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ARTICLE

Exploring the Syntactic Agreement of Verbs with Coordinated Controller Subjects in Najdi Arabic: A Constraint-Based Approach

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ABSTRACT

Agreement and coordination are linguistic phenomena that exist in all languages. The former refers to the grammatical relationship holding between two or more words or phrases, whereas the latter concerns the process through which two or more expressions are joined together. Each one of these two represents an intriguing topic in linguistics. The current paper attempts to explore a topic that combines them. It investigates the agreement of verbs with coordinated controller subjects in Najdi Arabic (NA). The research problem here is how to identify the appropriate agreement pattern between the verb and the subject, which consists of two coordinated expressions, considering that agreement can also be influenced by different intervening factors. The paper aims to address two research questions. The first is, how do verbs in NA agree with coordinated controller subjects? The second is, how can we theoretically account for this special type of agreement within the constraint-based approach of Head-driven Phrase Structure Grammar (HPSG)? The topic will be studied with a satisfactory amount of naturally occurring data. Among the key findings is that the paper proposes that there are two possible agreement patterns between verbs and coordinated controller subjects in NA. It offers a solid descriptive and theoretical account of these two patterns. The paper delves into the details of this complex type of agreement providing practical insights into understanding agreement and coordination cross-linguistically. This will contribute to the relevant existing literature and provide guidance on how to investigate the interaction of two or more complex linguistic phenomena.

Keywords: Agreement; Coordination; Najdi Arabic; Syntax; Semantics; Analysis

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1. Introduction

Agreement can be seen as a systematic covariance triggered by the controller's semantic and syntactic properties, which determine the choice of the agreement pattern reflected on the form of the target[1]. As indicated in this widely adopted definition of agreement, the key element in forming the agreement is referred to as a controller, which will be the focus of this paper. To elaborate more on this, consider the examples in (1) and (2).

(1) John loves horses.

(2) *John love horses.

As demonstrated in (1), the verb *loves*, which is the agreement target here, is marked with a singular number feature because of the controller *John*; hence, the verb reflects the number of *John*, not the number of loves (i.e., a displaced number feature). The example in (2), on the other hand, is ill-formed because the agreement pattern required by the controller subject is not correctly reflected on the target *love*.

Despite the extensive amount of literature addressing this phenomenon[2–9], it remains a stimulating area of research in linguistics, emphasizing the intricate and nuanced aspects of languages. Therefore, this paper aims to contribute to the ongoing research on agreement by focusing on the agreement of verbs with a special type of controller subject (i.e., the name 'controller subject' means that the subject is the one that plays the role of the controller in agreement). This special type is coordinated phrases (i.e., similar or identical syntactic units combined into a larger structure or group through the use of a coordinating conjunction such as *and*) functioning as a sentence subject[10]. A considerable idiosyncrasy has been observed in their agreement with verbs, primarily due to the absence of a distinctly defined syntactic head[11]. This can be briefly introduced here with reference to examples (3) and (4) below, which are from English and Hijazi Arabic, respectively.

(3) [[Mary]NP and [Tom]NP]NP got married

As demonstrated in example (3), a coordinated phrase typically includes a *coordinator* (e.g., and) along with syntactic units that the coordinator connects, known as *coordinands* or *conjuncts*, such as *Mary* and *Tom*[11]. Agreement involving this specific type of controller raises questions about which of the two coordinated noun phrases serve as the controller. Is it the first conjunct, the second, or the whole coordinated phrase? This ambiguity complicates speakers' ability to identify the appropriate agreement pattern.

Although this phenomenon is a cross-linguistic one, it is particularly more evident in Standard Arabic and local Arabic varieties. The language's productive number and gender system, combined with various semantic and syntactic factors, can result in various agreement patterns as the examples from Hijazi Arabic in (4) show.

(4) a. [[*ʕali*]NP *wa* [*faTima-h*]NP]NP	*darasuu/*daras*	*fi*	*harfard*[1]
Ali and Fatima-F	studied.3PL.M/studied.3SG.M	in	Harvard
b. *daras/darasuu*	[[*ʕali*]NP *wa* [*faTima-h*]NP]NP	*fi*	*harfard*
studied.3SG.M/studied.3PL.M	Ali and Fatima	in	Harvard
'Ali and Fatima studied at Harvard.'			([12], p. 258)

The examples in (3) and (4) highlight the complexity and richness of agreement in Arabic, providing an opportunity for deeper exploration and understanding of this topic when explored in one of the Arabic varieties.

As indicated in its title, this paper will explore the intriguing aspects of agreement when applied to coordinated constructions in Najdi Arabic (NA), an Arabic variety mainly spoken in the central region of Saudi Arabia. This will enhance the current understanding of both agreement and coordination cross-linguistically. Using naturally occurring linguistic data of NA provided by the researchers, who are native speakers of this Arabic variety, the paper will offer a descriptive and theoretical account of the agreement of verbs with coordinate controller subjects in NA. The theoretical framework used in this paper is Head-driven Phrase Structure Grammar (HPSG), which is "a declarative and monostratal version of Generative Grammar, in which linguistic expressions have a single relatively simple constituent structure"

[1] Regardless of their sources and for consistency purposes, the glossing of all the linguistic examples, here and throughout the paper, will follow the Leipzig Glossing Rules as much as possible. In addition, only the most relevant details will be included in the glosses.

([13], p. 3). The novelty of the current paper comes from the fact that it is the first, as far as the researchers know, that uses a non-transformational approach of Generative Grammar to offer a detailed analysis of the agreement of verbs with coordinated controller subjects in NA, or in any other Arabic variety.

The subsequent sections are structured as follows. Section 2 reviews the relevant literature on the agreement of coordinated controller subjects and offers a brief overview of the previous theoretical accounts on these subjects. Then, the theoretical framework that will be used to analyze the data will be introduced in Section 3. Section 4 will provide a descriptive account that illustrates the underlying linguistic facts regarding the agreement of verbs with coordinated controller subjects in NA. After this, Section 5 draws on the syntactic facts to build a theoretical account of coordinated controllers' underlying structure using the HPSG framework. Finally, Section 6 concludes the paper by summarizing the preceding sections, discussing some implications, and offering suggestions for future work.

2. Literature Review

Agreement represents a multifaceted phenomenon that causes considerable debates and challenges within the field of linguistics, attracting significant attention from researchers in related areas. The complexity of agreement is further heightened by coordinated constructions, a topic that has attracted extensive research due to its empirical features, which continue to challenge most linguistic theories [12, 14–17]. Researchers in this field often argue that coordination follows the assumption held in the transformational X-bar theory which considers the coordinator (e.g., and) the head of the construction, as demonstrated in **Figure 1** [15, 18].

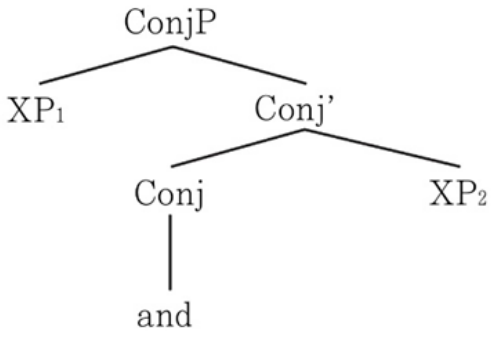

Figure 1. The analysis of conjunctions as heads in X-bar theory.

However, Borsley [19], among others, noted that this transformational approach presents several significant theoretical and empirical challenges. One might ask, for example, about the role played by a coordinating conjunction such as *and* which is considered in this view the head of such coordinated phrases and whether this head can govern or interact with the agreement pattern in any way. Coordinated phrases actually demonstrate intriguing characteristics in how co-heads (i.e., conjuncts) control agreement, potentially leading to diverse patterns or agreement strategies for a verb to agree with a coordinated controller subject. Therefore, they are significant for identifying the attributes of an effective syntactic model [20]. When combining multiple subjects, different agreement patterns may arise, including partial agreement (PA), and resolved agreement (RA).

Partial agreement (PA) occurs when only one conjunct within the coordinated phrase (usually the nearest) acts as the controller of agreement. A noteworthy instance of this phenomenon is known as first conjunct agreement (FCA). This syntactic phenomenon arises when a coordinated phrase subject has its leftmost member agreeing with the verb. It exhibits similarities with the agreement asymmetry observed in Standard Arabic (SA), particularly with respect to VS word order, as exemplified in (5).

(5) *dʒa:ʔa* *l-walad-u* *wa* *l-bint-u*
came.3SG.M DEF-boy.SG.M-NOM and DEF-girl.SG.F-NOM
'Ahmed and Layla came.'

On the other hand, resolved agreement (RA), also known as 'full agreement', occurs when the agreement is determined by the divers agreement values of the coordinated phrase (i.e., the features of two or more coordinated subjects are resolved collectively). According to Badecker [21], the resolution of features such as number and person are universal, while gender is language-specific. This means that universally, if there are two conjuncts, the resolution of the number feature will be either dual or plural. Furthermore, the resolution rule for the feature person is determined

by the person hierarchy (i.e., first-person> second-person> third-person). For example, coordination with a first-person will triggers first-person agreement. In the absence of a first-person conjunct, a second-person conjunct will trigger a second-person agreement, and if all the coordinands are third-person, third-person agreement will be triggered [11, 22].

The complexity raised by this transformational assumption (i.e., that conjunctions like "and" can head coordinated phrases without an apparent role in determining the agreement pattern) prompted us to explore an alternative non-transformational theoretical framework, particularly Head-Driven Phrase Structure Grammar (HPSG). In this framework, coordinate structures are characterized by the combined properties of the individual conjuncts. As highlighted by Sag [23], each element within a coordinate structure retains its unique features and contributes to a shared set of attributes (i.e., feature sharing) that help define the overall structure. Such attributes in HPSG function as constraints governing the structures. This approach allows for a better and more comprehensive understanding of how different components interact and relate to one another within grammatical constructions.

Given this together with what has been introduced in section 1, the main research gaps that the paper attempts to address include: a. identifying the appropriate subject-verb agreement pattern(s) in NA when the subject is a coordinated phrase; b. offering a detailed non-transformational analysis of the constructions where such agreement occurs, as an alternative to the transformational analysis that may not account for such complicated constructions thoroughly.

3. Theoretical Framework

3.1. An Overview of HPSG

The theory used in this paper is Head-driven Phrase Structure Grammar (HPSG). It is a mono-stratal constraint-based version of generative grammar developed in the mid-1980s by Carl Pollard and Ivan Sag [24]. As a mono-stratal approach, HPSG assumes that linguistic expressions have a single constituent level. In other words, HPSG is a non-transformational approach which does not include movement processes that allow for multiple levels for sentence structure (i.e., it does not assume that there are deep and surface structures). Furthermore, since HPSG is constraint-based, linguistic objects (words and phrases) are analyzed based on a set of constraints that must be met to predict well-formed constructions. These constraints are applied to linguistic objects through inheritance hierarchies [13].

Types provide a complex categorization of linguistic entities. They are organized multi-hierarchically, ranging from highly general to extremely specific. This allows for a more sophisticated classification system, sorting entities into more specific categories. The most fundamental type in this theory is the type *sign* and its subtypes. As shown in **Figure 2**, *sign* has two subtypes: *lexical-sign* (i.e., *lexeme*, *word*) and *phrase*. Each one of these subtypes (i.e., *lexeme*, *word*, and *phrase*) includes a complex system of subtypes that allows this framework to handle both idiosyncratic and general data [13].

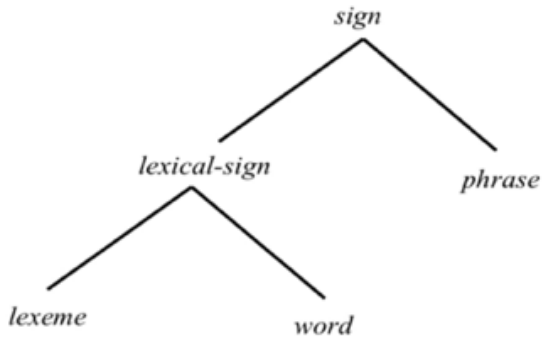

Figure 2. A hierarchy of types of signs ([13], p. 8).

As noted previously, agreement is not a simple phenomenon, but a complex area of research where various linguistic factors interact with it. This aligns with HPSG as demonstrated in **Figure 3** below, where we can directly employ linguistic information beyond the syntactic one.

As illustrated in **Figure 3**, the type *sign* is a complicated object with features that encode its phonological, syntactic, and semantic aspects. These aspects are expressed in HPSG via a system known as Attribute-Value Matrices (AVMs). The feature PHON represents the string of phonemes, whereas SYNSEM provides the synta-ctic and semantic properties of a *sign*. Furthermore, within SYNSEM, the feature CATEGORY encodes syntactic information, CONTENT encodes semantic information, and CONTEXT encodes pragmatic information. Hence, this system of types, features, and constraints provides a richly detailed, descriptive model that is applicable to various languages and constructions [13]. Being rich and detailed does

not necessarily mean that all linguistic information, features, values, and constraints should be explicitly included in the analysis. This is so because HPSG, as Crysmann [25] argues, employs the notion of under-specification which allows for partial description (i.e., the most relevant or specific information will be included in the analysis) as we will see soon in Sections 3.2 and 5.

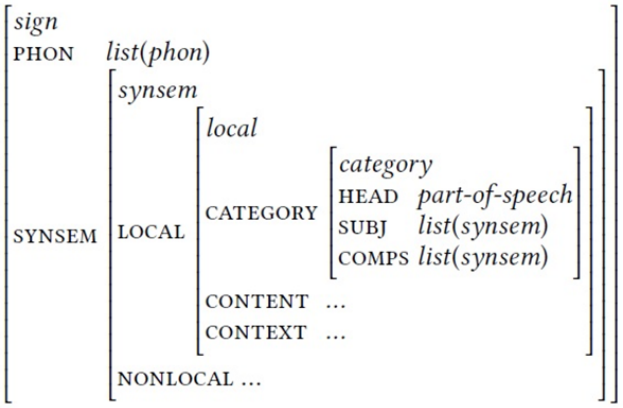

Figure 3. Attribute-value matrices ([13], p. 11).

3.2. Agreement in HPSG

In HPSG, agreement occurs when two distinct linguistic objects in a sentence have compatible feature values. This compatibility is achieved through "unification", where the two distinct objects must share the same feature value. Agreement in HPSG, as Wechsler and Zlatić [9] argue, has two types of features: INDEX and CONCORD. The INDEX feature is part of CONTENT, while the CONCORD feature is part of HEAD. Furthermore, they argue that the former is an NP-external agreement feature, while the latter is an NP-internal agreement feature. However, in this paper, we will follow Sag et al.'s [26] view of agreement, assuming that a verb and its subject have an AGR feature, which is part of the HEAD feature. The AGR feature is passed up from words to phrases, including the agreement features of (PER)SON, (NUM)BER, and (GEN)DER (phi features). When a verb and its subject agree, they share the same AGR feature, which is expressed, among other things, in HPSG by the boxed numerals (i.e., an integer used as a tag like [1] and [2]) as shown in **Figure 4**. These boxed numerals indicate that the two or more values sharing the same numeral are identical. In AGR as in (4), this means that they have the same value of PER, NUM, and GEN.

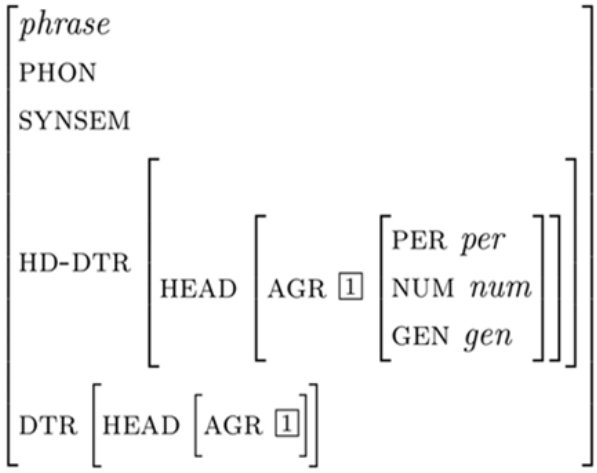

Figure 4. Agreement in HPSG.

4. Coordinated Controllers in Najdi Arabic: Description

This section is divided into two subsections. The Section 4.1 briefly overviews subject-verb agreement and coordinated constructions in Standard Arabic (SA) and in NA. SA is used here as a model of comparison since it is the standard and formal form of all Arabic varieties and its use here will make the argument clearer. The Section 4.2, on the other hand, delves into the agreement of verbs with coordinated controller subjects in NA and discusses the factors that may influence the choice of agreement patterns. Each subsection will rely on constructed data provided by the researchers, who are native speakers of NA. In addition, native NA speakers were consulted informally to ensure that the data represented well-formed, naturally occurring utterances of NA.

4.1. An Overview of Agreement and Coordinated Constructions in SA and NA

Agreement in SA is sensitive to word order. In a verb-subject (VS) order, the verb exhibits partial agreement with its subject in terms of gender and possibly person, as shown in example (6a). In contrast, example (6b) demonstrates that in a subject-verb (SV) order, the verb fully agrees with its subject in number, gender, and person features [14, 27–33].

(6) a. *ʔakal-**at*** *l-muʕallim-a:t-u*
ate-3SG.F DEF-teacher-PL.F-NOM
'The teachers ate.'
b. *l-muʕallim-a:t-u* *ʔakal-**na***
DEF-teacher-PL.F-NOM ate-3PL.F
'The teachers ate.' ([14], p. 5)

Similarly, with coordinated subjects, the verb in VS order agrees with the first conjunct subject only, as shown in the examples in (7).

On the other hand, in SV word order, the verb agrees with the resolved feature of the coordinated subjects, as demonstrated in (8). It is important to note that masculine is the resolved gender feature in SA when there is a mismatch between gender features (i.e., masculine and feminine), while dual serves as the resolved feature of two singular coordinated noun phrases.

(7) a. *dʒa:ʔa* *ʔaħmad-u* *wa* *layla*
came.3SG.M Ahmed.SG.M-NOM and Layla.SG.F
b. *dʒa:ʔ-**at*** *layla* *wa* *ʔaħmad-u*
came-3SG.F Layla.SG.F and Ahmed.SG.M-NOM
c. **dʒa:ʔ-**aa*** *ʔaħmad-u* *wa* *layla*
came-3DUAL.M Ahmed.SG.M-NOM and Layla.SG.F
'Ahmed and Layla came.'

(8) a. *ʔaħmad-u* *wa* *layla* *dʒa:ʔ-**aa***
Ahmed.SG.M-NOM and Layla.SG.F came-3DUAL.M
b.* *ʔaħmad-u* *wa* *layla* *dʒa:ʔa*
Ahmed.SG.M-NOM and Layla.SG.F came.3SG.M
'Ahmed and Layla came.'

However, Soltan [33] argues that when the subject is null or overt pronominal in SA, the verb partial agreement will not be possible regardless of the subject position, as exemplified in (9–11). Note that the parentheses are used here to indicate the optionality of the pronominal to be null or overt.

(9) a. *(hunna)* *katab-**na*** *ad-dars-a*
they.3PL.F wrote-3PL.F DEF-lesson-ACC
b. *katab-**na*** *(hunna)* *ad-dars-a*
wrote-3PL.F they.3PL.F DEF-lesson-ACC
c. **katab-**at*** *(hunna)* *ad-dars-a*
wrote-3SG.F they.3PL.F DEF-lesson-ACC
'They (the girls) wrote the lesson.'

Furthermore, in SA pronominal coordinated structure, the verb can only agree with the first pronominal conjunct in verb-initial sentences (i.e., agree completely in person, number, and gender), as shown in (10–11).

(10) a. *kataba* *huwa* *wa* *hind-un* *ad-dars-a*
wrote.3SG.M he.3SG.M and Hind.SG.M-NOM DEF-lesson-ACC
b.**katab-**aa*** *huwa* *wa* *hind-un* *ad-dars-a*
wrote-3DUAL.M he.3SG.M and Hind.SG.F-NOM DEF-lesson-ACC
'He and Hind wrote the lesson.'

(11) a.	*katab-**at***	*hia*	*wa*	*ʔaħmad-u*	*ad-dars-a*
	wrote-3SG.F	she.3SG.F	and	Ahmed.SG.M-NOM	DEF-lesson-ACC
b.*	*katab-**aa***	*hia*	*wa*	*ʔaħmad-u*	*ad-dars-a*
	wrote-3DUAL.M	she.3SG.F	and	Ahmed.SG.M-NOM	DEF-lesson-ACC

'She and Ahmad wrote the lesson.'

When comparing NA to SA, an interesting distinction emerges regarding verb agreement. In NA, verbs do not display dual agreement, and the agreement asymmetry observed in SA, as illustrated in example (6), is absent in NA. Instead, NA maintains consistent verb agreement in both VS and SV structures, as demonstrated in (12).

(12) a.	*iktiba-**n***	*al-bana:t*	*ad-dars*
	wrote-3PL.F	DEF-girls.PL.F	DEF-lesson
b.*	*iktiba-**t***	*al-bana:t*	*ad-dars*
	wrote.3SG.F	DEF-girl.PL.F	DEF-lesson
c.	*al-bana:t*	*iktiba-**n***	*ad-dars*
	DEF-girls.PL.F	wrote-3PL.F	DEF-lesson
d.*	*al-bana:t*	*iktiba-**t***	*ad-dars*
	DEF-girls.PL.F	wrote-3SG.F	DEF-lesson

'The girls wrote the lesson.'

As indicated previously in examples (9-11), pronominal subjects in SA do not permit partial agreement. This is also evident in NA. Consider the following examples in (13).

(13) a.	*iktiba-**n***	*(hin)*	*ad-dars*
	wrote.3PL.F	they.PL.F	DEF-lesson
b.*	*iktiba-**t***	*(hin)*	*ad-dars*
	wrote.3SG.F	they.PL.F	DEF-lesson
c.	*(hin)*	*iktiba-**n***	*ad-dars*
	they.PL.F	wrote.3PL.F	DEF-lesson

'They (the girls) wrote the lesson.'

These examples also highlight a key distinction. NA, unlike SA, maintains a relatively stable agreement pattern unaffected by the word order of the sentence.

4.2. Agreement of Verbs with Coordinated Controller Subjects in NA: Data

Two different strategies can handle subject-verb agreement in NA coordinated structures. A verb may either agree with the entire coordinated phrase (i.e., reflecting the resolved features of the coordinated subjects as a whole), or it may agree with just the first conjuncts (i.e., FCA). To elaborate more, consider the following examples in (14) and (15). Note that the exclamation mark will be used here and throughout the paper to indicate that the agreement pattern may be acceptable to some but not all NA speakers, as in (14a). Also note that the phonological context in spontaneous speech may change the pronunciation of the conjunction wa "and" in NA (i.e., *wa* can sometimes be pronounced *u*) as shown in the transliteration of the examples (14–15).

As can be seen in examples (14) and (15), verbs in VS word order may trigger both FCA and RA patterns. However, in the case of a preverbal coordinated subject, only full agreement is acceptable. The observation that FCA in VS word order is optional in NA, Moroccan Arabic, Lebanese Arabic, and Hijazi Arabic but not in SA supports the idea that word order has less of an impact on agreement in modern Arabic dialects[12, 28]. Furthermore, the examples in (10–11) and (16) illustrate that, unlike SA, FCA is optional in NA coordinated structures where the first conjunct is a pronominal subject. The verb can agree with either the first pronominal subject as in (15a) or the entire coordinated phrase as in (16b).

(14) a.!	*kitab*	*ʔaħmad*	*u*	*fatˁmah*	*ad-dars*
	wrote.3SG.M	Ahmad.SG.M	and	Fatima.SG.F	DEF-lesson
b.	*iktiba-**u***	*ʔaħmad*	*u*	*fatˁimah*	*ad-dars*

wrote- PL.M ma .SG.M an at ma.SG.F DEF- esson
'Ahmad and Fatima wrote the lesson.'

(15) a. *ʔaħmad u fatˁimah iktiba-**u** ad-dars*
Ahmad.SG.M and Fatima.SG.F wrote.3PL.M DEF-lesson
b.**ʔaħmad u fatˁimah kitab/iktiba-**t** ad-dars*
Ahmad.SG.M and Fatima.SG.F wrote-3SG.M/F DEF-lesson
'Ahmad and Fatima wrote the lesson.'

(16) a. *kitab huu u hind ad-dars*
wrote.3SG.M he.3SG.M and Hind-SG.F DEF-lesson
b. *iktiba-**u** huu u hind ad-dars*
wrote-3PL.M he.3SG.M and Hind-SG.F DEF-lesson
'He and Hind wrote the lesson.'

Various factors might also affect the distribution of the two patterns (i.e., RA and FCA). These factors may include word order[28], animacy[34], and cognitive factors like avoidance strategies[35]. These factors are known as conditions. They can either have an absolute influence, making one form of agreement obligatory, or a relative influence, where one pattern is preferred over others. For instance, examples (17a) and (17b) illustrate that no condition affects the choice of coordinated structure agreement; thus, both patterns are acceptable. In contrast, examples (17c) and (17d) show that the post-nominal verbs can only trigger RA, indicating that word order in this context has an absolute effect that enforces RA.

(17) a. *sˁalla ʔaħmad u xa:lid ba-l-masdʒid*
prayed.3SG.M Ahmad.SG.M and Khaled.SG.M in-DEF-mosque
b. *sˁall-**u** ʔaħmad u xa:lid ba-l-masdʒid*
prayed-3PL.M Ahmad.SG.M and Khaled.SG.M in-DEF-mosque
c. *ʔaħmad u xa:lid sˁall-**u** ba-l-masdʒid*
Ahmad.SG.M and Khaled.SG.M prayed-3PL.M in-DEF-mosque
d.**ʔaħmad u xa:lid sˁalla ba-l-masdʒid*
Ahmad.SG.M and Khaled.SG.M prayed-3SG.M in-DEF-mosque
'Ahmad and Khaled prayed in the mosque.'

The effect of animacy on the choice of agreement pattern with coordinated controllers has been explored in various languages (Corbett[36], for Slavic languages; Aresnijevic & Mitic[37], for Serbo-Croatian; Comrie[38], for Turkish; Corbett[7], for Miya and Russian, among many others). In Miya, animacy functions as an absolute condition in which resolved agreement occurs only when the controller is animate. In contrast, in Russian, animacy acts as a relative condition in which resolved agreement is more likely with animate controllers than with inanimate ones. According to Corbett[7], animacy is a condition on agreement; the higher the coordinated subjects are in the Animacy Hierarchy, the greater the likelihood of RA as follows.

"speaker > addressee > 3rd person > kin > human > animate > inanimate" ([39], p. 56)

This goes along with Comrie[38], who stated that verbs agree with noun phrases that are higher in animacy and fail to agree with those that are lower in animacy. This is also evident in NA verb-initial sentences. For example, the verb *ʔagbal* 'showed up' in (18) can only agree with the first subject since the second conjunct lacks the animacy factor (i.e., this is also related to agency as non-human nouns are less likely to be treated as agents); hence, animacy/agency in this example is a condition with an obligatory effect triggering FCA.

(18) a. *ʔagbal*	*imħammad*	*wa*	*l-xjr*	*muʕu-h*
show-3SG.M	Mohammed.SG.M	and	DEF-good	with-him
b.**ʔagbal-**u***	*imħammad*	*wa*	*l-xjr*	*muʕu-h*
show-3PL.M	Mohammed.SG.M	and	DEF-good	with-him
c.!*ʔagbal*	*al-xjr*	*wa*	*imħammad*	*muʕu-h*
show-3SG.M	DEF-good	and	Mohammed.SG.M	with-him

'Mohammed showed up with goodness.'

Additionally, as illustrated in (18c), the unmarked order is to place animate conjuncts before inanimate conjuncts[40]. This suggests that the arrangement of coordinated nominals within the coordinated phrase is influenced by a "featural hierarchy" ([41], p. 57). This hierarchy can be represented as follows.

> "Animacy> humanness> definiteness> honorificity> gender> number" ([41], p. 57)

However, when both of the coordinated subjects are plural generic inanimate nouns, as in (19), a deflected agreement is triggered (i.e., a plural controller triggering a feminine singular target)[42]. This is because non-human nouns are perceived as less capable of independent action than human nouns[43]. Note that these coordinated subjects have no specific order, as both conjuncts are definite inanimate plural nouns.

(19) a. *tˤaːħa-**t***	*al-bijuːt*	*wa*	*l-ʕamaːjir*
fall down-3SG.F	DEF-houses.PL	and	DEF-buildings.PL
b. *tˤaːħa-**t***	*al-ʕamaːjir*	*wa*	*l-bijuːt*
fall down-3SG.F	DEF-buildings.PL and	DEF-houses.PL	
c. *al-bijuːt*	*wa*	*l-ʕamaːjir*	*tˤaːħa-t*
DEF-house.PL and	DEF-buildingss.PL	fall down-3SG.F	

'The houses and buildings fell.'

Interestingly, when the coordinated controller subjects are specified, such as by numerals less than ten, as in (20b), feminine plural agreement is triggered, but not deflected agreement; thus, the choice between feminine RA and deflected agreement with an inanimate plural coordinated controller is determined by the controller's individuation level (specificity vs. genericness)[43].

As is demonstrated in (20d), these enumerated coordinated structures may also trigger masculine singular verb agreement. This could be due to the syntactic role of the numerals. Pre-nominal cardinal numerals are noun-like numerals; hence, they may prevent access to the enumerated noun features. However, as they are not absolute nouns or adjectives, they cannot govern the agreement but modify a head as adjuncts. Consequently, they will give rise to the 'default' (i.e., M.SG) agreement feature[36, 44]. It is worth noting that in contrast to the human coordinated subjects in (17d), the word order has no impact on the agreement choice with inanimate coordinated subjects, as demonstrated in (19) and (20).

Another condition that may influence the choice of agreement pattern is textual prominence (i.e., the speaker focus), as is demonstrated in (21a) and (21b) by the possessive clitic attached to the second coordinated subject; hence, textual prominence in this example is a condition with an obligatory effect.

(20) a.!*iftaħa-**t***	*θalaːθ*	*mitˤ**aːʕim***	*u*	*arbaʕ*	*maħall-**aːt***
open-3SG.F	three	restaurants.PL.M	and	four	stores.PL.F
b. *iftaħa-**n***	*θalaːθ*	*mitˤ**aːʕim***	*u*	*arbaʕ*	*maħall-**aːt***
open-3PL.F	three	restaurants.PL.M	and	four	stores.PL.F
c. *fitaħ*	*θalaːθ*	*mitˤ**aʕim***	*u*	*arbaʕ*	*maħall-**aːt***
open.3SG.M	three	restaurants.PL.M	and	four	stores.PL.F

d. *θala:θ* *mitˁ**a:**ʕim* *u* *arbaʕ* *maħall-**a:t*** *iftaħa-**n***
three restaurants.PL.M and four stores.PL.F open-3PL.F
'Three restaurants and four stores opened.'

(21) a. *ra:ħa-**t*** *al-um* *wa* *ʕja:la-**h***
went-3SG.F DEF-mother.SG.F and children.PL.M-her
b. **ra:ħ-**u*** *al-um* *wa* *ʕja:la-**h***
went-3PL.M DEF-mother.SG.F and children.PL.M-her
c. **ra:ħ-**u*** *ʕja:l* *wa* *al-um*
went-3PL.M children.PL.M and DEF-mother.SG.F
'The mother and her children are gone.'

Agency could be another factor favoring FCA in (21a) since children are perceived as less agent than adults. Another factor that could also affect the agreement and the order of the two conjuncts is definiteness (i.e., *al-*). As observed in the ungrammaticality of (21c), definite conjuncts are typically placed first in coordinated phrases.

Furthermore, when the first subject is the focus and has a higher textual prominence than the second coordinated subject, FCA will be triggered. Note that although the first conjuncts *al-malika-**h*** 'the queen' in (22) and *al-muʕallima-**h*** 'the teacher.F' in (23) are singular, they are placed before the plural conjunct *al-ʔmir-**a:t*** 'the princesses' and *atʕ-tʕa:lib-a:**t*** 'the students.F'. This could be due to the honorificity feature, which highlights the importance and significance of the first conjunct.

(22) a. *dʒilisa-**t*** *al-malika-**h*** *wa* *l-ʔmi:r-**a:t***
sat-3SG.F DEF-queen-SG.F and DEF-princes-PL.F
b. ***dʒilisa-**n*** *al-malika-**h*** *wa* *l-ʔmi:r-**a:t***
sat-3PL.F DEF-queen-SG.F and DEF-princes-PL.F
'The queen and princesses sat down.'

(23) a. *dʒilisa-**t*** *al-muʕallima-**h*** *wa* *tˁ-tˁa:lib-**a:t***
sat-3SG.F DEF-teacher-SG.F and DEF-student-PL.F
b. ***dʒilisa-**n*** *al-muʕallima-**h*** *wa* *tˁ-tˁa:lib-**a:t***
sat-3PL.F DEF-teacher-SG.F and DEF-student-PL.F
'The teacher and students sat down.'

As demonstrated in the previous verb-initial sentences (18–23), animacy/agency, specificity vs. genericness, and textual or physical prominence are all factors that should be taken into account when determining which agreement pattern is most suitable for a given linguistic context. Accordingly, the concept of the individuation continuum proposed by Brustad[43] can be applied to NA verb agreements with coordinated controller subjects. That is, if both of the coordinated controllers exhibit high levels of individuality, RA will be triggered. However, FCA will be triggered if the first conjunct shows a higher individuation level than the second subject. If both conjuncts display low individuation levels, they usually trigger deflected agreement. Recall that this only applies to verb-initial sentences (i.e., VS word order). When coordinated controller subjects occur in subject-initial sentences, there will be only one possible agreement pattern which is resolved agreement (RA).

5. Analysis

Given the observations discussed in the previous sections, it is possible to say that in NA, the verb in VS word order agrees fully with the subject (i.e., it agrees in person, number, and gender). Such verb-initial sentences can be analyzed in HPSG as instances of the type *hd-subj-comp-ph*[45]. Furthermore, as already introduced, agreement is accounted

for in HPSG by employing the AGR feature, whose value includes PERSON, NUMBER, and GENDER features[26]. To illustrate this, let us examine the sentence in (11a), which is repeated here in (24) and analyzed in **Figure 5**.

(24) *iktiba-**n*** *al-bana:t* *ad-dars*
wrote-3PL.F DEF-girl.PL.F DEF-lesson
'The girls wrote the lesson.'

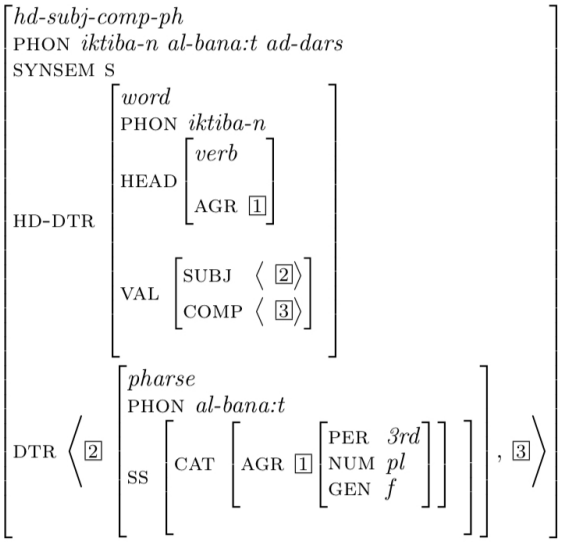

Figure 5. The structure of *iktiba-n al-bana:t ad-dars*.

The structure shown in **Figure 5** can be briefly illustrated as follows. The sentence *iktiba-**n** al-bana:t ad-dars* is a verb-initial 'simple' sentence which is structurally of the type *hd-subj-comp-ph*. It consists of the head verb *iktiba-n* 'wrote' followed by the subject *al-bana:t* 'the girls' and the complement *ad-dars* 'the lesson'. The agreement between the verb and its subject is accounted for here through the identical value of AGR which is the boxed numeral[1]. It means that the agreement features of the subject *al-bana:t* are fully reflected on the target verb *iktiba-**n***.

To account for more complex sentences where the verb agrees with a coordinated subject in NA, we will build on the analysis shown in **Figure 5** and adopt the widely-held view in HPSG that coordinated phrases are of the type *non-headed* phrases[11, 24, 46–48].

Furthermore, we will follow Villavicencio et al.'s[49] analysis of coordinated phrases, which stores agreement information about the leftmost and rightmost conjuncts in two new agreement-related features: LAGR for the leftmost conjunct and RAGR for the rightmost conjunct, as shown in **Figure 6**.

However, to propose a more unified analysis, the feature CONCORD, which only reflects the agreement information of GENDER and NUMBER values, will not be adopted here. Instead, we will assume that there is a feature called "RS-AGR," which encompasses all *phi*-features (i.e., PERSON, GENDER, and NUMBER). This is demonstrated in **Figure 7**. Additionally, since coordinated phrases are typically treated as non-headed phrases in HPSG, the HEAD feature will remain underspecified.

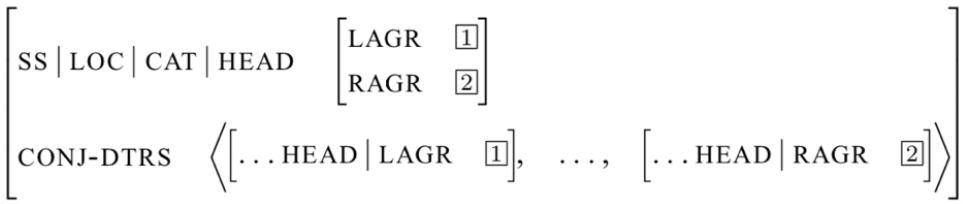

Figure 6. Agreement-related features ([49], p. 441).

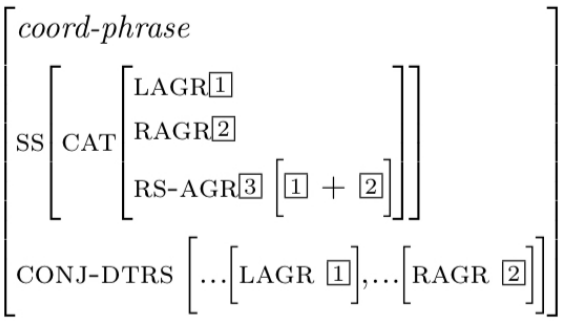

Figure 7. Proposed agreement feature.

The feature RA-AGR reflects the resolved agreement features computed from the values of the conjuncts. This is represented in **Figure 7** by the sign (+). This sign indicates that the coordination of two singular nouns, two plural nouns, or a combination of one singular and one plural noun will result in a plural agreement feature. Furthermore, the coordination of two masculine nouns or one masculine and one feminine noun will yield a masculine agreement feature, as masculine is considered the default gender marker in NA.

On the other hand, person agreement follows a hierarchy: coordination with a first-person noun will result in first-person agreement. If that is not the case and a second-person noun is present, it will yield second-person agreement. If neither first nor second person is available, then third-person agreement will apply.

The AVM below in **Figure 8** represents the structure of the sentence in (17b) repeated here in (25), which involves humans coordinated controller subjects triggering resolved agreement (i.e., plural masculine). This is demonstrated by the matching tag[4] shared between the head AGR feature and the RS-AGR feature.

(25) *sˁall-**u*** *ʔaħmad* *u* *xa:lid*
prayed-3PL.M Ahmad.SG.M and Khaled.SG.M

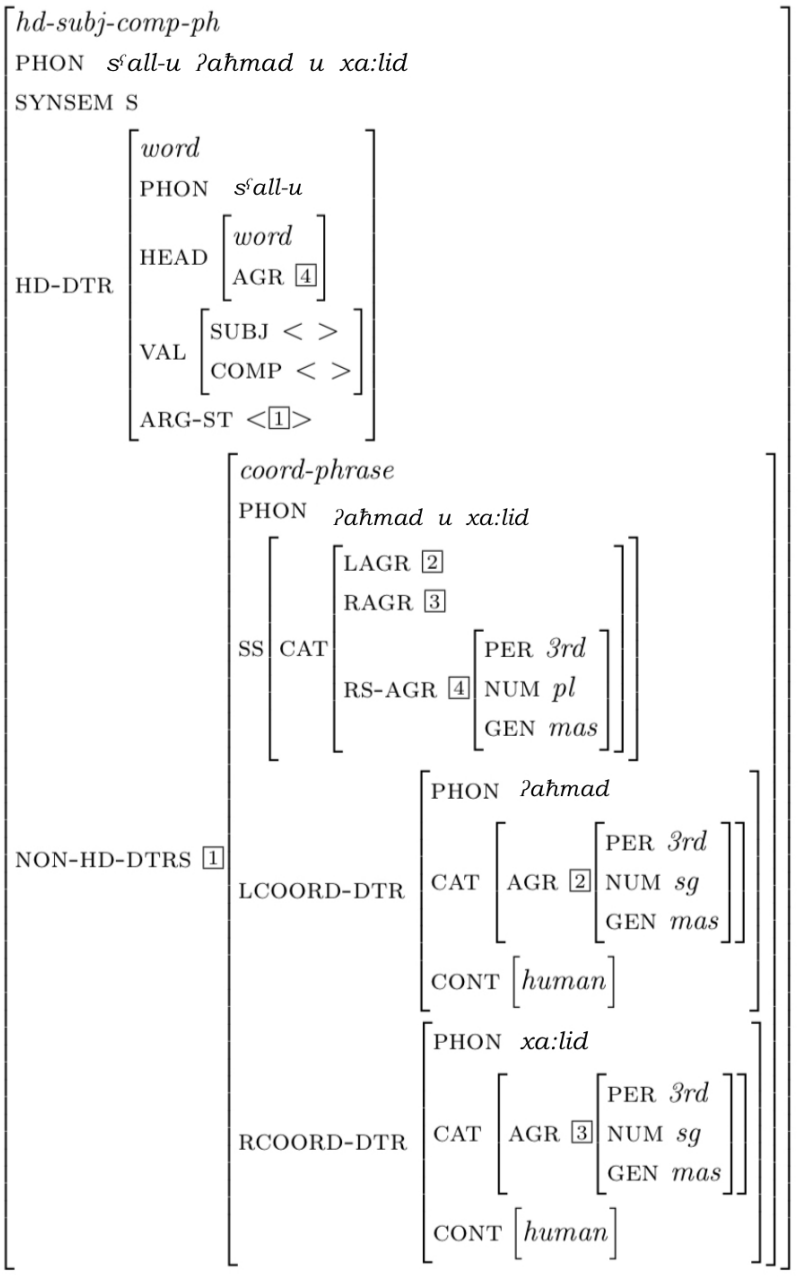

Figure 8. An instance of human coordinated noun resolved agreement (RA).

The other possible agreement pattern for this sentence, as previously shown in (17a) and repeated here in (26), is FCA. This is illustrated in **Figure 9**, where the verb *sʕalla* 'prayed' agrees with the first conjunct subject *ʔaħmad* 'Ahmad'. This is indicated by the identical numeral tag [2] shared between the verb and the first coordinated subject.

(26) *sʕalla* *ʔaħmad* *u* *xa:lid*
prayed.3SG.M Ahmad.SG.M and Khaled.SG.M
'Ahmad and Khaled prayed.'

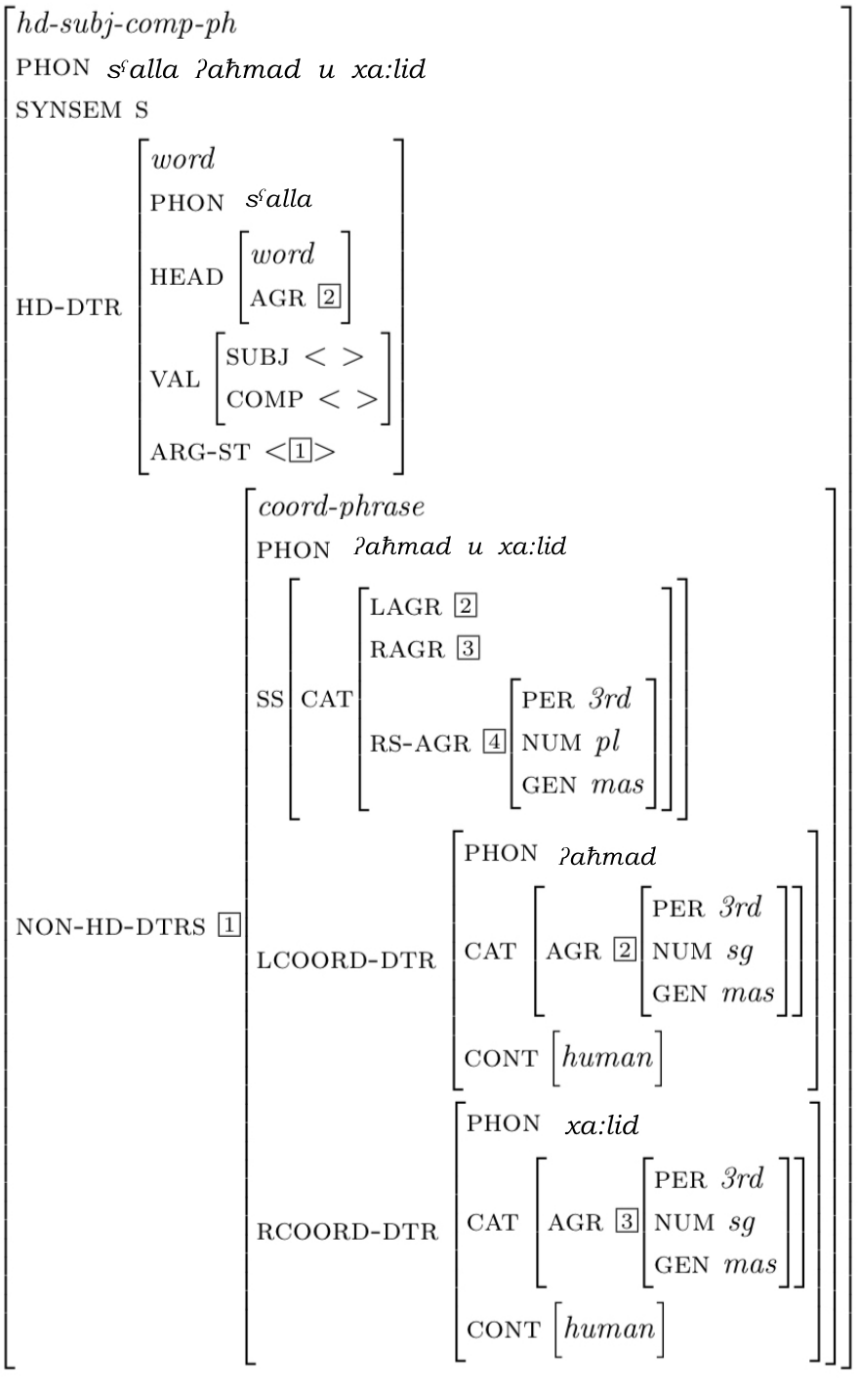

Figure 9. An instance of first conjunct agreement (FCA) in coordinated controller subjects.

To summarize, it has been observed that there are two possible patterns in the agreement of verbs with coordinated controller subjects in NA. The first is resolved agreement (RA) and the second is first-conjunct agreement (FCA) which is an instance of partial agreement (PA). The analysis of each one of these is exemplified in **Figures 8** and **9** respectively. These two patterns are possible together only in verb-initial sentences. In subject-initial sentences, only the resolved agreement is possible. It should be noted that, in NA, the sensitivity of the agreement to word order that applies here to constructions of coordinated subjects, does not apply to subject-verb agreement in general. This observation is shown in **Figure 10** which summarizes the agreement patterns of verbs and coordinated controller subjects in NA. The only exception to this is the limited instances of deflected agreement which apply, as discussed in section 5 with reference to the examples given earlier in (19), to constructions where the two conjuncts are plural generic inanimate nouns.

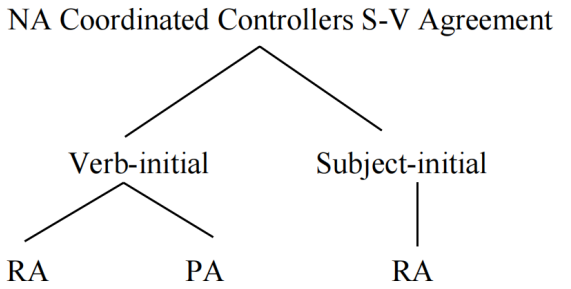

Figure 10. NA coordinated controllers subject-verb agreement.

6. Conclusions

The paper has examined the idiosyncratic agreement behavior that is observed in the agreement of verbs with coordinated controller subjects in NA. It offers a detailed descriptive account of this kind of agreement supported by a sufficient number of naturally occurring examples. The paper theoretically analyzes the structure of this agreement within the non-transformational framework of HPSG. This analysis represents the novelty of the paper since the literature currently does not have, as far as the researchers know, a single published work that offers a non-transformational analysis of this complex type of agreement in NA or in any other Arabic variety. This analysis has also offered a deeper understanding of the structure and grammar of the NA variety. Based on data observation, description, and analysis, the paper proposes that coordinated controller subjects in NA agree with verbs in two possible patterns: RA and FCA. In addition, the paper sought to explore the factors that contribute to the choice of agreement patterns, either FCA or RA. It also provides evidence that agreement is really a complex phenomenon influenced by different intervening factors.

The paper demonstrates that the verb agreement with coordinated controller subjects in NA is sensitive to word order. It also shows that the degree to which a verb agrees with one of the conjuncts (FCA) or with both conjuncts (RA) is influenced by various factors, including animacy, specificity versus genericness, definiteness, and textual prominence, among others. Furthermore, based on the available data, the arrangement of coordinated nouns within the coordinated phrase appears to be influenced by a hierarchy proposed by Saeed[41]. This hierarchy encompasses several features arranged in a specific order, such as animacy, humanness, and definiteness.

The observed agreement patterns and investigating agreement together with coordinated constructions in NA clearly demonstrate that understanding the underlying mechanism of agreement cannot be derived from merely one or two instances. Hence, it is important for future research to recognize that different targets are likely to produce varying results, as this paper has concentrated solely on one target type (i.e., verbs). A comprehensive study of a large corpus of spontaneous speech, particularly in a language with a rich system of agreement, is recommended to explore the potential variations in agreement patterns across different targets.

Author Contributions

Conceptualization, A.A and R.A.; methodology, A.A and R.A.; software, R.A.; validation, A.A and R.A.; formal analysis, A.A; investigation, A.A; resources, R.A.; data curation, R.A.; writing—original draft preparation, R.A.; writing—review and editing, A.A.; visualization, A.A. and R.A.; supervision, A.A.; project administration, A.A.; funding acquisition, A.A. All authors have read and agreed to the published version of the manuscript.

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Data can be given upon a reasonable request.

Conflicts of Interest

The authors declare no conflict of interest.

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