



A Minimalist Analysis of the Animal Coding System in Mehri Language within Probe-Goal Matching Approach

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Abstract

This paper discusses an Animal Coding System (ACS) of Mehri, the oral minority language in Yemen (Rubin, 2010; Watson, 2012). Considering the fact that lexical items are inserted into a mind/brain with bundle features (Adger, 2003) and (2008), we show that the ACS (camels and goats in particular) has formal features. These features are often cognitively understood, where some features are interpretable while others uninterpretable. Employing Chomsky's Probe-Goal Matching approach in Minimalist Program (Chomsky, 1995, 2000, 2008), we examine the phrasal constructions: verbal, non-verbal, definiteness, and genitive structures. Among these, the ACS plays a significant position: as an agentive subject, a thematic object, a non-verbal predicate, and a genitive annex. However, we argue that Definite and Tense comprise uninterpretable features, which automatically valued when they match and agree with the substantive features in the spec-vP, the spec-PossP. In the view of the case-assignment, we propose that both D and T are the nominative case assigners, the verbal affix is the accusative case assigner and the genitive jargons *ḍa-* 'of' and *bʔal* 'with' are the genitive case assigners on the complement annex. Moreover, the null focus feature is the accusative case assigner on objective animal codes in the non-verbal structures.

INTRODUCTION

Language has always played an essential role in the investigation of human cognitive abilities. It is considered a cognitive endowment, where the mind/brain is the primary store for human linguistic properties. All languages share the *competence* component and differ in the *performance* component. The classic *Arabic* expression which occurs in *Quran* (verse 28: p. 224) and its thematic translation in *English* is considered cross-linguistically:

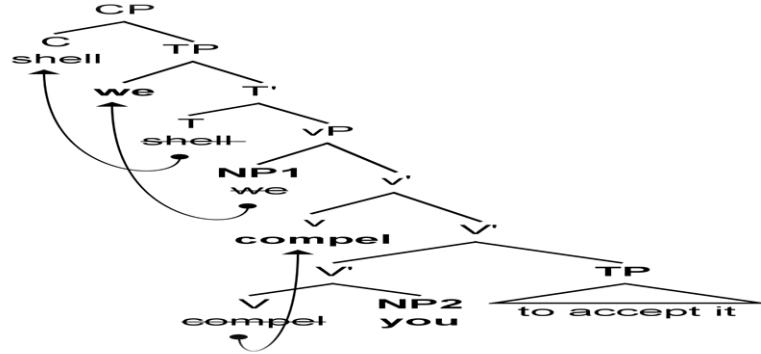
➤ **anul'zimukumūhā** أَنْتَلِزْمَكُمُوهَا 'shall we compel you to accept it'

Evidently, it is found that while there is an overlap between features (substantive and functional features) in Arabic, the English language has sole morphemes to present the same notion. Both languages share the thematic competence in human mind and contrast in actual performance. Despite this distinction, both structures have formal features which have the crucial role of constituting the phrasal and clausal structures. Mainly, via

derivational operations (*Merge*, *Agree*, and *Move*) we can find a balance between lexical items that is by selecting and merging the lexical arrays from the lexicon, valuing the agreement between constituents, and deriving the new structures from the underlying structure (i.e. interrogative clauses) as illustrated in these tree diagrams:

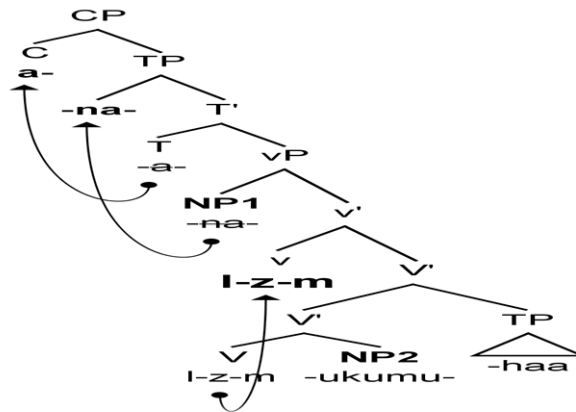
(1) **Argument structure in English: Verb: compel: [NP1, NP2, TP]**

Thematic structure: Verb: compel: <agent, recipient, theme>



(2) **Argument structure in Arabic: Verb: l-z-m: [NP1, NP2, TP]**

Thematic structure: Verb: l-z-m: <agent, recipient, theme>



In recent years, cognitive neuroscience has generated various important topics about how different linguistic aspects have imposed into human mind, for example, - object scrambling (Duman, Aygen, Ozgirgin, & Bastiaanse, 2007), the issue of syntactic movement and neural activation (Christensen, 2008), noun, verb and predicate/argument structures (Luuk, 2009), nouns and verbs in human brain (Kemmerer & Eggleston, 2010), functional nominalizations (Kornfilt & Whitman, 2011), Core linguistic computations (i.e. *Merge*, *Search*, and *Move*) (Rizzi, 2012), verbal argument structures (Marantz, 2013), and Parallel functional category deficits in clauses and nominal phrases (Wang, Yoshida, & Thompson, 2014). All these studies dealt with the evidences that the language is primarily generated in the human mind. It is the given endowment where the speakers of any natural language do not suffer to generate rules and principles for regulating their linguistic expressions. Apart from these studies, particularly in this paper, we further add evidence to the generative linguistics that the *fauna coding* or what is called *Onomastic system* is crucially generated in the human mind. This study is focused on an oppressed topic known as the *Animal Coding System (henceforth ACS)*. Most neuroscientific studies partly relied on the human naming system and partly on the phrasal or syntactic structures. There have been very few studies in ACS detailing how the examined codes are wired into the human mind. Comparing the current study with past findings (elaborated in the next section, i.e. literature review), it is noticed that the reviewed studies examined the naming system from the perspectives of anthropology and sociolinguistics, whereas the current work conversely attempts to provide a minimalist analysis of the ACS showing the inflected features which visibly or invisibly inserted into animal codes. Besides, this paper contributes to provide the theoretical analysis for the linguistic properties of one of the endangered languages in the real world, which is the *Mehri* language.

Mehri is a tribal minority language that is spoken by **Mehri** tribes of the **Mahrah** governorate in Yemen (see Appendix B). This language was originally generated from the dominant Arab ethnic group in Yemen.

Certainly, in the South of Arabian Peninsula, particularly, in the Sultanate of Oman and the Republic of Yemen, live some '100,000' Arabs whose native language is not the present Arabic, it is Mehri, which we believe is the old Arabic tongue that still preserves various Semitic features which are mentioned in Alfadly (2007), Rubin (2010), Simeone-Senelle (1997) and Watson (2012). The Mehri language remains virgin in receiving any linguistic examinations, as well as having a great deal of ignorance from the policy of the country, where this language is still orally spoken however is banned from being taught in public institutions. Despite some urbanization among the groups, most Mehri speakers remain semi-nomadic as they are involved in fishing and some sort of pastoral occupation (Cross Jr, 2010). Breeding animals, such as camels, goats, and little cows, is the most common activity of the Mehri people. Because of this, the language is mostly interpreted through the names of such domestic animals. Every single name bears many semantic and a morphosyntactic function, as well as it prescribes the social practice.

The current paper aims at cognitively exploring the micro linguistic features which are inserted within animal codes. From a pastoral community, we suggest that the animals are completely corresponded to humans in having names, showing categorization and identity. These names are used to label animals partly to categorize their descriptive variables and partly to identify or specify one another. Putting this study in a concrete footing, this topic is quite limited to examine this question:

- **In ACS, what is the significance of formal features which are imposed to the substantive animal words, and how can these features be valued?**

The paper is organized as follows. *Section 2* reviews some related studies. *Section 3* highlights the theoretical framework of the study. *Section 4* presents the methods of collecting data. *Section 5* deals with the data analysis. *Section 6* illustrates the theoretical discussions. *Section 7* concludes the findings of the study.

LITERATURE REVIEW

A survey of past literature within the animal naming system suggests that this particular issue is often ignored and hence suggests that only humans are likely to be labeled. Moreover, very few studies have been conducted to examine the pure linguistics phenomena in Mehri language such as its phonological, morphological, and syntactic issues, where the parts of the generative linguistics remain uninvestigated. Since Mehri people are "in-group" and are happy to share the ideological beliefs and cultures with others in Yemen as a whole, Al-Zumor (2009) investigated the anthroponymy of a Yemeni community, where his paper socially examined the female personal names of a particular ethnic group, *Saadah*, and the adjacent governorates (in Yemen), mentioning that the naming system are obviously associated with the surrounding organizational life of people in those areas. He brought evidences of female personal names such as *Nakhlah* 'palm tree' and *Zabeebah* 'raisin,' and argued that selecting names such as these should not be an arbitrary system, rather, they bear socio-cultural notions, where the target people in the *Saadah* society are involved with agricultural professions. Because of the famous and unique fruit and vegetable products that are grown in *Saadah* and distributed to many parts of Yemen, this place is sometimes called "the garden of Yemen." Based on such reason, typical female names are directly influenced by the socio-pragmatic in that society.

Qanbar (2011) in her paper 'A Sociolinguistic Study of the Linguistic Taboos in the Yemeni Society' discussed the relationship of using the linguistic taboo words with the socio-cultural contexts in a society. Using the 'politeness' approach by Brown and Levinson (1978, 1987) as a theoretical tool, she categorized taboo words into two types, Context-specific taboo words and General taboo words, where the first type means certain words become taboo due to the specific context in which it is spoken, for example using the words like *kalp* 'dog' and *khnzeer* 'pig' (i.e., types of animals which are known to be unacceptable in Muslim society). In this line, it can be argued that the social and culture, or the ideology of people in a particular domain has a crucial role to specify the speakers' linguistic items which are connected with abstract ideological concepts of any particular society.

Tohidian and Tohidian (2009) explored the Saussure's theories of the sign and the Sapir-Whorf Hypothesis. They asserted two issues. In terms of Saussure's notions, concepts and labels are essentially arbitrary, where both are connected with a single sign, terming the sequence of a word's sounds as the **Signifier** and the meaning interpretation as the **Signified**, and presuming that the connection between words and their abstract concepts is likely to be accidental. However, with respect to the typical examples *umbrella* and *tree* in their study, it is argued that the corresponding words/labels in Semitic languages in general and particularly Arabic and Mehri, are not accidentally constructed. Moreover, these two words are evidently generated or detached from the verbal roots as seen respectively *q-l-l* 'to shade,' *Maḍallah* 'umbrella,' and *š-j-r* 'to plant,' *šajarah* 'tree,' namely, the arbitrariness could not be generalized to the majority of common nouns in Semitic group which are specified and labeled from the notions of how they are used in organizational life, that is by deriving them from a concrete action which is represented by typical verbal consonantal roots. Moving to the Sapir-Whorf Hypothesis, it is stated that "cultures have different values and their language usages reflect their different perceptions of reality." This fact is probably attributed to the case of animal categorization and naming system, in which it is

known that selecting language for labeling animals is the reflection of the socio-cultural background of the pastoral people.

Lee (2003) explicated the interconnectedness of language and culture and how both jargons specify one's identity. Generally, he defined language, culture, and identity (see below)--assuming that all these jargon is interrelated. In specific, he argued that without culture, language is deemed to be meaningless or would not exist, saying that "culture is a broader umbrella concept, and that language is a part of culture." Based on the close interactions between language and culture, he brought in the following obvious definitions: **Language** can be defined as "The system of communication comprising codes and symbols that is used by humans to store, retrieve, organize, structure, and communicate knowledge and experience," whereas **culture** can be interpreted as "a cluster of attributes such as values, beliefs, behavior patterns, and symbols unique to a particular human group."

In accordance to the concept that language related to one's culture, Hamill, Sidky, and Subedi (2002) studied the ethno-semantic data of 134 bird specifications in Jiral ethnic group of Nepal. In their study, they logically aimed at exploring the socio-cultural aspects of the minority ethnic group. In addition, they presented how selecting specific linguistic terms for bird classifications reflect the surrounding culture of those people. At the end of the study, they pointed that the target brief research may open the door to further studies that would consider and investigate the entire meaning of living things. Basically, they suggested that language and culture are interrelated; that future researchers should consider the ways in which people label any living thing in their community by understanding their ideology, beliefs, and different socio-cultural aspects. Likewise, this study takes into account how the linguistic fauna names represent the ethno-pragmatic-contexts of a minority Mehri ethnic group in Yemen, studying the typological structures and semantic notions of the selecting samples of animals. Summarizing these, since our current paper deals with the generative linguistics, it is found that in the abovementioned reviewed studies, the writers totally ignored to analyze the lexical items from the syntactic perspectives. Furthermore, they had not employed any theoretical framework as an analytical tool for their explanations. However, the next part summarizes the cognitive modal which is employed in the current study.

THEORETICAL FRAMEWORK

Following the universal grammar approach in Chomsky (1995), (2000), (2008); Adger (2003), (2008); Lasnik (1999), (2002), (2003); Zwart (1998), (2009); Rizzi (2012), (2013) that, all languages cognitively share universal principles and contrast in specific parameters, in this paper we adopt the model called *Probe-Goal Matching* as part of the computational operations in Chomsky's Minimalist program. This model is concerned to value the embedded formal features, which are tacitly inserted in the human cognitive system or what is called the *Faculty Language*. In a lexicon, the lexical items are fossilized with multiple features, either content features or functional features. Precisely, each substantive word composes triadic features $\langle P, S, \& F \rangle$ (i.e. **P** for phonetic features, **S** for semantic features, and **F** for formal features). Narrowing the topic, this study is focused on the formal features which are visibly or invisibly imposed into the examined constituents (ACS). Employing the standard view of *Full Interpretation (FI)* principle:

"The principle FI is assumed as a matter of course in phonology; if a symbol in a representation has no sensorimotor interpretation, the representation does not qualify as a PF representation. This is what we called the "interface condition." The same condition applied to LF also entails that every element of the representation have [sic] a (language independent) interpretation" (Chomsky, 1995, p. 27)

It is assumed that the uninterpretable features must be eliminated from the interface levels:. Expressions are represented by Phonetic Form (**PF**) and Logical Form (**LF**) [*Exp.*= $\langle PF, LF \rangle$], otherwise the expression is crashed. However, the compatible approach of valuing features is the *Agree Operation*. As a part of the *Computational Procedure for Human Language (C_{HL})*, the agree operation is one of two further operations of C_{HL}: they are the *Merge* and the *Move* operations. All these operations occur in one "playhouse" (the human mind) where they try to derive and generate optimal and legible expressions. In contrast to Merge and Move, we argue that the Agree operation can be utilized even with a single item, especially if that item consists of various functional features (for example agreement, case, and definiteness features). On this basis, the agree operation comprises two components: the *Active Probe* and the *Local Goal*. The active probe usually has unvalued features which require checking, thus, it starts to probe down searching for the local goal which has valued features (interpretable). Once it finds the proper goal, the two components match together and the uninterpretable features must be valued and eliminated (in virtue of the valued features). Hence, it is called Probe-Goal Matching. This clarification is also illustrated by Soltan (2006, p. 11) when he stated that "Agree is an operation that establishes a relationship between an element α (called a **Probe**) with uninterpretable features and an element β (called a **Goal**) with matching interpretable features in the domain of α , whereby the uninterpretable features on the Probe are valued by the matching interpretable features on the Goal."

Referring to the camel's name *zamrēn*, this code is linguistically derived from the verbal root **z-m-r** 'to be strong.' It inflects into various features such as ϕ -features (agreement features) and *definiteness features*. However, within Probe-Goal Matching, this paper aims at valuing all such features within the abstract NP phrase and other features which can be found in the remaining examples.

DATA COLLECTION METHOD

In conjunction with ethnographic design, case studies are the most important vehicle which is focused on a typical type of ethnography (Creswell, 2008). Illuminating the issue of ACS, I personally concentrated on specific terms using two techniques: the Primary data and the Secondary data. Since Mehri is an overlapping language, the case of this study is restricted to a specific topic, which is the position of animal codes and their formal features (while ignoring other linguistic topics). For *Primary data*, I employed my own linguistic knowledge as a native speaker of the target minority language as well as interviewing the native Mehri student who is pursuing his studies in Malaysia. This student is a pastoral member who lives in Mehri desert and breeds different kinds of animals. Namely, he provides sufficient information of the ACS. For *Secondary data*, we have consulted the recent contribution of Eades, Watson, and Al-Mahri (2013). In particular, I used the exact terms which represent the camel's categorization.

Data Analysis

The study is aimed at understanding the formal features and their substantive categories which are frozen in the human mind. As shown below, the ACS in this work is subdivided into two parts, the animal *categorization* and the animal *identification*.

Animal Categorization

In table 1, the camel categories are explored according to the age stages starting from young to adult. In each stage, the camel is coded with a particular category. For example, the code **bād** is the young female camel, specifically in the early days of birth. This code is cognitively understood as that of a *definite, singular, feminine, and first person* young camel. The code **frayš** is the elder female camel in the later stage of being birth. It composes the same cognitive formal features of *definite, singular, feminine, and first person*. Corresponding to both codes, the term **šaylōg** is a *masculine* calf camel. In the case of **bōkar**, this term is interpreted as *singular and feminine* camel, particularly that it is two years old. The code **ībīt** is *indefinite, singular, and feminine* adult camel, whereas nominal **bšayr** is *definite/indefinite, singular, and masculine* adult camel.

Table 1: Camel Age Categorization

Code	W. class	Def. F	N. F	G. F	Pers. F	Maturity	Glossary
bād/badīd	Noun	Def/Indef.	Sg/Pl	f.	1 _{pers}	young	Young female camel
šaylōg/šalōg	+	+/+	+/+	Masc.	+	+	Young male camel
frayš/frōš	+	+/+	+/+	F	+	Calf	Female c camel calf
bōkar/bkōr	+	+/+	+/+	+	+	2 years	2 year old female camel
ībīt/bēr	+	Indef.	+/+	+	+	adult	Adult female camel
bšayr/ bašyōr	+	Def/Indef.	+/+	Masc.	+	+	Adult male camel

With regard to the goat codes in table 2, the terms **hōtar** and **darhīs** are inherently *feminine* and purely *singular* as well as *definite* or *indefinite* goats. The former code describes a young goat, whereas the latter describes a calf (i.e. 2-5 month old) goat. Conversely, the code **šarīd** is the pure *masculine* term. Besides, the words **ōz** and **ššayd** are adult goats where the former is an *indefinite, feminine, and singular* goat while the latter is a *definite/indefinite, masculine, and singular* goat.

Table 2: Goat Age Categorization

Code	W. class	Def. F	N. F	G. F	Pers. F	Maturity	Glossary
hōtar/ hītar	Noun	Def/Indef.	Sg/Pl	f	1 _{pers}	young	Young female goat
šarīd/šarōd	+	+/+	+/+	Masc.	+	+	Young male goat
ššayd/ššwōd	+	+/+	+/+	+	+	adult	Adult male goat
darhīs/darhōs	+	+/+	+/+	f	+	calf	Female goat calf
ōz/rawn	+	+/+	+/+	f	+	adult	Adult female goat

Camels and goats are also categorized according to their descriptive case. For example the two codes **kāšf** and **hōfi** in table 3 are event nouns which are derived from the verbal stems **k-š-f** 'to leave' and **h-h-f** 'to put,' respectively. Saying **hā-ībīt kāšfōt** means 'the camel *left* its young baby.' The derived noun is usually used to describe the pre-pregnant camel which has neither baby nor milk. Similarly, the word **hōfi** is actually derived

from the verbal stem, in this saying **aḡayg ahhfoh l-hā-ibīt-ah** 'the man puts a protector on his camel's breast.' This code is used to describe a female camel with a new birth. In the same ground, the terms like **rgād** and **gōbar** are event nouns which are respectfully derived from **r-ḡ-d** 'to allow' and **ḡ-b-r** 'to meet.' Each term specifies a particular event. For example, in pastoral community, the Bedouin allow pregnant camels to breed alone without caring for them. However, they say **hargāwd hā-ibīt** means 'he allows it to breed alone. From this assumption, they describe the adult pregnant camel by using such derived noun **rgād**. Also saying, **hā-ibīt ḡabarōt** 'the camel met the final days of getting new birth'. The same occurs with the deverbal noun **khawr** from **k-h-r** 'to overpower,' **gandil** from **g-n-d-l** 'to carry,' **gazōr** from **g-z-r** 'to become old,' and **haḵf** from **h-k-f** 'to change.' Formally, each code bears formal features such as definite/indefinite, number, feminine gender, and 1st person as illustrated in this table:

Table 3: Camel Case Categorization

Codes	W. class	Case	Def. F	N.F	G.F	1 st F	Maturity	Glossary
kāḥf/ kāḥayf	V (k-ḥ-f)	Pre-pregnancy	Def./In def	Sg/ Pl.	F.	1 _{pers}	adult	Free adult female camel
rgād/rīgād	V (r-ḡ-d)	Pregnant	+/+	+/+	f	+	+	Adult female camel in first pregnancy
gōbar/ ḡwabbar	V (ḡ-b-r)	+	+/+	+/+	+	+	+	Adult female camel in last stage of pregnancy
hōfi/ hḥōy	V (h-ḥ-f)	Post-pregnancy	+/+	+/+	+	+	+	Adult female camel with young calf
khawr/ ḵwuhhar	V (k-h-r)	+	+/+	+/+	+	+	+	Adult female camel with older calf
gandīl/ gnōdal	V (g-n-d-l)	+	+/+	+/+	+	+	+	Adult female camel at later stage of milking
gazōr /gazrawn	V (g-z-r)	Not in pregnancy	+/+	+/+	+	+	+	Adult female camel with no calf and no milk
haḵf	V (h-k-f)	+	+/+	Sg.	+	+	+	Adult female camel that lost its baby

Considering the *m-type* (**maṣrāf**, **madanay**, **maṣkar**) codes in the following table, we assume that the prefix *ma-* in Mehri is a participle marker. It is the common Semitic feature that is used with the derived nominals as seen in Arabic **k-t-b** 'to write,' **maktūb** 'being written' (Kremers, 2003), and **maktbāna** 'writer' in Syriac language (Rubin, 2007). However, in these codes the verbal stems are **ṣ-r-f** 'to finish', **d-n-y** 'to carry baby,' and **ṣ-k-r** 'to increase milk.' More precisely, the participle noun **maṣrāf** describes the goat which is in the early stage of pregnancy and has little milk, the **madanay** describes the pregnant goat, and the **maṣkar** describes the post pregnant goat that has much milk.

Table 4: Goat Case Categorization

Code	W. class	Case	Def. F	N. F	G. F	Per.F	Maturity	Glossary
?āgam	V (?-g-m)	Pre-pregnancy	Def./In def	Sg.	+	+	+	Free female goat calf
kāḥf/ kāḥayf	V (k-ḥ-f)	+	+/+	Sg./Pl	+	+	+	Free adult female goat
maṣrāf maṣōrāf	V (Ṣ-r-f)	Pregnant	+/+	+/+	+	+	+	Adult female goat in first pregnancy
madanay madōnī	V (d-n-y)	+	+/+	+/+	+	+	+	Adult female goat in last stage of pregnancy
maṣkar maṣōkar	V (ṣ-k-r)	Post-pregnancy	+/+	+/+	+	+	+	Adult female goat with young calf
gazawr / gazrawn	V (g-z-r)	Not in pregnancy	+/+	+/+	+	+	+	Adult female goat with no calf and no milk

5.2 Animal Identification

All the camel and goat names are derived from verbal stems. They are used to encode the animal behavior and actions. Like human, animals have proper names which are used to identify one from another. They are often definite and singular nouns where the definite marker is usually null and invisible. For example, the code **şllēn** in table 5 is a definite, singular, and masculine camel. Predominantly, the suffix **-ēn** is the masculine marker, but in some cases, the masculine marker is null as seen in **şfayr**. On the other hand, the suffix **-īt** is the feminine marker as utilized in the code **kabnīt** which is definite, singular, and feminine camel. Similarly, the feminine marker sometimes can be null as seen in **ţamkēr** and others. Culturally, the camel's names **dmśah** and **smḥah** are borrowed from Arabic language where the suffix **-ah** is used to determine female camels. Following this case, there are several camel names in Mehri community that end with the same suffix **-ah** in order to identify the feminine feature as presented in the name **şlēleh**:

Table 5: Camel Identification

Code	W. class	Base	Def. F	N. F	G. F	Pers. F	Glossary
şllēn	Noun	Verb (ş-l-l)	Def.	Sg.	Masc	1 _{pers}	The faster male camel
xraysēn	+	V (x-r-s)	+	+	+	+	The devastating male camel
zembrēn	+	V (z-m-r)	+	+	+	+	The strongest male camel
şfayr	+	V (ş-f-r)	+	+	+	+	The strangest male camel
kabnīt	+	V (k-b-n)	+	+	f	+	The defending female camel
taşwīt	+	V (t-w-a)	+	+	+	+	The faster female camel
ţamkēr	+	V (t-m-k-r)	+	+	+	+	The unclear female camel
şabī	+	V (ş-y-b)	+	+	+	+	The white-haired female camel
maşayb	+	V (ş-y-b)	+	+	+	+	The fleecy female camel
şlēleh	+	V (ş-l-l)	+	+	+	+	The faster female camel
dmśah	+	V (d-m-ş)	+	+	+	+	The clear female camel
smḥah	+	V (s-m-h)	+	+	+	+	The static female camel

In table 6, the compound codes **bʔal ʔāfar**, **bʔal ḥāwar**, and **bʔal šēhi** are genitive structures which are used as proper names for particular goats. These codes consist of three items: the headless noun (assuming goat), the possessor particle **bʔal** 'of/with,' and the annex complement (namely the verbal derived nouns). In Semitic languages, for example in Arabic Hebrew and Akkadian, these kinds of structures are usually known as Genitive Construct States see Ouhalla (2004), Bardeas (2008) and Henry (2013). Considering the code **bʔal ʔāfar** 'the goat of red colour,' the head feminine noun goat is null, and the genitive particle **bʔal** is masculine; it is supposed to be **bʔalit** as in **ḥa-ōz bʔalit ʔāfar** 'the goat of red.' This feature default derives a question 'why the head noun agrees with the following particle in genitive constructions and loses agreement in ACS?' Furthermore, the proper name **lbānan** is a diminutive noun where the stem noun is **labōn/ūbōn** 'white.' Both forms are derived from the verb **l-b-n** 'to be white' (Watson, 2012). The suffix **-ōt** in **şahlōt** is a feminine marker. This name is derived from the verbal stem **ş-h-l** 'to scream.' The last name **şāşmrīri** is the possessive nominal phrase where the suffix **-i** represents the possessive pronoun 'my.' The speaker in this situation shows respect towards a particular goat which he call **şāşmrīri**, which is derived from the verbal stem **ş-ş-m-r** 'to show love.'

Table 6: Goat Identification

Code	W. Class	Base	Def.F	N. F	G.F	Pers. F	Glossary
<i>bʔal ʔāfar</i>	Noun	V (ʔ-f-r)	Def.	Sg.	f	1 _{pers}	The goat that has red colour
<i>bʔal ḥāwar</i>	+	V (ḥ-w-r)	+	+	+	+	The goat that has black colour
<i>bʔal šēhi</i>	+	V (ş-ş-h)	+	+	+	+	The goat that has mark on body
<i>ḥabaş</i>	+	V (h-b-ş)	+	+	+	+	The goat that has two colours, black and gray
<i>tbārēk</i>	+	V (t-b-r-k)	+	+	+	+	The goat that has many colours mixed together
<i>lbānan</i>	+	V (l-b-n)	+	+	+	+	The entirely white goat
<i>trākaş</i>	+	V (t-r-k-ş)	+	+	+	+	The goat that has many colours mixed together
<i>trawkaş</i>	+	V (t-r-k-ş)	+	+	+	+	The goat that has many colours mixed together

ṭayrīt	+	V (ṭ-y-r)	+	+	+	+	The faster goat
marī	+	V (y-m-r)	+	+	+	+	The goat that has much milk
ṣahlōt	+	V (ṣ-h-l)	+	+	+	+	The noisy goat
ḵandēl	+	V (ḵ-n-d-l)	+	+	+	+	The isolated goat
šāṣmrīri	+	V (š-ṣ-m-r)	+	+	+	+	The beloved goat

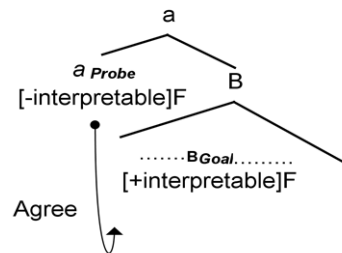
In summary, so far we have examined the typological formation of the ACS, observing the fact that the ACSs are *event type nouns* and *non-event type nouns*. The former are usually derived from verbal stems such as **ḵāṣf** from **ḵ-ṣ-f** ‘to leave,’ whereas the latter are pure nouns such as **ṣaylīg** ‘the young male camel.’ Usually it is used to categorize the animal’s particular age. While the animal identification are always *singular* as in **šllēn** (i.e. we cannot derive *plural* forms), the animal categorization can be singular and plural or rarely singular as presented in **ḵāṣf**, which is *singular* and **ḵāṣayf**, which is *plural*. On the other hand, the code **h-ḵ-f** is only *singular*. Considering the notion of pluralization in ACS, it supported the idea that broken plurals (irregular plurals) are the dominant feature of all Semitic languages (Watson, 2007) and (Musabhiem, 2009).

Having seen that the ACS is frozen in the mind, with typical features *φ-features* (agreement: person, number, and gender), *case* features, and *definiteness* features, the following section attempts to provide the theoretical analysis of particular expressions using the *Probe-Goal Matching* approach. In the following section, the phrasal structures are elicited. These syntactic phrases invariably contain the ACS as the main constituent which requires Minimalist exploration. All the expressions are inserted in the Appendix.

THEORETICAL DISCUSSION

To realize the embedded features on ACS, we heavily rely on Chomsky (2000), (2004), (2008) in assuming that the agreement in any natural language is induced through the application of *Agree Operation* which identifies the syntactic relations between constituents in particular structures, as illustrated in 3:

(3) Agree Operation (Probe-Goal Matching)



The Verbal Structures

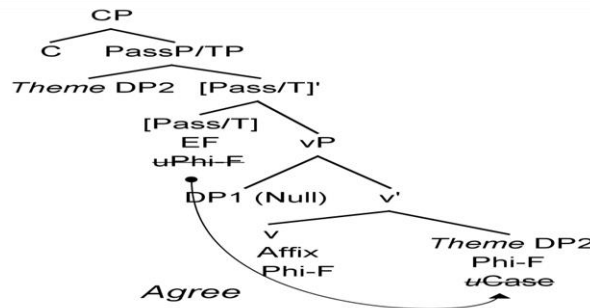
Accordingly, in the sentence (1) **bād maṣūr ḥā-ṭbīt** ‘the young female camel hardly suckled the camel,’ both the external argument **bād** ‘the young female camel’ and the internal argument **ḥā-ṭbīt** ‘the adult camel’ bear various features. On the basis of derivational operation ‘Agree’ we (native speakers) abstractly interpret all these features. To understand the features’ processing, the diagram in figure 4 is considered:

(4) The ACS within active verbal structures



Based on the above structure, we elicit that in the verbal Phase **vP**, the main verb **maṣūr** 'to suckle' is raised to host the affixal verbal feature 'light verb,' forming a matrix verb. In turn, the matrix verb has the virtue to assign the unvalued case on the DP2 **ḥā-ībīt** 'the adult female camel.' This DP2 composes the features (i.e. *singular* and *feminine*, and *unvalued case*). Following the assumption in Mahajan (2012) and Doron and Khan (2012) 'the little verb works as the case assigner,' in the examined sentence, the verbal affixal features (in matrix verb) is the case assigner on DP2, resulting in the accusative case assignment. Here, we got the *head-complement* relation. Furthermore, in CP (clausal phrase: the final *phase*), the T bears unvalued ϕ -features (*uN*, *uPers.*, and *uG*) as well as the EPP [Extended Projection Principle]¹ feature. To value the uninterpretable features, it is the *Active Probe* that probes down for the *local goal*. It is the spec-vP (DP1) **bād**² 'the young female camel.' They therefore agree and value the T's unvalued features. Since T has EPP, the T in this situation is the case-assigner that assigns the nominative case on the DP1. On the other hand, Musabhien (2009) and Mohamed (2014) assume that the nominative case on DP1 is valued with Topic feature (Topic is a nominative case-assigner as well). They attribute this to the definite feature which is imposed onto DP, namely, when the DP1 is definite, the nominative case must be valued via the Topic feature rather than the T. However, both assumptions are used to value the DP1 in the case of Mehri, either with Tense or Topic features creating the assumption of *Spec-Head* relation. Conversely, we considered the derived *passive* structure **ḥā-ībīt maṣīr-ēt** 'the camel was suckled.' In this case, the perfective form **maṣūr** 'to suckle sm.' is inflected to **maṣīr-ēt** 'was suckled sf.' The pre- or post-verbal thematic subject **ḥā-ībīt** 'the camel sf.' is in agreement with the passivized form **maṣīr-ēt**. To see ('how?'), the following diagram simplifies the process:

(5) *The ACS within passivized structures*



In particular, the Tense feature which is passivized probes down for the goal to value its uninterpretable features (the phi-F: *un-Singular* and *un-Feminine*). The only goal in the structure is the verbal complement, which is the DP2 **ḥā-ībīt** (DP2= *Singular* + *Feminine*). This DP is the sole goal that values the T's unvalued features and agrees with it after the spill out (the main verb raised to adjoin T). Moreover, the DP has an *un-Case* which requires checking. It is valued under the T'EF (Edge Features) forming the thematic nominative case (Soltan, 2007).

6.2 *The Non-verbal Structures*

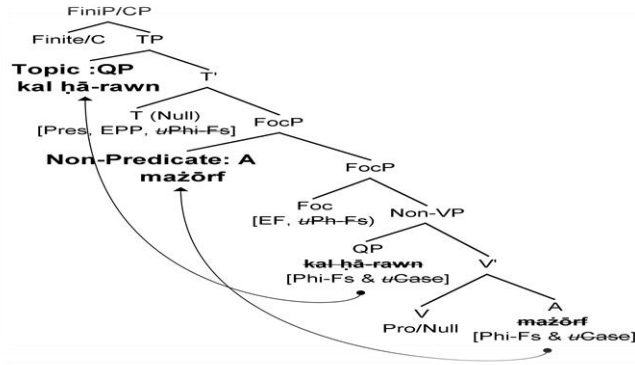
Non-verbal sentences are structures that lack a copular verb. Regardless of this syntactic default, verbless sentences are considered as finite clauses (composing: T, ϕ , and Mood) as well as a topic and non-verbal predicate (or what is called in Arabic literature *al-Jomlah al-Esmeih* 'the Nominal Sentence' (Al-Horais, 2010). The verbless constructions are similar to the pure verbal clauses in indicating structural cases (Nominative and Accusative cases) (Al-Balushi, 2012). However, under this standard definition, we will discuss the role of the ACS in the verbless structures in manipulating the agreement relations between the associated constituents. Verbless sentences are broadly used in Mehri literature, for example, we consider two structures of many others in the index. They are the sentence (5) **ōz brak a-žayg?** 'goat (is) inside the shed' and the sentence (10) **kal ḥā-rawn mažōrf** 'all the goats (are) in first stage of pregnancy.' See structure 6 below:

(6) *The ACS in non-verbal structures*

¹ EPP *Extended Projection Principle* feature generates a subject for the sentence by extended X-bar projection to merge with external NP/DP, more than this, it is defined as the case marker which specify the nominative case of the subject (Cook & Newson, 1996: 180) and (Adger 2003: 172).

Whereas the 'Edge Feature [EF] permits raising the verbal complement to the Spec-C in CP without feature matching' (Chomsky 2005: 19), for example the PP 'to school' in 'to school, I moved PP to school', which moved to Spec-C could not be considered as the subject which must has the nominative case.

² The pair codes like (**bād**, **frayz**) and (**ḥōṭar** and **darḥīs**) are all feminine codes as they all semantically indicate female camels and female goats, but grammatically they function as the masculine codes in Mehri language.



In sentence 5, the indefinite code **ōz** ‘goat’ initiates the structure. It is located at the external position of the TP (namely, the spec-TP). The code formally bears agreement features such as *singular*, *feminine*, and *1st person* (the ϕ -Features). Moreover, it has a semantic feature as being an adult female goat. Syntactically, this code c-commands the T-bar **brak a-żayg?** ‘(is) inside the shed’ and both the spec and the T-bar are dominated by the higher functional projection. It is the Tensed Phrase TP which is headed by an abstract Tense. Essentially, it is the present tense which formally agrees with the Topic **ōz** in agreement features. Furthermore, the code **ōz** is in a nominative case which is assigned by the case-assigner T.

In sentence (10) **kal ḥā-rawn mażōrf** ‘all the goats (are) in first stage of pregnancy’, we noticed two animal codes: one is the external argument (the Nominal Phrase NP/QP **kal ḥā-rawn** ‘all the goats’) and the other is the internal argument (the Adjective Phrase AP **mażōrf** (pregnant: particularly, in first stage of pregnancy)). Observing the agreement relations, it is found that the external NP/QP is logically *plural* and *feminine* (the Spec-NP: the quantifier **kal** ‘all’ is also in agreement with the nominal head **rawn** ‘goats’ in *plural*). This NP/QP binds the rest of the constituents in agreement features. More precisely, the abstract T ‘are’ is *plural* and the non-verbal predicate **mażōrf** is *plural* and *feminine*. With regard to the case-assignment, there is an immediate question which says: *what is the accusative case assigner for the non-verbal predicate if the main verb does not exist?* To answer this question, we have argued that as illustrated in figure 6, the internal Non-VP is split into two functional projections. They are focused and tensed phrases (FocP & TP). Within FocP, the head focus conceptually bears unvalued Phi/ ϕ - features (*u-Plural* & *u-Feminine*). These agreement features are directly valued by the corresponding features on Adjective object **mażōrf**. Furthermore, the abstract focused element is quite strong that has EF. This Edge Feature triggers to attract the non-predicated morpheme to the spec-FocP, assigning the accusative case. On the other hand, the null T bears present, EPP and unvalued Phi/ ϕ - features (*u-Plural* & *u-Feminine*). To check the unvalued feature, the T is probed down searching for the local goal. It is the closest QP **kal ḥā-rawn** that bears relevant valued features (*Plural* and *Feminine* features). Moreover, T is strong that comprises finite/EPP feature. This feature has the significant job to trigger the spec-VP to the last locus in spec-TP, assigning the nominative case.

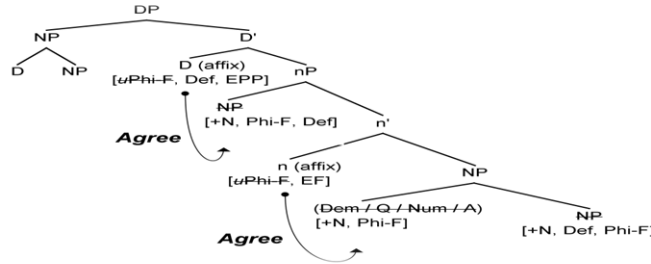
To sum up, it is apparent that the nominative case on spec-TP in both verbal and non-verbal structures is the result of the formal feature Finite/EPP, arguing that the non-verbal structures are fully tensed and finite constructions. Besides, the verbal complement on verbal structures is an accusative case that is assigned by light verb, whereas conversely assigned by the strong focus feature in nonverbal structures.

The definiteness structures

In view of the theoretical consideration that the Nominal Phrase NP is expanded to DP (Determiner Phrase), in this section, we discuss some evidences of how the ACSs are associated with determiners forming the DP structures. Unlike identification codes (proper names), the ACSs like all nominal phrases are prefixed with definite markers (**a-** and the prenominal fossilized suffixes [**ḥa-** or **ha**]) on the one hand. On the other hand, the indefinite marker is covert (null) Johnstone (1970) and revised in (Rubin, 2010) and Watson (2012). However, it can be said that the nominal phrases are usually dominated with DP. As shown by Fehri (1999), most of the modifiers in Standard Arabic can occur both pre- and post-head nouns, the Mehri modifiers like demonstratives Dem, quantifiers Q, and Numerals Num. have both optional positions before or after the nominal head. Besides, the adjectival modifier obligatorily occurs after the nominal head. In this subsection, we consider four phenomena: the post-verbal ACS **a-frōz laykam(ah)** ‘those female camel calves’ in sentence 3 **lḥō ḍa-yakanḥam a-frōš laykam(ah)?** ‘where are those female camel calves going?’, the preverbal ACS (**ʔrbšōt**) **adrhōs** ‘four female goat calves’ in sentence 4 **ʔrbšōt adrhōs ḍa-ytīkam ḥā-mōh** ‘the goat calves are drinking the water,’ the topic ACS **ḥa-ōz ḥawrōt** ‘the black goat’ in sentence 6 **ḥa-ōz ḥawrōt wa-šxaf-as a-lbōn** ‘the

black goat and its white milk’ and the topic ACS (**mēkan**) **aḥfōy** ‘many milked camels’ in sentence 7 **mēkan aḥfōy brak ḥa-wōdi** ‘many milked camels are in the valley.’ To see the functional DP and the syntactic relations among nominal heads and modifiers, the tree diagram is proposed below:

(7) *The ACS in definiteness structures*

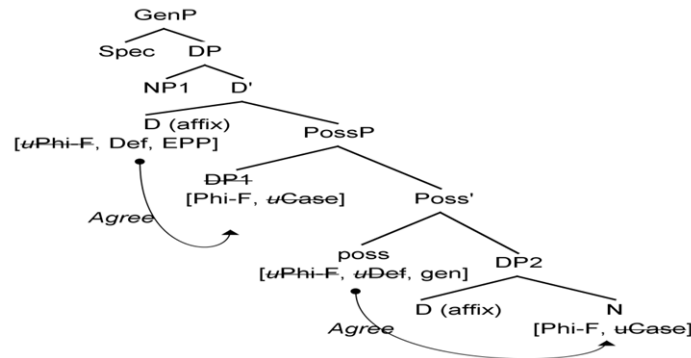


In the light of *nominal raising* in Fehri (1999), Ouhalla (2004), and Shlonsky (2004), we assume that the NP is the underlying base structure which therefore proceed to generate the DP structures. Obviously, in the tree diagram (figure 7), we argue that the DP is a meaningful *phase* which contains the higher projection and the terminal domain. All the modifiers in Mehri agree with the nominal heads. For instance, seeing the structure in sentence 7 **ḥa-ōz ḥawrōt** ‘the black goat,’ it is *singular*, *feminine*, and *definite* (namely, the definiteness on **ḥawrōt** ‘black’ is an inheritance feature). More specifically, the nominal affix is the active probe which has uninterpretable ϕ -features. These features are valued by an adjective (including nominal) feature. Once they agree, the Adjective should be raised to adjoin the nominal affix. The nominal affix also bears an edge feature which strongly attracts the head nominal to the left periphery of the NP. The definite affix also comprises uninterpretable ϕ -features which is valued by the only local goal. It is the spec-nP **ḥa-ōz** ‘the goat’ which is formally moved to the spec-DP forming the DP structure.

6.4 *The genitive structures*

Before considering the ACS within the genitive construction, genitive constructions are divided into two types: the Construct State and the Free State. In the *Construct State* the head noun is usually followed by the genitive DP, whereas in the *Free State* the genitive particle occurs between the nominal head and the genitive annex (Bardeas, 2008) and (Henry, 2013). Nevertheless, the ACS presents itself in the Free State where the genitive annex often follows the genitive markers such as the genitive prefix **ḏa-** in sentence 2 and 9 respectively: **ḥā-brē ḏa-ḏīm(ah) ḥā-ībīt** ‘the son of this camel,’ **a-šxōf ḏa-a-ḥaḵf** ‘the milk of the camel’ and the genitive particle **bʔal** as in sentence 13 **bʔal šēhi** ‘(the goat) with breast protector’ as illustrated in the following schema:

(8) *The ACS in genitive structures*



In the Possessive Phrase, the genitive marker bears uninterpretable ϕ -features and an unvalued definite feature. Thus, it probes down searching for a local goal. It is the annex (DP2) **ḏīm(ah) ḥā-ībīt** ‘this female camel’ in sentence 2 and **a-ḥaḵf** ‘the milked camel’ in sentence 9. Moreover, these complements bear a genitive case which is then valued by the genitive case assigner, the prefix **ḏa-** ‘of.’ Concerning the higher DP, the affix D composes uninterpretable ϕ -features. However, it probes down searching for the goal. The only valued goals are the spec-PossP DP1 **ḥā-brē** ‘the son’ and **a-šxōf** ‘the milk’ in both sentences. Since D bears the EPP, the DP1 is attracted to the left periphery of the DP having the nominative case. In the headless sentence 13, the code **bʔal šēhi** (the goat’s name) is a genitive structure. Within it, the particle **bʔal** ‘with’ strongly agrees with the annex in ϕ -features (*masculine* gender), saying that the genitive particle has an uninterpretable agreement features. These features are valued by the interpretable ones on the complement **šēhi** ‘breast protector.’ This particle also works

as the genitive case assigner that assigns the genitive case on the annex. In the case of these codes, the DP1 is always *null*, which is semantically licensed and interpreted bearing the nominative case and the valued interpretable ϕ -features.

CONCLUSION

Concerning the *topic question: what is the significance of formal features which are imposed to the substantive words and how can these features be valued?*, we have argued that the Animal Coding Systems in Mehri are complex items. Mainly, they are imposed with formal features in the human mind. These features are represented by *agreement features* (ϕ -features: gender, number, and 1st person), *definiteness features* (definite and indefinite) and *case-assignment features* (structural cases: nominative, accusative, and genitive). These features are cognitively interpreted--basically the native speakers of this minority language can interpret the syntactic and semantic specification on the target codes. Mostly, there are no morphological affixes annexed to the animal codes in Mehri.

Via Chomsky's minimalist model the Probe-Goal Matching in Chomsky (1995), (2000) and (2008), we discovered that the formal features are generally interpretable features and the uninterpretable features (uninterpretable Fs: must be valued and eliminated from the interface level LF). Usually, the uninterpretable features are cognitively realized within the functional categories: tense, verbal affix, definite, and possessive heads. Accordingly, these functional categories are the *Active Probes* which abstractly probe down searching for the Local Goals which bear the same valued features (interpretable F). However, these goals are the substantive animal codes which are located on the spec-vP, the V-Comp, the spec-nP, the spec-PossP, and the Poss-Comp. With regard to the case-assignment features, we found that the Tense and Topic (definiteness) features have the responsibility to value the unvalued nominative case on the animal coding subjects. Likewise, the verbal affix has the virtue to value the unvalued accusative case on the animal coding thematic objects in verbal structures, whereas in non-verbal structure, the focus feature has the great job to assign the accusative case on non-predicated objects. Additionally, the genitive case on the complement annex in genitive constructions is valued by the genitive case-assigners: **ǰa-** 'of' and **bʔal** 'with.'

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Appendix A: The position of the animal codes within phrasal structures

- 1- **Bād** maṣūr **ḥā-ibīt**
the-young camel sm. Nom ‘hardly suckle sm. perf’ the-camel sf. Acc.
‘The young camel hardly suckled the camel.’
- 2- ḏōm(ah) **afrayṣ** hā-brē ḏa-ḏīm(ah) **ḥā-ibīt**
This sm. calf camel sm. Nom. (is) the-son of-this sf. the-camel sf. Gen.
‘This female camel calf is the calf of this camel.’
- 3- lhō ḏa-yakanḥam **a-frōṣ** laykam(ah)?
where go pm prog. the-calf camel pm. those pm. Nom.
‘Where are those female camel calves going?’
- 4- ṛbṣōt **adrhōs** ḏa-yīḱam hā-mōh
Four m. the-calf goat pm. Nom. suckle pf. prog the-water Acc.
‘The goat calves are drinking the water.’
- 5- **ōz** brak a-ḏayg?
goat indef. sf. Nom. (is) inside the shed
‘Goat is inside the shed’
- 6- **ḥa-ōz** ḥawrōt wa-ṣxaf-as a-lbōn
the-goat sf. Nom, black sf. and-milk-it’s the-white
‘The black goat and its white milk.’
- 7- mēkan **aḥfōy** brak ḥa-wōdi
many the-milked camel pf. Nom. (are) in the-valley
‘Many milked camels are in the valley.’
- 8- ḥōm l-ṭrēd **a-rīgād**
want 1sm. to-follow the-pregnant camel pf. Acc
‘(I) want to follow the pregnant camels.’
- 9- a-ṣxōf **ḏa-a-ḥaḱf** wayn māṭak
the-milk Nom. of-the-milked camel sf. Gen. (is) very nice
‘The milk of the milked camel is very nice.’
- 10- kal **ḥā-rawn** **maṣōrf**
all the-goat pf. Nom. (are) (in first stage of pregnancy) pf. Acc.
‘All the goats are in the first stage of pregnancy.’
- 11- ḥād ṣnaw **ṣllēn?**
(any one) see sm. Pres. ṣllēn sm. Acc.
‘(Does) any one see ṣllēn?’
- 12- **Zemrēn** ḥabōnha gayēd
Zemrēn sm. Nom. sons-his gen. (are) beautiful
‘Zemrēn’s sons are beautiful.’
- 13- ḥaḱah **Bʔal ṣēhi** ḥamōh
(you) give 2sm. Pres. Bʔal ʔāfar sf. gen. the-water Acc.
‘You give Bʔal ʔāfar the water.’
- 14- **Marī** al-kalwt-lā yamōh
Marī sf. Nom. neg-come (at night)-neg today
‘Marī is not coming today.’

Appendix B: The Map of MSALs (Including Mehri language)



Figure 1 Map of MSALs adopted from Simeone-Senelle (1997, p. 381)