*der stock/\*der stock** liggen liegen  
 he leaves **the-nom:masc** stock/the **stock-nom:masc** untouched  
 (correct: den Stock ‘the-acc:masc stock’) (Baten, 2013, p. 209)
- b. ja den hintern sehen der vater und **der** sohn noch  
 yes **the-acc** bottom see the father and **the** son still (Baten, 2013, p. 217)

When a sentence had a ditransitive verb, four types of learners were observed (Baten, 2013).<sup>1</sup> The first and second exhibited the same patterns seen with sentences with transitive verbs in that the first used nominative markers across the board and the second contrasted nominative case with a general non-nominative case, e.g., accusative case, as in (9a). In the third

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<sup>1</sup> Baten (2011, 2013) showed similar results. I reported on the latter because its elicitation methods were in line with PT requirements.

group of learners, a distinction within the non-nominative cases emerged by mapping direct object to accusative case and indirect object to dative case, as in 9b. The most advanced group showed functional case assignment despite the position of direct and indirect object, as in (9c).

9. a. und der wollt **den goldfisch** verk.uften **\*an den vater**  
 and he wants.to the **goldfish-non nom** sell to **the father-non nom**  
 (correct: ... wollt dem Vater ‘the-dat father’ ...)
- b. ja er schenkt sein hart \*an einer puppe  
 yes he offers his heart to the-dat:fem puppet  
 (correct: ... schenkt einer Puppe ‘a-dat puppet’ ...) (Baten, 2013, p. 238)
- c. diesen knopf gibt er seinem sohn  
 this-acc button give he-nom his-dat son (Baten, 2013, p. 245)

The same issue was investigated in Russian as an L2 by Artoni and Magnani (2015) and Artoni et al. (2013). Russian distinguishes six cases: nominative, genitive, dative, accusative, instrumental, and prepositional. The focus was on lexical case assignment by the verb and on grammatical function case assignment, as in (10a) and (10b), respectively.

10. a. upravljaet biznesom  
 manages business-INST
- b. mal’čik dal Inne knigu  
 boy-NOM gave Inna-DAT book-ACC  
 [the boy gave Inna a book] (Artoni & Magnani, 2015, p. 179)

They argued that once learners achieved the category procedure and distinguished between categories like V and N with their lexical morphemes, they would distinguish between the nominative form and a general non-nominative form. At this stage, grammatical functions are assigned by position in a clear effect of PT’s default mapping principle. As a result, the minimal distinction between nominative case and a general non-nominative case is enough so that learners can organize their syntax in a canonical way, namely SVO, with the subject being marked by the nominative case and the object by a non-nominative case. When information exchange within phrases is achieved (phrasal procedure), learners will be able to exchange

information about case feature between the case of the argument object and what the verb assigns to its argument. Finally, with the activation of S-procedure, allowing information exchange across phrases, learners will assign case to grammatical functions in arguments despite their position, as in (11). Table 2.8 shows the hypothesized developmental stages for Russian case.

11. a. knigu čitaet mama  
 book-ACC reads mum-NOM  
 [the book mum reads (it)] (Artoni & Magnani, 2015, p. 184)

Table 2.8

*Hypothesized Developmental Stages for Russian Case*

Stage	Structure	Morpho-Syntactic Outcome
Non-canonical word order	OSV, OVS, etc.	
Inter-phrasal procedure	TOPOBJ and V unification SUBJ and V agreement	OBJACC V SUBJNOM
XP <sub>DF</sub> canonical word order	TOP <sub>ADJ</sub> SVO	ADJ SUBJNOM V OBJACC
Phrasal procedure	V and OBJ unification	V OBJ ACC/INST....
Canonical word order	SVO	
Category procedure	Case marking on N Nom vs non-NOM	SUBJNOM V OBJ <sub>non-NOM</sub>

To test the above claims, Artoni and Magnani (2015) and Artoni et al. (2013) collected data using various tasks, including conversation, storytelling, and spot the difference, from eight learners of Russian as an L2 with different proficiencies and L1 backgrounds. The results supported the PT-based developmental schedule. Specifically, they found that in canonical word order, pre-verbal NPs were assigned the nominative case and post-verbal NPs were assigned non-nominative case by all learners as a result of achieving the category level. However, even though the post-verbal NP was assigned the non-nominative case, as in (12a), nominative forms were used in this position by all learners, even the most proficient ones, as in (12b).

12. a. AL videla volke  
saw wolf-non-Nom (Artoni & Magnani, 2015, p. 188)

b. ochotniki našli volk  
hunters-Nom found-PL wolf-Nom  
[the hunters found the wolf] (Artoni & Magnani, 2015, p. 189)

Four of the learners showed advancement into the phrasal procedure as they were able to mark object with an INST case as required by the verb, as in (13a), while only two learners showed evidence of achieving the highest stage in which they assigned case to grammatical functions irrespective of the arguments' position, as in (13b).

13. a. ona zanimaetsja muzykoj  
she-NOM does music-INST  
[she practices music]

b. vilku prinesla balerina  
fork-ACC brought dancer-noM  
[the fork, the dancer brought it] (Artoni & Magnani, 2015, p. 189)

It was interesting that IL patterns were produced when structures like OVS were elicited by learners who had not yet acquired the procedural skills necessary for their production (Artoni et al., 2013). Beginner and intermediate learners marked both the pre-verbal OBJ and the post-verbal SUBJ with nominative case, as in (14a). However, a less common solution among the intermediate learners was to use position marking; that is, the topicalized object was assigned a nominative case while the post-verbal subject took the accusative case, as in (14b). Such patterns suggested that configurational case assignment could override semantic case assignment.

14. a. \*vilka prines balerin-a  
fork-NOM brought-MASC.SG dancer-NOM

b. \*vilka prines balerin-u  
fork-NOM brought- MASC.SG dancer-ACC (Artoni et al., 2013, p. 87)

Following the same line of reasoning as the above two studies, Di Biase et al. (2015) examined how case markers became associated with grammatical functions by L2 learners of Serbian. Serbian distinguishes seven cases: nominative, accusative, locative, genitive, instrumental, dative, and vocative. Cases assigned by verbs and prepositions were targeted. Based on PT processing procedure hierarchy and direct mapping principles, they argued that nominative case would be the first acquired by L2 learners because it was the citation form, coincided with accusative case in the singular form, and was the case found in the prominent initial position of the sentence most of the time. The development from this stage was expected to follow PT predictions attested in Russian and German. That is, when word order is organized in a canonical way, case assignment is positional; nominative is assigned to pre-verbal position and accusative to post-verbal position. The marking of N within prepositional phrases should occur when phrasal information exchange is available, and when S-procedure is active, case assignment becomes functional rather than positional. Table 10 shows Serbian L2 learners' developmental route as hypothesized by Di Biase et al. (2015, p. 202).

Di Biase et al. (2015) collected data from three heritage speakers of Serbian in an English-dominant context as well as one native speaker of Serbian. Three communicative tasks were used: short conversation, spot the difference, and storytelling. The results showed a developmental path similar to what is hypothesized in Table 2.9.

When canonical word order was employed in sentence formation, subject was invariably marked with nominative case by all participants. On the other hand, object was marked with accusative by all learners, including the least proficient one. However, this was not the only observed pattern in the least proficient speaker's data, as object was marked with nominative and genitive, as in (15a) and (15b), respectively.

Table 2.9

*Hypothesized Developmental Stages for Serbian Case*

Stage	Structure	Examples
Non-canonical word order	OSV (topicalization of object) VSO (focalization of subject)	supu voli devojčica soup-ACC.OBJ likes girl.NOM supu devojčica voli soup-ACC.OBJ girl.NOM likes voli devojčica supu likes girl.NOM soup-ACC.OBJ
XP Canonical Word Order	TOPADJ SVO	savkog dana daci imaju ispit every day-GEN ADJ students- NOM.SUBJ have exam-ACC.OBJ
Canonical Word Order	SVO	jedem krufnu (I) eat doughnut-ACC.OBJ devojčica voli supu the girl.NOM SUBJ likes soup-ACC.OBJ
Lemma access	Single Words Formulas	jar ser (I like cheese) zovem se Mary (My name is Mary)

15. a. ona samo drži mali \*ker  
she-NOM.SUBJ only hold-3.SG.AUX little dog-NOM.OBJ  
[she is only holding a little dog]

b. onak su videli \*kreveta  
then be-3.SG.AUX see-3.SG.AUX bed-GEN.OBJ  
[then they saw beds] (Di Biase et al., 2015, p. 209)

This pattern of uncertainty was also exhibited in this participant's marking of N within PP as he extended the accusative case, a pattern seen with the intermediate Serbian speakers as well. The behavior of the least proficient speaker was interpreted as a result of being in the nominative vs non-nominative stage, while the behavior of the intermediate speakers was attributed to lexical learning, as they were accurate in assigning accusative to the object argument. The only participant to escape canonical word order was the native speaker, who showed fully accurate case assignment with non-canonical word order OSV, as in (16).

16. a. moju je supu neko pojeo celu  
my-ACC be-3.SG.AUX soup-ACC.OBJ someone-nom.SUBJ eaten entire-ACC  
[someone has eaten my entire soup] (Di Biase et al., 2015, p. 210)

As another example, Baten and Verbeke (2015) claimed that even though Hindi exhibited both nominative-accusative and ergative-absolutive case patterns, a different case pattern than the rest of the languages reviewed above, PT could still account for ergative case acquisition. Thus, the scope of the study was limited to the acquisition of ergative case. Ergative case in Hindi marks subjects of finite transitive verbs with perfective morphology, as in (17a). All other subjects are marked with the nominative case, as in (17b).

17. a.	maim	ghar	gayā+h- ūm
	I.M.NOM	homewards	go.PRF.M.SG=AUX-PRS.1SG <sup>3</sup>
	‘I have gone home’		
b.	maim=ne	laRkī=ko	dekh-ā
	I.M=ERG	girl=ACC	see-PRF.M.SG
	‘I had written a book’		(Baten & Verbeke, 2015, p. 74)

Based on PT mapping and feature unification principles, Baten and Verbeke (2015) hypothesized that default (nominative) forms would be used at the early stages of L2 acquisition due to the deficient L2 lexicon and because the undeveloped L2 processor is not yet capable of storing or unifying features. Then, an ergative case marker is used and overextended to contexts other than subjects of finite transitive verbs with perfective morphology. At the final stage, since learners develop inter-clausal feature unification, they can use ergative case where it should be used. This developmental sequence is represented in Table 2.10 (from Baten & Verbeke, 2015, p. 85).

Baten and Verbeke (2015) collected data cross-sectionally from 11 Dutch native speakers learning Hindi at university level using various tasks, such as interviews and story retelling. The results supported the PT-based hierarchy proposed in Table 2.10. Default forms were used by the least proficient learners in all contexts, as shown in (18).

Table 2.10

*Ergative Case Developmental Sequence*

Feature Unification	Mapping	Case Development
Inter-phrasal	Non-direct mapping (= mapping is mediated)	The possibility of functional case use
		Overgeneralization of ergative marker
No feature unification	Direct mapping	Default forms

18. **maim** party=mem jā-tā+th-ī  
 I.NOM party=in go-NPRF.M.SG-AUX.PST-F.SG  
 ‘I was going to party’ (Baten & Verbeke, 2015, p. 94)

The intermediate learners used the ergative form, but in a non-TL manner, in that it was extended to contexts in which nominative forms were required, e.g., subjects of intransitive verbs with perfective morphology, as in (19).

19. chuTTī=mem **maim=ne** kaī parTī=ko gayā+h-ūm  
 holidays=in I[f]=ERG some.PL party=ACC go.PRF.M.SG+AUX-PRS.1SG  
 ‘In the holidays I have gone to some parties’ (Baten & Verbeke, 2015, p. 94)

On the other end of the spectrum, the most advanced learners used the ergative case marker functionally by confining it to subjects of transitive verbs with perfective morphology while assigning other subjects the nominative case, as in (20a-b).

20. a. aur us=ke bād **laRk-e=ne** memDhak=ko pukār-ā  
 and that=after boy-obl=ERG frog[m]=ACC call-PRF.M.SG  
 ‘and there after the boy called the frog’

b. aur **laRkā** aur **kuttā** panī=mem gir-ā  
 and boy[m]NOM and dog[m]NOM water=in fall-PRF.M.SG  
 ‘and the boy and the dog fell in the water’ (Baten & Verbeke, 2015, p. 95)

All of the studies reviewed above showed that different mapping principles between a-f-c structures—together with feature unification stages in PT—can successfully account for how L2 learners go about acquiring TL use of case markers. That is, in the early stage of L2 acquisition,

learners' use of default forms is expected since their L2 lexicon still lacks some necessary formal features. In addition, their L2 processor is still too underdeveloped to execute the feature unification necessary for case markers. This is followed by a stage in which pre-verbal NPs are associated with nominative case, while the post-verbal NPs take a non-nominative case. Such associations are a clear effect of default-linear mapping between a-f-c structures depicted in the unmarked alignment hypothesis. From this point onward, feature unification ability governs any further development of case markers. Once the L2 processor can handle feature unification within phrases, case assignment within phrases can be acquired. Likewise, the development to unify features across phrases marks the beginning of functional case assignment.

The rationale behind studying case markers separately from other morphological structures is that they appear in lexical items before phrasal, inter-phrasal, or inter-clausal information exchange is developed (Baten, 2011, 2013, 2015). At the lemma stage of L2 development, the default form, the nominative in all the languages covered so far, is the first to appear since it is the citation form and the case appearing in the salient sentence initial position. Then, once the category stage is achieved, this default form is contrasted with a general non-nominative case—accusative, genitive, or both—in a non-TL manner. This contrast is proposed to follow from default mapping in which nominative is mapped to initial NP and non-nominative is mapped to post-verbal NP. The other proposal claims that it is just a result of learners noticing form variation as they add lexical morphemes (Artoni et al., 2013; Artoni & Magnani, 2015; Di Biase et al. 2015). This non-TL manner is the first phase in the position marking stage in which the non-nominative is confined to post-verbal NPs. In the second phase, the IL experiences a split between the non-nominative cases; each case is gradually confined to its environment, e.g., accusative to post-verbal NP, genitive to oblique NP, and NP within construct state. This second

phase requires operable phrasal procedure in which L2 processing abilities can handle phrasal information exchange.

After this stage, case markers become associated with functions rather than the default position of functions, such as pre-verbal NP for subject and post-verbal NP for object. This is only allowed when the S-procedure is developed, in which the L2 processor can handle inter-phrasal information exchange, which allows grammatical functions to be scrambled with the ability of assigning case markers (Artoni et al., 2013; Artoni & Magnani, 2015; Baten, 2011, 2013, 2015; Di Biase et al., 2015).

## **2.5 L2 Studies**

This section reviews previous studies on L2 acquisition that had PT as a guiding framework. Section 2.5.1 reviews studies on the acquisition of MSA. Section 2.5.2 reviews studies investigating the development of L2 syntactic structures based on the later PT proposal.

### **2.5.1 Studies on MSA as an L2**

Mansouri (1999) was the first study to establish acquisitional stages for L2 Arabic syntax based on the processability hierarchy (Pienemann, 1998). He proposed that L2 Arabic syntax should develop, as shown in (21).

21. Word/formulae > equational sentences/negation > canonical word order (SVO) >  
non-canonical word order VSO > subordination

He collected data from four L2 Arabic learners who received their Arabic instruction at Deakin University. Based on the length of formal instruction, two learners were considered beginners and two intermediate learners. Six oral interviews were conducted across the span of two semesters. The results supported PT's predictions at lower stages, but higher stages were inconsistent with the hierarchy. The inconsistency was that subordination, which requires inter-

clausal procedures, tended to emerge before non-canonical word order (adverb fronting), which requires phrasal procedures. He attributed this inconsistency to avoidance strategies implemented by the learners or to how Arabic does not encourage such fronting.

Mansouri (2005) investigated phrasal, inter-phrasal, and inter-clausal agreement morphology with special attention given to form-function complexity. In inter-phrasal agreement, the focus was restricted to subject-verb agreement. In phrasal agreement, the focus was on the structures listed in (22). In inter-clausal agreement, the focus was on the agreement between the relativizer and the head noun.

22.
  - a. NPs with head nouns and their modifiers;
  - b. NPs containing possessive pronouns;
  - c. NPs containing *Idafa* i.e. possessive constructions of the order Noun-Noun; and
  - d. NPs preceded by cardinals. (p. 123)

Two native English speakers learning Arabic as an L2 were interviewed eight times across the span of four semesters. The emergence of agreement morphology followed the predicted pattern by PT, as shown in (23).

23. Phrasal agreement → inter-phrasal agreement → inter-clausal agreement

He concluded that structures within the same stage involved varied form-function relationships, including one-to-one, one-to-many, and many-to-one. PT does not claim that once a learner can handle information exchange within a stage, all structures belonging to that stage will be acquired, as there is more involved in this process. Complex form-function relationships require additional learning tasks. As a result, such patterns have to be taken into consideration when identifying and selecting the optimal structures to test PT predictions (Mansouri & Håkansson, 2007).

In a similar study, Al Shattar (2010) looked into agreement morphology development in native English speakers learning Arabic as an L2. Lexical, phrasal, inter-phrasal, and inter-clausal morphemes were analyzed, as shown in Table 2.11.

Table 2.11

*Predictions for Arabic Agreement Structures as Proposed in Al Shattar (2010)*

PT Stage	Structures
Inter-clausal	Relative pronoun and NP agreement
Inter-phrasal	Subject-verb agreement
Phrasal	Noun-adjective agreement Demonstrative-noun agreement
Lexical	Verb affixes Gender in nouns

Using a picture narration task and an interview, Al Shattar (2010) collected data in a cross-sectional quasi-longitudinal study from nine learners of Arabic representing three levels of proficiency. The results showed that while the emergence of structures conformed to the processability hierarchy proposed in Pienemann (1998), not all structures within a stage were produced. The morphemes that showed a one-to-one form-function relationship appeared before morphemes that had complex form-function relationships. This pattern was interpreted as support for the claim that tackling this form-function complexity constitutes an additional learning task (Mansouri & Håkansson, 2007).

Oulhaj (2015) investigated the acquisition of agreement morphology in seven grammatical structures belonging to three stages in the processability hierarchy (see Table 2.12). Using oral interviews, a picture description task, a picture comparison task, and a story-telling task to collect data, six learners of Arabic were observed longitudinally during two semesters. The order in which the structures in Table 2.12 emerged followed PT hierarchy. A point that sets this work apart from previous works is that another study was conducted as a follow up to

investigate what looked like counter evidence to the PT hierarchy to see whether an observed pattern was a developmental pattern or simply memorized chunks. The author claimed that even though some unexpected patterns may emerge, as with some participants in this study, such patterns could be merely formulaic language.

Table 2.12

*Development of Agreement within the Seven Structures as Proposed in Oulhaj (2015)*

PT Stage	Structures
Inter-clausal	Purpose structure Conditional structures
Inter-phrasal	Subject-verb agreement
Phrasal	Noun-adjective (attributive and predicative) agreement Noun-noun agreement

Alhawary (1999) conducted a study to test PT predictions regarding the development of gender in noun-adjective agreement, which requires a phrasal procedure, and in subject-verb agreement, which requires an inter-phrasal procedure. Due to form-function complexity, the focus was reduced to the singular masculine and feminine in noun-adjective agreement and to the third person singular masculine and feminine in subject-verb agreement. Based on the PT hierarchy, the former should emerge before the latter. Data were collected longitudinally from nine English native speakers using picture description, picture differences, picture sequencing, video story retelling, and informal interviews. Contrary to what PT predicts, subject-verb inter-phrasal agreement emerged before noun-adjective phrasal agreement in six of the participants even though they were exposed to noun-adjective agreement prior to subject-verb agreement.

All of the studies reviewed above except Alhawary (1999) supported the PT hierarchy (Pienemann, 1998). They showed that the development of Arabic L2 morphosyntax proceeded in a route predicted by PT in that lexical morphemes emerged before phrasal morphemes, which in turn emerged before inter-phrasal morphemes and inter-clausal morphemes. On the syntactic side

of development, canonical word order emerged before non-canonical word order, which in turn emerged before the use of embedding. Table 2.13 summarizes the development of Arabic L2 morphosyntax in light of the above studies.

Table 2.13

*Summary of Arabic L2 Morphosyntactic Development*

PT Stage	Processing procedure	Exchange of information	Morphological development	Syntactic development
Stage 5	Inter-clausal procedure	Inter-clausal	Inter-clausal agreement: NP - Relative pronoun	Subordination
Stage 4	Inter-phrasal procedure	Inter-phrasal	Inter-phrasal morphemes: S-V agreement <sup>2</sup> Anaphoric binding: left dislocation Noun-predicative Adj	Non-canonical Word Order VSO
Stage 3	Phrasal procedure	Phrasal	Phrasal morphemes Dem-(al)-N N-Adj agreement Cardinal-N-Adj Construct state	Adverb fronting
Stage 2	Category procedure	No information exchange	Lexical morphemes Gender in nouns Verbal affixes	Canonical word order SVO Equational sentences
Stage 1	Lemma access	No information exchange	Words / formulaic expressions	

### 2.5.2 L2 Syntactic Studies

Unfortunately, the predications of PT’s later proposal about syntactic development—as in Pienemann et al. (2005) or Di Biase and Bettoni (2015)—had not yet been empirically tested on Arabic, although it was tested on typologically different languages. Kawaguchi (2005), for example, investigated the acquisition of L2 Japanese syntax through two longitudinal studies with one participant each. Data were collected using interviews and various picture tasks to see how learners would organize their syntax as their knowledge of Japanese developed. The focus was on the transition from canonical word order, in which default mapping employed SOV, to

<sup>2</sup> Alhawary (1999) found that SV agreement emerges earlier than N-Adj agreement.

non-canonical word order, in which non-default mapping was employed either between constituent structure and functional structure (e.g., topicalized or focused arguments) or between argument structure and functional structure (e.g., passives, causatives, and benefactives). The results showed that both learners initially and exclusively organized their L2 syntax in a canonical way (SOV). Then, they moved to a stage where non-core arguments (e.g., adjuncts) preceded canonical word order. This is a crucial step towards breaking the rigidity of direct mapping since it triggers differentiation between discourse function focus and subject. Finally, learners were able to free themselves from the default mapping principle as evident in their production of the passive, causative, and topicalization of core arguments by the end of the second and third year of observation. The delay in the production of such structures was due to the inactive S-procedure, a phase where functional uncertainty is resolved.

Using the same framework, Bettoni and Di Biase (2011) proposed developmental stages of L2 Italian syntax and included question development in the interlanguage of L2 learners. The developmental stages in (24) were hypothesized.

24. Lemma access > SVO > Adjective SVO > Topic OBJi Cl<sub>i</sub> - VS  
 Wh<sub>Subj</sub> VO \*WH SV WH VS

In other words, they expected that the development of L2 Italian syntax would follow PT's proposed order. The cross-sectional study included 15 learners with varied proficiency levels and L1s. Data were collected using various tasks to test the developmental route. The development of syntactic structures in L2 learners of Italian supported the proposed PT hierarchy. That is, the least advanced participants only produced sentences that conformed to canonical word order, while most participants were a step further in that they produced adjectives and question words before canonical word order. Finally, only eight learners produced non-canonical word order in

that they assigned grammatical functions independent of position. In support of a fundamental notion in PT hierarchy, no learners produced structures belonging to higher stages without producing structures belonging to lower stages.

Liu (2015) investigated the development of Chinese as an L2. Based on PT principles, the hierarchy in Table 2.14 was proposed for declaratives and interrogatives. The structures in Stage 1 all involve direct or default mapping between the three structures since Y/N questions are formed by inserting the interrogative marker “ma” at the end of the sentence, which would not alter the mapping, and Wh-questions are formed by keeping the Wh-word in situ. The structures in Stage 2 involve fronting an XP in front of the canonical word order, which would not alter default mapping principles except for the fact that the subject is not associated with initial position anymore. Finally, the structures listed under Stage 3 involve non-canonical mapping between constituent and function structures.

Table 2.14

*Development of Syntactic Structures in Chinese as an L2*

Stage	Category	Structure
1	Canonical structures	Declaratives / Y/N questions / Wh-questions
2	XP + canonical structures	ADJ/NP <sub>TOP</sub> + SVO
3	Non-canonical word order	OSV/SOV

Liu (2015) collected data longitudinally for one year from six learners of Chinese as an L2 with varying levels of proficiency and L1 backgrounds. Interviews, short questions and answers, and picture tasks were the elicitation methods. The results supported the PT-based hypothesized hierarchy as the development of the listed structures in the beginner group proceeded from canonical word order (SVO) to ADJ+SVO and finally to structures that involved non-canonical mapping, as in OSV. Intermediate and advanced learners showed acquisition of non-canonical word order from the beginning of data collection.

## **2.6 Chapter Summary**

To the best of my knowledge, no previous study had focused on the development of sentential word order or case morphology in the IL of L2 Arabic learners within a PT framework. Thus, this study was guided by PT to hypothesize a developmental sequence for sentential word order and case morphology in MSA as an L2 and tested these claims empirically. The next chapter discusses the morphosyntactic features of the target structures.

## **Chapter 3**

### **Target Structures**

#### **3.1 Introduction**

This chapter describes the syntactic and morphological structures targeted in the study. Section 3.2 presents the structures in terms of word order, while Section 3.3 presents the case morphemes. Each section presents examples of the structures, including all possible structures within each mapping stage to increase the chances of observing all developmental stages in the data. Next, a descriptive explanation is offered. Each structure is viewed from a processability perspective to determine the degree of processing loads it involves compared to other structures. Section 3.4 presents the research questions and hypotheses of the study.

#### **3.2 Sentential Word Order**

##### **3.2.1 Default Mapping Sentences**

###### **3.2.1.1 Single Clause**

MSA is a non-configurational Semitic language with a rich agglutinative morphological system. It has a flexible word order. However, there is disagreement over what constitutes the unmarked word order of MSA, with two main views. The first claims SVO, as in (1a), is the basic word order with all others derived from it (Awwad, 1973; Lewkowicz, 1967, 1971; Mohammad, 1990), while the second states that VSO, as in (1b), is the basic word order (Aoun et al., 2010; Bakir, 1980; Fargil, 1986; Sultan, 2007). The first claim is based on the full vs. partial agreement facts exhibited in SVO (1a) and VSO (1b) order, while the latter rests on the fact that VSO is the only minimally presuppositional and pragmatically neutral order. VSO order views actions from an event-oriented angle while all others look at them from the perspective of participants.

1. a. at<sup>ʕ</sup>-t<sup>ʕ</sup>ulab-u                      ja-qraʔuna                      al-kitab-a  
 Def-student.Pl-Nom    3P.M-read.Pl    Def-book.M-Acc  
 ‘the students are reading the book’
- b. ja-qraʔu                      at<sup>ʕ</sup>-t<sup>ʕ</sup>ulab-u                      al-kitab-a  
 3P.M.Sg-read    Def-student.Pl.M-Nom                      Def-book.M-Acc  
 ‘The students are reading the book’

Since MSA is a pro-drop language, the subject can be dropped if it is already established and known to the interlocutors. This is shown in (2) in which subject phi-features are reflected on the form of the verb.

2. ja-qraʔuna                      al-kitab-a                      (VO)  
 3P.M.-read.Pl                      Def-book.M-Acc  
 ‘They are reading the book’

Verbs can take one object, as shown in Examples (1) and (2), two as in (3), or none as is the case for intransitive verbs in (4).

3. a. ʔat<sup>ʕ</sup>-t<sup>ʕ</sup>alib-u                      ʔaʕt<sup>ʕ</sup>a                      al-kitab-a  
 Def-student.M.S-Nom                      give.3P.M.Sg.Past                      Def-book.M.Sg-Acc  
 li                      l-muʕalim-at-i  
 to                      Def-teacher-F.Sg-Gen  
 ‘The student gave the book to the teacher’
- b. ʔat<sup>ʕ</sup>-t<sup>ʕ</sup>alib-u                      ʔaʕt<sup>ʕ</sup>a                      ʔal-muʕalim-at-a  
 Def-student.M.S-Nom                      give.past.3P.Sg.M                      Def-teacher-F.Sg-Acc  
 al-kitab-a  
 Def-book.M.Sg-Acc  
 ‘The student gave the book to his teacher’
4. a. ʔat<sup>ʕ</sup>-t<sup>ʕ</sup>ifl-u                      nama  
 def-child.m.s-nom                      slept.3ps.m.past  
 ‘The child slept’

In addition, MSA exhibits verbless predicate sentences in which a subject is followed by a noun phrase as in (5a), an adjective as in (5b), or a prepositional phrase as in (5c).

5. a. moḥamad-un                      t<sup>ʕ</sup>alib-un  
 Mohammad.M.Sg-Nom                      student.M.Sg-Nom  
 ‘Mohammad is a student’

- |    |  |                           |                               |
|----|--|---------------------------|-------------------------------|
| b. | moḥamad-un<br>Mohammad.M.Sg-Nom<br>'Mohammad is smart'   | ḏaki-un<br>smart.M.Sg-Nom |                               |
| c. | moḥamad-un<br>Mohammad.M.Sg-Nom<br>'Mohammad is at home' | fi<br>at                  | əl-bit-i<br>Def-home.M.Sg-Gen |

These structures—SVO, SV, VO, SVOO, VS, and verbless predicate sentences—exhibit direct or default mapping between argument-function-constituent structures; i.e., the agent is mapped to subject/topic function which, if overt, occupies sentence initial position while the object is mapped to object function and is post-verbal. VSO is the exception here since what occupies initial position is not the agent-subject but rather the verb. However, NP-subject and NP-object are still canonically ordered; i.e., the NP-subj precedes the NP-object.

Processability hierarchy of mapping principles suggests that after L2 learners pass the word/formula stage, the only producible sentences are the ones that map subject to the most prominent thematic role, e.g., agent, which in turn occupies sentence-initial position. This is suggested by the unmarked alignment hypothesis (Pienemann et al., 2005). This includes all the above sentence variants except VSO. In VSO sentences, there is default mapping between argument and function structures in that the subject is mapped to the most prominent role; the patient of the theme is mapped to the object function, but the verb rather than the agent-subject occupies initial position. This, I believe, must contribute to the delay of VSO production in comparison to SVO and verbless sentences or force early L2 learners to rely exclusively on SVO word order (see Mansouri, 1999; Oulhaj, 2015).

With regard to ditransitive verbs, the order of objects is either NP-PP (3a) or NP-NP (3b). This alternation is related to two distinct lexical items of the same verb (Falk, 2001). It is claimed the former involves lower processing loads because the mapping is canonical, regular,

and transparent (De Cuypere et al., 2010; Pienemann et al., 2005). This is illustrated in Figure 3.1.



*Figure 3.1.* Linear mapping (Pienemann et al., 2005, p. 228).

For NP PP order, the mapping is linear and default in that the agent is mapped to the subject, the theme is mapped to the object and the goal/beneficiary is overtly marked with a prepositional phrase or semantic case and mapped to the oblique function. More is required for NP-NP order. Since secondary objects are restricted in terms of the thematic roles they can take, knowledge of their intrinsic features is required. However, such intrinsic features are not available at the initial stage of L2 acquisition, as proposed by the multiple constraint hypothesis (Lenzing, 2016). Hence, early L2 learners always opt for NP PP construction. The other order, namely indirect object–direct object NP-NP, does not show up until intrinsic features of grammatical functions are developed. For languages in which secondary objects are marked with overt semantic case, it will not show up until case markers are developed. Once this is achieved, scrambling arguments to meet communicative needs is what drives argument order (Jäschke & Plag, 2015).

### **3.2.1.2 Double Clauses**

Subordination is a process in which independent sentences become dependent on a main clause. In MSA, this can be achieved in different ways. Of interest to this study at this stage of mapping is subject relative clauses and [?anna]-embedding. The examples in (6) present these two types of embedding.

6. a.  $\text{ʔəʕtaqala}$                        $\text{ʔa-ʕʕurʕi-u}$                        $\text{ar-razul-a}$                        $\text{allaði}$   
 arrest.3P.M.Sg.past      Def-policeman-Nom      Def-man-Acc      who.M.Sg  
 $\text{saraqa}$                                        $\text{a-ssajar-at-a}$   
 steal.3P.M.Sg.past                      Def-car.Sg-F-Acc  
 ‘The policeman arrested the man who stole the car’
- b.  $\text{ʔa-ʕtaqidu}$                        $\text{ʔanna}$   $\text{ar-razul-a}$                        $\text{sa-ja-ʔti}$   
 1P.M.Sg-believe                      Comp      Def-man-Acc      Fut-3P.M-come.Sg  
 ‘I believe that the man will come’

In (6a), the relative pronoun [allaði] “who/that,” which inflects for number and gender (see Table 3.1), introduces the embedded clause. The initial relative pronoun stands for the topic/subject NP and the final NP stands for the theme object. On the other hand, the embedded clause in (6b) is introduced by the complementizer [ʔanna] selected by the verb preceding it. The word order within the embedded clauses in (6a-b) is SVO.

Table 3.1

*Relative Pronouns in MSA*

Number	Masculine	Feminine
Singular	ʔallaði	ʔallati
Dual Nom	ʔallaðani	ʔallatani
Dual ACC/GEN	allaðajni	ʔallatajni
Plural	allaðina	ʔallaati/ʔlawati

Within PT processing procedure hierarchy, if a language requires a distinction between main and subordinate clauses in terms of word order, such as German and English, the production of subordinate clauses requires different processing procedures, i.e., S’-procedure, from main clauses, i.e., S-procedure. This is due to the fact that S’-procedure is what triggers the distinction in L2 learners’ production. If it was not active, word order in both clauses would be identical, which would not be target-like in English, as (7) from Pienemann (2005) shows.

7. \*I asked if could he come home. (p. 29)

However, word order in main and subordinate clauses varies in MSA except for subject relative clauses and embedded clauses that are introduced by the complementizer [ʔanna], which requires an SVO sentence. As demonstrated earlier, SVO order manifests default mapping of agent-subject initial position assumed by the unmarked alignment hypothesis (Pienemann et al., 2005) to be the initial syntactic stage. Therefore, embedded clauses introduced with [ʔanna] or [allaði] “who/that,” which relativize subject NPs, are producible once default mapping principles are achieved within main clauses since they involve identical mapping principles.

### 3.2.2 XP-Default Mapping Sentences

In MSA, adverbials have no fixed position. The sentences in (8) show that adverbs can appear in different slots within a sentence, e.g., sentence-final position in (8a), sentence-initial position in (8b), and sentence-medial position in (8c).

8. a. ʔatʕ-tʕulab-u                      ja-ʔtuna                      ʕila      al-madras-at-i  
 Def-student.M.Pl-Nom              3P.M.Sg-come              to      Def-school.Sg.F-Gen  
 fi asʕ-sʕabaḥ  
 in Def-morning  
 ‘Students come to school in the morning’
- b. fi asʕ-sʕabaḥ                      ʔatʕ-tʕulab-u                      ja-ʔtuna                      ʕila  
 in Def-morning                      Def-student.M.Pl-Nom                      3P.M.Sg-come                      to  
 al-madras-at-i  
 Def-school.Sg.F-Gen  
 ‘In the morning, students come to school’
- c. ʔal-muʕlim-u                      fataḥa                      bisurʕatin                      al-bab-a  
 Def-teacher.M.S-Nom                      open.M.Sg.Past                      quickly                      Def-door-Acc  
 ‘The teacher opened the door quickly’

The examples in (8a-b) show that SVO order is maintained despite adverbs appearing at its edge. However, the adverb intervenes between the verb and its argument in (8c), which breaks the SVO string. Such scrambling is for discourse or pragmatic reasons; e.g., when adverbials are fronted in declarative sentences, they occupy the topic position.

MSA also exhibits other structures in which a topical position that precedes an SVO order is filled with an external or dislocated topic (9a-b).

9. a.  $\text{ʔal-kitab-u}$                        $\text{ʔat}^{\text{ʕ}}\text{-t}^{\text{ʕ}}\text{alib-u}$                        $\text{ja-qraʔu-hu}$   
 Def-book.M-Nom      Def-student.M-Nom      3P.M.Sg-read-it  
 ‘The book, the student is reading’
- b.  $\text{ʔat}^{\text{ʕ}}\text{-ulab-u}$                       **hum**       $\text{ʔakram-u}$                        $\text{ʔal-muʕlim-a}$   
 Def-student.M.Pl-Nom      **they**      honored.Past-3P.Pl.M      Def-teacher.M.Sg-Acc  
 ‘The students, they honored the teacher’

Topics in (9a) and (9b) are external or left dislocated elements, which precede a canonical SVO order. They are anaphorically linked to a pronominal element, [-hu] and [-hum] respectively, within the sentences following them, which are complete and coherent on their own.

Another structure in which such facts are found is the single-proposition sentence with a relativized NP object with resumption. These also require a topic-subject distinction since the fronted relative pronoun occupies the topic position (Bresnan et al., 2015). The example in (10) shows a single-proposition sentence with an embedded clause in which an object NP is relativized with resumption. The order in the embedded clause resembles that of CLLD structures shown in (9a) in which a topicalized element is found in clause-initial position that is linked anaphorically to a pronominal clitic while the rest of the sentence is canonical.

10.  $\text{haða}$        $\text{huwa}$        $\text{ət}^{\text{ʕ}}\text{-t}^{\text{ʕ}}\text{ifl-u}$                        $\text{ʔallaði}$        $\text{ta-ħmilu-hu}$                        $\text{ʔal-marʔah}$   
 this      he      Def-child-Nom      who      3P.F.Sg-carry-him      Def-woman-Nom  
 ‘This is the child that the woman is carrying’

Within PT hierarchy of mapping principles, such initial positions are not readily available to L2 learners. Initially, topic is not differentiated from subject, as stated in the topic hypothesis (Pienemann et al., 2005) and prominence hypothesis (Bettoni & Di Biase, 2015). In other words, subjects are considered to be topics by default. As a result, this position is reserved for subjects in the IL initial phase. Thus, disassociation of discourse functions “topic” or “focus” from

subject must be achieved so these structures can be produced. PT expects IL development to precede from lower processing load structures to higher processing load structures. The less costly move here is to assign topic to anything other than verb arguments, e.g., adverbs, adjectives, and dislocated elements “external topic” (Bettoni & Di Biase, 2015; Pienemann et al. 2005). This move triggers the subject to not be associated with initial position, while everything else remains canonical or default, i.e., subject is still mapped to the most prominent role, agent.

As a result, embedded clauses introduced with [ʔanna] or [allaði] “who/that,” which relativize subject NPs, involve lower processing loads than those introduced with [allaði] “that,” which relativizes object NPs since in the former no topic/subject distinction is required for their production while in the latter a topic-subject distinction is required for the object relative pronoun to occupy topic position (Nottbeck, 2019).

### **3.2.3 Non-Default Mapping Sentences**

MSA allows word orders in which arguments of verbs are moved around for discourse reasons. These can be divided into two groups. The first contains structures that involve a non-default or complex argument to function structure mapping but maintain a default constituent to function structure mappings, e.g., passive and causatives. The second includes structures that involve a non-default constituent to function structure mappings but maintain a canonical or default argument to function structure mappings, such as OVS, OSV, and VOS.

#### **3.2.3.1 Non-Default Argument to Function Mapping Sentences**

In MSA, a passive construction has a non-agent subject, which is either unknown or deleted for discourse purposes, e.g., patient subject, and a special morphological verb form. Unlike English, in which the agent subject can be expressed by an optional “by” adjunct, subjects in MSA are totally dropped, as shown in (11) and (12).

11. a. ?at<sup>ʕ</sup>-t<sup>ʕ</sup>ulab-u                      ja-qraʔuna                      al-kitab-a  
 Def-student.Pl.M-Nom    3P.M-read.Pl                      Def-book.M-ACC  
 ‘The students are reading the book’
- b. quriʔa                                      al-kitab-u  
 read.Passive.Past.M.Sg    Def-book.M-Nom  
 ‘The book was read’
12. a. ?at<sup>ʕ</sup>-t<sup>ʕ</sup>alib-u                      ?aʕt<sup>ʕ</sup>a                      al-kitab-a  
 Def-student.M.Sg-Nom    give.3P.Sg.M.Past                      Def-book.M.Sg-Acc  
 li l-muʕalim-at-i  
 to Def-teacher.F.Sg-Gen  
 ‘The student gave the book to the teacher’
- b. ?uʕt<sup>ʕ</sup>ia                                      al-kitab-u                      li l-muʕalimat-i  
 give.Passive.Past.Sg.M .    Def-book.M.Sg-Nom                      to Def-teacher-F.Sg-Gen  
 ‘The book was given to the teacher’
- c. ?uʕt<sup>ʕ</sup>iat                                      ?al-muʕalimat-u                      al-kitab-a  
 give.Passive.Past.Sg.F    Def-teacher.F.Sg-Nom                      Def-book.M.Sg-Acc  
 ‘The teacher was given the book’

Examples (11) and (12) show active transitive and ditransitive verbs that have been passivized. The transitive verb in (11a) is passivized in (11b). The agent subject [ʔat<sup>ʕ</sup>-t<sup>ʕ</sup>ulab-u] “the students” is suppressed, the patient object [al-kitab-u] “the book” is promoted to subject position, and the verb form is changed from [ja-qraʔuna] to [quriʔa] “read.” The same is true for (12a). However, since there is a ditransitive verb [ʔaʕt<sup>ʕ</sup>a] “gave,” the direct object [al-kitab-u] “book” (12b) or the indirect object [ʔal-muʕalimat-u] “the teacher” (12c) can be promoted to subject position. This is accompanied by a morphological change to the verb [ʔaʕt<sup>ʕ</sup>a] to [ʔuʕt<sup>ʕ</sup>ia] “gave” and the suppression of the agent argument.

This morphological change in verb form causes non-linearity in the mappings between argument structure and function structure. It changes the functional destination of NPs. The mapping here involves a non-agent argument, which is less prominent in the thematic hierarchy in (13) and is mapped to the most prominent grammatical function, namely the subject.

### 13. Thematic Hierarchy

agent > beneficiary > experiencer/goal > instrument > patient/theme > locative

(Bresnan, 2001, p. 307)

This mapping diverges from the unmarked alignment hypothesis (Pienemann et al., 2005) and prominence hypothesis (Bettoni & Di Biase, 2015) for the initial stages of IL agent-subject and patient-object. As a result, L2 learners need to develop a means to handle non-linearity between argument and function structures to produce the passive. Specifically, they must develop inter-clausal information exchange to compute functional destinations of the arguments as required by the verb (Kawaguchi, 2005).

#### 3.2.3.2 Complex Argument to Function Mapping Sentences

Causatives in MSA involve a morphological process that internalizes the external argument and adds an external argument (Benmamoun, 1991). In other words, causatives rearrange the argument structure of verbs. There are two ways to form the causative of verbs in MSA and both are morphological, the examples shown in (14) and (15) presents one of them applied to an intransitive and a transitive verb respectively.

14. a. nazala                      ar-razul-u  
         came down      Def-man.Sg-Nom  
         ‘The man came down’
- b. ?anzala                              al-furt<sup>ʕ</sup>i-u                              ar-razul-a  
         cause-came down.M.Sg      Def-policeman.Sg.M-Nom      Def-man.M.Sg-Acc  
         ‘The policeman caused the criminal to come down’
15. a. ʃariba                              at<sup>ʕ</sup>-t<sup>ʕ</sup>ifl-u                              al-maʔ-a  
         drink.Past.3P.M.Sg      Def-child.M.Sg-Nom      Def-water-Acc  
         ‘The child drank water’
- b. ?aʃribati                      al-ʔum-u                              at<sup>ʕ</sup>-t<sup>ʕ</sup>ifl-a                              al-maʔ-a  
         cause-drink      Def-mother-Nom      Def-child.M.Sg-Acc      Def-water-Acc  
         ‘The mother caused the child to drink water’

The intransitive verb [nazala] “came down” requires only one external argument, which in (14a) is [arrazulu] “the man”. The transitive verb [fariba] “drank” requires one external argument, which in (15a) is [atʰiʰflu] “the child”, and one internal argument, which in (15a) is [almaʔa] “the water”. However, when the causative form of the same verbs in the above examples is used instead, an extra argument is introduced.

The argument structure of (14b) and (15b) is a bit complex. Starting with (14b), the causative verb [ʔanzala] “cause to come down” requires two agents and one patient. In other words, “cause to” requires an agent [aʃʃurtʰi-u] “the policeman” and a patient [arrazula] “the man,” while the lexical verb only requires an agent [arrazula] “the man.” In (15), the causative verb [ʔafaribati] “cause to drink” requires two agents and two patients. The causative verb requires an agent [alʔumu] “the mother” and a patient [atʰiʰfla] “the child,” while the lexical verb requires an agent [atʰiʰfl-a] “the child” and a patient [almaʔa] “the water.” As a result, both cases have one grammatical function that is associated with two thematic roles. In (14b), [arrazula] “the man” is both the patient of “cause to” and the agent of “came down,” while in (15b), [atʰiʰfla] “the child” is both the patient of “cause to” and the agent of “drink.”

This complex relationship between argument structure and function structure deviates from the unmarked alignment hypothesis in that two thematic roles are mapped onto one grammatical function (Pienemann et al., 2005). This complex mapping should delay the production of such structures in the IL. L2 learners have to develop from default mapping to XP-default mapping to non-default mapping, after which the processing resources necessary to produce such structures are presumably in place.

### 3.2.3.3 Non-Default Constituent to Function Mapping Sentences

The canonical object position in MSA follows the subject and verb. However, it can appear in other positions, as shown in (16a-b).

16. a. al-kitab-a            ja-qraʔu            at<sup>s</sup>-tʕalib-u            (OVS)  
 Def-book.M-Acc 3P.M.Sg.read Def-student.M.Nom  
 ‘The book the student is reading’
- b. ja-qraʔu                      al-kitab-a                      at<sup>s</sup>-tʕalib-u                      (VOS)  
 3P.M.Sg.read                      Def-book.M-Acc                      Def-student.M.Nom  
 ‘The student is reading the book’

In (16a), the object precedes both the verb and the subject, which appears sentence final. In (16b), it precedes the subject but follows the verb. When the object is moved from its canonical position to a focus position, the mapping between constituent structure and function structure is non-default or non-canonical as the most prominent grammatical function, the subject, is not mapped to the initial position. Instead, the object is.

Similar facts are found in (17a), but this time a relative pronoun is functionally related to a gap at object position in the embedded clause. This diverges from canonical mapping, resulting in the embedded clause having OVS order.

17. a. haḏihi            hia            al-kura-t-u                      allati            rakala            \_\_\_\_\_  
 this.F.Sg            it            Def-ball.Sg-F-Nom                      that.F.Sg            kick.Past.3P.M.Sg  
 ar-raʒul-u  
 Def-man.Sg.M-Nom  
 ‘This is the ball that the man kicked’

PT claims that learners’ ability to produce such sentences, in which constituent and function structures are not mapped in a default way, is conditioned by their ability to handle such mappings that diverge from what they are used to in the IL initial state. Learners have to develop processing resources that enable them to do so. The prominence hypothesis (Bettoni & Di Biase, 2015) and topic hypothesis (Pienemann et al., 2005) claim that after default mapping, in which

learners' production is confined to canonical word order, learners develop the ability to fill topic position with adjuncts, i.e., non-core arguments. This comes as a precursor to fronting core arguments exhibited in object focus. Therefore, within embedded clauses with relativized object NPs, clauses that have a resumptive pronoun filling the object position, as in (10a), involve lower processing loads than those lacking such a pronoun, as in (17a). Table 3.2 presents the targeted syntactic structures and their three structures mapping.

Table 3.2

*Targeted Syntactic Structures*

Mapping Principles	Structures
Non-default C to F mapping	Object relative clause without resumption OVS
Complex A to F mapping	Causative
Non-default A to F mapping	Passive
XP default mapping	Object relative clause with resumption
	Clitic left dislocation
	XPSVO
	XPVO
	XP verbless sentence
Default mapping + extra arguments	VSO
	VOXP
	SVOXP
Default mapping	Verbless sentence XP
	[?anna] embedding
	Subject relative clause
	SVOO
	SVO(PP)
	Verbless sentence
	VO
SVO	

### 3.3 Case Markers

MSA distinguishes three structural cases: nominative, accusative, and genitive. Since these case markers are associated with grammatical functions, word order tends to be very

flexible. Therefore, even though Arabic has two basic word orders, SVO and VSO, as in (18a-b), for discourse and pragmatic reasons, other word orders are possible, as shown in (18c-e).

18. a. at<sup>ʕ</sup>-t<sup>ʕ</sup>alib-u                      ja-qraʔu                      al-kitab-a                      (SVO)  
 Def-student.Sg.M.Nom    3P.M.Sg.read    Def-book.Sg.M-Acc  
 ‘The student is reading the book’
- b. ja-qraʔu                      at<sup>ʕ</sup>-t<sup>ʕ</sup>alib-u                      al-kitab-a                      (VSO)  
 3P.M.Sg.read              Def-student.Sg.M.Nom    Def-book.Sg.M-Acc  
 ‘The student is reading the book’
- c. ʔal-kitab-a                      ja-qraʔu                      at<sup>ʕ</sup>-t<sup>ʕ</sup>alib-u                      (OVS)  
 Def-book.Sg.M-Acc    3P.M.Sg.read              Def-student.Sg.M.Nom  
 ‘The book the student is reading’
- d. ja-qraʔu                      al-kitab-a                      at<sup>ʕ</sup>-t<sup>ʕ</sup>alib-u                      (VOS)  
 3P.M.Sg.read              Def-book.Sg.M-Acc    Def-student.Sg.M.Nom  
 ‘The student is reading the book’
- e. ʔal-kitab-a                      at<sup>ʕ</sup>-t<sup>ʕ</sup>alib-u                      ja-qraʔu                      (OSV)  
 Def-book.Sg.M-Acc    Def-student.Sg.M.Nom    3P.M.Sg.read  
 ‘The book the student is reading’

These examples show the subject [at<sup>ʕ</sup>-t<sup>ʕ</sup>alib-u] “student” is in nominative case and is the argument that agrees with the verb despite its position in the sentence. On the other hand, the object [al-kitab-a] appears invariably in accusative. In addition to the nominative and accusative cases seen in (18), a noun is assigned a genitive case when it is the inner noun in a construct state construction, as in (19a), or when it follows a preposition, as in (19b).

19. a. kitab-u                      ar-razul-i  
 book.M.Sg.Def-Nom    Def-man.Sg.M-Gen  
 ‘The book of the man’
- b. fi al-bajt-i  
 at Def-home.M.Sg-Gen  
 ‘At home’

However, the patterns of case assignment shown above are not exhaustive. For instance, subjects can appear in accusative when they follow the complementizer [ʔanna], as shown in (20).

20.    ʔa-ʕtaqidu    ʔanna ar-raʒul-a                    sa-ja-ʔti  
 1P.Sg-think    Comp Def-man.Sg.M-Acc    Fut-3P.M.Sg-come  
 ‘I think that the man will come’

For L2 learners of Arabic, case marker acquisition not only involves discovering what case marker goes with which grammatical function in what context—although this is a crucial step towards that goal—but also includes navigating form-function complexity, which is an additional learning task that could impede case marker acquisition. The discussion below sheds light on this issue.

As shown above, Arabic distinguishes three structural cases: nominative, accusative, and genitive. Cases and their markers are in a straightforward one-to-one relationship most of the time, as shown in (21)–(23).

- |     |  |  |  |
|-----|--|--|--|
| 21. | al-muʕalim- <b>u</b><br>Def-teacher.M.Sg- <b>Nom</b><br>‘The male teacher’         | b. al-muʕalim- <b>a</b><br>Def-teacher.M.Sg- <b>Acc</b>      | c. al-muʕalim- <b>i</b><br>Def-teacher M.Sg- <b>Gen</b>      |
| 22. | al-muʕalim-at- <b>u</b><br>Def-teacher.Sg-F- <b>Nom</b><br>‘The female teacher’    | b. al-muʕalim-at- <b>a</b><br>Def-teacher.Sg-F- <b>Acc</b>   | c. al-muʕalim-at- <b>i</b><br>Def-teacher.Sg-F- <b>Gen</b>   |
| 23. | al-muʕalim-a-at- <b>u</b><br>Def-teacher-Pl-F- <b>Nom</b><br>‘The female teachers’ | b. al-muʕalim-a-at- <b>a</b><br>Def-teacher-Pl-F- <b>Acc</b> | c. al-muʕalim-a-at- <b>i</b><br>Def-teacher-Pl-F- <b>Gen</b> |

These examples illustrate a one-to-one relationship between case marker forms and functions. That is, nominative case is expressed with [-u], accusative with [-a], and genitive with [-i], regardless of the gender—masculine in (21) and feminine in (22) and (23)—or the number of the noun—singular in (21) and (22) and plural in (23). However, number and case features are sometimes fused and expressed in one morpheme, as demonstrated in (24) and (25).

- |     |  |  |
|-----|--|--|
| 24. | al-muʕalim-ani<br>Def-teacher.M-Du.Nom<br>‘The two teachers’ | b. al-muʕalim-ajni<br>Def-teacher.M-Du.Gen/Acc<br>‘The two teachers’ |
|-----|--|--|

25.    al-muʕalim-una                      b. al-muʕalim-ina  
        Def-teacher.M-Pl.Nom              Def-teacher.M-Pl.Gen/Acc  
        ‘The teachers’                         ‘The teachers’

The morpheme [-ani] in (24a) expresses nominative case and dual number, while [-ajni] in (24b) expresses both the genitive and accusative cases along with dual number. In (25a), plural number, nominative case, and masculine gender are expressed through the morpheme [-una]. The same is true of (25b), in which [-ina] expresses plural number, masculine gender, and both genitive and accusative case. Table 3.3 presents the full case-marking paradigm in Arabic.

Table 3.3

*Case-Marking Paradigm in Arabic*

	Singular	Dual	Plural		Broken PL
	Both genders	Both genders	Masculine	Feminine	
Nominative	-u	-ani	-una	-u	-u
Accusative	-a			-a	-a
Genitive	-i	-ajni	-ina	-i	-i

This form-function complexity must be taken into consideration when investigating case morphemes as they have to be disassociated and kept separate from any intervening factors that could affect learners’ performance. Researchers have been encouraged to look for morphemes that show one-to-one form-function relationships when testing PT claims because complex form-function relationships might yield a pattern due to this complexity rather than due to how languages develop (Pienemann, 1998).

Therefore, the focus of the study was on the development of nominative and accusative Arabic case markers that are structurally assigned to grammatical functions of subject and object, as in (18), as well as genitive case markers assigned to construct state inner NP (19a) and NPs within PPs (19b). Taking form-function complexity into consideration, the study was confined to markers that exhibit one-to-one form-function relationships, as in masculine and feminine

singular or feminine regular plural and broken plural, as shown in Table 3.4. The masculine and feminine dual and the masculine plural were avoided due to the form-function complexity they exhibit.

Table 3.4

*Targeted Case Morphemes*

Case	Singular
Nominative	-u
Accusative	-a
Genitive	-i

PT predicts that case morphemes are not random in their development. They can be predicted based on the default form of words learned, default mapping, the activation of processing procedures, and matching grammatical functions and case morphemes (Artoni et al., 2013; Artoni & Magnani, 2015; Baten, 2011, 2013; Baten & Verbeke, 2015; Di Biase et al., 2015).

### **3.4 Research Questions and Hypotheses**

This section presents the research questions of this study as well as the hypotheses that are based on the development of processing procedures and mapping principles of the three structures of grammar proposed within PT.

#### **3.4.1 Research Questions**

This study sought to answer the following research questions:

1. Do the developmental routes for the acquisition of declarative sentence word order obey the principles of PT?
2. With ditransitive verbs, does the NP-PP sequence emerge before NP-NP? If not, what is the observed IL pattern?

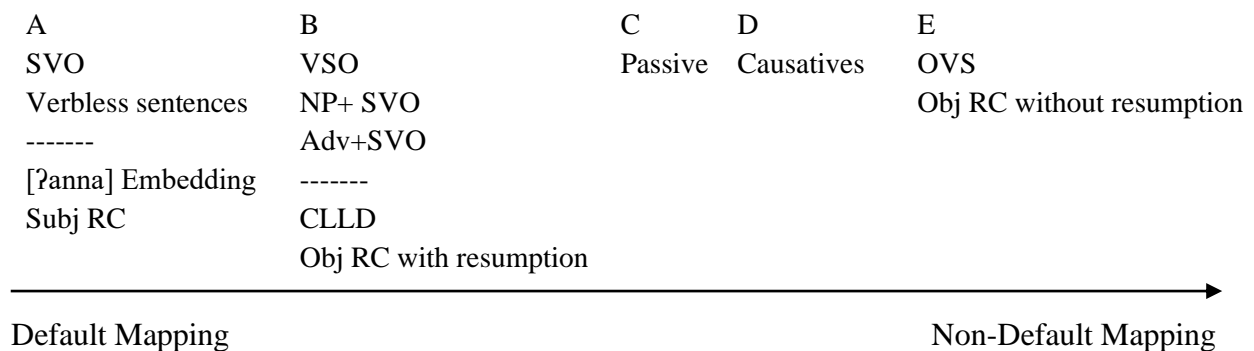
3. Do the observed developmental routes for the acquisition of case markers conform to the principles of PT?
4. Does free word order occur only if functional case marking has emerged?

### 3.4.2 Hypotheses

Based on the above discussion of the target structures and their mapping and processing procedures, I formulated the following four hypotheses to address the above research questions.

The hypotheses are numbered to correspond to the research question each of them addresses.

1. The order of development of declarative sentences will not violate the sequence A before B before C before D before E.



2. The order of emergence for ditransitive verbs will not violate the order NP-PP before NP-NP.
3. In the IL, case marking will develop in the following order: All Nominative → Positional → Phrasal → Inter-Phrasal (Functional)
4. In the IL, free word order will not emerge before functional case marking.

### 3.5 Chapter Summary

This chapter presented the target syntactic structures and discussed the mapping of their argument-function-constituent structures. This was done to identify what mappings they theoretically involved before hypothesizing a PT-based hierarchy for their development in MSA

as an L2. With regard to morphological structures, the chapter presented the target case markers and discussed what information exchange they theoretically involved. It then presented the research questions and PT-based hypotheses. The next chapter presents the empirical study.

## **Chapter 4**

### **Methodology**

#### **4.1 Introduction**

This cross-sectional study collected data via three communicative tasks from MSA learners with varied L1 backgrounds from mid-October 2020 to early January 2021. This chapter describes the methodology of the study. Section 4.2 states the research questions and hypotheses, Section 4.3 describes the participants, Section 4.4 describes the data collection, Section 4.5 presents the study procedures, Section 4.6 explains how the data were analyzed, and Section 4.7 discusses data interpretation.

#### **4.2 Research Questions and Hypotheses**

##### **4.2.1 Research Questions**

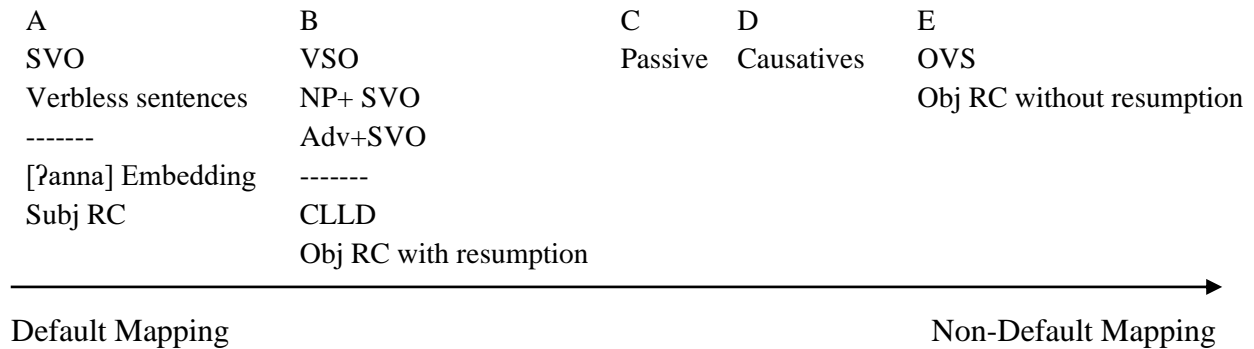
This study sought to answer the following research questions:

1. Do the developmental routes for the acquisition of declarative sentence word order obey the principles of PT?
2. With ditransitive verbs, does the NP-PP sequence emerge before NP-NP? If not, what is the observed IL pattern?
3. Do the observed developmental routes for the acquisition of case markers conform to the principles of PT?
4. Does free word order occur only if functional case marking has emerged?

##### **4.2.2 Hypotheses**

The hypotheses are numbered to correspond to the research question each of them addresses.

1. The order of development of declarative sentences will not violate the sequence A before B before C before D before E.



2. The order of emergence for ditransitive verbs will not violate the order NP-PP before NP-NP.
3. In the IL, case marking will develop in the following order: All Nominative → Positional → Phrasal → Inter-Phrasal (Functional)
4. In the IL, free word order will not emerge before functional case marking.

### 4.3 Participants

This study recruited 21 male adult learners of MSA. Their demographic information is shown in Table 4.1. Unlike all other studies conducted on the acquisition of Arabic within PT, the recruited learners were studying MSA in an L2 context in the TASOL institute at the Islamic University in Medina, where MSA was the medium of instruction. This university accepts applicants from all over the world in tuition-free undergraduate and graduate programs. Therefore, the goal of the institution is to prepare non-native speakers of Arabic to use MSA as the language of instruction in these programs. Students' L1s vary widely, making this site a good testing ground for PT. The institute has four levels of Arabic classes. Each level is a full semester, so all four levels take learners around 18 months to complete before they start their programs. Prospective students have to take a placement test upon arrival. However, if learners

are assigned to higher levels due to having exposure to MSA elsewhere, they can still start at Level 1. Therefore, when selecting participants, it was essential to only include those whose initial exposure to MSA was after puberty. Most participants had not received formal MSA instruction before, except for Participants 9 and 12 who studied it regularly on weekends at a private school when they were 15 or older.

Table 4.1

*Participant Background Information*

Participant	Age	Native Language	L2	TASOL Level
P1	26	Portuguese		3
P2	24	French / Comorian		2
P3	24	Urdu	Pashto	1
P4	23	Portuguese		3
P5	24	French		2
P6	25	French	English	2
P7	22	Albanian		1
P8	24	French		2
P9	22	English	Bengali (heritage)	1*
P10	24	Comorian	French	2
P11	24	Comorian	French	3
P12	23	Malay	English	1*
P13	27	English		3
P14	24	Oromo		3
P15	23	Swahili		3
P16	23	French		3
P17	34	French		4
P18	24	Pashto	Farsi / Urdu	4
P19	25	English		4
P20	30	Spanish	English	4
P21	24	English	Somali (heritage)	4

*Note.* \*Students with asterisk had earlier exposure to MSA at their home countries after puberty.

The researcher contacted the head of the program and explained the study and sent him a recruitment email that included a summary of the study and target participants as well as the researcher's contact information to forward to the list of enrolled students. Learners were asked to contact the researcher if interested in participating. They were informed that participation was

voluntary and they would not be compensated. After determining that learners fit the inclusion criteria, a date and time were set for participation. All participants completed a questionnaire asking for their contact information, current TASOL level, language background, age, and past formal exposure to MSA. A copy of the language background questionnaire is in Appendix A.

#### **4.4 Data Collection**

Given the scope of the study and the differences in frequency between the structures investigated, several tasks were adopted and modified to elicit the target structures. When conducting a study within PT, spontaneous or elicited speech data via longitudinal or cross-sectional studies are optimal (Pienemann & Lenzing, 2015). Thus, this cross-sectional study collected a mix of spontaneous and elicited speech data.

##### **4.4.1 Interview**

The first task was a structured interview in which participants were asked a set of 10 to 15 questions about their background, daily routine, past experiences, future plans, and friends (see Appendix B). This task shed light on participants' knowledge of syntax and morphology and helped determine their level in the PT hierarchy. The task was expected to generate many contexts in which various simple syntactic structures were used, such as word order, verbless sentences, and circumstantial adjuncts. However, it was not expected to generate contexts in which complex structures—like the passive, causatives, CLLD, subordination, and object focus—were likely to be used. As a result, more tasks had to be adapted to avoid such limitations and to ensure that contexts for such structures were created by the tasks before judgments regarding the developmental schedule could be made.

#### 4.4.2 Picture Description Task

A PowerPoint presentation containing 90 sets of pictures was presented to the learners in two sessions. These pictures were of various types as listed below (see Appendix C). Type 1 was adopted from Baten's (2013) arrow method and modified as follows. Each picture showed a named character involved in an action with an object or another named character. In 20 pictures, an arrow was pointing towards the object. After participants were given 3–4 sentences about the context of the picture, they were asked to describe the picture in one sentence, starting their sentences with the item the arrow was pointing at.

In 10 of these pictures, the same steps were followed. However, there was more than one object and the sentences about the context of the picture contradicted what the arrow was pointing at. Participants were asked to produce a sentence that correctly described the picture, starting their sentence with the item the arrow was pointing at. This was done to create a context for contrastive focus (see Appendix C, Type 1). Type 1 shed light on learners' ability to topicalize and place focus on objects. Once a sentence is produced after Type 1 pictures, participants were asked the following question 'Can you say it a different way?' as participants could use one strategy of fronting objects across both types of pictures.

Type 2 had 10 pairs of pictures. Each pair showed an object in two different states and the pair were followed with "what happened to the object?" (e.g., regarding a table and a broken table, an apple and a partially eaten apple). Type 2 shed light on learners' ability to form passive sentences (see Appendix C, Type 2).

Type 3 had 10 pictures showing regular activities done by a person. The pictures were accompanied by prompt words that the learners had to include in their answers. These words were a subset of verbs that select the complementizer [*?anna*], which introduces an embedded

sentence. Participants were asked the following question with each picture: “What is the subject doing?” The participants were encouraged to produce a sentence that would describe the situation in the picture using the prompt word. Type 3 revealed learners’ ability to form embedded clauses using [?anna] (see Appendix C, Type 3).

Type 4 had 10 pictures—each depicting an event in which someone was causing someone else to do something—to elicit causative structures, such as a mother causing her son to sleep or drink something. The researcher gave context first and then asked, “What did the subject do?” This subject was always the agent of the causative verb (see Appendix C, Type 4).

Type 5 consisted of 20 pictures depicting someone giving or sending something to someone else. Each picture had the target verb written with it to make sure learners produced it. This type shed light on how objects were organized, e.g., NP-NP or NP-PP (see Appendix C, Type 5).

Type 6 was adopted from Algady (2013). A total of 20 pictures were presented to participants, 10 to elicit embedding in subject position and 10 to elicit embedding in object position. Participants were shown a picture of someone involved in an action with a sentence produced by the researcher describing this picture. Then, this picture was cropped to focus on the subject, and participants were asked, “Who is this?” This task was used to elicit subject relative clauses. To elicit object relative clauses, the subject was removed to focus on the object, and the researcher asked the question “What is this?” (see Appendix C, Type 6).

#### **4.4.3 Elicited Imitation Task**

I created a list of 60 sentences based on Baten (2019), who used an elicited imitation task to test case marker development in L2 German. The sentences were 6–10 words each. A short distraction exercise was performed in which learners searched for the picture the researcher

described in a six-picture slide in the screen in front of them. Once they identified the picture, they said that “the sentence you uttered describes Picture (#).” Only after they found the picture and uttered the aforementioned sentence did they produce the sentence. This was done to ensure the sentences uttered were not pure repetition but rather reconstructions based on learners’ L2 knowledge. The number of reconstructions possible in all 60 sentences was 12 per argument in canonical position and 12 in non-canonical position for core arguments and 12 for oblique NPs (six for NPs within PP and six for NPs within CS). This made the total number of reconstructions possible for all NPs 72. In addition, 24 sentences had two non-target-like case markers each, and 24 sentences had one non-target-like case marker, bringing the total sentences to 42. Finally, 12 grammatical sentences were used as fillers (see Appendix D).

#### **4.5 Procedures**

Before any contact took place with participants, I contacted the head of the institute and explained my research. I was asked to send the recruitment email to him, and he forwarded it to the students enrolled in the program. In the email, the goal of the research and the target learners were clearly explained to make sure only those who met the criteria would contact the researcher. The researcher’s contact information was listed at the end of the email for those interested in participating. After the researcher made sure potential participants met the inclusion criteria, a date and time were set for them to participate.

Participants were sent a questionnaire to fill out and send back prior to the agreed upon meeting. In addition, 15 minutes before the meeting, they were sent the consent form to read, sign, and send back. Then, they were emailed a link to a Zoom meeting. Once they joined, they were asked if they had any questions regarding their participation. The researcher made it clear

that their participation was voluntary, would be recorded for the purpose of my dissertation, and they could end their participation at any time.

The data were collected through three communicative tasks: interview, picture description task, and elicited imitation task. Instructions for each task were given in MSA with examples, and all participants were encouraged to ask questions to make sure they understood each task. The details of how each task was conducted are presented below. All participants completed the three tasks except for Participant 20, who withdrew after the interview and the picture description task. All tasks were conducted online via Zoom in one sitting due to the Covid-19 pandemic.

#### **4.5.1 Interview**

The first task was the interview in which learners were asked a set of 10 to 15 questions. They were encouraged to respond in full sentences and provide details. The interview took around 15 minutes to complete. The questions were about learners' background, daily routine, past experiences, future plans, and friends. The researcher did not interrupt learners or ask another question until learners completely finished addressing the question they were answering.

#### **4.5.2 Picture Description Task**

The picture description task took around 35 to 45 minutes to complete. Once the researcher asked all the interview questions, he shared a PowerPoint presentation containing the pictures for the task. Pictures were divided into four sections based on what instructions they required before they could be performed by learners. The first included Type 2, 3, and 5.

Learners were asked to look at the picture and use accompanying prompts to describe them. With Type 2 pictures, there were no prompts; instead, pictures were followed by the question "What happened to the object?" At the beginning of the section, there was one example of each type so

that learners understood the task and the instructions. Again, learners were encouraged to produce full sentences when describing the pictures. If learners did not know the prompt words, an alternative lexical item was provided.

The second section contained 20 Type 1 pictures in two groups of 10. Each group was presented separately with different instructions. For each picture in the first group, after a 3–4 sentence context, learners were asked to describe the picture starting with the object an arrow was pointing at. For each picture of the second group, since there was more than one object and the arrow only pointed at one of them, the researcher’s sentence describing the picture contradicted what the picture showed. Learners were asked to produce a sentence that accurately described the picture starting with the object the arrow was pointing at. Once a sentence is produced after each picture, participants were asked the following question ‘Can you say it a different way?’ as participants could use one strategy of fronting objects across both types of pictures.

The third section contained Type 4 pictures. Learners were asked to listen to 3–4 sentences about the context of the pair of pictures presented to them and then produce a complete sentence about them that answered the question “What did the subject do?”

The last section contained Type 6 pictures. Each picture was shown twice. First, learners listened to a sentence describing the picture. The next slide presented the same picture with the object cropped out to focus on the subject, and the researcher asked, “Who is this?” Sometimes the subject was removed to focus on the object and the researcher asked, “What is this?” In both cases, when responding, learners needed to start with what was written under the picture “This is...” Once this task was over, participants were offered a break.

### **4.5.3 Elicited Imitation Task**

After the break, participants were told they would listen to a sentence produced by the researcher. Simultaneously, six pictures would be presented on a slide. They were told that their task was to listen to the sentence and identify the picture the sentence described by saying, “The sentence you uttered describes Picture (#).” They then were asked to repeat the sentence as they heard it. The first sentence was practice. For the remaining sentences, the researcher moved to the next slide once the learner finished repeating the sentence. Learners took 20 to 30 minutes to complete this task.

### **4.5.4 Data Management**

The tasks took 70 to 90 minutes to complete. Then, a file for each learner was created to save their questionnaire, consent form, recording, and spreadsheet. Once data collection ended for all learners, the recordings were converted into sound files compatible with Audacity software. After that, I went through every sound file to transcribe the content in IPA. Each sentence was transcribed and moved to an Excel file under the relevant column; e.g., passive sentences would be listed in their own column. The number of structures under each column was moved into a table like Table 4.2 to which the emergence criterion for syntactic structures was applied to test whether a syntactic structure had emerged (with “Participant X” replaced with the relevant participant’s number). With regard to case morphology, similar steps were followed, and the results were moved to a table similar to Table 4.3 to which the morphological emergence criterion was applied.

Table 4.2

*Sentential Word Order Results for Participant X*

	Participants	PX
Mapping Principles	Structure	
Non-default C to F mapping	ORWOR	
	OVS	
Complex A to F mapping	Causative	
Non-default A to F mapping	Passive	
XP default mapping	ORWR	
	CLLD	
	XPSVO	
	XPVO	
	XPVless	
Default mapping + extra arguments	VSO	
	VlessXP	
	VOXP	
	SVOXP	
Default mapping	[?anna]	
	SR	
	SVOO	
	SVO(PP)	
	Vless	
	VO	
	SVO	

Table 4.3

*Case Morphology Results for Participant X*

Processing Procedures	Case Marking Stage	NP Type	PX
Inter-phrasal	Functional	Pre-verbal NPobj	
		Post-verbal NPsubj	
	Inter-phrasal	[?anna]-subj	
Phrasal	Phrasal	P-Ncase	
Category	Positional	Post-verbal NPobj	
		Pre-verbal NPsubj	

**4.6 Data Analysis**

Since this study aimed to test PT predictions regarding the development of sentential word order and case morphology in MSA as an L2, it used the principles PT puts forward to judge whether a structure had emerged. PT uses emergence criteria when analyzing L2 data and claims that when a rule is applied in various contexts and lexical items, it must be an indication

of its existence in the learner's grammar (Pienemann, 1998). It is reasonable to think that if the question is developmental in nature, any change in the grammar is important since it shows the order in which elements emerge. Accuracy rates would miss such changes that might not hit the identified percentages due to testing environment, frequency, or avoidance issues. This was shown in Pienemann (1998) when for the same dataset, two accuracy percentages resulted in different developmental routes.

Thus, emergence criteria employed within PT would always capture initial instances of rule application and how learners' grammar develops from one stage to another. However, if the question is one of mastery, accuracy rates would be a reasonable choice even though the percentages would always be controversial. As a result, and since this study examined a developmental question, emergence criteria were adopted for the development of sentential word order and case morphology.

For syntactic structures, Pienemann (1998) considered one instance to be enough evidence to claim such a structure had emerged in the IL of a learner unless there were identical copies of this instance and they were the only ones in the data, suggesting a memorized chunk rather than a rule application. For longitudinal studies, if only one instance of rule application appears in a sample, judging whether it is the point of emergence is based on whether the rule becomes a constant part of the IL, as per the continuity assumption (Brown, 1973). In other words, if other examples of a rule being applied show up in the subsequent data, it is safe to assume the first rule application is the point of emergence. However, it cannot be viewed as such if there are no examples of it in the subsequent data.

Since this was a cross-sectional study and data collection was a one and done process, I took two cases of rule application, given that they were not identical, to be enough to assume

whether a rule had emerged in the IL of a learner. This served to eliminate the effect of memorized chunks or formulaic language since there would be no second data collection as in a longitudinal design. Thus, raising the number of rule applications to two cases in cross-sectional studies parallels the continuity assumption in longitudinal data.

For morphology, the minimum amount needed to judge whether the structure has emerged and is part of learner's IL is inconsistent among studies, for example, ranging from one (Glahn et al., 2001; Hammarberg, 1996) to three (Artoni, 2012; Zhang, 2005) to four (Pienemann, 1998). In this study, emergence in case marker morphology was defined as "a point in time corresponding to the first systematic and productive use of a structure" (Pallotti, 2007, p. 366). The rationale behind this criterion was the fact that once a learner uses a morpheme with various lexical items in different places, it is reasonable to claim that the rule responsible for its occurrence is becoming part of the IL. The requirement of various lexical items in various contexts is a precautionary measure to avoid misinterpreting memorized chunks in which the morphemes appear as valid instances of rule application. However, since I had control over the lexical items to be used, as indicated by the sentences in the elicited imitation task, I set this number to four cases of morpheme target-like reconstruction. While reconstruction in TL contexts is important, a non-TL context is crucial to consider before deciding on whether a structure has emerged since this context indicates whether the appearance of a morpheme was based on morpheme-context association or was part of overgeneralization in the IL. Therefore, I took the appearance of morphemes in non-TL contexts into consideration before making a judgment on acquisition. The number of morpheme overgeneralizations had to be less than 40% of all morphemes in a TL context to claim a morpheme-context association had been formed in the IL.

For syntactic structures, since each mapping stage was represented by a single set, the following criterion was adopted. To judge whether a mapping stage had emerged in the IL, one structure within the set representing it had to meet the emergence criteria for syntactic structures. Morphological structures had different criteria. To judge whether a processing procedure had emerged in the IL, one structure within the set representing it had to meet the emergence criteria for morphological structures. To judge whether a case marking stage had emerged in the IL, a target-like reconstruction on an NP representing that stage had to appear at least four times. To judge whether functional case marking had emerged in the IL, a target-like pre-verbal NP-obj reconstruction had to appear at least four times. The next chapter presents the results.

## Chapter 5

### Results

#### 5.1 Introduction

This chapter reports the results for the development of case morphology and sentential word order by learners of MSA as a second language. The goal was to test the hypotheses generated in Chapter 4 in light of the mapping principles and processing procedures within processability theory proposed by Pienemann (1998) and Pienemann et al. (2005). The sentential word order results are presented in Section 5.2 followed by the case morphology results in Section 5.3. The investigated syntactic structures are presented in Table 5.1 and the case morphemes in Table 5.2.

Table 5.1

#### *Targeted Syntactic Structures*

Mapping Principles	Structures
Non-default C to F mapping	Object relative clause without resumption OVS
Complex A to F mapping	Causative
Non-default A to F mapping	Passive
XP default mapping	Object relative clause with resumption
	Clitic left dislocation
	XPSVO
	XPVO
	XP verbless sentence
Default mapping + extra arguments	VSO
	VOXP
	SVOXP
Default mapping	Verbless sentence XP
	[?anna] embedding
	Subject relative clause
	SVOO
	SVO(PP)
	Verbless sentence
	VO
SVO	

Table 5.2

*Targeted Case Morphemes*

Case	Singular
Nominative	-u
Accusative	-a
Genitive	-i

As discussed in the previous chapter, an emergence criterion was applied to participants' data to indicate the developmental route for sentential word order and case morphology. For syntactic structures, I have taken two cases of rule application, given that they are not identical, to be enough to assume whether a structure has emerged in the IL of a learner. For morphological processes on the other hand, I took four cases of rule application, TL reconstruction, given that the number of over-generalizations is less than 40% of TL-suppliance, to indicate the rule had emerged in the IL of a learner.

I divided learners into four groups roughly corresponding to their levels in the TASOL institute: beginner, low intermediate, high intermediate, and advanced. For each group, two tables are presented. In the first, the total number of utterances are reported per participant per structure. The second gives a qualitative presentation of the data in which “+” indicates emergence of a structure, “-” indicates the structure did not emerge even though prompts were used to elicit it, a gap indicates the structure was not produced and there were no prompts targeting it, and “/” indicates the structure was produced but was one instance below the threshold of the emergence criterion. A continuous black line separates structures belonging to different mapping stages or processing procedures while a fine dotted line separates intra-stages within a mapping stage or a processing procedures. A thicker continuous line indicates the highest mapping stage or processing procedure the learner reached, while a jagged line indicates the highest structure the learner produced within a mapping stage or a processing procedure.

Then, a graph visualizes the mapping principles each learner employed in their sentence production.

## 5.2 Sentential Word Order Results

This section examines the results for IL sentential word order, i.e., how sentences produced by learners were similar or different in terms of how argument, function, and constituent structures were mapped. Although learners produced morphological markers (e.g., agreement, case markers) in their responses to interview questions and the picture description task, morphology is only remarked on when it is essential in the production of certain syntactic structures before claiming whether a structure has emerged. Thus, data in this section constitute participant responses to interview questions and the picture description task. With regard to case markers, the data were exclusively taken from the elicited imitation task. As a result, the presentation of sentential word order data from interviews and the picture description task are kept separate from case morphology in the elicited imitation task. When relevant to the discussion, both are mentioned together.

### 5.2.1 Beginner Results

The beginner group was composed of four learners. Their language background is presented in Table 5.3 and their results in Table 5.4.

Table 5.3

#### *Beginner Language Background*

Participant	L1	L2
P1	Portuguese	
P2	French / Comorian	
P3	Urdu	Pashto
P4	Portuguese	

Participants produced various structures, which are concentrated at the bottom of Table 5.4 where the A-F-C mapping is default. Starting with Participant 1, he produced around 110 sentences. The examples below are representative of the structures he produced in response to interview questions or to the picture description task.

Table 5.4

*Beginner-Level Sentential Word Order Results*

Mapping Principles	Participant Structure	P1	P2	P3	P4
Non-default C to F mapping	ORWOR	0	0	0	0
	OVS	0	0	0	0
Complex A to F mapping	Causative	0	0	0	0
Non-default A to F mapping	Passive	0	0	0	1
XP default mapping	ORWR	0	0	0	0
	CLLD	0	1	0	1
	XPSVO	0	0	0	0
	XPVO	0	0	1	1
	XPVless	0	0	0	2
	VSO	2	0	0	8
Default mapping + extra arguments	VlessXP	1	0	1	0
	VOXP	0	10	2	2
	SVOXP	0	3	3	0
Default mapping	[?anna]-Em	0	0	9	5
	SR	0	0	18	15
	SVOO	2	13	0	6
	SVO(PP)	7	6	4	6
	Vless	19	10	48	26
	VO	15	15	15	45
	SVO	64	26	28	45

**1. Participant 1**

**SVO**

a. muḥamad-u                      ja-biʃu                      ʔal-manzil  
 Mohammad.Nom                      3P.Sg.M-sell                      Def-house.Sg.M  
 ‘Mohammad is selling the house’

**VO**

b. \*ʔa-ɣraʔ      baʃðʕ-u      ʔal-kutub-u  
 1P.Sg-read    some-Nom    Def-book.Pl-Nom  
 ‘I read some books’

**Vless**

c. \*ʔalmuslim                      fi balad-i      qasʕir    zidan  
 Def-muslim.M.Sg    in country-my    short    very  
 ‘Muslims in my country are very few’

**SVO(PP)**

d. ʕumar-u    ja-ʕtʕi                      ʔal-qalam      li ʔahmad  
 Omar-Nom    3P.Sg.M-give    Def-pen.Sg    to Ahmad  
 ‘Omar is giving the pen to Ahmad’

**SVOO**

e. \*ʔal-ʔum-i                      ta-xbiru                      al-bint-u                      ʃajʔan      fi ʔuðnun  
 Def-mother-Gen    3P.Sg.F-tell                      Def-daughter-Nom    something    in ear.Sg.Indef  
 ‘The mother is telling the daughter something in the ear’

**VlessXP**

f. haða                      din                      ʔal-ʔawal                      fi balad-i                      fi ʕismat  
 this.M.Sg    religion.Indef    Def-first                      in country.my    in capital city  
 ‘This religion is the first in the capital city of my country’

**VSO**

g. ja-rmi                      ʔa-tʕfl-u                      ʔaʃjaʔ    fi      al-baħr  
 3P.Sg.M-throw    Def-child.Sg-Nom    thing-Pl    into    Def-sea  
 ‘The child is throwing things into the sea’

As the examples show, Participant 1 mainly produced simple sentences that involved default or canonical mapping between argument, function, constituent structures. In all his sentences, the most prominent semantic role was mapped to the subject, which also exclusively appeared initially, the most prominent position in constituent structure. Whatever semantic role appears after the agent must be linked to the object, which occupies a post-verbal position. NP-PP and NP-NP order of arguments after ditransitive verbs appeared in this participant’s data as well, as illustrated in (1d-e). Evidence of adjunction was found in the data following a verbless sentence in (1f). This appeared to be how Participant 1 organized his syntax since this happened

in 108 sentences of the 110 produced (98.18%). The only exception appeared twice, as he started two sentences with a verb rather than an agent-subject noun phrase. In the rest of these sentences, agent-subject preceded other arguments, as in (1g). Even though specifically designed tasks and visual cues were used to invoke the production of structures other than those that involve default mapping, Participant 1 failed to produce them.

Participant 2 produced around 84 sentences, 83 of which conformed to default canonical mapping (98.8%), as exemplified below. NP-PP and NP-NP order of arguments after ditransitive verbs appeared in his data as well, as illustrated in (2d-e). However, he produced more examples of adjunction after such mapping, as evidenced in (2f) and (2g).

## 2. Participant 2

### SVO

- a. ʔal-ʔatʔfal-u                      ja-ʔtar-una      ʔal-ħalwa  
 Def-child.Pl-Nom                      3P.M-buy-Pl    Def-candy.Pl  
 ‘The children are buying the candy’

### VO

- b. faʕal-tu                                  ʔal-ʕumrah  
 preformed-1P.Sg                      Def-Umrah  
 ‘I performed Alumrah’

### Vless

- c. ʔuzur alqamar                      dawlat-u              ʔislamiah  
 Comoros                                  state.Sg-Nom    Islamic  
 ‘Comoros is an Islamic state’

### SVO(PP)

- d. ʔal-mudarib                      ju-ʕtʔi                      ʔal-kurat-a              li-tʔifl  
 Def-coach.M.Sg      3P.M.Sg-give              Def-ball.Sg-Acc    to-child.M.Sg  
 ‘The coach is giving the ball to the child’

### SVOO

- e. \*ʔal-muwaðʕaf-u                      ju-xbiru              ʔal-mudir-i              siran  
 Def-employee.Sg.M-Nom    3P.M.Sg-tell    Def-manager-Gen    secret.Indef  
 ‘The employee is telling the manager a secret’

### SVOXP

f. \*ʔana            ʔixtiaru                    ʔaddirasa            ʔal-ʔislamiah    hina    fi  
 I                    choose.Past                    studying            Def-Islamic    here    in  
 l-ʔamiʕah                    ʔal-ʔislamiah    liʔanahu            huna    fihi    kaθirah  
 Def-university.indef            Def-Islamic    because            here    there    lot  
 ʔidan            ʔal-ʕilm  
 very            Def-science  
 ‘I chose Islamic schooling here in the Islamic University because there is a lot of  
 knowledge here’

### VOXP

g. \*ʔiʔ-tu                    huna    fi            ʔal-madinat-i            li-ʔadrusu  
 come.1P.Sg.past    here    in            Def-Medina-Gen    to-1P.study  
 ʔa-lluya-t-a                    ʔal-ʕarabi-ah  
 Def-language.Sg-F-Acc    Def-Arabic-F  
 ‘I came here to Medina to study Arabic’

### CLLD

h. ʔatʕ-tʕifl                    ja-ħmilu-hu                    ar-razul  
 Def-child.M.Sg    3P.Sg.M-carry-clitic.Sg.M            Def-man.M  
 ‘The child, the man is carrying him’

Another difference in Participant 2’s data was that he produced one sentence without default mapping in (2h). In this example, what occupied initial position was not the subject but rather a topic NP ([ʔatʕ-tʕifl] ‘the child’) linked to a pronominal clitic attached to the verb [hu]. It was produced in response to a prompt designed to elicit CLLD structures. Similar to Participant 1, Participant 2 did not produce structures higher up in the table despite prompts to elicit them.

Even though Participants 1 and 2 produced sentences conforming to default mapping, they did not produce subject relative clauses or [ʔanna] embedding. These involve default mapping but differ in that they have two clauses rather than one. This issue was clear with Participant 2 since he failed to produce subject relative clauses and [ʔanna] embedding despite being able to produce structures that were higher.

Participant 3 produced 129 sentences. The vast majority had canonical and default order in mapping the three structures of grammar, as illustrated in (3), amounting to 128 sentences

(99.2%) of the total produced. In ditransitive verbs, only NP-PP order was found, as in (3d). In six instances, this participant produced adjuncts after sentences, as shown in (3e-g).

### 3. Participant 3

#### SVO

- a. ?ana katab-tu ?al-waʒib-at  
 I wrote.Past-1P.Sg.M Def-homework-Pl  
 ‘I wrote the homework’

#### VO

- b. ?u-darrisu ?a-tʔʔulab  
 1P.Sg-teach Def-student.Pl.M  
 ‘I teach students’

#### Vless

- c. ?ana ʒala kifalat-i ?ab-i  
 I on sponsorship-Gen father-my  
 ‘I am sponsored by my father’

#### SVO(PP)

- d. \*?aħmad ju-ra fajʔan li-ʒumar  
 Ahmad 3P.Sg.M-show.Passive.Past something to-Omar  
 ‘Ahmad is showing something to Omar’

#### SVOXP

- e. ?ana ?u-fakir ?iða ziʔ-tu hunak  
 I 1P.Sg-think if come-1P.Sg there  
 ‘I will think about it when I go there’

#### VOXP

- f. wa na-ħðʕur fi ?il-ʒamiʕa-h ?ila θalaθ-ah  
 and 3P.Pl-attend in Def-university.Sg-F until three.F  
 ‘We attend classes at the university until three’

#### VlessXP

- g. \*?ana talibun fi ?alʒamiʕ-at-u ?alʔislamjah bi-lmadinah  
 I student.Sg.Indef at Def-university-F-Nom Def-Islamic at-Medina  
 ‘I am a student at the Islamic University in Medina’

#### XPVO

- h. wa baʕda kuruna na-ðhabu ?ila ?almadinat-i  
 and after corona 1P.Pl-go to Def-Medina-Gen  
 ‘After corona, we go to Medina’

**SR**

- i. haða huwa ʔal-ʔimam allaði ju-sʕali binnas  
 this he Def-imam who.M.Sg 3P.Sg.M-pray people  
 ‘This is the imam who leads people in prayer’

**ʔanna**

- j. ʔa-ʕtaqid ʔanna haði-hi ʔalmarʔa-h taysilu ʔaθ-θiab-a  
 1P.Sg-think Comp this.Sg.F Def-woman.Sg 3P.Sg.F.clean Def-cloth.Pl-Acc  
 ‘I think this woman is cleaning clothes’

Participant 3 differed from Participants 1 and 2 in two respects. First, he placed a time adverbial before a canonical sentence, as in (3h), which appeared only once in the data. Second, he produced subject relative clauses 18 times and [ʔanna] embedding nine times, features missing from the data for Participants 1 and 2. However, Participant 3 produced no other structures despite various prompts.

Participant 4’s data consisted of 163 sentences, the majority of which had default mapping, as shown in (4a-e), amounting to 150 sentences (92%) of the total produced. In ditransitive verbs, NP-PP and NP-NP order of arguments were productively utilized, as shown in (4d-e). Four examples of XPs were found before such sentences and only two after them. In the former case, what was found before such sentences was either an adverbial phrase—in three cases, as in (4g-h)—or a topic NP—in one case, as in (4l). In the latter, they were solely adverbials, as shown in (4f). VSO sentences were productively used as they appeared eight times, as in (4k).

**4. Participant 4****SVO**

- a. ʔal-muʕalim ju-ʕalim ʔatʕ-tʕalib  
 Def-teacher.Sg.M 3P.Sg.M-teach Def-student.M.Sg  
 ‘The teacher is teaching the student’

**VO**

- b. ma ðahab-tu ila ʔaj madina-h  
 not go.Past-1P.Sg to any city.Sg-F  
 ‘I have not visited any city’

**Vless**

- c. \*ʔal-jahud-in wa ʔan-nasʕara ʔakθar min ʔal-muslim-in  
 Def-Jew-Pl.Acc and Def-Christian.Pl more than Def-Muslim-Pl.Acc  
 ‘Jews and Christians are more than Muslims’

**SVO(PP)**

- d. \*ʔal-ʔum ja-fariħ ʔatʕ-tʕariq li-l-bint  
 Def-mother.Sg 3P.Sg.M-explain Def-road.Sg.M to-Def-girl.Sg  
 ‘The mother explains the road to the girl’

**SVOO**

- e. ʔal-muʕalim ju-nawil ʔatʕ-tʕifl-a ʔal-kitab-a  
 Def-teacher.Sg.M 3P.M.Sg-hand Def-boy.Sg-Acc Def-book.Sg-Acc  
 ‘The teacher hands the boy the book’

**VOXP**

- f. ʔu-ðakiru durus-i bajna ʔas-saʕa-h ʔas-sadisa-h  
 1P.Sg-study lesson.Pl-my between Def-hour.Sg-F Def-six-F  
 ʔila ʔas-saʕ-ah ʔat-tasiʕa-h  
 until Def-hour.Sg-F Def-nine-F  
 ‘I study between six o’clock and nine o’clock’

**XPVO**

- g. ʔalʔan ʔa-fhamu ʔal-ʕarabia-h wa ʔa-qraʔ wa ʔaktub  
 Now 1P.Sg-understand Def-Arabic-F and 1P.Sg-read and 1P.Sg.write  
 ‘Now I understand, read, and write Arabic’

**XPVless**

- h. \*ʔsʕlan ʔana fi ʔal-ʕarb  
 originally I in Def-west  
 ‘Originally I am from the west’

**SR**

- i. haða huwa allaʕib-u allaði ja-rkulu ʔal-kura-h  
 This.M.Sg he Def-player.M.Sg-Nom who.Sg.M 3P.Sg.M-kick Def-ball.Sg-F  
 ‘This is the player who is kicking the ball’

**ʔanna**

- j. \*ʔaðunnu ʔanna ʔar-razul-u ja-bki  
 1P.Sg.think Comp Def-man.Sg-Nom 3P.Sg.M-cry  
 ‘I think the man is crying’

**VSO**

- k. ja-ktub ʔatʕ-tʕifl  
 3P.Sg.M-write Def-child.Sg.M  
 ‘The child is writing’

**CLLD**

- l.   ʔat<sup>f</sup>-t<sup>f</sup>alib                      ʔal-muʔalim-u                      ja-ð<sup>f</sup>ribu-h  
       Def-student.M.Sg      Def-teacher.M.Sg-Nom      3P.Sg.M-clitic.M.Sg  
       ‘The student, the teacher is hitting him’

**Passive**

- m.   \*ʔal-qahwa-h   ʔuriba  
       Def-coffee-F   drink.M.Past.Passive  
       ‘The coffee was drunk’

Participant 4 did not drastically differ from the other learners at this level. The sentences he produced maintained default mapping and, in some cases, adjuncts were found after such sentences. However, he differed from Participants 1 and 2—and was similar to Participant 3—in that he produced subject relative clauses and [ʔanna] embedding, as shown in (4i-j). The only case in which he showed a clear departure from the default mapping principle was one passive sentence in (4m). What was mapped to initial position here was not the agent but rather the patient, the grammatical subject.

Figure 5.1 shows the types of mapping principles the beginner-level learners used when constructing their sentences. It shows that they relied on default mapping. Participants 2 and 3 produced examples of default mapping followed by adverbials. Participant 4, while still using default mapping, was able to place elements ahead of such mapping. No other mapping principles appeared in the data at this level.

The emergence criterion was applied to the numbers in Table 5.4 to judge whether a structure had emerged in learners’ IL. This yielded the implicational sequence in Table 5.5. The highest stage each learner reached is indicated by a thick line. Thus, the implicational sequence revealed that all beginner-level learners had gone beyond the lemma access stage since they produced sentences productively rather than formulaic or memorized sentences. In addition, they organized their sentences in such a way that did not diverge from the default mapping principle.

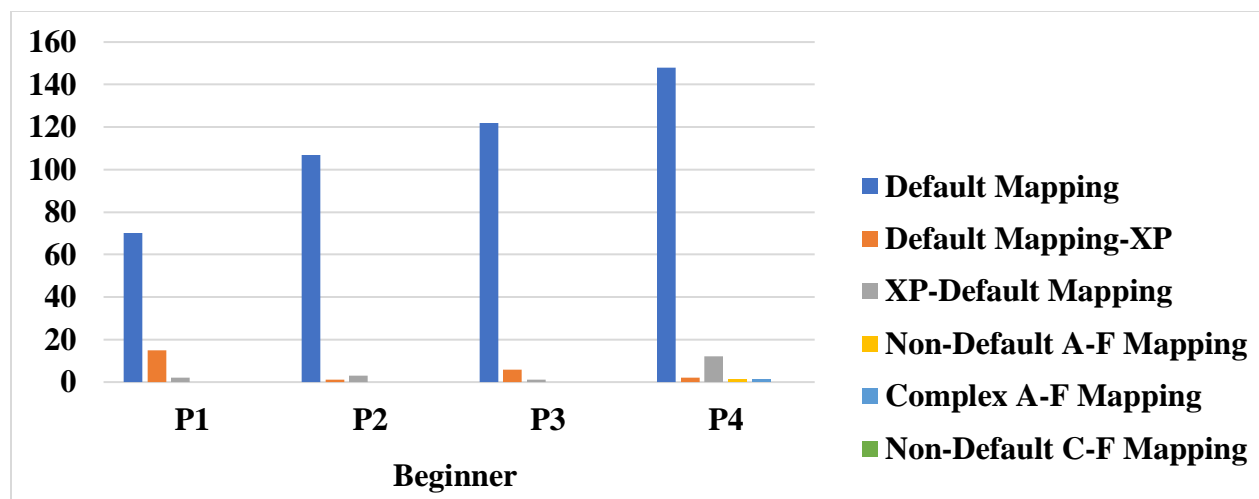


Figure 5.1. Types of mapping principles found in the beginner-level data.

Table 5.5

*Beginner-Level Sentential Word Order Implicational Sequence*

Mapping Principles	Participant Structure	P1	P2	P3	P4
Non-default C to F mapping	ORWOR	-	-	-	-
	OVS	-	-	-	-
Complex A to F mapping	Causative	-	-	-	-
Non-default A to F mapping	Passive	-	-	-	/
	ORWR	-	-	-	-
XP default mapping	CLLD	/	/	-	/
	XPSVO				
	XPVO			/	/
	XPVless				+
	VSO	+	-	/	+
Default mapping + extra arguments	VlessXP	/		/	
	VOXP		+	+	+
	SVOXP		+	+	
Default mapping	[?anna]-Em	-	-	+	+
	SR	-	-	+	+
	SVOO	+	+	-	+
	SVO(PP)	+	+	+	+
	Vless	+	+	+	+
	VO	+	+	+	+
	SVO	+	+	+	+

While adverbials or extra arguments showed up in the data for Participants 2 and 3, these were confined to post-sentence position. Only Participant 4 showed an ability to slightly escape this principle by placing non-core arguments (e.g., time adverbial adjuncts) ahead of such mapping. While this represented a crucial development away from the rigidity of default mapping, the rest of the sentence, after the adverbial was placed initially, maintained default mapping.

The jagged line indicates intra-stages within different mapping stages. Table 5.5 shows possible intra-stages within the default mapping stage, the default mapping stage + extra arguments, and the XP default mapping stage. In other words, learners produced enough examples to demonstrate that a certain mapping principle had emerged but failed to produce certain structures within that stage involving identical mapping principles. This was reflected in Participants 1 and 2 failing to produce subject relative clauses and [?anna] embedding despite these structures involving similar mapping principles as the rest of the sentences they produced.

Table 5.5 also shows another clear case of an intra-stage. Participant 4 was able to place adverbials ahead of default mapping sentences but failed to produce CLLD and object relative clauses with resumption even though the latter two belonged to the same XP default mapping and were targeted with prompts. In the discussion section, I go over why such intra-stages emerged with these specific structures rather than others. With regard to the upper part of Table 5.5, despite tasks designed to target higher structures, participants failed to produce structures belonging to other mapping stages.

### **5.2.2 Low-Intermediate Results**

The low-intermediate group was composed of six learners. Their language background is presented in Table 5.6 and their results in Table 5.7.

Table 5.6

*Low-Intermediate Learners' Language Background*

Participant	L1	L2
P5	French	
P6	French	English
P7	Albanian	
P8	French	
P9	English	Bengali (heritage)
P10	Comorian	French

Table 5.7

*Low-Intermediate Level Sentential Word Order Results*

	Participant	P5	P6	P7	P8	P9	P10
<b>Mapping Principles</b>	<b>Structure</b>						
Non-default C to F mapping	ORWOR	0	0	0	0	1	0
	OVS	0	0	0	0	0	0
Complex A to F mapping	Causative	0	0	0	0	0	0
Non-default A to F mapping	Passive	0	0	0	1	0	1
XP default mapping	ORWR	0	0	1	10	13	2
	CLLD	1	0	0	13	11	22
	XPSVO	0	0	3	3	7	10
	XPVO	4	6	2	9	11	0
	XPVless	2	0	0	1	0	0
	VSO	1	3	0	5	11	2
Default mapping + extra arguments	VlessXP	0	0	0	1	0	2
	VOXP	4	8	0	12	15	4
	SVOXP	1	4	5	3	24	14
Default mapping	[?anna]-Em	7	3	8	0	15	11
	SR	16	17	15	13	9	5
	SVOO	0	3	0	0	4	3
	SVO(PP)	13	20	13	16	13	9
	Vless	32	23	37	13	18	2
	VO	40	21	15	30	19	7
	SVO	9	38	66	19	21	41

This group produced a wide range of structures, mainly concentrated in the default mapping section of Table 5.7, which shows default A-F-C mapping, and above that section, where there is an additional XP after or before default mapping. While only Participant 4 of the

beginner-level participants made it to the XP default mapping stage by fronting non-core arguments (adverbials), all low-intermediate participants had reached this stage, although they fronted different items ahead of default mapping.

Participant 5 produced 130 sentences, with 122 (93.8%) conforming to the canonical mapping principle, as illustrated in (5a-h). With regard to ditransitive verbs, only NP-PP order was found in his data, as shown in (5d). Subject relative clauses and [ʔanna] embedding were found as well, in (5e) and (5f), respectively. Adjuncts were found after default mapping sentences in five cases, as in (5g-h).

## 5. Participant 5

### SVO

- a. \*ʔannas ja-tasil biʔ-furtʕa-h  
 People 3P.M.Sg-call Def-Police-F  
 ‘People call the police’

### VO

- b. na-taʕalam ʔal-luʕa-h wa al-quran  
 1P.PI-learn. Def-language-F and Def-Quran  
 ‘We learn the language and the Quran’

### Vless

- c. \*haðihi al-misʕbaħ maksura-h  
 this.Sg.F Def-light bulb.M broken-F  
 ‘This light bulb is broken’

### SVO(PP)

- d. ju-ʕti ʔan-nuqud ʔila al-faqir  
 3P.Sg.M-give. Def-money.Pl to Def-poor.M.Sg  
 ‘The man gives the money to the poor’

### SR

- e. haða huwa ʔatʕ-tʕifl-u allaði ja-qtʕaʕu aʕ-ʕazara-h  
 This.M.Sg he Def-child.Sg.M-Nom who.Sg.M 3P.Sg.M-cut Def-tree.Sg-F  
 ‘This is the child who is chopping down the tree’

### ʔanna

- f. ʔa-ʔtaqid ʔanna al-ʔatʕfal-a ja-ʔtar-una ʔajskrim  
 1P.Sg.M-think Comp Def-children-Acc 3P.M-buy-Pl ice-cream.Sg.M  
 ‘I think the children are buying ice cream’

### SVOXP

- g. ʔana ʔa-ʕmal kula al-jawm ʔila as-saʕ-ah ʔssabiʕa-h massaʔan  
 I 1P.Sg-work all Def-day until Def-hour-F seven-F evening  
 ‘I work every day until seven in the evening’

### VOXP

- h. ʔadrus fi al-ʔamiʕat-i fi al-mustawa al-ʔani ʕan-buʕd  
 1P.Sg.M-study at Def-university-Gen in Def-level Def-two online  
 ‘I study at the university in Level 2 online’

### VSO

- i. ja-ħðifu atʕ-tʕalib ʔas-sabura-h  
 3P.Sg.M-delete Def-student.M.Sg Def-blackboard.Sg-F  
 ‘The student is cleaning the blackboard’

### XPVless

- j. maʕa haða al-wabaʔ haða sʕaʕb  
 with this.M.Sg Def-pandemic this.M.Sg difficult  
 ‘With this pandemic, this is difficult’

### XPVO

- k. munðu ʔuzbuʕ-ajn na-statʕiʕ ʔan na-xruʕ min saʕat-i  
 since week-Du.Gen 1P.Pl-can to 1P.Pl-leave from hour-Gen  
 ʔas-sdis-ah sʕabaħan ʔila as-saʕat-i ʔaθ-θamina-h masaʔan  
 Def-six-F morning to Def-hour-Gen Def-eight-F evening  
 ‘Since two weeks ago, we can leave from 7 am to 8 pm’

### CLLD

- l. ʔar-risal-ah kataba-ha ar-razul  
 Def-letter.Sg-F write.Past-it Def-man.Sg  
 ‘The letter, the man wrote it’

VSO order was found once in (5i), and adverbials were found in seven instances occupying sentence-initial position, as in (5j-l). While this clearly indicates advancement to the XP default mapping stage, this position was occupied by circumstantial adjuncts in six cases, as in (5j-k), and a noun phrase was only found once in a CLLD structure in (5l).

Similar to Participant 5, Participants 6 and 7 organized most of their syntax according to the default mapping principle and in several cases placed circumstantial adjuncts in sentence-initial position. Participant 6 produced 146 sentences, 137 (93.8%) of which had default mapping, as shown in (6a-i). Post-verbal arguments of ditransitive verbs showed NP-PP as well as NP-NP order, exemplified in (6d) and (6e), respectively. Circumstantial adjuncts were found in post-sentence position, as in (6h-i), and six times in sentence-initial position, as in (6k). VSO order appeared in only three instances, as in (6j).

## 6. Participant 6

### SVO

- a. ?al-mar?at-u      tu-nað'if                      ?al-yurf-ah  
 Def-woman-Nom 3P.Sg.F-clean              Def-room.Sg-F  
 'The woman is cleaning the room'

### VO

- b. ma              waza-tu                      ?umur              ?al-kararhi-ah  
 not.past      find.Past-1P.Sg              things              Def-racism-F  
 'I have not found racism'

### Vless

- c. huwa              razul-un                      s'alih  
 he              man-Nom.indef              good  
 'He is a good man'

### SVO(PP)

- d. \*?az-zawzu              ju-?iru              miftah-u              as-sajara-h      ?ala      zawzat-u-hu  
 Def-husband              3P.Sg.M-lend      key-Nom              Def-car.Sg-F      on              wife-Nom-his  
 'The husband lends the car key to his wife'

### SVOO

- e. ?al-muwað'af              ju-xbir              ?al-mudir              kalaman      fi      ?uðuni-h  
 Def-employee.M.Sg 3P.Sg.M-tell Def-manager.M      talk.indef      in      ear.Sg-his  
 'The employer is telling the manager something in his ear'

### SR

- f. ?al-mar?              huwa      ?allaði              akala              haða              ?at-tufaḥ  
 Def-man.Sg              he              who.Sg.M              eat.past.M.Sg      this.Sg.M      Def-apple.Sg  
 'The man is the one who ate the apple'

### **ʔanna**

- g. ʔa-ʕtaqid            ʔannahu            fi            al-matʕar  
1P.Sg.M-think    Comp-he            in            Def-rain  
'I think he is in the rain'

### **SVOXP**

- h. ʔal-marʔa-t-u            tu-ʕtʕi            al-laban ʔila    atʕ-tʕifl            liki    ja-skut  
Def-woman-F-Nom 3P.Sg.F-give    Def-milkto    Def-child    so    3P.Sg.M-be quiet  
'The woman is giving the child milk so he will be quiet'

### **VOXP**

- i. \*ʕiʔ-tu                    ila    ʔəl-ʕamiʕat-u            li-ʔa-drusa            ʔəluyatu  
Come.Past-1P.Sg    to    Def-university-nom    to-1P.SgM-study    Def-language-Nom  
ʔəl-ʕarabiat-a            li-ʔana-hu            luyat-u                    ʔəl-quran-u  
Def-Arabic-Acc    because-he            language-Nom            Def-Quran-Nom  
'I came to the university to study Arabic because it is the language of the Quran'

### **VSO**

- j. \*ja-ktub                    atʕ-tʕifl            ar-risal-a            ʔila            ʔabu-h-u  
3P.Sg.M-write    Def-child.M    Def-letter            to            father-his-Nom  
'The child is writing a letter to his father'

### **XPVO**

- k. baʕda            ar-riadʕa-h            ʔa-ʕud            ila            mhʕaʕ-i  
after            Def-exercise-F            1P.Sg-return    to            room-my  
'After exercising, I return to my room'

Participant 7 produced 165 sentences, 159 (96.3%) of which involved default mapping of the three structures of grammar, as illustrated in (7a-g). Subject relative clauses and [ʔanna] embedding were also produced. While he produced ditransitive verbs in 13 instances, only NP-PP order was utilized, as in (7d). With regard to XP adjunction, he showed the ability to place such phrases before and after sentences. Adjuncts were found after default mapping sentences six times, as in (7g), and seven times before such sentences, as in (7h-i).

## **7. Participant 7**

### **SVO**

- a. \*ʔana            daxal-ta                    fi            ʔal-madrasat-i            ʔaḏ-ananwia-h  
I            enter.Past-1P.Sg            in            Def-school-Gen            Def-high-F  
'I entered high school'

**VO**

- b. ?a-kun maʕa ?ahl-i ?a-ʃrabu ʃajan maʕ ʔahl-i  
 1P.Sg-be with family-my 1P.Sg-drink tea with family-my  
 ‘I am with my family, I drink tea with my family’

**Vless**

- c. ?al-kusufa bilad-un sayir-un  
 Def-Kosovo country-Nom.Indef small-Nom.Indef  
 ‘Kosovo is a small country’

**SVO(PP)**

- d. ?asʕadiq ju-qrdʕ ?al-qalam li-ʕumar  
 Def-friend.Sg.M 3P.Sg.M-lend Def-pen.Sg to-Omar  
 ‘The friend lends the pen to Omar’

**SR**

- e. haða huwa ar-razul-u allaði ja-ʃrabu al-qahwa-h  
 this.M.Sg he Def-man-Nom who.Sg.M 3P.Sg.M-drink Def-coffee-F  
 ‘This is the man who is drinking coffee’

**?anna**

- f. \*?aʕtaqidu ?anna haða al-marʔah ja-ʕtasilu ?almaalabis  
 1P.Sg-think Comp this.M.Sg Def-woman.Sg 3P.Sg.M-clean Def-clothes  
 ‘I think this woman is washing clothes’

**SVOXP**

- g. \*?ana hazar-a maʕa ?ahl-i fi-əl-madinah al-axar  
 I immigrate.Past-3P.Sg.M. with family-my in-Def-city.Sg Def-other  
 ‘I moved with my family to the other city’

**XPVO**

- h. da?iman fi kuli jawm ?u-sʕali asʕ-sʕabaħa  
 always in every day 1P.Sg-pray Def-morning-Acc  
 ‘Every day, I always pray in the morning’

**XPSVO**

- i. \*baʕda ?as-saʕat-u ?as-sabiʕa-h naħnu la na-statʕiʕ ?an na-xruza min  
 after Def-hour-Nom Def-seven-F we not 3P.Pl-can to 3P.Pl-leave from  
 al-bujut  
 Def-house.Pl  
 ‘After seven o’clock, we cannot leave the house’

**ORWR**

- j. haðihi hia al-ħaqiba-t-u allati ja-ħmilu-ha atʕ-tʕifl  
 this.F.Sg it.F.Sg Def-pack bag-F-Nom that.F.Sg 3P.Sg.M-carry-it Def-child  
 ‘This is the backpack the child is carrying’

While Participants 6 and 7 were identical in what structures they produced and how their syntax appeared to be constrained, Participant 7 differed in that he produced an object relative clause with resumption once, in (7j), which was the highest structure produced by any participant so far. Object relative clauses are theoretically part of the XP default mapping stage, which he showed several cases of in (7h-i) by placing circumstantial adjuncts ahead of sentences that have default mapping. However, object relative clauses are more complex. The object relative pronoun has to be linked to a pronominal clitic affixed to the verb.

Participant 8 produced 149 sentences, 107 (71.8%) of which had default mapping, as shown in (8a-h). Ditransitive verbs were found in 16 sentences and their post-verbal arguments only appeared in NP-PP order. He produced subject relative clauses 13 times, as in (8e), and there was evidence he could place circumstantial adjuncts after default mapping sentences, as in (8f-h), as well as before them, as in (8j-m).

## 8. Participant 8

### SVO

- a. ?aħad      qatʿaʕa                      haðihi              ?af-ʕazara-h  
 someone   cut.Past.3P.Sg.M      this.F.Sg              Def-tree.Sg-F  
 ‘Someone cut this tree’

### VO

- b. ta-ɣadaj-tu                      wa      raʕaʕ-tu                      ?ila      yurfat-i.....  
 eat-lunch.Past-1P.Sg.M      and      come.past-1P.Sg.M      to      room-my  
 ‘I ate lunch and then came back to my room’

### Vless

- c. ?an-nafiða-h                      maɣluqa-h  
 Def-window.Sg-F                      close.Sg-F  
 ‘The window is closed’

**SVO(PP)**

- d. \*haða ar-razul-u al-faqir ja-sʔalu an-nuqud  
 this.Sg Def-man-Nom Def-poor.Sg.M 3P.Sg.M-ask Def-money  
 min haða ar-razul-u al-ʔani  
 from this.Sg.M Def-man-Nom Def-rich  
 ‘This poor man is asking the rich man for money’

**SR**

- e. \*haðihi al-marʔa-h allazi ʔistaqbal-at ar-razul  
 this.F.Sg Def-woman-F who.M.Sg welcome.Past-3P.Sg.F Def-man  
 ‘This is the woman who welcomed the man’

**SVOXP**

- f. ʔana ma sʔaddaqt liʔanna ʔana qul-tu kajfa fi  
 I not.past believe.1P.Sg because I say.past-1P.Sg how in  
 ʔassaʔudja-h fi dizir  
 Def-Saudia-F there desert  
 ‘I did not believe I said how there is a desert in Saudi Arabia’

**VOXP**

- g. daras-t ʔal-quran qalilan hata ʔas-saʔa-h ʔamania-h  
 study.Past-1P.Sg Def-Quran little until Def-hour-F eight-F  
 ‘I studied the Quran a little until eight o’clock’

**VlessXP**

- h. ʔatʔ-tʔifl ʔala as-sarir li-ja-nam  
 Def-child.M on Def-bed.Sg.M to-3P.Sg.M-sleep  
 ‘The child is in bed to sleep’

**VSO**

- i. tu-wasʔsʔif al-ʔum ʔila al-marʔah allati fi as-sajara-h  
 3P.Sg.F-describe Def-mother to Def-woman who.F.Sg in Def-car-F  
 tu-wasʔifu-ha ʔatʔ-tʔariq  
 3P.Sg.F-describe-her Def-route  
 ‘The mother describe the route to the woman’

**XPVO**

- j. bi-lluy-at-i al-firinsja-h ʔa-qul laha dizir/ sʔaħraʔ  
 in-Def-language-F-Gen Def-French-F 1P.Sg.M-call it desert  
 ‘In French, I call it desert’

**XPSVO**

k. qabala      ʔann      na-ʔti                      fi-lʒamiʕ-at-i                      ʔana ma  
 before      comp      3P.Pl.M-come in-Def-university-F-Gen I      not.past  
 daras-tu                      alluy-at-a                      al-ʕarabia-h      ʔabadan  
 study-1P.Sg                      Def-language-F-Acc      Def-Arabic-F never  
 ‘Before coming to the university, I had never studied Arabic’

**CLLD**

l. ʔssajar-ah                      rakib-at-ha                      al-marʔ-ah  
 Def-car-F.Sg                      get in.past-3P.Sg.F-it      Def-woman-Sg.F  
 ‘The car, the woman got in it’

**ORWR**

m. \*haða      hia      as-samak-ah      allaði                      ʔakal-at-ha                      al-marʔ-ah  
 this.Sg.M      it.F.Sg      Def-fish.Sg-F      that.M.Sg                      eat.past-3P.Sg.F-it      Def-woman.F-Sg  
 ‘This is the fish the woman ate’

**Passive**

n. ʔal-maʔ      ʒuriba    bi-haða                      al-kalb  
 Def-water      drink.Past.Passive.Sg.M                      by-this.M.Sg      Def-dog.Sg.M  
 ‘The water was drunk by this dog’

In contrast to other learners at this level, Participant 8’s ability to place an XP in default mapping sentences was not limited to time adverbials but included noun phrases linked to a pronominal clitic affixed to the verb, as in (8l), which was found in 13 instances. In addition, his production of object relative clauses with resumption appeared 10 times, as in (8m). While almost all of his structures maintained default mapping with adjuncts appearing before or after such sentences, he produced one sentence in which such mapping was not followed. In (8n), he produced a passive sentence suppressing the agent ([al-kalb] ‘the dog’) and linking the patient to the subject and placing it sentence initially. This created non-linearity in mapping between argument and function structures, a strategy that appeared only once in the data. A gap appeared in the data when he could not produce [ʔanna] embedding despite prompts to elicit that structure.

Similarly, Participant 9 produced 192 sentences, 149 (77.6%) of which had default mapping, as in (9a-i). Within the default mapping sentences, ditransitive verbs showed both NP-

NP and NP-PP order of post-verbal arguments (9d-e). Subject relative clauses and [ʔanna] embedding were found, as in (9f) and (9g), respectively. VSO word order was produced in 11 cases, as shown in (9j), while XP adjunction was found productively after default mapping sentences, as in (9h-i), and before them, as in (9k-l).

## 9. Participant 9

### SVO

- a. \*ʔat<sup>f</sup>-t<sup>f</sup>ifl-u                      ja-ktubu                      waʒib-u-hu                      al-manzili  
 Def-child.M.Sg-Nom      3P.Sg.M-write                      assignment-Nom-his      Def-home  
 ‘The child is writing his homework assignment’

### VO

- b. \*tawaqaf-tu                      min      dirasi                      fi-l-ʕulum-i                      al-ḥasub  
 stop.past-1P.Sg.M from      studying                      in-Def-science-Gen      Def-computer.Sg.M  
 ‘I stopped studying computer science’

### Vless

- c. \*ʔannas      huna                      ʔaylab-u-hum                      t<sup>f</sup>aib-in  
 People      here                      most-Nom-them                      nice-Gen  
 ‘Most of the people here are nice’

### SVO(PP)

- d. ʔat<sup>f</sup>ifl-u                      ja-ktubu                      risala-h                      li-ʔab-i-hi  
 Def-child.Sg.M-Nom      3P.Sg.M-write letter.Sg.Indef-F                      to-father-Gen-his  
 ‘The child is writing a letter to his father’

### SVOO

- e. \*ʔal-ʔab-u                      ju-ʕalimu                      ʔibn-u-hu                      al-qiada-h  
 Def-father.Sg-nom                      3P.Sg.M-teach son-Nom-his      Def-driving-F  
 ‘The father is teaching his son how to drive’

### SR

- f. haḏa      huwa      al-muʔalim-u                      allaḏi                      ja-fraḥu  
 this.M.Sg he      Def-teacher.Sg.M-Nom who.M.Sg      3P.Sg.M-explain  
 ad-dars  
 Def-lesson.Sg.M  
 ‘This is the teacher who explains the lesson’

### ʔanna

- g. ʔa-ʕtaqidu                      ʔanna                      al-marʔa-h                      tu-naḏ<sup>f</sup>if  
 1P.Sg.M-think      Comp                      Def-woman.Sg-F                      3P.Sg.F-clean  
 ‘I think the woman is cleaning’

**SVOXP**

- h. ?alan      ?ana              ?a-staiqið<sup>ʕ</sup>u              min    an-nawm      fi  
 Now      I                      1P.Sg-wake up              from    Def-sleep      at  
 as-saʕ-at-i              ?as-sadis-at-i wa      ?arbaʕ-ina      daqiqa-h  
 Def-hour.Sg-F-Gen      Def-six-F-Gen and      forty-Pl.Gen      minute.Sg-F  
 taħdidan    li-sʕalat-i                      al-faʒr-i  
 exactly    for-prayer-Gen              Def-fajr-Gen  
 ‘Now, I wake up at exactly 6:40 am for the Fajr prayer’

**VOXP**

- i. \*istaslam-tu                      ar-risala-h              min    al-zamiʕ-at-i              al-?islamia-h  
 receive.Past-1P.Sg              Def-letter-Sg-F      from    Def-university-F-Gen      Def-Islamic-F  
 bi-l-madinah      binisbat-i      li-d-dirasah              hunak    li-ðalik  
 at-Def-Medina      regarding-Gen      for-Def-studying              there    thus  
 tawaqaf-tu      min              dirasi              fi-lʕulumi      al-ħasub  
 stop.Past-1P.Sg.      from              studying              in-science      Def-computer  
 ‘I received a letter from the Islamic University in Medina about studying there, so I stopped studying computer science’

**VSO**

- j. ju-nawilu              ʕali-un              al-kura-h              ?ila      saʕid  
 3P.Sg.M-pass      Ali-Nom              Def-ball.Sg-F      to      Saeed  
 ‘Ali is passing the ball to Saeed’

**XPVO**

- k. fi madin-at              birmingham      juzad    mul              kabir              zidan  
 in city.Sg-F              Birmingham      exist    mall.M.Sg              big.M.Sg              very  
 ‘In the City of Birmingham, there is a big mall’

**XPSVO**

- l. \*wa              baʕda              ?a-staiqið<sup>ʕ</sup>              ?ana      ?a-ðhabu              ila  
 and              after              1P.Sg-wake up              I              1P.Sg-go              to  
 an-nadi-arriaði      ?ajð<sup>ʕ</sup>an  
 Def-gym              as well  
 ‘And after I wake up, I go to the gym as well’

**CLLD**

- m. ?at<sup>ʕ</sup>-tʕalib                      ja-ð<sup>ʕ</sup>ribu-hu              al-muʕalim  
 Def-student.M.Sg              3P.Sg.M-hit-him              Def-teacher.Sg.M  
 ‘The student, the teacher is hitting him’

**ORWR**

- n. haðihi      hia      as-saʕa-h                      alla-ti              ta-lbasu-ha              al-marʕah  
 This.Sg.F    it.F.Sg    Def-watch.Sg-F              that.Sg-F              3P.Sg.F-wear-it      Def-woman  
 ‘This is the watch the woman is wearing’

## ORWOR

- o. ?uridu                      ?an      ?a-ʔala                      ?afaj?                      allaði      ?ana      ?u-ħib  
1P.Sg-want                      to      1P.Sg-do                      thing-Pl.M                      that.Sg.M I                      1P.Sg-love  
'I want to do the things I love'

In the IL of Participant 9, initial position had topic noun phrases ahead of default mapping sentences in 11 instances, as in the CLLD structure in (9m) where ([ʔatʰ-tʰalib] “student”) is linked to the pronominal clitic affixed to the verb ([jaðʰribu-**hu**] “hit-him”). Object relative clauses with resumption were also found in 13 instances, as in (9n), and only once without resumption in (9o).

The last member of this group, Participant 10, produced 145 sentences, 108 (74.4%) of which had default mapping, as in (10a-j). All of the target structures in the default mapping stage were produced, including ditransitive sentences with both NP-NP and NP-PP order of post-verbal arguments, as in (10d-e). Subject relative clauses and [ʔanna] embedding were found, as in (10f-g), as well as VSO word order in two cases, as in (10k).

## 10. Participant 10

### SVO

- a. ?ana                      zur-tu                                      zabal                                      ?uħud-in  
I                                      visit.Past-1P.Sg                                      mountain.Sg.M                                      Uhud-Gen  
'I visited Uhud Mountain'

### VO

- b. \* ta-zura                      al-madin-at-u                      al-baqia-h  
3P.Sg.F-visit                      Def-city.Sg-F-Nom                      Def-remaining-F  
'I will visit the remaining cities'

### Vless

- c. huna                      ?afðʰal min                      zuzur al-qamar  
here                      better than                      Comoros  
'Here is better than Comoros'

### SVO(PP)

- d. ?atʰ-tʰifl-u                                      ja-rmi                                      al-ħazara                      ʕala                      al-baħr  
Def-child.Sg.M-Nom                                      3P.Sg.M-throw                                      Def-rock.Sg                      to                      Def-sea  
'The child is throwing the rock into the sea'

## SVOO

- e. \*haða ar-razul ju-ʕtʕi ʔatʕ-tʕiflat-u al-kutub  
this.M.Sg Def-man.Sg 3P.Sg.M-give Def-child.F.Sg-Nom Def-book.Pl.M  
'This man is giving the girl books'

## SR

- f. haða huwa allaʕib allaði ja-ðʕrib al-kurra-h  
This.M.Sg he Def-player.Sg.M who.M.Sg 3P.Sg.M-hit Def-ball.Sg-F  
'This is the player who is hitting the ball'

## ʔanna

- g. \*ʔa-ðʕunn ʔanna haðihi al-fariq-a ja-ðhab-una ʔila  
1P.Sg-think Comp this.Sg.F Def-team.M.Sg-Acc 3P.M-go-Pl to  
al-makan-i kurr-at-u al-qadam  
Def-place-Gen ball-F-Nom Def-soccer  
Intended Meaning: 'I think this team will go to the soccer field'

## SVOXP

- h. \*ʔana ʔa-θhabu ʔajðʕan ʔila al-matʕam li-ta-ʔkul al-ʕaʕa?  
I 1P.Sg-go also to Def-restaurant to-2P-eat.Sg Def-dinner  
'I also go to the restaurant to eat dinner'

## VOXP

- i. \*wa ta-ʕalu al-muraʕaʕa-h ʔajðʕan ʔila baʕda sʕalat-i al-mayrib  
and 2P.Sg-do Def-revision-F also until after prayer-Gen Def-magrib  
'I also revise until after Magrib prayer'

## VlessXP

- j. ʔana min zuzur-alqamar fi blad sima  
I from Comoros in country Sima  
'I am from the town of Sima in the Comoros'

## VSO

- k. ja-nzilu al-maʔ-u fi-l-kub  
3P.Sg.M-goes down Def-water-Nom in-Def-cup.Sg.M  
'The water goes down into the cup'

## XPSVO

- l. \*ħata alʔana ʔana ma ʔistatʕaʕa ʔa-ja-zura almadin-at-a al-ʔaxara  
until now I not can.3P.Sg.M to-2P-visit Def-city.Sg-F-Acc Def-other  
'Until now, I could not visit the other cities'

## CLLD

- m. asʕ-sʕunduq-u ja-ftaħu-hu ar-razul  
Def-box.Sg.M-Nom 3P.M.Sg-open-it Def-man.Sg.M  
'The box, the man is opening it'

**ORWR**

n. haða huwa at<sup>s</sup>-tʃifl allaði ja-ħmilu-hu  
 This.M.Sg he Def-child.Sg.M who 3P.M.Sg-carry-him  
 ‘This is the child the man is carrying’ [the man is a dropped subject]

**Passive**

o. \*haðihi at-tufaħ-u ʔukil-at baṣḏ<sup>s</sup>u-ha  
 This.Sg.F Def-apple.Pl-Nom eat.Past.Passive-Sg.F some-it  
 ‘Some of this apple was eaten’

In the IL of Participant 10, placement of circumstantial adjuncts was found after default mapping sentences, as in (10h-j), as well as before them, as in (10l). In addition to adverbials, the pre-sentence position had topical noun phrases, as in the CLLD in (10m). Object relative clauses were only found with resumption, as in (10e). Only one case of non-default mapping between argument and function structures was found in the passive structure in (10o) in which ([at-tufaħ-u] ‘apples,’ the sentence-initial theme, was mapped to the subject, suppressing the agent altogether. Figure 5.2 presents the types of mapping principles in the IL data of the low-intermediate learners.

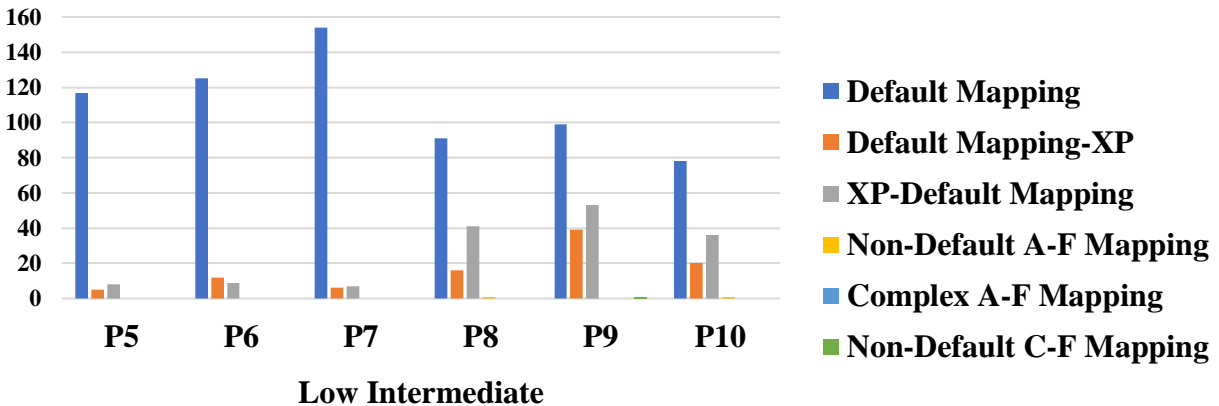


Figure 5.2. Types of mapping principles found in the low-intermediate level data.

Most of their sentences showed default mapping, and they were all able to place non-core arguments either before or after default mapping, as reflected by the XP Default Mapping and Default Mapping XP bars in the graph. The emergence criterion was applied to the numbers in

Table 5.7 to judge whether a structure under investigation had emerged in the IL of learners. This yielded the sequence in Table 5.8. The highest stage each learner reached is indicated by the thick line. Thus, the implicational sequence indicates that all learners had reached the XP default mapping stage by producing various structures within this stage. Although they disconnected the agent-subject → initial-position link by mapping circumstantial adjuncts to initial position, what followed the initial phrases in their IL continued to be faithful to default mapping in that the agent-subject was placed ahead of patient-object. In other words, these learners overcame the inability to distinguish topic and subject from each other as assumed by the topic (Pienemann. et al, 2005) and prominence hypotheses (Bettoni & Di Biase, 2015).

Table 5.8

*Low-Intermediate Level Sentential Word Order Implicational Sequence*

Mapping Principles	Participant Structure	P5	P6	P7	P8	P9	P10
Non-default C to F mapping	ORWOR	-	-	-	-	/	-
	OVS	-	-	-	-	-	-
Complex A to F mapping	Causative	-	-	-	-	-	-
Non-default A to F mapping	Passive	-	-	-	/	-	/
	ORWR	-	-	/	+	+	+
XP default mapping	CLLD	/	-	-	+	+	+
	XPSVO	+	+	+	+	+	+
	XPVO	+	+	+	+	+	-
	XPVless	+					
	VSO	/	+	-	+	+	+
Default mapping + extra arguments	VlessXP				/		+
	VOXP	+	+		+	+	+
	SVOXP	/	+	+	+	+	+
Default mapping	[?anna]-Em	+	+	+	/	-	+
	SR	+	+	+	+	+	+
	SVOO	-	+	-	-	+	+
	SVO(PP)	+	+	+	+	+	+
	Vless	+	+	+	+	+	+
	VO	+	+	+	+	+	+
	SVO	+	+	+	+	+	+

The jagged line indicates the highest structure produced within a mapping stage. Table 5.7 shows one intra-stage within the XP-default mapping stage. All learners demonstrated they had delinked agent-subject from initial position by placing circumstantial adjuncts sentence initially. Participants 5, 6, and 7 produced such structures before VO and verbless sentences—and for Participant 7, this was true even before SVO sentences. However, they did not produce any topicalized noun phrase linked to a pronominal clitic affixed to the verb, as is the case in CLLD and object relative clauses with resumption, which only Participants 8, 9, and 10 produced, even though such structures were targeted with prompts about 20 times.

Participants 8, 9, and 10 produced one instance each of structures belonging to non-default A-F or C-F mapping, but none of those met the emergence criterion. As a result, the highest stage this group reached was the XP default mapping stage. Although prompts were used to invoke responses with higher structures—such as passive voice, OVS word order, object relative clauses without resumption, and causative structure—none of the learners produced enough tokens to meet the emergence criterion of two instances of rule application.

### 5.2.3 High-Intermediate Results

The high-intermediate group was composed of six learners. Their L1 background is presented in Table 5.9 and their results in Table 5.10.

Table 5.9

#### *High-Intermediate Learners' Language Background*

Participant	L1	L2
P11	Comorian	French
P12	Malay	English
P13	English	
P14	Oromo	
P15	Swahili	
P16	French	

The participants in this group produced a wide range of structures spread throughout Table 5.10. They were distinguished from the low-intermediate group by being able to produce structures that involved non-default mapping, i.e., marked mapping between argument and function structures, as reflected in passive constructions. Furthermore, Participants 14, 15, and 16 were a step ahead of others in their group in that they produced structures that involved complex mapping between argument and function structures, as in causative constructions.

Table 5.10

*High-Intermediate Level Sentential Word Order Results*

Mapping Principles	Participant Structure	P11	P12	P13	P14	P15	P16
Non-default C to F mapping	ORWOR	0	0	0	0	0	0
	OVS	0	0	0	0	0	0
Complex A-F mapping	Causative	0	0	0	3	4	6
Non-default A to F mapping	Passive	19	22	12	10	25	11
XP default mapping	ORWR	1	9	8	10	8	10
	CLLD	1	0	13	7	5	18
	XPSVO	3	1	3	5	1	0
	XPVO	28	0	3	15	11	11
	XPVless	1	2	7	1	1	0
	VSO	7	1	1	7	2	6
Default mapping + extra arguments	VlessXP	3	0	2	4	0	0
	VOXP	23	9	5	17	9	13
	SVOXP	11	4	8	6	1	0
Default mapping	[?anna]-Em	16	5	10	10	10	12
	SR	24	10	10	20	9	10
	SVOO	5	3	0	2	8	15
	SVO(PP)	6	18	18	13	11	5
	Vless	25	16	20	19	20	4
	VO	26	58	18	30	22	12
	SVO	17	22	33	22	12	12

Participant 11 produced 216 sentences, only 156 (72.2%) of which had default mapping between A-F-C structures. Default mapping sentences contained transitive verbs with and without subject dropping, as in (11a-b), and they had some verbless sentences, as in (11c).

Sentences with ditransitive verbs were found with both NP-PP and NP-NP order of post-verbal arguments, as in (11d-e). Subject relative clauses and [ʔanna] embedding were also produced, as in (11f-g). Regarding XP adjunction, this participant tended to place circumstantial adjuncts after and before default mapping sentences, as in (11h-j) and (11l-n), respectively. His placement of XPs prior to default mapping sentences was not restricted to adverbials, extending to noun phrases, as in (11o-p). VSO word order appeared seven times, as in (11k).

## 11. Participant 11

### SVO

- a. \*ʔuzur al-qamar ja-nqasim ʔila ʔarbaʕ ʔuzur  
 Comoros 3P.Sg.M-divide to four.M island.Pl.M  
 ‘Comoros is divided into four islands’

### VO

- b. kun-tu ʔa-drus fi madaris al-faransia-h  
 be.past-1P.Sg 1P.Sg-study in school.Pl Def-French-F  
 ‘I was studying in French schools’

### Vless

- c. al-qahwa-h fi-l-kub  
 Def-coffee-F in-Def-cup.M.Sg  
 ‘The coffee is in the cup’

### SVO(PP)

- d. ʕali ja-biʕu al-ʔawraq li-l-ʕaʔila-h  
 Ali 3P.Sg.M-sell Def-paper.Pl.M to-Def-family.Sg-F  
 ‘Ali sells the papers to the family’

### SVOO

- e. \*al-marʔ-ah ju-ʕti al-kalb atʕ-tʕaʕam  
 Def-woman.Sg-F 3P.Sg.M-give Def-dog.Sg.M Def-food  
 ‘The woman is giving food to the dog’

### SR

- f. \*haða hia af-ʕurtʕi-at-u allaði ta-ʕtaqilu al-muʔrim  
 this.Sg.M she Def-policewoman-F-Nom who.M.Sg 3P.Sg.F-arrest Def-criminal  
 ‘This is the policewoman who is arresting the criminal’

**ʔanna**

- g. ʔa-ʕtaqidu ʔanna al-ʔatʕfal ja-ðhab-una ʔila al-madrasa-h  
 1P.Sg-think comp Def-child.Pl 3P-go-M.Pl to Def-school.Sg-F  
 ‘I think the children are going to school’

**SVOXP**

- h. naħnu na-ħðʕuru fi ħalaqa-h lakin ʕan-tʕariq ʔal-ʔintarnit  
 we 1P.Pl-attend in class.indef-F but through Def-Internet  
 ‘We attend a class online’

**VOXP**

- i. na-ʔaʔ-tu fi zuzur-alqamar fi ʔazira-t hinzwan  
 1P-grow up.past-Sg in-Comoros in island-Sg.F hinzwan  
 ‘I grew up in Comoros on the island of Hinzuan [Anjouan]’

**VlessXP**

- j. huwa ʔajru mumtaz bi-ma ʔataʕalaqu bi-t-tarx  
 he not excellent.Sg.M with regard to-Def-history  
 ‘He is not very good at history’

**VSO**

- k. \*waðʕaʕa al-marʔah ʔatʕ-tʕfl-a fawqa al-kursi  
 put.Past.3P.Sg.M Def-woman Def-child-Acc on Def-chair.Sg.M  
 ‘The woman put the child on the chair’

**XPVless**

- l. ʔiða wasʕal-ta fi zuzur-alqamar hunaka mafi ʔaj ʔiʕkal fi-l-matʕar  
 once arrive-2P.Sg.M in Comoros there no any problem at-Def-airport  
 ‘Once you arrive in Comoros, there will be no problems at the airport’

**XPVO**

- m. \*bisabab haða al-muʕkila-h ʔaxbara-ni ʔf-ʔajx  
 because this.Sg.M Def-problem.Sg-F tell.Past.3P.Sg.M-me Def-man  
 ʔan ʔa-dxula fi-l-mustawa alʔawal  
 to 1P.Sg.M-enter in-Def-level Def-one  
 ‘Because of this problem, the man told me to start in Level 1’

**XPSVO**

- n. \*lama ʔaʔa al-waqt-i haða ʔar-razul-u allaði  
 when come Def-time.Gen this.M.Sg Def-man-Nom who.M.Sg  
 kana ju-saʕidu-ni ʔaxbara-ni ʔann  
 be.past.M.Sg 3P.Sg.M-help-me told.past-3P.M.Sg-me Comp  
 al-waqt qad ʔaʔa  
 Def-time just come.past  
 ‘When the time came, the man who was helping me told me the time had come’

### CLLD

o. fi balad                      n-usami-ha      kumuni  
 in country                    1P.Pl-call-it    Kumuni  
 ‘In a village, we call it Kumaoni’

### ORWR

p. \*haḏihi    hia    al-qitʿa-h    allaḏi                      ju-tʿʿimu-hu    bi-l-marʔ-ah  
 this.F.Sg    it.F    Def-cat.Sg-F    that.M.Sg                    3P.Sg.M-feed-it by-Def-woman-F  
 ‘This is the cat the woman is feeding’

### Passive

q. ʔal-himar                              ḏʿuriba                              ḏʿarb-at-an      ʔadid-h  
 Def-donkey.M.Sg                    hit.Passive.Sg.M                    hit-F-Sg                    strong-F  
 ‘The donkey was hit hard’

He also produced 19 cases in which the mapping between A-F structures was not default.

These were all in the passive voice, as in (11q). In such sentences, something other than the agent, either the theme or the patient was mapped to the subject.

Participant 12’s data showed a similar tendency. He produced 180 sentences, 145 (80.5%) of which had default mapping. Default mapping sentences included transitive verbs with and without subject dropping, as in (12a-b), as well as verbless sentences and sentences with ditransitive verbs, as in (12c) and (12d-e), respectively. Both NP-PP and NP-NP orders of post-verbal arguments were found with ditransitive verbs. Subject relative clauses and [ʔanna] embedding are shown in (12f-g). XP adjunction was found after and before default mapping sentences, as in (12h-i) and (12k-l), respectively. The placement of XP prior to default mapping sentences occurred with adverbials and noun phrases, as exemplified in (12m). VSO word order was produced once in (12j).

## 12. Participant 12

### SVO

a. \*al-kur-h                      ja-muru                      fawqa                      al-laʔib  
 Def-ball.Sg-F                    3P.Sg.M-pass    above                      Def-player.Sg.M  
 ‘The ball passes over the player’

**VO**

- b. wa            na-ʒlis            na-taʒawar    maða    muʃkil-at-u-hum  
 and            1P.Pl-sit            1P.Pl-discuss    what    proplem-Pl.F-Nom-their  
 ‘And we discuss what their problems are’

**Vless**

- c. \*as-sukan            ʔas<sup>ʕ</sup>li-ah            malawi-ah  
 Def-population    Def-indigenous-F    malawi-F  
 ‘The indigenous people are Malawians’

**SVO(PP)**

- d. \*muḥamad            ja-biʃu            bajt-a-hu    ila    aʃ-ʃarik-at-i  
 Muhammad    3P.Sg.M-sell    house-Acc-his to    Def-company-F-Gen  
 ‘Muhammad is selling his house to the company’

**SVOO**

- e. al-muʃalim            ju-ri            at<sup>ʕ</sup>-t<sup>ʕ</sup>alib            ʔal-ʒumla-h  
 Def-teacher.M.Sg    3P.M-show    Def-student.Sg.M    The-sentence.Sg-F  
 ‘The teacher shows the students the sentence’

**SR**

- f. haða            huwa    at<sup>ʕ</sup>-t<sup>ʕ</sup>ifl-u            allaði            ja-qudu            ad-daraʒ-at-a  
 this.M.Sg    he    Def-child-Nom    who.Sg.M    3P.M.Sg-drive    Def-bicycle-F-Acc  
 ‘This is the child who is riding the bicycle’

**ʔanna**

- g. ʔa-ʃtaqidu            ʔanna    al-laʃib-a            ja-ʃʃuru            bi-l-ʔalam-i  
 1P.Sg-think    Comp    Def-player.Sg.M-Acc    3P.M.Sg-feel    Prep-Def-pain-Gen  
 ʃindama    ja-lʃabu            kurat-a            al-qadam-i  
 when    3P.M.Sg-play    ball.Sg-Acc    Def-soccer-Gen  
 ‘I think the player is in pain when he plays soccer.’

**SVOXP**

- h. ʔana            ʔa-ʃtayil            ḥata    as-saʃa-h            ar-rabiʃa-h  
 I            1P.Sg-work            until    Def-hour.Sg-F            Def-four-F  
 ‘I work until four o’clock’

**VOXP**

- i. ʔa-lʃabu    kurat-a            al-qadam            ḥata    ʔaḏan-i            al-mayrib  
 1P.Sg-playball.Sg-Acc    Def-soccer            until    call-Gen            Def-magrib  
 ‘I play soccer until the call for the Magrib prayer’

**VSO**

- j. ʔaʃt<sup>ʕ</sup>a            al-yani            ila    al-faqir            as<sup>ʕ</sup>-s<sup>ʕ</sup>adaqa-h  
 give.past.3P.Sg.M    Def-rich.Sg.M            to    Def-poor.Sg.M    Def-charity.Sg-F  
 ‘The rich man gave the poor man charity’

**XPVless**

- k. ʔal-malawia-h                      dinuhum              islam  
 Def-malawian.Pl-F                      religion-their      Islam  
 ‘The Malawians, their religion is Islam’

**XPSVO**

- l. wabaʕda    as-sala-h                      baʕda    ʔadai-tu                      sʕalat-a  
 after              Def-prayer.Sg-F                      after    perform.past-1P.Sg              prayer-Acc  
 al-fazri...              ʔana    ʔa-ʒlis                      wa    ʔa-qraʔu              baʕðʕa  
 Def-fajr-Gen              I              1P.Sg-sit                      and    1P.Sg-read              some  
 as-suwar              min    al-qurʔan  
 Def-chapter.Pl              from    Def-Quran  
 ‘After prayer, after I perform the Fajr prayer, I read some chapters from the Quran’

**ORWR**

- m. haða              huwa              al-ħiðaʔ-u                      allaði              ja-lbisu-hu              arrazul  
 this.M.Sg    it.M.Sg              Def-shoe.Sg.M-Nom              that.Sg.M    3P.Sg.M-wear-it              Def-man  
 ‘This is the shoe the man is wearing’

**Passive**

- n. \*al-ʒidar              hudim-at                      /              kusir-at  
 Def-wall.Sg.M              demolish.Past.Passive-F                      break.Past.Passive-F  
 ‘The wall was demolished, broken’

In addition to default mapping sentences, default mapping sentences XP, and XP default mapping sentences, Participant 12 produced 22 sentences with non-default mapping between argument and function structures, as in the passive construction in (12n). The agent was suppressed and the patient ([alʒidar] ‘the wall’) was promoted and mapped to the subject. The participant produced a wide range of structures but not all of the targeted structures. Even though clitic left dislocation was targeted with specifically designed tasks, Participant 12 did not produce a single instance of this structure but was able to produce higher structures in the table when targeted, e.g., passive.

The trends in Participant 13’s data were similar. He produced 171 sentences, 149 (87.1%) of which had default mapping. Default mapping sentences had transitive verbs with and without subject dropping, as in (13a-b), and verbless sentences, as in (13c). Sentences with ditransitive

verbs only had NP-PP order of post-verbal arguments, as in (13d), and subject relative clauses and [ʔanna] embedding are shown in (13e-f). With regard to XP adjunction, he placed XPs after default mapping sentences, as in (13g-i), as well as before, as in (13k-m). Fronting XPs ahead of default mapping was not limited to adverbials, including non-core argument noun phrases that were relativized, as in (13o), or left dislocated, as in (13n). VSO word order appeared once in (13j).

### 13. Participant 13

#### SVO

- a. ʔana            ʔa-skun            fi            sakan            al-ʔamiʕa-h  
 I            1P.Sg-live            in            housing            Def-university.Sg-F  
 ‘I live in university housing’

#### VO

- b. wa            ʔa-stamiʕ            ʔila            al-ʔaxbar  
 and            1P.Sg-listen            to            Def-news  
 ‘And I listen to news’

#### Vless

- c. fi   ʔusrat-i            xams-at-u            ʔaʕxasʕ  
 in family-my            five-F-Nom            people  
 ‘In my family, there are five people’

#### SVO(PP)

- d. ʔaz-zawʕ-u            ʔaʕtʕa            miftaħ            ʔas-sajara-h            ila zawʕ-at-i-hi  
 Def-husband.Sg-Nom            give-3P.Sg.Past            key.Sg.M            Def-car.Sg-F            to wife.Sg-F-Gen-his  
 ‘The husband gave the car key to his wife’

#### SR

- e. haða            huwa            atʕ-tʕabib-u            allaði            ja-ʕtani            bi-tʕ-tʕifl  
 this.M.Sg            he            Def-doctor-Nom            who.M.Sg            3P.M.Sg-take care of-Def-child  
 ‘This is the doctor who is taking care of the child’

#### ʔanna

- f. \*ʔa-ʕtaqidu            ʔanna qalb-u-hu            inkasara bisababi            al-ʔimraʔa-h  
 1P.Sg-think            Comp heart-Nom-his break            because of            Def-woman.Sg-F  
 ‘I think his heart is broken because of a woman’

**SVOXP**

- g. \*ʔana ʔa-stʕidu li-d-durus li-taʕalimi al-fasʕl-i fi-l-ajl  
 I 1P.Sg-prepare for-Def-lessons to-teach Def-class.Sg.M-Gen at-Def-night  
 ‘I prepare the lessons to teach the class the night before’

**VOXP**

- h. zur-tu najjiria lakin faqatʕ li-ʔisbuʕ-ajl  
 visit.Past-1P.Sg Nigeria but only for-week-Dual.Gen  
 ‘I visited Nigeria but only for two weeks’

**VlessXP**

- i. ʔana mutaradid-un bajna al-ħadiθ wa al-qurʔan  
 I hesitant-Nom between Def-hadith and Def-Quran  
 ‘I am trying to choose between the Hadith and the Quran as a major’

**VSO**

- j. ta-bdaʔ ad-dirasah min as-saʕa-h al-waħida-h ʔila  
 3P.Sg.F-start Def-studying from Def-hour.Sg-F Def-one-F to  
 as-saʕa-t-i as-sadisa-h  
 Def-hour.Sg-F-Gen Def-six-F  
 ‘School lasts from 1 pm to 6 pm’

**XPVless**

- k. fi əl-ʔinʒilizja-h ʔal-kalim-at hunaka tʕarqa-t-un waħid-ah li-nutʕqi-ha  
 in Def-English-F Def-word.Pl-F there way-F-Nom one-F to-pronounce-them  
 ‘In English, there is one way to pronounce words’

**XPVO**

- l. lakin fi-l-ʕarabja-h la juzad ʕakl fi-l-kutub  
 but in-Def-Arabic-F no exist form in-Def-book.Pl.M  
 ‘But in Arabic, there is no way in the books’

**XPSVO**

- m. ʕindama kun-tu mudarisan ʔana ʔa-stajqiðʕu mutabakiran  
 When be.past-1P.Sg teacher.M.Sg I 1P.Sg-wake up early  
 ‘When I was a teacher, I woke up early’

**CLLD**

- n. \*ʔal-zidar-a bana-hu bannaʔ-u-n  
 Def-wall.Sg.M-Acc build.past-it construction worker-Nom-Indef  
 ‘The wall, a construction worker built it’

**ORWR**

o. haða huwa al-bab-u allaði ja-ftaħu-hu  
 this.M.Sg it.M.Sg Def-door.M-Nom that.M.Sg 3P.M.Sg-open-it  
 al-mudaris-u  
 Def-teacher.M.Sg-Nom  
 ‘This is the door the teacher is opening’

**Passive**

p. muli?a al-kub bi-lma?  
 fill.passive.past.M Def-cup.Sg.M with-water  
 ‘The cup was filled with water’

In the non-default mapping stage, this participant produced 12 examples of passive constructions. For example, in (13p), the agent is suppressed and the patient ([al-kub] “the cup”) is mapped to the subject.

Participants 11, 12, and 13 produced sentences with default mapping that were preceded or followed by circumstantial adjuncts. This was similar to their classmates in the low-intermediate level. However, what set them apart is that they productively produced passive constructions involving non-default mapping. This was the only structure with non-default mapping produced by those learners. Other structures like causative and OVS were elicited, but these three participants did not produce them, ignoring all prompts.

Participants 14, 15, and 16 constituted the second group of high-intermediate learners. Participant 14 produced 201 sentences, 143 (71.1%) of which had default mapping. Default mapping sentences had transitive verbs that appeared with and without subject dropping, as in (14 a-b), and verbless sentences were produced, as in (14c). Sentences with ditransitive verbs were found with both NP-PP and NP-NP order of post-verbal arguments, as shown in (14d-e). In addition to single clause default mapping sentences, subject relative clauses and [?anna] embedding were produced, as illustrated in (14f-g). With regard to XP adjunction, he placed them after default mapping, as in (14h-j), and before, as in (14l-n). Sentence-initial placement of

circumstantial adjuncts included adverbials and topicalized noun phrases, as in (14o-p). VSO word order was found several times in the data, as (14k) illustrates.

#### 14. Participant 14

##### SVO

- a. \*hum ja-taħadaθ-un luyā-h mutanawifā-h  
 they 3P.M-speak-Pl language.Sg-F various-F  
 ‘They speak various languages’

##### VO

- b. \*ʔintahaj-tu min mustawa ʔaθ-θaliθ  
 finish.Past-1P.Sg from level Def-three.M  
 ‘I finished Level 3’

##### Vless

- c. ʕadad-u-hum murtafiʕ zidan  
 number-Nom-their high very  
 ‘Their numbers are high’

##### SVO(PP)

- d. \*ʔahmad-u ja-qruḏʕu al-qalam-a li ʕumar-a  
 Ahmad-Nom 3P.M.Sg-lend Def-pen.M.Sg-Acc to Omar-Acc  
 ‘Ahmad lends the pen to Omar’

##### SVOO

- e. ʕali ja-biʕu al-ʕaʔil-at-a sajara-h  
 Ali 3P.M.Sg-sell Def-family-F-Acc car-F.Indef  
 ‘Ali is selling the family a car’

##### SR

- f. haḏaini huma ar-raʕul-ajni allaḏ-ajni ja-qtatil-an  
 this.dual.M Pro.dual Def-man-Dual.Acc who-Dual.M 3P.M-fight.Dual  
 ‘Those are the men who are fighting’

##### ʔanna

- g. \*ʔa-ʕtaqidu ʔanna haḏa ar-raʕul-u ju-fakiru bi-ʕtiraʔi  
 1P.Sg-think Comp this.M.Sg Def-man-Nom 3P.M.Sg-think of-buying  
 as-sajara-h  
 Def-car.Sg-F  
 ‘I think this man is thinking about buying the car’

### SVOXP

- h. naħnu      ġindana      ħalaq-at      fi      al-mawad      allati  
 We      have      class.PI-F      in      Def-subject.PI that.Sg-F  
 ta-s<sup>ġ</sup>ub      ġala-jna      xasatan      bil-luġa-h      sawa?an  
 2P.F-complicate      on-us      especially      in-language.Sg-F      whether  
 kana      bi-s<sup>ġ</sup>-s<sup>ġ</sup>arf      ?aw      an-naħw  
 be.Past      in-Def-morphology      or      Def-syntax  
 ‘We have classes in subjects that get complicated for us, especially in language morphology and syntax’

### VOXP

- i. wa      nu-ðakir      darsa-na      taqriban      ħata      as-saġa  
 and      1P.PI-study      lesson.Sg-our      approximately until      Def-hour.Sg  
 al-ġafira-h      ?aw      alħadia-h ġafar  
 Def-ten.F      or      Def-eleven  
 ‘We study our lessons until 10 or 11 pm’

### VlessXP

- j. ?ana      mustaġidu      liriħla-h      baġda      jawm      ?aw      jawm-ajn  
 I      ready.Sg.M      for-trip.indef-F      after      day.Sg or      day-dual.Acc  
 ‘I am ready for a trip after one or two days’

### VSO

- k. ja-ktubu      ?at<sup>ġ</sup>-t<sup>ġ</sup>ifl      ġala      al-warqa-h  
 3P.M.Sg-write      Def-child.M.Sg      on      Def-paper-F  
 ‘The child is writing on the paper’

### XPVless

- l. hunaka      ?aġ-ġaġb      ?aġð<sup>ġ</sup>an      kaθir  
 there      Def-people      also      many  
 ‘There are also many people there’

### XPVO

- m. al-mustawa      al-qadim      sa-?a-bda?      fi-l-mustawa      ar-rabiġ  
 Def-level.Sg      Def-next      Fut-1P.Sg-start      in-Def-level      Def-four.M  
 ‘The next level, I will start Level 4’

### XPSVO

- n. fi waqti      faray-i      ?ana      ?u-saġidu      walid-aj  
 in time-Gen      free-my      I      1P.Sg-help      parent-Dual.my  
 ‘In my free time, I help my parents’

**CLLD**

- o. as-sabur-at-u                      ja-msaḥu-ha    at<sup>ʕ</sup>-tʕalib  
 Def-whiteboard-F-Nom    3P.M-erase-it    Def-student.Sg.M  
 ‘The whiteboard, the student is cleaning it’

**ORWR**

- p. haḏihi      hia      al-qitʕa-h      allati                      tu-tʕʕimu-ha      al-marʔa-h  
 This.F.Sg    it.F.Sg    Def-cat.Sg-F    that.F.Sg                      3P.F-feed-it      Def-woman-F  
 ‘This is the cat the woman is feeding’

**Passive**

- q. hia              kaʔanaha              sʕuwir-at  
 it.F.Sg          as if                      picture.past.passive-F  
 ‘As if it had been pictured’

**Causative**

- r. huwa          ʔasʕatʕa-ha  
 it.M.Sg      fall.3P.Sg.M.Caus-it  
 ‘It caused it to fall down’

Within the non-default mapping stage, structures that involved non-default argument to function structure mapping were produced, as reflected in several examples of the passive construction, such as (14q). The patient ([hia] “it”), referring to a car in one of the pictures presented, is the patient in the event. It was mapped to the grammatical subject, and the agent of the event was suppressed.

Within the complex mapping stage, Participant 14 produced three examples of a causative construction, as in (14r). This exemplifies complex mapping between argument and function structures, showing a typical intransitive verb ([saqatʕ] “fall”) used transitively. A new argument was introduced ([huwa] “it”), referring to a male cat in the picture presented. The new argument was the agent of the causative verb and was mapped to the subject function while the clitic [ha] referred to the object being broken in the picture and was the agent of the lexical verb and the patient of the causative verb. Two thematic roles within the argument structure of this sentence were mapped to the object function.

Similarly, Participant 15 produced 159 sentences, 104 (65.4%) of which had default mapping. Within default mapping, various structures were produced, such as sentences with transitive verbs with and without subject dropping, as in (15a-b), and verbless sentences, as in (15c). Sentences with ditransitive verbs appeared with NP-PP and NP-NP order of post-verbal arguments, as in (15d-e). In addition, two clauses with default mapping appeared in subject relative clauses and [ʔanna] embedding, as shown in (15f-g).

With regard to XP adjunction, this participant produced many examples in which adverbials were placed after default mapping sentences, as in (15h-i), as well as before such sentences, as in (15k-m). Topical noun phrases were also placed ahead of default mapping sentences, as illustrated in (15n-o), and he produced two instances of VSO order instead of the more predominant SVO, as in (15j).

## 15. Participant 15

### SVO

- a. wa ʔustað al-mutun ja-stamiʕ ʔil-aja ma ʔafið<sup>s</sup>-tu  
 and teacher.Sg.M Def-mutun.Pl 3P.M.Sg-listen to-me what memorize-1P.SG  
 ‘The teacher of almutun listens to what I memorized’

### VO

- b. kun-tu ʔu-darisu ʔabnaʔa al-muslim-in  
 be.past-1P.Sg 1P.Sg-teach children Def-Muslim-Pl.Gen  
 ‘I was teaching Muslim children’

### Vless

- c. huwa ʔas<sup>s</sup>ʔaru min-i sinan  
 he younger than-me age  
 ‘He is younger than me’

### SVO(PP)

- d. \*ar-razul-u ju-nawilu al-kitab-a ʔila-at<sup>s</sup>-t<sup>s</sup>ifl-a  
 Def-man.Sg.M-Nom 3P.M.Sg-hand Def-book.Sg-Acc to-Def-child.Sg-Acc  
 ‘The man is handing the book to the child’

**SVOO**

- e. ar-razul-u                      ju-ʕtʕi                      al-faqir-a                      al-mal-a  
 Def-man.Sg-Nom                      3P.M.Sg-give Def-poor.Sg.M-Acc                      Def-money-Acc  
 ‘The man is giving the poor man money’

**SR**

- f. haða                      huwa                      ar-razul-u                      allaði                      ʕariba                      al-qahwa-h  
 this.M.Sg he                      Def-man.Sg-Nom                      who.M.Sg                      drink.Past.M.Sg Def-coffee-F  
 ‘This is the man who drank the coffee’

**ʔanna**

- g. ʔa-ʕtaqidu                      ʔanna                      at-tʕifl-a                      ja-bki  
 1P.Sg-think                      Comp Def-child.Sg.M-Acc                      3P.M.Sg-cry  
 ‘I think the child is crying’

**SVOXP**

- h. ʕum huwa                      sa-ju-rʕidu-ka                      kaajfa                      sa-ta-ʔti                      wa                      kajfa                      sa-tsʕil  
 then he                      Fut-3P.M.Sg-tell-you how                      Fut-2P-come                      and how                      Fut-2P-arrive  
 ʔila burundi  
 to Burundi  
 ‘Then, he will tell you how to arrive to Burundi’

**VOXP**

- i. ʔa-zuru-hum                      liʔanna-na                      naħnu                      na-skun                      baʕidin  
 1P.Sg-visit-them                      because-we                      we                      1P-Pl-live                      far away  
 ‘I visit them because we live far away’

**VSO**

- j. \*ju-ʕiru                      ar-razul-a                      zawʕ-at-a-hu                      as-sajara-h  
 3P.M.Sg -lend                      Def-man-Acc                      wife-F-Acc-his                      Def-car.Sg-F  
 ‘The man lends his wife the car’

**XPVless**

- k. \*wa naħnu fi dawlati-na                      al-ʕaw-u                      bajna                      alħar-u                      wa                      al-barid  
 and we                      in country-our Def-weather-nom                      between Def-hot-Nom and Def-cold  
 ‘And in our country, the weather is between hot and cold’

**XPSVO**

- l. huw                      razul-un                      tʕajb                      wa                      li-haða                      as-sabab                      ʔana  
 he                      man.Sg-Nom.Indef                      kind.M.Sg                      and                      because-this                      Def-reason.Sg I  
 ʔaħbab-tu-hu  
 love.Past-1P.Sg-him  
 ‘He is a kind person and for this reason, I liked him’

**XPVO**

m. fi ʔas-sabaḥ ʔa-stajqiðʕu qabla sʕala-t-i al-faʔr birubʕi saʕah  
 in Def-morning 1P.Sg-wake up before prayer-F-Gen Def-fajr quarter hour  
 ‘In the morning, I wake up 15 minutes before the Fajr prayer’

**CLLD**

n. ʔal-zidar ja-bni-hi al-muhandis  
 Def-wall.M.Sg 3P.Sg-build-it Def-engineer.Sg.M  
 ‘The wall, the engineer is building it’

**ORWR**

o. al-luya-h allati ʔa-taḥadaθu-ha hia as-sawahili  
 Def-language.Sg-M that.Sg.F 1P.M.Sg-speak-it it.F.Sg Def-Swahili  
 ‘The language I speak is Swahili’

**Passive**

p. sʕuba al-maʔ  
 pour.Past.Passive.M Def-water.M  
 ‘The water was poured’

**Causative**

q. ʔaf-furtʕi-u ʔawqafa-hu  
 Def-policeman.Sg-Nom stop.caus-him  
 ‘The police officer stopped him’

Within the non-default mapping stage, Participant 15 showed very productive use of the passive construction, with 25 instances, as in (15p). In this example, the theme ([almaʔ] “water”) was mapped to the subject while the agent of the action was suppressed.

Within the complex mapping stage, Participant 15 produced four instances of causative construction, as in (15q). The typically intransitive verb [waqafa] “stop.past.3P.MSg” was used transitively by applying the morphological template of the causative. The newly introduced argument [ʔaf-furtʕi-u] “Def-policeman.Sg-Nom” was mapped to the subject of the causative verb, and the patient [hu] “him”—simultaneously the agent of the lexical verb and the patient of the cause verb—was mapped to the object function.

The structures produced by Participant 16 were comparable to others in this group, especially Participants 14 and 15. He produced a total of 145 sentences, only 83 (57.25%) of

which had default mapping. Sentences with transitive verbs appeared with overt subject, as in (16a), and with subject dropping, as in (16b). Verbless sentences appeared as well, as in (16c). Sentences with ditransitive verbs were produced with both NP-PP and NP-NP order of post-verbal arguments, as in (16d-e). His production of default mapping sentences was not limited to single clause sentences, as two-clause sentences were seen in (16f-g).

With regard to XP adjunction, he showed an ability to place circumstantial adjuncts after sentences in default mapping, as in (16h), and before them, as in (16j). The latter position was not limited to circumstantial adjuncts but included topicalized noun phrases, as in (16k-l).

## 16. Participant 16

### SVO

- a. \*haða      ʔat<sup>ʕ</sup>-t<sup>ʕ</sup>ifl-u                  ja-ktibu                  al-waʒib-u  
 this          Def-child.Sg.M-Nom    3P.Sg.M-write          Def-homework-Nom  
 ‘This child is writing the homework’

### VO

- b. θuma      ʔa-rʒiʕu      ʔila      ɣurf-at-i      wa      ʔa-qraʔu      al-qurʔan  
 then          1P.Sg.return    to          room-F-Gen    and      1P.Sg.read      Def-Quran  
 ‘Then, I return to my room and I read the Quran’

### Vless

- c. al-qahwa-h      mawʒudun                  fi-l-kub-i  
 Def-coffee-F      existing                  in-Def-cup-Gen  
 ‘The coffee is in the cup’

### SVO(PP)

- d. ʕali-un      ju-nawil      ʔal-kurra-h      li-safid  
 Ali-Nom    3P.M.Sg-pass    Def-ball.Sg-F    to-Saeed  
 ‘Ali is passing the ball to Saeed’

### SVOO

- e. ʔal-ʔum-u      tu-xbiru      al-bint-a      xabaran  
 Def-mother-Nom    3P.F.Sg-tell    Def-girl-Acc    news.Sg.Indef  
 ‘The mother is telling the girl the news’

**SR**

- f. haḏihi al-marʔa-t-u allati ta-staqbilu ʔar-razul-a  
 this.F.Sg Def-woman-F-Nom who.F.Sg 3P.F.Sg-meet Def-man-Acc  
 ‘This is the woman who is meeting the man’

**ʔanna**

- g. \*ʔaʕtaqidu ʔanna haḏa al-fariq qad ta-ʕib-u  
 1P.Sg-think Comp this Def-team.Sg.M already 3P-exhausted-Pl.M  
 ‘I think this team is exhausted’

**VOXP**

- h. \*na-bdaʔu ʔad-dirasa ʔas-saʕ-at-u ʔaθ-θamina-h ḥata  
 1P.Pl-begin Def-school Def-hour-F-Nom Def-eight-F until  
 ʔas-saʕ-at-u ʔaθ-θanijah ʕafara min al-masaʔ  
 Def-hour-F-Nom Def-two-F ten in Def-evening  
 ‘We have school from 8 am to 12 pm’

**VSO**

- i. \*ja-sʔalu al-faqir-u al-ʔani-u fulusan  
 3P.M.Sg-ask Def-poor.Sg-Nom Def-rich.Sg-Nom money.Indef  
 ‘The poor man is asking the rich man for money’

**XPVO**

- j. wa baʕda al-muʕalaʕa-h sa-ʔa-kulu al-ʕiʕaʔ  
 and after Def-reading-F Fut-1P.Sg-eat Def-dinner  
 ‘And after reading, I will eat dinner’

**CLLD**

- k. ʔad-daraʕ-ah ja-qudu-ha ʔatʕ-tʕifl  
 Def-bicycle.Sg-F 3P.M.Sg-drive-it Def-child.Sg.M  
 ‘The bicycle, the child is riding it’

**ORWR**

- l. haḏihi hia al-marʔ-at-u allati ja-ḏʕribu-ha ar-razul  
 this.F.Sg she Def-woman-F-Nom who.F.Sg 3P.M.Sg-hit-her Def-man  
 ‘This is the woman the man is hitting’

**Passive**

- m. ʔat-tuʕaḥ-at-u ʔukila baʕḏʕ-u-ha  
 Def-apple.Sg-F-Nom eat.passive.Past.M some of-Nom-it  
 ‘The apple, some of it was eaten’

**Causative**

- n. \*ʔal-ʔum-u ʔaʕlas-a-hu ʕala al-kursj  
 Def-mother-Nom sit-caus.past-M.Sg-him on Def-chair.Sg.M  
 ‘The mother caused the child to sit down’

Finally, Participant 16 produced constructions that showed a clear departure from default mapping between the three structures of grammar. The first construction was the passive, shown in (16m), in which the agent was suppressed and [baʕð<sup>ɕ</sup>-u-ha] “some of it” was mapped to the subject and assigned the nominative case. The second was a causative construction, as in (16n), which had a typical intransitive verb used in the causative form [ʔaʒlas-a], transforming it into a transitive verb. [ʔal-ʔum-u] “the mother-Nom” was the agent-subject of the causative verb while the pronoun [-hu] was the patient of the causative verb and the agent of the lexical verb [ʒalas] “sit.past” and was mapped to the object function.

Figure 5.3 shows the types of mapping principles found in the sentences of high-intermediate learners. Besides default mapping and the placement of non-core arguments, XP, at both edges—which they shared with some learners in the low-intermediate group—non-default argument to function structure mapping appeared in their IL as well. While this was the case for all learners in this group, only Participants 14, 15, and 16 showed evidence of complex argument to function structure mapping, as reflected in their production of causatives.

The emergence criterion was applied to the numbers in Table 5.10 to judge whether a structure under investigation had emerged in the IL of learners. This yielded the sequence in Table 5.11. The highest stage each participant reached is indicated by the thick line. This yielded the implicational sequence in Table 5.11.

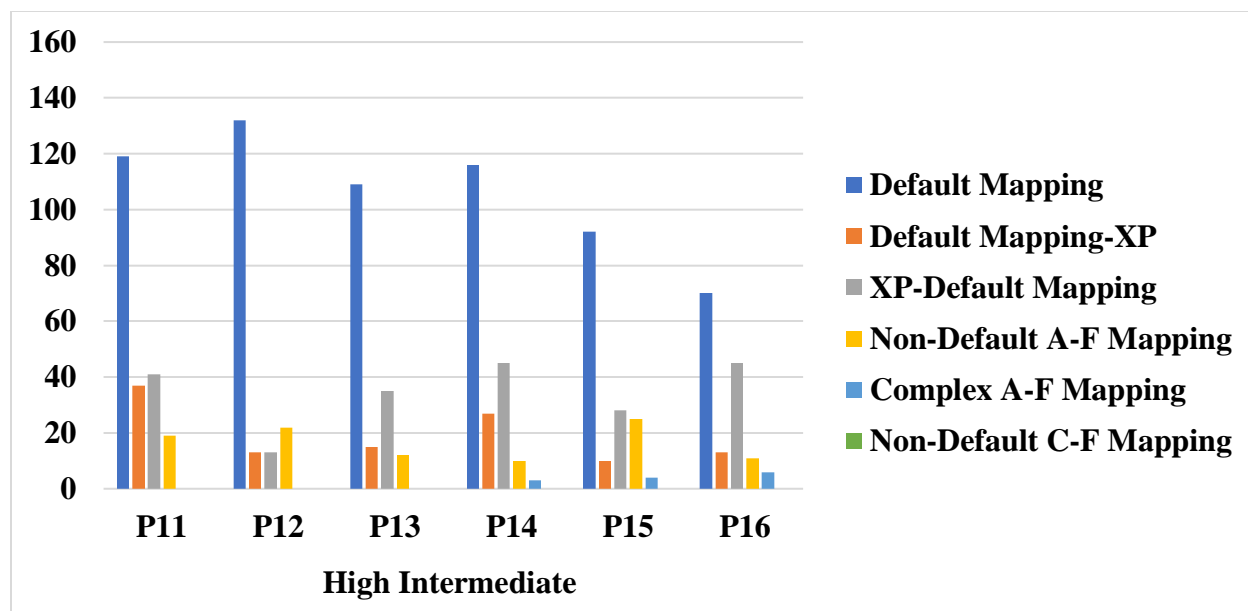


Figure 5.3. Types of mapping principles found in high-intermediate data.

The implicational sequence shows that all learners produced structures beyond default mapping of the three structures of grammar. It also shows they were aware of the default mapping edges, as reflected in their ability to place non-core arguments after as well as before default mapping sentences. In other words, the initial position was not constrained to agent-subject. While their IL shared this characteristic with low-intermediate learners, the high-intermediate group went a step further in the implication table. This is reflected in their production of structures involving non-default mapping, e.g., the passive. Their production of the passive construction represents a huge step toward freeing their syntax as it demonstrates they no longer had an agent-subject link constraint active in their IL.

The IL of Participants 14, 15, and 16 had also developed one step further as they were able to link multiple thematic roles into one grammatical function, as seen in the causative constructions presented for each of them in Table 5.11. This complex mapping is the highest degree of non-linearity between argument and function structures.

Table 5.11

*High-Intermediate Level Sentential Word Order Implicational Sequence*

Mapping Principles	Participant Structure	P11	P12	P13	P14	P15	P16
Non-default C to F mapping	OVS	-	-	-	-	-	-
	ORWOR	-	-	-	-	-	-
Complex A to F mapping	Causative	-	-	-	+	+	+
Non-default A to F mapping	Passive	+	+	+	+	+	+
	ORWR	/	+	+	+	+	+
XP default mapping	CLLD	/	-	+	+	+	+
	XPSVO	+	/	+	+		
	XPVO	+		+	+	+	+
	XPVless	/	+	+	/	/	
	VSO	+	/	/	+	+	+
	VlessXP	+		+	+		
Default mapping + extra arguments	VOXP	+	+	+	+	+	+
	SVOXP	+	+	+	+	/	+
	[?anna]-Em	+	+	+	+	+	+
Default mapping	SR	+	+	+	+	+	+
	SVOO	+	+	-	+	+	+
	SVO(PP)	+	+	+	+	+	+
	Vless	+	+	+	+	+	+
	VO	+	+	+	+	+	+
	SVO	+	+	+	+	+	+

The jagged line indicates intra-stages. While all the participants in this level productively produced at least one structure from every mapping stage and one from every intra-stage within mapping stages, only Participant 11 did not do so for one intra-stage. Table 5.11 shows that he produced several examples of higher stages, e.g., passive, and structures of the same stage, e.g., XPSVO and XPVO, in which the XP preceding the sentences was adverbial. Nevertheless, he did not produce CLLD and object relative clauses with resumption, in which the fronted XP is a noun phrase even though they theoretically involve the same mapping principle.

Thus, the highest structure apparent in the IL differed from one high-intermediate learner to another. While Participants 11, 12, and 13 demonstrated non-default argument to function

structure mapping, i.e., passives, Participants 14, 15, and 16 had reached the complex mapping stage within argument to function structures, i.e., causatives.

#### 5.2.4 Advanced Level Results

The advanced group was composed of five learners. Their L1 background is presented in Table 5.12 and their results in Table 5.13.

Table 5.12

##### *Advanced Learners' Language Background*

Participant	L1	L2
P17	French	
P18	Pashto	Farsi / Urdu
P19	English	
P20	Spanish	English
P21	English	Somali (heritage)

This group produced almost all of the structures targeted in this study. Besides being able to produce sentences involving default mapping and placing non-core arguments on both edges, all group members showed evidence of structures involving non-default mapping and complex mapping between argument and function structures—as was the case with the high-intermediate learners. Only Participants 19, 20, and 21 produced structures that involved non-default mapping between constituent and function structures. However, they differed in how productive the structure was in their IL. While Participants 19 and 20 produced a single case each, Participant 21 produced 13 cases with such mapping.

Participant 17 produced 217 sentences, 157 (72.3%) of which had default mapping in the form of various structures. He produced sentences with transitive verbs with and without subject dropping, as in (17a-b); verbless sentences, as in (17c); and sentences with ditransitive verbs but only with NP-PP order of post-verbal arguments, as in (17d). Multiple-clause sentences were

found as well, reflected in his production of subject relative clauses and [ʔanna] embedding, as in (17e) and (17f), respectively.

Table 5.13

*Advanced Level Sentential Word Order Results*

Mapping Principles	Participant Structure	P17	P18	P19	P20	P21
Non-default C to F mapping	ORWOR	0	0	1	1	3
	OVS	0	0	0	0	10
Complex A to F mapping	Causative	9	5	6	3	9
Non-default A to F mapping	Passive	11	14	18	11	11
	ORWR	10	10	3	8	7
XP default mapping	CLLD	19	21	3	2	4
	XPSVO	1	5	0	1	0
	XPVO	9	10	3	16	9
	XPVless	1	14	1	0	3
	VSO	0	16	10	6	2
	VlessXP	1	2	5	2	1
Default mapping + extra arguments	VOXP	2	7	20	15	10
	SVOXP	5	0	1	2	1
	[ʔanna]-Em	14	7	13	3	12
Default mapping	SR	14	10	15	13	11
	SVOO	0	1	5	1	0
	SVO(PP)	21	18	13	16	20
	Vless	38	14	13	9	14
	VO	35	14	13	27	30
	SVO	27	20	11	27	10

In several cases, Participant 17 placed non-core arguments after as well as before sentences in default mapping, as in (17g-i) and (17j-l), respectively. These were not limited to adverbials—as was the case with some low-intermediate learners—but included topic noun phrases, as in (17m-n).

**17. Participant 17**

**SVO**

- a. \*mustawa-i      kan-at      ɖʕaʕifa-h      zidan  
     level-my      be.Past-Sg-F      weak.Sg.F      very  
     ‘My level was very weak’

**VO**

- b. ?a-bqa                      fi            al-yurfa-h                      kaθiran  
 1P.Sg-stay                      at            Def-room.Sg-F                      lot  
 ‘I stay in the room a lot’

**Vless**

- c. ?uzra-t            al-bujut                      raxis<sup>s</sup>a-h                      zidan  
 rent.F            Def-house.Pl.F                      cheap-F                      very  
 ‘The rent for houses is very cheap’

**SVO(PP)**

- d. al-?ab-u                      ju-?alim                      al-qiada-h                      li-bni-hi  
 Def-father-Nom                      3P.M.Sg-teach                      Def-driving-F                      to-son-his  
 ‘The father is teaching his son how to drive’

**SR**

- e. haða            huwa    at<sup>s</sup>-t<sup>s</sup>ifl-u                      allaði                      kassara                      az-zuza?                       
 this.M.Sg    he            Def-child-Nom                      who.Sg.M                      break.Past.M.3P                      Def-glass.M  
 ‘This is the child who broke the glass’

**?anna**

- f. ?a-?taqidu                      ?anna    ?al-?xaw-aini                      ja-ðhab-ani                      il-al-madrasa-h  
 1P.Sg-think                      Comp    Def-brother-Dual.Acc                      3P-go-M.Dual                      to-Def-school-F  
 ‘I think the two brothers are going to school’

**SVOXP**

- g. wa                      ?ax-i                      allaði                      ja-li-ni                      tazawa?a  
 and                      brother-my                      who.M.Sg                      3P.M-come next-me                      marry.past.M.Sg  
 fi    as-sana-h                      qabla                      al-mað<sup>s</sup>i-ah  
 in    Def-year-F                      before                      Def-last-F  
 ‘My brother who was born after me got married the year before last’

**VOXP**

- h. ?iða                      ja-ra                      al-?ajb                      fi-ka    ju-nabihu-k  
 if                      3P.M.Sg-see                      Def-mistake                      in-you    3P.M.Sg-warn-you  
 ma-hma    balaya    t<sup>s</sup>ulu-k  
 no-matter    get            height-your  
 ‘If he sees something wrong in you, he warns you no matter who you are’

**VlessXP**

- i. al-ma?ifa-h                      hunaka                      raxis<sup>s</sup>a-h                      muqaranatan                      bi-s-sa?udia-h  
 living expenses-F                      there                      cheap-F                      compared                      to-Def-Saudia-F  
 ‘Living expenses are cheap compared to Saudi Arabia’

**XPVless**

- j. daʔiman ʔanta fi al-ʔurfa-h  
 always you in Def-room-F  
 ‘Always, you are in the room’

**XPSVO**

- k. bi-kul-i sʕaraħa-h ʔana ma ʔa-xruʒ kaθiran  
 in-all-Gen honesty.F I no 1P.Sg-go out a lot  
 ‘In all honesty, I do not go out a lot’

**XPVO**

- l. fi haðihi al-fatra-h kunna suzanaʕ fi al-ʔuraf  
 in this.F.Sg Def-period-F be.past.1P.Pl prisoner.Pl in Def-room.Pl  
 ‘In that period, we were prisoners in our rooms’

**CLLD**

- m. ʔas-sabura-h ja-msaħu-ha ʔat<sup>ʕ</sup>-tʕalib-u  
 Def-whiteboard.Sg-F 3P.M.Sg-clean-it Def-student.M-Nom  
 ‘The whiteboard, the student is cleaning it’

**ORWR**

- n. haðihi hia al-qahw-ah allati ja-ʕrabu-ha ar-razul  
 this.F.Sg it.F.Sg Def-coffee-F that.F.Sg 3P.M.Sg-drink-it Def-man.Sg  
 ‘This is the coffee the man is drinking’

**Passive**

- o. kusira zuʒaʒ-u as-sajar-ah  
 break.Passive.Past.M glass-Nom Def-car.Sg-F  
 ‘The car window was broken’

**Causative**

- p. ʔal-ʒundi ʔayraqa ar-razul fi al-maʔ  
 Def-soldier.Sg.M drown.Caus.Past.M Def-man.Sg in Def-water  
 ‘The soldier caused the man to drown’

In addition, Participant 17 produced sentences with non-default mapping between argument and function structures. In (17o), the passive sentence has a suppressed agent argument and a patient argument mapped to the subject position and assigned a nominative case, while in (17p), such mapping is more complex than the passive. In (17p), a typical transitive verb ([ʔayraqa.past.M] “drown”) is used in the causative form ([ʔayraqa] “drown.Caus.Past.M”). This leads to thematic fusion in which the object is mapped to the patient of the causative verb and the



**Vless**

- c. ?ahlu                      ?afyanistan    t'abi?atu-hum    mutayajr min    ?ali  
 people.Nom              Afghanistan    nature-their    different from people-Gen  
 buldan                      al-?ajr  
 country.Pl                Def-other  
 'People of Afghanistan, their nature is different from other people'

**SVO(PP)**

- d. ar-razul-u                      al-?ani              ju-?t'i              al-mal              ?ila al-faqir  
 Def-man.M.Sg-Nom              Def-rich.Sg.M    3P.M-give.Sg    Def-money              to    Def-poor  
 'The rich man is giving money to the poor'

**SVOO**

- e. \*?a-l?ab                      ju-?alim              ?ibn-u-hu              t'ariqah at-tazruba-h  
 Def-father.Sg.M    3P.M-teach.Sg              son-Nom-his              way    Def-experiment.Sg-F  
 'The father is teaching his son the experiment'

**SR**

- f. haða              huwa    al-mu?alim-u              allaði              ja-?rahu              ad-dars  
 this.M.Sg    he    Def-teacher.Sg-Nom    who.M.Sg    3P.M-explain.Sg    Def-lesson.Sg  
 'This is the teacher who is explaining the lesson'

**?anna**

- g. ?a?taqidu                      ?anna-hu              qad              iytasala  
 1P.Sg-think              Comp-he              just              bathe.past.M.Sg  
 'I think he just had a bath'

**VOXP**

- h. hazarna                      ?ila pakistan    qabla    taqriban ?arba?-in    sanah  
 immigrate.past.1P.Pl              to Pakistan    before    around    forty-Gen    year.Sg  
 'We immigrated to Pakistan forty years ago'

**VlessXP**

- i. ?afyanistan                      balad-u              al-?arb    minðu taqriban ?arba?-in sanah  
 Afghanistan              country-nom    Def-war since    about    forty-Gen year.Sg  
 'Afghanistan has been a battlefield for the past forty years'

**VSO**

- j. ja-takalam                      ?annas              bi              θalaθ-in              luyah  
 3P.M.Sg-speak    people              with    thirty-Gen              language.Sg.Indef  
 'People speak thirty languages'

**XPVless**

- k. \*fi ?afyanistan    tis?at-un    wa    tis?un              bi-lmi?ah              musliman  
 in Afghanistan    nine-Nom and    ninety-Nom    in-Def-hundred.Sg    Muslim.Sg  
 'In Afghanistan, ninety-nine percent are Muslim'

### **XPSVO**

- l. fi waqt-i al-faray jawma al-zumuʿa-h naħnu na-zuru baʿḏana-baʿḏan  
in time-Gen Def-free day.Acc Def-Friday-F we 3P.Pl-visit each other  
'In free time on Friday, we visit each other'

### **XPVO**

- m. fil-ḡumri al-qasʿir ta-ḡalama kaḏiran min al-ʔaʿjaʔ  
in-age.Gen Def-short 3P-learn.Sg.M.Past a lot of Def-thing.Pl  
'At a young age, he learned a lot of things'

### **CLLD**

- n. ʔad-daʒaʒa-h ʔakala-h razul-un  
Def-chicken.Sg-F eat.past.Sg.M-it man-Indef  
'The chicken, the man ate it'

### **ORWR**

- o. haḏihi hia al-ḡaqiba-t-u allati ḡamala-ha atʿ-tʿifl  
This.F.Sg it Def-backpack-F-Nom that.F.Sg carry.Sg.M-it Def-child.Sg  
'This is the backpack the child is carrying'

### **Passive**

- p. ʒuriba finʒal waḡid wa turik ʔaxar  
drink.past.Passive cup.Sg.M one.M and leave.past.passive.M other.M  
'One cup was drunk and another was left'

### **Causative**

- q. al-qitʿ-u ʔasqatʿa al-baq-ah  
Def-cat.Sg.M-Nom drop.Past.Caus Def-vase.Sg-F  
'The cat caused the vase to fall over'

In addition to default mapping sentences that followed or preceded non-core arguments, sentences with non-default argument to function structures appeared productively in Participant 18's data. In (18p), he produced two coordinated passive verbs ([ʒuriba] "drink.Past.Passive.M" and [turik] "leave.Past.Passive.M") in which the subject was suppressed and the patients were mapped to the subject function. He also produced several causative constructions, as in (18q) in which the intransitive verb ([asqatʿ] "fall") was used transitively. Complex mapping in this example was due to the addition of a new external argument ([al-qitʿ-u] "Def-cat.Sg.M-Nom") mapped to the subject of the causative verb ([ʔasqatʿa] "drop.Past.Caus"). The old external

argument ([al-baq-ah] “Def-vase.Sg-F”) was internalized, became both the patient of the causative verb and the agent of the lexical verb, and was mapped to the object position. The causative was the highest structure produced by this participant. He did not produce structures with non-default C-F mapping, e.g., OVS or object relative clauses without resumption.

Thus far in the data, Participants 17 and 18 had similar structures and mapping principles in their IL to some of the high-intermediate participants in that the highest structures both groups produced was the causative. What distinguished Participants 19, 20, and 21 was that they produced structures in which constituent to function structure mapping was not default.

Participant 19 produced 154 sentences, 109 (70.7%) of which had default mapping. In his data, default mapping sentences appeared with both overt subjects, as in (19a), and dropped subjects, as in (19b). Verbless sentences appeared in several cases, as shown in (19c). With ditransitive verbs, post-verbal arguments had NP-PP and NP-NP, as in (19d) and (19e), respectively. In addition to single clause sentences, he produced subject relative clauses as well as [ʔanna] embedding, as in (19f-g). This participant also produced default mapping sentences in which he placed non-core arguments after such sentences, as in (19h-j), and before them, as in (19l-o).

### 19. Participant 19

#### SVO

- a. \*ʔan-nil ta-bdaʔ min baħr fiktorĩa  
 Def-Nile 3P.F.Sg-start from Lake Victoria  
 ‘The Nile starts from Lake Victoria’

#### VO

- b. \*ʔaʕtʔa-ha ʔatʕ-tʕifl-u  
 give.past.3P.M.Sg Def-child-Nom  
 ‘He gave it to the child’

**Vless**

- c. ?al-luya-h                    ?ar-rasmia-h    fi    haðihi    ?ad-dawla-h    hia    al-luy-ah  
 Def-language.Sg-F    Def-official-F    in    this.Sg.F    Def-country-F    it.F    Def-language-F  
 al-?inzilizija-h  
 Def-English-F  
 ‘The official language in this country is English’

**SVO(PP)**

- d. ja-rmi                    ?at<sup>ʕ</sup>-t<sup>ʕ</sup>ifl-u                    al-ħazar-at-a                    fi                    al-ma?  
 3P.M.Sg-throw    Def-child.Sg.M-Nom    Def-rock-F-Acc                    in                    Def-water  
 ‘The child is throwing the rock into the water’

**SVOO**

- e. ju-ʕt<sup>ʕ</sup>i                    ar-razul-u                    ?al-faqir-a                    al-xubz-a  
 3P.M.Sg-give                    Def-man.Sg-Nom                    Def-poor-Acc    Def-bread-Acc  
 ‘The man is giving bread to the poor’

**SR**

- f. haða                    huwa    al-?imam                    allaði                    ju-s<sup>ʕ</sup>ali                    bi-nnas  
 this.M.Sg    he                    Def-imam                    who.M.Sg                    3P.M.Sg.pray    people  
 ‘This is the imam who leads people in prayer’

**?anna**

- g. ?a-ʕtaqid                    ?anna                    haða                    ?al-laʕib                    mus<sup>ʕ</sup>ab  
 1P.Sg-think                    Comp                    this.M.Sg                    Def-player.Sg.M                    injured.Sg.M  
 ‘I think this player is injured’

**SVOXP**

- h. ?ana    taʕalam-tu                    ?afja?    kaθirah    fi    alluyah                    al-ʕarabja-h  
 I                    learn.past-1P.Sg    thing.Pl    many    in    Def-language-F    Def-Arabic-F  
 fi                    maʕhad    taʕlim                    al-luya-h                    al-ʕarabja-h  
 at                    institute    teaching                    Def-language-F    Def-Arabic-F  
 ‘I learned many things in Arabic at the Arabic Teaching Institute’

**VOXP**

- i. ?ataj-tu                    ?ila    al-ʕamiʕa-h                    ?awalan                    li-dirasati  
 come.past-1P.Sg    to                    Def-university-F                    first                    to-study  
 al-luya-h                    al-ʕarabja-h    wa    ?ajðan    ?ad-diras-at                    ?al-islamia-h  
 Def-language-F    Def-Arabic-F    and    also    Def-science-Pl.F                    Def-Islamic-F  
 ‘I came to the university to study Arabic language and Islamic sciences’

**VlessXP**

- j. wa haðihi alluḡa-h maṣrufah zida min ḡat<sup>ᶜ</sup>-t<sup>ᶜ</sup>uful-ah  
 and this.F.Sg Def-language-F known-F very from Def-childhood-F  
 ḡila zamiṣ al-maraḡil li-ḡaj daris  
 to all Def-level.Pl for-any student.Sg-Indef  
 ‘And this language is very well known for any student from childhood to all levels’

**VSO**

- k. tu-xbiru ḡal-ḡum al-bint-a ṣan al-ḡaxbar  
 3P.F.Sg-tell Def-mother Def-daughter-Acc about Def-news.Pl  
 ḡas<sup>ᶜ</sup>-s<sup>ᶜ</sup>adir-ah fi ḡal-jawm  
 Def-published-F in Def-day.Sg  
 ‘The mother is telling the daughter about the news published today’

**XPVless**

- l. haðihi ḡad-dawl-ah hia manbaṣ nahri ḡan-nil  
 this.F.Sg Def-country-F it.F.Sg source river Def-Nile  
 ‘This country, it is the source of the Nile River’

**XPVO**

- m. baṣda ḡad-dars ḡa-ḡhab ḡila al-masḡid li-ḡadaḡi s<sup>ᶜ</sup>alati ḡaḡ<sup>ᶜ</sup>-ḡ<sup>ᶜ</sup>uhur  
 after Def-lesson.Sg 1P.Sg-goto Def-mosque.Sg to-pray prayer Def- dhuhr  
 ‘After class, I go to the mosque for the Dhuhur prayer’

**CLLD**

- n. ḡar-ras<sup>ᶜ</sup>as<sup>ᶜ</sup> ja-ḡmilu-hu al-ḡundj  
 Def-bullet.Pl 3P.M.Sg-carry-it Def-soldier  
 ‘The bullets, the soldier is carrying them’

**ORWR**

- o. haḡa huwa al-bab-u allaḡi ja-ftaḡu-hu ḡal-muṣalim  
 this.M.Sg it.M.Sg Def-door.Sg-Nom that.M.Sg 3P.M.Sg-open-it Def-teacher.Sg.M  
 ‘This is the door the teacher is opening’

**Passive**

- p. ḡujira lawn-u al-ḡidar ḡila lawn mulawan  
 change.passive.past.M color-Nom Def-wall.Sg to color colorful  
 ‘The color of the wall was changed to be more colorful’

**Causative**

- q. nazzala-hu ḡila taḡt bi-lquwa-h  
 go down.past.caus.M.3P.Sg to down with-force-F  
 ‘He forced him to get down’

**ORWOR**

r. \*mafiʃ      ʔaj      ʔafjaʔ      ʔallaði      lazɹ      tu-ħðʕir      maʕ-ak  
 no            any      thing.M.PL      that.Sg.M      must      2P-bring.M.Sg      with-you  
 ‘There’s nothing you need to bring with you’

Participant 19 productively produced sentences with non-default mapping between argument and function via the passive construction in (19p). The agent was suppressed and the patient ([lawn-u al-ʒidar] “color-Nom Def-wall.Sg”) was mapped to the subject function and assigned the nominative case. He also produced sentences with complex mapping of argument to function via the causative in (19q). In this example, [nazala] “get down.past.M.Sg,” which is typically an intransitive verb, was used transitively. The new external argument (subject) was dropped since it was understood from context, while an internalized argument was mapped to the object position, realized here by the clitic [hu]. Complex mapping was reflected in the mapping of two thematic roles within the argument structure; namely, [hu]—being both the patient of the causative verb and the agent of the lexical verb—was mapped to this object function.

In addition, this participant produced one object relative clause without resumption in (19r). The topicalized relative pronoun [ʔallaði] “that.Sg.M” stands for the object noun phrase, which appears as a gap in the embedded clause. This diverges from default mapping between constituent and function structures as the gap has to be linked to the fronted relative pronoun, and they in turn are mapped to the object function. He did not produce OVS at all even though it involves roughly similar mapping principle as seen in object relative clauses without resumption.

Participant 20 produced 163 sentences, 115 (70.5%) of which had default mapping. Within the default mapping sentences, he produced sentences with overt subject, as in (20a); dropped subject, as in (20b); and verbless sentences, as in (20c). When the verb was ditransitive, NP-PP and NP-NP order of post-verbal arguments showed up, as in (20d-e), with a clear reliance on NP-PP as it was produced 16 times, while NP-NP appeared only once. He also productively



**VOXP**

- h. wa           ʔintahaj-tu           min           maʕhad           ʔalluy-ah           fi  
 and           finish.Past-1P.Sg from           institute           Def-language.Sg-F           in  
 ʔal-fasʕl-i                           al-maðʕi  
 Def-semester.Sg-Gen           Def-past.M  
 ‘I finished the language institute last semester’

**VSO**

- i. saqa                           ar-razul-u                           al-kalb  
 quench.past.M.Sg Def-man.Sg-Nom           Def-dog.Sg.M  
 ‘The man quenched the dog’

**XPVless**

- j. fi baladina           al-ʕilm-u                           ʔaf-ʕarʕi           qalil-un           ʕidan  
 in country-our           Def-science-Nom           Islamic           little-Nom           very  
 ‘In our country, Islamic science is very little’

**XPSVO**

- k. \*li-ʔana-hum                           kufar                           θaqaf-atu-hum                           ja-xtalif  
 because-Comp-they                           non-Muslims                           culture-F-their                           3P.M-differ  
 tamamen                           ʕan dini                           al-ʔislam  
 completely                           from religion                           Def-Islam  
 ‘Because they are non-Muslims, their culture is completely different from Islam’

**XPVO**

- l. ʔiða                           ʕind-i waqt-u                           faray           ʔa-takalm           maʕa ʔusrat-i           ħata baʕðʕ  
 if                           have-I time-Nom                           free           1P.Sg-speak           with family-my even some  
 ʔasʕdiqaʔi                           fi balad-i  
 friend.Pl.M                           in country-my  
 ‘If I have free time, I talk to my family and even some of my friends’

**CLLD**

- m. ʔsʕ-sʕunduq                           ja-ħmilu-hu                           ʔar-razul  
 Def-box.M.Sg                           3P.M.Sg-carrying-it                           Def-man.Sg  
 ‘The box, the man is carrying it’

**ORWR**

- n. \*haðihi           hia           ʔas-saʕ-at-u                           allaði           ta-lbasu-ha           al-marʔa-h  
 this.F.Sg           it.F           Def-watch-F-Nom                           that.M.Sg           3P.F-wear-it           Def-woman.Sg-F  
 ‘This is the watch the woman is wearing’

**Passive**

- o. \*ʔat-tufaħ-ah                           ʔukila                           ʕuzʔ-un                           min-hu  
 Def-apple-F                           eat.Passive.Past.M                           part.M-Nom.Indef                           from-it.M  
 ‘A piece of the apple was eaten’

### Causative

p. ʔamsaka-hu                      wa      ʔanzal-a-hu                      ʔila      ʔal-ʔasfal  
hold.past.M.Sg-him              and      get down.Past.Caus.-M.Sg-him      to      Def-ground  
'He held him and caused him to get down on the ground'

### ORWOR

q. haða      huwa      al-bab-u                      allaði      ja-ftaħu                      ar-razul  
this.M.Sg    it.M.Sg    Def-door.Sg.M-Nom      that.M.Sg    3P.M.Sg-open      Def-man.Sg  
'This is the door the man is opening'

Non-default mapping sentences were produced as well. Participant 20 produced passive and causative constructions. In both, the mapping between argument and function was not default. In the passive in (20o), the agent was suppressed and the patient ([ʔuzʔ-un] “part.M-Nom.Indef”) was mapped to the subject function and assigned the nominative case.

On the other hand, the causative produced in (20p) has complex rather than non-default mapping. The causative form ([nazal] “get down.caus.past.M”) has internalized the external argument realized by ([hu] “him”) and added a new external argument mapped to the subject function, which is dropped here but realized in verbal morphology. This creates a complex argument structure as it has two arguments required by the causative verb and a third by the lexical verb. The agent of the causative verb has been mapped to the subject, while the patient of the causative verb and the agent of the lexical verb have been fused into one object function.

Similar to Participant 19, Participant 20 produced only one instance of a non-default constituent to function structure in the form of the object relative clause in (20q). The fact that it did not have a resumptive pronoun but instead a gap in the constituent structure represents a non-default mapping between constituent and function structure. The topicalized object relative pronoun ([allaði] “that.M.Sg”) is linked to the gap, which in turn is linked to the object function in function structure. Even though this represented evidence of non-default constituent to

function structure, other structures like OVS with a similar mapping principle were not produced.

Participant 21 produced 167 sentences, only 91 (54.4%) of which had default mapping. Within the default mapping structures, he produced sentences with overt subjects as well as with subject dropping, as in (21a) and (21b), respectively. He also produced verbless sentences, as in (21c). With ditransitive verbs, only NP-PP order of post-verbal arguments was produced, as in (21d). Multiple default mapping clauses appeared, as in (21e-f). With regard to XP adjunction, he placed them after default mapping sentences, as in (21g-i), and before such sentences, as in (21k-n). He produced two instances of VSO word order, as in (21j).

## 21. Participant 21

### SVO

- a. haḏihi al-furs<sup>ḥ</sup>-ah qad tantahi qad la taʕudu l-i  
 this.F.Sg Def-opportunity.Sg-F may end may not return to-me  
 ‘This opportunity might end or never return’

### VO

- b. wa na-ʕrab ʕai wa na-ḏhab ila al-bar  
 and 1P.Sg-drink tea and 3P.Sg-go to Def-desert  
 ‘And we drink tea, and we go to the desert’

### Vless

- c. luyat-i al-ʔum hia al-luy-at-u al-ʔinziliziah  
 language-my Def-mother it.F.Sg Def-language-F-Nom Def-English  
 ‘My native language is English’

### SVO(PP)

- d. ar-razul-u ju-ʕti sʕadaqa-h li-kabir-i is-sin  
 Def-man.Sg-Nom 3P.M.Sg-give charity-F to-old-Gen Def-age  
 ‘The man is giving charity to the old man’

### SR

- e. haḏa huwa at<sup>ḥ</sup>-tʕabib-u allaḏi ja-ʕtani  
 this.M.Sg he Def-doctor.Sg.M-Nom who.Sg.M 3P.M.Sg-take care  
 bi al-mariḏ<sup>ḥ</sup>  
 of Def-patient.Sg.M  
 ‘This is the doctor who is taking care of the patient’

**ʔanna**

- f. ʔa-ð<sup>s</sup>unnu ʔanna haða al-muʔalim ju-s<sup>s</sup>aħih  
 1P.Sg.M-think that this.M.Sg Def-teacher.Sg.M 3P.M.Sg-correct  
 awraq at<sup>s</sup>-t<sup>s</sup>ulab  
 paper.Pl Def-student.Pl.M  
 ‘I think this teacher is correcting students’ papers’

**SVOXP**

- g. \*ʔal-walid-ajñ zaʔu min as<sup>s</sup>-s<sup>s</sup>umal qabla  
 Def-parent-Dual.Acc came.Past.3P.Pl.M from Def-Somalia before  
 wilad-at-i bi sit sanaw-at  
 birth-F-my with six year-Pl.F  
 ‘My parents came from Somalia six years before I was born’

**VOXP**

- h. kunt fi zamiʔ-ah fi turintu li-dirasat al-luya-h  
 be.Past.1P.Sg in university.Sg-F in Toronto to-study Def-language-Sg.F  
 al-ʔinʔlizi-ah  
 Def-English-F  
 ‘I was in a university in Toronto to study English’

**VlessXP**

- i. hunaka mafakil fi ad-diras-ah min haðihi an-naħia-h  
 there problem.Pl in Def-school-F from this.F.Sg Def-angle-F  
 ‘There is a problem in school from this angle’

**VSO**

- j. ja-biʔu ʕali as-sajar-ah li-ʕaʔil-ah.....  
 3P.M.Sg-sell Ali Def-car-F.Sg to-family-F.Sg.Indef  
 ‘Ali is selling the car to a family’

**XPVless**

- k. bi-nnisb-at-i li haðihi al-furs<sup>s</sup>-ah furs<sup>s</sup>-ah  
 with-regard-F-Gen me this.F.Sg Def-opportunity-Sg.F opportunity-Sg.F.Indef  
 ðahabi-ah  
 golden-Sg.F  
 ‘Personally, to me, this is a golden opportunity’

**XPVO**

- l. fi ħali al-kuruna tayair lakin ʔa-qum salat  
 in period Def-corona change.Past.M.Sg.3P but 1P.Sg-wake up prayer  
 al-faʔr na-ðhab nu-s<sup>s</sup>ali  
 Def-fajr 1P.Pl-go 1P.Pl-pray  
 ‘In the Corona era it changed, but I wake up for Fajr prayer and we go pray’

**CLLD**

m. al-ħisʿan-u            ja-ðʿribu-hu            atʿ-tʿifl-u  
 Def-horse-Nom    3P.M.Sg-hit-it            Def-child.Sg-Nom  
 ‘The horse, the child is hitting it’

**ORWR**

n. \*haðihi    al-qitʿ-at-a            allati    tu-tʿʿimu-ha            al-marʔ-at-a  
 this.F.Sg    Def-cat-F.Sg-Acc    that.F.Sg    3P.Sg.F-feed-it            Def-woman-F.Sg-Acc  
 ‘This is the cat the woman is feeding’

**Passive**

o. suqia                            ʔal-maʔ  
 quench.Past.Passive.M    Def-water  
 ‘The water was quenched’

**Causative**

p. ʔallasa-hu  
 sit.caus.3P.Sg.M-him  
 ‘He caused him to sit down’ / ‘He sat him down’

**ORWOR**

q. haðihi    hia    al-ħaqib-at-u            allati    ja-ħmilu            atʿ-tʿifl-u  
 this.F.Sg    it.F.Sg    Def-pack.Sg-F-Nom    that.F.Sg    3P.M.Sg-carry    Def-child-Nom  
 ‘This is the backpack the child is carrying’

**OVS**

r. al-waraq-at-a            ja-qraʔu            al-mudir-u  
 Def-paper.Sg-F-Acc    3P.M.Sg-read            Def-manager.Sg-Nom  
 ‘The paper, the manager is reading it’

In addition to default mapping sentences, non-default argument to function structures were produced by this participant as well. Passive and causatives represented non-linear mapping between such structures. In (21o), he used the passive verb ([suqia] “quench.Past.Passive.M”), suppressed the agent, and mapped the patient ([ʔal-maʔ] “Def-water”) to the subject function. On the other hand, the non-linearity in (21p) is a result of a thematic fusion in which two thematic roles, namely the patient of the causative verb and the agent of the lexical verb, have been mapped onto the object function.

In addition to the previous structures shared with everyone in his level, Participant 21 produced object relative clauses without resumption and OVS word order. Although object relative clauses were produced by other learners in this level, namely Participants 19 and 20, they were only produced once by each learner. Participant 21, in contrast, made more productive use of these structures, producing object relative clauses three times and OVS 10 times. In (21q) and (21r), a gap was found in constituent structures that was linked to a displaced core argument: the relative pronoun [allati] “that.F.Sg” in (21q) and [al-waraq-at-a] “Def-paper.Sg-F-Acc” in (21r).

Figure 5.4 represents the types of mapping principles this group of learners used to produce sentences.

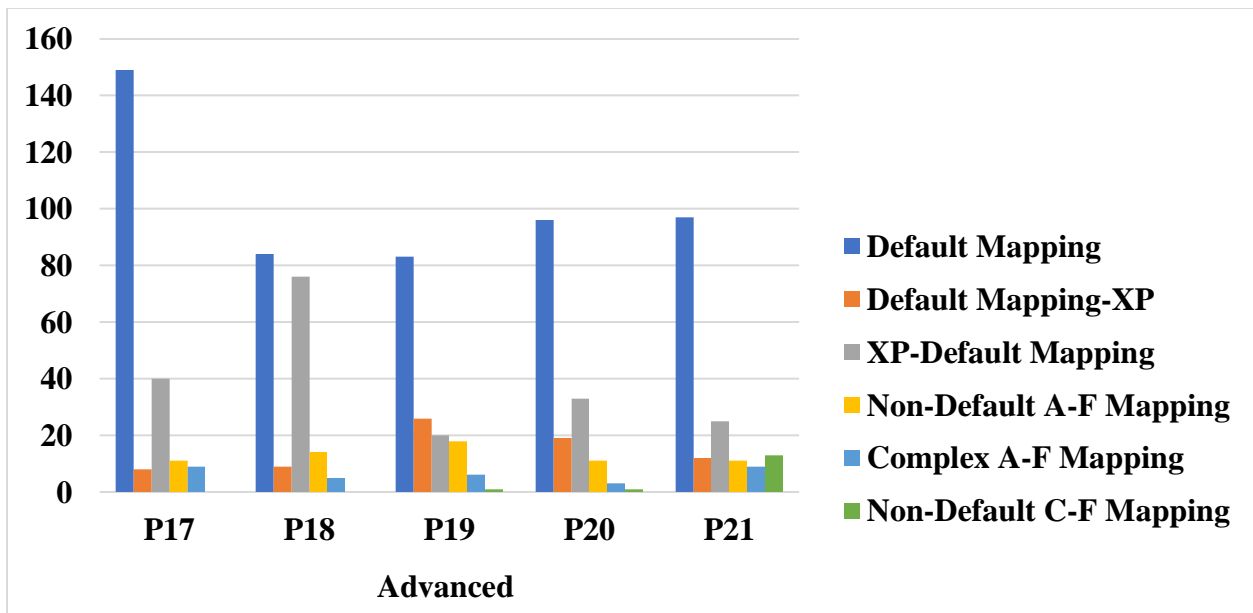


Figure 5.4. Types of mapping principles found in the advanced-level data.

The graph shows diverse ways of mapping in how sentences are built and how the three structures of grammar are mapped onto each other. All participants showed the ability to produce default mapping sentences and to control the position of non-core arguments relative to the sentences produced. In addition, they produced sentences with non-default or complex argument

to function structures. However, only Participants 19, 20, and 21 produced sentences with non-default constituent to function structure mapping, with a quantitative difference for Participant 21.

The emergence criterion was applied to Table 5.13 to judge whether a structure under investigation had emerged in the IL of learners. This yielded the sequence in Table 5.14. The highest stage each participant reached is indicated by the thick line. This yielded the implicational sequence in Table 5.14. The implicational sequence shows that the participants in this group were far beyond the default mapping stage and the placement of XPs at its edges.

Table 5.14

*Advanced-Level Sentential Word Order Implicational Sequence*

Mapping Principles	Participant	P17	P18	P19	P20	P21
	Structure					
Non-default C to F mapping	ORWOR	-	-	/	/	+
	OVS	-	-	-	-	+
Complex A to F mapping	Causative	+	+	+	+	+
Non-default A to F mapping	Passive	+	+	+	+	+
	ORWR	+	+	+	+	+
XP default mapping	CLLD	+	+	+	+	+
	XPSVO	/	+		/	
	XPVO	+	+	+	+	+
	XPVless	/	+	/		+
	VSO	/	+	+	+	+
	VlessXP	/	+	+	+	/
Default mapping + extra arguments	VOXP	+	+	+	+	+
	SVOXP	+		/	+	/
	[?anna]-Em	+	+	+	+	+
Default mapping	SR	+	+	+	+	+
	SVOO	-	/	+	/	/
	SVO(PP)	+	+	+	+	+
	Vless	+	+	+	+	+
	VO	+	+	+	+	+
	SVO	+	+	+	+	+

It also shows they had all achieved the non-default argument to function structure mapping reflected in the passive construction. For Participants 17, 18, 19, and 20, the

implicational sequence shows that the causative construction was the highest structure produced, while for Participant 21, it was the object relative clause without resumption. Therefore, the highest mapping stage for the former participants was the complex argument to function structure mapping, while for Participant 21 it was non-default constituent to function structure mapping.

Table 5.15 presents word order results for all participants of all levels alongside each other, while Table 5.16 applies the emergence criterion to Table 5.15. This could allow for a more comprehensive look at the IL differences between all participants.

Table 5.15

*Sentential Word Order Results*

Mapping Principles	Participant Structure	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Non-default C to F mapping	ORWOR	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	3
	OVS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
Complex A to F mapping	Causative	0	0	0	0	0	0	0	0	0	0	0	0	0	3	4	6	9	5	6	3	9
Non-default A to F mapping	Passive	0	0	0	1	0	0	0	1	0	1	19	22	12	10	25	11	11	14	18	11	11
XP default mapping	ORWR	0	0	0	0	0	0	1	10	13	2	1	9	8	10	8	10	10	10	3	8	7
	CLLD	0	1	0	1	1	0	0	13	11	22	1	0	13	7	5	18	19	21	3	2	4
	XPSVO	0	0	0	0	0	0	3	3	7	10	3	1	3	5	1	0	1	5	0	1	0
	XPVVO	0	0	1	1	4	6	2	9	11	0	28	0	3	15	11	11	9	10	3	16	9
	XPVless	0	0	0	2	2	0	0	1	0	0	1	2	7	1	1	0	1	14	1	0	3
Default mapping + extra arguments	VlessXP	1	0	1	0	0	0	0	1	0	2	3	0	2	4	0	0	1	2	5	2	1
	VOXP	0	10	2	2	4	8	0	12	15	4	23	9	5	17	9	13	2	7	20	15	10
	SVOXP	0	3	3	0	1	4	5	3	24	14	11	4	8	6	1	0	5	0	1	2	1
Default mapping	[?anna]-Em	0	0	9	5	7	3	8	0	15	11	16	5	10	10	10	12	14	7	13	3	12
	SR	0	0	18	15	16	17	15	13	9	5	24	10	10	20	9	10	14	10	15	13	11
	SVOO	2	13	0	6	0	3	0	0	4	3	5	3	0	2	8	15	0	1	5	1	0
	SVO(PP)	7	6	4	6	13	20	13	16	13	9	6	18	18	13	11	5	21	18	13	16	20
	Vless	19	10	48	26	32	23	37	13	18	2	25	16	20	19	20	4	38	14	13	9	14
	VO	15	15	15	45	40	21	15	30	19	7	26	58	18	30	22	12	35	14	13	27	30
SVO	64	26	28	45	9	38	66	19	21	41	17	22	33	22	12	12	27	20	11	27	10	

Table 5.16

*Sentential Word Order Implicational Sequence*

Mapping Principles	Participant Structure	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Non-default C to F mapping	ORWOR	-	-	-	-	-	-	-	-	/	-	-	-	-	-	-	-	-	-	/	/	+
	OVS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
Complex A to F mapping	Causative	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	+	+	+
Non-default A to F mapping	Passive	-	-	-	/	-	-	-	/	-	/	+	+	+	+	+	+	+	+	+	+	+
	ORWR	-	-	-	-	-	-	/	+	+	+	/	+	+	+	+	+	+	+	+	+	+
	CLLD	/	/	-	/	/	-	-	+	+	+	/	-	+	+	+	+	+	+	+	+	+
XP default mapping	XPSVO								+	+	+	+	/	+	+			/	+		/	
	XPVO		/		/	+	+	+	+	+	-	+		+	+	+	+	+	+	+	+	+
	XPVless				+	+						/	+	+	/	/		/	+	/		+
	VSO	+	-	/	+	/	+	-	+	+	+	+	/	/	+	+	+	/	+	+	+	+
Default mapping + extra arguments	VlessXP	/		/					/		+	+		+	+			/	+	+	+	/
	VOXP		+	+	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+
	SVOXP		+	+	/	+	+	+	+	+	+	+	+	+	+	/	+	+		/	+	/
Default mapping	[?anna]-Em SR	-	-	+	+	+	+	+	/	-	+	+	+	+	+	+	+	+	+	+	+	+
	SVOO	+	+	-	+	-	+	-	+	+	+	+	+	-	+	+	+	-	/	+	/	/
	SVO(PP)	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	Vless	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	VO	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	SVO	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

**5.3 Case Morphology Results**

This section presents the case morphology results obtained from the elicited imitation task. The goal of this task was to see how case morphology developed in the IL of L2 learners of MSA, specifically reconstructions of non-TL case morphology. In the following tables, the highest number of reconstructions that can be reach at each position is 12. While the examples below might have TL-case marking, the ones reconstructed by each participant are in bold, and the rest are mere repetitions of what was in the stimulus sentences.

The numbers and letters within brackets in the tables stand for the numbers and types of non-TL case morphemes supplied at these positions. In the following presentation of the results, for every participant, I provide examples for case morphemes reconstructed at every stage given that the number of reconstructions meet the morphological emergence criterion adopted in this

study, which was set at four instances of TL reconstruction. Based on the reconstruction patterns in the results, participants were divided into three groups.

### 5.3.1 Group 1

Group 1 contained seven participants. While they all had TL reconstructions, the number and position of these reconstructions varied greatly between learners. The number of TL reconstructions per participant per position is presented in Table 5.17.

Table 5.17

#### *Group 1 Case Morphology Results*

Processing Procedures	Case Marking Stage	NP Type	P1	P5	P10	P4	P7	P2	P6
Inter-phrasal	Functional	Pre-verbal NPobj	0	1	0 (G1)	0	0	0	0
		Post-verbal NPsubj	0	1	0	4	1	0	4
	Inter-phrasal	[?anna]-subj	0	1	0	2	0	1	1
Phrasal	Phrasal	P-Ncase	0	2	0 (1N)	2	0 (1N)	2	0
Category	Positional	Post-verbal NPobj	1	1	1 (5N)	0 (3N)	2 (3N)	1	5 (5N)
		Pre-verbal NPsubj	2	2	4	3	8	6	12

Participant 1 only reconstructed three case morphemes at two positions belonging to the same stage, namely the position marking stage. Similarly, even though Participant 5 was able to reconstruct eight case morphemes at different stages, he did not reach the four-instance threshold in any of them.

On the other hand, Participant 10 had five TL case morpheme reconstructions at the position marking stage, four of which were supplementing the nominative case marker [-u] on pre-verbal subjects. However, nominative case was also supplied six times in several non-TL contexts, amounting to 150% of all of his TL reconstructions.

The same pattern appeared in the data for Participants 4 and 7. Participant 4 had 11 TL reconstructions: three at the position marking stage marking a pre-verbal subject, two at the phrasal case marking stage, two at the inter-phrasal case marking stage marking [?anna] (Subj), and four at the functional case marking stage marking a post-verbal subject. This use of

nominative case in non-TL contexts represented 42.8% of total TL reconstructions. Participant 7 likewise had 11 TL reconstructions, 10 of which were at the position marking stage. Of these 10, eight were reconstructions of pre-verbal subjects and two were reconstructions of post-verbal objects. Similar to Participant 4, Participant 7's use of nominative case in non-TL contexts represented 44.4% of total TL reconstructions.

The number of nominative case reconstructions in TL contexts suggested that case had emerged in the IL of Participants 10, 4, and 7. However, a closer look at how often they supplied the nominative case in non-TL contexts out of total TL use suggested otherwise. This indicated the nominative case morpheme was not a result of rule application or morpheme-context association but rather overgeneralizing the default case. As a result, no participants had enough reconstructions that were a result of rule application at any position.

Participant 2, on the other hand, had 10 TL reconstructions. Seven appeared at the position marking stage, two at the phrasal marking stage, and one in inter-phrasal case marking. Within the position marking stage, six reconstructions were on a pre-verbal subject, as in (22a), and one on a post-verbal object in (22b). He did not have any cases of morpheme suppliance in non-TL contexts.

22. a. \* al-mudir-at-**u**                      ju-karimu                      al-muwaḏʕaf-ina  
           Def-manager.Sg-F-**Nom**            3P-honor                      Def-employee-Pl.Acc  
           ‘The manager is honoring the employees’
- b. al-ʔum-u                      ta-ḏʕaʕu                      atʕ-tʕaʕam-**a**    ʕala                      atʕ-tʕawil-at-i  
           Def-mother-Nom            3P.F.Sg-put                      Def-food-**Acc** on                      Def-table-F-Gen  
           ‘The mother is putting the food on the table’

Participant 6 had 22 TL reconstructions. Of these, 17 were at the position marking stage and four at the functional case marking stage. Within the position marking stage, 12 were on pre-

verbal subjects and five on post-verbal objects, as in (23a) and (23b), respectively. Within the functional case marking, four reconstructions were on a post-verbal subject, as in (23c).

23. a. al-muhandis-**u**                      ja-taʔakadu                      min      al-zisr  
 Def-engineer.Sg-**Nom**                      3P.Sg.M-make sure      of      Def-bridge.Sg  
 ‘The engineer is checking of the bridge’
- b. ʔat<sup>f</sup>-t<sup>f</sup>alib-u                      an-naʒib-u                      ja-qraʔu                      haða      alkitab-**a**  
 Def-student.M-Nom      Def-smart-M.Nom                      3P.M.Sg-read      this      Def-book-**Acc**  
 kula      jawmin  
 every      day-Gen  
 ‘The smart student reads this book everyday’
- c. as-sabur-at-u                      ja-msaħu                      at<sup>f</sup>-t<sup>f</sup>alib-**u**                      qabla      adars  
 Def-blackboard-F-Nom      3P.Sg.M-clean      Def-student.M-**Nom**      before      Def-class  
 ‘The blackboard, the student is cleaning it before class’

The emergence criterion for morphology was applied to the numbers in Table 5.17 to judge whether a case marking stage under investigation had emerged in the IL of learners. This yielded the implicational sequence in Table 5.18.

Table 5.18

*Group 1 Case Morphology Implicational Sequence*

Processing Procedures	Case Marking Stage	NP Type	P1	P5	P10	P4	P7	P2	P6
Inter-phrasal	Functional	Pre-verbal NPobj	-	-	-	-	-	-	-
		Post-verbal NPsubj	-	-	-	-	-	-	+
	Inter-phrasal	[ʔanna]-subj	-	-	-	-	-	-	-
Phrasal	Phrasal	P-Ncase	-	-	-	-	-	-	-
Category	Positional	Post-verbal NPobj	-	-	-	-	-	-	+
		Pre-verbal NPsubj	-	-	-	/	-	+	+

Even though participants 10, 4, and 7 had reached the four tokens of target-like reconstructions of nominative case morphemes at different positions, a closer look at their data revealed that such cases were part of an overgeneralization of the nominative in their IL that equaled or exceeded 40% of nominative TL reconstructions.

As indicated by the thick line, only Participants 2 and 6 had achieved the positional case marking as they reconstructed enough tokens to meet the emergence criterion. In terms of each structure individually, while Participant 2 reconstructed the nominative case six times on pre-verbal NPsubj, he did not have enough reconstructions on the post-verbal NPobj. This pattern of development is represented in Table 5.18 by the jagged line. Participant 6 had enough reconstructions on pre-verbal NPsubj and post-verbal NPobj to meet the emergence criterion for both positions. He also produced five instances of nominative case in non-TL contexts, but that number was less than the 40% threshold of nominative TL-suppliance.

Thus, the highest case marking stage achieved within this group was the position marking stage attained by Participants 2 and 6, where case morphemes were used as markers of NP positions. However, Participant 6 reconstructed four cases in which a post-verbal NPsubj was assigned a nominative case, even though he did not produce enough reconstructions at the lower phrasal case marking stage. A closer look in the discussion reveals this was nominative across the board, an IL pattern employed by L2 learners in OVS when functional case marking had not yet developed.

### 5.3.2 Group 2

Group 2 consisted of eight participants. Table 5.19 shows the number of reconstructions per position for each participant.

Table 5.19

#### *Group 2 Case Morphology Results*

Processing Procedures	Case Marking Stage	NP Type	P3	P12	P13	P11	P14	P16	P17	P19
Inter-phrasal	Functional	Pre-verbal NPobj	0	0	0	0	1	0	0	0
		Post-verbal NPsubj	0	0	2	2	1	0	0	0
	Inter-phrasal	[?anna]-subj	0	3	3	4	11	12	12	11
Phrasal	Phrasal	P-Ncase	6	6	7	5	7	4	10	6
Category	Positional	Post-verbal NPobj	10 (1N)	3 (1N)	6 (1N)	6 (1N)	8	12	11	5
		Pre-verbal NPsubj	11	10	12	7	8	10	12	9

Interestingly, the number of reconstructions in which a case morpheme was supplied in non-TL contexts almost disappeared. Only Participants 3, 12, 13, and 11 produced one instance each of nominative case on a post-verbal NPobj.

With regard to reconstruction patterns, Participants 3, 12, and 13 all reconstructed case morphemes at two stages, namely the positional and phrasal marking stages. Participant 3 had 27 TL reconstructions within the positional and phrasal case marking stage. Within position case marking, 11 instances were on the pre-verbal NPsubj as in (24a) and 10 instances were on a post-verbal NPobj as in (24b), while six instances were within the phrasal case marking stage, as in (24c).

24. a. al-ʔum-**u**                      ta-ð<sup>s</sup>aʃu                      at<sup>s</sup>-aʃam-a                      li-l-ʔat<sup>s</sup>fal-i                      ʃala  
 Def-mother-**Nom**    3P.F.Sg-put                      Def-food-Acc    to-Def-child.Pl-Gen    on  
 at<sup>s</sup>-awil-ah  
 Def-table.Sg-F  
 ‘The mother is putting food on the table for the children’
- b. kitab-u                      t-tarix-i                      ja-rwi                      al-qis<sup>s</sup>at-**a**  
 book.Sg-Nom    Def-history-Gen                      3P.Sg.M-tells    Def-story.Sg-**Acc**  
 ‘The history book tells the story’
- c. al-walad-u                      ja-qraʔu                      al-kitab-a                      fi                      al-maktab-at-**i**  
 Def-boy.Sg-Nom                      3P.Sg.M-read    Def-book-Acc    in                      Def-library-F-**Gen**  
 as<sup>s</sup>-ayira-h  
 Def-small-F  
 ‘The boy is reading the book in the small library’

Participant 12 had 22 TL reconstructions: 10 on a pre-verbal NPsubj, as in (25a); three on a post-verbal NPobj, as in (25b); and six in phrasal case marking, as in (25c). TL reconstructions appeared at higher stages, but the number of reconstructions was less than four.

25. a. \*al-muʃalim-at-**u**                      n-naʃit<sup>s</sup>-at-u                      faza-t                      al-ʒaʔiza-t-a  
 Def-teacher-F-**Nom**    Def-active-F-Nom                      win.Past.3P.Sg.F    Def-prize-F-Acc  
 ‘The active teacher won the prize’

- b. ?at<sup>ʕ</sup>-tʕifl-u                      n-naʒiħu                      ja-msaħu                      as-saburra-t-**a**  
 Def-child.Sg.M-Nom Def-successful.Sg.M 3P.M.Sg-erase Def-board-F-**Acc**  
 al-bajð<sup>ʕ</sup>aʔ-a                      qabla ad-dars-i  
 Def-white-Acc                      before Def-lesson-Gen  
 ‘The successful child is erasing the whiteboard before class’
- c. \*kitab-u                      t-tarix-**i**                      ja-rwi                      qis<sup>ʕ</sup>at-u-ha  
 book.Sg-Nom                      Def-history-Gen                      3P.Sg.M-tells story.Sg-Nom-her  
 ‘The history book tells her story’

Participant 13 showed a similar pattern in that his reconstructions were at the positional case marking stage as well as the phrasal case marking stage. Out of his 30 TL reconstructions, 12 were on a pre-verbal NPsubj, as in (26a); six on a post-verbal NPobj, as in (26b); and seven at the phrasal case marking stage, as in (26c). In addition, he had several TL reconstructions on different structures at the inter-phrasal and functional case marking stages, but none of them exceeded four cases.

26. a. \*ar-razul-**u**                      musin-u-n                      ja-ðhabu                      ?ila  
 Def-man.Sg-**Nom**                      old-Nom.Indef                      3P.Sg.M-go to  
 al-masʒid-i                      al-kabir  
 Def-mosque.M.Sg-Gen                      Def-big.M.Sg  
 ‘The old man is going to the big mosque’
- b. ?ustað-u                      t-tawħid                      ju-lqi                      ad-durus-**a**  
 teacher.Sg.M-Nom                      Def-monotheism                      3P.Sg.M-present Def-lesson.Pl-**Acc**  
 ʕala tʕulab-i-h  
 on student.Pl.M-Gen-his  
 ‘The monotheism teacher presents the lessons to his students’
- c. al-walad-u                      ja-qraʔu                      al-kitab-a                      fi-l-maktab-at-**i**  
 Def-son.Sg-Nom                      3P.Sg.M-read Def-book.Sg-Acc                      at-Def-library-F-**Gen**  
 as<sup>ʕ</sup>-s<sup>ʕ</sup>ayira-h  
 Def-small-F  
 ‘The son is reading the book in the small library’

The rest of the participants in this level (Participants 11, 14, 16, 19, and 9) were distinguished by having TL reconstructions at the positional and phrasal marking stages as well as at the inter-phrasal case marking stage on [ʔanna]-subj.

Participant 11 had 24 TL reconstructions: 13 at the positional marking stage, as in (27a-b); five at the phrasal marking stage, as in (27c); and four at the inter-phrasal case marking stage as in (27d). The remaining two were at the functional case marking stage.

27. a.  $\text{ʔal-ʕamil-u}$                        $\text{ja-fuzu}$                        $\text{bi-lʒaʔiz-at-i}$                        $\text{bʔada}$   
 Def-worker.Sg.M-**Nom**                      3P.Sg.M-win                      Prep-Prize-F-Gen                      after  
 $\text{munafas-at-i-n}$                        $\text{ʕadid-at-i-n}$   
 competition-F-Gen-Indef                      strong-F-Gen-Indef  
 ‘The worker is wining the prize after a strong competition’
- b.  $*\text{al-marʔ-at-u}$                        $\text{ju-laqi}$                        $\text{l-qisʕat-a}$                        $\text{li-l-ʔatʕfala}$   
 Def-woman-F-Nom                      3P.Sg.M-read                      Def-story.Sg-**Acc**                      to-Def-child.Pl-Acc  
 $\text{qabla}$                        $\text{an-nawm}$   
 before                      Def-sleep  
 ‘The woman reads the story to the children before they go to sleep’
- c.  $\text{ʔa-talib}$                        $\text{ja-qraʔu}$                        $\text{al-kitab-a}$                        $\text{fi maktab-at-i-n}$   
 Def-student.M.Sg                      3P.Sg.M-read                      Def-book-Acc in                      library-F-**Gen**  
 $\text{sʕayir-at-i-n}$   
 small-F-Gen-Indef  
 ‘The student is reading the book in a small library’
- d.  $*\text{ʔa-ʕtaqidu}$                        $\text{ʔanna as-saʔiq-a}$                        $\text{ju-hibu}$                        $\text{ʕamal-u-hu}$                        $\text{ʒidan}$   
 1P.Sg-think                      Comp Def-driver.Sg.M-**Acc**                      3P.M.Sg-like                      job-Nom-his                      very  
 ‘I think the driver likes his job a lot’

Similarly, Participant 14 had 36 TL reconstructions. Of these, 16 were at the positional marking stage, as in (28a) marking a pre-verbal NPsubj and as in (28b) marking a post-verbal NPobj. At the phrasal case marking stage, he had seven reconstructions, as in (28c). Another 11 were on [ʔanna]-subj at the inter-phrasal case marking, as in (28d). The remaining two appeared at the functional case marking stage, but this number did not meet the emergence criterion.

28. a.  $\text{al-marʔ-at-u}$                        $\text{tu-naðʕðʕifu}$                        $\text{l-yurf-at-a}$   
 Def-woman.Sg-F-**Nom**                      3P.Sg.F-clean                      Def-room.Sg-F-Acc  
 $\text{al-mutasix-at-a}$                        $\text{ʒidan}$   
 Def-dirty-F-Acc                      very  
 ‘The woman is cleaning the very dirty room’

- b. sʿaʔq-u            s-sajar-at-i            ʔaʕtʕa            al-miftaħ-a  
 driver-Nom    Def-car.Sg-F-Gen    give.Past.3P.Sg.M    Def-key.Sg-Acc  
 li-s-saʔiq-i            al-ʔadid  
 to-Def-driver.M.Sg-Gen    Def-new.M  
 ‘The driver of the car gave the key to the new driver’
- c. al-ʕamil            ja-fuzu            bi-l-ʔaʔiz-at-i            bʔada  
 Def-worker.M.Sg    3P.Sg.M-win    Prep-Def-prize.Sg-F-Gen    after  
 munafas-at-i-n            ʕadid-at-i-n  
 coopetition-F-Gen    strong-F-Gen  
 ‘The worker is wining the prize after a strong competition’
- d. ʔa-ðʕunnu            ʔanna ʔal-marʔ-at-a            tu-ðakiru            darsan            fi  
 1P.Sg-think    Comp Def-woman-F-Acc    3P.Sg.F-study    lesson.Sg.M    in  
 kuli    jawm-in  
 every    day.Sg.M-Gen.Indef  
 ‘I think the woman studies one lesson every day’

Participant 16 had 38 TL reconstructions: 22 at the positional case marking stage, as in (29a-b); four at the phrasal case marking stage, as in (29c); and 12 on [ʔanna]-subj at the inter-phrasal case marking stage, as in (29d).

29. a. al-muhandis-u            al-bariʕ            ja-taʔakadu            min  
 Def-engineer.Sg-Nom    Def-excellent.M.Sg    3P.M.Sg-make sure    of  
 al-bunjan-i            al-ʔadid  
 Def-building.Sg.M-Gen    Def-new.Sg.M  
 ‘The excellent engineer is checking the new building’
- b. ʕamil-u            al-ħadiq-at-i            ja-sqi            az-zahr-at-a            maʔan  
 worker.Sg.M-Nom    Def-park.Sg-F-Gen    3P.M.Sg-water    Def-flower-F-Acc    water  
 ‘The park worker waters the flower’
- c. tʕalib-u            l-ʔamiʕ-at-i            ja-tasalamu  
 student.Sg.M-Nom    Def-university.Sg-F-Gen    3P.M.Sg-receive  
 al-ʔaʔiz-at-a            min    al-mudir  
 Def-prize-F-Acc    from    Def-manager.M.Sg  
 ‘The university student receives the prize from the manager’
- d. ʔa-ʕtaqidu            ʔanna al-ʔad-at-a            tu-ʕidu            atʕ-tʕaʕam-a  
 1P.Sg-think    Comp Def-grandmother-F-Acc    3P.F.Sg-prepare    Def-food-Acc  
 ‘I think the grandmother is preparing the food’

Participant 17 had 45 TL reconstructions. They were distributed almost equally across three case marking stages. He had 23 at the position marking stage, 12 of them marking pre-verbal NPsubj as in (30a) and 11 marking a post-verbal NPobj as in (30b). He had 10 at the phrasal case marking stage, as in (30c), and another 12 at the inter-phrasal case marking stage marking [ʔanna]-subj, as in (30d).

30. a. at<sup>ʕ</sup>-tʕifl-at-**u**                      s<sup>ʕ</sup>-s<sup>ʕ</sup>ayir-at-**u**                      ta-laʕabu                      bi-ʔalʕab-i-ha  
 Def-child-F-**Nom**                      Def-young-F-Nom                      3P.Sg.F-play                      with-toy.Pl-Gen-her  
 maʕa    walid-at-i-ha  
 with    mother-F-Gen-her  
 ‘The young daughter plays with her toys with her mother’
- b. tʕalib-u                      l-zamiʕ-at-i                      ja-tasalamu                      al-zaʔizat-**a**  
 student.Sg.M-Nom                      Def-university.Sg-F-Gen                      3P.M.Sg-receive                      Def-prize-F-**Acc**  
 min    al-mudir-i  
 from    Def-manager.M.Sg-Gen  
 ‘The university student receives the prize from the manager’
- c. al-mudir-at-u                      tu-karimu                      muwaðʕafi-ha                      xilala                      ʕaflat-**i**  
 Def-manager-F-Nom                      3P.Sg.F-honer employee.Pl-her                      during                      ceremony.Sg-**Gen**  
 t-takrim  
 Def-honor ceremony  
 ‘The manager honors her employee during the award ceremony’
- d. \*ʔa-ʕtaqidu                      ʔanna as-saʔiq-**a**                      ju-ħibu                      ʕamal-u-hu                      kaθiran  
 1P.Sg-think                      comp                      Def-driver-**Acc**                      3P.Sg.M-like                      job-Nom-his                      a lot  
 ‘I think the driver likes his job a lot’

Finally, participant 19 had 31 TL reconstructions: 14 at the positional case marking stage, as in (31a) marking a pre-verbal NPsubj and as in (31b) marking a post-verbal NPobj; six at the phrasal marking stage, as in (31c); and 11 at the inter-phrasal marking stage, as in (31d).

31. a. al-marʔ-at-**u**                      al-zajd-at-**u**                      tu-naðʕifu                      al-yurfah  
 Def-woman.Sg-F-**Nom**                      Def-good-F-Nom                      3P.F.Sg-clean                      Def-room.Sg  
 al-mutasix-at-a                      zidan  
 Def-dirty-F-**Acc**                      very  
 ‘The good woman is cleaning the very dirty room’

- b.\* kalb-u                      al-maʃi-at-u                      tu-raʃi                      al-xaruf-a  
 dog.Sg.M-Nom                      Def-sheep-F-Nom                      3P.F.Sg-herd                      Def-sheep.Sg-**Acc**  
 fi                      al-ḥaql  
 at                      Def-field.Sg.M  
 ‘The sheep dog is herding the sheep in the field’
- c. al-walad-u                      ja-qraʔu                      al-kitab-a                      fi                      l-maktab-at-i  
 Def-son.Sg-Nom                      3P.Sg.M-read                      Def-book-Acc at                      Def-library-F-**Gen**  
 as<sup>s</sup>-s<sup>s</sup>ayir-at-i  
 Def-small-F-Gen  
 ‘The son is reading the book in the small library’
- d. ja-bdu                      ʔanna an-nahr-a                      sa-ja-ntahi                      qabla  
 3P.Sg.M-appear                      comp                      Def-river-**Acc**                      Fut-3P.Sg.M-finish                      before  
 ʔal-matʕar  
 Def-rain.M.Sg  
 ‘It appears the river will dry up before it rains’

Applying the emergence criterion to the numbers in Table 5.19 resulted in the implicational sequence in Table 5.20.

Table 5.20

*Group 2 Case Morphology Implicational Sequence*

Processing Procedures	Case Marking Stage	NP Type	P3	P12	P13	P11	P14	P16	P17	P19
Inter-phrasal	Functional	Pre-verbal NPobj	-	-	-	-	-	-	-	-
		Post-verbal NPsubj	-	-	-	-	-	-	-	-
	Inter-phrasal	[ʔanna]-subj	-	/	/	+	+	+	+	+
Phrasal	Phrasal	P-Ncase	+	+	+	+	+	+	+	+
Category	Positional	Post-verbal NPobj	+	/	+	+	+	+	+	+
		Pre-verbal NPsubj	+	+	+	+	+	+	+	+

As the thick line indicates, Participants 3, 12, and 13 had reached the phrasal case marking stage in which a genitive case is assigned to the inner NP of a construct state or an NP of a prepositional phrase. This entails active phrasal information exchange in their IL. Nominative and accusative on the other hand remained markers of positions in that a nominative case marked a pre-verbal NPsubj while the accusative marked a post-verbal NPobj rather than being associated with grammatical functions. Participants 12 and 13 had some TL

reconstructions on [ʔanna]-subj and on a post-verbal subject, respectively, but neither met the four-case threshold.

The rest of this group (Participants 11, 14, 16, 17, and 19) had reached the inter-phrasal information exchange. This was indicated by their ability to consistently assign the accusative case on [ʔanna]-subj as a result of information exchange across phrases, e.g., when the case assigner and NP are not in the same phrase.

Even though case assignment at the upper two case marking stages—the inter-phrasal and the functional—is argued to be a result of active inter-phrasal information exchange, the data showed a delay in the emergence of the functional case marking stage. This is represented by the jagged line. Although Participant 11, 14, 16, 17, and 19 assigned the accusative case to [ʔanna]-subj, they did not have any reconstructions on pre-verbal NPobj or post-verbal NPsubj. The exception to this was Participant 14, who had two cases at both positions but did not meet the emergence criterion. Therefore, the highest stage achieved by these learners was the inter-phrasal case marking stage.

### 5.3.3 Group 3

The third group had five learners. Table 5.21 shows the number of reconstructions per participant per position.

Table 5.21

#### *Group 3 Case Morphology Results*

Processing Procedures	Case Marking Stage	NP Type	P9	P8	P15	P18	P21
Inter-phrasal	Functional	Pre-verbal NPobj	0	0	0	0 (1N)	8
		Post-verbal NPsubj	4	7	4	12	4
	Inter-phrasal	[ʔanna]-subj	12	3	10	11 (1N)	9
Phrasal	Phrasal	P-Ncase	7	4	8	8 (1N)	6 (1N)
Category	Positional	Post-verbal NPobj	3 (2N)	3 (2N)	10 (1N) (1G)	8 (N3)	10 (1N)
		Pre-verbal NPsubj	12	8	10	12	7

All the participants in this group produced TL reconstructions at all stages. However, they varied with regard to what NP type they reconstructed at the functional case marking stage. While all showed TL reconstructions on post-verbal NPsubj, only Participant 21 had TL reconstructions on both pre-verbal NPobj and post-verbal NPsubj. Therefore, Table 5.21 shows two distinctive patterns of reconstructions within this group.

The first pattern is reflected in the columns for Participants 9, 8, 15, and 18. While they had TL reconstructions at the functional case marking stage, these only appeared on post-verbal NPsubj and never on pre-verbal NPobj. The second pattern is reflected in Participant 21's data as he was the only one to have TL reconstructions on pre-verbal NPobj several times. The following paragraphs go over them one by one with examples from their data.

Participant 9 had 38 TL reconstructions. Fifteen were at the positional case marking stage, of which 12 appeared on a pre-verbal NPsubj as in (32a) and only three on a post-verbal NPobj as in (32b). At the phrasal case marking stage, he had seven reconstructions, as in (32c), while the inter-phrasal case marking stage had 12 marking [ʔanna]-subj, as in (32d). At the functional case marking stage, he had four reconstructions that appeared on a post-verbal NPsubj, as in (32e).

32. a    al-ʒad-**u**                                    ja-ðhabu            ila ʔal-masʒid            li-ʔadaʔi  
           Def-grandfather-**Nom**                    3P.Sg.M-go        to Def-mosque.Sg.M to-perform  
           əsʕ-sʕal-ah  
           Def-prayer.Sg-F  
           ‘The grandfather goes to the mosque to pray’
- b.    sʕaħib-u                    s-sajar-at-i            ʔaʕtʕa                    əlmiftaħ-**a**  
           owner.Sg-Nom    Def-car.Sg-F-Gen    give.Past.3P.Sg.M    Def-key.Sg.M-**Acc**  
           li-l-malik-i                    al-ʒadid  
           to-Def-owner.M-Gen    Def-new.M  
           ‘The owner of the car gave the key to the new owner’

- c. ?af-ʃajx-u          ju-lqi                  ad-dars-a                  fi-bait-**i**-hi  
 Def-sheik-Nom 3P.M.Sg-present    Def-lesson.Sg-Acc    at-house-**Gen**-his  
 baʔda                  aðˤ-ðˤuhr  
 after                  Def-noon  
 ‘The sheik is presenting the lesson at his home in the afternoon’
- d. ?a-ðˤunnu          ?anna al-ħakam-**a**                  ?anha                  al-mubara-at  
 1P.Sg-think    Comp Def-referee.M.Sg-**Acc**    end.Past.M.Sg    Def-match.Sg-F  
 bajna                  al-fariq-ajñ  
 between                  Def-team.M-Dual.Gen  
 ‘I think the referee ended the game between the two teams’
- e.\* al-qalam-u                  ju-ʃtˤi                  atˤ-tˤalib-**u**                  li-zamil-i-h  
 Def-pen.Sg.M-Nom    3P.Sg.M-give    Def-student.Sg.M-**Nom**    to-mate-Gen-his  
 fi                  asˤ-sˤaf  
 in                  Def-class.Sg.M  
 ‘The pen, the student is giving it to his classmate’

Similarly, Participant 8 had 25 TL reconstructions at all positions. Of these, 11 were at the positional case marking stage as in (33a) marking a pre-verbal NPsubj and as in (33b) marking a post-verbal NPobj. At the phrasal case marking stage, he had four, as in (33c). While he only had three reconstructions at the inter-phrasal case marking stage, as in (33d), he reconstructed post-verbal NPsubj seven times, as in (33e).

33. a. \*al-mudaris-**u**                  al-fiqh                  ja-ʃraħu  
 Def-teacher.Sg.M-**Nom**    Def-jurisprudence    3P.Sg.M-explain  
 li-tˤ-tˤulab                  ?ad-dars  
 to-Def-student.M.PI    Def-lesson.Sg.M  
 ‘The jurisprudence teacher is explaining the lesson to his student’
- b. muʃalim-u                  ar-riaðˤiat                  ja-ʃraħu                  adars-**a**  
 teacher.Sg.M-Nom    Def-math                  3P.Sg.M-explain    Def-lesson.Sg-**Acc**  
 li-tˤulab-i-h  
 to-student.PI-Gen-his  
 ‘The math teacher is explaining the lesson to his students’
- c. aʃ-ʃajx-u                  ju-lqi                  ad-dars                  fi-manzil-**i**-hi  
 Def-sheik-Nom                  3P.M.Sg-present                  Def-lesson.Sg    at-house.Sg-**Gen**-his  
 baʔda    aðˤ-ðˤuhr  
 after    Def-noon  
 ‘The sheik presents the lesson at his house in the afternoon’

- d. ?a-?taqidu      ?anna al-kurr-at-**a**      xara?at      xari?a al-mal?ab  
 1P.Sg.M-think Comp Def-ball-F-**Acc** leave.Past-3P.Sg.F out Def-field.Sg  
 ‘I think the ball left the field’
- e.\* as-sabur-at-u      ja-msa?u      at<sup>f</sup>-t<sup>f</sup>alib-**u** qabla      bidai-at-u  
 Def-board-F-Nom      3P.Sg.M-erase Def-student.M.Sg-**Nom** beginning-F-Nom  
 ad-dars  
 Def-lesson.Sg  
 ‘The whiteboard, the student is erasing it before the beginning of the class’

Participant 15 had 42 TL reconstructions at all stages. At the positional case marking stage, he had 10 on pre-verbal NPsubj as in (34a) and 10 on post-verbal NPobj as in (34b). At the phrasal case marking stage, he had eight, as in (34c), and 10 at the inter-phrasal case marking stage, as in (34d) marking [?anna]-subj. He also had four reconstructions at the functional case marking stage marking a post-verbal NPsubj, as in (34e).

34. a.\* ?ar-ra?is-at-**u**      ja-xu?u      al-?intixab-at-i      fi  
 Def-president.Sg-F-Nom      3P.Sg.M-running      Def-election-F-Gen      at  
 nihaj-at-i      ?-fahr-i  
 end-F-Gen      Def-month-Gen  
 ‘The president will run in the election at the end of the month’
- b. ?al-mudir-u      ja-mna?u      l-za?iz-at-**a**      li-l-muwa?af-i  
 Def-manager-Nom      3P.Sg.M-award      Def-prize-F-**Acc** to-Def-employee.Sg-Gen  
 al-mu?tahid  
 Def-diligent  
 ‘The manager awards the prize to the diligent employee’
- c. ?al-?um-u      ta-?a?u      at<sup>f</sup>-t<sup>f</sup>a?am-a      li-?at<sup>f</sup>fal-i-ha      ?ala  
 Def-mother.Sg-Nom      3P.Sg.F-put      Def-food-Acc to-child.Pl-Gen-her      on  
 at<sup>f</sup>-t<sup>f</sup>awil-at-**i**  
 Def-table.Sg-F-**Gen**  
 ‘The mother puts food on the table for her children’
- d. ja-bdu      ?anna an-na?ar-**a**      s<sup>f</sup>an?a      al-bab-a  
 3P.Sg.M-appear      Comp Def-carpenter make.Past.3P.M.Sg      Def-door-Acc  
 al-?amil-a  
 Def-beautiful-Acc  
 ‘It appears the carpenter made the beautiful door’

- e. ?al-kaʔs-u                      ju-msiku              at<sup>ʕ</sup>-tʕifl-**u**                      li-ja-ʃraba  
 Def-cup.Sg-Nom              3P.Sg.M-hold Def-child.Sg.M-**Nom** to-3P.Sg.M-drink  
 al-maʔ-a  
 Def-water-Acc  
 ‘The cup, the child is holding it to drink the water’

Similarly, participant 18 had 51 TL reconstructions. Of those, 20 were at the positional case marking stage, as in (35a) marking a pre-verbal NPsubj and as in (35b) marking a post-verbal NPobj. Eight were at the phrasal case marking stage, as in (35c); 11 were at the inter-phrasal case marking stage, as in (35d) marking [ʔanna]-subj; and 12 were at the functional case marking stage, as in (35e) marking a post-verbal NPsubj.

35. a. ?al-muʕalim-**u**                      ja-ʃraħu                      dars-a                      al-fiqh  
 Def-teacher.Sg.M-**Nom**              3P.Sg.M-explain lesson-Acc Def- jurisprudence  
 li-t<sup>ʕ</sup>-t<sup>ʕ</sup>ulab  
 to-Def-student.Pl.M  
 ‘The teacher is explaining the jurisprudence lesson to the student’
- b. ʕamil-u                      al-ħadiq-at-i                      ja-sqi                      az-ahr-at-**a**  
 worker.M.Sg-Nom              Def-park-F-Gen                      3P.Sg.M-water Def-flower-F-**Acc**  
 maʔan  
 water.Indef  
 ‘The park worker waters the flower’
- c.\* ?al-mudir-u                      ju-karimu                      al-muwað<sup>ʕ</sup>af-ina  
 Def-manager.Sg.M-Nom              3P.M.Sg-honor                      Def-employee-Pl.Acc  
 ʕinda                      ħafl-**i**                      as-sana-h  
 at                      ceremony-**Gen**                      Def-year-F  
 ‘The manager honors the employees at the yearly ceremony’
- d. jabdu                      ?anna al-laʕib-**a**                      ju-ʕani                      min  
 3P.Sg.M-appear              Comp Def-player.Sg.M-**Acc** 3P.Sg.M-suffer                      from  
 al-ʔs<sup>ʕ</sup>aba-h  
 Def-injury.Sg-F  
 ‘It appears the player is suffering from an injury’
- e.\* ?al-bab-u                      ta-ftaħu                      al-marʔ-at-**u**                      li-ta-dxula  
 Def-door.Sg-Nom              3P.Sg.F-open Def-woman-F-**Nom** to-3P.Sg.F-enter  
 ‘The door, the woman is opening it to enter’

Finally, Participant 21, who had TL reconstructions on all NP types at all stages, had 44 TL reconstructions. Of these, 17 were at the positional case marking stage, as in (36a) marking a pre-verbal NPsubj and as in (36b) marking a post-verbal NPobj. He had six at the phrasal case marking stage, as in (36c); nine at the inter-phrasal case marking stage, as in (36d) marking [ʔanna]-subj; and 12 at the functional case marking stage marking both a pre-verbal NPobj and a post-verbal NPsubj, as in (36e).

36. a. ʔal-muʕalim-at-**u**    al-mutamajza-ah    fazat    biʒaʔiz-ah sanawj-ah  
 Def-teacher-F-Nom Def-distinguished.Sg-F win.Past.F.Sg Prize.Sg-F yearly-F  
 ‘The distinguished teacher won the yearly prize’
- b. ʔat<sup>ʕ</sup>-t<sup>ʕ</sup>alib-u    an-nazib-u    ja-msaħu    as-sabur-at-**a**  
 Def-student.F.Sg-Nom Def-smart.F.Sg-Nom 3P.Sg.M-erase Def-board-F-**Acc**  
 qabla ad-dars  
 before Def-class  
 ‘The smart student is erasing the whiteboard before class’
- c. kitab-u    at-tarix-**i**    ja-rwi    al-qis<sup>ʕ</sup>-at-a  
 book.Sg.M-Nom Def-history-**Gen** 3P.Sg.M-narrate Def-story.Sg-F-**Acc**  
 bi-kamil-i    tafas‘il-i-ha  
 with-complete-Gen detail.Pl-Gen-its  
 ‘The history book narrates every detail of the story’
- d. ʔa-ð<sup>ʕ</sup>unnu    ʔanna    al-ħakam-**a**    ʔanha  
 1P.M.Sg-think Comp Def-referee.Sg.M-**Acc** end.Past.3P.Sg.M  
 al-mubar-at-a    li-kila    al-fariq-ajñ  
 Def-match-F-**Acc** for-both Def-team-Dual.Gen  
 ‘I think the referee ended the game for both teams’
- e. ʔal-kaʔs-**a**    ju-msiku    at<sup>ʕ</sup>-t<sup>ʕ</sup>ifl-**u**    li-ja-ʒraba  
 Def-cup.Sg.M-**Acc** 3P.Sg.M-hold Def-child-**Nom** to-3P.Sg.M-drink  
 al-maʔ-a  
 Def-water-**Acc**  
 ‘The cup, the boy is holding it to drink water’

Applying the emergence criterion to the numbers in Table 5.21 resulted in the implicational sequence in Table 5.22.

Table 5.22

*Group 3 Case Morphology Implicational Sequence*

Processing Procedures	Case Marking Stage	NP Type	P9	P8	P15	P18	P21
Inter-phrasal	Functional	Pre-verbal NPobj	-	-	-	-	+
		Post-verbal NPsubj	+	+	+	+	+
	Inter-phrasal	[?anna]-subj	+	-	+	+	+
Phrasal	Phrasal	P-Ncase	+	+	+	+	+
Category	Positional	Post-verbal NPobj	/	/	+	+	+
		Pre-verbal NPsubj	+	+	+	+	+

As the thick line in Table 5.22 indicates, all learners in this group showed evidence of an active inter-phrasal processing procedure. In this sense, they were similar to Participants 11, 14, 16, 17, and 19 of the second group, who achieved this by virtue of marking [?anna]-subj with accusative case. However, Group 3 differed from Group 2 in that nominative and accusative case morphemes in some of Group 3's reconstructions were associated with the grammatical functions of the noun phrases they marked rather than their position in the sentence. While this pattern occurred only with post-verbal NPsubj for Participants 8, 9, 15, and 18, Participant 21 showed it with both pre-verbal NPobj and post-verbal-NPsubj. This intragroup difference is indicated by the jagged line.

The shaded area in Table 5.22 represents a gap in the implicational sequence for Participants 8 and 9 in which they had TL reconstructions on structures of higher stages but failed to meet the emergence criterion for marking a structure in a lower stage, namely post-verbal NPobj. However, this was not a violation of the implicational sequence as they did have TL reconstructions on pre-verbal NPsubj, which was enough to assume emergence for the positional marking stage.

Table 5.23 presents case marking results for all participants, while Table 5.24 applies the emergence criterion to Table 5.23.

Table 5.23

*Case Morphology Results*

Processing Procedures	Case Marking Stage	NP Type	P1	P5	P10	P4	P7	P2	P6	P3	P12	P13	P11	P14	P16	P17	P19	P9	P8	P15	P18	P21
Inter-phrasal	Functional	Pre-verbal NPobj	0	1	0 (G1)	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	8
		Post-verbal NPsubj	0	1	0	4	1	0	4	0	0	2	2	1	0	0	0	4	7	4	4	12
	Inter-phrasal	[?anna]-subj	0	1	0	2	0	1	1	0	3	3	4	11	12	12	11	12	3	10	11 (1N)	9
Phrasal	Phrasal	P-Ncase	0	2	0 (1N)	2	0 (1N)	2	0	6	6	7	5	7	4	10	6	7	4	8	8 (1N)	6 (1N)
Category	Positional	Post-verbal NPobj	1	1	1 (5N)	0 (3N)	2 (3N)	1 (5N)	5 (1N)	10 (1N)	3 (1N)	6 (1N)	6 (1N)	8	12	11	5	3 (2N)	3 (2N)	10 (1N) (1G)	8 (N3)	10 (1N)
		Pre-verbal NPsubj	2	2	4	3	8	6	12	11	10	12	7	8	10	12	9	12	8	10	12	7

Table 5.24

*Case Morphology Implicational Sequence*

Processing Procedures	Case Marking Stage	NP Type	P1	P5	P10	P4	P7	P2	P6	P3	P12	P13	P11	P14	P16	P17	P19	P9	P8	P15	P18	P21	
Inter-phrasal	Functional	Pre-verbal NPobj	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	
		Post-verbal NPsubj	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+
	Inter-phrasal	[?anna]-subj	-	-	-	-	-	-	-	-	-	/	/	+	+	+	+	+	+	-	+	+	+
Phrasal	Phrasal	P-Ncase	-	-	-	-	-	-	-	+	+	+	+	+	+	+	+	+	+	+	+	+	
Category	Positional	Post-verbal NPobj	-	-	-	-	-	-	-	+	+	/	+	+	+	+	+	+	/	/	+	+	+
		Pre-verbal NPsubj	-	-	-	/	-	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

## **Chapter 6**

### **Discussion**

#### **6.1 Introduction**

The previous chapter presented the results of the cross-sectional study on the development of sentential word order and case morphology in MSA as an L2. This chapter discusses whether the hypotheses generated in Chapter 4 are borne out empirically and is organized as follows. Section 6.2 presents the research questions. Sections 6.3 and 6.4 discuss the hypotheses and relate the results to each hypothesis separately.

#### **6.2 Research Questions**

This study sought to answer the following questions:

1. Do the developmental routes for the acquisition of declarative sentence word order obey the principles of PT?
2. With ditransitive verbs, does the NP-PP sequence emerge before NP-NP? If not, what is the observed IL pattern?
3. Do the observed developmental routes for the acquisition of case markers conform to the principles of PT?
4. Does free word order occur only if functional case marking has emerged?

#### **6.3 Sentential Word Order Discussion**

The PT hypotheses describe the shape of L2 syntactic structures produced at the IL initial stage and how they develop from that point forward. Specifically, they state a set of mapping constraints acting over what is produced at the initial stage. Such constraints are overridden as learners develop different mapping principles that contribute to the production of diversified syntactic structures. These constraints are stated in PT's premises, namely, the unmarked

alignment hypothesis, the topic hypothesis, and the lexical mapping hypothesis (Pienemann et al., 2005) recast later as the lexical mapping hypothesis and the prominence hypothesis, respectively (Bettoni & Di Biase, 2015).

The unmarked alignment hypothesis claims that L2 learners organize their syntax by initially mapping the most prominent semantic role available onto the most prominent grammatical function (i.e., the subject), which in turn is placed sentence initially (Pienemann et al., 2005). The topic hypothesis describes how discourse-pragmatic devices develop in the IL of L2 learners (Pienemann et al., 2005). It claims that at the initial stage, learners do not differentiate subject from topic. Such differentiation eventually happens in two steps. In the first, differentiating topic function and subject function is triggered by the placement of a non-core argument, e.g., a time adverbial at the most prominent position in constituent structure. This is followed by a second step in which core arguments, e.g., objects, can occupy this position.

The lexical mapping hypothesis describes how argument to function structure mapping develops after the unmarked alignment stage in learners' IL. It claims that after the default mapping stage, they learn to map something other than the agent to the subject (non-default argument to function mapping) and then map more than one argument role to one function (complex argument to function mapping) (Pienemann et al., 2005).

The modified version of both the unmarked alignment hypothesis and the lexical mapping hypothesis—also named the lexical mapping hypothesis—makes similar but more discreet claims (Bettoni & Di Biase, 2015). First, at the initial stage of L2 IL, learners map the most prominent semantic role onto the subject. Then, they add additional arguments that get mapped to other grammatical functions other than subject and object. After that, they learn to

map lower semantic roles onto the subject or higher semantic roles onto grammatical functions other than the subject for pragmatic purposes.

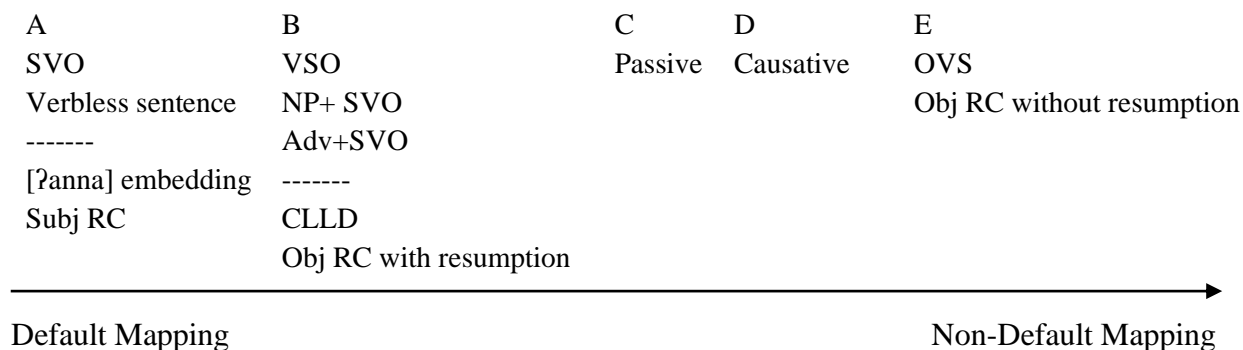
The prominence hypothesis, the modified version of the topic hypothesis, claims that focus and topic are distinguished from the subject function at the first step of differentiation given that the order afterwards is still canonical. Such inclusion of focus allows questions to appear at this stage of differentiation. As can be seen, the two versions of PT's hypotheses differ with regard to the addition of further arguments after subject-object functions, the mapping of constituent to function structures, and subject-topic differentiation.

While neither hypothesis in Pienemann et al. (2005) overtly states a step in which additional arguments are added after subject-object functions, the lexical mapping hypothesis in Bettoni and Di Biase (2015) does. With regard to default mapping, it is a three-component link in the unmarked alignment hypothesis: most prominent argument to most prominent grammatical function to most prominent constituent structure position. However, in the lexical mapping hypothesis, it is a two-component link (i.e., most prominent argument to most prominent grammatical function) with no assumptions as to where it will appear in the constituent structure (Bettoni & Di Biase, 2015). Finally, with regard to topic-subject split, the prominence hypothesis explicitly adds focus alongside topic function to the initial differentiation step between grammatical functions and discourse functions given that canonical order is unchanged.

While such differences have important implications for IL development, the current cross-sectional study hypothesized a developmental sequence based on the claims of both versions of PT's hypotheses. Therefore, the first hypothesis about word order was based on PT's premises mentioned above.

### 6.3.1 Hypothesis 1

Hypothesis 1 proposed that the order of development of declarative sentences will not violate Sequence A before B before C before D before E. Hypothesis 1 reflects how MSA L2 word order should develop over time.



The rationale behind such order is based on PT's hypotheses. Despite the number of clauses that [?anna] embedding and subject relative clauses manifest, Set A structures showed default mapping between the three structures of grammar. In other words, they did not violate what the initial stage of IL should look like according to PT's unmarked alignment hypothesis. Set B structures on the other hand had either a circumstantial adjunct adverbial, external topic, or a verb mapped to initial position in constituent structure, although the rest of the sentence maintained default mapping.

The passive construction was in Set C because it involved non-default mapping between argument and function structure. According to PT's lexical mapping hypothesis (Pienemann et al., 2005) and its later version the lexical mapping hypothesis (Bettoni & Di Biase, 2015), such a structure emerges only after the learner goes through default mapping and develops the means to handle non-linearity in the mapping between these two structures. The causative construction was put in Set D since it had complex argument to function structure mapping. In PT, handling such mapping is ordered after the non-default mapping seen in the passive (Pienemann et al.,

2005). Finally, Set E had two structures: object relative clauses without resumption and OVS.

These were ordered last as they involved a core argument being fronted with a gap in constituent structure of the sentence that needed to be functionally mapped to the fronted element.

The results presented in Table 5.16 show that Hypothesis 1 was fully supported if participants of different proficiency levels are considered to represent IL development over time. The implicational sequence shows gradual development in accordance with Hypothesis 1. When evidence of a set appeared in the data of a learner, all sets to the left of that set appeared as well but not necessarily those to the right. In other words, sets formed an implicational hierarchy, as shown in Table 6.1.

Table 6.1

*Set Implicational Hierarchy*

Implication	Set A	Set B	Set C	Set D	Set E
If a structure of Set E has emerged in the IL, it implies that all sets to the left have emerged as well.	+	+	+	+	+
If a structure of Set D has emerged in the IL, it implies that all sets to the left have emerged as well.	+	+	+	+	-
If a structure of Set C has emerged in the IL, it implies that all sets to the left have emerged as well.	+	+	+	-	-
If a structure of Set B has emerged in the IL, it implies that all sets to the left have emerged as well.	+	+	-	-	-
If only Set A has emerged in the IL, it implies an active default mapping constraint on the IL of the learner.	+	-	-	-	-

Below is a discussion of how the results in Table 5.16 form the implicational hierarchy in Table 6.1 and how this hierarchy supports Hypothesis 1. This is done by examining learners' IL and the apparent developmental steps they followed in relation to Table 6.1 and Hypothesis 1. First, however, it is important to state what PT considers to be the initial stage of L2 IL. PT argues for a pre-default mapping stage in which only words and formulaic language are produced. However, the results showed no evidence of such a stage. This was likely due to data

collection occurring two to four months into the semester, when learners had likely already passed that stage. Since this was anticipated before data collection, it was not part of Hypothesis 1 from the outset.

For the first three learners in Table 5.16 (Participants 1, 2, and 3), their part of the table is reproduced in Table 6.2, showing that they only produced structures that had default argument-function-constituent structure mapping. In other words, they only showed structures of Set A. This pattern could not be due to gaps in the data as numerous contexts were designed in the picture description task to elicit higher structures that involved different mapping principles. Thus, these three learners had a very limited syntax dictated by the default mapping principle assumed in the unmarked alignment hypothesis (Pienemann et al., 2005) and lexical mapping hypothesis (Bettoni & Di Biase, 2015) at their initial IL stage.

Table 6.2

*IL with Set A Structures*

Mapping Principles	Participant Structure	P1	P2	P3
Non-default C to F mapping	ORWOR	-	-	-
	OVS	-	-	-
Complex A to F mapping	Causative	-	-	-
Non-default A to F mapping	Passive	-	-	-
	ORWR	-	-	-
XP default mapping	CLLD	/	/	-
	XPSVO			
	XPVO			/
	XPVless			
Default mapping + extra arguments	VSO	+	-	/
	VlessXP	/		/
	VOXP		+	+
	SVOXP		+	+
Default mapping	[?anna]-Em	-	-	+
	SR	-	-	+
	SVOO	+	+	-
	SVO(PP)	+	+	+
	Vless	+	+	+
	VO	+	+	+
	SVO	+	+	+

A subject-topic split was hypothesized to emerge next. This was reflected in Set B structures in Hypothesis 1. This developmental step was produced by Participants 4–10, whose data are reproduced in Table 6.3. That is, while showing evidence of sentences in the default mapping (i.e., Set A structures), they were able to place a discourse function topic (i.e., Set B structures) sentence initially followed by a canonically ordered sentence.

This indicated the assumed subject-topic split had emerged in their IL. In other words, their L2 processor was in a stage where the subject was only distinguished from topicalized non-core arguments. Their results were in accordance with the order in Hypothesis B as they did not show evidence of a structure to the right of Set B in the implicational hierarchy. This suggested their IL was still constrained by default mapping after what had been fronted ahead of it.

Table 6.3

*IL with Set A and B Structures*

Mapping Principles	Participant Structure	P4	P5	P6	P7	P8	P9	P10
Non-default C to F mapping	ORWOR	-	-	-	-	-	/	-
	OVS	-	-	-	-	-	-	-
Complex A to F mapping	Causative	-	-	-	-	-	-	-
Non-default A to F mapping	Passive	/	-	-	-	/	-	/
XP default mapping	ORWR	-	-	-	/	+	+	+
	CLLD	/	/	-	-	+	+	+
	XPSVO				+	+	+	+
	XPVO	/	+	+	+	+	+	-
	XPVless	+	+					
	VSO	+	/	+	-	+	+	+
Default mapping + extra arguments	VlessXP					/		+
	VOXP	+	+	+		+	+	+
	SVOXP		/	+	+	+	+	+
Default mapping	[?anna]-Em SR	+	+	+	+	/	-	+
	SVOO	+	+	+	+	+	+	+
	SVO(PP)	+	+	+	+	+	+	+
	Vless	+	+	+	+	+	+	+
	VO	+	+	+	+	+	+	+
	SVO	+	+	+	+	+	+	+

The next stage up was the emergence of non-default argument to function mapping, which was reflected in Set C of Hypothesis 1. The relevant results from Table 5.16 are reproduced in Table 6.4. This step was apparent in the data of Participants 11, 12, and 13, who produced the passive construction, in which argument and function structures were mapped in a non-default manner. In accordance with Hypothesis 1, while they showed evidence for non-default argument to function mapping reflected in the passive, they produced evidence for every set to the left of Set C (i.e., Sets A and B) but failed to do so for any set to the right, supporting the implicational hierarchy of Hypothesis 1. Thus, those participants had developed the ability to handle non-default argument to function structure mapping.

Table 6.4

*IL with Set A, B, and C Structures*

Mapping Principles	Participant Structure	P11	P12	P13
Non-default C to F mapping	ORWOR	-	-	-
	OVS	-	-	-
Complex A to F mapping	Causative	-	-	-
Non-default A to F mapping	Passive	+	+	+
	ORWR	/	+	+
	CLLD	/	-	+
	XPSVO	+	/	+
XP default mapping	XPVO	+		+
	XPVless	/	+	+
	VSO	+	/	/
	VlessXP	+		+
Default mapping + extra arguments	VOXP	+	+	+
	SVOXP	+	+	+
	[?anna]-Em	+	+	+
Default mapping	SR	+	+	+
	SVOO	+	+	-
	SVO(PP)	+	+	+
	Vless	+	+	+
	VO	+	+	+
	SVO	+	+	+

Complex argument to function structure mapping is the next stage up. In Hypothesis 1, this developmental step was reflected in Set D. The production of a causative construction was taken as evidence for this complex mapping since that construction involves two thematic roles mapped onto one grammatical function. Support for this step is shown in Table 6.5, reproduced from Table 5.16, in which Participants 14–20 produced causative constructions several times each. Their IL had escaped the unmarked alignment constraint and reached the highest stage within the lexical mapping hypothesis, as they could handle complex mapping between argument and function structures. Therefore, their IL supported the implicational sequence in Hypothesis 1 in that it showed evidence for every structure to the left of Set D.

Table 6.5

*IL with Set A, B, C and D Structures*

Mapping Principles	Participant Structure	P14	P15	P16	P17	P18	P19	P20
Non-default C to F mapping	ORWOR	-	-	-	-	-	/	/
	OVS	-	-	-	-	-	-	-
Complex A to F mapping	Causative	+	+	+	+	+	+	+
Non-default A to F mapping	Passive	+	+	+	+	+	+	+
	ORWR	+	+	+	+	+	+	+
XP default mapping	CLLD	+	+	+	+	+	+	+
	XPSVO	+			/	+		/
	XPVO	+	+	+	+	+	+	+
	XPVless	/	/		/	+	/	
	VSO	+	+	+	/	+	+	+
	VlessXP	+			/	+	+	+
Default mapping + extra arguments	VOXP	+	+	+	+	+	+	+
	SVOXP	+	/	+	+		/	+
	[?anna]-Em SR	+	+	+	+	+	+	+
Default mapping	SVOO	+	+	+	-	/	+	/
	SVO(PP)	+	+	+	+	+	+	+
	Vless	+	+	+	+	+	+	+
	VO	+	+	+	+	+	+	+
	SVO	+	+	+	+	+	+	+

It was assumed that the final step extended what the initial position could host to include core arguments other than the subject. This developmental step was reflected in Set E of

Hypothesis 1. Only one participant showed evidence of achieving this stage, as shown in Table 6.6 reproduced from Table 5.16. In addition to Set E structures, he showed evidence of all structures to the left of that set.

Table 6.6

*IL with Set A, B, C, D and E Structures*

Mapping Principles	Participant	P21
	Structure	
Non-default C to F mapping	ORWOR	+
	OVS	+
Complex A to F mapping	Causative	+
Non-default A to F mapping	Passive	+
	ORWR	+
	CLLD	+
XP default mapping	XPSVO	
	XPVO	+
	XPVless	+
	VSO	+
	VlessXP	/
Default mapping + extra arguments	VOXP	+
	SVOXP	/
	[?anna]-Em	+
Default mapping	SR	+
	SVOO	/
	SVO(PP)	+
	Vless	+
	VO	+
	SVO	+

This section explained how the results in Table 5.16 supported Hypothesis 1 and the implicational hierarchy it proposed based on the premises of PT.

### 6.3.1.1 Sentential Word Order Intra-Stages

Table 5.16 showed that some learners consistently failed to produce some structures within a mapping stage they had shown evidence for in their IL. While some of these were obviously gaps resulting from structures that were not specifically targeted, and thus their absence did not mean anything, others were likely language-specific intra-stages.

The idea of intra-stages within PT was first developed by Mansouri and Håkansson (2007), who showed that within phrasal morphology in Arabic, full marking agreement in definiteness (Def-N  $\rightarrow$  Def-Adj) emerges prior to partial marking (CS:  $\emptyset$ -N  $\rightarrow$  Def-Adj), which in turn emerges prior to zero marking ( $\emptyset$ -N  $\rightarrow$   $\emptyset$ -Adj). This sequence was argued to be due to form-function complexity, which constitutes an additional task for the learner (Pienemann, 1998). Mansouri and Håkansson (2007) argued that one-to-one form-function relation is optimal for testing and important for implicational hierarchy. As a result, if an optimal structure of inter-phrasal morphology emerges before a phrasal structure that involves a complex form-function relationship, this cannot be taken as evidence falsifying the PT implicational hierarchy. This is because the complex form-function phrasal structure is not optimal for testing and not important for implicational hierarchy. Therefore, the delay observed for some syntactic structures in this study must be due to similar factors on the syntactic level.

The first intra-stage was seen at the default mapping stage with Participants 1 and 2, as shown in Table 6.7, reproduced from Table 5.16. Even though they produced various sentences within the default mapping stage, they failed to produce subject relative clauses and [?anna] embedding even though these were specifically targeted by the picture description task. One explanation for their lag lies in the fact that both subject relative clauses and [?anna] embedding consist of two clauses in default mapping rather than one, compared to what was previously produced in the default mapping stage.

The second intra-stage is seen in Table 6.8, reproduced from Table 5.16, in which Participants 4, 5, 6, 7, and 11 frequently placed a circumstantial adjunct ahead of default mapping sentences, demonstrating that disassociating subject function from topic had emerged. The topic and prominence hypotheses both claim that once learners distinguish subject from

topic, they develop the ability to topicalize non-core arguments (Pienemann et al., 2005; Bettoni & Di Biase, 2015). This step was confirmed in the development of sentential word order.

However, the results suggested a further distinction within the non-core arguments category.

Table 6.7

*Syntactic Intra-Stage 1*

Mapping Principles	Participant	1	2
	Structure		
	[?anna]-Em	-	-
	SR	-	-
Default mapping	SVOO	+	+
	SVO(PP)	+	+
	Vless	+	+
	VO	+	+
	SVO	+	+

Even though learners showed they distinguished subject from topic by fronting circumstantial adjuncts, they consistently failed to produce structures in which the fronted syntactic element was an external topic noun phrase, as shown in the CLLD and object relative clauses with resumption. As explained in Chapter 3, what is fronted in both of these structures is a topic noun phrase that is linked to a post-verbal clitic. It seems that when the fronted element is a circumstantial adjunct, i.e., adverbial, subject topic distinction is facilitated compared to when it is a topic=noun.

Liu (2015) found a similar pattern when investigating the acquisition of L2 Chinese syntax. Two structures exhibited two different fronted elements ahead of a sentence in default mapping, i.e., SVO. In the first, the topicalized element was an adjunct “adverbial,” while the second had a topicalized NP. The longitudinal data showed that within the XP-default mapping stage, marked as Stage 2, the placement of a circumstantial adjunct ahead of SVO emerged far earlier than the placement of noun phrases ahead of SVO. The relevant part is shown in Table

6.9 reproduced from Liu (2015, p. 84). Since that study had three participants, the point of emergence for adjuncts in the topic position was in Week 4 for Leo and Aiko and Week 8 for Ross. On the other hand, it was not until Week 18 for Aiko, 39 for Leo, and 46 for Ross that an external topic NP was placed sentence initially.

Table 6.8

*Syntactic Intra-Stage 2*

Mapping Principles	Participant Structure	4	5	6	7	11
Non-default A to F mapping	Passive	/	-	-	-	+
XP default mapping	ORWR	-	-	-	/	/
	CLLD	/	/	-	-	/
	XPSVO				+	+
	XPVO	/	+	+	+	+
	XPVless	+	+			/
	VSO	+	/	+	-	+
Default mapping + extra arguments	VlessXP					+
	VOXP	+	+	+		+
	SVOXP		/	+	+	+
Default mapping	[?anna]-Em	+	+	+	+	+
	SR	+	+	+	+	+
	SVOO	+	-	+	-	+
	SVO(PP)	+	+	+	+	+
	Vless	+	+	+	+	+
	VO	+	+	+	+	+
	SVO	+	+	+	+	+

Table 6.9

*Stage 2 L2 Acquisition of Chinese Syntax*

Stage	Structure	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15
	Week	W2	W4	W6	W8	W10	W12	W14	W16	W18	W30	W33	W36	W39	W42	W46
2	NP <sub>TOP</sub>					(+)	(+)	(+)	+A	+	+	+	+L	+	+R	
	ADJ <sub>TOP</sub>		+L/A	+	+R	+	+	+	+	+	+	+	+	+	+	+

### 6.3.2 Hypothesis 2

Hypothesis 2 stated that the order of emergence for ditransitive verbs would not violate the order NP-PP before NP-NP. This hypothesis was based on the assumption that the intrinsic features specifying the set of thematic roles that can be associated with the secondary object do not develop right away (Lenzing, 2016) and that in NP-PP order, the second argument is a functionally underspecified semantic argument (Artoni, 2012). Therefore, knowledge of the secondary object’s intrinsic features is required before NP-NP order emerges. The results showed that while all learners had NP-PP order, only a subset had NP-NP order. The relevant data are presented in Tables 6.10 and 6.11, reproduced from Table 5.16.

Table 6.10

#### *Ditransitive Argument Order*

Participant	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
Structure											
SVOO	+	+	-	+	-	+	-	-	+	+	+
SVO(PP)	+	+	+	+	+	+	+	+	+	+	+

Table 6.11

#### *Ditransitive Argument Order*

Participant	P12	P13	P14	P15	P16	P17	P18	P19	P20	P21
Structure										
SVOO	+	-	+	+	+	-	/	+	/	/
SVO(PP)	+	+	+	+	+	+	+	+	+	+

While these results did not contradict Hypothesis 2 in that there was not a single case in which a learner produced NP-NP order and not NP-PP, these results did not show that learners developed from NP-PP only to having both orders available. For some—namely Participants 3, 5, 7, 8, 13, 17, 18, 20, and 21—only NP-PP was produced. One could assume that development within a single stage, i.e., intra-stage developmental steps, is subject to individual differences and

learners proceed differently. While this could be the case, the fact that beginner learners had developed NP-NP order while advanced learners who showed more complex structures did not, as was the case for Participant 21, makes this claim untenable.

A better explanation lies in the timing and methods of this study. It was assumed that both structures belonged to the initial stage of syntactic development. Therefore, to catch the emergence of an early structure, data collection should start relatively near the beginning of instruction. Since data collection in this study took place two to four months after the beginning of formal instruction, I assumed both structures would have emerged in the IL of all participants by the time of data collection. This is why most of the learners were alternating between NP-NP and NP-PP order of arguments.

This raises the question of why this was not the case with participants who exclusively relied on NP-PP order. The answer lies in how ditransitive constructions were elicited. The picture description task was used to specifically target many structures, including sentences with ditransitive verbs. Various verbs that either allow both orders or one of them were used as prompts with pictures. Once a learner produced a sentence, the researcher moved to the next slide. There was no strategy to force a particular order once a sentence was produced. Therefore, since the assumption was that NP-PP involved a lower processing load than NP-NP, some L2 learners might have favored it over NP-NP. I believe this contributed to the structure not being produced by some high-intermediate and advanced learners.

#### **6.4 Case Morphology Discussion**

PT bases its L2 developmental schedule on its main claim that the set of computational routines or procedural skills that constitute the language processor are hierarchical and develop gradually (Pienemann, 2005). The following represent their implicational order:

- Word/lemma
- Category procedure (lexical category)
- Phrasal procedures (head)
- S-procedure and Word Order Rules
- Matrix/subordinate clause (Pienemann, 2005, p. 13)

PT takes information exchange between linguistic elements to reflect what learners have developed when they attain a certain processing procedure (Pienemann, 2005). PT argues that once a learner attains a certain procedural skill or certain processing procedure, they can produce structures that are delineated under that processing procedure. Therefore, lexical morphemes emerge before phrasal morphemes, which emerge before inter-phrasal morphemes, which emerge before inter-clausal morphemes. This is because the processing procedures at work in their production develop in that order. Taking these facts into account, Baten (2011, 2013) and others have proposed a developmental route for case morphemes. It predicts the development before and after such processing procedures are developed. Hypothesis 3 represents the proposed developmental hierarchy and tested its claims on the development of case markers in MSA.

#### **6.4.1 Hypothesis 3**

Hypothesis 3 proposed that in the IL, case marking would develop in the following order: all nominative → positional → phrasal → inter-phrasal ‘functional’. Case assignment is a result of information exchange between a case assigner and the noun phrase or case assignee. At any level (i.e., phrasal, inter-phrasal, or inter-clausal), information exchange requires active processing procedures for that stage to take place. Therefore, the rationale behind the sequence in Hypothesis 3 is that this sequence mirrors how processing procedures become available to

learners as their availability dictates information exchange between linguistic elements (Pienemann, 2005).

This implicational order of processing procedures assumes that at the initial stage, no processing procedure is active and learners only produce words or formulaic language. However, the assumption I adopted is that case markers do not develop from no case marking to TL-case marking but rather go through IL patterns beforehand (Artoni et al., 2013; Artoni & Magnani, 2015; Baten, 2011, 2013; Baten & Verbeke, 2015).

Thus, since TL case marking requires active processing procedures to enable information exchange that dictates their distribution, it was expected that only the nominative case would be produced at the initial stage (Artoni et al., 2013; Artoni & Magnani, 2015; Baten, 2011, 2013; Baten & Verbeke, 2015). If other case markers were produced, they would be part of formulaic language or a memorized chunk. In Hypothesis 3, this is represented by the “all nominative” stage. However, such production is not a result of information exchange but rather of using the default case, which in MSA is the nominative (Aoun et al., 2010; Fehri, 2012).

At the category procedure stage, variations in form emerge as a result of introducing lexical morphemes (Artoni et al., 2013; Artoni & Magnani, 2015; Baten, 2011, 2013; Baten & Verbeke, 2015). Consequently, learners contrast the nominative case with one non-nominative case and confine their use to pre-verbal NP and post-verbal NP, respectively. This IL pattern is not a result of information exchange because at the category procedure stage, only lexical morphemes are added directly from the lexicon with no information exchange needed. In Hypothesis 3, this was represented by positional case marking.

At the phrasal procedure stage, information exchange within phrases is developed in learners' IL (Pienemann, 1998, 2005). Therefore, case marking that is required by feature

unification within phrases should emerge. In Hypothesis 3, this is reflected in the phrasal case marking stage in which I expected a split between accusative and genitive case morphemes in that the accusative marks post-verbal noun phrases and the genitive marks noun phrases within construct state and prepositional phrases.

At the next stage up, inter-phrasal information exchange is developed. As a result, case marking that is required by inter-phrasal feature unification should develop (Pienemann, 1998, 2005). In Hypothesis 3, this is reflected in the inter-phrasal functional case marking stage in which case markers are associated with grammatical functions irrespective of their position. In MSA, case assignment that is required via inter-phrasal feature unification appears on [?anna]-subj as well as on either noun phrase in an OVS sentence.

Contexts for some case morphemes are rare. In addition, learners tend to drop case markers since they tend to rely on word order or subject-verb agreement to communicate grammatical relations. As a result, I developed an elicited imitation task, similar to the one developed by Baten (2019), to elicit case markers. If a learner can reconstruct a defiant form into a TL-form, it can be argued that the rule responsible for the production of this structure is part of their IL.

The results in Table 5.23 and the implicational sequence in Table 5.24 fully support Hypothesis 3, showing patterns of reconstructions consistent with case marker development anticipated in that hypothesis. While some learners showed no reconstruction, others reconstructed in almost every position. Below, I go over every reconstruction pattern found in both tables and discuss how this data support Hypothesis 3.

I have ignored Participants 1 and 5 since their reconstruction numbers were very low and inconclusive. Hypothesis 3 claims that learners should go through an initial “all nominative”

stage. At this stage, nominative case is overgeneralized. What this means for an elicited imitation task is when learners are at the initial stage of case morphology development, they overgeneralize the nominative when a sentence is repeated. In Table 6.12, reproduced from Table 5.23, this IL pattern is reflected in the data from Participants 10, 4, and 7. Their use of nominative case is not a result of a rule application as it is supplied on pre-verbal and post-verbal noun phrases. The pattern was clear for Participant 10 as he only used the nominative case in all of his reconstructions despite noun phrase position shown in brackets, i.e., four on pre-verbal NPsubj, five on post-verbal NPobj, and once on NPobj of a preposition. With Participant 4 and 7, nominative was still overgeneralized, as the numbers within brackets indicate, but other case markers were used as well, namely accusative. Therefore, I take these three participants to support the “all nominative” stage, as they appeared to not yet be aware of case markers.

Table 6.12

*All Nominative Stage*

Processing Procedures	Case Marking Stage	NP Type	P10	P4	P7
Inter-phrasal	Functional	Pre-verbal NPobj	0 (G1)	0	0
		Post-verbal NPsubj	0	4	1
	Inter-phrasal	[?anna]-subj	0	2	0
Phrasal	Phrasal	P-Ncase	0 (1N)	2	0 (1N)
Category	Positional	Post-verbal NPobj	1 (5N)	0 (3N)	2 (3N)
		Pre-verbal NPsubj	4	3	8

After the “all nominative” stage, Hypothesis 3 argues for a position marking stage in which the nominative is contrasted with one general case marking post-verbal noun phrase. This developmental step is reflected in the reconstructions of Participants 2 and 6 in Table 6.13, reproduced from Table 5.24. They showed a clear contrast in case morpheme suppliance based on noun phrase position with qualitative differences between the two learners.

When a noun phrase with the wrong case was a pre-verbal NP, these participants produced TL reconstructions, supplying the nominative case with those noun phrases. On the other hand, when the noun phrase with the wrong case was a post-verbal NP, only Participant 6 produced TL reconstructions by supplying the accusative case, contrasting noun phrases in this position with those in a pre-verbal position.

Participant 2 confined the nominative case to pre-verbal noun phrases while Participant 6 reconstructed it on pre-verbal noun phrases, with some overgeneralization on post-verbal noun phrases. Therefore, the reconstruction patterns of Participants 2 and 6 supported the positional case marking stage. In addition, given that Participant 2 did not have any TL reconstructions on both a pre-verbal NPobj and post-verbal NPsubj, this suggested TL case suppliance associated case morphemes with positions rather than grammatical functions.

The interpretation of Participant 6's reconstructions is important for Hypothesis 3. He produced four TL reconstructions on a post-verbal NP-subj. However, his reconstructions on a post-verbal NP-subj were considered part of an IL pattern preceding functional case marking. In this pattern, learners who had not achieved functional case marking produced nominative case marking on pre-verbal NP-obj and post-verbal NP-subj, supporting Hypothesis 3. Otherwise, since he did not show reconstructions at the phrasal level, Hypothesis 3 would be contradicted by the IL of this participant.

As established in the rationale for Hypothesis 3, case marking within phrases (e.g., genitive noun phrase within construct state and within prepositional phrases) requires an active phrasal procedure to allow for phrasal feature unification. While showing evidence of the position marking stage, Participants 3, 12, and 13 produced phrasal case marking, as shown in Table 6.14, reproduced from Table 5.24. In other words, when a noun phrase with the wrong

case was the object of a preposition or the inner noun of a construct state, they reconstructed the TL case on these nouns by supplying the genitive case. However, none of them reconstructed any case marker or met the emergence criterion for TL reconstructions when reconstructing case that required inter-phrasal information exchange, which entails an inactive inter-phrasal processing procedure. This IL reconstruction pattern supported the implicational developmental sequence in Hypothesis 3.

Table 6.13

*Positional Case Marking Stage*

Processing Procedures	Case Marking Stage	NP Type	P2	P6
Inter-phrasal	Functional	Pre-verbal NPobj	-	-
		Post-verbal NPsubj	-	+
	Inter-phrasal	[?anna]-subj	-	-
Phrasal	Phrasal	P-Ncase	-	-
Category	Positional	Post-verbal NPobj	-	+
		Pre-verbal NPsubj	+	+

Table 6.14

*Phrasal Case Marking Stage*

Processing Procedures	Case Marking Stage	NP Type	P3	P12	P13
Inter-phrasal	Functional	Pre-verbal NPobj	-	-	-
		Post-verbal NPsubj	-	-	-
	Inter-phrasal	[?anna]-subj	-	/	/
Phrasal	Phrasal	P-Ncase	+	+	+
Category	Positional	Post-verbal NPobj	+	/	+
		Pre-verbal NPsubj	+	+	+

Case marking that requires inter-phrasal feature unification is the final stage in case morphology development according to Hypothesis 3. Learners would not be able to reconstruct case at this stage unless they could unify features across phrases. While reconstructing case at both the positional and phrasal stages, all participants listed in Table 6.15, reproduced from

Table 5.24, had reconstructed case markers that required inter-phrasal feature unification. This is shown in their TL reconstruction of [ʔanna]-subj with the wrong case.

Target-like case assignment to pre-verbal NPobj and post-verbal NPsubj is theoretically similar to case assignment in [ʔanna]-subj in that both require an active inter-phrasal processing procedure to allow for feature unification across phrases. However, TL reconstructions of pre-verbal NPobj and post-verbal NPsubj, which I call functional case marking, lagged behind [ʔanna]-subj. Only a subset of learners who had TL reconstructions of [ʔanna]-subj (namely Participants 9, 8, 15, 18, and 21) marked noun phrases based on their functions rather than positions. While Participants 9, 8, 15, and 18 only reconstructed a TL post-verbal NPsubj, Participant 21 reconstructed the TL case at both positions.

Table 6.15

*Inter-Phrasal Case Marking Stage*

Processing Procedures	Case Marking Stage	NP Type	P11	P14	P16	P17	P19	P9	P8	P15	P18	P21
Inter-phrasal	Functional	Pre-verbal NPobj	-	-	-	-	-	-	-	-	-	+
		Post-verbal NPsubj	-	-	-	-	-	+	+	+	+	+
	Inter-phrasal	[ʔanna]-subj	+	+	+	+	+	-	+	+	+	+
Phrasal	Phrasal	P-Ncase	+	+	+	+	+	+	+	+	+	+
Category	Positional	Post-verbal NPobj	+	+	+	+	+	/	/	+	+	+
		Pre-verbal NPsubj	+	+	+	+	+	+	+	+	+	+

The results in Table 5.24 support the PT-based implicational sequence proposed in Hypothesis 3 as they form the TL reconstruction patterns in Table 6.16. Learners who reconstructed the TL case required by inter-phrasal feature unification were able to reconstruct the TL case when phrasal feature unification required but not vice versa (Pattern 3). Learners who reconstructed the TL case when required by phrasal feature unification reconstructed case on both pre-verbal NPsubj and post-verbal NPobj, in which a case-position association was formed but not vice versa (Pattern 2). Learners at the category procedure stage, in which

nominative and accusative are contrasted based on NP position, were only able to reconstruct the TL nominative case on pre-verbal NP and accusative case on post-verbal NP (Pattern 1). Finally, the data suggested an implicational hierarchy within TL reconstructions required by the activation of inter-phrasal feature unification, namely TL reconstructions of [ $\text{?anna}$ ]-subj and TL reconstructions based on NP function, even though their production required development of identical processing procedures (Pattern 4).

Table 6.16

*TL Reconstruction Implicational Hierarchy*

Processing Procedure	Category Procedure	Phrasal Procedure	Inter-Phrasal Procedure	
Case Marking Stage	Positional	Phrasal	Inter-Phrasal	Functional
Pattern 4	+	+	+	+
Pattern 3	+	+	+	-
Pattern 2	+	+	-	-
Pattern 1	+	-	-	-

**6.4.1.1 Case Morphology Intra-Stages**

The data on case morphology development showed two intra-stages. The first is seen in Table 6.17, which shows how Participant 2 reconstructed positional case. He reconstructed the TL case on pre-verbal NP<sub>subj</sub> in enough tokens with zero overgeneralization to meet the criterion for positional case marking emergence. However, he failed to meet the emergence criterion for marking post-verbal NP<sub>obj</sub> as he only reconstructed the TL case at this position once. It is difficult to assume an intra-stage based on this since it only occurred with this participant.

A possible explanation lies in the number of sentences Participant 2 could not repeat and case dropping in the ones he repeated. A closer look at his data showed that he could not repeat two sentences that contained a post-verbal NP<sub>obj</sub> with the wrong case. Also, at the post-verbal NP<sub>obj</sub> position, he dropped case six times since the case markers were at the end of utterances,

which is a pattern among native speakers as well (Hallberg, 2016). Therefore, this is likely to be a result of a dropping pattern this participant had rather than form-function complexity as the case morphemes utilized here showed one-to-one correspondence between form and function.

Table 6.17

*Case Morphology Intra-Stage 1*

Processing Procedures	Case Marking Stage	NP Type	P2
Category	Positional	Post-verbal NPobj	-
		Pre-verbal NPsubj	+

The second intra-stage appeared within case marking requiring an active inter-phrasal procedure, as shown in Table 6.18. At this stage, [?anna]-subj and displaced subject and object in OVS were investigated. In both structures, case assignment requires feature unification across phrases since the case assigner and the NP that receives case are not in the same phrase. Despite the same inter-phrasal feature unification required for both case marking stages, [?anna]-subj marking emerged before forming case-function association in OVS sentences.

Table 6.18

*Case Morphology Intra-Stage 2*

Processing Procedures	Case Marking Stage	NP Type	P11	P14	P16	P17	P19	P9	P8	P15	P18	P21
Inter-phrasal	Functional	Pre-verbal NPobj	-	-	-	-	-	-	-	-	-	+
		Post-verbal NPsubj	-	-	-	-	-	+	+	+	+	+
	Inter-phrasal	[?anna]-subj	+	+	+	+	+	+	-	+	+	+

Participants 11, 14, 16, 17, and 19 all reconstructed TL case on [?anna]-subj. However, they failed to do so on NPs in OVS constructions, indicating they had not yet formed a case-function association in their IL. On the other hand, Participants 9, 8, 15, and 18 were able to reconstruct TL case on both [?anna]-subj and post-verbal NPsubj in OVS constructions. Only

Participant 21 could reconstruct the TL on all NP types, namely [ $\text{?anna}$ ]-subj, post-verbal NPsubj, and pre-verbal NPobj.

This lag could be explained by the differences in which each case assignment takes place and whether the syntactic structure in which they appear has emerged. In Chapter 3, it was determined that a topicalized NP was assigned the default nominative case, as shown in (1a-b). When this NP follows [ $\text{?anna}$ ], as shown in (2a-b), it takes the accusative case despite what function it is linked to within the constituent structure following [ $\text{?anna}$ ].

1. a.  $\text{?at}^{\text{f}}\text{-t}^{\text{f}}\text{alib-u}$                        $\text{ja-qra?u}$                        $\text{al-kitab-a}$   
       Def-student.M.Sg-Nom 3P.M.Sg-read Def-book.Sg-Acc  
       ‘The student is reading the book’
- b.  $\text{al-kitab-u}$                        $\text{ja-qra?u-hu}$                        $\text{?at}^{\text{f}}\text{-t}^{\text{f}}\text{alib-u}$   
       Def-book.Sg-Nom                      3P.M.Sg-read-it                      Def-student.M.Sg-Nom  
       ‘The book, the student is reading it’
2. a.  $\text{?a-?taqidu}$   $\text{?anna}$   $\text{?at}^{\text{f}}\text{-t}^{\text{f}}\text{alib-a}$                        $\text{ja-qra?u}$                        $\text{?al-kitab-a}$   
       1P.Sg-think Comp Def-student.M.Sg-Acc                      3P.M.Sg-read Def-book.Sg-Acc  
       ‘I think that the student is reading the book’
- b.  $\text{?a-?taqidu}$   $\text{?anna}$   $\text{al-kitab-a}$                        $\text{ja-qra?u-hu}$                        $\text{?at}^{\text{f}}\text{-t}^{\text{f}}\text{alib-u}$   
       1P.Sg-think Comp Def-book.Sg-Acc 3P.M.Sg-read-it Def-student.M.Sg-Nom  
       ‘I think that the book the student is reading’

Marking topicalized NPs after the complementizer [ $\text{?anna}$ ] with accusative case was found regardless of what function the NP was linked to in c-structure, while in OVS, case was exclusively associated with NP function. Therefore, since reconstructing TL [ $\text{?anna}$ ]-NP with accusative case was a clear indication of an active inter-phrasal feature unification in learners’ IL, figuring out NP functions to assign them a specific case in OVS structures must have created additional processing loads that caused case assignment based on function to emerge later, creating an intra-stage once the inter-phrasal feature unification had emerged in the IL.

Finally, within the functional case marking stage, reconstruction patterns suggested that before case-function association was developed—i.e., marking a pre-verbal NPobj with accusative case and marking a post-verbal NPsubj with nominative case, as seen in Participant 21’s data—learners went through an IL pattern in which they marked both NPs with nominative case identical to the pattern in (3) from Participant 8’s data. This pattern was observed in the reconstructions of Participants 6, 9, 8, 15, and 18.

3. \*as-sabur-at-u    ja-msaħu    at<sup>ʕ</sup>-t<sup>ʕ</sup>alib-**u** qabla    bidai-at-u  
 Def-board-F-Nom 3P.Sg.M-erase Def-student.M.Sg-**Nom** beginning-F-Nom  
 ad-dars  
 Def-lesson.Sg  
 ‘The whiteboard, the student is erasing it before the beginning of the class’

This IL pattern was found in the acquisition of other languages as well. As reviewed in Chapter 2, learners of German and Russian who had not achieved functional case marking marked both noun phrases in OVS with nominative case (Artoni et al., 2013; Baten, 2013).

#### 6.4.2 Hypothesis 4

Hypothesis 4 predicted that free word order would not emerge in the IL of the participants before functional case marking. Since learners at the initial stage lacked the morphological means to mark grammatical functions, i.e., S-V agreement and case morphology, they alternatively relied on SVO word order and expressed grammatical functions positionally. Escaping the rigidity of such word order requires developing alternative morphological means. Thus, free word order, i.e., OVS and VOS, would not emerge in the IL unless learners developed these alternative means by marking grammatical functions independent of position. Case-function association requires information exchange across phrases, i.e., active inter-phrasal procedure. It is only then that learners can organize sentences based on their own pragmatic choices.

Hypothesis 4 was borne out in the data. The comparison between learners' sentential word order and case morphology results shown in Table 6.19 reveals that only those who could reconstruct TL functional case by marking pre-verbal NPobj with accusative case produced OVS when required by the picture description task. Below, I elaborate on how this comparison supported Hypothesis 4.

Table 6.19 specifies the highest mapping principle and highest processing procedure attained by each learner.

Table 6.19

*Highest Sentential Word Order and Case Morphology Reached by Each Participant*

Processing procedure	/	Category	Phrasal	Inter-phrasal	
Case Marking stage	All nominative	Positional	Phrasal	Inter-phrasal	Functional
Participant					
21					Δ▲
19				Δ ▲	
18				Δ ▲	
17				Δ ▲	
16				Δ ▲	
15				Δ ▲	
14				Δ ▲	
13			Δ▲		
12			Δ▲		
11			Δ	▲	
10	▲	Δ			
9		Δ		▲	
8		Δ		▲	
7	▲	Δ			
6		▲Δ			
5		Δ			
4	▲	Δ			
3	Δ		▲		
2	Δ	▲			
1	Δ				
Mapping principles	Default mapping	XP-default mapping	Non-default A to F mapping	Complex A to F mapping	Non-default C to F mapping

*Note.* ▲ = case morphology, Δ = mapping principles.

The first row in Table 6.19 lists case marking stages, the last row lists mapping principles, and the first column lists participants who did both tasks. A black triangle specifies the highest case marking stage each learner showed evidence of, and a white triangle specifies the highest mapping principles in sentence formation. While the table makes it look like case marking stages and mapping principles were in one-to-one correspondence, they were not. It is important to only consider the relevant triangle when looking at a row.

Only Participant 21 reconstructed TL case on pre-verbal NPobj and produced sentences that had non-default C-F mapping, i.e., OVS. On the other hand, learners who could not do this by associating case marker with grammatical functions still abided by the SVO or VSO schemata. This indicated case-function association is essential before escaping the rigidity of canonical word order.

The results supported the claim that once the inter-phrasal procedure is in place, which entails information exchange across phrases, inter-phrasal case assignment should emerge (Artoni, 2012; Artoni & Magnani, 2015; Baten, 2011, 2013; Di Biase et al., 2015). The results also showed a language-specific intra-stage in which functional case assignment was preceded by consistently marking [ $\varnothing$ anna]-subj with accusative case. This is why Table 6.19 has two stages in the inter-phrasal processing procedure with inter-phrasal and functional case assignment.

This is apparent in the data of Participants 14–19, who showed evidence of inter-phrasal information exchange in which they reconstructed TL case on [ $\varnothing$ anna]-subj. However, case-function association was not present in their IL despite active inter-phrasal information exchange. While they reconstructed TL nominative on post-verbal NPsubj, which could be an example of case-function association, I believe this is not clear evidence of case-function association in the IL since post-verbal nominative NPsubj was found in other structures like CLLD. In addition, it

was an IL pattern used on OVS structures when functional case marking had not been achieved yet (Artoni et al., 2013; Baten, 2013). This is why I preferred marking pre-verbal NPobj with accusative case as clear evidence of case function association in the IL of the learners.

## **Chapter 7**

### **Conclusion**

#### **7.1 Overview**

Previous research on the acquisition of MSA within PT was largely limited to agreement morphology from learners with certain L1 backgrounds in a foreign language context. While such research is important, it could obscure a lot of IL features that might emerge if the context and L1 of learners were different. Therefore, this study investigated the development of sentential word order and case morphology in MSA as an L2. It adopted a PT framework developed by Pienemann et al. (2005) and Di Biase and Bettoni (2015) to investigate sentential word order and concepts from Pienemann (1998) and Baten (2011, 2013) to investigate case morphology.

#### **7.2 Summary of the Study**

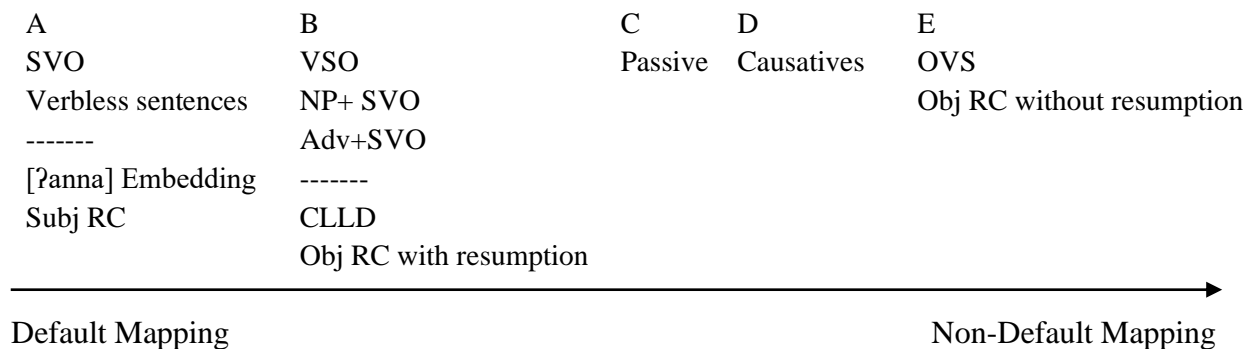
The study sought to answer the following research questions:

1. Do the developmental routes for the acquisition of declarative sentence word order obey the principles of PT?
2. With ditransitive verbs, does the NP-PP sequence emerge before NP-NP? If not, what is the observed IL pattern?
3. Do the observed developmental routes for the acquisition of case markers conform to the principles of PT?
4. Does free word order occur only if functional case marking has emerged?

The study employed the unmarked alignment hypothesis, lexical mapping hypothesis, and topic hypothesis from Pienemann (2005) as well as Di Biase and Bettoni's (2015) revised lexical mapping hypothesis and prominence hypothesis to generate a developmental sequence for

sentential word order. With regard to case morphology, it utilized PT processing procedures from Pienemann (1998) and Baten's (2011, 2013) proposal to hypothesize the following developmental sequences.

1. The order of development of declarative sentences will not violate the sequence A before B before C before D before E.



2. The order of emergence for ditransitive verbs will not violate the order NP-PP before NP-NP.
3. In the IL, case marking will develop in the following order: All Nominative → Positional → Phrasal → Inter-Phrasal (Functional)
4. In the IL, free word order will not emerge before functional case marking.

Data were collected from 21 L2 learners of MSA in the TASOL institute at the Islamic University in Medina via an interview, picture description task, and elicited imitation task. Learners' proficiency levels and L1 backgrounds were varied to provide a stronger testing ground for PT-based developmental sequences. To judge whether a structure had emerged in the IL of the learners, the emergence criteria as stated below were applied to the data. The justifications for adopting such criteria and further details are found in Chapter 4.

- Syntax: two instances of rule application.
- Morphology: four target-like reconstructions at a single position.

The results supported all four PT-based developmental sequences. Assuming that learners' IL across proficiency levels represented how an IL develops over time, the results showed that syntactic structures mirror how mapping principles become available to the learner.

Learners' IL developed from an initial stage in which sentences are constrained by the unmarked alignment hypothesis (i.e., default argument-function-constituent structure mapping with SVO and its variants) to a stage where such default mapping is preceded by a non-core argument (i.e., adverbials and external topics ahead of default mapping). After that, they developed the ability to handle argument-function non-default mapping, i.e., passive voice. At the final stage of argument-function structure mapping, learners developed complex mapping (the causative). At the final stage of syntactic structures as far as this study was concerned, learners developed the ability to handle non-default constituent-function structures (i.e., OVS) and object relative clauses without resumption. These findings supported Hypothesis 1.

All learners who had the sequence NP-NP had NP-PP as well. While not every learner had NP-NP, its absence was not enough to assume the relevant IL lacked such an order due to some methodological issues with the relevant task. However, assuming that such order was part of the IL but the task was not narrowed enough to elicit it, the results would show simultaneous emergence, supporting Hypothesis 2.

Hypothesis 3 was fully supported as case markers in learners' IL developed based on case development proposal in (Baten 2011, 2013) and the activation of different processing resources (Pienemann, 1998). Case markers went through a stage in which nominative was reconstructed on different syntactic positions. After that stage, it was confined to pre-verbal NPs and contrasted with accusative on post-verbal NPs. Once the phrasal procedure was developed, genitive was added to the IL case system and was confined to NPs within PPs and inner NPs in construct

state. At the final stage, once the inter-phrasal procedure was developed, inter-phrasal case marking was developed in two steps. It was target-like reconstructed on [?anna]-subj before being reconstructed based on grammatical functions regardless of position in constituent structure.

With regard to Hypothesis 4, the results showed that only learners who produced target-like reconstructions of case based on grammatical functions of NPs were able to free themselves from the rigidity of SVO order and consequently produced OVS when elicited. Learners who did not have target-like reconstructions based on NP function could not do this.

### **7.3 Significance of the Findings**

The contributions of this study are twofold. First, it contributes to the growing body of literature supporting the typological plausibility and validity of PT with regard to sentential word order and case morphology. There is a growing body of literature from different languages supporting PT's applicability to L2 acquisition (e.g., Artoni, 2012; Artoni & Magnani, 2015; Baten & Verbeke, 2015; Kawaguchi, 2005; Liu, 2015; Oulhaj, 2015; Wang, 2010; Yamaguchi, 2010; Zhang, 2007). This study offers support for PT's mapping principles and case morphology development proposal from a new testing ground: learners of MSA as an L2. Moreover, the results are robust since data were collected from learners of typologically varied L1s (Albanian, Comorian, English, French, Malay, Oromo, Pashto, Portuguese, Spanish, Swahili, Urdu).

The second contribution is related to PT's theoretical assumptions about subordinate clauses. It is assumed that subordinate clauses are acquired very late in L2 acquisition since the processing procedures assumed to be involved in their production are placed at the highest stage of the PT hierarchy. L1 and L2 research suggests this is not the case because some types of relative clauses emerge very early in language development (e.g., Diessel, 2004; Kawaguchi &

Yamaguchi, 2016). Nottbeck (2019) argued that placing all types of subordination at one stage very late in L2 development was inconsistent with empirical data and called for an alternative view, suggesting the emergence of subordination should follow the type of mapping principle involved. In agreement with this view, the results of the present study showed that despite the number of propositions in [ $\lambda$ anna] embedding, subordination emerged once default mapping was in place for mono-clausal sentences since both clauses in [ $\lambda$ anna] embedding had default mapping. Moreover, the results suggested a similar order for single-proposition relative clauses. Subject relative clauses and object relative clauses with resumption emerged following the appearance of the mapping principle involved in how their three structures were mapped in mono-clausal sentences. These empirical findings call for a reformulation.

With regard to data collection methods, spontaneous spoken data is the optimal type of data within PT. While almost a third of the data in this study was collected this way, other tasks were also used. An elicited imitation task was first used within PT by Baten (2019). The case morphology developmental sequence found in the elicited imitation task data was similar to the results of other well-accepted tasks, such as storytelling (Baten, 2011) and spot the difference (Di Biase et al., 2015), providing more validity to this task.

#### **7.4 Limitations and Suggestions for Future Research**

Future research within a PT framework should address different subordination types as they obviously involve many interrelated factors (e.g., number of propositions, mapping principles, relativized NP grammatical function, and location of the embedding) that contribute to differences in their time of emergence within the IL. Contrary to PT claims about relative clauses, this study showed that subordination and single-proposition relative clauses emerged early in learners' IL. Unfortunately, this is an area where PT underpredicts. Nottbeck (2019)

attempted to address this issue by proposing a hierarchy based on the mapping principles such structures involve. While this is a step in the right direction, more is needed theoretically and empirically to reposition them within the PT developmental hierarchy and disentangle the aforementioned interrelated factors.

Most research has thus far kept morphological and syntactic developments separate and avoided making corresponding developmental schedules. Therefore, an interesting direction for research within PT would be to link such developments. On the other hand, according to PT, L2 acquisition is a matter of developing an L2 processor in which processing procedures are developed in an implicational hierarchy (Pienemann, 1998). It is relatively easy to identify optimal structures by which processing procedures are tested empirically. However, once form-function complexity manifests in a structure, PT calls for language-specific hierarchies for intra-stages as form-function relationships vary across languages. Therefore, research on MSA as an L2 should continue to identify such intra-stages as there is only one study on this topic (i.e., Mansouri & Håkansson, 2007).

Another under-examined area in MSA PT research is interrogative sentence development. The scope of this study was limited to declarative sentences. It would be interesting to investigate the development of interrogative sentences and see whether interrogative and declarative sentences that involved similar mapping principles emerged at the same time. Such research would inform both theory and language teaching.

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## APPENDIX A:

### Questionnaire

استبانة

السلام عليكم،

أقوم حاليا بإجراء هذه الدراسة كجزء من متطلبات درجة الدكتوراه. تهتم هذه الدراسة باكتساب اللغة العربية كلغة ثانية. أرجوا التكرم بالإجابة على الأسئلة الآتية:

الإسم: .....

العمر: .....

البريد الإلكتروني: .....

اللغة الأم (الأولى): .....

اللغات التي تتحدثها: .....

متى بدأت تعلم اللغة العربية وكم كان عمرك حينها؟

.....  
.....

في أي مستوى تدرس العربية حاليا؟

.....

كيف تقيم لغتك العربية من ١٠؟

١ = مبتدئ

١٠ = ممتاز

١ ٢ ٣ ٤ ٥ ٦ ٧ ٨ ٩ ١٠

## APPENDIX B:

### Interview Questions

مرحباً إسمي عبدالله ما اسمك؟

Hello, My name is Abdullah What is your name?

من أي بلد أنت؟ حدثني عن بلدك قليلاً؟

Where are you from? Can you tell me about it?

منذ متى تدرس العربية ولماذا تدرسها؟

When did you start learning Arabic? And Why?

في أي صف أنت؟ وماهي المواضيع التي تدرسونها؟

What level of Arabic class are you currently enrolled? What topics do you discuss?

هل سبق وسافرت إلى مدن أخرى؟ حدثني عن زيارتك لها ولماذا زرتها؟

Have you ever travelled to other cities? Talk about these visits for one minute?

حدثني عن برنامجك اليومي؟

How is your daily schedule? Talk to me about it? How about weekends?

أين تسكن وكيف هي أسعار السكن بالمدينة؟

Where do you live? How are the prices here?

ماذا تدرس من المواد حالياً؟؟ وكيف هي الدراسة هنا؟

What other classes are you taking this semester?

ماذا تخطط أن تفعل بعد تخرجك؟

What are you planning to do after graduating?

اختر اثنين من اصدقائك وتحدث لدقيقة عن كل واحد منهم؟

Choose two of your close friends, and talk about each of them for a minute?

ماذا تفعل أنت وأصدقائك في وقت فراغكم؟

What do you do with your friends in your free time?

ما الصعوبات التي واجهتها في بداية تواجدك بالمدينة؟

What are the difficulties that you faced in your first days in Medinah?

ماذا أحببت بالمدينة وماذا كرهت؟

What did you like and what did you hate about this city?

في حال قرر شخص ما زيارة بلدك ما الأماكن التي تنصح به زيارتها والاحتياجات الواجب أخذها قبل السفر؟

If someone decides to visit your country, what are the needed preparation that should be taken before traveling?

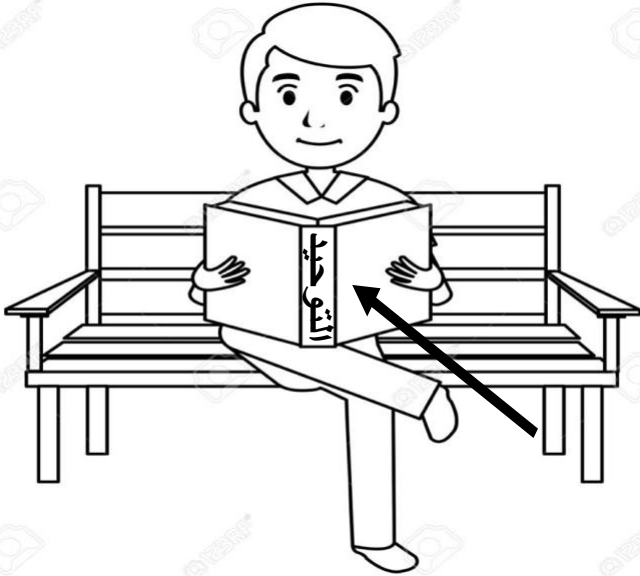
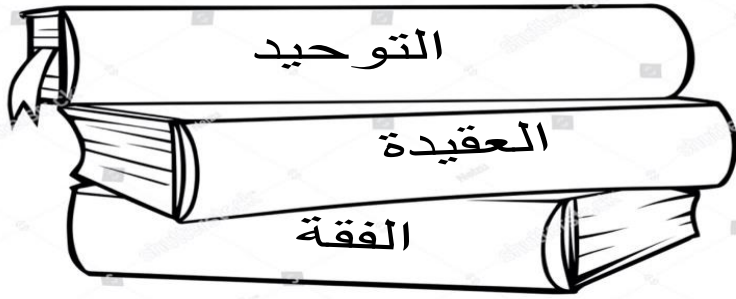
كيف كانت فترة حضر التجول؟ كيف كنتم تتنقلون وتشترون المستلزمات؟ لم أكن موجوداً؟ حدثني عنها بالتفصيل؟ وكيف كنتم تقضون أوقاتكم؟

How was the curfew period in Medinah? How did you move from one place to another and buying stuff? Talk about it in details as I was not here?

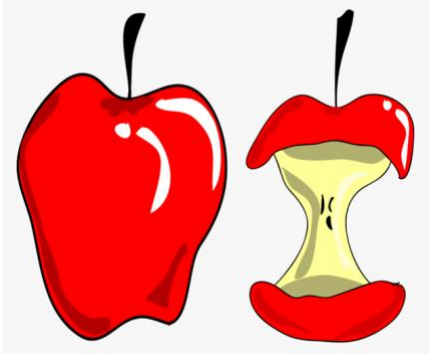
APPENDIX C:

Picture Description Task

Type 1



## Type 2



### Stimuli

- a. maḏa      ḥadatha      li-atufaḥ-at-i?  
What      happened      to-DEF-apple.SG-F-GEN  
'What happened to the apple?'

## Type 3



أَعْتَقِدُ

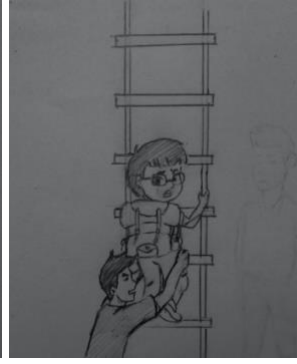
### Stimuli

- a. maḏa      ja-fʿal-u      ar-razul-u?  
what      3P.Sg.M-do      Def-man-Nom  
'What is the man doing?'

## Type 4

**Stimuli:** This question will be asked after giving some contextual information

- maḏa      faʿal-a      ar-razul-u      bi tʿ-tʿifl-i  
What      do.Past.3P.M.Sg      Def-man-Nom      to Def-child-Gen  
'what did the man do to the child?'

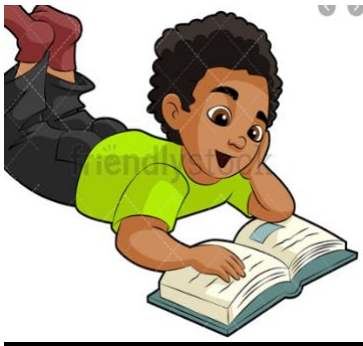


**Type 5**



يُعطي

**Type 6**



at<sup>ʕ</sup>-tʕifl-u  
Def-boy-Nom  
'The boy is reading the book'

ja-qraʔ-u  
3P.Sg.M-read

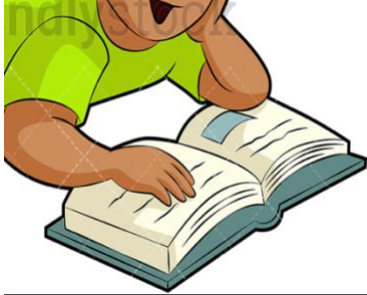
al-kitab-a  
Def-kitab.M.S-Acc

**Subject RC**



b. man haða?  
who this.M.S  
'who is this?'

**Object RC**



d. ma haða?  
what this.M.S  
'what is this?'

## APPENDIX D:

### Elicited Imitation Task

تفاصيلها	بكامل	القصةُ	يروى	التاريخُ	كتاب	23		
لاحفادها	الطعام	تعد	الجدَّةُ	أن	أعتقد	40		
ماءا	الحمراءُ	الزهرةُ	يسقى	الحديقةِ	عاملُ	9		
الصغيرة	المكتبةُ	في	الكتابُ	يقرأُ	الولدُ	19		
الملعب	أرض	من	خرجت	الكرةُ	أن	أعتقد	46	
بأول	أولا	دروسه	يذاكر	المجتهد	الطالبُ	49		
الجائع	الطفل	تطعم	المرأةُ	أن	أعتقد	38		
المهمل	الموظف	سيعاقب	المديرُ	أن	يبدو	41		
النوم	قبل	أطفالها	ل	القصةُ	تقرأُ	الأمُ	8	
المدير	من	الجائزةُ	يتسلم	الجامعةُ	طالبُ	18		
لاطفالها	الطاولةُ	على	الطعامُ	تضع	الأمُ	21		
والدتها	و	والدها	مع	بالالعاب	تلعب	الصغيرةُ	الطفلةُ	3
السجن	في	ليضعه	الشرطيُ	يعتقل	المجرمُ	36		
						14		

السنوي	الاجتماعُ	خلال	الموظفين	يكرم	المديرَ		43
جميلا	بابا	سيصنع	النجارُ	أن	يبدو		11
الدرس	قبل	البيضاءِ	السبورةِ	يمسح	النجيبُ	الطالبُ	7
يوم	كل	الكتابُ	هذا	يقراً	النجيبُ	الطالبُ	22
الجديد .	للمالك	المفتاح	أعطى	السيارةُ	صاحبُ		26
الصف	داخل	المعلم	يفتح	الكتابُ			4
طلابه	ل	الفقة	درس	يشرح	الجيد	المعلم	60
الشديد	من البرد	لتقيهم	النار	يشعلون	الأطفال		39
يوم	كل	الرياضة	يمارس	الجدُ	أن	يبدو	50
عبر الشبكة	لطلابه	الدرس	يشرح	المتميزُ	المعلمُ		54
فالفصل	لزميله	قلما	يعطي	الصغير	الطفل		57
التهم	كل	من	المتهم	ببراءة	يحكم	القاضي	51
بشوش	بوجه	العملاء	يخدم	الموظف			29
الماء	ليشرب	الطفلَ	يمسك	الكأسُ			52
يوم	كل	لاطفالها	الطعامَ	تعد	الام		

الغرفة	تدخل	المرأة	تفتح	الباب			28
الرجل	المسن	يذهب	إلى	المسجد	الكبير	لاداء	1
الصلاة							10
معلم	الرياضيات	يشرح	الدرس	ل	طلاب		6
المهندس	البارع	يتأكد	من	تصميم	الجسر	الجديد	24
مدرس	الفقه	يشرح	الدرس	في	الحرم	المكي	42
أظن	أن	الطالبة	تذاكر	دروسها	دائما		16
أستاذ	التوحيد	يلقي	الدرس	على	طلاب		33
السيارة	تقود	المرأة	كل	يوم			53
الأطفال	يلعبون	الكرة	في	الحديقة	المجاورة	لبيتهم	47
على ما أظن	أن	الحكم	أنهى	المباراة	بين	الفريقين	56
الشرطي	يعتقل	المجرم	الخطير	جدا			17
كلب	الماشية	يطارد	القطيع	في	الحقل		45
يبدو	أن	النهر	سيتوقف	قريبا	لقلة	الامطار	5
المعلمة	المتميّزة	فازت	بجائزة	التفوق	السنوية		15
الرئيس	يخوض	الانتخابات	الصعبة	نهاية	الشهر		

بيتَه	في	ليضعها	الرجلَ	يشترى	الطاولةُ	32
الهدف	ليسجل	اللاعبَ	يركل	الكرةُ		30
فالصف	زميله	ل	الطالبَ	يعطي	القلَمُ	25
كورونا	جائحة	بسبب	الحضور	علقت	الجامعة	59
المسجد	إلى	سيذهب	الرجلُ	أن	أعتقد	37
جداً	المتسخة	الغرفة	تنظف	الجميلةُ	المرأةُ	2
العائلة	لتطعم	الأمَ	تعد	الدجاجةُ		34
جديدة	لتبدو	السيارة	ينظف	النظافةِ	عاملُ	55
صباح	كل	فالمسجد	الشيخَ	يلقي	الدرسُ	27
فراغه	وقت	في	الطفلَ	يركب	الدراجةُ	35
الموسم	هذا	المباريات	كل	خسر	الفريق	58
المثالي	الموظف	ل	الجائزةَ	يمنح	المديرُ	12
الظهر	بعد	فالببيتَ	الدرس	يلقي	الشيخَ	20
شديدة	منافسة	بعد	بالجائزةَ	يفوز	العاملُ	13
						48

يبدو أن اللاعبُ يعاني من الإصابة

31

السبورةُ يمسخ الطالبُ قبل بداية المحاضرة

44

أعتقد أن السائقُ يجب عمله كثيرا

## **CURRICULUM VITAE**

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