

Documenting Raising and Control in Moro

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1 Introduction

Himmelmann (2006) defines language documentation as the creation of “a lasting, multipurpose record of a language” (p.1). With such a broad definition, description and analysis of linguistic structure form vital components of language documentation, and this process is in turn informed and enriched by linguistic theory (Sells 2010). In this paper, we show that the semantic and syntactic diagnostics from formal theories of grammar enable a nuanced understanding of embedded clauses in Moro that would not be possible without such tests. Specifically, these tests detect the distribution of various types of raising and control predicates in Moro. Such tests are especially important, as the identification of control and raising predicates are often completely neglected in grammatical descriptions and documentary work,¹ even while they have played a central role in the development of syntactic theory for over forty years (Davies and Dubinsky 2004). By supplying theorists with additional data, documentarians can help shape future developments in theoretical topics like raising and control, which have sometimes been focused on a restricted set of easily accessible languages (Polinsky and Potsdam 2006).

In this paper we show that the superficial morphological categories that mark embedded clauses in some cases correspond quite neatly to the complements of raising and control predicates. In other cases, however, the connection is less direct. Distinguishing these cases, and the connections between complement types and raising and control, must make use of data which can most reliably be gathered via elicitation, including negative judgments. Such in-depth elicitation is only possible due to a solid analytical foundation in the phonology, morphology and basic syntax of the language, information which has been accumulated through extensive prior documentation and description. Thus, there is no doubt that the lines between documentation, description and formal theoretical analysis are blurred and these different enterprises are complementary. While documentary approaches have rightly encouraged theorists to look beyond elicitation as a basic tool of data collection, elicitation guided by linguistic theory also permits insights which are difficult to establish solely on the basis of texts. Thus, the study of endangered languages is most effectively conducted with the benefit of a solid foundation in linguistic theory.

This paper is part of the research of the Moro Language Project hosted by UC San Diego, a project which was funded by the National Science Foundation (Grant No. 0745973) from 2008-2013, and has focused on in-depth data analysis of all aspects of the language. Moro is a Kordofanian (Niger-Congo) language spoken in the Nuba Mountains area in South Kordofan State in the

¹For example, Dixon (2010, ch. 18) does not make this distinction in his discussion of complement clauses, nor does he provide discussion of any comparable concept. Noonan (2007) is a notable exception in his clear discussion of these issues.

Republic of Sudan. The Nuba Mountains are linguistically rich. Approximately fifty languages are spoken there, half of which are generally assumed to belong to the Niger-Congo phylum. Moro is classified as a member of the Heiban branch of Kordofanian (Schadeberg 1981, 2013), and has six or seven dialects. The number of Moro speakers is unknown, due to decades of war, which has caused the death and displacement of thousands of Moro people, as well as other Nubans. A large displaced Moro-speaking community resides in Omdurman, Sudan, near Khartoum, and Moro refugees have fled to neighboring African countries such as South Sudan and Egypt. Some have also relocated to Europe, Australia and North America. Since it is not currently feasible to travel to the Nuba Mountains area, working with displaced speakers is the only possible documentation method. Despite the drawbacks of speaker displacement from the home area, working with the same speakers on a long-term regular basis has provided the opportunity for more in-depth and sustained examination of the language, and has allowed more concentrated documentation of one particular dialect. In Omdurman and the Khartoum area of Sudan, dialect convergence may have accelerated due to greater dialect contact and the influence of the standard written form.

This paper focuses on the Thetogovela dialect of Moro. The native name for Moro in this dialect is [ðəmwərénjá], and the dialect name is [ðətəgovélá].² The authors of this paper have worked with two native speakers of this dialect, Elyasir Julima and Ikhlas Elahmer, residing in San Diego, California for almost a decade. Mr. Julima and Ms. Elahmer are part of an interconnected but dispersed Moro community who live across North America. In 2013, we were also able to work with Angelo Naser, the head of the Moro Language Committee in Omdurman, Sudan. The data for this paper are based on the speech and judgments of all three individuals.

As the examples below demonstrate, Moro has a complex set of finite and infinitival complements, both of which appear with putative control and raising predicates, categories which will be defined below:³

(1) Finite complementation

- a. *Kúk:u g-a-rámáṭ-iə* [(*tá) g-é-[↓]fáḍ-á ugi]
K. clg-rtc-continue-ipfv compl clg-dpc1-chop-ipfv clg.tree
'Kuku kept chopping the tree.'
- b. *é-g-a-mwandəḍ-ó Kúk:u-(y)* [tá g-á-[↓]noán-á ðamala]
1sg-clg-rtc-ask-pfv Kuku-acc compl clg-dpc2-watch-ipfv clj.camel
'I asked Kuku to watch the camel.'

(2) Infinitival complementation

- a. *Kúk:u g-iḍ-á* [(*n-)áyá-[↓]džóm-é]
Kuku clg-(rtc-)do/will-ipfv compl-3sg.inf-move-infl
'He will move.'

²In standard Moro, these terms are Ðəmwéðənia and Tobeñelda respectively. Standard Moro is based on the Werria or Longorban dialects, and has a number of phonological, morphological and lexical differences from Thetogovela. The Moro Language Committee oversees the production of written material in Standard Moro (pedagogical books, a newsletter and religious translations) and teaches literacy to the community in Sudan.

³Abbreviations: acc – accusative case; adj – adjectival final vowel; appl – applicative; cl – weak noun class concord; comp1/2 – complementizer 1 (embedded declarative) and complementizer 2 (some control complements, relative clauses); dpc1/2 – dependent clause 1 (subject relative clauses, some raising complements) and dependent clause 2 (non-subject relative clauses, complements of some verbs of communication) ipfv – imperfective; pas – passive; pfv – perfective; pst – past tense; pl – plural; pos – possessive; rtc – root clause; scl – strong noun class concord; sg – singular.

- b. *Kúk:u g-əndətʃin-ú [(n)-áŋá-[↓]lávátf-a nál:o(-ŋ)]*
 Kuku clg-(rtc)-try-pfv comp2-3sg.inf-hide-inf2 Ngalo-acc
 ‘Kuku tried to hide Ngalo.’

The examples in (1a) and (1b) represent two of the three types of finite complements in Moro, distinguished by the clause-type prefix (*é* vs. *á*) and the availability of a complementizer, while (2a) and (2b) represent the two types of infinitival complements in Moro, distinguished by the final suffix on the stem and, again, the possibility of an overt complementizer.

In the following sections we appeal to the following theoretical claims, few of which are completely uncontroversial, about raising and control to make sense of the rich landscape of clausal complementation in Moro:

- Raising and control structures are generated by distinct syntactic mechanisms (e.g. Landau 2003, 2013); see the papers in Hornstein and Polinsky (2010) for an opposing view that they are both generated by the same mechanism (‘A-movement’).
- Control complements are typically CPs (‘complementizer phrases’, or full clauses). (e.g. Bošković 1997; Landau 2013), but involve distinct semantic subclasses of No Control, Predicative Control and Logophoric Control (Landau 2014)
- Raising complements vary in size; while they are arguably TPs (‘tense phrases’, lacking information structural projections) (e.g. Bošković 1997); they can sometimes be finite CPs (Ura 1996, ch. 3, Carstens and Diercks 2013), but in the latter cases typically do not allow overt complementizers (Chomsky 1981; Grosu and Horvath 1984); in other cases raising complements are structurally small, for example a simple VP (Wurmbrand 2003).

The fact that an under-documented and understudied language such as Moro provides clear evidence supporting these hypotheses, in many cases by means of overt morphological marking, provides important support for their cross-linguistic viability. At the same time, the relevance of these claims to Moro provides testament to the applicability of theoretical analysis of language to the documentation of endangered languages.

2 Background: Raising and control predicates

We will consider a verb or adjective a raising or control predicate if it meets the following three criteria:

- (3) Definition of a control or raising predicate:
- a. Control/raising predicates select a clausal complement.
 - b. The subject of the clausal complement must be coindexed with a syntactic argument of the control/raising predicate.
 - c. The subject of the clausal complement cannot be overt.
 - d. $[S_1 \dots DP_i \dots [S_2 ec_i VP]]$

By ‘clausal complement,’ we do not make any commitment to the formal or structural properties of the constituent, e.g., whether it is a CP, TP, or VP, or a non-verbal category, or its finiteness; there will be some discussion about the differing structural complexity of complements in this paper.

Second, in (3)b we are using the term “coindexed” in a theory neutral way, as a cover term for coreference, binding, and dependencies generated by “movement.” The diagram in (3d) schematizes the requirements stated in prose in the earlier three points; *ec* stands for “empty category,” a cover term for null anaphoric elements (Chomsky 1981).

Criterion (3b) specifies that the shared argument of the control/raising predicate must a syntactic argument rather than a semantic one. Whether the higher argument is a semantic and syntactic argument of the higher predicate or only a syntactic argument of the higher predicate is the crucial distinction between control and raising predicates, respectively. In other words, only control predicates introduce semantic entailments (theta-roles) about the properties of this argument:

- (4) a. **Control predicate:** A predicate that requires one of its semantic arguments to be coindexed with the subject of a complement clause.
- b. **Raising predicate:** A predicate that requires the subject of a complement clause to occur as one of its syntactic arguments.

As such, the diagnostics that distinguish control predicates from raising predicates are tests that determine whether the coindexed argument of the higher predicate is a semantic argument of that predicate, typically by identifying semantic restrictions which hold for the relevant argument (see Landau 2013, 8-28). While more sophisticated semantic diagnostics can be employed, we will rely on simple contrasts like the following, first observed for English by Rosenbaum (1967):

- (5) a. It seemed to rain.
- b. #It tried to rain
- (6) a. The gun seemed to be fired.
- b. #The gun tried to be fired.

(The # symbol indicates semantic unacceptability.) (5a) and (6a) constitute evidence that the predicate *seem* does not make any semantic requirements of its structural subject, by virtue of the fact that *seem* allows the expletive subject of its complement (in (5a)) or the passivized underlying object of its complement (in (6a)) to occur as its subject. Contrasts like (6) will be especially useful, as Moro has a productive rule of passivization, and the ‘fire a gun’ collocation is idiomatic in Moro as in English: *bágú ís:íð* ‘fire a gun’, literally ‘hit gun.’

Once control and raising are distinguished, we can break both of them down into two more subcategories distinguished by which syntactic argument of the higher predicate, either the subject or object, is coindexed with the embedded subject. This then produces a four-way distinction in control and raising clauses:

- (7) a. Subject control: A subject that is a semantic argument of the higher predicate (typically an agent) is coindexed with the null subject in the lower predicate.
- b. Object control: An object that is a semantic argument of the higher predicate (typically a patient) is coindexed with the null subject of the lower predicate.
- c. Raising-to-subject: A subject that is not a semantic argument of the higher predicate is coindexed with the null subject in the lower predicate.
- d. Raising-to-object: An object that is not a semantic argument of the higher predicate is coindexed with the null subject in the lower predicate.

In the traditional, Government-and-Binding analysis of control versus raising predicates, the subject or object of the control predicates in the main clause binds a silent pronoun in the lower clause (“PRO”), while the the subject or object of the main clause of raising predicates has moved to that position from the lower clause, which contains a trace or copy of the moved element (e.g. Landau 2003, 2013). Generative analyses which distinguish between control and raising go back at least to the seminal works of Rosenbaum (1967) and Postal (1974), though the analysis of control in particular was quite different then. A major alternative analysis of control in recent years, stemming from Hornstein (1999), has been to analyze it as an involving movement to an argument position, thereby unifying the two phenomenon syntactically. One tempting motivation for this unification is the fact that control and raising constructions look so similar in English, involving an infinitival complement with a null subject. However, we will see that control and raising predicates always occur with distinct types of complement clauses in Moro, a point which generally supports the more traditional analysis of control and raising as syntactically distinct, with the type of complement clause neatly mapping to instances of control and raising in at least two instances.

3 Finite complementation

Control and raising predicates in Moro can be split into two basic types: those that select a finite complement and those that select an infinitival complement. This section provides a brief overview of finite verbal morphology and clause structure in Moro. Like all Moro clauses, finite clauses exhibit SVO word order:

- (8) *yerá η-a-satʃ-ú jamala*
 clj.child clj rtc-see-pfv clj.camel
 ‘The child saw the camels.’

This example demonstrates that Moro verbs are morphologically complex, agreeing with their subject while marking aspect, clause type, and other categories. The full complexity of the Moro verb is discussed in Rose (2013); the template below schematizes the distribution of different morphemes within the Moro verb:

- (9) **Simplified finite verb template:**

$$\underbrace{\text{comp} - \text{s.agr} - \text{s.class}}_{CP/TP} - \underbrace{\text{clause-}}_{\text{clause}} \underbrace{\text{obj} - \text{iter} - \sqrt{\text{root}}}_{vP} - \underbrace{\text{extension} - \text{pfv/tpfv} - \text{obj}}_{vP}$$

The extension prefixes include valence affecting morphology, including anti-passive, applicative, passive, locative applicative and causative suffixes. The brackets above demonstrate that the syntactic and semantic properties of these clauses can be roughly identified with the CP/TP domain, to the left of object marker prefixes, typically taken to include subject agreement, tense, and complementizers, and the *vP* domain, often taken to include object agreement aspectual morphology, and voice and valence affecting morphology. For more on the distribution of the object markers, and morphophonological evidence for the existence of two distinct domains (Jenks and Rose 2011, 2015).

One invariant characteristic of finite clauses is their agreement pattern. When the subject of a finite clause is a nominal argument, the verb agrees for number and one of Moro’s thirteen noun

classes (Gibbard et al. 2009; Jenks 2013). If the subject is a pronoun, which is typically silent unless emphatic, the verb agrees for person and number (10):

- (10) **Finite subject agreement:** Person/number - noun class - clause vowel (Perfective, ‘watch’)

	Singular	Plural
1	<i>é-g-a-wəndat̪-ó</i>	<i>ná-g-a-wəndat̪-ó</i>
1+2	<i>álá-g-a-wəndat̪-ó</i>	<i>álá-g-a-wəndat̪-ó-r</i> (1st incl. dual; 1st incl. plural)
2	<i>á-g-a-wəndat̪-ó</i>	<i>ná-g-a-wəndat̪-ó</i>
3	<i>g-a-wəndat̪-ó</i>	<i>l-a-wəndat̪-ó</i>

The examples above show that finite verbs with pronominal subjects also include a kind of ‘dummy’ noun class agreement marker *g-*, the singular subject agreement morpheme for the noun class which typically includes human nouns.⁴ We will see in the following section that subject agreement is distinct in infinitival clauses, as they have a distinct paradigm for person and number and never agree for noun class.

Another characteristic of finite verbs in Moro is a three-way alternation on the ‘clause’ vowel, which occurs immediately after subject noun class agreement. In relative clauses and ex-situ wh-questions, this morpheme seems to transparently mark argument extraction (Rose 2013; Rose et al. 2014), though the control and raising cases suggest that there may be more to the story than this simple characterization would suggest. The vowel in the first two prefixes is determined by vowel-height harmony with the verb root (?):

- (11) a. [a/ʌ-] Finite root clauses with no extraction (root clause rtc, (12a))
 b. [é/i-] Subject relative clauses (dependent clause 1 dpc1, (12b))
 c. [á-] Non-subject relative clauses (dependent clause 2 dpc2, (12c))

- (12) a. *Kúk:u g-[ʌ]-sʌtʃ-ú jamala*
 Kuku clg-rtc-see-pfv clj.camel
 ‘Kuku saw the camels.’
 b. *jamalá [-s:-↓i]-sʌtʃ-ú Kúk:u]*
 clj.camel sclj-dpc1-see-pfv Kuku
 ‘the camels that saw Kuku’
 c. *jamalá [-s:ə (ná-↓)Kúk:u (ná-↓)g-[á]-sʌtʃ-ú]*
 clj.camel -scl comp2-Kuku comp2-clg-dpc2-see-pfv
 ‘the camels that Kuku saw’

Another interesting difference between the different kinds of extraction clauses is in their complementizer. Non-subject relative clauses occur with a complementizer, the clitic *ná=*, while subject relative clauses never have a complementizer, an apparent ‘COMP-trace’ effect (see Kandybowicz 2009, for a similar effect in a Nigerian language, Nupe, and citations.). There are also slight differences in the agreement paradigms in the different forms, see Rose (2013) for details.

This distinction in the main vowel also occurs in clausal complements to putative control and raising predicates, and these seem to be determined by the class of the embedding predicate:

- (13) a. [-a/ʌ-] Normal finite complementation

⁴In the related language Tira, the marker is l- in the plural forms, the normal plural noun class agreement for humans (Stevenson 2009).

- b. [-é/i-] Complements of verbs of perception, some modal and aspectual verbs → raising
- c. [-á-] Complements of communication verbs → “no control”

The notion of No Control (Landau 2013, p. 87-97) describes cases where the subject of the lower clause is a pronoun bound by the matrix subject, but not due to any semantic requirement of the higher predicate, resulting in a construction which appears to be a case of control. Details of this construction will be further clarified below, along with the details of the distribution of the three classes of finite complements.

3.1 Standard finite complements

Standard finite complement clauses in Moro feature exactly the verbal morphology that is characteristic of root clauses, essentially the verbal template in (9), including finite subject agreement and the presence of the root-clause vowel *-a/a-*. These clauses are also introduced by the complementizer *tá*, allowing distinct subjects, and allow distinct tense and aspect in the two clauses, as the examples below demonstrate:

- (14) a. *i-g-a-tf-á nano [tá Kúk:u g-[a]-koreð-ó yál:o-(y)]*
 1sg-clg-rtc-bad-adj prt comp1 Kuku clg-rtc-scratch-pfv Ngalo
 ‘I’m sad that Kuku scratched Ngalo.’
- b. *é-g-a-láyétf-a [tá Kúk:u ká-g-[a]-tund-ú]*
 1sg-clg-rtc-know-ipfv comp1 Kuku pst-cl-rtc-cough-pfv
 ‘I know that Kuku had coughed.’
- c. *i-g-a-laf-ətf-ú or-ápn-ó [tá é-g-[a]-yó-naf-a uṭərə]*
 1sg-cl-promise-appl-pfv brother-1pos-acc comp1 1sg-clg-rtc-3sgo-give-ipfv clg.pig
 ‘I promised my brother that I’d give him a pig.’

The following classes of predicates occur with standard finite complement clauses in Moro:

- (15) a. **Assertive:** *-at-* ‘say/think’, *-nd-* *yéné* ‘believe,’ *-láf-* ‘promise’, *-doát-* *ygámá* ‘whisper,’ *-lúgátf-* ‘tell (say + appl)’
- b. **Perceptive:** *-n-:* ‘hear’, *-sátf-* ‘see,’ *-wándaft-* ‘watch’
- c. **Factive:** *-láyétf-* ‘know’, *-lál:əyədžətfən-* ‘remember,’ *-adžívátfən-* ‘forget,’
- d. **Evaluative adjectives:** *-tf-* *nano* ‘sad’, *-tf-* ‘bad,’ *-yər-* ‘good’

While the verbs and this class are both factive and non-factive, it is worth pointing out that early semantic judgments have indicated that the adjectives in (15d) are all factive, as in English. Thus, all finite factive complements in Moro show up in standard finite complement clauses.

3.2 Finite raising complements

A number of complement clauses occur with the *subject relative clause* vowel:

- (16) a. *Kúk:u g-a-rámátf-iə [(*tá) g-[é]-tfðð-á ugi]*
 K. clg-rtc-continue-ipfv compl clg-dpc1-chop-ipfv clg.tree
 ‘Kuku kept chopping the tree’

- b. *oráŋ g-a-n:-ó Kúk:u-ŋ* [(**tá*) *g-[é]-land-ó* *awúr*]
 man clg-rtc-hear-pfv Kuku-acc comp1 clg-dpc1-close-prfv clj.door
 ‘The man heard Kuku close the door’

A complementizer is prohibited in the embedded clause in these examples, as in subject relative clauses. Neither of the embedded clauses above has an overt subject, and in fact overt subjects are prohibited in these examples.⁵ Additionally, the argument which is interpreted as the agent of the embedded verb occurs as the subject of the matrix clause in (16a) and as the object of the matrix clause (16b), as indicated by its accusative case marking.

Despite not allowing an overt subject, these clauses are finite. The most basic evidence comes from the verbal morphology of the embedded verbs, which is identical to that in main clauses, with the exception of the clause type vowel. In addition, the two clauses can receive independent aspect marking:

- (17) *é-g-a-n:-ó Kúk:u-ŋ g-i-↓kið-íə* *awur*
 1sg-clg-rtc-hear-pfv Kuku-acc cl-dpc1-open-ipfv clj.door
 ‘I heard Kuku opening the door.’

As we will see in the following sections, the perfective/imperfective distinction only occurs in finite clauses in Moro.

While the embedded clause is finite, these clauses still constitute cases of raising-to-subject (16a), and raising-to-object (16b). This can be shown in that the promoted argument does not receive a semantic (theta) role from the higher verb. For example, both positions allow inanimate nouns such as ‘water’ to occur there:

- (18) a. *ηáw η-a-rámáṭ-iə* *η-é-↓dán-éə*
 clj.water clj-rtc-continue-ipfv clj-dpc1-rain-ipfv
 ‘It keeps on raining.’
- b. *é-g-a-n:-á ηáw η-é-↓dán-éə*
 1sg-clg-rtc-hear-ipfv clj.water clj-dpc1-rain-ipfv
 ‘I hear it raining.’

Additionally, a passivized argument of the lower clause can undergo raising. This is significant as the raised argument in these cases has already received its theta role from the lower verb. Moreover, the lower verb in this case is an idiom meaning ‘shoot the gun’ (lit: ‘hit the gun’); the idiomatic meaning is preserved under raising:

- (19) a. *is:iə j-á-rámáṭ-iə* *j-i-p-áñ-iə*
 clj.gun clg-rtc-continue-ipfv clj-dpc1-beat-pas-ipfv
 ‘The gun kept being fired.’
- b. *é-g-a-n:-ó is:iə j-i-bug-ən-ú*
 1sg-clg-rtc-hear-pfv clj.gun clj-dpc1-hit-pas-pfv
 ‘I heard the gun be shot.’

Other arguments could be adduced but we take these examples to be conclusive.

⁵The unavailability of an overt lower subject militates against another possible analysis of these facts, as instances of *prolepsis*, or ellipsis of a lower bound argument (Davies 2005). Thanks to an anonymous reviewer for this point.

The following classes of predicates select finite raising/dpc1 complements:

- (20) a. **Perception (R-t-O):** -n:- ‘hear’, -sátf- ‘see,’ -wándat- ‘watch’
 b. **Desiderative (R-to-O):** -bwán- ‘want’
 c. **Modal (R-to-S):** -án:- ‘seem’
 d. **Aspectual (R-to-S):** -rámáł- ‘continue’

Regular perception verbs allow both finite complements and finite raising complements. This fact itself supports the raising analysis of these clauses, because it demonstrates that the raising predicates themselves do not semantically require a nominal object. However, these verbs can also occur with a nominal object instead of a clausal one, in which case that individual itself is the theme argument.

Bošković (1997) and Landau (2013) hypothesize that raising complements are universally TPs rather than CP, on the basis of other languages. The unavailability of complementizers in these kinds of complements in Moro is expected on the basis of these hypotheses, as a complementizer would not be expected to occur in a clause without a CP projection. This conclusion suggests in turn that subject relative clauses are TPs, given that they are morphologically identical to raising complements and also prohibit complementizers. More work is needed to determine whether this hypothesis is correct.

The idea that raising can occur out of putatively finite complements is not typologically unprecedented, as similar phenomena have been attested in Bantu and Romance languages. In Bantu, the relevant cases have been identified as ‘hyper-raising’ by Carstens and Diercks (2013),⁶ who similarly suggest that these finite clauses are structurally deficient, although they argue that this is by virtue of possessing a special C head which does not form a barrier to movement (technically, a weak rather than strong phase head). Additionally, the Moro construction above is transparently similar to a phenomenon in Romance dubbed pseudo-relatives, whereby putative subject relative clauses occur in raising environments (e.g. Cinque 1995). This recurrent cross-linguistic correlation between subject relative clause morphology and raising from finite clauses poses an apparent problem for the putative distinction between cases of A-movement (movement into an argument position, such as raising) and A-bar movement (movement into a non-argument position, such as relativization), although exploring a resolution to this tension would take us beyond the descriptive goals of this paper.

3.3 Finite “no control” complements

Other finite complement clauses in Moro occur with the *non-subject relative clause* vowel -á-, as in the following examples:

- (21) a. é-g-a-mwandəð-ó Kúk.u-ŋ [tá k-[á]-noán-á ðamala]
 1sg-clg-rtc-ask-pfv Kuku-acc comp1 clg-dpc2-watch-ipfv clð.camel
 ‘I asked Kuku to watch the camel.’
 b. é-g-a-neð-ó [tá Kúk.u g-[á]-noán-á ðamala]
 1sg-clg-rtc-refuse-pfv comp1 Kuku clg-dpc2-watch-ipfv clð.camel
 ‘I refused/don’t like that Kuku watch the camel.’

⁶See Ura (1996) for earlier theoretical discussion and additional examples of hyper-raising.

While the example in (21a) looks like object control, example (21b) cannot be an instance of object control because the lower verb has an overt subject. This pattern has primarily been found with verbs of communication, including the examples above as well as *-lúgáč-* ‘tell.’ Like non-subject relative clauses, these examples allow the normal ‘finite’ complementizer *tá*.

Given these issues, there are two possibilities. The first is that both examples above are instances of object control, and that (21b) is a case of Backward Control (Polinsky and Potsdam 2002), where it is the higher clause which surfaces with a null argument. The second hypothesis is that these are not instances of control at all.

There is good reason to favor the second hypothesis: Landau (2013) observes that there are no attested cases where finite complement clauses with agreement serve as the complements of obligatory control predicates:

- (22) *The finiteness rule for Obligatory Control* (Landau 2013)

In a fully specified complement clause (i.e., the I^0 head carries slots for both [T] and [Agr]):

- a. If T_0 carries both semantic tense and agreement ([+T,+Agr]), No Control obtains.
- b. Elsewhere, Obligatory Control obtains.

For Landau, No Control predicates refers to those that may allow a normal pronominal subject in the embedded clause, which is realized in languages like Moro with rich agreement on the verb. However, that subject need not be coindexed with a matrix argument; and when it is, it constitutes a normal cases of semantic binding of a pronominal anaphor (i.e. analogous to English *John; told Mary that he_i was sick.*). If these are instances of No Control, non-coreferential subjects should be freely available in the lower clause, and the null subject of the embedded clause in (21a) should be able to refer to someone besides the subject. The following example shows that the first of these predictions is correct:

- (23) *i-g-a-lug-áč-ú Kúk:u-ŋ [tá ŋál:o g-á-↓nóan-á ðamala]*
 1sg-clg-rtc-say-appl-pfv Kuku-acc comp1 Ngalo clg-dpc2-watch-ipfv clð.camel
 ‘I told Kuku for Ngalo to watch the camel.’

In this example, the embedded subject co-occurs with the non-subject relative clause vowel, and this subject is not coindexed with a matrix argument.⁷ Thus, this is not an instance of control. In a way this conclusion is a relief: obligatory control and non-subject relative clauses do not seem to form a natural morphosyntactic class, and it would be difficult to reconcile their shared morphology from a theoretical perspective.

If these are not instances of obligatory control, what feature is the “non-subject relative clause” vowel *á*- an exponent of? We would like to suggest that this morpheme may be an exponent of subjunctive or irrealis mood. If correct, this hypothesis would provide a natural explanation for why this vowel occurs in the examples above: these are unrealized actions, requested or imagined by the speaker, and hence a natural environment for the subjunctive. The more difficult question is why the subjunctive would occur in non-subject relative clauses. We would like to suggest that this vowel is also simply a reflex of clauses marking A-bar dependencies, and that irrealis clauses

⁷The second prediction has not been systematically tested. A context could be established where there is a topic DP which is an individual distinct from the subject. The null subject in the second clause would then be expected to be preferentially co-indexed with this topic.

and questions form a natural class syntactically.

The table below summarizes the different kinds of finite clauses in Moro. The analyses suggested above have been outlined, and the different classes of predicates which occur in each class is listed as well.

(24) **Summary: Finite complements**

Clause vowel	Predicate Class	Complementizer	Analysis
a-/ʌ-	Assertive	tá	Normal finite complement
	Perceptive	tá	Normal finite complement
	Factive	tá	Normal finite complement
é-/í-	Perceptive	-	Raising-to-object
	Desiderative	-	Raising-to-object
	<i>seem</i>	-	Raising-to-subject
ó-	Aspectual	-	Raising-to-subject
	Communicative	tá	No control

As these examples show, the occurrence of different classes of finite clausal complements with control or raising predicates is systematic. For one, we can clearly see now that control predicates never occur with finite complements in Moro, as predicted by Landau's finiteness rule for obligatory control. Similarly, we have found that the é-clause vowel always occurs in the complement of raising predicates, very similar to Romance pseudo-relatives. These descriptive generalizations have direct implications for how these different classes of complements behave, which would be obscure if it were not for the control and raising diagnostics employed above. Thus, these clauses serve as the first basic example for why the adequate documentation of clausal complements should make use of control and raising diagnostics.

4 Infinitival complementation

This section outlines the distribution of infinitival clauses in Moro,⁸ and their syntactic distribution vis-a-vis control and raising. Infinitive verb forms in Moro are morphologically complex, agreeing for *person* and *number* with a distinct set of agreement prefixes from finite verb forms, but lack noun class agreement or the clause vowel:

- (25) **Infinitival verb template:**
 sagr - om - iter - √root - extension - inf

- (26) **Infinitival subject agreement**, Proximal Infinitive 2, *wəndat* 'watch' (Rose 2013)

⁸The term infinitive might seem inappropriate to a category that expresses the inflectional distinctions that Moro infinitives do; we take the definitional properties of an infinitive to be (i) it does not occur as a matrix verb, but must be embedded, (ii) it is still morphologically verbal, rather than nominal, and (iii) it is systematically restricted in the inflectional categories it can express relative to another 'indicative' or finite verb form. See (Noonan 2007) for relevant discussion of these issues and a similar characterization of infinitives.

	Singular	Plural
1	<i>ne-wándat-a</i>	<i>na-wándat-a</i>
1+2	<i>ál(á)-↓wándat-a</i>	<i>ál(á)-↓wándat-a-r</i>
2	<i>a-wándat-a</i>	<i>na-wándat-a</i>
3	<i>áŋ(á)-↓wándat-a</i>	<i>alə-wándat-a</i>

Infinitival verb forms are simplified in terms of their TAM marking. They do not allow the ‘reduplicative’ past tense (see the embedded clause in (14b)).⁹, and they also lack the perfective/imperfective distinction found on finite verbs, but their final vowel (inf in (25)) marks which of two types of infinitive inflections the verb is in as well as deixis (Rose 2013):

(27) Basic morphological distinctions on Moro verb forms, <i>wándat</i> ‘watch’ (Rose 2013). ¹⁰		
Finite	Perfective	-wándat-ó
	Imperfective proximal	-wándat-a
	Imperfective distal	-á-wándat-ó
<i>e</i> -infinitive	Proximal	-wándat-e
	Distal	-wándat-a
<i>a</i> -infinitive	Proximal	-wándat-a
	Distal	-wándat-ó

The two morphologically distinct classes of infinitives in Moro occur in different environments:

(28) Distribution of infinitival clauses in Moro

- a. ***e*-infinitive (Infinitive 1):** i) Structurally reduced complements of raising-to-subject tense, aspect and modal auxiliaries; ii) *logophoric control*
- b. ***a*-infinitive (Infinitive 2):** i) Complements of some obligatory *predicative control* verbs; ii) complements of the negative auxiliary

These labels will be explained below.

4.1 *e*-infinitives (Infinitive 1)

Moro *e*-infinitives occur after three semantically distinct classes of verbs. The first class of verbs which occur with *e*-infinitives is TAM auxiliaries. The *e*-infinitives following TAM auxiliaries do not allow a complementizer:

- (29) a. *Kúk:u g-ið-á* (**ta*) *áŋá-↓džóm-é*
 Kuku clg-(rtc)-do/will-ipfv comp1 3sg.inf-move-infl
 ‘He will move.’

⁹For two of our three speakers, this past tense verb is actually an auxiliary construction with identical finite verb agreement on the auxiliary and lower verb. For Mr. Elyasir Julima of San Diego, this auxiliary has been “eroded” to reduplication of the class marker + clause vowel, a form that has also occurred in some texts recorded by Moro speakers in Khartoum in normal-rate speech.

¹⁰The names of the classes are slightly different in (Rose 2013), where the *e*-infinitive is “Subordinate 1” and the *a*-infinitive is “Subordinate 2”. Since the finite verb forms above are just as subordinate as those described in this section, we have opted for the term infinitive for reasons described in the previous footnote.

- b. *Kuk:u g-a-vál-á (*tá) áŋjá-[↓]dzóm-é*
 Kuku clg-rtc-go-ipfv comp1 3sg.inf-move-infl
 ‘Kuku is going to move.’

Other members of the TAM auxiliary class include *-tóð-* ‘start to’ (lit.: ‘move’) as well as the modals *-dwadaþó* ‘can,’ and *-mantá* ‘should.’

TAM auxiliaries selecting *e*-infinitives are best analyzed as obligatory raising-to-subject predicates, similar to the *restructuring* predicates studied in (Wurmbrand 2003).¹¹ Supporting evidence for this claim comes from the fact that these auxiliaries do not place any semantic restrictions on their subjects, or on the semantics of their complement, as in the stative adjectival predicate in (30).

- (30) *jamala j-a-vál-á al-oan-ðt-é*
 clj.camel clj-rtc-go-ipfv 3pl.inf-many-appl-infl
 ‘The camels are going to be more.’

Further evidence that TAM auxiliaries are obligatory raising-to-subject predicates come from passives: example (31) employs the ‘hit the gun’ idiom test, whose meaning is preserved under passivization and raising:

- (31) *íslá j-a-válá áŋjá-búg-áñ-i*
 clj.gun clj-rtc-go-ipfv 3sg.inf-[↓]hit-pas-infl
 ‘The gun is going to be shot.’

Interestingly, the intransitive variant of the verb *-bwán-* ‘want’ also occurs in this pattern. Example (32) shows that the matrix subject in this construction does not need to be semantically volitional, as the complement is a comparative adjective (cf. (30)). As the translation indicates, being plentiful is not a state that the matrix subject would be expected to have ‘control’ over in these examples. Thus, these raising-to-subject instances of *-bwán-* are likely quasi-modals comparable to English ‘need’:

- (32) *jamala já-j-a-bwán-á al-oan-ðt-é*
 clj.camel pst-clj-rtc-want-ipfv 3pl.inf-many-appl-infl
 ‘The camels were supposed to / needed to be more.’

The negative auxiliary, which will be discussed in the following section, has an interesting distribution relative to TAM auxiliaries, apparently preferring to come after modal auxiliaries while preceding putative tense and aspectual auxiliaries:

- (33) a. *é-g-a-n:á jn-ið-í ne-nđr-é*
 1sg-clg-rtc-neg.ipfv 1sg-will-inf1 1sg-sleep-inf1
 ‘I won’t be sleeping.’¹²

¹¹ Wurmbrand’s main evidence for restructuring come from phenomena such as clitic climbing, scrambling, and long passives in Germanic and Romance. We have not been able to replicate any of these tests in the relevant Moro sentences. The absence of clitic climbing might be related to the observation that object marker incorporation or cliticization in Moro seems more phonological than syntactic (Jenks and Rose 2015).

¹²This example is surprising in that the auxiliary following negation is marked with infinitive 1 rather than infinitive 2. More work is still needed in understanding the distribution of the two infinitives in sequences of auxiliaries.

- b. *Kuk:u g-a-bantá áŋ-an:á áŋjá-[↓]vál-á áŋjá-[↓]ndr-é*
 Kuku clg-rtc-should 3sg-neg.pfv 3sg-go-inf2 3sg-sleep-infl
 ‘Kuku should not be about to fall asleep.’

This finding indicates that clauses with an auxiliary and an *e*-infinitive can be analyzed as monoclusal (again, cf. Wurmbrand 2003). These ordering preferences between auxiliaries are reminiscent of the templatic syntactic orderings proposed by Cinque (1999).

A second environment for *e*-infinitives is after the transitive variants of *-bwáŋ-* ‘want’ and the periphrastic causative verb *-ŋgit-* ‘let.’ These two predicates are syntactically different from the TAM auxiliaries in that they take an object noun phrase in addition to the infinitival complement:

- (34) a. *k-á-ndλ-ŋgit-iə na-tʃðð-é ugi*
 clg-rtc-2plo-let-ipfv 2pl.inf-chop-inf1 clg.tree
 ‘He is letting you all chop the tree.’
- b. *é-g-a-bwáŋ-á ŋáw (*tá) áŋjá-[↓]qáñ-é*
 1sg-cl-rtc-want-ipfv clj.water (comp1) 3sg.inf-rain-inf1
 ‘I want it to rain.’

In (34a), the second person plural object marker is incorporated into the higher verb, demonstrating that it is a syntactic object of that verb. However, the higher object is not necessarily a semantic object of the higher verb, and in fact the most plausible analyses of these predicates is as raising-to-object predicates. For one, (34b) shows that the object does not need to be a potential agent. This same example also shows that the complementizer is prohibited in these examples, with an athematic object.

However, with the same predicates, a complementizer is sometimes judged acceptable. The third environment where we find *e*-infinitives, then, is with exactly the same class of predicates but with an animate, potentially agentive object. In these environments, the complementizer is allowed by Moro speakers, but is optional:

- (35) a. *é-g-a-bwáŋ-á Kuk:u-ŋ (tá) áŋjá-[↓]váð-é ŋál:o-ŋ*
 1sg-clg-rtc-want-ipfv Kuku-acc comp1 3sg.inf-shave-inf1 Ngalo-acc
 ‘I want Kuku to shave Ngalo.’
- b. *Kuk:u g-á-ŋgit-iə ŋál:o-ŋ (tá) áŋjá-[↓]noán-é ðamala úlalítu*
 Kuku clg-rtc-let-ipfv Ngalo-acc comp1 3sg.inf-watch-inf1 cl.ð.camel tomorrow
 ‘Kuku is forcing Ngalo to watch the camels tomorrow.’

The complementizer plus *e*-infinitives pattern also occurs with transitive *-mwándøð-* ‘ask’, *-ámadañ-* ‘help’, and *-lúgáñ-* ‘tell’.¹³

¹³The complementizer *ná-* is sometimes used with these examples instead:

- (i) *é-g-amadañ-ó ŋál:o-ŋ n-áŋjá-[↓]noán-é ðamala*
 1sg-clg-(rtc)-help-ipfv Ngalo-acc comp2- 3sg.inf-watch-inf1 cl.ð.camel
 ‘I helped Ngalo to watch the camel.’ (hasn’t happened yet)

More investigation is needed if any syntactic or semantic differences obtain in these cases.

- (36) a. é-g-a-mwandəð-ó kúk:u-ŋ ták áŋjá-↓búg-i ís:iá
 1sg-clg-rtc-ask-pfv Kuku-acc comp1 3sg.inf-give-infl clj.gun
 ‘I asked Kuku to shoot the gun.’
- b. é-g-amadat-ó ŋál:o-ŋ ták áŋjá-↓pág-é ŋóréðá
 1sg-clg-(rtc)-help-ipfv Ngalo-acc comp1 3sg.inf-pick-infl clj.sesame
 ‘I helped Ngalo to pick the sesame.’ (hasn’t happened yet)

We have seen that this same class of predicates occurs with subjunctive No Control complements as well as normal finite complements.

We would like to suggest that the complementizer plus *e*-infinitive pattern comprise cases of obligatory object control, a fact which is supported by the availability of complementizers. Even stronger support for this conclusion comes from the idiom-chunk test, in which an inanimate, non-agentive object is semantically anomalous (indicated by) in the object position of the main clause, as it attributes animacy to the gun:

- (37) #é-g-a-mwandəð-ó ís:iá ták áŋjá-↓búg-án-i
 1sg-clg-rtc-ask-pfv clj.gun comp1 3sg.inf-hit-pas-infl
 ‘I asked the gun to be fired.’

This finding is unsurprising under an object-control analysis, as the object of the higher verb is its semantic argument as well, and thus, in this example, is required to have the agentive properties typical of control arguments.

This, then, is the first true instance of control in Moro that we have seen. Furthermore, its restriction to a particular subclass of verbs — those expressing various kinds of attitude reports — suggests that these cases of control should be analyzed as *logophoric control*, a term introduced by Landau (2014) to describe control constructions which involve a context of evaluation which is shifted to the belief worlds or mental states of the speaker or another interlocutor. While precise connection between the Moro ‘Infinitive 1’ morphology and the semantics of logophoric control remains unclear, the fact that these control clauses typically require the ‘finite’ complementizer *ták*, likely etymologically related to the verb *-aq-*, meaning ‘say,’ may correlate with the introduction of semantic operators which represent the perspective of the logophoric center. Additionally, these instances of control do seem to allow *split control* in examples like (36b), wherein the subject of the embedded predicate is controlled by both the subject and the object of the main clause. As observed by Landau (2014), cases of split control are typically restricted to logophoric control environments.

To summarize, the distribution of *e*-infinitives is complex, including instances of both raising-to-subject and raising-to-object as well as object control. The main surface difference between the cases of control versus raising is the availability of the complementizer, which corresponds to differences in structural size of the embedded clause. The control examples conform to Landau’s “finiteness rule for OC” (22) as these examples have agreement but are non-finite. However, no instances of subject control were found with *e*-infinitives. We will see instances of subject control below.

4.2 *a*-infinitives (Infinitive 2)

The second inflectional category for infinitives, the *a*-infinitive, occurs in two environments: after certain subject control verbs (implicatives and desideratives) and after negation.¹⁴ We will begin with the subject control predicates, which are shown below:

- (38) a. *Kúk:u g-a-néðfin-ú* (n)-áŋð-[↓]*lérváf-[a]* *ŋál:o(-ŋ)*
 Kuku clg-(rtc)-try-pfv comp2-3sg.inf-hide-inf2 Ngalo-acc
 ‘Kuku tried to hide Ngalo.’
- b. *Kúk:u g-a-neð-ó* (n)-áŋð-s-[↓][a]
 Kuku clg rtc-refuse-pfv comp2-3sg.inf-eat-inf2
 ‘Kuku refused to eat.’
- c. *Kúk:u g-a-bwáñ-á* (n)-áŋð-[↓]*p^w-[á]* *íš:íð*
 Kuku clg rtc-want-ipfv comp2-3sg.inf-beat-inf2 clj.gun
 ‘Kuku wants to fire the gun.’

Semantically and syntactically, the behavior of these predicates is as expected for control predicates. These verbs impose thematic restrictions on their complement, requiring agentive subjects and complements (39a). Similarly, idiomatic meanings are not preserved with these predicates (39b) ((39) and (40)):¹⁵

- (39) #*tárbesá ð-a-neð-ó* n-áŋð-[↓]*bár-n-ið*
 clð.table clð rtc-refuse-inf2 comp2-3sg.inf-touch-pas-inf2
 ‘The table refused to be touched.’
- (40) #*íš:íð j-a-[↓]bwáñ-á* n-áŋð-[↓]*pw-án-ið*
 clj.gun clj rtc-want-ipfv comp2-3sg.inf-beat-pas-inf2
 ‘The gun wants to be beaten.’ (*‘The gun wants to be shot.’)

Another piece of evidence supporting the control analysis of these cases is the availability of a complementizer, in this case the complementizer *ná-*, which also occurs in non-subject relative clauses (see ex. (12c)). The occurrence of a relative clause complementizer after control predicates is compatible with analyses of control which posit predicational semantics for control complements (Williams 1980; Chierchia 1984), particularly via PRO-movement (Clark 1990). Under such theories, these complements could be analyzed as CP-sized predicates, like relative clauses, which serve as the internal argument of the control verb.

The second environment where *a*-infinitives occur is after the negative auxiliary verb *án*. In these cases, no complementizer occurs:

- (41) *l-an:á alə-wað-a*
 cll-not.pfv 3pl.inf-poke-inf2
 ‘They did not poke.’

¹⁴We will see below that (38c) is problematic for the generalizations about control types. This example is actually ambiguous between a proximal *a*-infinitive and a distal *e*-infinitive. However, as we lack any clear evidence that (ic) must receive a distal interpretation, and its complementizer matches the other *a*-infinitives, we have left this example in this section.

¹⁵Other evidence suggests that *-néð-* ‘refuse’ may have a raising variant as well, perhaps one which is semantically distinct in ways which need more study.

Given that negation is a propositional operator, we expect it to be a raising verb, like the other TAM auxiliaries.

As expected, there is strong evidence that negation is an obligatory raising-to-subject predicate. For one, complementizers are unavailable under negation, as we have already mentioned:

- (42) *Kúk:u g-a-n:á (**gá*/**ná*-) áŋjá-[↓]tóð-á*
 Kuku clg-rtc-not.pfv comp1/2 3sg.inf-move-inf2
 ‘Kuku’s not moving.’

Recall that all of the instances of raising we have seen so far similarly prohibit complementizers.

Additionally, athematic subjects are fine with negation (43), and the negative auxiliary can embed other raising verbs, such as TAM auxiliaries (44):

- (43) *ŋáw ŋ-a-n:á áŋjá-[↓]dán-é*
 clŋ.water clŋ-not.pfv 3sg.inf-rain-infl
 ‘It’s not raining.’¹⁶
- (44) a. *Kúk:u k-án:(a) áŋjá-[↓]vál-á áŋjá-ndr-[↓]é*
 Kuku clg-not.ipfv 3sg.inf-go-inf2 3sg.inf-sleep-infl
 ‘Kuku isn’t going to fall asleep.’
- b. *é-g-a-n:á i-gíð-i ne-báð-é ŋáni*
 1sg-clg-rtc-not.pfv 1sg.inf-will-inf1 1sg.inf-pet-inf1 clŋ.dog
 ‘I will not pet the dog.’

In summary, then, *a*-infinitives occur after two major classes of predicates. While many of these cases are instances of obligatory subject control, negation also takes an *a*-infinitive complement.

The summary of the distribution of infinitival complements is below:

(45) **Summary: Infinitival complements**

Infinitive class	Predicate Class	Comp.	Analysis
<i>e</i> -infinitive	TAM	-	Raising-to-subject
	‘want’, ‘let’	-	Raising-to-object
	‘want’, ‘let,’	<i>gá</i>	Object control
	Communication	<i>gá</i>	Object control
<i>a</i> -infinitive	Desiderative	<i>ná</i>	Subject control
	Implicative	<i>ná</i>	Subject control (predicative)
	Negation	-	Raising-to-subject

Some generalizations have emerged. First, infinitive cases of raising-to-object only occur with *e*-infinitive complements. Second, object versus subject control predicates consistently take either *e*-infinitive versus *a*-infinitive complements, respectively. Furthermore, there is a consistent correlation between the type of infinitive and the complementizer type: the ‘finite’ *gá* complementizer (comp1) occurs with object control predicates while the ‘relative’ *ná* complementizer (comp2) occurs with subject control predicates. Once again, these generalizations would be impossible to formulate without the control and raising diagnostics used above.

¹⁶It is not clear why this example has the *e*-infinitive.

Another source of insight about infinitival complements comes from ordering restrictions between them, another type of data which is difficult to gather in the absence of elicitation. These ordering restrictions suggest that the differences between *e*-infinitives versus *a*-infinitives with respect to raising predicates can be reduced to differences in their structural size (cf. Wurmbrand 2003). The clearest evidence for this claim comes from negation. Notably, all of the different predicates discussed above can embed the negative auxiliary except some TAM predicates, which must follow negation ((46), cf. (44)):

- (46) *Kúk:u g-a-vál-á áŋ-[↓]án:-e áŋjá-nđr-[↓]á
 Kuku clg-go-ipfv 3sg.inf-not-infl 3sg.inf-sleep-inf2
 (Intended: ‘Kuku is going to not fall asleep.’)

This indicates that the TAM predicates that must follow negation are lower on the clausal spine than negation.

If we take the negative auxiliary to be relatively high on the clausal spine, at TP or above, we might conjecture that its complement is always realized as a *a*-infinitive, and hence, that an *a*-infinitive is smaller than TP. In contrast, the complement of the aspectual auxiliaries, which can be analyzed as verbal heads (V/v)¹⁷ are always in the form of *e*-infinitives. These verbal heads would also be able to select each other recursively, subject to further ordering constraints, resulting in multiple *e*-infinitives. Under this view, the unavailability of negation as complement of some TAM auxiliaries follows from the general requirement that TP always occur above VP within a single clause (cf. Cinque 1999).¹⁸

Supporting evidence for this proposal comes from the distribution of finite agreement, which occurs on negation after *a*-infinitive-selecting control predicates (47):

- (47) a. Kúk:u g-ʌ-v-ándətʃən-iə g-áŋ:a áŋjá-nđr-[↓]á
 Kuku clg-rtc-ipfv-try-ipfv clg-not.impf 3sg.inf-sleep-inf2
 ‘Kuku is trying to not fall asleep.’
 b. *Kúk:u g-ʌ-v-ándətʃiŋ-iə n-áŋ-[↓]án:a áŋjá-nđr-[↓]á
 Kuku clg-rtc-ipfv-try-ipfv comp2-3sg.inf-not.impf 3sg.inf-sleep-inf2

If finite agreement always occurs on T, and negation is always in T, accounting for its ability to take finite agreement, an explanation is available for why finite agreement and negation are always correlated. When *a*-infinitival complements occur as the complement of these control verbs, they would be occupying lower positions on the clausal spine, staying in their VP position, but still the direct complement of T. Thus, agreement on infinitives might be the realization of agreement on a V head, rather than T, explaining why multiple instances of agreement sometimes occur in putatively monoclausal structures, such as with negative or aspectual auxiliaries.

¹⁷In general, the final vowels of the relevant forms can be analyzed as *v* heads; see Jenks and Rose (2015) for phonological evidence that the *vP* is a phonological domain.

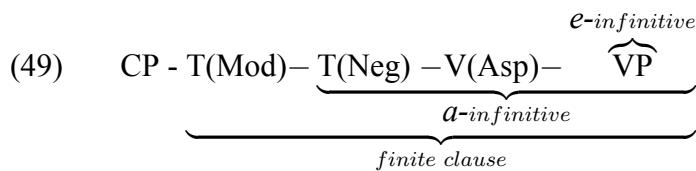
¹⁸We might further conjecture that in the absence of a higher auxiliary like negation, the lexical verb would occur in T (by head movement or some equivalent) and take finite morphology.

In this light consider the example below where modals occur above negation, as we saw above:

- (48) *Kúku g-a-mantá áŋjá-n:á áŋjá-[↓]vál-á áŋjá-n-dr-é*
 Kuku clg-rtc-should 3sg.inf-neg.pfv 3sg.inf-go-inf2 3sg.inf-sleep-infl
 'Kuku should not be about to fall asleep.'

We can now analyze this example as follows: both modals and negation are types of T heads. When in the same clause, only one element can realize the finite T head, the modal in (48), resulting in negation occupying a lower head below T, hence realizing an *a*-infinitive form. Likewise, the fact that the inchoative auxiliary *vál* also occurs with the *a*-infinitive corresponds to the fact that it is the complement of negation. However, the lexical verb which is the complement to the inchoative auxiliary emerges with the *e*-infinitive, because it is the complement to a higher V head, and thus is the structurally smallest of the three.

The diagram below summarizes the distribution of the two infinitives according to this theory:



Again, in the absence of a higher head, the lexical verb or any higher auxiliary will simply move to the highest position and take the regular finite morphology. Crucially, though, this does not affect the size of its complement, which must stay in the low position. Additionally, agreement is realized on each verbal within a single clause. To summarize, then, we can see that the ordering diagnostics make sense of the distribution of the raising predicates in (45) by virtue of attributing them different 'sized' complements, a result that has been clearly established for Germanic and Romance languages (Wurmbrand 2003).

5 Gerunds

A final class of complement clauses in Moro are nominalized or gerundive verb forms, which occur after a large class of subject control predicates:

- (50) a. *i-g-ʌ-ŋgitʃ-ú (é-)ðá-noán-áŋ ðamala*
 1sg-clg-rtc-finish-pfv (loc-)clð-watch-ger clð.camel
 'I finished watching the camel.'
 b. *i-g-ʌ-tʃ-á nano é-ðá-nóáná-ŋ jamala*
 1sg-clg-rtc-bad-adj part (loc-)clð-watch-ger clj.camel
 'I'm sad to watch the camels.'
 c. *k-amədat-ó ŋál:o-ŋ (é-)ðá-pág-áŋ gi*
 clg-(rtc)-help-pfv Ngalo-acc (loc-)clð-weed-ger clg.field
 'He helped Ngalo weed the field'

This class of complements are morphologically nominal. Deverbal morphology in Moro is realized as the *ð*-class prefix, a *-ŋ* suffix (which is optional for one of our speakers), and all-H tone (all-L tone for the speaker which lacks the *-ŋ* suffix). These gerundive forms can occur in subject position,

triggering normal δ -class agreement on the verb (not shown). Unlike all of the verb forms above, gerunds do not agree with any subject. Additionally, these forms optionally occur with a locative prefix, an intriguing analogue of the complementizer that was witnessed with clausal complements.

Many standard classes of control predicates, including all of the attested control adjectives, occur with the gerundive complements:

- (51) a. **Aspect:** *-ŋgitʃ-* ‘finish’, *-dúrw-* ‘stop’
 b. **Implicative:** *-ámadaq-* ‘help’, *-wátf-* ‘prevent,’ *-líləŋadžətʃən-* ‘remember’
 c. **Evaluative adjectives:** *-tf-* *nano* ‘sad’ (Adj.), *-tf-* ‘bad,’ *-ŋær-* ‘good’

This class of predicates and their gerundive complements seem to fall into the category of what Landau (2014) calls ‘predicative control,’ basically those predicates which always exhibit exhaustive and obligatory control by the controller and take a simple predicate as their complement, rather than a proposition, following the earlier proposal of Chierchia (1984). Thus, we can give a syntactic and semantic characterization of the class of control predicates as those which select a nominal (or prepositional) complement, but semantically must compose with a simple one-place predicate. See Landau (2014) and Grano (2012) for details.

6 Implications

Recall the different properties of control constructions that began the paper:

- Raising and control structures are generated by distinct syntactic mechanisms (e.g. Landau 2003, 2013); see the papers in Hornstein and Polinsky (2010) for an opposing view that they are both generated by the same mechanism (‘A-movement’).
- Control complements are typically CPs (‘complementizer phrases’, or full clauses). (e.g. Bošković 1997; Landau 2013), but involve distinct semantic subclasses of No Control, Predicative Control and Logophoric Control (Landau 2014)
- Raising complements vary in size; while they are arguably TPs (‘tense phrases’, lacking information structural projections) (e.g. Bošković 1997); they can sometimes be finite CPs (Ura 1996, ch. 3, Carstens and Diercks 2013), but in the latter cases typically do not allow overt complementizers (Chomsky 1981; Grosu and Horvath 1984); in other cases raising complements are structurally small, for example a simple VP (Wurmbrand 2003).

Let us summarize how Moro bears on each of these claims.

The Moro data in some cases supports the idea that control and raising are syntactically distinct. For example, raising predicates occur with finite subject relative clause morphology in Moro which is otherwise correlated with movement in relative clauses. On the other hand, the apparent relative clause morphology observed in the “no control” complements proved to be a red herring, as these did not feature displaced constituents at all. Together these facts suggest that raising is syntactically distinct from control. At the same time, however, we saw that both control and raising constructions overlapped, both occurring with each of the two types of infinitives in Moro. This could be taken as support for a unified, movement-based analysis to both raising and control. On the other hand, the fact that the distribution of complementizers so reliably tracks the raising vs. control distinction, with complementizers being systematically prohibited only in raising contexts,

casts doubt on whether these infinitival facts do in fact support a unified analysis; instead, it seems that the absence of complementizers can be identified with movement into the higher clause, i.e. exclusively with raising constructions.

Second, the distribution of complementizers also provided evidence for differences in the size of control and raising complements: the fact that overt complementizers always introduced the clausal complements of control predicates indicated that they were uniformly CPs. While complementizers never occur with raising structures, both finite and nonfinite raising complements were found, and the two classes of infinitive raising complements appear to correspond to different-sized structures:

(52) **Raising complements in Moro**

Clause type	Past tense	Aspect	Negation	Deixis
é- (DPC1) finite clause	Y	Y	Y	Y
e-infinitive	N	N	Y/N	Y
a-infinitive	N	N	Y	Y

Control was shown to be similarly diverse in Moro, in that distinct classes of No Control, with finite complements, and Predicative Control, with gerundive complements, were found. Additionally, control predicates could take two distinct classes of infinitival complements which also exhibited distinct complementizers. These facts are summarized below, along with a suggested analysis which we turn to now:

(53) **Control complements in Moro**

Clause type	Complementizer	Control type
ə- (DPC2) finite clause	ta	No Control
e-infinitive	ta	Logophoric control
a-infinitive	ná	Predicative control w/ PRO movement
Gerunds	-	Direct predicative control, no PRO

The different classes of logophoric control, predicative control with PRO movement, and direct predicative control are due again to Landau (2014). The difference between logophoric control on the one hand and predicative control on the other for Landau is that only the former allows partial (non-exhaustive) control; we saw some evidence for this conclusion above in section 4.1, and also that the class of predicates occurring with e-infinitive complements were exactly the propositional attitude predicates that Landau analyzes with logophoric control. For Landau, logophoric control always involves a full CP, again in accord with the Moro facts. In contrast, predicative control verbs with PRO movement are those which take a full CP complement with the interpretation of a predicate. Again, there is overt morphological evidence for this claim in Moro: not only do predicative control verbs, such as implicatives, take full CPs complements, but the complementizer which occurs in these examples is the same complementizer which occurs in relative clauses, which are also CP-predicates.¹⁹ Additionally, it is still unclear why e-infinitives never occur with subject control. Thus, further fine-grained semantic work on control predicates in Moro is still needed to

¹⁹Recall, however, that some data showed that a-infinitives unexpectedly occurred with desideratives, which may indicate there is more flexibility in the matching of complement type with control predicate than Landau allows.

see whether they can be fully reconciled with existing analyses.

7 Conclusion

Given the rich inventory of clausal complements of Moro, we take the close match of contemporary theories of control and raising with the Moro facts as a compelling argument for the cross-linguistic validity of these theories as well as their maturity. In fact, every major theoretical distinction that had been proposed not only finds an empirical correlate in Moro, but in many cases the analyses which have been proposed in the literature find overt morphological support. This kind of morphological evidence cannot be found in most European languages. These morphological facts makes Moro an ideal language on which to conduct additional theoretical work on raising and control.

Returning to the issue of documentation, it is hard to say that Moro would be fully documented or described if we simply had a list of the different classes of predicates and the types of complement clauses that they took. The diagnostics employed above clarified the distribution of control and raising predicates in Moro and led to important generalizations regarding the types of complements they could select and the nature of these complements. Thus, the distribution of raising and control in Moro provides an object lesson in the importance and relevance of formal syntactic theory in the investigation of endangered and understudied languages.

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