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THE ACQUISITION OF MORPHOLOGY IN MOROCCAN HERITAGE SPEAKERS
IN FRANCE

by

AMAL EL HAIMEUR

A Dissertation Submitted in
Partial Fulfillment of the
Requirements for the Degree of

Doctor of Philosophy
in Linguistics

at

The University of Wisconsin-Milwaukee

May 2019

ABSTRACT

THE ACQUISITION OF MORPHOLOGY IN MOROCCAN HERITAGE SPEAKERS IN FRANCE

by

Amal EL Haimeur

The University of Wisconsin-Milwaukee, 2019
Under the Supervision of Professor Sandra Pucci

There are two major perspectives regarding heritage speakers' (henceforth HS) ultimate attainment. Some researchers on HS in the U.S. conclude that HS have incomplete grammars (Benmamoun, Montrul & Polinsky, 2013). It is argued that heritage languages (henceforth HL) do not fully develop (Montrul, 2016), and they are not completely acquired because of shifting to a dominant language (Benmamoun et al., 2013). Other researchers argue that HS' grammars are complete, but simply different as monolingual and HS experience different linguistic realities (Pascual y Cabo & Rothman, 2012). While there is abundant research on Arabic as a HL in the U.S., research on HS in Europe has been rather limited (Montrul, 2016). This dissertation focuses on Moroccan Arabic (henceforth MA) as a HL in France and aims at contributing to the understanding of the linguistic outcomes of the acquisition of Arabic as a HL in an immigrant context.

The current study investigates the acquisition of nominal morphology and verbal-derivational patterns by Moroccan HS in France. Nominal morphology was represented by plural and diminutive formation, and verbal derivations were represented by four patterns. Nominal morphology gives insights into both concatenative and non-concatenative morphological processes. Verbal derivational processes are characterized by the use of non-concatenative

morphological processes, and semantic notions such as causativeness and reciprocity are lexicalized within the MA verb-pattern system. The studied patterns are the basic (P1), causative (P2), medio-passive (P5), and reciprocal (P6). 15 Moroccan-French participants took part in this study. The data were gathered through three production experiments. Experiment 1 investigated the acquisition of 3 sound morphemes and 14 broken plurals. In experiment 2, participants were tested in diminutive formation, exemplified by the six types of diminutives, and experiment 3 examined the acquisition of verbal derivations.

Experiment 1 revealed that participants' plural system is mainly characterized by concatenative processes as just two sound plural morphemes were acquired by a significant number of participants. All the participants acquired the morpheme -at and 80% of the participants acquired the sound morpheme -in. Participants depend on overgeneralization and simplification of their plural system. The sound morphemes characterize the HL and were overgeneralized in broken plural targeted data. Additionally, the sound plural [-at] seems to be the underspecified default morpheme in the HL.

The findings of experiment 2 show that the mean percentage of source-like use of diminutive forms is 38%. The results revealed that just two patterns were acquired by a significant number of participants: CCiCa and CCiC_jC_jəC. Diminutive forms that do not require complex processes are acquired by a significant number of participants and the percentage of source-like use is high as well. In this study, a brief analysis of diminutive derivational processes was given, and participants' patterns of acquisition correspond to the suggested continuum of complexity. Irregular stems present difficulties to HS as complex processes are applied. Non-source like data is rule-governed as 69% of the non-source-like data shows the use of either initial consonant cluster or insertion of the glide /-j/, and these are the main processes

characterizing diminutive processes. Additionally, the requirement of having two syllables was met. Participants tend to regularize diminutive formation and show a preference to the following processes: initial constant cluster and insertion of the palatal glide. Generally, HS's variety is mainly characterized by two patterns.

Experiment 3 reveals that the basic pattern (P1) was acquired by all the participants and 40% of the participants acquired the causative (P2). The medio-passive pattern (P5) and the reciprocal patterns (P6) were not acquired. ANOVA showed that there were statistically significant differences among the use of the four patterns. The main finding of this study is that semantic distinction realized by pattern alternation is neutralized in the HL. Specifically, the basic pattern (P1) and periphrastic constructions were used predominantly in P5 and P6 targeted data. It is likely that the basic pattern is used as a default morphological device because it is unmarked.

The three experiments demonstrate that participants omit irregularities and non-source like forms are rule governed. Less complex and less marked morphological structures characterize the HL. Specifically, morphological aspects thought to be acquired earlier in language development are the ones characterizing the HL. Additionally, the findings of the experiments propose implicational hierarchies for the acquisition of the studied morphological structures. Adopting overgeneralization in nominal morphology, and neutralization in verb patterns showed that HS speak a variety that is reanalyzed. Accordingly, HS in France have a distinct variety that was shaped by their linguistic experience. Their variety is different, reanalyzed and does not comprise all the patterns attested in the source language.

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To
my parents,
my husband, Yasmine
and my beloved son, Ziyad

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LIST OF ABBREVIATIONS

3	3rd person
ANOVA	Analysis of Variance
ASP	Aspect
CA	Colloquial Arabic
DEF	Definite
DM	Diminutive
F	Feminine
HL	Heritage languages
HS	Heritage speakers
L1	First Language
L2	Second Language
M	Masculine
MA	Moroccan Arabic
MSA	Modern Standard Arabic
N	Noun
Part	Participle
PL	Plural
SA	Standard Arabic
SLA	Second Language Acquisition

ACKNOWLEDGMENTS

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ
"وَمَا تَوْفِيقِي إِلَّا بِاللَّهِ عَلَيْهِ تَوَكَّلْتُ وَإِلَيْهِ أُنِيبُ" هود (88)

“And my success (in my task) can only come from Allah.
In Him I trust, and unto Him I look”

I would like to express my sincerest gratitude and appreciation to a number of people who have given me invaluable support and help to advance in my studies over the last four years. First and foremost, I would like to thank my advisor, professor Sandra Pucci. If I had not taken her class, I would not have learned about the population I have investigated in this dissertation. I would like to thank her for all the knowledge she shared with me and for spending endless hours reading my drafts. She is a source of inspiration. Her support, help, and encouragement make this work possible. Professor Pucci, thank you for the high standards of advising and guidance you provided me with. Words cannot express my gratitude. Your support gives me the power and confidence that I need in order to complete my work. I am deeply thankful for your support throughout my journey at UWM.

I also want to express my gratitude to my committee members, which includes professors Eckman, Ouali, and Fleisher. I send my thanks to Dr. Eckman. I am truly thankful for taking two of his SLA classes. Dr. Eckman’s intriguing classes provided me with the tools for analyzing and understanding data in language acquisition. I would like to thank him for giving me the opportunity to use some of my dissertation data in his class. I thank him for all the insightful feedback. He significantly contributed to my work. I would also like to extend my gratitude to professor Ouali for contributing to this dissertation. His expertise helped me understand many aspects of Arabic linguistics. Specifically, the independent study I took with professor Ouali

covered topics related to some of the structures that have been investigated in this dissertation, such as plural formation. I also want to thank him for the insightful comments on my work. Finally, I send my thanks to professor Fleisher for the fascinating classes in syntax and semantics. Professor Fleisher, I also thank you for your time and feedback on my work. I also want to express my appreciation to all the faculty members and staff in the Linguistics program. I am indebted to The Department of Linguistics and The Department of Foreign Languages and Literature for funding me at the graduate program through the Graduate Teaching Assistant Scholarship.

This dissertation would not be possible without the contribution of my participants. I would like to thank my Moroccan-French participants. I am also grateful to my Aunt Aisha who hosted me in her house in France during data collection in December 2017 and December 2018. My thanks goes to all my friends and colleagues in Milwaukee for making my PhD journey memorable, and I am truly happy to have met them here. I am sending love and appreciation to each one of them.

Finally, I owe my sincere thanks to my family. I am especially grateful and deeply thankful to my mother for all her support, guidance, love, and prayers. Very special thanks goes to my aunt in America, Saida Laabidi, for her support and unconditional love. Lastly, yet most importantly, I want to thank my loving and supportive husband, Yasmine, and my wonderful son, Ziyad. I am blessed to have you both in my life.

Chapter One

Introduction

To study native speakers' linguistic competence, previously, linguists' focus was the idealized native speaker in generative grammar, who had acquired their native language by age 5 (Chomsky, 1981). Monolingualism was considered the benchmark of being a native speaker (Rothman & Treffers-Daller, 2014). However, multilingualism has recently become the normal and default state as more than 50% of the world's population live in a naturalistic bilingual context (Kupisch & Rothman, 2016). HS's research shifts attention and interest to a different type of native speaker whose linguistic outcome is the result of the interaction of multiple factors such as setting of acquisition, quantity and quality of input, among other factors. HS present unique and intriguing opportunities to study native speakers' grammar, which is acquired under different social context. HS were referred to as a subset of native speakers (Rothman & Treffers-Daller, 2014) based on the criterion of age of onset and naturalistic context. Rothman and Treffers-Daller (2014) define a native language as the "one that is acquired from naturalistic exposure, in early childhood and in an authentic social context/speech community" (p. 97). Accordingly, based on the discussed criteria, HS are native speakers of their HL as they acquire their language in a natural setting. They acquire the language in an implicit way and in a family setting at a young age (Aalberse & Muysken, 2013). HS are also bilingual speakers and native speakers of the majority language if the acquisition process takes place before or at age 4-6 years (Rothman & Treffers-Daller, 2014). They are bilingual of "immigrant and/ or ethnic minority background" (Albirini, 2014, p. 731). HS speak a minority language, which is usually confined to home and community setting and a majority language (Montrul, 2008, 2015; Polinsky, 2008). And they usually do not receive formal education in their HL (Pascual y Cabo & Rothman,

2012). Hence, HS are native speakers and bilinguals as well and could be considered as natural linguistic resource for language acquisition studies.

HS have been the focus of theoretical linguists, educationalists and sociolinguists (Aalberse & Muysken, 2013). HS' grammar is highly debated in HS' research. Linguistic research on HS show that the endstate of HS grammar is different from monolingual speakers (Benmamoun et al., 2013; Montrul, 2008, 2012, 2016; Polinsky, 2008). HS' grammar was either described as incomplete (Montrul, 2016) or was described as simply being different from monolingual speakers and does not imply incompleteness (Kuppisch & Rothman, 2016). Given the complexity of HL acquisition, where many factors interact to affect the linguistic outcomes of acquiring a HL, including social, cultural and linguistic factors (see Albirini, 2014; Montrul, 2016), it is expected that HS' varieties will be different from monolingual speakers because of different and distinct realities of monolingual and HS experiences in their language development (Pascual y Cabo & Rothman, 2012). However, difference does not affect the given fact that HS are native speakers of their HL.

The study's focus is the endstate of the process of language acquisition of HS in an immigrant context. Learning the grammars of a language is a continuous and a gradual process. Montrul (2016) explains that "learning the grammar of a language is a process with a beginning followed by a period of development that spans several years, the study of language acquisition is concerned with describing the typical courses of development of different aspects of vocabulary and grammar"(p. 1). And the study of acquisition of HL as a native language is also concerned with the investigation of different linguistic components. HS are exposed to their HL since birth and they acquire their HL through naturalistic exposure. The acquisition process of a HL was described as disrupted (Albirini, 2014; Benmamoun et al., 2013), since the acquisition of HS'

grammar does not end at age 5 as the development of language lasts across the lifespan and HS usual shift to the majority language (Albirini, 2014; Montrul, 2016). Montrul (2008, p. 267) suggests ages 8 and 10, as a plausible age of language fixation. She also argues that many aspects of late developed structures continue across the lifespan. And to achieve adult proficiency the minimum is 13 to 14 years (Montrul, 2016). Therefore, the acquisition of a language does not stop at age five and language development, especially late learnt structures, continues across the lifespan of learners.

Studies demonstrate that early input is advantageous to HS for phonology and core syntax, but not for morphosyntax (Au, Knightly, Jun, & Oh, 2002; Knightly, Jun, Oh, & Au, 2003; Montrul, 2012). The final linguistic attainment of HS has been the focus of a number of studies and the conclusion was that HS' grammars are incomplete and that the acquisition of morphosyntax presents difficulties to HS (Benmamoun et al., 2013; Montrul, 2008). Other scholars propose the differential acquisition term to express the attested differences in monolinguals' and HS' grammars and argue that difference cannot be interpreted as incompleteness (Kupisch & Rothman, 2016) as diversity is attested among monolingual speakers, and accordingly, this diversity will be multiplied in bilingual speakers, and HS are no exception (Rothman & Treffers-Daller, 2014). The attested linguistic disparity in the two groups is the result of the circumstances surrounding HL acquisition (Kupisch & Rothman, 2016), and therefore, HS' grammars are worthy of formal and scientific description and provide opportunities for testing available linguistic theories as well.

There has been a great amount of research on HL in North America in the last two decades (Montrul, 2016). There is also ample research on Levantine Arabic as a HL in the US (Albirini, 2014; Albirini & Benmamoun, 2014; Albirini, Benmamoun, & Chakrani, 2013;

Albirini, Benmamoun, & Saadah, 2011; Rouchdy, 2002; Saadah, 2011). Rouchdy (2002) claims that the variety spoken by Arab-Americans does not correspond to any specific Arabic dialect, and she affirms that their ethnic variety is understood only by members within the linguistic community in the US. And it is not understood by Arab immigrants outside the US. It will be of great interest to study the linguistic outcomes of acquiring Arabic as a HL in Europe and explore the characteristics of HL in a European setting. Research on immigrant varieties in Europe has been rather scarce (Montrul, 2016). And accordingly, research on Arabic as a HL in Europe remains scarce as well. Turkish and Moroccan immigrants are two major immigrant groups in many European countries (Boumans & de Ruiter, 2002; Montrul, 2016). Moroccan Arabic (henceforth MA) is one of the major HL in Europe. This study focuses on MA as a HL in France and aims to contribute to the understanding of the linguistic outcomes of the acquisition of an Arabic HL in an immigrant context where the majority language is French. The novelty of the study is that the acquisition of MA as a HL will be investigated for the first time in a European immigrant context (France), and will contribute to the geographical diversity of research in HL. Additionally, the acquisition of morphological structures by Moroccan-French HS will be studied for the first time as well. The aim is to reach an understanding of HL as a subset of the source language that is different, systematic and rule-governed.

More specifically, the current study investigates and reports on the acquisition of nominal morphology and verbal-derivational patterns by Moroccan HS in France. MA is one of the HL in France where the second generation use their dominant language widely and the minority language is confined to home and community settings. So, what are the linguistic outcomes of acquiring a HL in an immigrant context? To understand HS' language and pattern of acquisition, I studied both nominal morphology, represented by plural formation and diminutive formation,

and verbal derivational patterns. The rationale behind choosing nominal morphology is that it gives us insights into both concatenative and non-concatenative morphological processes. In MA, sound plurals are derived by a suffixation process. This type of derivation is referred to as concatenative morphology. On the other hand, broken plurals depend on stem modification (non-concatenative morphology). Diminutive forms also require non-concatenative processes. Usually concatenative morphology is simple and acquired by age three in L1 majority contexts. However, non-concatenative morphology is complex and may be acquired beyond age 6 (Albirini & Benmamoun, 2014).

Verbal derivational morphology will be the focus of this research as well. It depends on pattern alternation and it is acquired in stages and beyond school age (Badry, 1982). Verbal derivational processes in MA highlight both the use of non-concatenative morphology and how semantic notions such as causativeness and reciprocity are lexicalized within the MA verb-pattern system. It also represents an interface of morpho-semantic components in deriving different verb patterns, consequently, the acquisition of verb pattern alternation is a multi-faceted task. It is expected that HS's non-concatenative morphology will be modified, and therefore, this study aims at understanding the linguistic change that HS adopt, and the linguistic outcomes of acquiring a HL in an immigrant European context that provides different circumstances for the process of HL acquisition. Additionally, this study also aims at understanding HS' variety as an independent and rule-governed sub-system.

To recapitulate briefly, the study explores the acquisition of two different morphological processes that characterize MA, suffixation (concatenative processes), and the use of patterns (non-concatenative processes). The findings of the study are intended to understand the acquisition pattern in HS' variety, to explore the adopted strategies and find out the general

characteristics of HS' morphological system. This study will also give insights into the change that HS adopt as a result of the modified context of acquisition and help in understanding the acquisition pattern of Semitic processes in general and MA in particular. The findings of the study will also test the Critical Period Hypothesis suggested in Granena and Long (2013).

The dissertation is structured as follows. Chapter two provides the context of the current study by defining HL and HS and reviewing the main findings on HS' acquisition of different linguistic components. In this chapter, the relation between early input in HL and critical period is also discussed. Then, an overview of HS in France and the studied morphological structures are given. The main research questions and hypotheses are stated for each experiment in this chapter. Methodology is outlined and explained in chapter three. Chapter four reports the results of nominal morphology, represented by plural formation and diminutive tasks, followed by a discussion of the findings. Chapter five will report the verbal morphological result, exemplified by verbal derivational patterns. Then, the finding of the acquisition of verb pattern alternation will be discussed in the context of the proposed hypotheses and related studies. Finally, chapter six provides a complete discussion of the overall findings and links the results of all the experiments, addressing the main hypotheses and questions posted. It will also report on implications of the study for L2 and HS learners of Arabic. After discussing the limitations and future studies, I will conclude this dissertation.

Chapter Two

Background

The objective of this chapter is to introduce HS and the main relevant research on HS. This chapter will be organized as follows: Section 2.1 provides a definition of HL and HS and factors affecting HL maintenance. Section 2.2 discusses the debated issue of HS' grammars as being incomplete grammars or state of differential acquisition. Section 2.3 reviews previous findings on HL acquisition including morphosyntax, phonology and sociolinguistics. The relationship between early exposure to the HL and the Critical Period Hypothesis is also examined. The rationale of the study is discussed in this section as well. Section 2.4 describes the population under study, and section 2.5 describes plural formation in MA. Section 2.6 gives an overview of diminutives in MA, and section 2.7 provides a description of verb patterns. Section 2.8 identifies the questions the current research aims to answer. Finally, the hypotheses that the study tests are stated in section 2.9.

2.1 Heritage Languages and Heritage Speakers

The American Heritage College dictionary defines the word heritage as something acquired from birth (as cited in Montrul, 2016). Montrul explains that what makes a language a 'heritage' language is its local social context and the conditions under which HL are learned. It is usually implied that there is a majority language and a minority one. The phrase heritage language was first coined and used in Canada in 1977, and it was used in the USA by American scholars until the late 1990s to refer to minority languages (Cummins, 2005, p. 585). The term HS is relatively new in the field of language acquisition (Kupisch & Rothman, 2016) and HL are native languages. Rothman (2009) gives a thorough description of which language qualifies as a HL. He also gives a description of the characterization of HL acquisition:

A language qualifies as a *heritage language* if it is a language spoken at home or otherwise readily available to young children, and crucially this language is not a dominant language of the larger (national) society [...] the *heritage language* is acquired on the basis of an interaction with naturalistic input and whatever in-born linguistic mechanisms are at play in any instance of child language acquisition. (p. 156)

Rothman's definition indicates that HL are acquired through natural exposure and they are minority languages. HS are also defined in the context of immigration. Montrul (2008, 2016) defines HS as early bilinguals. They grew up hearing and possibly speaking an immigrant minority language, and have been dominant in the majority language of the larger community since an early age (Polinsky, 2011). They "are the children of immigrants born in the host country or immigrant children who arrived in the host country some time in childhood" (Montrul, 2012, p. 4). Valdés (2001) emphasizes HS' bilingualism as she defines a HS as "a language student who is raised in a home where a non-English language is spoken, who speaks or at least understands the language and who is to some degree bilingual in that language and in English" (p. 38). HS groups are linguistic minorities (Valdés, 2005) who speak a "non-societal and non-majority language"(p. 41). Montrul (2008) defines HS as "early bilinguals of minority languages" (p. 161). Albirini (2014) also defines HS as bilinguals "who usually come from immigrant and/or ethnic minority backgrounds" (p. 731). And HS are by definition native speakers of their HL (Kupisch & Rothman, 2016). The mentioned definitions take into consideration HS' language proficiency and the status of HL as minority languages.

There are other definitions that take into consideration sociohistorical factors such as Fishman's definition (2001), where HS are either indigenous speakers of native American languages, colonial HL speakers, or immigrant HL speakers. HS are also defined from

psychological and sociopolitical perspectives. According to Hornberger and Wang (2008), HS are “individuals with familiar or ancestral ties to a language other than English who exert their agency in determining if they are HL speakers of that language” (p. 6). In this definition, HS have the agency to identify with a specific HL. Therefore, HS practice their identities in identifying with a HL. It is clear from the presented definitions that HL are not necessarily immigrant languages. In this research, I adopt the definitions that stress the characterization of HL as a native language (Rothman, 2009; Rothman & Treffers-Daller, 2014) which is acquired in an immigrant context where a majority language dominates (Montrul, 2016; Polinsky, 2008).

HS are early bilingual speakers and most HS are simultaneous bilinguals or early sequential bilinguals (Montrul, 2016, p. 98). They could be first or second generation immigrants. From an early age, HS grow up speaking two languages that are part of their linguistic and social environment. According to De Houwer’s (2009) definition, HL acquisition could also be a type of bilingual first language acquisition if HS are exposed to the HL and the majority language from birth. There are also cases when HS are introduced to the HL first, but they start hearing the majority language later in their childhood (sequential bilingualism). Additionally, they are referred to as native speakers and could have multiple L1. Kupisch and Rothman (2016) define HS as “a native-speaker bilingual of a minority language spoken at home and either also a native speaker (in the case of 2 L1) or a child L2 learner of the majority language of the society in which she/he lives and is educated” (p. 4). Montrul (2008) claims that HS comprise different types of bilinguals: simultaneous bilinguals, who are exposed to the heritage and the majority language before the age of 3-4, sequential bilinguals, exposed to the HL at home until age 4-5 and then exposed to the majority language at pre-school. The third type of HS are the late child L2 learners, monolingual children, who attended elementary school in

their home country, and immigrated around ages 7-8 or later. Therefore, HS are bilingual and native speakers of their varieties and they constitute different types of bilinguals.

2.1.1 HS as a specific group of native speakers. HS acquire their HL in different social contexts than their parents' or other monolingual speakers' contexts of acquisition. HS cannot be equated with either monolingual speakers nor L2 speakers. O'Grady, Kwak, Lee, and Lee (2011) describe HS acquisition as a naturally occurring experiment since HS are similar to monolingual speakers in the sense that both of them acquire their L1 implicitly and in a natural setting before puberty. But the two groups could differ in the amount of input and language use, and experience distinct realities in their acquisition (Pascual y Cabo & Rothman, 2012). Rothman (2009) also notes that there are qualitative and quantitative differences in the input that monolingual and HS get, and they also differ in literacy and formal education, in addition to the influence of the majority language. It is pointed out that HS as native speakers constitute a different type of learners for teachers and educators as they have unique needs (Kagan & Dillon, 2003). HS are believed to be similar to second language learners as they don't have native like attainment, and may experience interference from the dominant language. They also experience similar difficulty with inflectional morphology (Montrul, 2008). On the other hand, HS are different from second language learners because of their strength in oral comprehension (Polinsky & Kagan, 2007) and they differ in other language aspects as well (Aalberse & Muysken, 2013). Aalberse and Muysken (2013) mention that "it is clear that across generations in a HL community there is much more of a chance that the original language is modified" (p. 260). Language shift is more likely to take place in second generation (Aalberse & Muysken, 2013; Montrul, 2008). Therefore, HS as a different subtype of native speakers are predicted to modify their HL. Additionally, language change is a reoccurring phenomenon in human languages.

Montrul (2016) maintains that HS command of their two languages “changes throughout the life course and the language learning period” (p. 17). HS children, who are younger than ten years, are more likely to shift to the majority language. Montrul (2008) points out that “minority-speaking children younger than 10 years of age show a more rapid shift to the L2 and a larger degree of L1 loss than children older than 10” (p. 136). Montrul (2008) claims that HS are a heterogeneous group. There is a variation among this group as well and their proficiency in the HL may vary among individuals. Research on the acquisition of HL studies the developmental stages and the linguistic outcomes of acquiring a HL (Montrul, 2016). Before talking about previous studies on HS attainment, it is worth citing the main factors affecting HL acquisition. The following section will present a discussion of the main factors discussed in the literature, pertaining to HL maintenance.

2.1.2 Factors affecting HL maintenance. HS vary in their linguistic abilities, ranging from possessing monolingual-like abilities to possessing basic linguistic skills as they get older (Köpke & Schmid, 2004). There are many factors that affect HS’ linguistic abilities such as quantity and quality of input, language use, social and demographic factors, and schooling (Albirini, 2014; Rothman, 2007; Silva-Corvalán, 1994; Zentella, 1997). Psycholinguistic research points to the importance of language use as it could predict L1 attrition (Köpke, 2004, 2007; Schmid, 2007; Schmid & Köpke, 2007). Language input also has a tremendous role as a predictor of language maintenance or loss. Language input has a major role in the development and acquisition of L1 components, it is similarly important in mastering complex structures that require consistent and uninterrupted input (Albirini & Benmamoun, 2014; Montrul, 2005) and it is claimed that HS often have significantly less input than monolingual speakers (Kupisch & Rothman, 2016). Aalberse and Muysken (2013) discuss possible factors for the attested disparity

in HS performance. One factor they cite is the quality of input, since monolingual speakers usually receive schooling in their language and HS generally don't receive formal education in the HL. Montrul (2008) also emphasizes the role of schooling in HL maintenance. In addition to speaking and hearing an L1, reading and writing are claimed to be vital factors in L1 maintenance as they are thought to be a source of confirming evidence for L1 maintenance (Smith & Van Buren, 1991).

Age of arrival, country of birth, and parents' native language are equally important factors in language maintenance (Nagano, 2015). Nagano highlights other factors such as language ideologies, cultural assimilation and religious participation. It is pointed out that there are external factors, such as the cultural context of the immigrant that influence the linguistic attainment of HS (Köpke, 2007). Albirini (2014) investigates those factors that contribute to this variability among HS. He explains: "External factors refer to linguistic, socio-affective, and socio-contextual factors, such as language use and input, language attitudes, family pressure, community support, and school experiences" (p. 732). Ethnic identity is another critical factor in HL maintenance (Albirini, 2014; Rouchdy, 2002). Likewise, motivation is a key factor in maintaining a HL. To understand the role of motivational factors in maintaining a HL, we may adopt Gardner's (2005) integrative and instrumental orientation in L2 acquisition. He points out that integrative orientation refers to interest of learning an L2 because there is an interest in the community and their culture. Instrumental orientation, on the other hand, is defined by Gardner as referring to "conditions where the language is being studied for practical or utilitarian purposes" (p. 11). Therefore, HL may be maintained based on both integrative and instrumental needs. Hence, there are many factors that interact to affect HS linguistic attainment.

Many researchers have studied the influence of sociolinguistic and demographic factors in HS' development and maintenance (Albirini, 2014; El Aissati, 1997; Rouchdy, 1992, 2002; among others). Rouchdy (2002) predicts that Arabic will never die among Arab-Americans. They will continue learning Arabic because of sociolinguistic factors such as ethnic identity and religion. Rouchdy (2002) mentions that contact with English may result in language change but Arabic will be maintained. In her survey of Arab-American students studying SA, the students claim that they are interested in studying Arabic because of ethnic identity, religious affiliation, fulfilling a language requirement, importance of Arabic from a global prospective and influence of parental advice. Those factors are ordered from the most important to the least important. Various factors contribute to the differences in language shift per language group. One factor is cultural distance (Clyne & Kipp, 1997). For example, speakers from Islamic/Eastern orthodox cultures in Australia show more language maintenance, compared to other groups from Northern Western and Central Europe. Smolicz, Secombe, and Hudson (2001) point out that language is very important to cultural values. Therefore, if a language is intertwined with cultural values, it is likely that it will be maintained. Albirini et al. (2011) claim that Palestinian HS outperformed their Egyptian counterparts in syntactic and morphological linguistic features such as word order, which could be explained in terms of the strong relationship between language and ethnic identity in Palestinian HS. Prestige and numerical strength are important factors that influence language maintenance in HS (Aalberse & Muysken, 2013). For example, if a HL enjoys prestige and a wider practical use as Chinese, it will be maintained. Xu and Moloney (2014) studied Chinese HS in Australia and found that their job prospects received higher scores as the first orientation for learning a HL, followed by cultural heritage, then cultural identity. Rothman

(2007) stresses the role of schooling in acquiring grammatical features in HL. Hence, studies show that HS' attainment is affected by both linguistic and sociolinguistic factors.

2.2 The Debate of HS' Linguistic Attainment

2.2.1 The notion of incomplete acquisition in HS' research. Some researchers on HS in the USA conclude that HS have incomplete grammars (Albirini & Benmamoun, 2014; Benmamoun et al., 2013a; Montrul, 2008, 2011, 2016; Polinsky & Kagan, 2007). It is argued that HL do not fully develop (Montrul, 2016), and they are not completely acquired because of shifting to another dominant language (Benmamoun et al., 2013a). Benmamoun et al. (2013a) also claim that "the heritage language was first in the order of acquisition but did not develop fully at age appropriate levels because of the individual's switch to the societally-dominant language" (p. 9). And HS L1 is expected to be the weaker language (Albirini, 2014; Albirini & Benmamoun, 2014). HS' attainment has also been described as near-native (Scontras, Fuchs, & Polinsky, 2015). The argument is that HS usually miss or fail to acquire specific linguistic aspects of their HL and their competence is different from monolingual speakers. In Polinsky's definition (2008), an "incomplete learner or heritage speaker of language A is an individual who grew up speaking (or only hearing) A as his/her first language but for whom A was then replaced by another language as dominant and primary" (p. 40). After being critiqued for describing HS' grammars as incomplete, Benmamoun et al. (2013b) explain that they "support the notion of incomplete acquisition as a process, but want to discourage the use of the term 'incomplete grammar' to describe the end result of the process" (p. 278). According to Montrul (2008), second generation HS are more likely to experience language attrition and loss, "as the majority language begins to be used more than the home language, some aspects of the heritage language may be incompletely acquired, others may undergo attrition, and yet others may undergo attrition

when they were not fully mastered” (pp. 162-163). Additionally, in HS acquisition, it has been claimed that certain grammatical domains are vulnerable (Montrul, 2008, 2012; O’ Grady et al., 2011). Montrul (2008) proposes that linguistic features that depend on the interface between two linguistic components are the most vulnerable, and therefore may not be completely acquired, for example, the interface between semantics and syntax or pragmatics and syntax. And that grammatical properties at interfaces are “inherently more complex than properties internal to specific domain” (Montrul, 2016, p. 273). The difficulty of acquiring linguistic structures at interface was suggested by the Interface Hypothesis (Sorace, 2011). The complexity arises from the combination of multiple linguistic knowledge such as syntax and semantics. Furthermore, according to Albirini and Benmamoun (2014) and O’Grady et al. (2011), structures that depend on frequency are the most vulnerable in HL acquisition.

2.2.2 HL as a state of differential acquisition. I believe that in order to understand HS’ language, the term incomplete grammars should not be used to describe HS’ system. HL should be perceived as being a sub-system that originates from the source language and is systematic. HS provide opportunities for linguists to test available theories and to gain an understanding of language change. Pascual y Cabo and Rothman (2012) mention that HS’ competence is complete, but simply different as monolingual and HS experience different linguistic realities and the ultimate attainment will be different as well. Rothman and Treffers-Daller (2014) maintain that HS grammars are native and the term implies variation. Since there is variation among monolingual speakers, that variation would be multiplied in HS. Therefore, HS grammars are expected to display variation as well. Kupisch and Rothman (2016) argue that the use of ‘incomplete acquisition’ as a term to describe differences between monolingual controls and HS is “theoretically flawed and misleading” (p. 3). They explain that in linguistic theory

completeness is defined “on the basis of whether grammars abide by the universal rules of natural language” (p. 11), and HS grammars do not violate universal rules of natural languages. They further explicate that linguistic completeness of any grammars cannot be determined by comparing it to another grammars. They assert that the “endstate grammars” of HS is different from monolingual speakers, and for this reason, difference should not be perceived as incompleteness. Instead, they suggest the term “differential acquisition” (p. 15), as a more appropriate term to capture differences between HS and monolinguals. This research will adopt the differential acquisition term as well when referring to participants’ endstate grammars. Therefore, ‘differential acquisition’ refers to HS’ system, and it is the system that is acquired by my participants. And it is anticipated that it is different from monolinguals’ system and is systematic. In what follows, previous studies on HS’ morphosyntax and phonology will be presented, and sociolinguistic studies focusing on HS’ sociolinguistic competence will be discussed as well.

2.3 Linguistic Findings on HL Acquisition

2.3.1 Morphosyntax studies. There is an immense amount of research on HS that focuses on the linguistic outcomes of contact between a HL and a dominant societal one. Albirini and Benmamoun (2014b) studied the acquisition of concatenative and non-concatenative plural formation in Arabic L1, L2, and HS. In their study, three groups of learners were compared. Non-concatenative derivation is expected to be hard to learn because of its complexity. Its formation requires the singular stem to undergo an internal modification in the prosodic and vowel patterns (McCarthy, 1979). Albirini and Benmamoun also claimed that some of the plural concatenative forms are acquired beyond age 6. Their results revealed that both HS and L2 learners showed more accuracy in sound plural formation than in broken plural formation. It was

concluded that HS and L2 speakers had incomplete knowledge of plural morphology. In a different paper, Albirini and Benmamoun (2014a) concluded that HS had difficulty in dual formation and in using the correct Arabic pattern, since HS applied English rules. Also, HS overgeneralized the rule pattern of sound morphology to broken plural. HS did not have a problem with analytic genitives but had problems with the construct state (N+NP). Besides, a common pattern in the production of HS, in this study, was the use of the complementizer with indefinite relative clauses. In this study, L2 transfer cannot be separated from attrition and incomplete acquisition. Albirini et al. (2013) studied Egyptian and Palestinian HS, their results indicated that HS performance in subject verb agreement was better than noun-adjective agreement.

Polinsky (2008) equated HS' knowledge of noun categorization with 'incomplete acquisition'. Her study focused on gender assignment to nouns by HS of Russian. Russian has three genders: masculine, feminine, and neuter. Polinsky claimed that since gender assignment in Russian crucially depends on the knowledge of the Russian declensional system, such knowledge was either absent or reduced in HS's knowledge. Stem-stressed neuters and feminine nouns ending in palatalized consonants were problematic for HS. Montrul (2011) compared HS and L2 learners. She found that Spanish HS made more errors in written morphological tasks than in the oral ones. On the other hand, L2 speakers were more accurate in written tasks. Rothman (2007) investigated inflected infinitives in Brazilian Portuguese HS. His results revealed that HS grammars did not have inflected infinitives since they are learnt through formal education and HS usually don't have experience in formal education. Merino (1983) studied language loss in Spanish HS of Mexican origin. The study group attended American schools and were identified as balanced bilinguals. In this study, 41 bilingual children were studied from

kindergarten to fourth grade (5-10 years old). Morphosyntactic structures of Spanish (gender and number, tense, word order, relative clauses, conditional and subjunctive) and English were studied. The results showed that there were no significant differences by grade in comprehension in Spanish. However, there was a sharp decline in older groups in production (from 84% in first grade to 65% in fourth grade). The subjunctive and the conditional verb forms were challenging structures for Spanish HS in this study. This study showed evidence of language loss in Spanish HS. Merino claimed that severe language loss occurred in speakers who use both English and Spanish with the same speaker.

There is not much literature on Arabic HS in Europe. El Aissati (1997) studied plural formation by MA young speakers in the Netherlands where participants were tested in sound and broken plural. He studied plural formation in the Netherlands from the perspective of language loss, being a consequence of the second generation's diminished exposure to their L1. The purpose was to investigate the effect of reduced input on plural formation by second generation Moroccan immigrants and the strategies that they depend on. Participants were provided orally 30 nouns and asked to provide the plural forms. El Aissati found that in plural formation, the choice of overgeneralized patterns was idiosyncratic and a result of individual "paradigmatic levelling" (p. 75). Participants tended to rely on a fewer strategies and preferred to regularize the morphology of their language. In a quantitative study, Boumans (2006) studied the use of synthetic and analytic genitive by Moroccan immigrant children in the Netherlands and their counterpart monolingual group in Morocco. MA has two syntactic structures to express possession, synthetic and analytic constructions. Results indicated that immigrant children in the Netherlands prefer the analytic genitive. It could result from contact with the dominant language and limited language input. Bos (1997) investigated children's understanding of the relative

clause by both monolingual children and bilingual Moroccan children in the Netherlands, varying the word order of the main clause. Bos found that monolingual children in Morocco performed better than their peers in the Netherlands in sentences with OVS, and they were better at processing grammatical cues than bilingual Moroccans in the Netherlands (p. 85). On the other hand, she found that bilingual children have better performance in SVO sentences. Hence, HS' morphosyntax tends to be distinct from monolinguals.

2.3.2 Phonology studies. HL' phonology could be influenced by contact with the dominant language's phonology. Lyskawa, Maddeaux, Melara, and Nagy (2016) argued that two phonological systems may undergo convergence, just like two syntactic systems do. In their paper, the influence of contact between the HL (Polish) and the dominant language (Canadian English) was examined. The studied linguistic area was obstruent devoicing in Polish conversational speech. They proposed that it is possible that two phonological systems to undergo convergence. The results suggested that Polish second generation HS' devoicing pattern was similar to both homeland Polish speakers and English speakers. El Aissati (1997) studied the phonology of Moroccan HS in the Netherlands diaspora, the focus of the study was sound production and perception. The results demonstrated that HS have no difficulty in sound perception even when the sounds don't exist in the dominant language, such as pharangelized sounds. The influence of the dominant language was emphasized in sound production task as participants depended on phonological processes such as sound substitution, reduction of geminates, and simplification of syllable structure. El Aissati's study indicated that HS were able to perceive the studied sounds, but they were not able to produce them. Contrarily, it was also claimed that HS' phonology is the best preserved linguistic component (Benmamoun et al., 2013). HS are known for their strength in oral comprehension (Polinsky & Kagan, 2007), and

have better pronunciation and perceptual discrimination than L2 learners (Montrul, 2016). Saadah (2011) studied vowel production in HS of Palestinian Arabic and English-speaking L2 learners of Arabic. In her study, HS outperformed L2 learners and their VOT values were closer to monolingual speakers. Therefore, HS' phonology is the most preserved linguistic component.

2.3.3 Sociolinguistics studies. HS' sociolinguistic competence may be different from monolingual speakers' competence. Albirini and Chakrani (2017) studied the sociolinguistic competence of Arabic HS in using their multiple codes in narrative. The study examines HS' ability to use their Arabic varieties and English in the construction of narratives of personal experience. They concluded that HS are not socially and pragmatically competent in their alternation of their codes (Colloquial Arabic (CA), Standard Arabic (SA), and English (ENG)). The CA-based narratives revealed that codeswitching to SA was not always pragmatically appropriate. Albirini and Chakrani (2017) claimed that HS' context of acquisition limits both their access to the HL and the possibility "to observe its use in a socially and pragmatically appropriate manner. This diminishes their ability to use the heritage language according to the rules of social and pragmatic appropriateness" (p. 2). Albirini (2016) mentions that Arabic HS do not experience Arabic as a diglossic language as monolinguals in the Arab world do. Albirini explains that diglossia is "an abstract notion that is never realized in the daily social lives of Arab-American heritage speakers" (p. 301).

Similar findings were reported by Jo (2001). She concluded that second generation Korean heritage speakers have difficulties in using honorifics. The reason is that second generation Korean HS don't interact with grandparents and older relatives. Additionally, Jo described honorific usage to be complex. And honorific suffixes involves an interaction between two domains, morphology and pragmatics. Hence, sociolinguistics studies demonstrate that HS'

sociolinguistic competence is modified as well.

Studies on HS' linguistic components show that HS' competence is different from monolingual speakers, and the most affected area is morphosyntax. It is worth exploring the role of early input in the acquisition of phonology and morphosyntax. The purpose is to understand why difference appears to be prevalent in morphosyntax and come up with a hypothesis for the apparent disparity.

2.3.4 Early Exposure in the HL and the Critical Period Hypothesis

The critical period was referred to as a temporal span during which there is an intensified sensitivity to certain experiential stimuli, the presence of which is required for language development. During the critical period, there is an abrupt onset, followed by a gradual offset (Birdsong, 2005, p. 111). Language acquisition is more successful in younger learners, and age of acquisition is an important predictor of ultimate proficiency (Pallier, 2007). For language acquisition to be successful, exposure to a rich linguistic environment should take place before puberty. The theory was also extended to second language acquisition. It is predicted by the Critical Period Hypothesis that for attaining native-like level, learners should be exposed to the language at an early age and before puberty. Since HS get early input and are exposed to their HL since birth, it will be predicted that there will be no difference in attainment between HS and monolingual speakers. It is undebatable that young children acquire their L1 sound system at 10-12 months as during these months they lose the ability to discriminate phonetic distinctions used across natural languages (Werker & Tees, 1984). This is explained by their forming their own L1 sound system, and not being exposed to other sound systems. Research on HS phonology lends support to the advantages of early exposure for phonology (Au et al., 2002; Knightly et al., 2003). On the other hand, research on HS's morphology demonstrate that HS experience

difficulties in this linguistic area (Benmamoun et al., 2013; Montrul, 2016). Early input is advantageous to HS for phonology and core syntax, but not for morphology (Montrul, 2012, 2016). Au et al. (2002) and Knightly et al. (2003) conducted an experimental study of incipient L2 learners of Spanish and Spanish HS. Au et al. studied the performance of HS, who are over-hearers of their language during childhood. The purpose was to study long-term effects of childhood overhearing on phonology and morphosyntax. The over-hearers' accents were more native-like than the L2 learners. The over-hearers and the late L2 learners performed worse than monolingual speakers in morphosyntax tasks. They concluded that early exposure to language has an effect on phonology but not on morphosyntax. Knightly et al. (2003) confirmed Au et al.'s findings, as they found that there is a pronunciation advantage for the childhood HS over-hearers over late L2 learners. However, there is no benefit for morphosyntax. Both studies concluded that early exposure, as predicted by critical period, is advantageous for phonology, but not for morphosyntax in HS.

Therefore, research show that early input makes HS' phonology robust. It is known that to attain native-like pronunciation, you need to be exposed to a language from an early age. Long (2005) maintains that only young child starters could attain native like proficiency in phonology. And to get native-like attainment, exposure should take place before age 5. However, it was suggested in L1 acquisition that morphologically complex structures are acquired beyond age 5. In Berman (1982), it was proposed that the critical age for the acquisition of passives is generally between ages 7-9, and that pattern alternation in Hebrew depends on complex interactions between cognitive maturations and linguistic competence. Montrul (2016) maintains that to acquire L1 complex structures, the process of acquisition extends beyond age school to

adolescence. Also, Badry (2005) claims that Moroccan children acquire verb patterns beyond school age. Hence, age seems to play a central role in the developmental processes.

The effect of age and maturational constraint was also studied in regard to L1 attrition. Bylund (2009) investigated maturational constraints and first language attrition, so as to explain age-related differences in L1 attrition. It was suggested that there is a small gradual decline in attrition susceptibility during the maturation period followed by a major drop at its end (posited at around age 12). Attrition has been viewed as gradient, and it is more prominent in morphosyntax studies. When L1 speakers experience reduced L1 contact as in the case of immigrant communities (HS), speakers who are 12 years and older cope with the changes of linguistic setting without any radical language loss (Bylund, 2009). The changes in the linguistic setting take place at 12 years and older, after the maturation period, and the attrition susceptibility has faded.

To support his argument, Bylund cited previous studies on L1 speakers in contact situations. Hyltenstam, Bylund, Abrahamsson, and Park (2009) studied 21 Korean adoptees living in Sweden in order to determine whether the adoptees' early exposure to Korean was advantageous when relearning this language. Participants were compared to a group of Swedish learners of L2 Korean. Grammaticality judgment tests showed that the advanced Swedish learners attained higher scores than the Korean adoptees participants. However, voice onset time (VOT) results revealed that the adoptee participants did better than L2 learners. Hyltenstam et al. suggested that language exposure during childhood may have long-term effects on phonology. Silva-Corvalán (1994) found similar trends of age effect in her study on L1 Spanish speakers of Mexican immigrant origin in Los Angeles. Silva-Corvalán's study involved three groups. Group 1 consisted of those who arrived in the United States after the age of 11; Group 2 consisted of

those who arrived before the age of 7; and Group 3 comprised those who were born in the United States. The focus of the study was tense-mood-aspect system and copula. Results showed that Group 2 and Group 3 exhibited simplifications in tense-mood-aspect and extended the use of the copula *estar* 'to be'. In group one, participants' performance displayed the most conformity with Spanish monolingual patterns. Participants in Group 1 came to the US after age 11. Bylund claimed that Silva-Corvalán's work lends support to the idea that a person's L1 proficiency is less subject to change if reduced L1 contact takes place after the age of 11. Findings from studies on L1 relearning indicated that when reduced L1 contact takes place at age 5, speakers are subject to attrition in morphosyntax to a higher degree than speakers who arrived in the host country after age 11. Bylund concluded that maturational period is located at age 12 and the pattern of sensitivity is described to be "a declining gradient rather than a plateau with no internal variation" (p. 701). In phonology, early exposure is advantageous even when the age of reduced contact with L1 is less than 5 years. Therefore, maturational period is gradient and depends on the acquired linguistic area. The fact that speakers older than 12 years cope up with their modified linguistic environment may suggest that morphosyntax is acquired by the mid-teens, and that is why attrition is not noticeable in older speakers. In Bylund (2009), it is not clear if the attested pattern in participants, who moved to a modified linguistic context at age 5, is a result of attrition or if the tested morphological areas need a longer window of time to develop.

Age as an important factor in language acquisition has also received support from studies on SLA. Long (2005) believes that different domains, including phonology and morphosyntax, are subject to sensitive periods; however, the off-set point might be different. It was suggested that in L2 acquisition there is a different critical period for morphology. Granena and Long

(2013) investigated ultimate attainment in Chinese learners of Spanish. Their purpose was to identify maturational constraints in three language domains. The study consisted of participants from various ages. Ranging from children, aged 3 years to 29 years old adults. The results of the performance of three age groups (3-6, 7-15, and 16-29) revealed that age of onset was the steepest for phonology, followed by lexis and collocation, then morphosyntax. The results evidenced the existence of three consecutive critical or sensitive periods for the studied areas. The native-like attainment for these domains are age 5 in phonology, 9 in lexis and collocation, and 12 in morpho-syntax.

Based on the discussed studies on L1 and L2 acquisition, I hypothesize that there is not a fixed stage for the critical period and it is gradient. Hence, the discussed studies in both L1 and L2 acquisition lend support to Granena and Long's (2013) hypothesis. Adopting the principles of maturational constraints in L2 acquisition will suggest that HS will exhibit native-like attainment in phonology, mastering the phonology of their HL by 5, but the acquisition of morphosyntax is a continuous process. Therefore, mastering all the aspects of morphosyntax will continue beyond age 5, spanning the whole school age, till age 12 or beyond. In other words, morphosyntax acquisition needs more time. Given the circumstances of HS acquisition, it is hypothesized that they will have different patterns of acquisition and their morphology will not reflect all the aspects attested in their source language,¹ and for that reason, modification and morphological change is expected in HS' variety.

¹ Source language is used to refer to MA, the variety spoken by monolingually raised speakers in Morocco. Source-like refers to forms conforming to the source language. Non-source like is used to describe forms not conforming to MA. It implies difference, but does not imply any type of violation of MA grammar.

2.3.5 The Rationale of the Study

Previous studies demonstrated that HS' linguistic competence is different from both monolingual speakers and L2 speakers. The acquisition of a native language under different circumstances leads to language change in HS' grammars. In this study, I investigate nominal morphology represented by plural formation and diminutive forms, and verbal-derivational patterns, represented by four patterns. This study reports on the pattern of acquisition of nominal and verbal morphology, and seeks an understanding of HS' system and the general mechanism characterizing their morphological system. The rationale of examining two morphological processes in this research is that concatenative morphology is usually simple and acquired by age three. However, non-concatenative morphology is complex and may be acquired beyond age 6. In what follows, I will give an overview of HS in France and the investigated morphological areas.

2.4 Moroccan HS in France

There is a large community of immigrants of Moroccan origin in France. Odasso (2016) stated that currently "France is home to the largest legally residing population of Moroccan descent" (p. 79). Moroccan immigrants are the result of labor migration in the 1960s. In 1963, there was an agreement, called French-Moroccan labor recruitment agreement, to regulate immigration to France. According to the nationality criterion, based on Eurostat (1998), the number of Moroccan immigrants in France is 572,652 (Boumans & de Ruiter, 2002). Their community consists of a first, second, and third generation. First generation Moroccans were born and raised in Morocco, and second generation Moroccans were born either in Morocco or in France. The third generation children are nearly all born in France. The first generation in Europe, generally, have low levels of formal education (Boumans & de Ruiter, 2002). Lebon

(1996) claims that during the onset of their immigration, they were overrepresented in low wage jobs. This representation has hardly changed today (as cited in Boumans & de Ruiter). Generally, just 13% of native-born in France immigrants have a university degree or higher (Schain, 2008). Nowadays, France is no longer interested in labor immigration, and immigration from Morocco to France has been restricted. Since 2000, a number of French laws enforced new conditions and limitations for family reunion. Odasso (2016) contended that change in French immigration policies “transformed Moroccans from invited workers (with their spouses and children) to undesirable migrants” (p. 79). In 2013, there was an agreement between Morocco and the European Union to facilitate issuing visas for certain groups such as students, researchers and professionals. Accordingly, labor immigration is no more desirable in France. And there was a shift from labor immigration to skilled immigration (Odasso, 2016).

‘Languages of origin’ (langues d’origine) is the term used to refer to languages spoken by immigrant communities (Helot & Young, 2002). They claimed that children in France start school at an early age, usually three, but, sometimes they start school as young as two years old. The motivation behind starting school at an early age is to acquire the necessary linguistic skills so as to be prepared for elementary school. HL, in France, are thought to be harmful. This is similar to the notion of language parochialism. According to the notion of linguistic parochialism, bilingualism is harmful and minority languages are not welcomed (Lessow-Hurley, 2005). In France, the term bilingualism is used when learning a European language. According to Helot and Young,

Languages of origin are still perceived in French schools as the main obstacle to the acquisition of the French language and as a source of learning difficulties. This explains

why the term bilingual, which has many positive connotations in French society today, is never used in official texts to refer to children from migrant backgrounds. (2002, p. 97)

Therefore, HL are perceived to hinder academic achievement and the process of assimilation. The majority of the HS in France only have access to the spoken form and did not study Standard Arabic, as Arabic is a diglossic language and two distinct varieties co-exist. One is referred to as the high variety (Standard Arabic) and the other one is the low one (colloquial Arabic). The high variety is the one used in schools, the media, while the low variety is the spoken one. HS usually know just the spoken variety, which they acquire at home. They have little or no knowledge of SA and they share similarities with non-literate Arabic speakers from the Arab world (Montrul, 2016) as both groups have access just to CA. However, HS are usually educated in the majority language. Unlike monolingual speakers, Arabic HS don't experience the diglossic context of SA and CA (Albirini, 2016).

2.5 Plural Formation

Plural formation in MA has been described as a complex process (El Aissati, 1997). El Aissati maintains that “it presents a very different picture to the analyst and the learner. There are more than forty types of plural nouns, and it is usually not possible to say which singular form takes which plural form” (p. 61). There are two major plural types in MA: sound plurals and broken plurals. Albirini and Benmamoun (2014) claim that “the two patterns of plural derivation vary with regard to acquisition age, morphological complexity” (p. 855).

2.5.1 Sound Plurals

Sound plurals are formed by concatenative derivation which depend on the suffixation of a plural morpheme to the right edge of the singular stem (Albirini & Benmamoun, 2014). Sound plurals are formed by the addition of an ending (suffixation) without any basic change in

the stem of a noun or an adjective to which it is added. In MA, there are three sound plural suffixes: -in, -a, and -(a)t. In what follows, I will present the main context of use of sound plural suffixes, which is mainly adopted from Harrell (1962).

The sound plural suffix -at: It occurs more frequently with nouns than adjectives. All diminutive feminine forms take the suffix -at to form the plural as in [bnita] ‘little girl’; [bnita-t] ‘girls’. A very large number of nouns from diverse classes ending in ‘a’ take the suffix ‘-at’ to form plural forms. These nouns can be nouns of unity from collectives as in [bida] [bid-at] ‘eggs’, nouns ending in -ija as in [namusija] [namusijat] ‘beds’, nouns of instance [fəʕla] [CəCCa] and [təʕʕila] [CəCCiCa] as in [dəʕʕa] [dəʕʕ-at] ‘pushes’, nouns of the pattern [mCaCCa] as in [mdabza] [mdabz-at] ‘quarrels’, nouns of the [fəʕʕala] [CəCCaCa] pattern which refer to human females as in [xəbbaza] [xəbbazat] ‘woman baker’, sex gender pairs [malika] [malika-at] ‘queens’, most nouns on the pattern of [fʕa] [CCa] as in [bra] [braw-at] ‘letters’, and it is suffixed to feminine participles used as nouns as in [mərʕuda] [mərʕudat] ‘rejected’. In Arabic, the sound feminine morpheme is more frequent than the sound masculine morphemes as it occurs with human and nonhuman nouns (Albirini & Benmamoun, 2014).

The sound plural suffix -in: This ending occurs mostly with adjectives or adjectives which have come to be used as nouns. There are eleven word classes that form their plural forms through -in suffixation. Only the first two of these classes, the participles and the nisbas ‘relative adjectives’, embrace a large number of words. Examples of these classes are: [nasj-in] ‘having forgotten’ (participle); [məʕʕrij-in] ‘Egyptians’. Examples from other classes: masculine diminutive adjectives as in [zwiwən] [zwiwn-in] ‘pretty. pl’, the ordinal numerals as in /talt-in/ ‘the third. pl’, adjectives of the [fəʕʕlan] [CəCCan] type as in [ħaʕʕman] [ħaʕʕman-in] ‘shy. pl’, adjectives of the [fəʕʕal] [CəCCaC] pattern as in [ʕəjjan] [ʕəjjan-in] ‘tired. pl’, adjectives of the

[məʃʃal] [məCCaC] as in [mebrad] [mebrad-in] ‘cold-natured. pl’, adverbial adjectives of the [fəʃlaC] [CəCCaC] pattern as in [məmad-in] ‘clumsy. pl’, adjectives of the [ʃil] [CCiC] pattern as in [rʃiʃ] [rʃiʃ-in] ‘excellent. pl’, and adjectives of the pattern [fijjəl] [CijjəC] as in [hijjən] [hijjnin] ‘easy. pl’.

The sound plural suffix -a: It is attached to a limited number of nouns. There are three classes that form their plurals by -a suffixation. Those classes are used to refer to persons with “a professional or habitual activity” (Harrell, 1962, p. 105). The first two classes are made up of a large number of nouns. Nouns of the first two categories are common while the third is represented by a small number. The first class is made up of nouns with the structure [CvCCaC] [fəʃʃal] which refer to professional or habitual activity such as [bənnaj] [bennaj-a] ‘masons’. The second class is made up of nouns with [CCVCCi] pattern. They also refer to professional or habitual act and they are mostly ‘nisbas’ formed from broken bases as in [bnadri] [bnadriy-a] ‘tambourine players’. The third class of the nouns that takes the ending -a is the quadrilateral noun pattern [fəʃlaC] [CəCCaC]. There are very few nouns of this sort as in [sʰəmsʰar] [sʰamsʰar-a] ‘brokers’. From the classes that Harrell (1962) describes, it seems that the morpheme plural -a occurs only with human beings and it is less frequent than the other sound morphemes.

2.5.2 Broken Plurals

Broken plurals are formed by an internal change in the singular stem and involve non-concatenative derivation as the prosodic and vowel patterns are modified (McCarthy, 1979). The process involves the mapping of a consonantal root onto a template that is composed of slots for vowels and consonants. Most nouns, and many adjectives, have broken plurals. One of the most common broken plurals is the pattern CCaCəC, which accounts for about half of the broken plural in MA (Harrell, 1962, p. 113). There are approximately 40 different broken plural patterns. The

most common patterns are: CCaCəC, CCaC, CCaCi, CCuC, CCuCa,CCaCa, CuC₁C₁aC, CiCaC, CuC₁C₂aC, CuCəC, CCəC, ʔaCCija, CuCuC and CCiC. I adopted Harrell’s classification of the patterns from the most frequent ones to the least frequent ones. In Harrell (1962), the order of presentation of the broken forms corresponds approximately to their frequency.

2.6 Diminutive Forms

Diminutives are derived from nouns and adjectives. A diminutive form is characterized by an initial cluster of two consonants followed by a vowel. Benchiba-Savenius (2013) notes that diminutives in MA are rarely referred to in linguistic literature. MA diminutives are formed by the affixation of the morpheme –i- after the second segment of the base, after an initial cluster of two consonants. It was described as very productive and used “to express affectivity or close relation with the addressee, or to establish a climate of intimacy” (Versteegh, 2008, p. 279).

Harrell (1962) summarizes six types of diminutives in MA which depend on word stem. And the stem determines the pattern. Monosyllable stems form four sub-types. The first sub-type is trilateral monosyllables as in [bʁal] [bʁijjəl] ‘mule. dm’ and the applied pattern is [fʁijjəl] [CCiC_jC_jəC]. And it is formed by inserting ‘-j’ between the second and third consonants.

Monosyllables with middle weak trilateral roots usually have the diminutive pattern [fwijjəl] [CC_wiC_jC_jəC], as in [bir] [bwijjər] ‘well. dm’. The third type of monosyllable stems has a /ə/ and use [fʁila] [CCiCa] pattern as in [bənt] [bnita] ‘girl.dm’. The fourth type of monosyllable stems are adjectives of color and defect (Harrell, 1962) and many adjectives of the pattern [fʁil] have diminutives of the pattern [fʁiʁəl] [CC₂iC₂əC], showing a repetition of the second root consonant as in [bkəm] [bkikəm] ‘mute. dm’. The stem [fəʃl/ foʃl+vowel] represents type two and applies [fʁila] [CCiCa] pattern in diminutive formation. In this pattern, the diminutive form is usually formed by inserting /i / between the second and third consonants while retaining the final vowel

as in [bəgra] [bgira] ‘cow. dm’. The third type is represented by middle-weak stems with a final vowel (disyllables). This type of stems form their diminutive form as the stems fəʃl / foʃl+vowel do, but a /w/ is added as the second consonant, and the pattern [fwiʃv] [CC_{wi}Cv] is applied to form diminutive forms as in [biru] [bwiru] ‘office. dm’. The fourth type of diminutives is represented by fʃala/ fʃila stems. These types of stems form their diminutives using the pattern [fʃijjla] [CCiC_jC_jCa] as in [dʒaʒa] [dʒijjʒa] ‘hen. dm’. Type five of diminutives consists of words with four consonants. Irrespective of their root and pattern structure, usually words with four consonants have the diminutive pattern CCiCəC as in [kəskas] [ksikəs] ‘couscous pot. dm’. Category six in diminutives is represented by three-consonant words with a stable vowel between the first and second consonants. Words of this type follow the same pattern as words with four consonants. But, a /w/ is inserted as the second consonant of the diminutive pattern as in [raʒəl] [rwiʒəl] ‘man. dm’. Table 2.1 summaries the main diminutive patterns in MA.

Table 2.1	
<i>Diminutive Patterns</i>	
Stem type	Required pattern
1. Monosyllables <ul style="list-style-type: none"> • Trilateral monosyllables • Middle-weak trilateral monosyllables • Trilateral monosyllables with a vowel ‘ə’ • Adjectives of color and defect 	fʃijjəl [CCiC _j C _j əl] fwijjəl [CC _{wi} C _j C _j əC] fʃila [CCiCa] fʃiʃəl [CC _{2i} C _{2ə} C]
2. fəʃl/ foʃl+vowel	fʃila [CCiCa]
3. Middle-weak stems with a final vowel	fwiʃv [CC _{wi} Cv]
4. fʃala/ fʃila stems	fʃijjla (CCiC _j C _j Ca)
5. Words with four consonants	CCiCəC
6. Three-consonant words with a stable vowel	fwiʃəl(v) (CC _{wi} CəC(v))

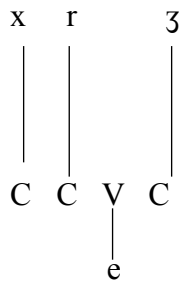
2.7 Verbal Derivational Patterns in MA

Words in Arabic and other Semitic languages can be derived through both concatenative and non-concatenative morphology. Concatenative morphological processes depend on affixation. On the other hand, non-concatenative morphological processes are based on root pattern alternation (Ennaji, Makhoukh, Es-saiydi, Moubtassime, & Slaoui, 2004). Verbs in Semitic languages are characterized by a combination of Root + Pattern (Berman, 1985, 1999). The root is typically composed of three consonants, and it conveys the semantic core of a word. The patterns tend to modify the core meaning (Berman, 1985). Verbs are formed according to patterns, and semantic notions such as causativeness, reciprocity and passive are lexicalized according to morphological verb pattern system of a Semitic language. Root-and-Pattern is an important derivational device for the verbal system of a Semitic language (Ayalew, 2011).

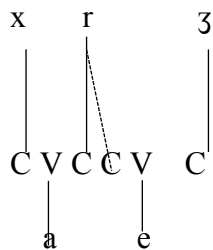
The major derivational forms in MA are causatives, reciprocals, reflexives and the passive (Ennaji et al., 2004). MA's verb forms are also built up on consonantal skeleton, referred to as root (Badry, 1982, 2005, 2009; Harrell, 1962). The derivation relies mainly on combining the consonantal roots with verbal patterns, referred to as measures. McCarthy (1979, 1981) provides a templatic account of the Arabic verb measures, with each measure having its own template. For example, measure II is represented with a CVCCVC template and a special association rule is needed, as consonantal root and vocalic melodies are associated to prosodic templates. At the underlying level of representation, there are three tiers, the first one is the consonantal root tier. And the second tier is the skeletal tier and it is also referred to as the prosodic template, and the third tier is the vocalic melody tier. In agreement with the well-formedness constraint, the three tiers are linked together by association lines. The direction of the

association proceeds from left to right. The derivation of pattern1 in MA is illustrated in example 1), and 2) is an example of the derivation of causative forms (pattern 2).

1. xreʒ² ‘went out’



2. xerreʒ



Modern SA has 15 patterns (McCarthy, 1979) and just ten of them that are used frequently (Badry, 2005). MA has only seven patterns (Badry, 2005). MA has lost three patterns as shown in table 2.2. Only four patterns that are represented by a large number of verbs (Harrell, 1962). In Harrell (1962), measure1, 1a, 2 and 5 are represented with a large number of verbs. In Badry (2005), measure 1a and 5 constitute one pattern (P5) and they express medio-passive.

² The adopted transcription in verb patterns is very broad. Modern Standard Arabic short vowels are either dropped or reduced in MA. /e/ represents any of the reduced short vowels and in many cases could be transcribed as a schwa (adopted from Badry, 2005).

Pattern 1 (P1) is the most frequent and is referred to as the basic one. It is represented by CCeC template for the sound root and has several syntactic and semantic functions, and described to be the simplest (Badry, 1982). It can be transitive or intransitive. Badry claims that pattern 1 may be the first pattern to be analyzed by children and productively derived from the root (Badry, 1982). It is also very frequent and easy to understand by children (Badry, 1982; Berman, 1985) and therefore should be the earliest to acquire. Formally, it is simple as just one vowel is added to the root (C-C-C), and also has multiple semantic functions depending on the root. Pattern 2 (CeCCeC) is used for causatives as in [ʃerreb] ‘cause to drink’; pattern 5 (tCeCCeC) for medio-passive as in [t-herres] ‘to be broken’, and pattern 6 [t-CaCeC] is used to express reciprocity and derive reciprocal verbs as in [t-ʃaneq/ t-ʃanqu] ‘they hug each other’. In subsequent sections, a brief description of patterns 2, 5 and 6 is presented.

Note. Adopted from Badry (2005, p. 245)

Pattern	MSA	MA	Gloss	Semantic function
PI/P1	CvCvCv daxala ʃariba kabura	CCvC dxel ʃreb kber	“enter” “drink” “grow”	Multiple
PII/P2	CaCCaCa daxxala	CeCCeC dexxel	“bring in”	Causative
PIII/P3	Ca:CaCa sʕa:ħaba	CaCceC sʕa:ħeb	“befriend s.o.”	Conative/reciprocal
PIV/P4	?aCCaCa	-----		Causative

	ʔadxala		“bring about”	
PV/P5	taCaCcaCa tadaxxala	tCeCceC tdexxel	“get (oneself) involved”	Reflexive/medio- passive
PVI/P6	taCa:CaCa tada:xala	tCaCeC tdaxel	“interact”	Reciprocal
PVII/P7	ʔinCaCaCa ʔinʕakasa	-----	“reflect”	Medio-passive”
PVIII/P8	ʔiCtaCaCa ʔiʕtarada	-----	“block/obstruct”	Reflexive
PIX/ P9	ʔiCCaCca ʕihmarra	CCaC ħmar	“become red”	Inchoative
PX/P10	ʔistaCCaCa ʔistaʕradʕa	steCCeC Staʕredʕ	“review/present”	Multiple

2.7.1 Causative verbs (P2). Causative verbs in MA express a relationship of cause and effect (Ennaji et al., 2004). In other languages, causative morphemes may be isolated and be realized with a particular phonological form (Benmamoun, 1991). In MA, causative verbs are formed by the affixation of a consonantal mora to the verbal root. The affixed consonant is invariably the geminate of the second radical of the root (Benmamoun, 1991; Loutfi, 2017). Hence, the morphological process of causative verb depends on gemination and infixation. To explain the reason why the causative morpheme targets the second consonant, three accounts have been proposed. The templatic-based account proposes that consonant gemination results

from a fixed shape template (CvCCvC) (McCarthy, 1979, 1981). The second account proposes that the first radical of the root to be a privileged position and gemination is a required process pertaining to syllable well-formedness (Noamane, 2013). The third explanation (Loutfi, 2017) adopted the framework of Optimality Theory as an explanation. For the purpose of this study, I adopted the templatic-based account as an explanation for causative as a morphological process. In McCarthy (1979, 1981) medial gemination in measure II is accomplished with a CVCCVC template and a special association rule.

2.7.2 Medio-passives (P5). Medio-passive verbs are formed on the basis of pattern 5 [t-CeCceC] for sound stems as in ‘tkeffeh’ ‘to be spilled’. Medio-passive is formed by affixing a prefix-t to measure 2. Also, medio-passive may be formed by affixing t- to measure1 as in [baʕ]; [t-baʕ] ‘to be sold’ and [dʕrab] ‘to hit’ and [ttədʕreb] ‘to be beaten’. Harrell (1962) explains that the simplest meaning of medio-passive is the ‘pure passive’. Medio-passive acquisition in Semitic languages such as Hebrew is acquired late (Berman, 1982). And in Badry’s results (1982, 2005), MA speaking children show an overuse of the causative pattern at the expense of medio-passive forms.

2.7.3 Reciprocal verbs (P6). Reciprocal verbs are derived by pattern 6 (t-CaCeC) ‘t-daxel’ ‘get interfered’; ‘tfahem’ ‘to come to a mutual understanding’. Reciprocal verbs express the mutuality of an action as two parties are involved. In the singular form a preposition is needed. It expresses a mutual transitive action and implies the existence of two agents (Badry, 1983, 2005; Harrell, 1962). In plural forms, no preposition is needed. Plural forms are more common than singular forms; as in ‘t-fahmu’ ‘to come to a mutual understanding’; [dʕ-dʕabzu] ‘they fight each other’. Reciprocal verbs express a mutual action and they can also express the notion of competition and rivalry (Harrell, 1962). Badry’s study (2005) suggests that reciprocals

are acquired late in MA. She explains that “in Arabic, the reciprocal pattern is semantically transparent but conventionally not utilized productively by adult speakers as many reciprocal functions are expressed with analytical phrases including P1 and a pronominal form ‘each other’” (p. 259). She also pointed to the complexity of the reciprocals that children face during their developmental stages as the difficulty arises from complex semantic relations; first, the action is performed by two agents who are affected by the action and affecting the action as well. Therefore, two perspectives of analysis are involved in the acquisition of the reciprocal forms. Reciprocals are late acquired in other Semitic languages such as in Hebrew as they are considered to be conceptually more difficult (Berman, 1980, 1985).

2.7.4 The Acquisition of Verbal-Derivational Patterns in Semitic Languages

Badry (2009) proposed derivational verbal morphology milestones in Arabic. She referred to her data from 2:5- to 9:9-year old children acquiring MA. Her studies (1983, 2005) show that Moroccan children depend on both horizontal (deriving from other surface patterns) and vertical (deriving from the root) strategies. In other words, words are formed from roots as well as from other surface patterns, and the choice of a strategy depends on the developmental stage. She listed four developmental stages: the first stage is characterized by the use of patterns as amalgams, it was suggested that words are acquired as independent and unanalyzed units. The second stage is described as pattern discover phase (Badry, 1982). The third stage is characterized by vertical derivation as the child become able to extract the consonantal root from the patterns. The fourth stage is ‘the horizontal derivation stage’, the child is able to derive from other surface patterns, and derive complex forms from the basic ones. Her studies show that P1 is the most productive and frequent in child’s language. Children at all studied ages were able to use pattern1 productively among the other three patterns and the percentage of use differ among

the three patterns. After mastering P1, the causative pattern was the first to be used productively by children and was stabilized by age 3;5. It is followed by the reciprocal then the middle voice patterns. Badry (2005) explains the reason of including children from various ages to study verbal derivation in MA is based on her previous studies that revealed that both Arabic and Hebrew speaking children start to use their derivational morphology productively about age 3 and they continue their process of acquisition by reorganizing their mental lexicon, using both vertical and horizontal derivation beyond preschool years.

Another example of pattern development in Semitic languages is the acquisition of Hebrew patterns. Berman (1982) studied pattern alternation in Hebrew speaking children. Results show that the basic pattern (P1) is the most frequent in children's language in 2;4 age group as a given verb-root was used largely in one single pattern. The oldest children aged 5-6 were able to use most of the studied patterns including causative forms. However, they did not master passive and inchoatives. These two concepts are lexicalized in the Hebrew system. It was suggested that Hebrew speaking children will not master these two patterns until a later stage in grade school. The children in the study avoid using the pattern associated with passive and inchoative and they express the target meaning, passive and inchoative, through using "suitable, non-immature paraphrases" (p. 183).

It was suggested that the critical age for the acquisition of passives in general being between ages 7-9. Berman argues that the process of acquiring pattern alternation in Hebrew depends on complex interactions between cognitive maturations and linguistic competence. A metalinguistic conceptualization of the patterns is needed where the knowledge of consonantal root and patterns is required. This type of knowledge depends on literacy as well. It could not be mastered until puberty. Berman also highlights the importance of input in determining what the

Hebrew speaking child conceives of as a basic form. Moreover, Berman (1985) discussed two types of errors that children make during encoding semantic notions within the verb-pattern system. These types of errors are neutralization of semantic distinction and pattern substitution.

Previous studies in Arabic and Hebrew verb patterns may imply that there is a separate critical period for the acquisition of morphology, since acquisition needs to be established beyond age 5. Also, children are faced with multi-tasking as they need to acquire a specific morphological pattern and simultaneously need to conceptualize the semantic function associated with a particular pattern. And because verb pattern alternation is one of the complex forms, I maintain that it is among the late acquired structures. It was claimed that morphological complexity is a predictor of age of acquisition (Albirini & Benmamoun, 2014). Both nominal and verbal morphology studies address the following research questions:

2.8 Research Questions

1. What are the acquired patterns in plural formation, diminutive forms, and verbal derivational processes?
2. How do speakers compensate for the patterns that are possibly not acquired?
3. What are the characterizations of HS' nominal and verbal derivational processes?

2.9 Hypotheses

3.9.1 Plurals' Hypotheses

The hypotheses that plural formation study aims to test are:

1. Within sound plural, the order of acquisition and percentage of source-like forms will be in the following order: -at>-in>-a. The rationale for the hypothesized order is based on the sound plural morphemes frequency in MA.

2. Participants will experience greater ³ difficulties with broken plural formation since it involves non-concatenative⁴ processes. The hypothesis will be supported if the percentage of accuracy is low.
3. HS will overgeneralize plural concatenative processes (suffixation) to forms that require non-concatenative processes (internal stem modification).
4. The morpheme plural -at will be used as a default form for plural formation in MA.

3.9.2 Diminutives' Hypotheses

In this study, the acquisition of diminutive forms in HS are also investigated. Hypotheses that the diminutive data tests are listed in 1, 2 and 3.

1. HS will experience greater difficulties forming diminutive forms, since diminutive formation involves non-concatenative morphology. The hypothesis will be supported if the percentage of source-like use is low.
2. HS's production will show non-source like diminutive forms; however, they will be rule-governed. The hypothesis will be supported if participants' non-source like data exhibits a consistent pattern.

³ The use of the terms difficulty or divergence are used to describe the difference between the HL and source language so we can have a broader picture of HS' system. They don't imply any morphological deficit.

⁴ Non-concatenative processes are considered complex processes and are acquired late in L1 acquisition (Albirini & Benmamoun, 2014)

3. Less complex patterns will be acquired and will be generalized to patterns required by irregular stems.⁵ My hypothesis will be supported if acquired and less complex patterns are overgeneralized to middle-weak stems.

2.9.3 Verb Patterns' Hypotheses

In addition to nominal morphology, this study also investigates verb patterns in HS. The hypotheses that are tested for verbal derivational morphology are:

1. Pattern 1 will be acquired and used productively in the HL.
2. HS will use pattern 2 productively to derive causative forms. However, the phonological form will be modified. My hypothesis will be supported if data shows that participants use P2 at about 70% or higher, and participants have constraints against geminate consonants in applying P2.
3. Morpho-semantic distinctions will be neutralized in the HL, as semantic distinction (medio-passive and reciprocal) will not be lexicalized using morphological patterns (P5, P6). The hypothesis will be supported if P1 and periphrastic constructions are used instead of P5 and P6.

2.9.4 General Hypothesis

A general hypothesis applying to the data on nominal and verbal morphology test is:

⁵ In Badry (2005), more errors were attested in weak roots, where one of the consonantal positions is a glide. In this study, I use irregular stem to refer to weak roots, four consonants roots and three consonants with a stable vowel.

1. Data will support the hypothesis that there is a distinct Sensitive Period (critical period) for the acquisition of morpho-syntax and the closing is in mid-teens (Granena & Long, 2013; Long, 2005).

In the next three chapters, methodology and results will be presented. First, chapter three concerns methodology. It provides an explanation for the chosen methods in data collection. It also gives details on participants and reports on details of the production tasks of three experiments including stimuli and procedures. Results of nominal morphology are presented in chapter four. A discussion of both plural formation and diminutive forms is also presented in this chapter. Chapter five describes the findings of verbal morphology. A discussion is also provided in this chapter.

Chapter Three

Methodology

Finding the right and appropriate methodology for studying HS is one of the most challenging aspects in HS research (Polinsky, 2008). Grammatical judgment tasks were critiqued and found to present difficulties in HL studies, as it was claimed that HS perform at random (Polinsky, 2008). Corvalán (2001) pointed out that grammatical judgement tasks are not considered reliable (as cited in Montrul, 2016). Informal observation of naturally occurring speech is difficult and challenging as well (Polinsky, 2008). Montrul (2016) states that production and comprehension tasks yield precious information about the linguistic knowledge of a speaker. She further claims that “if a language learner/ speaker produces and understands a particular linguistic expression (such as a word, a phrase, or a sentence), it is reasonable to conclude that this expression is part of the learner’s/ speaker’s linguistic knowledge”(p. 193). Oral production tasks proved to be one of the appropriate tasks in HS research. For example, Montrul, Foote, and Perpiñán (2008) employed both written and production tasks. In their study, they investigated gender agreement in Spanish L2 learners and HS. Results showed that L2 learners did better in written tasks but HS did better in the oral tasks. Written tasks need more metalinguistic awareness and oral tasks need fast and spontaneous responses. They further claim that in their study “the written tasks favor L2 learners’ metalinguistic abilities, whereas the oral task favors heritage speakers’ spontaneous skill with the language” (p. 548). Since HS acquire their HL through the oral modality and in a natural setting, it will be appropriate to use oral tasks in studying HS. The task needs to match the modality through which they acquire their HL. And since HL are acquired implicitly, the task should be designed to generate the implicit acquired structures. Additionally, the method that needs to be used in studying HS should take into

consideration the social and linguistic context under which HL are learned. Polinsky (2008) maintains that by using simple experimental methodology, vital linguistic data can be obtained. In this research, I found oral production tasks to be the most appropriate tool for studying my participants' grammatical knowledge on nominal and verbal morphology. My participants have almost no formal education on their HL and since birth they have been using their HL orally and have no metalinguistic awareness of their HL, as metalinguistic awareness is acquired through schooling in the HL.

The baseline against which HS' performance is compared is a debatable issue on HS studies (Montrul, 2016). It is better not to compare HS to monolingually raised speakers to avoid negative implications and destructive judgments about HS grammars, and because HS and monolingual speakers acquire their native language in different and distinct contexts of acquisition (Pascual y Cabo & Rothman, 2012). Linguistic diversity is attested on all levels, among monolinguals and in HS as well (Rorthman & Treffers-Daller, 2014). Also, there are qualitative and quantitative differences in the input they got during their childhood (Kupisch & Rothman, 2016) and the mode of acquisition is also different since monolingual speakers enhance their development by formal education and acquire metalinguistic skills in their native language. Because of the different realities and different social contexts of acquisition, and because both monolingual speakers and HS are native speakers of their varieties, it is expected that the linguistic outcomes of the two groups will be different, and therefore, we should not compare them to make generalizations that favor monolingual performance. This research aims at understanding HS' variety as a subset of MA that is systematic, different, and rule governed. This research also aims at understanding the change and linguistic difference in the HL. I will take the source language (MA) as a point of reference to determine the characterization of HS'

grammars. And the ultimate aim is to reach an understanding of HL as a subsystem variety that is a result of a modified context of acquisition.

Montrul (2016) claims that after selecting participants for a study, a detailed description of participants is needed so as to understand extralinguistic factors that play a role in their linguistic knowledge. Accordingly, a detailed questionnaire is needed to understand other variables that have a bearing on HS' linguistic knowledge such as age of acquisition of the HL and the majority language, country of birth among other factors. The questionnaire may also inform on the perceived proficiency of both the HL and the majority language.

Before conducting the three experiments, I started with a questionnaire in French that participants needed to complete. It gives details on age, education, age of arrival, father's and mother's country of birth, their parents' job, parents' education and number of visits to the home country. After completing the questionnaire, three experiments were conducted during different days. Experiment 1 investigated plural formation in HS. In experiment 2, HS were tested in diminutive formation and in experiment 3, participants were tested in verbal derivational patterns. In what follows, details on participants will be given on section 3.1. Method and procedures for each experiment are explained in section 3.2. Then, in section 3.3, a brief overview of HL analysis is given, and section 3.4 discusses the motivations behind the choice of the studied grammatical areas.

3.1 Participants

Fifteen French-Moroccan HS participated in this study. Eight participants are females and 7 are males. Their age is between 18-40. 11 were born in France and 4 of them came to the adopted country before age 7. 11 participants were exposed to the two languages since birth. The other four participants were exposed to MA since birth and were exposed to French later in their

childhood. One of the four participants was exposed to French at age 5 and the other three participants were exposed to French at age 7. All of them live in Nice and neighboring cities Grasse and Cannes. They don't have any formal educational background in Arabic, except for two participants that rated their writing and reading skills around 2. They belong to working class families. Their parents have less than a high-school diploma, and they were born in Morocco. 12 participants completed high school and two of them have an associate degree diploma (still continuing their education) and one of them has a middle school diploma. 13 participants visit the home country every year. One of the participants visits the home country every two years. Except for one participant who reported that she used to visit the country every year, since she formed her own family and has her own children, she visits the home country every five years.

Participants were asked to rate their language skills in MA and in French from 0 to 5 (0- Very bad; 1- Bad: a few words such as greetings; 2-Average; 3-Good; 4-Very good; 5 - Excellent). Proficiency was measured using a five-point Likert scale with 0 being "very bad" and 5 being "excellent". The questionnaire shows that participants have strong skills in their dominant language French. The only skill, in the HL, they rated that they are good at is speaking. The questionnaire about the proficiency was needed so we can proceed to plural formation task and helps in recruiting participants. This study excluded individuals who rated their proficiency below 2, which corresponds to average. Hence, all the fifteen participants, in this study rated their proficiency at the scale 2 or above. Figure 3.1 informs on the average of the perceived proficiency in both MA and French (scale 0 to 5).

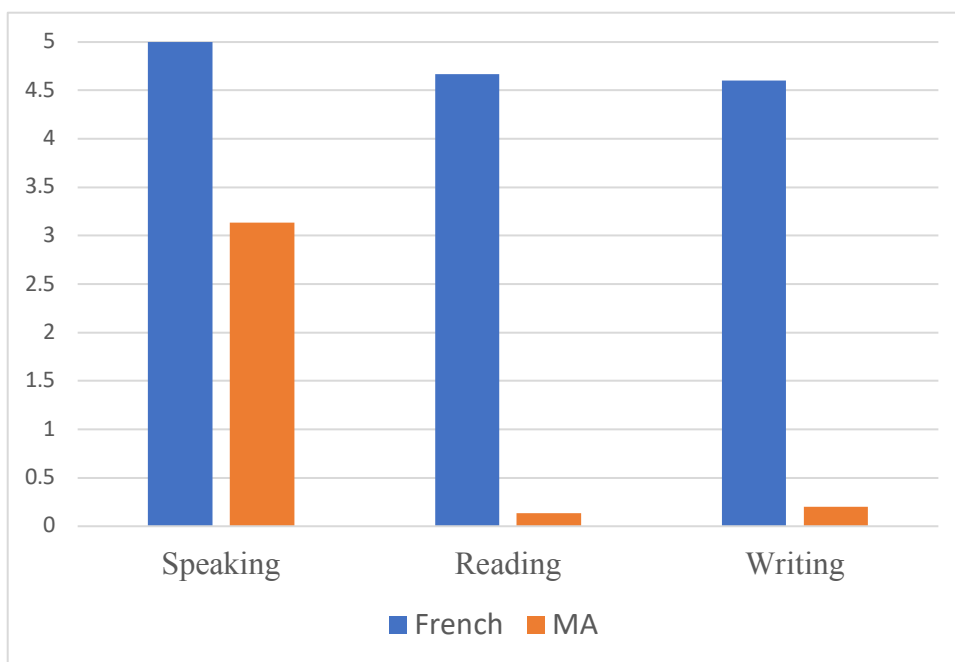


Figure 3.1 The rating of language proficiency

Figure 3.1 shows the average of the perceived proficiency in the HL and the dominant language French. The perceived proficiency is in accordance with previous findings since it is uncontroversial that HS are dominant in their majority language and receive formal education through the majority language as well. Participants tended to rate their French proficiency at higher levels for speaking, reading and writing than their HL. In the HL, speaking is the only language skill that was rated high, which shows that HS did not receive formal education in their HL. The linguistic experience of HS in this study is comparable to other HS in Europe. Bos (1997) gave a very good description of the linguistic experience of HS in the Netherlands:

The language development these children go through is quite complex. First, they learn Moroccan Arabic at home and in the context of their ethnic community. In addition, some Dutch might enter into their lives through television, peer contact and occasionally

through day-care. From the moment they enter primary school, however, all of a sudden the greater part of their language input is Dutch. (p. 11)

3.2 Method and Procedures

3.2.1 Experiment 1. 85 pictures were used to elicit plural forms in a production experiment in which participants were given a singular noun orally. Then two pictures were displayed on a computer. One of the pictures represented the singular form and the second picture the plural form. For example, a picture of a window is displayed. The experimenter provided the name in MA [hada fraʒəm] ‘this is a window’, then provided them with a set of windows in a picture and asked the participants what about these: ‘These are ___’. In Figure 3.2, a sample from the pictures and stimuli used in this experiment is given. The task took about an hour. Participants were tested in three sound plural endings (-at,-in, -a), each sound plural ending was represented by five tokens. Participants were also tested in other 14 broken patterns and each of them was represented by 5 stimuli. Participants were asked to give the plural form of 85 singular nouns that were randomized. Then, the responses were written down in Arabic and transcribed as well. The total number of tokens that were analyzed are 1275. Word frequency was not used in selecting the experimental tokens because, as far as we know, there are no publicly available frequency databases for MA. The collected data was transcribed and entered into Excel documents. The percentage of source-like use and non-source like use was calculated. Also, the percentage of use of each pattern was calculated.

My criterion in deciding if a pattern is acquired by participants is that it should be used in 3/5 of the studied pattern. There were five stimuli for each type of plural pattern, and if subjects were able to produce the target response type at least 3 out of 5 times (60%), they were considered to have acquired that type. This criterion seems reasonable considering that subjects

had only five chances to produce each type. And the total number of tokens that represent the studied patterns is 1275. Then, HL data was analyzed as an independent sub-system to understand the characterizations of plural formation. The tested forms are detailed in Appendix A.

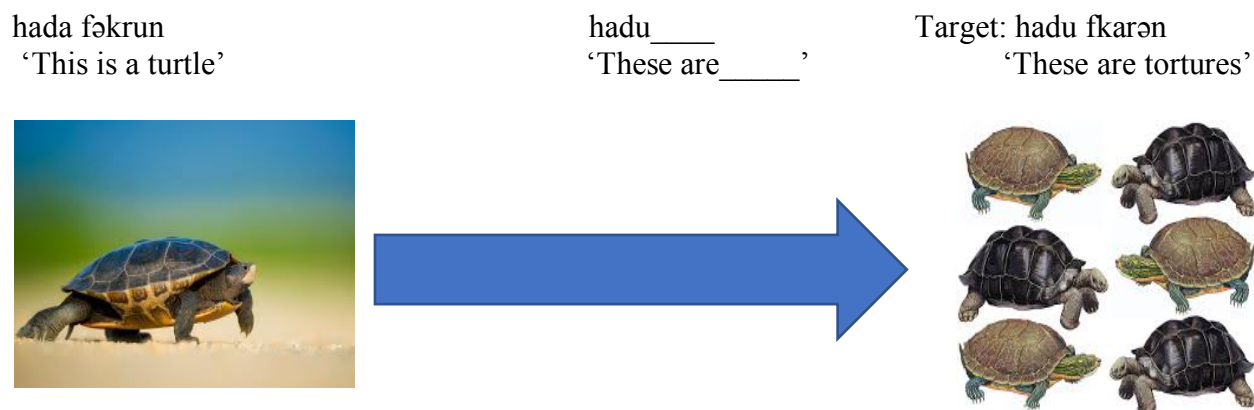


Figure 3.2 Example of the presented pictures and target responses in experiment 1

3.2.2 Experiment 2. In a production experiment, 45 pictures were displayed on a computer screen. Pictures of animals, objects and humans were used. First, participants were provided, in a training session, with a set of nouns and adjectives that would be used in diminutive forms. The 5 nouns and adjectives in the training session were not included in the analysis. Participants put the target noun or adjective in a frame sentence that the experimenter gave orally (This is a N. This is N+ Diminutive). There are six diminutive types, and each diminutive type was represented by 5 stimuli. Tokens were randomized and exemplified the common patterns in diminutive formation. Each stimulus was encountered only once. Two sets of pictures were displayed on a computer screen. For example, the experimenter displayed a picture of a big dog. Then, a picture of a little and cute doggie was displayed, so the diminutive form use could be triggered. In Figure 3.3, a sample from the pictures and stimuli used in this experiment is presented. The tested forms and stimuli are detailed in Appendix B. Subjects were

tested individually in a quiet place and the experimenter documented their production by hand. The collected data was transcribed and entered into Excel documents. Percentage of source-like use and non-source-like use was calculated. Also, the percentage of use of each pattern was calculated. My criterion in deciding if a pattern is acquired by a participant is that a pattern should be used in 3/5 of the studied pattern. There were five stimuli for each type of diminutive form, and if subjects were able to produce the target response type at least 3 out of 5 times (60%), they were considered to have acquired that type. This criterion seems reasonable considering that subjects had only five chances to produce each type. And the total number of tokens that represent the studied patterns is 675. Then, the data was analyzed on its own to look for general patterns and strategies.

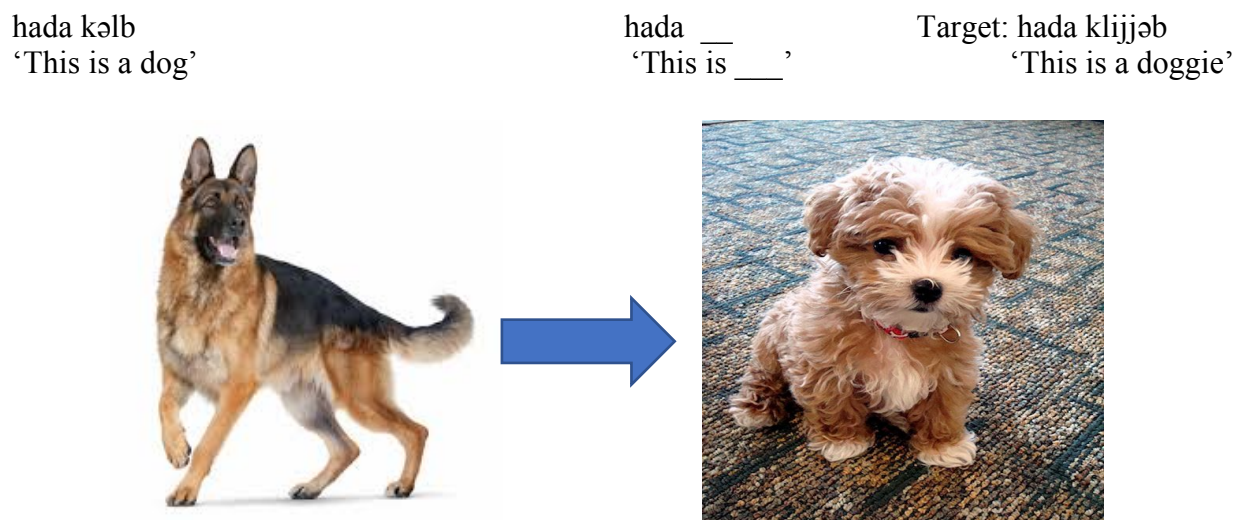


Figure 3.3 Example of the presented pictures and target responses in experiment 2

3.2.3 Experiment 3. Participants were tested in four major verb-patterns in MA. More precisely, they were tested in pattern 1(CCeC) that is associated with several semantic functions depending on the meaning of the root, and other three major derivational categories: the causative forms (P2, CeCCeC), the reciprocal forms (P6, tCaCeC), and the medio-passive forms (P5, tCeCCeC). Each category was represented by ten pictures that illustrated an action that

accomplished one of the semantic functions: causativeness, reciprocity and passive. The pictures representing the four derivational patterns were randomized. Participants were asked to describe a picture guided by four questions (Adopted from Badry, 2005; Berman, 1982). Each stem was used in more than one context which required pattern change. The task reflected both semantic contrast (active/ medio-passive, basic/ causative, and reciprocal/ basic) and morphological one (P1, P2, P5 and P6). Specifically, the responses targeted were ten causatives, ten reciprocals and ten medio-passive forms and another ten pictures necessitated the use of P1. Four additional pictures were used in a practice session to familiarize participants with the task. Four questions were used alternatively to elicit the target verb form in the experiment. To elicit the use of P1, participants were asked: “What did X do?” And for causative, the question was “what is X doing to Y?”. When the target is reciprocal, the question was “what are they doing to each other” and for medio-passives, the question was “what has happened to X ?” The choice of stems depends on basic and common verbs in MA. The majority of them were adopted from Badry since her choice of the verbs depended on the data produced by children in her study. Both regular and irregular stems were included in the experiment. In Figure 3.4, a sample from the pictures and stimuli used in this experiment is given. The tested patterns and stimuli are detailed in Appendix C. Participants were tested individually and the task took about 40 minutes. Responses were written down. The mean percentage use of each pattern was calculated. Responses were first compared to the source language and scored either source-like or not. The percentage of source-like use was calculated for each pattern.

My criterion in deciding if a pattern is acquired by a participant is that a pattern should be used in at least 7/10 of the studied patterns. There were ten questions for each verb pattern, and if subjects were able to produce the target response type at least 7 out of 10 times (70%), they were

considered to have acquired that pattern. This criterion seems reasonable considering that subjects had 10 chances to produce each type. My criterion of acquisition is different from the one used in the previous experiments, because in this experiment participants have more chances to produce each pattern. And the total number of tokens that represent the studied patterns is 600. To make the results of this study comparable to Badry (1983, 2005), statistical analyses were needed. ANOVA and t-test pairwise comparisons were used to study variation in pattern use. Then, the data was analyzed on its own to look for general patterns and strategies adopted in deriving the basic pattern (P1), causative (P2), reciprocal (P6) forms and medio-passive (P5). Participants who completed task 1 and 2, also completed task 3.



Question: ʔaf wqaʕ əlʕasʕir
‘What has happened to the juice?’

Target answer: tkeffeh
‘The juice was spilled’

Figure 3.4 Example slide presentation, question and target response in experiment 3

3.3 Analysis

Two types of analysis are adopted in this research. The first one considers the source language as the baseline for deciding on source-like forms, non-source like forms, and the acquisition criterion. The second analysis analyzes the HL as a sub-system, which originates from the source language. However, it is an independent, different and grammatical system that

emerges under different social-linguistic factors. And the aim is to look for the characterization of the HS' morphology as a type of deferential acquisition and independent grammatical system that could be accounted for on its own. Therefore, the second analysis aims at determining the general characteristics emerging from the HL.

3.4 Motivation for Studying the Target Grammatical Structures

Both experiment 1 and 2 are designed to study the acquisition of nominal morphology represented by plural formation and diminutives forms. The choice of these grammatical structures is based on the fact that plural formation gives an opportunity to study the acquisition of two main morphological processes in Arabic, namely suffixation (concatenative morphology) and stem internal modification (non-concatenative morphology), that requires pattern alternation. Diminutive forms also give insights into non-concatenative morphology and pattern change in deriving different types of diminutive forms. Experiment 3 was designed to explore the acquisition of verbal derivational patterns in MA, and they provide an appealing opportunity to study not only non-concatenative morphological processes, but the manifestation of the interface of two linguistic components, morphology and semantics. Also, they are a window through which semantic notions such as causatives and passives are lexicalized using morphological patterns.

Chapter Four

Nominal Morphology Results

This chapter will report nominal morphology results. Section 4.1 will cover sound plural and adopted strategies in non-source like data. Section 4.2 will report broken plural and adopted strategies in non-source like data, and the analysis of the HL as an independent sub-system will be covered in section 4.3. The findings of diminutive forms will be given in section 4.4, and the adopted strategies in non-source like data will be given in section 4.5. Finally, section 4.6 discusses the findings of both plural formation and diminutive forms in the context of the previously proposed hypotheses, and the implications of the findings will also be discussed. Section 4.7 is a conclusion for nominal morphology results.

4.1 Plural Formation: Sound Plural

Participants were asked to form plural forms for words that require the use of the sound morphemes [-at], [-in] and [-a]. They need to be suffixed to the right edge of a stem. The sound feminine [-at] is very frequent and used with both human and non-human nouns. It occurs more frequently with nouns than adjectives (Harrell, 1962). The sound morpheme [-in] occurs with adjectives or adjectives which have come to be used as nouns. There are eleven word classes which take it. And the sound morphemes [-a] is attached to a limited number of nouns and never to adjectives. There are three classes which take the morpheme [-a]. Participants' pattern of use and acquisition corresponds to the frequency of the morphemes in the language. Figure 4.1 shows the percentage of source-like use of the three sound plural endings, -at, -in and -a in the HL. The figure shows that the percentage of source-like use of the suffix [-at] is 80%. The suffix -in is used in about 71% of the data. The suffix plural [-a] is used in 32% of the data.

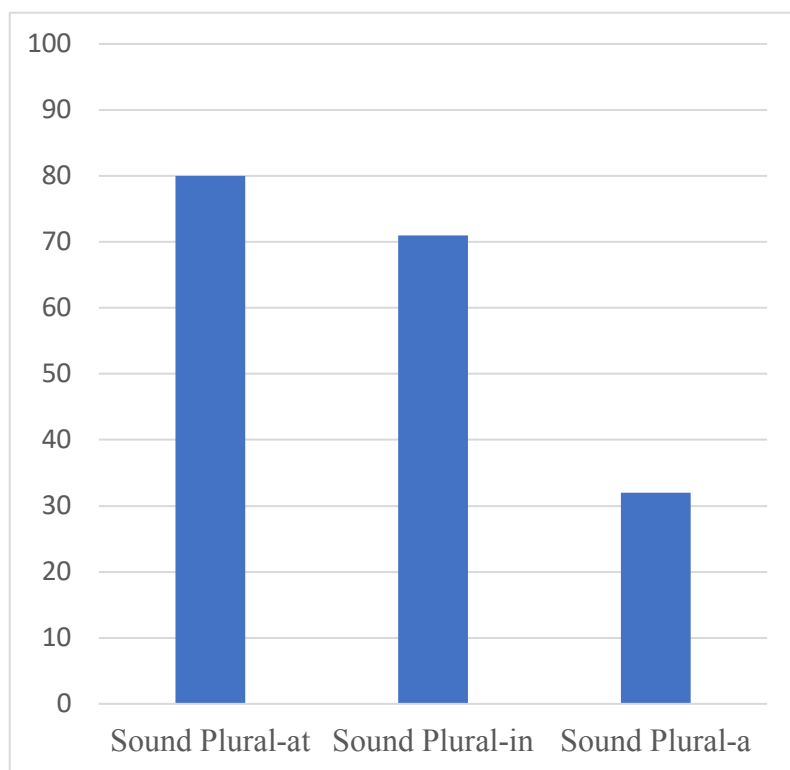


Figure 4.1 The accuracy percentage of sound plural

The results reveal that all the participants acquire the sound plural -at. 80% of the participants acquire the suffix -in. on the other hand, just 33% of the participants acquire the sound plural ending -a. Therefore, the pattern of acquisition corresponds to the pattern of source-like use of the sound plural endings. For example, the sound plural ending -a is acquired just by 33% and the percentage of source-like use is 32%. Data analysis reveals that participants produce plural forms that are distinct from the source language. The question that is worth asking is: are the non-source like forms just random mistakes or they are rule-governed forms? The data below will explain the strategies that HS adopt to produce plural forms in their HL.

4.1.1 Adopted strategies in non-source like data. To form plurals in MA for nouns that require the affix -at, -at needs to be suffixed to the right edge of a singular noun as in [namusija-at] ‘beds’. 33% of non-source like forms result from forming plural for the diminutive singular

[mfɪʃa] ‘cat’. The suffix -at needs to be suffixed to it as in [mfɪʃa-t] ‘cats’. It seems that participants have difficulty with forming diminutive plural forms. 27% of the non-source like data shows the use of broken plural pattern CCuC [*mʃu:ʃ], which is used in MA to form plurals for non-diminutive singular forms for cat /mɔʃʃa/ ‘cat’. Hence, participants experienced difficulties in forming plural nouns for diminutives. But, they successfully attach the suffix -at to other plural types. The sound plural suffix -in was generalized in about 20% in non-source like forms as in 1 and 2.

1. *smaw-in

sky.pl

‘skies’

2. *smaj-in

sky-pl

‘skies’

Participants also need to attach the suffix -in to the studied data as in [ʃijjan] [ʃijjan-in] ‘tired. pl’. To compensate for the non-use of the suffix -in, participants used the suffix -at in 45% of non-source-like forms as in 3 and 4. Broken patterns were generalized in a low percentage. For example, participants used the broken pattern CuCuC about 18% as in [*tulut] ‘the third. pl’. The CCiC pattern was used in 5% of non-source like forms as in [*nqiw] ‘clean.pl’.

3. *ənqij-at

clean-pl

‘clean’

4. *ʃijjanat

tired-pl

‘tired’

Just 33% of the participants acquire the sound plural ending -a. Participants need to attach the suffix -a to the stem as in [bənnaj-a] ‘masons’. Data analysis shows that the sound plural ending [-in] was generalized to 41% of non-source like forms as in 5 and 6. And the ending -at was generalized to 20% in non-source like forms as in example 7, which means that the sound plural ending -at and -in were overgeneralized to 61% of non-source like forms. The broken plural patterns were generalized in a low rate. For example, the pattern CCaCəC was applied in 8% of the non-source like forms as in [*ʃafər] ‘thieves’.

5. *ʃaffar-in

thief-pl

‘thieves’

6. *bannaj-in

mason-pl

‘masons’

7. *bənnaja-t

mason-pl

‘masons’

Data analysis demonstrated that the acquired sound plural morphemes are -at and -in. The sound plural suffix -a was acquired by 33% of the participants. Results also revealed that participants had difficulty in forming plural forms with the suffix -a. HS used sound plural ending -at and -in as the primary fallback strategy in forming plurals for forms that require the morpheme -a, which showed that participants have a common strategy. Using other broken

plural patterns as strategy in a low percentage was attested as well. However, participants did not consistently depend on a common broken pattern.

4.2 Plural Formation: Broken Plural

Figure 4.2 shows the percentage of source-like use of broken plural. The average of source-like use of the 14 patterns is 25%. We may postulate that HS have difficulty applying these patterns. 53% of the participants acquire the broken pattern CCaCeC, 47% acquire the pattern CCaCa and 60% of the participants acquire the pattern CiCaC. And a very small number acquire the other patterns. For example, 27% of the participants acquire the pattern CCiC, 20% of the participants acquire both the patterns CCuC and CuC₁C₂aC. And 13% of the participants acquire CCuCa, CuC₁C₁aC, CuCuC and CCaCi patterns. Just 7% of the participants acquire the pattern CCaC. No participant acquires the following patterns: CuCəC, CCəC and ?aCCija. Therefore, just three patterns were acquired by a significant number of participants. Figure 4.2 reveals that the three patterns that were acquired by a significant number of participants are used in a higher percentage than the rest of the eleven patterns. For example, the pattern CiCaC was used accurately in 57% of the data, the pattern CCaCəC is used about 53%, and CCaCa pattern is applied in 44% of the tested data.

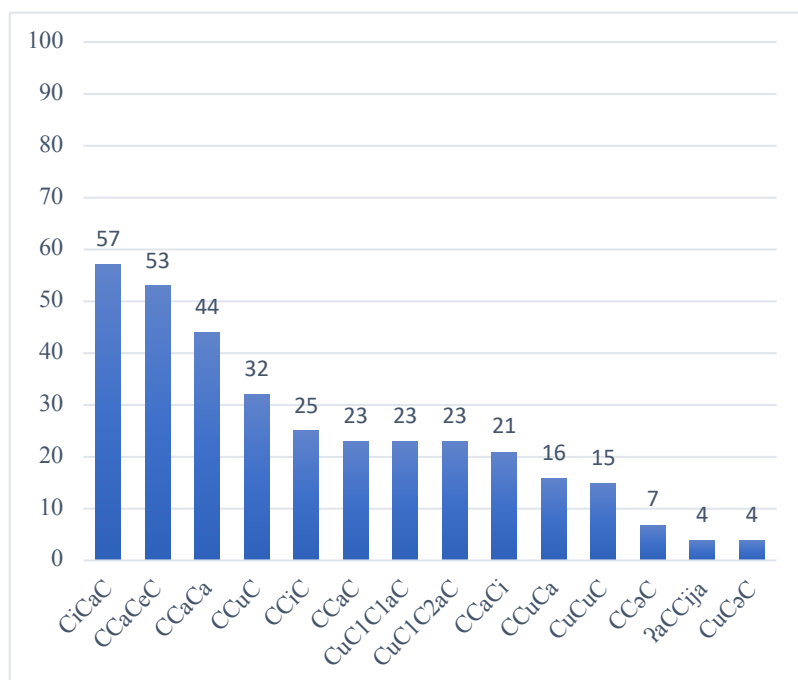


Figure 4.2 The accuracy percentage of broken plural

In what follows, I will provide explanations to non-source-like data and determine the strategies used to compensate for the patterns that were not acquired. I will argue that non-source like data is rule-governed and unique as it is a representation of a simplified and rule-governed plural system.

4.2.1. Adopted strategies in non-source like data. We will start with plural forms that were acquired by a significant number of participants: CiCaC, CCaCəC and CCaCa, were acquired by 60%, 53% and 47%, respectively. An example of plural nouns that use the CiCaC pattern is [far] [firan] ‘rat’. The sound plural suffix -at was overgeneralized in 44% in the non-source like data as in 8 and 9. The sound plural ending -in was used 13% as in examples 10 and 11. The percentage of broken plural generalization was low. 6% of CCuC pattern was used as in [*ɟjur] ‘caves’. And CCaC was used in 3% of the non-source like data as in [*ɟwar] ‘caves’. 6% of the non-source-like data used the pattern CuCuC as in [*furur] ‘rats’. And 3% of the data used the pattern CCaCa as in [*kwasə] ‘drinking glasses’.

8. *ʒar-at
neighbor-pl

‘neighbors’

9. *yar-at
cave.pl

‘caves’

10. *ʒar-in
neighbor-pl

‘neighbors’

11. *yawr-in
cave.pl

‘caves’

Interestingly, when broken patterns are generalized, the root consonants are mapped correctly and successfully to the plural pattern as in [*kwasa]. A glide was also inserted as there was an empty consonant slot, as the mapping of root consonants to the template results in an empty consonant.

12. k w s
| | |
C Ca Ca

The second pattern that was acquired by a significant number of participants is CCaCəC as in [ʃərʒəm] [frazəm] ‘windows’. 66% of non-source like data either has the sound plural ending -at or -in. Specifically, 34% of the non-source like data used -at as in examples 13 and 14. And the sound plural ending -in was used 32% as in 15 and 16. And in 9% of the non-source like data the suffix -a was applied as in 17. Other broken plural patterns were generalized as well. For

instance, 3% of the data showed the use of CCaCa as in [*ɣnawa] ‘addresses’. 3% of the non-source like data resorted to CCiCaC as in [*fkiran] ‘turtles’.

13. *fəkrun-at

turtle-pl

‘turtles’

14. *farɜm-at

window-pl

‘windows’

15. *srawl-in

‘pants-pl’

‘pants’

16. *mənɟar-in

saw-pl

‘saws’

17. *mənɟar-a

saw-pl

‘saws’

The pattern CCaCa was also acquired by a significant number of participants, which is 47%. An example of nouns that form their plural using this pattern is [fərɟi] [frada] ‘pistols’.

36% of the non-source like data uses the sound plural ending -at as in examples 18 and 19.

Interestingly, a glide is inserted at the edge of the stem, whenever a stem ends in a vowel. The sound plural suffix -in was used in 21% of the non-source like data as in 20 and 21. Other broken patterns were also generalized to compensate for the non-use of the pattern CCaCa. The broken

pattern CCaCəC was used 5% as in [*kwarəs] ‘chairs’. The broken pattern CCaCi was used in 17% of the non-source like data as in [*fradi] ‘pistols’.

18. *ʕazrij-at

bachelor-pl

‘bachelors’

19. *kursij-at

chair -pl

‘chairs’

20. *ħawl-in

sheep.pl

‘sheep’

21. *ʕazri-n

bachelor-pl

‘bachelors’

Overgeneralization also prevails in non-source like data that requires the use of patterns that were acquired by a small number of participants. For example, the pattern CCaC was acquired just by 7% of the participants and was used in 23% of the studied data. An example of nouns that require the CCaC patterns is [ʒməl] [ʒmal] ‘camels’. The sound plural ending [-at] was applied about 48% in non-source like data as in 22 and 23. The suffix -in was used in 3% of the non-source like data as in 24. A low percentage of other broken patterns was used as well. 7% of the non-source like forms shows the use of the pattern CCaCa as in [*ʒmala] ‘camels’, and 5% of the data used CiCaC pattern as in [*biran] ‘water wells’.

22. *bir-at
well-pl
'water wells'

23. *ħuk-at
can-pl
'cans'

24. *zaml-in
camel-pl'
'camels'

The broken pattern CuC₁C₂aC was also acquired by a small number of participants, as it was acquired just by 20%. An example of a stem that requires this pattern is [ħazəb] [ħəzban] 'eyebrows'. The sound plural ending -at was generalized to 19% of the non-source like data as in examples 25 and 26. Also, the sound plural ending -in was used 16% in non-source like forms as in examples 27, 28 and 29. Broken plural patterns were generalized as well in non-source like data. The pattern CCaCeC was used in 7% of the non-source like data as in [*tʰrarəg] 'streets'. And the pattern CCaC was used in 3% of the data as in [*ʕras] 'grooms'. Also, the pattern (C)CiCaC was applied in 3% of the non-source like data as in [blidan] 'countries'.

25. *ħazb-at
eyebrow-pl
'eyebrows'

26. *tʰriq-at
street.pl
'streets'

27. *tʃrajg-in

street-pl

‘streets’

28. *ʒris-in

groom-pl

‘grooms’

29. *blad-in

country-pl

‘countries’

Another example from patterns that were acquired by insignificant number of participants is CuCuC pattern. This pattern was acquired by 13% of the participants and applied in 15% of the studied data as in [dərs] ‘lesson’, [durus] ‘lessons’. This pattern is shared with SA, which may suggest that the acquisition of this pattern is enhanced through formal education. The suffix ending -at was used in 45% of the non-source like data as in examples 30 and 31. The sound plural ending -in was used in 5% of the data as in examples 32 and 33. Broken plural patterns were also attested in the non-source like data. The broken pattern CCuC was applied in 13% as in [*dru:s] ‘lessons’. Participants used CCuCa pattern about 6% as in [*hmuma] ‘worries’.

30. *dars-at

lesson.pl

‘lessons’

31. *ham-at

worry.pl

‘worries’

32. *fard^ɕ-in
obligation-pl

‘obligations’

33. *ham-in
worry.pl

‘worries’

The broken pattern ?aCCija is one of the three patterns that was not acquired by any participant and was used just in 4% of the studied data as in [nbi][ʔanbija] ‘prophets’. Also, it is another example of patterns that are shared with SA. To compensate for the nonuse of this pattern, a pattern of overgeneralization was adopted. The suffix -at was used in 39% of the non-source like data as in examples 34 and 35. The sound plural ending -in was used in 26% in the non-source like data as in 36. Other broken patterns were used at a low rate as well. For example, the pattern CCaCa is used in 6% of the data as in [*nwaba] ‘prophets’.

34. nbij-at
prophet-pl

‘prophets’

35. *walij-at
saint.pl

‘saints’

36. *walij-in
saint.pl

‘saints’

To sum up, the suggested order of acquisition is that the sound plural -at and -in would be the first acquired patterns. Then, the broken plural patterns would be acquired in the following order CiCaC > CCaCəC > CCaCa > CCiC > CCuC ; CuC₁C₂aC > CCuCa, CuC₁C₁aC, CuCuC and CCaCi > CCaC > CuCəC, CCəC, ʔaCCija. Various strategies were used to compensate for the non-use of the source plural form patterns. Results proved that participants' HL is different, systematic and an independent sub-system. And therefore, HL could be accounted for on its own as a rule governed subsystem.

4.3 Analyzing HL as an Independent Sub-System

To understand the characterization of HS's system, I will first present the percentage of the generalized patterns. My argument is that patterns which are generalized in a high percentage are the ones that characterize HS' plural formation, since patterns that are learnt are the ones that are overgeneralized (Quintero, 1992). A second argument that I will adopt to understand HS' plural formation is the suggested acquisition hierarchy and the inferred stabilized forms in the HL. Figure 4.3 informs on the percentage of the generalized patterns in non-source like data.

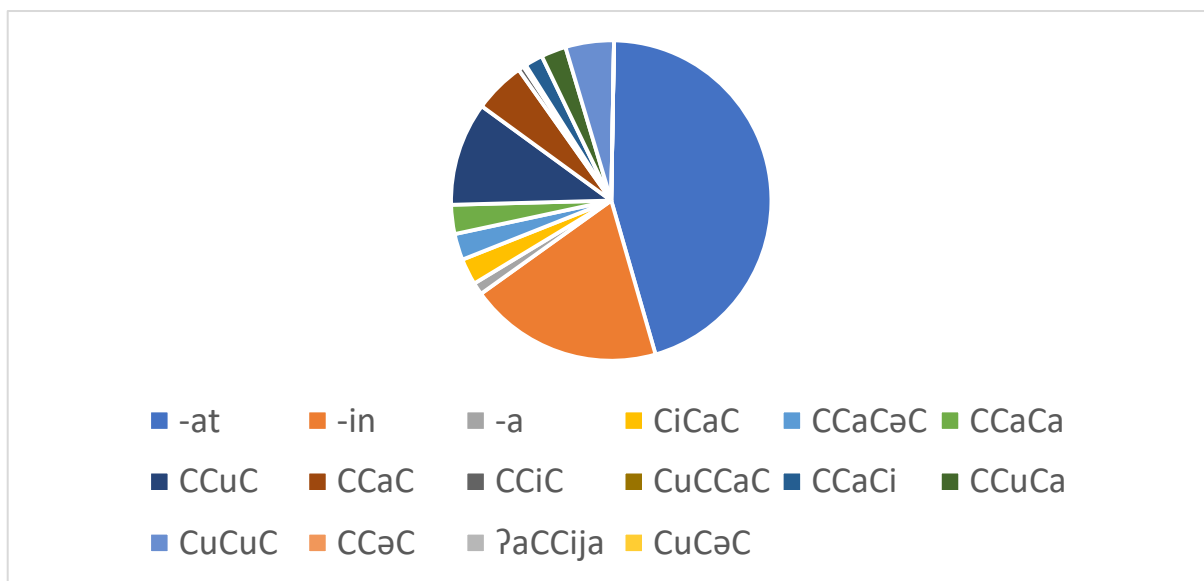


Figure 4.3 Generalized patterns in non-source like data

The sound plural-at and -in constitute 65% of the generalized patterns. The sound plural -at was extensively overgeneralized to other patterns. In comparison to other patterns, the -at ending was applied 45%. The percentage of generalizing the sound plural ending -in was 20%. The sound plural suffix -a constituted 1% of the generalized patterns. Then other broken patterns were generalized at a low percentage. For example, the percentage of generalizing the CCuC pattern was 10%. The CCaC pattern constituted 5% of the generalized patterns. And the CuCuC pattern constituted 5% of the generalized patterns. Each of the following patterns CCuCa, CCaCa, CCaCəC and CiCaC represented 3% of the generalized patterns. The pattern CCaCi comprised 2% of the generalized patterns. CCiC constituted 1% of the generalized patterns. Both CuCCaC patterns represented 0.23% of the generalization. Three patterns that were not generalized at all are: CCəC, ?aCCija, CuCəC and these patterns were not acquired by any participant. It seems that participants have a common strategy which is overgeneralization of the sound suffixes -at and -in. Because of the fact that they did not master broken patterns, the percentage of generalizing other broken forms was not high ranging from 10% to 0% as figure 4.3 showed.

Analyzing HL as an independent different subsystem, which originates from the source language, will show that plural formation in HS is mainly characterized by the use of sound plural morphemes -at and -in since the percentage of generalizing these sound morphemes is 65%. Apparently, HS produce plural forms that are different from the source language, but the mechanisms characterizing their plural system are systematic and governed by MA plural formation processes. HS in this study depend mainly on concatenative morphological processes. And concatenative morphological processes are one of the main processes in MA morphology. Broken patterns require mapping of the consonant root into the right pattern, participants have

difficulty in applying the source-like pattern, and their performance shows that they are not stabilized in their HL. Relating what characterize the HL to an implicational hierarchy in the acquisition of plurals will give insights into what is acquired first and may be stabilized in plural forms.

The findings of this study suggest an implicational hierarchy for the acquisition pattern of sound plurals. Table 4.1 summarizes the implications of the sound plural acquisition in the HL. For example, if a learner only knows one plural morpheme, it will be the sound suffix [-at]. For instance, participant 5 acquires just one sound plural morpheme and it is the suffix [-at]. And if a learner knows only two sound plural morphemes, they will be the morphemes [-at] and [-in]. 47% of the participants acquire just two sound plural morphemes and they are the morphemes: -at and -in. And there is no participant that acquires the suffix [-a] and did not acquire the suffixes [-at, -in]. Hence, if a learner acquires the sound plural suffix [-a], it is more likely that the sound plural [-at], and [-in] are acquired as well.

Table 4.1			
<i>Implications for Sound Plural Acquisition in the HL</i>			
Implications	-at	-in	-a
If the sound plural -a is acquired, it implies that both the sound plural -in and -at are acquired.	X	X	X
If the sound plural -in is acquired, the sound plural -at should be acquired as well.	X	X	–
If the sound plural -at is acquired, it does not imply that the sound plural -at and -in are acquired.	X	–	–

From the inferred implicational hierarchy, the sound plural -at seems to be stabilized first in the HL, then the sound plural -in appears to be the second in acquisition. The sound suffix -a is acquired at a later stage in language development and since it is used with limited classes in MA, its acquisition should take place beyond school age. The percentage of acquisition and generalization also proved the broken pattern not to be stabilized in the HL. Therefore, HL as a subsystem of the source language is different from the source language and characterized mainly by the use of concatenative processes. More specifically, the affixation of the sound plural -at and -in.

4.4 Results: Diminutives

Table 4.2 summaries the percentage of source-like use and the percentage of acquisition as well. The table also informs on stem types and the required patterns. The results revealed that just two patterns that were acquired by a significant number of participants. These patterns are fʃila (CCiCa) and Fʃijjəl (CCiCjCjəC).

Stem type	Required pattern	Percentage of source-like use	Percentage of acquisition
1. Monosyllables			
• Trilateral monosyllables	Fʃijjəl (CCiCjCjəC)	63	53
• Middle-weak trilateral monosyllables	Fwjjəl(CCwiCjCjəC)	32	27
• Trilateral monosyllables with a vowel 'ə'	fʃila (CCiCa)	57	73
• Adjectives of color and defect	fʃiʃil(CC ₂ iC ₂ iC)	4	0
2. Stem patterns fəʃl/foʃl+vowel	fʃila (CCiCa)	67	73
3. Middle-weak stems with a final vowel	fwiʃv (CC _{wi} Cv)	35	27
4. Stem patterns fʃala/fʃila	fʃijjla (CCiCjCjCa)	43	40
5. Words with four consonants	CCiCəC	25	27
6. Three-consonant words with a stable vowel	fwiʃəl(v) (CC _{wi} CəC)	12	7

The findings of this study show that the mean percentage of source-like use of the diminutive forms is 38%. However, some patterns seem to be less complex and easier to apply. For example, the first diminutive pattern to be acquired is the [fʃila] [CCiCa] pattern as 73% of

the participants acquire it. This pattern is required by trilateral monosyllables with a vowel ‘ə’ as in [bənt] [bnita] ‘little girl’ and required by [fəʃl/ foʃl+vowel] stems as in [bəgra] [bgira] ‘cow.dm’. Both stems depend on initial consonant cluster and insertion of /i/ after the cluster, except that monosyllable stems also insert a final /-a/. 53% of the participants acquire the diminutive pattern [fʃijjəl] [CCiCjCjəC], required by trilateral monosyllables and the percentage of source like use is 63%. It involves consonant cluster and insertion of a glide after the second consonant as in [zməl] [zmijjəl] ‘camel.dm’. And 40% of the participants acquire [fʃijjla] [CCiCjCjCa] pattern, which is necessitated by [fʃala/ fʃila] stems. It needs just an insertion of the glide [-j] after the second consonant as the stem already has a cluster of two consonants as in [dʒaʒa] [dʒijjʒa] ‘hen.dm’.

Generally, the percentage of accuracy was low in forming diminutive forms for irregular stems. Middle weak stems seem to be more complex and present a difficulty for HS in both middle weak trilateral monosyllables and middle weak stems with a final vowel (two syllables) as just 27% of the participants acquire those patterns. Middle weak monosyllables depend on [fwijjəl][CCwiCjCjəC] pattern as two glides need to be inserted: the velar /w/ form a cluster with the first consonant then /j/ is inserted as the onset of the second syllable as in [buq] [bwijjəq] ‘horn.dm’, and the percentage of source-like is 32%. Middle weak with a final vowel stems require [fwiʃv][CCwiCv] pattern, where a glide needs to be inserted to form a cluster with the first consonant as in [biru][bwiru] ‘office’, and the percentage of source-like use is 35%.

Words with four consonants use the pattern CCiCəC as in [kəskas] [ksikəs] ‘couscous pot.dm’. Participants experience difficulty with this pattern since just 27% of the participants acquire it and the percentage of accuracy is 25%. Forming diminutive forms for three consonant words with a stable vowel is acquired just by 7% and the percentage of source-like is just 12%.

This type of stem tends to present a difficulty as the velar glide needs to be inserted as in [raʒal] [rwizel.dm] ‘man’. No participant acquires the diminutive pattern [fʔiʔəl] (CC₂iC₂əC) as it requires a repetition of the second consonant as in [kbir] [kbibər] ‘big.dm’. And the percentage of accuracy is 4%.

Diminutive forms that do not require complex processes are acquired by a significant number of participants and the percentage of source-like use is high as well. Middle weak stems present a challenge to HS since a /w/ is needed to be inserted after the first consonant then an /i/ is inserted. Words with more than three consonants are hard to form diminutive forms too. The analysis of 675 tokens shows that just 38% of the data that uses patterns conforming to the source language. However, 69% of the non-source-like data shows the use of either initial consonant cluster or insertion of the glide. Additionally, the requirement of having two syllables in forming diminutives was met, which means that to some extent participants produce rule-governed forms. In what follows, examples from non-source like data from each pattern will be presented, and the overgeneralizations that were applied in non-source like data will be reported as well.

4.5 Adopted Strategies in Non-Source Like Data

4.5.1 [fʃila](CCiCa) pattern. Trilateral monosyllables with a vowel ‘ə’ stems and [fəʃl/foʃl+vowel] stems realize their diminutive forms using the [fʃila](CCiCa) pattern. Trilateral monosyllables with a vowel ‘ə’ realize the diminutive forms by applying the pattern [fʃila] as in [rʒəl] [rʒila] ‘foot.dm’. 73% of the participants acquire this pattern and the percentage of source-like use is 57%. In 53% of the non-source like data, participants insert the glide -j after the second consonant as in 37 and 38, or they suffixed it to the edge of the stem as in 39 and 40. 9%

of the data depends on the pattern that repeats the second consonant as in 41 and 42. 16% of the non-source like data resorts to initial consonant cluster as in 43.

37. *ʕsijjəl

‘honey.dm’

38. *rʒijjəl

‘foot.dm’

39. *raʒlijja

‘foot.dm’

40. *ʕaslija

‘honey.dm’

41. *tmimra

‘dates.dm’

42. *ʃmimijfa

‘sun.dm’

43. *tmir

‘dates.dm’

fəʕl / foʕl+vowel stems also realize their diminutive form using [fʕila] (CCiCa) pattern as in [bəgra] [bgira] ‘cow.dm’. The percentage of source-like use is 67%. 48% of the non-source like data inserts the glide ‘-j’ after the second consonant as in 44 or inserts it word finally as in example 45. 8% of the non-source like data use a pattern that combines insertion of /w/ as second consonant then inserting the glide ‘-j’ and meeting the requirement of two syllables as in 46 or depends on initial consonant cluster then the glide /w/ is inserted as the onset of the second syllable as in 47.

44. *bgajar

‘cow.dm’

45. *d^harbija

‘a blow.dm’

46. *ɣwajrda

‘garden.dm’

47. *bgiwra

‘cow.dm’

4.5.2 [fɛijjəɫ][CCiC_jC_jəC] pattern. Monosyllables with trilateral roots form their diminutive forms by initial consonant cluster then the glide / -j / is inserted between the second and third consonant as in [kəlb] ‘dog’, [klijjəb] ‘dog.dm’. This pattern is acquired by 53% of the participants and the percentage of source-like use is 63%. 36% of non-source like data shows that participants form their diminutive forms using the [fɛila] (CCiCa) pattern as in examples 48 and 49. 7% of the non-source like data inserts the glide ‘-j’ but in a non-source like environment, at the edge of the stem, as in 50 and 51 without applying the basic rule which is initial consonant cluster. 14% of the non-source like data show that participants deploy the pattern [fɛiɛəɫ] [CC₂iC₂əC], showing a repetition of the second root consonant as in 52 and 53. 25% of the non-source like data partially applied the rule of diminutive formation which is consonant cluster and the insertion of the vowel /i/ as in example 54.

48. *kliba

‘dog.dm’

49. *ħmira

‘donkey.dm’

50. *barlijja

‘mule.dm’

51. *zamlijja

‘camel.dm’

52. *ħmimir

‘donkey.dm’

53. *zmiməl

‘camel.dm’

54. *bril

‘mule.dm’

4.5.3 [fʃijjla] [CCiC;C;Ca] pattern. [fʃala/ fʃila] stems form their diminutive form by using the [fʃijjla] (CCiC;C;Ca) pattern as in [zbiba] ‘raisin’, [zbijjba] ‘raisin.dm’. It is acquired by 40% of the participants and percentage of source-like use is 43%. 19% of the non-source like data inserted the vowel /i/ and glide [-j] after the last consonant of the stem as in 55 and 56. 14% of the non-source like data shows a repetition of the second consonant after an initial consonant cluster as in 57. 9% of the data inserts [-j] after the second consonant, just like trilateral root as in 58, as [-j] was inserted after initial consonant cluster. 9% of non-source like data depends on [fʃila][CCiCa] pattern as in 59.

55. *blas^ʕijja

‘place.dm’

56. *zbibija

‘raisin.dm’

57. *rfifisa

‘Moroccan dish.dm’

58. *zbijjəb

‘raisin.dm’

59. *qsʕira

‘party.dm’

4.5.4 [fwijjəl] (CC_wiC_jC_jəC) and [fwiʕv] (CC_wiC_v) patterns. Both [fwijjəl] (CC_wiC_jC_jəC) and [fwiʕV] (CC_wiC_v) patterns are required by middle weak stems to form diminutive forms. Middle weak stems prove to be more complex and present a difficulty for HS in both middle weak trilateral monosyllables and middle weak stems with a final vowel (two syllables), and just 27% of the participants acquire those patterns. Middle weak monosyllables depend on [fwijjəl] (CC_wiC_jC_jəC) pattern as two glides need to be inserted. First, the velar /w/ forms a cluster with the first consonant then /j/ is inserted as the onset of the second syllable as in [buq] [bwijjəq] ‘horn.dm’, and the percentage of source like is 32%. The middle weak stem with a final vowel requires just the insertion of the glide to form a cluster with the first consonant as in [biru][bwiru] ‘office’, and the percentage of source-like forms is 35% .

Participants experience a greater difficulty applying the pattern [fwijjel] (CC_wiC_jC_jəC) to form diminutives for middle weak monosyllables as in [kas] ‘cup’, [kwijjəs] ‘cup.dm’. The difficulty arises from having to insert the glide /w/ after the first consonant. 18% of non-source like data inserts the glide ‘-j’ which is required to be the onset of the second syllable as mapping the consonant roots results in an empty onset. And it is a requirement to have two syllables in diminutive forms. However, they were not successful in applying the insertion of ‘w’ to form a cluster with the first consonant as in 60 to 62. Examples 61 and 62 show a non-source like insertion of different consonants to solve the problem of a required consonant to form a complex

onset. 8% of the non-source like data shows the insertion of /-j/ at the edge of the singular word without any initial consonant cluster as in example 63. 16% of the non-source like data resorts to initial consonant cluster, but did not apply the insertion of [-j] as in 64. 10% of the non-source like data depends on the repetition of the second consonant. This pattern, which is deployed by adjectives of color and defect, is applied in non-source-like data as in 65. Interestingly, the consonant that is inserted is the glide /w/. It is the one which is repeated, and it is not part of the root.

60. *bijjab

‘door.dm’

61. *tʰajjar

‘bird’

62. *rħajjah

‘wind.dm’

63. *babijja

‘door.dm’

64. *rwiħa

‘wind.dm’

65. *kwiwis

‘cup.dm’

Middle-weak with a final vowel stems form their diminutive in a similar way, except that middle weak disyllable stems insert just /w/ as the second consonant of the diminutive form as in [biru] [bwiru] ‘office.dm’. Just 27% of the participants acquire this pattern and the percentage of accuracy is 35%. 43% of the non-source like data relies on glide insertion. In examples 66 and

67, the glide -j was inserted. The insertion was applied after the insertion of the glide /w/ to form a cluster with the first consonant as in 66. In 67 after initial consonant cluster, a glide -j was inserted. And in 68, after initial cluster, the glide /w/ was inserted as the onset of the second syllable. 14% of non-source like data depends on consonant cluster and repetition of the second consonant. In 69 and 70, the glide /w/ was inserted to form the initial cluster then the glide was repeated after the vowel.

66. *fwajjas

‘native to Fez.dm’

67. *ħtajjat

‘fish.dm’

68. *bri:wi

‘office.dm’

69. *lwiwiħa

‘painting.dm’

70. *ħwiwitaħ

‘fish.dm’

4.5.5 [fwiʕəl(v)] (CC_wiCəCv) pattern. Three-consonant words with a stable vowel stems follow the same pattern as words with four consonants. But they differ in the insertion of a glide. A /w/ is inserted as the second consonant of the diminutive pattern as in [raʒal] [rwizəl] ‘man.dm’. It is acquired by 7% and the percentage of accuracy is 12%. 21% of the non-source like data applies the pattern [fʕijjla] (CCiC_jC_jCa) or [fʕila] (CCiCa) where there is a cluster of two consonants and insertion of /i/ as in 71 and 72. It seems that participants apply an existing rule that is required in diminutive formation which is to have two syllables and an initial

consonant cluster. 18% of the non-source like data deploys the repetition of the second consonant, which is common in [fʕiʕel] pattern, as in example 73. 9% of the non-source like data inserts the glide [-j] between the second and third constant just like trilateral monosyllables as example 74 shows. 15% of non-source like data applies the partial rule of diminutive that was attested in one of the patterns such as consonant cluster or insertion of a glide after the third consonant as in examples 75 and 76.

71. *ʕwifa

‘fire.dm’

72. *ftʕijma

‘Fatima.dm’

73. *ʕfifija

‘fire.dm’

74. *rʕajjəl

‘man.dm’

75. *rʕil

‘man.dm’

76. *xumija

‘curtains.dm’

4.5.6 [fʕiʕəl] (CC₂iC₂əC) pattern. Monosyllables that require the pattern [fʕiʕel] (CC₂iC₂əC) are adjectives of color and defect and many adjectives of the pattern [fʕil], deploying a repetition of the second root consonant. The percentage of accuracy is 4% and no participant acquires it. 35% of non-source like data applies the [fʕijjəl] pattern as in 77. The pattern fʕiʕel is the one listed in Harrell (1962) to form diminutives for colors and adjectives of defects.

However, using [fʁijjəl] pattern is acceptable in MA as an alternative to form diminutives for colors and adjectives in this context, which shows the diversity within monolingual speakers and source language in forming diminutive for the same stem. Example 77 also shows that the vowels in the pattern are different from the one in [fʁijjəl], since the applied pattern is [*fʁajjal]. 8% of the data shows familiarity with the pattern but struggles with which consonant to be repeated as in 78 and 79, where the third consonant is repeated instead of the second. 7% of the non-source like data repeats the second consonants, but they add an extra vowel. Example 80 and 81 show that participants experience difficulty with the last syllable as they insert a vowel at the end to satisfy the requirement of having two syllables. 4% of the data attaches the glide -j to the stem edge as in 82. 6% of the data inserts the glide [w] as the onset of the second syllable as in 83 or inserts both the glides [j,w] as in 84.

77. kbajjar

‘big.dm’

78. *bkimim

‘mute.dm’

79. *bxajlili

‘mean. dm’

80. *khihla

‘black.dm’

81. *kbibra

‘big.dm’

82. *baxlijja

‘mean.dm’

83. *kbiwer

‘big.dm’

84. *khajwal

‘black.dm’

4.5.7 [CCiCeC] pattern. Words with four consonants use the CCiCeC pattern to form their diminutive form. Forming diminutives for words with four consonants present a difficulty for participants in this study. It is acquired just by 27% of the participants and the percentage of source like use is 25%. 23% of the non-source like data inserts the -j glide after the second consonant as in 85. 4% of non-source-like data repeats the third consonant after a consonant cluster as in 86, and 11% depends on consonant cluster as in 87. 5% of non-source like data attaches the glide at the edge of the stem as in 88. Insertion of the glide [-w] was attested in 4% of the non-source like forms as in example 89.

85. *ksajjas

‘couscous pot.dm’

86. *mxixra

‘incense burner.dm’

87. *mkinisi

‘native to Fez.dm’

88. *maknasiju

‘native to Meknes’

89. maknawasi

‘native to Meknes’

The presented data is a sample from participants' non-source like production. It demonstrates the difficulty in forming diminutive patterns in the HL, and it also reveals a clear pattern that depends on basic diminutive processes such as initial consonant cluster and insertion of glides in non-source like environments.

Analyzing HL as an independent subsystem will show that the diminutive system in the HL is mainly characterized by [fʁila][CCiCa] and [fʁijjəl][CCiCjCjəC] patterns, and they are acquired by 73% and 53%, respectively. Forming diminutive forms for irregular stems, such as middle weak, tend to present challenges to HS and are acquired by insignificant number of participants. Also, the main processes adopted in 69% of the non-source-like data are consonant cluster or insertion of a glide. And these are the processes common in the acquired patterns. Moreover, the requirement of having two syllables in diminutives was also respected.

4.6 Discussion

4.6.1 Plural Formation

Data analysis shows that all participants in this study acquire the sound plural ending [-at] and 80% of the participants acquire the sound plural suffix [-in]. Results also reveal that just 33% of the participants acquire the plural ending [-a]. The percentage of acquisition corresponds to source-like percentage use. For example, data analysis shows that all the participants acquire the sound plural morpheme -at and the percentage of source-like use is 80%. Additionally, data analysis shows that 80% of the participants acquire the plural morpheme -in and the percentage of source-like use is 71%, and just 33% of the participants acquire the sound morpheme -a and the percentage of source-like use is 32%. Hypothesis 1 is supported and data analysis demonstrates that the morpheme [-at] is acquired by all the participants and the rate of source-like use is high as well, and the sound morpheme -in is also acquired by a significant number of

participants and percentage of source-like use is high as well. However, the morpheme -a is acquired by only a small number of participants. The question here is why the morpheme -at seems to be acquired and the percentage of source-like use is high? Why is the suffix -a acquired by a small number of participants? In MA, there are no previous studies that investigate the acquisition of plural by children. Therefore, I will depend on other Arabic dialect studies to seek an explanation for the attested pattern of sound plural acquisition.

Ravid and Farah (1999) study the acquisition of noun plurals in Palestinian Arabic. Their results demonstrate that sound feminine plurals were fully acquired by the age of 3. All of the age groups (2, 3, 4, and 5) experience difficulties with sound masculine and broken plurals. The younger children showed a tendency to use sound feminine plurals instead of sound masculine and broken plural. Similar findings in other studies on other Arabic dialects were obtained, such as Egyptian and Jordanian Arabic (Albirini, 2015; Omar, 1973). These studies suggest that sound feminine plural acts as the default category that is acquired earlier than other forms and often overgeneralized to masculine and broken plural forms. Albirini and Benmamoun (2014) explain that the sound masculine plurals are not acquired earlier than broken plurals, “Possibly because they are semantically restricted to human nouns and are less frequent than their sound feminine counterparts”(p. 858). The morpheme -in is used in other Arabic dialects and is semantically restricted to human nouns. But, in MA, it is not restricted to human nouns as it can be used with both human nouns and non-human nouns as examples 90 and 91 indicate. Therefore, we expect that the sound plural morpheme [-in] in MA to be the second one in frequency after [-at] since the data shows that 80% of the participants acquire it. The plural morpheme [-a], which is restricted to three classes that are mainly used to describe persons with a profession (Harrell,

1962), should be the least frequent one, and for that reason it is possibly that it should be acquired beyond age 5.

90. huma ʕijan-in

they tired.3PL

‘They are tired’

91. had əlkisan rfiʕ-in

these the-glasses excellent.PL

‘These drinking glasses are excellent’

Within sound plural data, non-source like data shows a pattern where the sound plural -at is overgeneralized and used as the primary fallback strategy. For example, to compensate for non-source like data in forms that require -in suffixation, participants resorted to the suffix -at in 45% of non-source-like forms. Also, they substituted the morphemes -at and -in for the plural ending -a. Data analysis showed that the sound plural ending -in was generalized to 41% of non-source like forms that require the morpheme -a suffixation. And the ending -at was generalized to 20% in non-source like forms that require the morpheme -a. Generalizing the plural morphemes -at and -in could be an evidence that they are learnt as claimed in Quintero (1992):

Based on generalization, once a structure is learned, it may be extended to similar lexical items and the structures at any given stage will also gradually extend through the lexicon via the process of generalization, which will result in many correct generalizations as well as certain overgeneralizations. Eventually, through the process of either preemption by further input or loss of a tentative hypothesis, the overgeneralizations will be lost. (p. 46)

I speculate that HS have not received consistent input to change their overgeneralization patterns in forms that require the sound plural -a. Therefore, those forms may be reanalyzed and become part of HS' plural system.

The broken patterns were generalized in a lower rate, but it is suggestive. It shows that HS are aware and have familiarity with the sound broken patterns, but they are struggling to apply them in source-like environments. Also, the acquired plural forms are extended to other plural forms and the result could be overgeneralization as data analysis shows. It is clear that HS use a strategy that is usually deployed by second language learners and children, which is overgeneralization. Their production in non-source like data is rule-governed. The lower percentage of generalizing other broken patterns in forming sound plural nouns could indicate that HS are exposed to broken plural forms but the type of input they receive did not grant them the opportunity to test their hypothesis and form their system through stages since learning take place through different stages. We could speculate that HS did not receive consistent input to go through the required stages for mastering the broken plural patterns.

We will propose the principles of learning to account for the attested patterns as discussed in Quintero (1992). These principles are conservatism, continuity, cumulative development and generalization. We may argue that HS acquired a plural structure (-at & -in) that is preferable in language acquisition as they are adjacent to the nouns. According to continuity principle (suggested in Quintero): "Within categorical grammar this principle refers to the cross-linguistic preference for items that combine to be adjacent" (p. 44). Developmental stages in plural formation is a sequence of stages. And the sound plural morpheme -a was not acquired as HS start school at age 3 as it is believed that early schooling help immigrants acquire the necessary linguistic skills in French (Helot & Young, 2002). Furthermore, participants' HL

was not incorporated into their schooling, and input was limited in MA. Based on conservatism principle, HS would not hypothesize any structure that is not evident in the input. Since HS in this study overgeneralize broken patterns, even though in a low percentage, it could be evidence that they had some access to broken plural. However, we may hypothesize that the type and quantity of input does not help in mastering the patterns and developing a full representation of source-like language structures as a process of cumulative development through stages of complexity is needed. Also, extended period of time is required to acquire broken formation since it is considered a complex process and in first language acquisition it is acquired late (Albirini, 2015; Omar, 1973).

Participants experience a different rate of difficulties with broken plural patterns. And the percentage of acquisition differs across different patterns. For example, 60% of the participants acquire the CiCaC pattern, 53% of the participants acquire the pattern CCaCeC and 47% acquire the pattern CCaCa. And a very small number of the participants acquire the other patterns. 27% of the participants acquire the pattern CCIc. And 20% of the participants acquire both the patterns CCuC and CuC₁C₂aC. 13% of the participants acquire CCuCa, CuC₁C₁aC, CuCuC and CCaCi patterns. Just 7% of the participants acquire the pattern CCaC. No participant acquires the following patterns: CuCəC, CCəC and ?aCCija. My results did not adhere to Harrell's order of patterns (CCaCeC, CCaC, CCaCi, CCuC, CCuCa, CCaCa, CuC₁C₁aC, CiCaC, CuC₁C₂aC, CuCeC, CCeC ; ?aCCija; CuCuC, CCIc), which corresponds to the order of frequency. Harrell's suggested order is interrupted by the findings of this study. Also, the pattern of percentage of acquisition corresponds to the percentage of source-like use. For example, the percentage use of CiCaC, CCaCeC and CCaCa pattern is 57%, 53% and 44%, respectively. And no participant

acquires the following patterns: CuCəC, ʔaCCija , CCəC and the percentage of source-like use is 4%, 4%, 7%, respectively.

The mean accuracy percentages on sound (-at,-in, -a) versus broken plural is 61% and 25%, respectively. Hypothesis 2 is supported since data analysis reveals that HS encounter greater difficulties with broken plural. Also, hypothesis 3 is supported. Instead of applying non-concatenative processes in forming broken plurals, the suffixation of sound morphemes -at and -in dominate, which demonstrate that participants' production tend to prefer regularity and simplicity. Hence, concatenative processes are the preferred ones. Studies in previous Arabic dialects (Albirini, 2015; Ravid & Farah, 1999) demonstrate that broken plural tend to be acquired late in child language development. Moreover, Albirini and Benmamoun (2014) claim that broken plural presents challenges to HS because of their interrupted language development as consistent input is needed throughout their childhood. The findings of this study also confirm the greater difficulty that HS may face in forming broken plurals. In addition to the availability of various patterns that need to be acquired, non-concatenative derivation involves complex processes, which require mapping consonants and vowels into templates. To some extent, HS' production indicate that HS have some knowledge of the root and pattern of plural system, but the difficulty results from selecting the plural templates conforming to the grammar of the source language, and there are several templates to choose from. The acquisition of broken patterns in MA may need sustained input and it is more likely that their acquisition takes place beyond age 5, since previous studies assert that most of the late acquired forms represent the morphologically complex broken (Albirini & Benmamoun, 2014). Furthermore, It has been suggested that morphological complexity may influence age of acquisition and rates of sound and broken plural use (Albirini & Benmamoun; Omar, 1973).

Participants regularize and simplify the plural forms in their variety. The plural morpheme [-at] seems to be the default form as the percentage of applying it constitutes 45% of the applied plural patterns, and therefore, hypothesis 4 is supported. The Underspecification Hypothesis (McCarthy, 2007) claims that underspecified forms are unmarked. And learners may produce underspecification errors, because underspecified forms extended to marked or specified ones as they have a simpler representation. Albirini and Benmamoun (2014) argue that in Levantine Arabic, the sound morpheme -at is the underspecified form. The sound plural -at seems to be the default form even among monolingual speakers of MA. For example, the morpheme -at is used to form plural for borrowed words. For instance, to form plural for a French borrowed word, the suffix -at is attached to the stem of the French word, as in [place] ‘place’, [plasa-t] ‘places’. Another example is [bureau] ‘office’, [biruwa-at] ‘offices’. Borrowing is evidence that the suffix -at is the unmarked one and it is the preferred one in plural formation. The suffix -in generalization constitutes 20% of the generalized patterns. Overgeneralizing the sound plural morphemes -at and -in show that participants have a simplified and regular plural system that prefers concatenative derivation. Albirini and Benmamoun’s findings (2014) also show that Levantine Arabic HS in the U.S used the language-specific default form, namely the sound plural ending -at, which confirms previous findings on child language acquisition studies (Albirin, 2015; Omar, 1973; Ravid & Farah, 1999). Accordingly, this study also confirms that the sound plural suffix -at is the default one. And it is the one preferred in native speakers of MA, in both monolingually raised speakers and HS, since it is the default morpheme applied in French borrowed words, and it is extensively overgeneralized in HS’ variety to compensate for the non-use of the patterns that were not acquired.

Within broken plural data, HS deploy broken patterns as a means of overgeneralization in a low percentage. It shows that HS are testing their hypothesis about a complex system, it also shows that HS are exposed to non-concatenative morphology in plural formation. Their rule-governed errors imply that they are aware of mapping the root consonants to the right slots as in [*ʃwarəf][ʃurraf] ‘old.pl’, when a participant erroneously map the root consonants to [CCaCeC] template. And therefore, this participant has some knowledge about a complex process but not sure which pattern to choose. Unsurprisingly, the patterns that were not acquired by any participant were not generalized at all. The other broken patterns were generalized in a low percentage. Participants did not deploy just one common broken pattern in their overgeneralization strategy, which reflects the richness and complexity of MA plurals. Data analysis also suggested that participants are leveling out the irregularities by applying suffixation in context where stem modification (non-concatenative processes) is needed. Additionally, there is a correlation between the pattern of acquisition and patterns of generalizations. For example, participant 5 relies mainly on the -at suffixation as a strategy, and participant 5 acquires just the plural morpheme -at, which could suggest that participants reanalyze the plural system in their HL depending on the acquired plural structures.

Two of the studied 14 broken patterns are shared with SA. These patterns are [CuCuC] [ʔaCCija]. No participant acquires the latter, and just 13% of the participants acquire the former. Results suggest that their acquisition needs formal education support. The results revealed that the two patterns were almost absent from participants’ production, which supports the claim that formal education contributes to the apparent disparity between monolingual speakers’ and HS’ grammar (Rothman, 2007); and it also supports Rothman’s findings. In Rothman (2007), HS of Brazilian Portuguese do not have inflected infinitives in their variety because they did not have

any formal education. And therefore, some grammatical features may be absent in the HL as a result of lack of formal education.

The findings of this study also suggest an implicational hierarchy for the acquisition pattern of plurals. For example, if a speaker only knows one plural morpheme, it will be the sound suffix [-at]. For instance, participant 5 acquires just one sound plural morpheme and it is the suffix [-at]. And there is no speaker who acquired the sound suffix -a and did not acquire the suffix -at and -in, which suggests that the sound plural -at and -in are stabilized and acquired at an early age. As early as 3 years, HS start school and become dominant in their societally dominant language, French. The source of input for plural nouns will be limited as it is expected that the use of French will increase and the use of HL will decrease. Despite having a big community from North Africa and the adjacency to the home country, it is likely that the quantity and quality of input did not help HS to master the broken plurals, which require complex process. However, difference does not imply any value judgement about the HL, as data analysis showed that HS' plural system is rule-governed and rich. There are patterns in participants' forms. HS' plural forms may indicate that HS in France participate in language change by forming a distinct variety that originates from the source language. It is an independent variety, in the sense that it has its own characteristics, and its grammar is complete.

Analyzing HL as an independent sub-system shows that plural formation in HS is mainly characterized by the use of sound plural morphemes -at and -in. This finding was supported by the percentage of acquisition, source-like use, and the percentage of over-generalizing the sound plural morphemes -at and -in, since the percentage of generalizing the sound morphemes is 65%, and it was suggested that learnt structures are overgeneralized to other structures (Quintero,

1992). HL as a subsystem that is largely characterized by concatenative processes was also supported by the suggested hierarchy of acquisition of plurals in MA. The sound plural -at and -in appears to be stabilized in HS and acquired during early stages in plural acquisition. The study's finding confirms previous studies that demonstrated that the sound plural -at is used as a default form in child language. Previous studies in Arabic dialects show that the sound masculine plural is acquired late as it is restricted to plural humans, but in MA, it is possible that they are acquired at an early age since it has wider distribution and it is not limited to masculine plurals. Apparently, HS produce plural forms that are different from the source language, but the mechanisms characterizing their plural system is systematic and governed by MA plural formation processes. HS in this study depend mainly on concatenative morphological processes. And concatenative morphological processes are one of the main processes in MA morphology.

The findings of plural formation tend to support the hypothesis claimed in Granena and Long (2013). It proposes that the acquisition of morphosyntax has a distinct sensitive period, and the offset is the mid-teens. The acquisition of plural in MA is gradient. And the sound plurals -at and -in tend to be acquired and stabilized at an early age. And the sound plural -a and non-concatenative processes in plural formation are acquired in stages and in a continuum. It is likely that the closing is mid-teens since the sound plural -a is not frequent in MA and structures that depend on frequency are the most vulnerable in HL acquisition (Albirini & Benmamoun, 2014; O'Grady et al., 2011). Also, broken plural was described to be among the morphologically complex structures (Albirini & Benmamoun, 2014), and they are acquired late. The results evidenced that participants have some experience with broken plural, but because of the need of an expanded window of time, the result is differential acquisition system (proposed by Kupisch & Rothman, 2016), that is basically characterized by concatenative processes.

4.6.2 Diminutives

The findings of this study show that diminutive forms in HS are non-source like, since the percentage of source-like use is 38%, and therefore, hypothesis 1 was supported as diminutive forms depending on non-concatenative morphology present difficulty to HS. Despite producing non-source like diminutive forms, 69% of the non-source like data depends either on consonant cluster or insertion of a glide; additionally, the requirement of having two syllables is respected. Hence, hypothesis 2 was supported and participants produced rule governed errors. Data analysis revealed that some patterns seem to be less complex and easy to apply than the others. And the percentage of acquisition corresponds to the complexity of a pattern. For example, 73% of the participants acquire [fʁila] [CCiCa] pattern, and it is used to form diminutive forms for trilateral with a vowel ‘ə’ stem as in [bənt] [bnita] ‘girl’, and it is also required by fəʁl/ foʁl+vowel stems to form diminutives. It deploys a cluster of consonants and insertion of vowel /i/ as in [bəgra][bgira] ‘cow’. For a better understanding of diminutive formation and the complexity of diminutive patterns, as this linguistic function is realized through multiple processes, I will propose a derivational analysis.⁶ In example 92, the application of [fʁila](CCiCa) pattern is presented. 53% of the participants acquire [fʁijjəl][CCiCjCjəC] pattern, and it is used to form diminutives for trilateral monosyllables and the percentage of source-like use was 63%. It involves consonant cluster and insertion of a glide after the second

⁶ I adopted the prosodic approach in plural formation submitted in Troyer (2006) to account for diminutive derivation in this study. The last consonant is always considered extrametrical consonant. And I suggest the following order in deriving diminutives. Left-to- right association of the consonants in syllable 1 to the first portion of the template (CCV-). The rest of the consonants get associated to the end of the template from right to left. In case there is an empty consonant slot, a glide should be inserted.

consonant as in [kəlb] [klijjəb] ‘dog’, and the second geminate is obtained through a process of spreading of the inserted glide. The mapping of consonant root to the pattern is illustrated in example 93. And 40% of the participants acquire [fʕijjla][CCiCjCjCa] pattern and it is used to form diminutive forms for [fʕal/ fʕila] stems. It requires just insertion of the glide [-j] after the second consonant as the stem already has a cluster of two consonants as in [dʒaʒa][dʒijjʒa] ‘hen.dm’. And example 94 is an illustration of the derivation of diminutive form that requires [fʕijjla] pattern. Pattern [fʕila](CCiCa) appears to be less complex and for that reason the percentage of acquisition and accuracy was high.

92. bəg.ra ‘cow’

Underlying consonants b g r
 | | |
 CCiCa

93. kəl.b ‘dog’

Underlying consonants k l b
 | | |
 CCiCCəC
Glide insertion |
 j

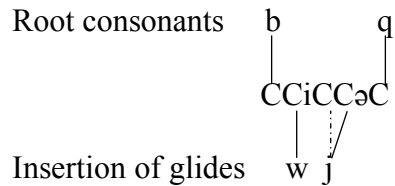
94. dʒa.ʒa ‘hen’

Underlying consonants d ʒ ʒ
 | | |
 CCiCCCa
Glide insertion |
 j

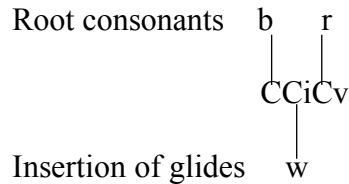
Irregular stems including middle weak stems, four consonant stems and three consonants with a stable vowel present difficulties to HS. Middle weak stems seem to be more complex and present a difficulty for HS in both middle weak trilateral monosyllables and middle weak stem

with a final vowel (two syllables) as just 27% of the participants acquire this pattern. Middle weak monosyllables depend on [fwijjel][CC_wiC_jC_jəC] pattern and two glides need to be inserted: the velar /w/ form a cluster with the first consonant then /j/ is inserted as the onset of the second syllable as the derivation of [buq][bwəjjiq] ‘horn’ in 95 demonstrates, and the percentage of source-like was 32%. Middle weak stems with a final vowel apply [fwiʕv][CC_wiC_v] pattern. It requires just the insertion of the glide to form a cluster with the first consonant as derivation 96 shows, and the percentage of source-like was 35% as in [biru][bwiru] ‘office’.

95. bu.q ‘horn’



96. bi.ru ‘office’



The source of difficulty in deriving diminutive forms in middle weak stems could be that participants don’t know exactly which consonant should form the cluster with the first one, and participants tend not to insert the velar glide /w/, since there is a pattern of overgeneralizing the insertion of the palatal glide. Words with four consonant use the pattern CCiCəC as in [kəskas][ksikəs] ‘couscous pot’. Participants experience difficulty with this pattern since just 27% of the participants acquired it and the percentage of source-like use was 25%. The source of difficulty is that participants have to deal with four consonants, and three consonant root is the typical one in MA. Another characteristic of this pattern is that if the stem has a vowel it should

be retained in the diminutive form as in [taffaħa] [tfifəħa] ‘apple’. Example 97 shows the derivation of diminutive for this type of stems. Three consonant words with a stable vowel were acquired just by 7% and the percentage of source-like use was 12%. Forming diminutives for this type of stem appears to present difficulties to HS because applying [fwiʕəl(v)] [CC_wiCəC(v)] pattern necessitates the insertion of a velar glide as in [raʒəl] [rwiʒəl] ‘man’. In example 98, the derivation of diminutive forms for three consonant stem with a stable vowel is given. And no participant acquires [fʕiʕil] (CC₂iC₂iC) pattern as in [kbir][kbibər]. Example 99 illustrates the derivation of this pattern. The introduced derivations and patterns demonstrate that speakers of MA express diminutives as a linguistic function through different non-concatenative processes. And therefore, HS are faced with dealing with multiple processes in deriving diminutives. The complexity of patterns could be ranged in a continuum in the order exemplified by the derivational processes.

97. kəs.kas

Underlying consonants k s k s
 | | | |
 CCiCəC

98. ra.ʒəl ‘man’

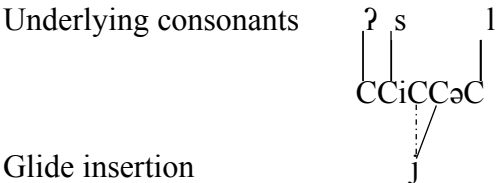
Underlying consonants r ʒ l
 | | |
 CCiCəC
 Glide insertion w

99.kbi.r

Underlying consonants kb r
 | | |
 CC₂iC₂əC
 Reduplication b

A rule that participants were applying even in non-source like environments is the insertion of a glide. For example, trilateral monosyllables with schwa don't form their diminutive forms by inserting the glide [j], instead, just initial consonant cluster is required as the pattern [ʔila][CCiCa) should be applied. However, 53% of the non-source like data inserted the glide [j] as in [*ʔsijjəl] 'honey'. In this example, the pattern [ʔijjəl] was applied successfully, since consonants in the first syllable were mapped to the first part of the template from left to right and the extrametrical consonant was mapped to the last consonant slot in the template. Then a glide was inserted as example 100 shows.

100.*ʔsəl 'honey'



It seems that participants' diminutive system is characterized by consonant cluster and insertion of a glide -j. It is avoiding irregularities and complex processes. We may hypothesize that because of the complexity of diminutive forms, such as forming diminutives for middle weak forms, sufficient and sustained input is needed to master those patterns and they may be acquired beyond age 5. Additionally, multiple processes are needed to express the same linguistic function. In verb-pattern alternation, Badry's findings (1982) show that irregular stems tend to be difficult for children and they are among the late acquired. Moreover, previous studies demonstrate that non-concatenative morphology is usually acquired after age 6 (Albirini, 2015; Benmamoun et al., 2014). Benmamoun et al. (2013) argue that some language properties are acquired very early, on the other hand, other complex properties take longer time to develop. And Montrul (2016) also argues that some properties of language have never been acquired by

HS. Diminutive forms, relying on non-concatenative morphology, represent difficulty for HS just as broken plural do, and just two patterns are acquired by a significant number of participants. And the derivational processes demonstrate that they are less complex. 69% of the non-source-like data depends on either initial consonant cluster or insertion of a glide. These rules are part of the acquired patterns and were generalized to non-source like data. Hence, hypothesis 3 is supported, since acquired processes are generalized to forming diminutives for irregular stems. Also, non-source like data respect the requirement of having two syllables in forming diminutives. Participants are omitting irregularities and non-source like forms are rule governed. We postulate that HS' diminutive forms are distinct and could indicate that HS in France are participating in language change.

This study also suggests a developmental order for diminutive patterns in MA. For example, since the basic rule in MA diminutive forms is consonant cluster and an insertion of the vowel /i/, it is expected that stems that require just initial consonant clusters and insertion of the vowel /i/ are the first learnt processes in diminutive formation. And therefore, [fʁila] pattern is expected to be the first pattern to be applied by a learner of MA. The second process to be acquired is inserting a palatal glide after the second consonant and applying the pattern [fʁijjəl]. Diminutive patterns required by irregular stems such as the middle weak, trilateral consonants with a stable vowel and four consonantal stems should be acquired beyond school age and may be never acquired by HS, which will also suggest that diminutive patterns are acquired in stages.

The findings of this study also propose an implicational hierarchy for the acquisition pattern of diminutive forms. For example, if a learner only knows one diminutive pattern, it will be the [fʁila] pattern. For instance, 27% of the participants acquire just one diminutive pattern and it is [fʁila] pattern. And if a learner knows only two patterns, they will be the [fʁila] and

[fʕijjəl] and it was evidenced by the data since 20% of the participants acquire just two patterns and they are [fʕila] and [fʕijjəl] patterns. And if a participant acquires [fʕijjila] pattern, it is expected that they also acquire [fʕila] and [fʕijjəl] as 27% acquire the three patterns. Results also show that 83% of the participants that acquire forming diminutive forms for middle weak (fwijjəl, fwilv) also acquire [fʕila] and [fʕijjəl] patterns.

Analyzing HL as an independent rule governed subsystem will demonstrate that diminutive forms in HS's variety are mainly characterized by two patterns: [fʕila] and [Fʕijjəl]. The percentage of acquisition and the implicational hierarchy emerging from data analysis lend support to this claim. Also, the pattern of generalization in non-source like data was mainly characterized by initial consonant cluster and glide insertion.

[fʕila] pattern was acquired by 73% of the participants and [fʕijjəl] pattern was acquired by 53% of the participants. Additionally, the proposed acquisition hierarchy suggested that other patterns could not be acquired without implying that [fʕila] and [Fʕijjəl] patterns were present in the HL. Therefore, I propose that [fʕila] pattern should be acquired and stabilized in the HL at an early age during development, then followed by [fʕijjəl] pattern, since these patterns are not complex. And because morphological complexity is an indicator of late acquired structures (Albirini & Benmamoun, 2014), patterns requiring complex processes such as forming diminutives for middle weak stems are acquired late in MA. And for all what is said, I argue that the acquisition of diminutive forms in MA is gradient as many processes are needed for deriving diminutive forms. They need longer time to be stabilized and acquired. I maintain that the critical period of mastering all the patterns and processes for diminutive forms is mid-teens. And the analysis of non-source like data shows that 69% of the non-source like data depends on initial consonant cluster and insertion of glide [-j], and these processes are part of the processes applied

in the acquired first two patterns. It is more likely that these are the processes acquired first by children during language development. Thus, participants' diminutive system is mainly employing two patterns in deriving diminutive forms.

4.7 Conclusion

Plural formation results suggest that MA HS in France have a distinct system that does not consist of all the patterns attested in the source language. Non-concatenative morphology is modified in the HS' variety. The sound plural morpheme [-at] was used as a default and a main fallback strategy in plural formation. Also, the plural suffix [-in] was acquired and the percentage of source-like use and generalization was significant. The sound plural morpheme [-a], which is an example of structures that are limited to specific classes, was acquired by a small number of the participants. Additionally, HS experience difficulties with broken plural and the strategy was overgeneralizing the sound morphemes to broken plural forms. Hence, overgeneralizations and regularization are characteristics of their plural forms. In this study, we refer to the difficulty and complexity of structures to have a broader picture of the process of acquisition of a HL. It is understood that HS's grammar is complete, systematic and independent and it is a type of differential acquisition.

Analyzing the plural system as an independent sub-system shows that HS's system is mainly characterized by concatenative processes, affixation of the sound plural morphemes -at and -in. Results also lend support to the hypothesis suggested in both Granena and Long (2013), and in Long (2005), as results proposed that the acquisition of non-concatenative morphology needs longer time and the closing should be mid-teens.

Diminutive forms depend on non-concatenative morphology as well and multiple processes are needed to express one linguistic function. Participants experience different degrees

of difficulty with the studied patterns. Some patterns are less complex than the others. Patterns applied to stems that have less than four consonants and require just initial consonant cluster were acquired by a significant number of participants. Irregular stems that require complex processes such as middle weak monosyllables, which require insertion of a velar glide to form initial cluster with first consonant then insertion of the palatal glide after the second consonant, present a difficulty to HS. Participants tend to regularize diminutive formation and show a preference to the following pattern: initial constant cluster and insertion of the palatal glide. Results indicate that participants are not aware of all diminutive templates attested in the source language, and they struggle in selecting the template conforming to the source language, since in MA different processes are required to derive diminutives. Benmamoun et al. (2014) and Montrul (2016) propose that complex structures need sufficient and consistent input to be acquired. Our results also suggest that HS experience difficulty with non-concatenative morphology, which could be explained by both complexity and received input.

Results demonstrate that HS have a modified version of diminutive forms that comprises only two patterns. And 69% of the non-source-like data shows the use of either initial consonant cluster or insertion of the glide. These non-source like data also respect the requirement of having two syllables, which means that to some extent participants produce rule-governed diminutive forms that adhere to one of the diminutive rules. Results also lend support to the hypothesis that non-concatenative processes in MA are gradient and have a distinct critical period and the off-set is the mid-teens.

Nominal morphology results demonstrate that MA HS in France have a modified morphological system. In plural acquisition results, the emerged pattern is that concatenative morphological processes dominate and characterize HS' plural morphology. Diminutives results

revealed that not all diminutive patterns depending on non-concatenative processes were present in the HL. And the mechanism characterizing their diminutive processes are initial consonant cluster, glide insertion and two syllables. HL as a sub-system is different and rule-governed. Nominal morphology results support the hypothesis that the acquisition of non-concatenative processes have a distinct critical period and the closing should be mid-teens. If early input was advantageous for nominal morphology, all the attested patterns in the source language should be present in the HL.

Chapter Five

Verbal Morphology Results

This chapter will report verbal morphology results. To recapitulate, in a production experiment, four questions were used alternatively to elicit the use of one of the four verbal patterns. Specifically, the questions were used to elicit the use of the basic pattern (P1), causative (P2), medio-passive (P5), and reciprocal (P6). There were 600 verb tokens in this study (40× 15 participants). The aim of this study is to explore the acquisition of pattern alternation in HS in France, and to study if semantic distinction of causativeness, passive and reciprocity is lexicalized in the HL through using specified morphological patterns. Section 5.1 will report on verb alternation results. The general pattern of participants' production will be reported in this section. More specifically, the mean percentage use of the four patterns and the percentage of acquisition of each pattern is introduced in section 5.1.1. Statistical analysis of the data using ANOVA and T-test pairwise comparisons are also reported in section 5.1.2. In section 5.2, data produced on each pattern will be discussed to look for the characterization of participants' production on each of the four verb patterns in the HL. Section 5.3 discusses the findings of the acquisition of pattern alternation in the HL in the context of the main conducted research in the acquisition of verb pattern in Semitic languages. Additionally, results will be discussed in the light of the previously proposed hypotheses. Finally, section 5.4 is a conclusion for the acquisition of verb patterns results.

5.1 Verb Pattern Results

5.1.1 The acquisition of verb patterns. Figure 5.1 reports the mean percentage of the use of the basic pattern (P1, CCeC), causative pattern (P2, CeCCeC), medio-passive (P5, tCeCCeC) and reciprocal pattern (P6, tCaCeC). Table 5.1 reports the percentage of acquisition of

the four patterns. My acquisition criterion is that a pattern should be used at least 70% by a participant. The mean percentage of source-like pattern use differs from one pattern to another. Generally, the basic pattern was the only pattern used at higher percentage, which is 100%. The causative pattern (P2) was the second in use as the mean percentage use is 51%. And the mean percentage of the usage of medio-passive and reciprocal pattern was low, 22% and 15%, respectively. Also, the acquisition percentage differs among the four patterns. The basic pattern (P1) was acquired by all the participants and 40% of the participants acquired the causative (P2). And no participant acquired the medio-passive pattern (P5) and the reciprocal pattern (P6).

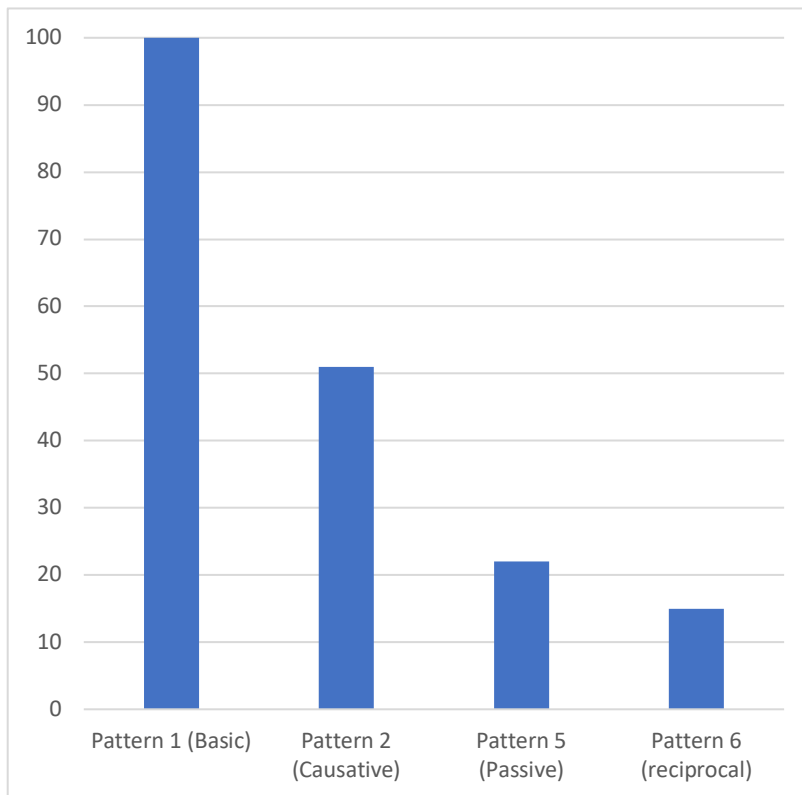


Figure 5.1 Mean percentages of source-like verb pattern responses

Table 5.1	
<i>The Percentage of Acquisition of the Four Verb Patterns</i>	
Required pattern	Percentage of acquisition
Basic (P1, CCeC)	100
Causative (P2, CeCCeC)	40
Medio-passive (t-CeCCeC)	0
Reciprocal (P6, tCaCeC)	0

5.1.2 Pattern usage differences. ANOVA shows statistically significant differences among the use of the four patterns ($F(df=3)=160.57, p<0.01$). We performed t-test comparisons to find if there is significant differences among each pair of patterns. T-test pairwise comparisons showed that between the usage of the basic pattern (P1) and causative (P2), there was a significant difference ($t(df=149)=11.88, p<0.008$). There was also a highly significant difference in the usage of the basic pattern (P1) and the medio-passive pattern (P5) ($t(df=149)=22.98, p<0.008$). Between the usage of the basic pattern (P1) and the reciprocal pattern (P6), there was a significant difference ($t(df=149)=28.68, p<0.008$). There was also a significant difference in the usage of causative (P2) and medio-passive (P5) ($t(df=288)=5.51, p<0.008$). Between the usage of P2 and P6, there was a significant difference as well ($t(df=271)=7.13, p<0.008$). And there was no significant difference between P5 and P6. Therefore, there were statistically significant differences in the usage of the four patterns. In what follows, each targeted pattern in participants' production will be reported, and the pattern emerging from participants' productions in each targeted pattern data will be discussed in detail.

5.2 The Characterization of Targeted Patterns in Participants' Production

5.2.1 The basic pattern (P1). The analysis of the results from the verbal patterns production task reveals that the basic pattern (P1), which expresses multiple semantic notions and acquired at an early age by Moroccan children, was used at a higher percentage, which is 100% and all the participants acquired it. P1 was applied productively by the participants in this study. And all the participants applied P1 in the studied data without resorting to any pattern substitutions as in *d^rreb* 'hit' and *ʃreb* 'drink'. Hence, participants' productions proved P1 to be very productive and stable in their verbal derivational system. And there was a statistically significant difference between the use of P1 and the rest of the three patterns.

5.2.2 The causative pattern (P2). Pattern 2, which is used to express causativeness and the semantic meaning is lexicalized through the use of the morphological form CeCCeC, was the second pattern in the percentage of use. The mean percentage of the use of P2 is 51%, and 40% of the participants acquired it. There was a statistically significant difference between the use of this pattern and P1, there were also statistically significant differences in the use of P2 and the use of either P5 or P6. In 49% of targeted-P2 data, P1 was substituted for P2. Also, P1 was used with paraphrastic constructions to express the semantic notion of causativeness without using the lexicalized pattern for expressing causativeness. For example, in 1 to 5, P2 (CeCCeC) is needed and the target answers are a) *kaj-ʃewwem waldu* 'he is bathing his son'; b) *ferreħ waldu* 'he made his son happy'; c) *zerrat əlkalb* 'she made the dog run'; d) *qerrat-u* 'she taught him'; e) *ʃerreb* 'he watered'. Participants express the semantic meaning 'causativeness' for 1, 2, 3, 4 and 5 with periphrastic constructions that include P1. P1 plus periphrastic constructions is available as another option in MA to express the meaning of causativeness.

1. ta-j-dir li-h əduʃ
 Asp-3-do-SM for-him DEF-shower
 ‘He is giving him a shower’

2. daba fərhan hit baba-h əʃta-h kadu
 now happy because dad-his gave-3SM gift
 ‘Now, he is happy because his dad gave him a gift’

3. ka-t-ʃad əlkalb baʃ taʒri
 Asp-3- hold-SF DEF-dog so run-3SF
 ‘She is holding the dog to run’

4. ta-tə-qra əl-wald-ha
 Asp-3-read-SF DEF-son-her
 ‘She is reading for her son’

5. ka-j-ʃti-h əlma
 Asp-3-give-S- him DEF- water
 ‘He is giving him water’

In all the 51% of the data that used P2, the phonological form was modified since CeCCeC becomes CeCeC as in ‘nʃas ‘sleep’; taj-naʃes waldu ‘putting his sun to sleep’ and literally means cause his son to sleep. The gemination which is an important process in forming P2 was not applied. It seems that participants depended on vowels as a clue in using P2 to express causativeness, as vowels were not substituted. The only process that was not applied is gemination of the second consonant. Since some roots were used in both P1 and P2 in this experiment, we can compare the use of those patterns in participants’ production to prove that

morphological distinction of P1 and P2 is maintained as the examples below demonstrate. And therefore, the phonological realization of P2 is modified by the participants that used P2.

6. lbes ‘wear’ (P1)

CCeC
| | |
l b s

7. lebes (P2)

CeCeC
| | |
l b s

8. freb ‘drink’ (P1)

CCeC
| | |
kat -f re b she drinks’

9. fareb (P2)

CaCeC
| | |
kaj-fa re b waldu ‘he gives water to his son’

5.2.3. The medio-passive pattern (P5). No participant acquired P5 and the mean percentage of pattern use was 22%. According to t-test pairwise comparisons, there was a statistically significant difference between the use of this pattern and the basic one ($t(df=149)=22.98, p<0.008$). There was also a significant difference between the use of P5 and P2 ($t(df=288)=5.51, p<0.008$). There was no statistically significant difference between P5 and P6. 71% of the data that did not use pattern 5 used P1 despite using a question that renders the use of P5 as the best candidate. For example, medio-passive pattern (tCeCCeC) as in tderbat ‘it was hit’; tesbey ‘it was painted’; tkeffeħ ‘it was spelled’; tejreb ‘it was drank’ ; teqt’eſ ‘it went off’ were replaced by P1 as in examples 10, 11, 12, 13 and 14. Hence, participants highlighted the agent of an event when they used P1. And by using P1, they did not refute responsibility and agency in communicating an event.

10. darat əksida

Did-3SF accident

‘It had an accident’

11. sabyu-h

painted-3PL- it

‘They painted it’

12. tʰaħ əlkas

fell-3S DEF -cup

‘The cup fell down’

13. ʃarbu-ha

drank- 3PL- it

‘They drank it’

14. ətʰfaw əldew

turned off-3PL DEF-light

‘They turned off the light’

29% of the data that did not use pattern 5 used adjectives. Specifically, they used adjectives derived from verbs (Harrel, 1962). Adjectives derived from verbs are also referred to as passive participle of measure1 and the pattern is [mefʃul] as in mebjuʃ ‘sold’ (Harrel, 1962). And therefore, medio-passive was replaced by adjectives. The examples in 15, 16, 17 and 18 are derived from transitive verbs sbey ‘paint’; qteʃ ‘cut’; xzen ‘hide’ and ħal ‘opened’. And it is also pragmatically correct and acceptable in monolingual speech.

15. məsbuy

‘painted’

16. məqtuʃ

‘cut’

17. məxzuna

‘hidden’

18. məhlul

‘open’

5.2.4 The reciprocal pattern (P6). No participant acquired the reciprocal pattern (P6, tCaCeC). The mean percentage of its use was 15%. Additionally, there was no statistically significant difference in the use of P5 and P6. However, there was a statistically significant difference in the usage of P6 and P2 ($t(df=271)=7.13, p<0.008$). And between the use of P6 and P1, there was also a significant difference ($t(df=149)=28.68, p<0.008$). 85% of the data that did not apply pattern 6, used P1 with analytical phrases. For example, to express reciprocity and the agency of two participants in performing an action, tCaCeC is needed as in *tyamzu* ‘they winked at each other’; *tʃanqu* ‘they hugged each other’; *traʃʃu* ‘they sprayed each other’; *ddaʃaw* ‘they took each other to the court/sued’; *tʃaddu* ‘they held each other’s hands’; *t-sʔaħbu* ‘they became friends’; *tʒarru* ‘they pulled each other’; and *tsalmu* ‘they greeted each other’. Examples from 19 to 26 show the use of an analytical phrase and P1 instead of the use of the specified pattern. For example, to express a reciprocal action, the basic pattern (P1) + a demonstrative pronoun was used as in example 20, *hada əmʃanəq hada* ‘this one is hugging this one’, and in example 24, *hadi ədʃat hadi* ‘this one filed a lawsuit against this one’. And expressions such as this one + P1 + and the other + P1 as in example 25 were also used. There are other expressions that accompanied the use of P1 such as each other and between them.

19. ka-j-sadu ʃajni-hum

Asp-3-close-PL eyes-their

‘They are closing their eyes’

20. hada əmʕanəq hada

this hugging. Part this

‘This one is hugging this one’

21. ka-j-raʕu binat-hum

Asp-3-spray-PL between- 3PL

‘They are spraying water’

22. dʕa-w bəʕdəjat-hum

sued-3PL each other-3PL

‘They filed a lawsuit against each other’

23. ka-t-ʕad li-ha ʕad-ha

Asp-3- hold-SF for her hand-her

‘She is holding her hand’

24. hadi dʕa-t hadi

this sued-3SF this

‘This one filed a lawsuit against this one’

25. waħəd ʕar wa laxar ʕar

this one pulled-3SM and the other one pulled-3SM

‘This one is pulling and the other one is pulling’

26. ka-j-salmu bi-ʕadi-hum

Asp- 3-greet-PL with-hand-their

‘They are greeting and shaking hands’

To sum up, just two patterns that were acquired by a significant number of participants and the mean percentage of use was high for these two patterns as well. The basic pattern (P1)

was acquired by all the participants and the mean percentage use was 100%, and the second pattern that was acquired by a significant number of participants was the causative (P2) as 40% of the participants acquired it and the mean percentage of use was 51%. ANOVA statistical analysis showed that there was a significant difference in pattern usage. Also, analyzing participants' production demonstrated that participants relied heavily on P1 and that semantic distinction was not emphasized in their production. In the production of the data that targeted the use of the three patterns (P2, P5, P6), P1 constituted 69% of the use of the patterns as illustrated in Figure 5.2. P1 dominated despite that the prompt in the experiment favored the use of the lexicalized patterns (P2, P5 and P6). The percentage of the causative (P2) usage was 18%, the medio-passive (P5) constituted 8%, and the reciprocal (P6) use constituted 5% of the usage. Participants' verbal derivation system is mainly characterized by P1 and the low percentage use of P5 and P6 demonstrate that they are not productive in participants' verbal derivational processes. Additionally, neither P2, P5 nor P6 are generalized in the studied data.

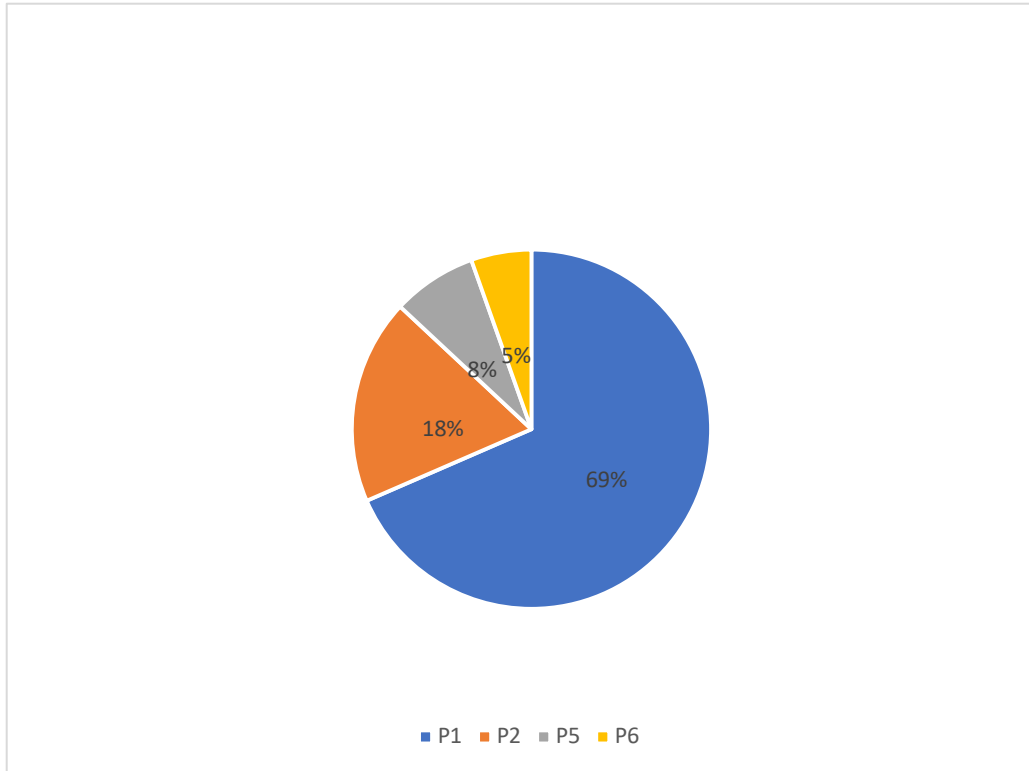


Figure 5.2 Pattern use in causative, medio-passive and reciprocal targeted-data

5.3. Discussion

I will briefly present the results and discuss them in the light of other research in the field of language acquisition. Specifically, results will be discussed in relation to research conducted in the acquisition of verb patterns in Semitic languages. Additionally, the results will be discussed in the light of the previously proposed hypotheses for this study.

All the participants in this study acquired the basic pattern (P1) and the mean percentage of use was 100%. Badry's research (1982, 1983, 2005) on the acquisition of verb patterns by Moroccan children showed that P1 is stable by age 3. It is the first pattern to be analyzed by children, and it is very frequent and easily understood by them (Badry, 1982; Berman, 1980, 1982). It is also used productively to derive verbs from roots. It was claimed that P1 is morphologically simple and it is the unmarked one (Badry, 2005; Berman, 1985). Berman (1982)

studied pattern alternation in Hebrew speaking children. Results revealed that the basic pattern (P1) is the most frequent in children's language in 2;4 age group, as a given verb-root was used largely in one single pattern. Berman's results also suggested that P1 is the first pattern to be acquired and used productively by Hebrew speaking children. Along the same lines, this study confirms previous findings about the stability and productivity of P1 in Moroccan children's verb pattern system. The basic pattern's (P1) productivity is confirmed by Moroccan HS even in adulthood. Hypothesis 1 is supported as participants acquire this pattern and it is used productively in the HL.

ANOVA shows that there is a significant difference in the use of the four patterns ($F(df=3)=160.57, p < 0.01$). And t-test pairwise comparisons reveals that there is a statistically significant difference in the usage of the basic pattern (P1) and the causative one (P2) ($t(df=149)=11.88, p < 0.008$), and there is a highly significant difference in the use of pattern 1 and the medio-passive pattern (P5) ($t(df=149)=22.98, p < 0.008$). There is also a statistically significant difference in the use of P1 and the reciprocal pattern (P6) ($t(df=149)=28.68, p < 0.008$).

In an attempt to provide an explanation for the prevalence of the basic pattern (P1), we may refer to Clark and Hecht's (1982) proposal of the principles affecting the acquisition of word formation devices which are semantic transparency, productivity, and conventionality, in addition to formal simplicity (Clark & Berman, 1984). Formally, P1 is the simplest pattern as only one vowel is added to the root (C-C-C). Functionally, it has multiple semantic functions depending on the meaning of the root. Pragmatically, it is diverse as it can be used in many discourse situations (Badry, 1983). P1 is considered to be used productively as it is the most productive pattern in MA. Clark and Hecht (1982) define the most productive forms as the ones

used most often by adults in word innovations. The most used forms in adult speech will be adopted predominantly by children to form new words. Furthermore, simpler forms are easier to acquire. Simplicity being measured by amount of change, and the less a word-form-changes, the simpler it is (Clark & Berman, 1984, p. 9). Based on this definition, patterns that make a few changes to the root are the preferred ones in word derivation. And therefore, participants in this study acquired a pattern that is morphologically simple, very productive, and very frequent in the language. This acquired pattern is also very productive in the HL.

Both Badry (1983) and Berman (1982) found that the causative pattern (P2) was used at an early age in childhood, and the mean percentage of this pattern was high. It is predicted to be the second pattern acquired in Semitic languages. In this experiment, just 40% of the participants acquired it and the mean percentage of its use was 51%. Also, data analysis showed that there was a statistically reliable variation in the use of P2 and P5 ($t(df=288)=5.51, p<0.008$), and between the usage of pattern 2 and 6, there was a significant difference ($t(df=271)=7.13, p<0.008$).

Hypothesis 2 was not fully supported as it was expected that P2 should be used at a higher percentage since it is acquired and stabilized at an early age in childhood. The phonological form of P2 was modified as the hypothesis predicted. This finding supported El Aissati' conclusion (1997) that HS in the Netherlands rely on geminate reduction in their production. Likewise, this study showed that HS in France have constraints against the production of geminate consonants. However, the distinction between P1 and P2 was maintained as participants depended on other clues such as vowels, but the second geminate consonant was absent in their production as CeCCeC becomes CeCeC; and evidence of the their awareness of the morphological form of P2 was supported by producing the same root in P1 and P2 as in lbes

‘dress’; lebes ‘to dress someone’. In the data that did not use P2, a transitive verb (P1) was used plus periphrastic constructions which is attested in monolingual speech. The question used in the experiment favored the use of P2; however, it was not used in 49% of the causative-targeted data. Badry (1983) predicted that P2 should be the highest in use after P1 and she explained that P2 is semantically transparent, very productive, and formally it is simple. Her results (1983, 2005) revealed that the causative pattern was the first to be used productively after P1, followed by the reciprocal then the middle voice pattern, and it was stabilized by age 3;5. In this study, P2 was the second one to be used at higher percentage and 40% of the participants acquired it.

To confirm that participants do not conceive and produce geminate consonants, I propose that an acoustic experiment should be conducted to measure the duration of the second consonant in the causative form as studies show that speakers may have covert contrast that is not perceived by the experimenter. When L1 learners produce a statistically reliable distinction, in phonemic contrast, and this distinction is not perceived by adults, including phonetically trained ones, this phenomenon is referred to as covert contrast (Eckman, Iverson, & Song, 2015). In Eckman et al. (2015), some of the participants exhibited a covert contrast between the bilabial [p] and [b] in their interlanguage production. The participants’ native language is Arabic, and it does not have this phonemic contrast. Their study revealed that some participants produced a statistically significant distinction in voice onset time lags between the target sounds. This contrast was not perceived by phonetically trained transcribers. Their results support the claim that covert contrast is likely a part of phonological learning. It is also hypothesized that covert contrast comprises an intermediate stage in the acquisition of phonology. And it is an important step in the acquisition of phonemic contrast. Because of the fact that covert contrast cannot be perceived even by trained transcribers, I believe that an acoustic phonetic analysis is needed to

study the length of the second consonant in the causative pattern and compare it to the length of its singleton counterpart to check if there is an intermediate stage of covert contrast in participants' causative data.

Despite being described as formally simple in L1 acquisition (Badry, 1983), P2 suggests that its complexity in the HL may result from its phonological realization as participants need first to acquire the singleton geminate contrast in order to produce the geminate in P2. Khattab and Al-Tamimi (2015) claimed that they were the first to study the acquisition of gemination in Arabic by conducting an acoustic experiment. Their results suggest that the acquisition of gemination in Lebanese children is a complex process, and that language contact in Lebanon makes it challenging for geminate acquisition. Additionally, geminates are marked consonants (Khattab & Al-Tamimi, 2015). Hence, the acquisition of the singleton geminate contrast may be among the late acquired structures. Also, language contact could influence the acquisition of geminates in the HL.

Medio-passive acquisition in Semitic languages such as Arabic and Hebrew is acquired late (Badry, 1983; Berman, 1982, 1985). In Badry's studies (1982, 2005), MA speaking children overused the causative pattern at the expense of medio-passive forms. Badry (1983) claimed that medio-passive pattern in MA is expected to present some difficulties in language acquisition because of its formal structure and its semantic ambiguity. Additionally, medio-passive pattern (P5) is formed by attaching a prefix *t-* to the template *CeCCeC*. The prefix *t-* has several derivational and inflectional functions in Arabic, and needs to be attached either to P2 or P1. Derivationally, it is also used to derive reciprocal patterns and reflexives (Badry, 1983). Berman (1985) argued that the use of passive is delayed in the acquisition of Hebrew as they are rare in input, and morphologically they are marked. The availability of periphrastic constructions for

performing the meaning associated with passive structures is another factor in its late acquisition. In Berman (1982), the oldest children aged 5-6 were able to use most of the studied patterns including causative forms. However, they did not master passive. It was suggested that Hebrew speaking children will not master this pattern until a later stage in grade school, and that literacy enhanced the acquisition of passive. It was also suggested that the critical age for the acquisition of passives in general being between ages 7-9.

In this study, no participant acquired the medio-passive pattern (P5) and the mean percentage of use was 22%. The difference between the use of this pattern and P1 was statistically significant and the difference between the use of this pattern and P2 was also statistically significant. And there was no significant difference between the usage of this pattern and P6. For the targeted medio-passive data, in 71% of the data that did not use pattern 5, P1 was used; and in 29% of the data that did not use pattern 5, participles were used, which is acceptable in monolingual speech. Additionally, it was proven in Badry and Berman's research that the acquisition of medio-passive is gradual and acquired at a later stage in children. Accordingly, it is not surprising that HS in this study did not acquire this pattern, given the morphological markedness of this pattern and the availability of periphrastic constructions. Furthermore, HS' limited context of language use and immersion into the majority language, French, might hinder the acquisition of this pattern. Participants' pattern of acquisition of P5 suggested that there is a levelling of verb pattern distinctions and the prompt used in the experiment required the use of P5, but participants largely used P1.

In language acquisition, it is predicted that reciprocal pattern (P6) would be used in a low percentage by children as it was expected to be the last one to be acquired (Badry, 1983). P6 is semantically complex as it expresses complex semantic relations to refer to a reciprocal action.

Reciprocal verbs can also express the notion of competition and rivalry (Harrell, 1962). Additionally, formally is not a simple one. It is formed by prefixing t- to the required template (t-CaCeC). Badry's study (2005) suggests that reciprocals are acquired late in MA. And therefore, the concept of simultaneity is acquired late in MA. She also pointed to the complexity of the reciprocals that children face during their developmental stages as the difficulty arises from complex semantic relations. Specifically, the action is performed by two agents who are affected by the action and affecting the action as well. Therefore, two perspectives of reasoning are involved in the acquisition of the reciprocal forms. Reciprocals are late acquired in other Semitic languages such as in Hebrew as they are considered to be conceptually more difficult (Berman, 1982, 1985). Semantically, P6 is one of the marked patterns (Berman, 1982). In this study, this pattern was not acquired by any participant and the mean percentage of usage was 15%. While there is a statistically significant differences between the usage of P6 and P1, and P6 and P2, there was no significant differences between P5 and P6. In reciprocal targeted data, participants relied on analytical expressions that include P1 plus other expressions such as pronominal and demonstratives. Both P5 and P6 were not acquired and the mean percentage of use was low. Both patterns are morphologically and semantically complex. Hypothesis 3 is supported since P1 was used predominantly in P5 and P6 targeted data, and therefore, morpho-semantic distinctions are neutralized in the HL, as semantic distinction (medio-passive and reciprocal) is not lexicalized using the specified morphological patterns (tCeCCeC (P5); tCaCeC (P6)). Instead, P1 and periphrastic constructions are used.

Results revealed that just P1 and P2 that were used at a higher percentage, 100% and 51% respectively. ANOVA showed that there was significant difference among patterns ($F(df=3)=160.57, p < 0.01$). And t-test pairwise comparison revealed that there was a significant

difference in the use of P1 and P2, and between the use of P1-P5, and P1-P6. Also, there was a significant difference in the usage of P2- P5, and P2 - P6. And there was no significant difference between the usage of P5 and P6. Participants productions to some extent obeyed the proposed order of acquisition in Semitic languages (Badry, 1983; Berman, 1982, 1985) (P1>P2> P5 >P6). According to the adopted criterion in this research, no participant acquired P5 and P6. Hence, the proposed order of acquisition in the HL is: P1> P2> P5-P6. Pattern alternation involves the interface of two linguistic components: semantic and morphology, which could affect the acquisition of P5 and P6. According the Interface Hypothesis proposed in Sorace (2011), grammatical structures at interface are not likely to be acquired completely as they are complex and they integrate multiple linguistic components, such as structures involving interface between syntax and pragmatics. The term Interface Hypothesis was first proposed in L2 acquisition then was extended to bilingual first language acquisition.

Furthermore, both P5 and P6 are considered to be semantically and morphologically complex. It was suggested that morphological complexity is one of the main factors pertaining to age of acquisition (Albirini & Benmamoun, 2014; Omar, 1973). Also, morphologically, P5 and P6 are marked. And unmarked structures such as P1 in Arabic should be the first ones to be acquired as a morphological derivational device, and marked structures such as P5 and P6 should be acquired late in Semitic languages. Furthermore, French has a wider use after school age, which could restrict the development of P5 and P6 in the HL. Hence, in addition to the markedness and complexity of P5 and P6, unequal use of the HL and the majority language may contribute to the neutralization of semantic notions in MA, and limits the use of semantically specified morphological patterns such as medio-passive and reciprocal pattern, because the

acquisition of P5 and P6 is a gradual process and needs an extended period of time, and the suggested offset is mid-teens.

It was suggested in Berman (1982) that the critical period for the acquisition of medio-passive is between 7-9, which coincides with HS' immersion into French at school. Results supported the claim that there is a distinct critical period for the acquisition of morphology, and its offset is mid-teens (Granena & Long, 2013; Long, 2005). Specifically, I argue that P5 and P6 are developed beyond age 5, spanning the entire school period, and the offset of P5 and P6 acquisition is mid-teens. Berman argues that the process of acquiring pattern alternation in Hebrew depends on complex interactions between cognitive maturations and linguistic competence. And therefore, the acquisition of P5 and P6 should be extended to later language development, school age period.⁷ Additionally, a metalinguistic conceptualization of the patterns is needed where the knowledge of consonantal root and patterns is required. This type of knowledge depends on literacy as well. And patterns such as P5 and P6 could not be mastered until puberty, as suggested in Berman (1982). Berman also explains that the appropriate use of pattern alternation depends on "mental space becoming available for the task and on more exemplars from input" (p. 188). More input and exemplars are needed during later development period so that HS can form hypotheses and acquire pattern alternation including P5 and P6. Some studies in English morphology also suggest that not all morphological structures of a language are learnt as early as 3 years old, the preliterate period. Derwing (1976) studied the acquisition of agent and instrument nouns in English speaking children aged 8 to 17. They produced agent-er 86% of the time, and instrument-er 55% of the time. Clark and Hecht (1982)

⁷ Montrul (2016) used the preliterate period to refer to preschool period, and later development period to refer to school age period.

claim that Derwing's study suggested that agent and instrument suffixes are mastered at a late age, and their acquisition is completed after age 10 and 12. Thus, not all morphological aspects are acquired during the preliterate period.

The findings of this study also suggests an implicational hierarchy for the acquisition of pattern alternation in MA. For instance, if a MA learner acquires only one verb patterns, it will be the basic pattern (P1). This implication was supported by the percentage of acquisition, since 60% of the participants acquires just one verb pattern, which is P1. Moreover, if a learner acquires two verb patterns they will be P1 and P2 as 40% of the participants acquired these patterns.

Participants' verbal systems are mainly characterized by the use of P1. Analyzing participants' production demonstrated that participants rely heavily on the basic pattern (P1) and that semantic distinction is not emphasized in their production. In the production of the three patterns, P1 constituted 69% of the use of the patterns in the targeted-causative, medio-passive and reciprocal data as Figure 5.2 showed. Also, it is likely that the basic pattern is used as a default morphological device because it unmarked and underspecified. According to Underspecification Hypothesis (McCarthy, 2007), structures that are underspecified and unmarked are used as a default and extend to marked and specified ones. Predictably, none of the marked patterns were extended or generalized in the studied data. The percentage of P2 usage was 18% in the data targeting the causative, medio-passive and reciprocal data. P5 constituted 8% and P6 constituted 5% of the usage. Participants' verbal derivation is mainly characterized by P1. The medio-passive pattern (P5) and the reciprocal (P6) pattern are not productive in participants' verbal derivational processes. Therefore, P1 is used predominantly in data requiring P5 and P6. Hence, participants tend to level out the distinctions between P1, P5 and P6. And HS'

verb pattern derivational processes are different from the ones used in the source language. Their variety is mainly characterized by unmarked patterns.

5.4 Conclusion

In this study, the acquisition of pattern alternation was explored in MA HS in France. The main finding is that semantic distinction realized by pattern alternation is neutralized in the HL. Results revealed that participants acquired the basic pattern (P1), and 40% of the participants acquired P2. There was a statistically significant difference in the use of the studied patterns. Specifically, the use of P1 and P2 was significantly different from the use of P5 and P6. However, there was no significant difference between the use of P5 and P6, and no participant acquired these patterns. The pattern of HS' acquisition corresponds to the order of pattern acquisition in children acquiring Semitic languages, in the sense that P1 was acquired first then followed by the causative (P2). The HL seems to depend mainly on P1 in medio-passive and reciprocal-targeted data. And therefore, participants tend to neutralize the morpho-semantic distinction achieved by using P5 and P6, as P1 and periphrastic constructions dominate in the data. Results suggest that the acquisition of verb pattern alternation is a gradual process. Patterns that are semantically and morphologically simple are the first ones to be acquired, and structures that are both formally and semantically complex are among the late acquired structures. Accordingly, complex patterns are likely to be absent in HS' verb pattern system. Verb patterns mainly depend on non-concatenative processes, in addition to prefixation in P5 and P6. Results support the claim that non-concatenative morphology should be acquired by mid-teens, and needs sustained input to be acquired.

Chapter Six

Discussion and Conclusion

This study examined the endstate of the process of language acquisition in HS in an immigrant context. Specifically, the current study reported on the acquisition of nominal morphology and verbal-derivational patterns by Moroccan HS in France. There is ample research in HL acquisition as an emerging field (El Aissati, 1997; Kupisch & Rothman, 2016; Montrul, 2005, 2008, 2011, 2012, 2016; Polinsky, 2008, 2011; Polinsky & Kagan, 2007; Rothman, 2007; Valdés, 2001, 2005). There is also a growing body of research on Arabic HS in the U.S (Albirini, 2014, 2015, 2016; Albirini & Benmamoun, 2014; Albirini & Chakrani, 2017; Albirini et al., 2013; Albirini et al., 2011; Saadah, 2011). This study was motivated by the need to expand Arabic HS research and to explore a different population of HS than those studied in the U.S., both geographically and linguistically. The main objective was to understand the outcomes of acquiring a native language in an immigrant context. Additionally, this study also aimed at uncovering the general linguistic characteristics of a HL that is acquired in a modified setting of acquisition where there is also a qualitative and quantitative difference in the received input (Rothman, 2009). The ultimate aim was analyzing and describing the HL as an independent system, though originating from the source language, under the assumption that every human language or variety should be analyzed as an independent linguistic system. As an example, creoles originate from pidgins. However, the two varieties are different because of each variety having its distinct reality. This study also aimed at informing on linguistic theories by testing available hypotheses in language acquisition, namely the Critical Period Hypothesis, and examine the advantage of early input in language acquisition (discussed in chapter 2).

The remainder of this chapter is structured as follows. Section 6.1 will present a complete discussion of the overall findings, linking the results of all the experiments and addressing the main hypotheses and questions previously posted. Section 6.2 questions the relationship between the findings of the three experiments and the Critical Period Hypothesis or Sensitive Periods, suggested in Granena and Long (2013). This section also provides an explanation of the attested pattern of acquisition in the three experiments. Section 6.3 will discuss the findings of the study in relation to previously drawn conclusions on HS ultimate attainment, that is to say incomplete grammars or differential acquisition. Section 6.4 will report on implications of the study for L2 and HS learners of Arabic. After discussing the limitations and future studies in section 6.5, I will conclude this dissertation in section 6.6.

6.1 The acquisition of Nominal and Verbal Morphology

The acquisition of both nominal and verbal morphology in MA HS were explored in this research. Nominal morphology was represented by plural formation and diminutive forms, and verbal morphology was exemplified by four verb patterns. In this study, three experiments were conducted to answer three empirical questions: 1) What are the acquired patterns in plural formation, diminutive forms, and verbal derivational processes? 2) How do speakers compensate for the patterns that are not possibly acquired? 3) What are the characterizations of HS' nominal and verbal derivational processes? In what follows, the three research questions will be answered in the context of each experiment's finding.

6.1.1 Plural formation. In this study, the acquisition of both sound and broken plural formation were investigated. There are three sound plural morphemes deployed in sound plural formation, and they need to be suffixed to the edge of a stem. Results of sound plural data revealed that all participants acquired the sound plural suffix [-at]. Results also showed that 80%

of the participants acquired the sound plural suffix [-in]. On the other hand, just 33% of the participants acquired the plural suffix [-a]. The attested order of acquisition of sound morphemes support hypothesis 1 as participants' order of acquisition is: -at>-in> -a. Non-source like data shows a pattern where the sound plural -at is overgeneralized and used as the primary fallback strategy. For example, to compensate for non-use of -in suffixation, participants applied the suffix -at in 45% of the data targeting -in suffixation. Besides, they substituted the morphemes -at and -in for the plural ending -a. The sound plural ending -in was generalized to 41% of non-source like forms that require the morpheme -a suffixation in the source language. And the sound morpheme -at was generalized to 20% in non-source like forms that necessitate the morpheme -a. Generalizing the plural morphemes -at and -in could be an evidence that they are learnt, as acquired forms usually extend to the patterns that they are not developed (Quintero, 1992).

The average of source-like use of the 14 patterns is 25%. Therefore, hypothesis 2 is supported as HS in this study experience difficulties with broken plural formation; and the difficulty resulted from the need to apply non-concatenative processes. The difficulty is demonstrated by the low percentage of source-like use. Additionally, the percentage of acquisition differs across different patterns. Just three patterns were acquired by a significant number of participants. Specifically, 60% of the participants acquired the CiCaC pattern, 53% of the participants acquired the pattern CCaCeC and 47% of the participants acquired the pattern CCaCa. But, a very small percentage of the participants acquired the other 11 patterns ranging from 27% to 0%. Generally, overgeneralization of concatenative morphological processes was the main adopted strategy in non-source like data, when compared to the source language. The suffixation of sound morphemes -at and -in dominated as the percentage of generalizing the sound morphemes -at and -in was 65%. Non-source like data is a representation of a simplified

and a rule-governed plural system, and concatenative processes are the preferred ones. Therefore, Hypothesis 3 is also supported as concatenative processes were generalized to forms requiring non-concatenative processes in the source language. Additionally, the plural morpheme -at seems to be the default form as the percentage of applying it in non-source like data constitutes 45% of the applied plural patterns; accordingly, hypothesis 4 is supported as the sound plural -at functions as the default form. According to Underspecification Hypothesis (McCarthy, 2007), default categories are underspecified and unmarked and they extend to marked or specified ones. The study's findings confirm previous studies that demonstrated that the sound plural -at is the first one to be acquired (Omar, 1973; Ravid & Farah, 1999), plus it is used as a default form in children's language.

This experiment also reported on the characterization of HS plural formation system. Analyzing HL as an independent sub-system demonstrated that plural formation in HS was mainly characterized by the use of sound plural morphemes -at and -in. This finding was supported by the percentage of acquisition, source-like use, and the percentage of over-generalizing the sound plural morphemes -at and -in. HL as a subsystem that is largely characterized by concatenative processes was also supported by the suggested implicational hierarchy of acquisition of plurals in MA. For example, if a speaker only knows two plural patterns, they will be the sound plural endings -at and -in (see Table 4.1). The sound plural -at and -in appeared to be stabilized in HS and acquired during early stages in plural acquisition. HS in this study depended mainly on concatenative morphological processes. Concatenative morphological processes are central processes in MA morphology. Broken patterns require mapping of the consonant root into the right pattern, participants have difficulty in applying non-concatenative processes; and data analysis showed that they are not stabilized in their HL.

Broken plural complexity was also confirmed in other studies on Arabic HS (Albirini & Benmamoun, 2014; El Aissati, 1997). Hence, HL as a subsystem of the source language is different from the source language and characterized mainly by the use of concatenative processes. More specifically, the affixation of the sound plural morphemes -at and -in.

6.1.2 Diminutives. There are six types of diminutives in MA that depend on a word stem (Harrell, 1962), as the stem determines the pattern (see Table 2.1). The results revealed that just two patterns that were acquired by a significant number of participants. 73% of the participants acquired [fʕila] [CCiCa] pattern and 53% of the participants acquired fʕijjəl (CCiCjCjəC) pattern; these patterns are less complex and easy to apply than the others. 40% of the participants acquired [fʕijjla] [CCiCjCjCa] pattern. The percentage of accuracy was low in forming diminutive forms for irregular stems. Middle weak stems appeared to be more complex and presented difficulties for HS in both middle weak trilateral monosyllables and middle weak stems with a final vowel (two syllables), as just 27% of the participants acquired the patterns fwijjəl(CCwiCjCjəC) and fwiʕv (CCwiCv). The proposed derivational processes (see chapter 4) revealed that patterns that depend on complex processes were not acquired by a significant number of participants. Also, just 27% of the participants acquired CCiCəC pattern, used in stems with four consonants. Besides, just 7% of the participants acquired forming diminutive forms for three consonant words with a stable vowel using fwiʕəl(v) (CCwiCəC) pattern. No participant acquired the diminutive pattern [fʕiʔəl] (CC₂iC₂əC); this pattern depends on reduplication as a process. The mean percentage of diminutives source-like use was 38%, and therefore, hypothesis 1 was supported as diminutive forms depending on non-concatenative processes presented difficulty to HS. Despite producing non-source like diminutive forms, 69% of the non-source like data depended either on consonant clusters or insertion of a glide.

Furthermore, the requirement of having two syllables was respected. Hence, hypothesis 2 was supported and participants produced rule governed non-source like forms, and their production in non-source like data showed a consistent pattern. Additionally, non-source-like data depended mostly on either initial consonant cluster or insertion of a glide. These rules are part of the patterns that were acquired by a significant number of participants, and were generalized to non-source like data; thus, hypothesis 3 was supported, since acquired processes were generalized to forming diminutives for irregular stems.

Analyzing HL as an independent rule governed subsystem demonstrated that diminutive forms in HS's variety are mainly characterized by two patterns [fʕila][CCiCa] and [Fʕijjəɫ][CCiC;C;əC] patterns. The percentage of acquisition, pattern of generalization in non-source like data, and the implicational hierarchy showed that HS' diminutive forms are mainly characterized by two patterns.

6.1.3 Verb patterns. The acquisition of verb pattern alternation was also the focus of this study. In Arabic, verbs are formed according to patterns, and semantic notions such as causativeness, reciprocity and passive are lexicalized according to specific morphological verb pattern. Root -and-Pattern is an important derivational device for the verbal system (Ayalew, 2011). The derivation relies mainly on combining consonantal roots with verbal patterns. The studied patterns were the basic (P1), causative (P2), medio-passive (P5), and reciprocal (P6). The aim of this study was to explore the acquisition of pattern alternation in HS in France, and to study if semantic distinctions of causativeness, passive, and reciprocity were lexicalized in the HL through using different morphological patterns. The basic pattern (P1) was acquired by all the participants and 40% of the participants acquired the causative (P2). Participants did not acquire the medio-passive pattern (P5), nor did they acquire the reciprocal pattern (P6). The

basic pattern was the only pattern used at a higher percentage, which is 100%. The causative pattern (P2) was the second in use as the mean percentage use is 51%. The mean percentage of the usage of medio-passive and reciprocal pattern was low, 22% and 15%, respectively.

Statistical analysis was used since this experiment referred to Badry's (2005) study of verb alternation, and she depended on statistical analysis to study the differences in pattern use, and to make generalizations about the acquisition of patterns in MA. To make the results of this study comparable to Badry's findings, regarding the use of these patterns and their acquisition, statistical analyses were used. ANOVA showed that there were statistically significant differences among the use of the four patterns ($F(df=3)=160.57, p < 0.01$). We performed t-test comparisons to find if there were significant differences between each pair of patterns. T-test pairwise comparisons showed that between the usage of the basic pattern (P1) and causative (P2), there was a significant difference ($t(df=149)=11.88, p < 0.008$). There was also a highly significant difference in the usage of the basic pattern (P1) and the medio-passive pattern (P5) ($t(df=149)=22.98, p < 0.008$). Between the usage of the basic pattern (P1) and the reciprocal pattern (P6), there was a significant difference ($t(df=149)=28.68, p < 0.008$). There was also a significant difference in the usage of causative (P2) and medio-passive (P5) ($t(df=288)=5.51, p < 0.008$). Between the usage of P2 and P6, there was a significant difference as well ($t(df=271)=7.13, p < 0.008$). And there was no significant difference between medio-passive (P5) and reciprocal (P6). Badry (2005) claims that by age 3;5 the causative is stabilized in children, followed by reciprocal then medio-passive. Furthermore, she found a statistical difference in the use of the causative and medio-passive, and in the use of the causative and reciprocal. However, there was not a statistically significant difference between medio-passive and reciprocal in her production experiment, similar to the findings of this experiment.

Analyzing participants' production demonstrated that participants relied heavily on the basic pattern (P1), and semantic distinction was not emphasized in their production. In the production of the data that targeted the use of the three patterns (P2, P5, P6), P1 constituted 69% of the use of the patterns. The basic pattern (P1) dominated despite that the prompt in the experiment favored the use of the lexicalized patterns (P2, P5 and P6). The percentage of the causative (P2) usage was 18% of the data targeting the use of the three patterns (P2, P5, P6), the medio-passive (P5) constituted 8%, and the reciprocal (P6) use constituted 5% of the usage of the three patterns. Participants' verbal derivation system was mainly characterized by P1, and the low percentage use of P5 and P6 demonstrated that they were not productive in participants' verbal derivational processes. Additionally, neither P2, P5 nor P6 were generalized in the studied data. This study confirmed previous finding about the stability and productivity of the basic pattern (P1) in Moroccan children's verbal pattern system (Badry, 1983, 2005). Hypothesis 1 was supported and participants acquired this pattern and it was used productively in the HL. Hypothesis 2 was not fully supported as it was expected that the causative pattern (P2) would be used at 70% or higher, since it is acquired and stabilized at an early age in childhood (Badry, 1983, 2005; Berman, 1982, 1985). The phonological form of the causative (P2) was modified as the hypothesis predicted. This finding supported El Aissati's (1997) conclusion that HS in the Netherlands depend on geminate reduction. Likewise, this study proved that HS in France also had constraint against the production of geminate consonants. Hypothesis 3 was also supported since the basic pattern (P1) was used predominantly in P5 and P6 targeted data, and therefore, morpho-semantic distinction is neutralized in the HL, as semantic distinction (medio-passive and reciprocal) was not lexicalized using the specified morphological patterns (tCeCCeC (P5); tCaCeC (P6)). Instead, P1 and periphrastic constructions were used. This study also suggested an

implicational hierarchy in the acquisition of verb patterns. For example, if a speaker acquires only one verb pattern, it will be the basic one. 60% of the participants in this study mastered just one verb pattern and it is the basic one (P1). And if a speaker acquires two verb patterns, they will be the basic pattern (P1) and the causative (P2), since 40% of the participants acquired two patterns and they are P1 and P2.

Participants' verbal system is mainly characterized by the use of the basic pattern (P1). Analyzing participants' verbal system demonstrated that participants relied heavily on the basic pattern (P1) and that semantic distinction was not emphasized in their production. In the production of the three patterns, P1 constituted 69% of the use of the patterns in the targeted - causative, medio-passive and reciprocal data. It is likely that the basic pattern is used as a default morphological device because it unmarked. None of the marked patterns were extended or generalized in the studied data. Additionally, no participant overgeneralized the causative (P2) despite the fact that 40% of the participants acquired it. It is possible that participants avoided it because of the phonological complexity characterizing the production of the geminates. Hence, participants tend to level out the distinctions between P1, P5 and P6. Data analysis revealed that HS' verb pattern derivational processes are different from the ones used in the source language. Their variety is mainly characterized by unmarked patterns. The main finding of this study is that semantic distinction realized by pattern alternation is neutralized in the HL.

The three experiments revealed that participants are omitting irregularities and non-source like forms are rule governed. Less complex and less marked structures tend to characterize the HL. Specifically, morphological aspects thought to be acquired earlier in language development are the ones characterizing the HL. Overgeneralization in plural formation, and neutralization in verb patterns showed that HS speak a variety that is reanalyzed.

Accordingly, HS' morphological forms are distinct and indicate that HS in France have a distinct variety.

6.2 What Do These Studies Tell us about the Role of Early Input and the Critical Period Hypothesis in the Acquisition of MA Morphology?

Structures that are less complex are stabilized at an early age in children's language. Research on Arabic morphology proved that the sound plural morpheme -at is learnt and stabilized at an early age (Omar, 1973; Ravid & Farah, 1999). The morpheme -at is very frequent and productive in the language, and morphologically, it is simple as it needs to be suffixed to a stem. This study also supported the claim that the suffix -at is among the first acquired structures and learnt before five years and, therefore, this sound plural morpheme is among the first acquired morphemes in the HL as morphologically it is less complex, very frequent, and tends to be the underspecified morpheme in the HL. Accordingly, the sound morpheme -at benefits from early input and appeared to be acquired and stabilized in the HL. Similarly, the sound morpheme -in was acquired and stabilized in the HL. Because the sound morpheme -a is not very frequent in the source language and limited to specific classes, it was acquired by a small number of participants, and early exposure was not beneficial enough for the acquisition of the sound plural morpheme -a; for that reason, the acquisition of this morpheme needs sustained and continuous input.

Broken plural formation depends on non-concatenative processes, where participants need to map root consonants to templates. HS' production was mainly characterized by concatenative processes, which suggested that broken plural and non-concatenative processes are acquired by mid-teens as their acquisition require continuous input, metalinguistic awareness and cognitive maturation abilities. Research conducted on Arabic speaking children (Omar, 1973;

Ravid & Farah, 1999) proved that broken plural is acquired gradually and in later stages in language development, and the sound morpheme -at was generalized by children in the context where broken plural was needed. Results of broken plural suggested that they are among the complex processes that need extended periods of time. Accordingly, the findings of the plural lend support to the general hypothesis tested in this study, which is the existence of a distinct critical period for the acquisition of morphology. Structures that are morphologically simple and frequent, such as the sound morphemes -at and -in are earlier acquired and should be part of the HL, and complex structures, such as broken plural templates, are acquired in later stages in language development and the offset is mid-teens. In HS research (Montrul, 2008), it was claimed that HS have linguistic advantage, in language acquisition, predicted for structures of early language development, but not for structures of later language development. In other words, structures acquired at an early stage by children will be part of HS' grammars. It is likely that complex structures acquired late by children will be absent in HS' grammars.

As far as I know there are no available studies on the acquisition of diminutives in the literature. Diminutives depend on non-concatenative morphological processes, and the locus of difficulty is the availability of many processes. This linguistic function is realized through multiple processes. The brief derivational sketch presented in chapter 4 showed that some processes are easier than the others. Less complex processes are the ones characterizing the HL. Diminutive forms requiring complex processes, such as forming diminutives for four consonant stems, were not acquired. Thus, results of diminutive experiment proposed that the acquisition of diminutives, which requires non-concatenative processes and applying different patterns, should be acquired at a later stage in MA. As stated before, there is no available study on the acquisition

of diminutives by Moroccan children. It will be interesting if HS' pattern of acquisition could be compared to the pattern sequence attested in children at different age groups.

Results of the acquisition of verb pattern alternation also supported the general hypothesis tested in this study. The acquisition of the verb pattern alternation demonstrated that patterns that are morphologically simple and productive in the language are the first ones to be acquired such as the basic pattern (P1). On the other hand, patterns that are both morphologically and semantically complex, such as medio-passive and reciprocal patterns, are acquired late. The basic pattern (P1) was acquired by HS. Medio-passive (P5) and reciprocal (P6) were not acquired by HS, and studies in first language acquisition evidenced that these patterns are acquired late by children (Badry, 1983, 2005; Berman, 1982, 1985). A compelling question is why structures that are predicted to be acquired at a later stage in language development and need cognitive maturation tend not to be acquired by HS?

The argument I advance is that HS linguistic experience in an immigrant context influence their final linguistic attainment. HS in France start school at an early age (Helot & Young, 2002) and the majority language is used widely at the expense of the HL which is confined to the home and community setting. Also, participants' HL, in this study, is not recognized in French public schools. This modified context of acquisition might limit the growth of the acquisition of complex and less frequent patterns. Presumably, the learners did not have the opportunity to acquire complex and less frequent structures after they start school. Accordingly, HS were not granted the opportunity to test their hypotheses about complex structures such as the ones tested in this study. The findings of this study are in line with previous studies in suggesting that early input is not necessarily advantageous to morpho-syntax, since sustained and continuous input needs to be provided beyond age 5, spanning the entire

school age period, till mid-teens. That is to say that early exposure to a native language may not guarantee the acquisition of complex morphological structures, if a sustained and rich linguistic environment is not provided.

Previous studies proved that early input is advantageous to HS for the acquisition of phonology and core syntax, but not for the acquisition of morphology (Au et al., 2002; Knightly et al., 2003; Montrul, 2012, 2016). Bylund (2009) argued that when L1 speakers experience reduced L1 contact, speakers 12 years and older cope with the changes of linguistic setting without any radical language loss. Silva- Corvalán (1994) studied tense-mood-aspect system and copula in L1 Spanish speakers of Mexican origin in Los Angeles. Her Results showed that those who were born in the U.S or arrived before the age of 7 exhibited simplifications in tense-mood-aspect and extended the use of the copula *estar* ‘to be’. Participants who came to the U.S after age 11 displayed the most conformity with Spanish monolingual patterns. I think Silva-Corvalán’s findings suggest that morphology is acquired by mid-teens, and her participants who conformed to monolingual’s patterns moved to an immigrant context after they acquired the target morphological structures. On the other hand, participants who moved to the U.S before age 7 showed a different pattern of acquisition that depended mainly on simplification as a result of their modified context of acquisition as they received input that is quantitatively and qualitatively different from the one received by monolinguals in Mexico. Bylund claimed that Silva-Corvalán’s work supports the idea that a person’s L1 proficiency is less subject to change if reduced L1 contact takes place after the age of 11.

In this study, reduced input and modified context of acquisition takes place at an early age, as 11 participants were born in France and the other four participants came to France before age 7, which resulted in a variety that is different from the source languages. Complex and

marked structures such as non-concatenative processes, and structures that depend on interface between two linguistic components, such as verb patterns, were affected by the modified context of acquisition. It was suggested in L1 acquisition that morphological complex and marked structures are acquired late in Semitic languages (Berman, 1982, 1985). For example, Berman (1982) contended that the general age for the acquisition of passives in Hebrew is 7-9. She further proposed that the knowledge of consonantal roots and morphological patterns depend to some extent on formal schooling; and such knowledge is “probably not mastered until around puberty” (p. 185). Montrul (2016) maintains that the acquisition of many structures in L1 acquisition “extend beyond age 3 or 4, spanning the entire school-age period until adolescence” (p. 114). Montrul also points that language acquisition research is mainly concerned with the preliterate child (p. 103). She claimed that later language development, school age period, has not been as intensely investigated in linguistics as the preschool period, which shows that the school age period is an important period for the acquisition of late acquired structures. This study supports the claim that the acquisition of different linguistic domains are subject to sensitive periods, but the offset point may be different (Granena & Long, 2013; Long, 2005). Granena and Long (2013) proposed that the offset of the acquisition of morphology and attaining native like attainment is mid-teens. Adopting the principles of the Critical Period Hypothesis (Long, 2005; Granena & Long, 2013), I advance the argument that the offset of the acquisition of the tested complex morphological structures in this study is mid-teens. In this study, participants’ pattern of acquisition is a result of modified context of acquisition. When it is stated that the offset of the acquisition of morphology is mid-teens (Granena & Long, 2013), it is implied that sustained and rich linguistic environment should be provided to the learner so as morphological structures could be learnt and stabilized. Therefore, early input is always an advantage in language

acquisition, but constant and rich linguistic environment should be provided and extended till mid-teens so as complex, marked and less frequent structures can be stabilized and acquired. Another pertinent question is: Do the findings of this study suggest that HS' grammar is incomplete? Or, it is a state of differential acquisition?

6.3 Incomplete Acquisition or Differential Acquisition?

HS' grammars have been described as incomplete (Albirini & Benmamoun, 2014; Benmamoun et al., 2013a; Montrul, 2008, 2011, 2016; Polinsky, 2008). The claim is that HL do not fully develop (Montrul, 2016). Additionally, they are not completely acquired because of switching to another dominant language (Benmamoun et al., 2013a). Pascual y Cabo & Rothman (2012) argue that HS' competence is complete, but simply different as monolingual and HS have different linguistic realities and the ultimate attainment should be different as well. I also argue that HS' grammars are different as a result of their different realities of acquisition. Their grammars are not incomplete but simply different. They are native speakers of MA, but the variety they speak does not comprise all the patterns attested in the source language and their grammar is reanalyzed. Their production is rule governed and acquired patterns are generalized to the patterns that are not acquired. Importantly, they did not violate any universal rules that characterize natural languages, and they did not use patterns that don't belong to MA, but exhibited a rule-governed linguistic behavior. Therefore, their grammars are not incomplete. Rothman and Treffers- Daller (2014) contend that HS grammars are native ones and the term imply variation. And there is variation among monolingual speakers, and variation should be multiplied in HS. HS in this study also proved that they are native speakers since HS in this study applied patterns and rules available in the source language, and they did not apply any rules that are specific to another language. For example, no participant in this study applied

French grammars in forming plural forms. An interesting example that shows variation in Arabic dialects is that the sound plural morpheme *-at* may be allowed in contexts in MA, where it is not grammatical in Egyptian Arabic. In Omar's (1973) research on the acquisition of Arabic plurals by Egyptian children, the sound plural morpheme *-at* was overgeneralized to contexts where broken plural was needed as in */*kura-at/* 'balls'; and the correct form in Egyptian Arabic is */kuwar/*. In Egyptian Arabic, it is ungrammatical to use the sound plural *-at* to form plural form for the word */kura/* 'ball'; */*kura-at/*. However, in MA, it is acceptable. MA native speakers have this variation in their dialect, they either depend on *-at* suffixation to form the plural of ball or they depend on broken pattern CCaCi to form plural for the same word */kwari/* 'balls'. Thus, we cannot conclude that speakers of MA have incomplete grammars because of the use of the sound plural *-at*, and speakers of Egyptian Arabic have complete grammars. This example reveals that variation exists within monolingual varieties. Kupisch and Rothman (2016) explain that linguistic completeness of any grammars cannot be determined by comparing it to another grammars. They assert that the "endstate grammars" of HS are different from monolingual speakers, and difference should not be perceived as incompleteness. Also, in this study difference is not interpreted as incompleteness, since incompleteness cannot be determined by comparing the grammars of the HL to the source language. Kupisch and Rothman suggested the term "differential acquisition" (p. 15), as a more suitable term to capture differences when HS are compared to monolinguals. The differential acquisition is an appropriate and inclusive term to understand differences attested in the HL in this study. Participants' pattern of acquisition demonstrated that their variety is different, systematic and does not violate universal rules of natural languages. Additionally, adopting processes such as overgeneralization and neutralization demonstrate a reanalysis of the system and implementation of linguistic change. As difference is

attested in monolingual speech, this difference should be multiplied in HS as stated in Rothman and Treffers- Daller (2014). Furthermore, because of HS's context of acquisition, including setting of acquisition, quality and quantity of the input, participants' HL is different and does not comprise all the patterns attested in the source language.

6.4 Implication for Arabic HS Learners and L2 Learners

HS are very relevant to L1 acquisition, L2 acquisition, and linguistics in general (Montrul, 2016). An inclusive theory in second language acquisition should predict areas of difficulty and order of acquisition, and provide a theoretical background for Arabic instructors in general and MA instructors in particular, since the targeted morphological processes discussed in this study are relevant to MA and SA. This study provided implicational hierarchies for the acquisition of plurals, diminutives, and verb pattern alternation. It also proposed a developmental order in the acquisition of morphological patterns. Generally, it was suggested that the acquisition of concatenative morphological processes are less complex than the acquisition of non-concatenative processes. Rich linguistic environment and extended period of time are required for L2 students to acquire non-concatenative morphological processes as they need metalinguistic awareness and explicit grammatical instruction, as implicit learning may not be efficient. Granena and Long (2013) claim that learners' capacity for implicit learning gradually deteriorates with age (p. 336). Research proved that form-focused instruction and feedback is beneficial for morphosyntax (Montrul, 2016). Similarly, the acquisition of pattern alternation is a gradual process, and less marked patterns such as the basic pattern (P1) should be acquired first, followed by causative pattern. It is likely that the geminates in the causative (P2) will require emphasis and articulatory training. Furthermore, passive and reciprocal forms are among the marked structures and should present difficulties to L2 learners. Therefore, their acquisition may

be emphasized by consistent input and explicit grammatical explanation. Another implication for the predicted difficulties is that structures that depend on interface between two linguistic components should be hard to acquire for L2 learners and may need consistent instruction and longer time. Therefore, implications of this study informed on a theoretical background for SLA, and I believe a good language instructor should be equipped with linguistic theoretical background to predict the sequence of acquisition of Arabic morphology.

HS learners are different type of learners in language classes and they are different from L2 learners. HL learners are learners who aim to regain or improve their home language through formal instruction (Polinsky & Kagan, 2007). Additionally, HS have different language needs that pose challenges to instructors (Valdés, 1995). Their early exposure is advantageous for phonology (Au et al., 2002; Knightly et al., 2003), but not necessarily, for morphology. Valdés (1995) contend that there is a lack of theoretical background to support HL learning. Along the same lines, Polinsky and Kagan (2007) argue that pedagogical theories pertinent to HL learning cannot be framed without language specific research, and they referred to research in grammatical areas that they found to be underdeveloped. Polinsky and Kagan (2007) also raised the issue of foreign language placement tests as they are not suitable for placing HS in a language class, as HS do not acquire their HL through a textbook.

Accordingly, there is a need of a theory that predicts Arabic HS' difficulties in language acquisition and linguistic areas that are acquired first or subject to late acquisition. HS are native speakers of Arabic, but their variety does not comprise all the patterns attested in the source language, which shows that HS have different linguistic needs and they may face challenges in Arabic as a foreign language classes. HS instructors, likewise, are faced with challenges since their students are native speakers of the language and they cannot tell which grammatical areas

or morphological processes are established and stable in their students' system. Thus, there is a need of a theory that predicts the morphological processes that possibly HS did not acquire. The findings of this study implied that non-concatenative processes should be difficult for HL learners. And therefore, non-concatenative processes should be emphasized in a HL class. As a language instructor and having HS in my Arabic language class, it is clear that HS in my class have difficulties in broken plural and in applying non-concatenative morphological processes while forming plurals. In Berman (1982), it was argued that schooling has a merit in the acquisition of late acquired verb patterns such as passive, in this study it was also implied that metalinguistic awareness is needed so that HS can master verb pattern alternation and non-concatenative processes. Additionally, structures depending on interface between two linguistic components, such as verb patterns, may also need emphasis and further instruction. It was predicted by the Interface Hypothesis (suggested in Sorace, 2011) that structures at interface present difficulties to learners and are delayed in bilingual acquisition. Thus, explicit teaching of the complex morphological forms is needed.

HS and L2 learners are often given the same instruction and assigned the same courses. Results of this study suggest that some morphological processes are stable in HS' morphological system such as concatenative processes. Despite that concatenative processes are simple and established in HS' morphological system at younger age, L2 learners may need longer time to conceptualize and acquire new morphological aspects. The pace of acquisition will be different for the two groups. Therefore, this study suggests that HS and L2 learners should not be grouped in the same classroom, as they have different linguistic needs.

6.5 Future Studies and Limitations

It should be the aim for future research to study MA HS children who moved to France in their mid-teens and compare their acquisition to HS, who were either born in France or moved to France before age 7 to support the claim that the investigated complex structures in this study are acquired late. It was pointed out in Montrul (2016) that HS may be an agent in diachronic change, if that change started in a speech community, they may reinforce it and create a language variety. It will be interesting to compare HS pattern of acquisition in this study to young bilingual Moroccans who attend French schools, namely the French ‘Mission Universitaire et Culturelle’. These bilingual Moroccans were born in Morocco, but they attend French schools in Morocco. The aim is to study the pattern of change emerging in both groups to have a deeper understanding of what structures might undergo change in native speakers when there is an immersion into an L2. Additionally, for future studies an acoustic experiment is needed to see if participants have covert contrast in producing the geminates in the causative pattern [CeCCeC]. Since HS pattern of acquisition is different from the source language, participants might produce contrast of the geminates and their singleton counterpart, but it was not perceived by the researcher.

HL acquisition is an emerging field that is related to L1 acquisition, L2 acquisition, languages in contact, and linguistics in general. It is an appealing field that requires more investigation in order to understand the complexity of language acquisition. Arabic as a morphologically rich language provides tempting opportunities to uncover the patterns of acquisition in native speakers with different linguistic experiences. Additionally, syntactic structures should also be explored in HS, including core syntax and complex structures such as the acquisition of relative clauses. Relative clauses are acquired late in MA. Bos (1997) studied

the acquisition of relative clauses by Moroccan monolingual children and their bilingual counterparts in the Netherlands. She suggested that age 8 is the age at which children develop reasonable ability to understand difficult relative clauses (p. 86). The differences in HS's linguistic performance inform and contribute to helping construct theoretical background in the acquisition of Arabic by L1 and L2 speakers. HS's linguistic differences also inform on the major role of the linguistic experience in shaping the final state in both L1 and L2 acquisition.

It is worth noting that this study depended mainly on production experiments to study HS' final attainment of morphological structures. Comprehension tests also proved to be efficient in studying HS' linguistic outcomes. I think a combination of production and comprehension tasks should be carried out, since comprehension can be distinct from production. Clark and Hecht (1983) stated that in many areas of language use comprehension and production remain distinct (p. 326). Studies in first language acquisition also propose that understanding and perceiving sound structure and meaning precedes production (Clark & Hecht, 1982). Polinsky (2008) emphasized the use of both comprehension and production experiments in HS research. In studying noun categorization in Russian HS, Polinsky depended on both comprehension and production tasks, as she questioned if differences in HS's production may be simply due to on-line production problem (p. 56). Production experiments remain the most suitable and appropriate experiments for studying HS, but if they are used alongside comprehension, they will be more efficient.

6.6 Conclusion

To conclude, by studying the acquisition of nominal and verbal morphology in HS in France, this study contributed to Arabic linguistics, HL acquisition and linguistics in general. It explored the complex linguistic realities of acquiring a native language in a modified context.

These realities were deciphered into a different, systematic, reanalyzed, and rule governed variety. The findings of this study suggest that linguistic experience plays a major role in shaping the ultimate attainment and acquisition of a native language. The study also proposes that different linguistic experiences in acquiring the same source language may result in two distinct varieties.

By studying HS' ultimate attainment, this study highlights the complexity of acquiring a native language, and how multiple factors interact in the process of language acquisition. For example, this study emphasized the importance of age as a critical factor in the acquisition of morphology. Both preschool period and later language development are important phases in L1 acquisition. That is to say not all morphological aspects are acquired by age 5. Complex structures, which research on child's language development demonstrate to be acquired late, are the structures that need continuous input; and they are usually absent in HS grammars. Additionally, the findings of this study suggest that schooling is another factor that plays a role in the linguistic outcomes of a native speaker, since grammatical aspects are emphasized and metalinguistic awareness is triggered. Additionally, the results of this study also give insights into grammatical aspects that may undergo change and divergence from the source language. Non-concatenative morphological processes are vulnerable linguistic domains and may be replaced by concatenative processes, when a native language is acquired in a modified context of acquisition. Also, in the verb pattern results, it was suggested that structures which depend on the interface between two linguistic components are subject to modification as semantic distinction can be neutralized. Hence, pattern alternation in MA is another vulnerable domain, specially, medio-passives and reciprocal patterns are vulnerable structures that are subject to change.

The dynamicity of the HL is manifested in this adopted change. HS' variety utilizes

grammatical aspects that are shared with the source language, meanwhile, the variety is characterized with distinct processes such as overgeneralization in the acquisition of nominal morphology, and neutralizing the difference as in the acquisition of verb patterns.

Overgeneralization and neutralization of grammatical differences demonstrated that HS reanalyzed their variety. HS in this study proved to have an immigrant variety that experiences reanalysis, and it is different from the source language because of HS' linguistic experience. A compelling question, which was also raised in Polinsky and Kagan, 2007, is what motivates this reanalysis? This study also advocated for a linguistic understanding of the differences in HL because differences should not be interpreted as incompleteness for the reasons previously discussed in this dissertation. Conversely, differences in HL can inform linguistic theories, in general, and language acquisition in particular.

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Appendices

Appendix A: Word list for plural experiment 1 production

Stimulus number	Stimuli	pattern	plural type	plural	Gloss
1	nqi	_in	Sound	nqijin	clean.pl
2	nasi	_in	Sound	nasijin	forget.pl
3	zwiwen	_in	Sound	zwiwnin	beautiful.pl
4	ətalet	_in	Sound	ətaletin	third.pl
5	ʕəjjan	_in	Sound	ʕəjjanin	tired.pl
6	bənnaj	_a	Sound	bənnaja	masons
7	bnadri	_a	Sound	bnadrija	tambourine player
8	qettal	_a	Sound	qettala	killers
9	ʃaffar	_a	Sound	ʃaffara	thieves
10	əħʃajʃɪ	_a	Sound	əħʃajʃija	drug addicted
11	mʃɪʃa	_at	Sound	mʃɪʃat	cats
12	bajdʕa	_at	Sound	bajdʕat	eggs
13	namusija	_at	Sound	namusijat	beds
14	biru	_at	Sound	biruwat	desks
15	sma	_at	Sound	smawat	skies
16	mənʃar	CCaCəC	Broken	mnaʃər	saws
17	ʃərʒəm	CCaCəC	Broken	ʃraʒəm	windows
18	fəkrun	CCaCəC	Broken	fkarən	turtles
19	ʕənwan	CCaCəC	Broken	ʕnawən	addresses
20	serwal	CCaCəC	Broken	srawəl	pants
21	bənt	CCaC	Broken	bnat	girls
22	ħukk	CCaC	Broken	ħkak	cans
23	ʒməl	CCaC	Broken	ʒmal	camels
24	kəʃba	CCaC	Broken	kʃab	ankles
25	bir	CCaC	Broken	bjar	wells
26	dəʃwa	CCaCi	Broken	dʃawi	lawsuits
27	nuqtʕa	CCaCi	Broken	nqatʕi	dotes
28	ħufra	CCaCi	Broken	ħfrari	holes
29	xənʃa	CCaCi	Broken	xnaʃi	sacks
30	χamja	CCaCi	Broken	χwami	curtains
31	χədd	CCuC	Broken	χdud	checks
32	χətʕʕ	CCuC	Broken	χtʕutʕ	lines
33	ʒəld	CCuC	Broken	ʒlud	skins

34	sif	CCuC	Broken	sjuf	swords
35	bit	CCuC	Broken	bjut	rooms
36	d ^f fær	CCuCa	Broken	d ^f fura	fingernails
37	hænʃ	CCuCa	Broken	hnuʃa	snakes
38	kfæn	CCuCa	Broken	kfuna	shrouds
39	mqs ^s	CCuCa	Broken	mqs ^s a	scissors
40	dərb	CCuCa	Broken	druba	streets
41	fərđi	CCaCa	Broken	frada	pistols
42	kursi	CCaCa	Broken	krasa	chairs
43	hawli	CCaCa	Broken	hwala	sheep
44	ʒənwɪ	CCaCa	Broken	ʒnawa	knives
45	ʕəzri	CCaCa	Broken	ʕzara	bachelors
46	kafər	CoCCaC	Broken	kuffar	unbelievers
47	katəb	CoCCaC	Broken	kuttab	clerks
48	sarəh	CoCCaC	Broken	surrah	shepherds
49	ʃarəf	CoCCaC	Broken	ʃurraf	old.pl
50	hbil	CoCCaC	Broken	hubbal	crazy.pl
51	far	CiCan	Broken	firan	rats
52	kas	CiCan	Broken	kisan	drinking glasses
53	zar	CiCan	Broken	ziran	neighbors
54	yar	CiCan	Broken	yiran	caves
55	nar	CiCan	Broken	niran	fire.pl
56	blad	CoCCaC	Broken	boldan	countries
57	hazəb	CoCCaC	Broken	hazban	eyebrows
58	t ^r riq	CoCCaC	Broken	t ^r orqan	Streets
59	ʕris	CoCCaC	Broken	ʕorsan	grooms
60	laʕəb	CoCCaC	Broken	luʕʕab	players
61	bjəd ^s	CuCəC	Broken	bujəd ^s	white.pl
62	khəl	CuCəC	Broken	kuhəl	black.pl
63	qrəʕ	CuCəC	Broken	qurəʕ	bald.pl
64	smək	CuCəC	Broken	sumək	deaf.pl
65	χd ^s ər	CuCəC	Broken	χud ^s ər	green.pl
66	χima	CCəC	Broken	χjəm	tents
67	χurs ^s a	CCəC	Broken	χrəs ^s	metal rings
68	ʕmud	CCəC	Broken	ʕməd	wooden columns
69	gamla	CCəC	Broken	gməl	lice
70	nəm̄la	CCəC	Broken	nməl	ants
71	dwa	?aCCija	Broken	?adwija	drugs
72	nbi	?aCCija	Broken	?anbija	prophets

73	wali	ʔaCCija	Broken	ʔawlija	saints
74	ʔani	ʔaCCija	Broken	ʔaynija	rich.pl
75	duʕaʔ	ʔaCCija	Broken	ʔadʔija	prayers
76	dərs	CuCuC	Broken	durus	lessons
77	fərd ^ʕ	CuCuC	Broken	furud ^ʕ	Religious obligations
78	hemm	CuCuC	Broken	humum	worries
79	t ^ʕ ariqa	CuCuC	Broken	t ^ʕ uruq	ways
80	ʕəlm	CuCuC	Broken	ʕulum	sciences
81	məʕza	CCiC	Broken	mʕiz	goats
82	ħmar	CCiC	Broken	ħmir	donkeys
83	ʕəbd	CCiC	Broken	ʕbid	slaves
84	qərs	CCiC	Broken	qris	punches
85	əʕʕira	CCiC	Broken	ʕʕir	oats

Appendix B: Word list for diminutive experiment 2 production

Stimulus-Number	Stimulus	Diminutive	Pattern
1	kəlb ‘dog’	klijjib	fʃijjəl
2	xubz ‘bread’	xbijjiz	fʃijjəl
3	bʏəl ‘mule’	bʏəjjil	fʃijjəl
4	ħmar ‘donkey’	ħməjjir	fʃijjəl
5	ʒməɫ ‘camel’	ʒməjjil	fʃijjəl
6	bab ‘door’	bwəjjib	fwijjəl
7	tʰajr ‘bird’	tʰwəjjir	fwijjəl
8	riħ ‘wind’	rwəjjih	fwijjəl
9	kas ‘cup’	kwijjis	fwijjəl
10	buq ‘horn’	bwəjjiq	fwijjəl
11	kbir ‘big’	kbibər	fʔiʔəl
12	bkəm ‘mute’	bkikəm	ʔiʔəl
13	kħel ‘black’	kħihəl	ʔiʔəl
14	bxil ‘mean’	bxixəl	ʔiʔəl
15	ʏlidʰ ‘fat’	ʏlilədʰ	ʔiʔəl
16	rʒəl ‘foot’	rʒila	fʃila
17	ʃsel ‘honey’	ʃsila	fʃila
18	tmər ‘dates’	tmira	fʃila
19	bənt ‘girl’	bnita	fʃila
20	ʃəms ‘sun’	ʃmisa	fʃila
21	bəgra ‘cow’	bgira	fʃila
22	ħalwa ‘candy’	ħliwa	fʃila
23	zənqa ‘street’	znika	fʃila
24	dʰərba ‘a blow’	dʰriba	fʃila
25	ʒərda ‘garden’	ʒrida	fʃila
26	biru ‘office’	bwiru	fwiʃv
27	luħa ‘painting’	lwiħa	fwiʃv
28	fasi ‘native to fez’	fwisi	fwiʃv
29	ħuta ‘fish’	ħwita	fwiʃv
30	kaʃʃa ‘blanket’	kwifʃa	fwiʃv
31	blasʰa ‘place’	blijjsʰa	fʃijjla

32	dʒaʒa	‘hen’	dʒijjʒa	fʃijjla
33	zbiba	‘raisin’	zbijjba	fʃijjla
34	rfisa	‘Moroccan dish’	rfijjsa	fʃijjla
35	qsʕara	‘a party’	qsʕijjra	fʃijjla
36	kʕskas	‘couscous pot’	ksikis	CCiCəC
37	mbəxra	‘incense burner’	mbixra	CCiCəC
38	meknasi	‘native to Meknes’	mkinsi	CCiCəC
39	sokkar	‘sugar’	skikər	CCiCəC
40	təffaha	‘apple’	tfifəha	CCiCəC
41	ʃafja	‘fire’	ʃwifja	fwiʃəl(v) Ants
42	xamja	‘curtains’	xwimja	fwiʃəl(v)
43	razal	‘man’	rwizəl	fwiʃəl(v)
44	buhali	‘foolish’	bwihili	fwiʃəl(v)
45	fatʕma	‘girl's name’	fwitʕma	fwiʃəl(v)

Appendix C: Word list for verb patterns experiment 3 production

Basic stem	Target	Pattern	Picture used
ʃreb ‘drink’	ʃerbat	CCeC (P1)	a woman drinking juice
lbes ‘dress’	lbes	CCeC (P1)	a man putting on a t-shirt
dʳeb ‘hit’	dʳeb	CCeC (P1)	a boy hitting a ball
kla ‘eat’	kla	CCeC (P1)	a boy eating a sandwich
ʒra ‘run’	ʒrat	CCeC (P1)	a girl running
qra ‘read’	qrat	CCeC (P1)	a women reading a book
ʃra ‘buy’	ʃra	CCeC (P1)	a man buying ice-cream
hell ‘open’	hell	CCeC (P1)	a man opening a door
reʃʃ ‘spray’	reʃʃ	CCeC (P1)	a man spraying water
ɣmez ‘wink’	ɣmez	CCeC (P1)	a boy winking
nʃS ‘sleep’	neʃʃes	CVCCVC (P2)	a father putting his son to sleep
ʃreb ‘drink’	ʃerreb	CVCCVC (P2)	a man giving water to his baby
lbes ‘dress’	lebbes	CVCCVC (P2)	a man dressing his son
ʃam ‘take a shower’	ʃewwem	CVCCVC (P2)	a father bathing a baby
ʒra ‘run’	ʒerrat	CVCCVC (P2)	A woman running her dog
qra ‘read’	qerrat	CVCCVC (P2)	a mother teaching a boy
dab ‘melt’	dewweb	CVCCVC (P2)	sun melting snow
freh ‘happy’	ferreh	CVCCVC (P2)	father giving a gift to his son
tʰah ‘to fall’	tʰajjeh	CVCCVC (P2)	wind blowing a tree
xaf ‘to be afraid’	xewwef	CVCCVC (P2)	monster scaring a girl
baʃ ‘sell’	tbaʃet	tCeCCeC (P5)	a sold house
kefeh ‘spill’	tkeffeh	tCeCCeC (P5)	spilled juice
dreb ‘hit’	tdrebet	tCeCCeC (P5)	a car involved in an accident
xzen ‘hide’	txeznet	tCeCCeC (P5)	hidden girl
hell ‘open’	tʰall	tCeCCeC (P5)	opened window
qtʰeʃ ‘cut’	teqtʰeʃ	tCeCCeC (P5)	power outage picture
xlʃ ‘scare’	texleʃ	tCeCCeC (P5)	scared baby
sʰbey ‘paint’	tesʰbey	tCeCCeC (P5)	painted wall
ʃreb ‘drink’	teʃreb	tCeCCeC (P5)	empty glass
xser ‘broke’	t-xesser	tCeCCeC (P5)	a broken radio
bas ‘kiss’	tbawsu	t-CaCeC (P6)	two women greeting each other
dʳeb ‘hit’	dʳdʳarbu	t-CaCeC (P6)	2 men hitting each other
ɣmez ‘wink’	tɣamzu	t-CaCeC (P6)	2 women winking at each other
ʃaneq ‘hug’	tʃanqu	t-CaCeC (P6)	2 men hugging each other
reʃʃ ‘spray’	traʃʃu	t-CaCeC (P6)	2 men spraying water at each other
dʃa ‘suit’	ddaʃaw	t-CaCeC (P6)	2 women at the court

fedd	‘hold’	tʃaddu	t-CaCeC (P6)	2 girls holding hands
sʼaheb	‘friend’	t-sʼaħbu	t-CaCeC (P6)	2 friends hugging each other
ʒer	‘pull’	tʒarru	t-CaCeC (P6)	2 boys pulling a rope
selam	‘greet’	tsalmu	t-CaCeC (P6)	2 men shaking hands

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