

On the semantic dimension of complementation

LILIÁN GUERRERO
Instituto de Investigaciones Filológicas-UNAM

1. Introduction

For the study of complementation, most theories agree on the fact that the degree of syntactic integration is established straightforwardly based on specific structural properties, while trying to determine the degree of semantic cohesion among the main predicate and its complement is somewhat more complicated. Take for example the set of predicates expressing the cognitive notion of thinking. These predicates share a number of semantic and conceptual features that partly condition the morpho-syntactic properties of the construction in which they can appear; still, several members of this class may combine with more than one type of complement, making it difficult to predict the overall meaning of the construction. This paper provides evidence for a revised hierarchy based on the participant's mental disposition, the epistemic values of the predicate as well as the speaker's degree of subjectivity, which helps motivate the semantic side of the Interclausal Relation Hierarchy as proposed by Role and Reference Grammar. The analysis focuses on the semantic notion of thinking as realized in a number of Southern Uto-Aztec languages.

The information is organized as follows. Section 2 briefly reviews some proposals dealing with the form and function of complementation, and draws the attention to the semantic dimension. Section 3 lays out the basic principles of clause union in Role and Reference Grammar. Section 4 analyses the morpho-syntactic and semantic properties of complement clauses involving mental predicates in a number of Uto-Aztec languages. Section 5 provides arguments in favor of the revised participant's mental disposition scale which, together with the temporal scale, and the necessarily shared participant hierarchy, serve to better explain the semantic extensions covered by a basic mental predicate and their correlation with its syntactic manifestation. Section 6 concludes this study.

2. The syntactic and semantic dimensions of complementation

Most theories examining complement constructions pay a close attention to the structural properties of the dependent unit in terms of (i) the verb form employed, i.e. whether it is finite, non-finite, or a special form; (ii) the coding of the participants, i.e., the omission of an argument, its expression as accusative, possessor or oblique; (iii) the presence of clause linkage markers; and (iv) whether or not the linked unit is embedded. There is less agreement in how the semantic relation between the main predicate and the dependent unit can be established. There are three major approaches which consider the syntactic and semantic dimensions of clause union.

The first approach classifies the complement-taking predicates based on their meanings. From this classification, the complement types are predetermined, i.e., complementation is a matter of matching (Noonan 1985: 90, 2007; Dixon 1995; 2006). Dixon proposes four classes of primary predicates, in Table 1.¹ Members of the “thinking” class usually take two of the four mayor complement types.

Verb types	Examples	Complement types
ATTENTION	<i>see, hear, notice, smell, show recognize, discover, find</i>	Activity & Fact types Fact type
THINKING	<i>know, understand, believe, suspect assume, suppose think, consider, imagine, dream remember, forget</i>	Fact type Fact type Fact & Activity types Fact, Activity & Potential types
LIKING	<i>like, love, prefer, regret; fear, enjoy</i>	Activity type
SPEAKING	<i>say, inform, tell describe, refer to promise; order, command, persuade</i>	Fact type Activity type Potential type

¹ Dixon (2006: 27-33) overtly distinguishes between main predicates –those that function as a main verb in simple and complement clauses– from “secondary concepts” –those predicates that usually appear with a verbal complement only (explicitly or not). The latter may receive a special treatment in particular languages, i.e. they may be realized as an uninflected particle, a verbal affix or a lexical verb.

Verb types	Examples	Complement types
SECONDARY CONCEPTS	<i>want, wish (for), hope (for), intend, plan (for), pretend; make, cause, force, let, help</i>	Potential type

Table 1. Dixon's classification of complement-taking predicates (2006: 10)

Predicates like *know, understand, believe, suppose*, are generally restricted to a Fact complement type, whereas predicates like *think, consider, imagine* may select either a Fact (preferably), but also an Activity complement clause. The Fact type generally refers to the fact that something took place, typically has a similar structure to a main clause, is fully independent in relation to tense-aspect-mood (TAM), its time reference is generally independent from the main unit, and it is typically marked by a complementizer (e.g. *Raúl thinks that the election of Felipe was a mistake*). The Activity type generally refers to some ongoing activity, usually has some nominal properties and less specification of TAM and its verb may have a special form (e.g. *I am thinking about quitting the party*). Predicates like *remember* are special, since they may combine with a Fact (*I remembered that you didn't vote*), an Activity (*I remembered watching the elections*), as well as a Potential complement type (*I remembered to turn off the TV*), the latter referring to the potentiality of the participant to become involved in an activity, involving also a series of typical morpho-syntactic characteristics, such as subject deletion and a special verb form.

Although these main predicate-complement matching types may capture important distribution patterns cross-linguistically, they are intended to predetermine, rather than explain, the form-function correlation among the units, meaning no attempts are made to semantically motivate which type of complement can be used with a given predicate, especially when a predicate may combine with more than one type (e.g. *remember*).

The second approach formulates a semantic scale, rather than a list, also based on the meaning of the complement-taking predicates (Kiparsky & Kiparsky 1970; Silverstein 1976, 1993; Haiman 1985; Lehman 1988; Givón 1980: 269, [1990] 2001). The well-known scale of event integration proposed by Givón is presented in Table 2. Under this approach, the 'binding' relation between the main predicate and its complement determines some semantic features of the dependent unit

such as the reference of the subject, the time reference, and the aspect or mood values of the dependent unit (Cristofaro 2003: 111).

Modality verbs: <i>want, begin, finish, try, etc</i> Manipulation verbs: <i>make, tell, order, ask, etc</i> Perception-Cognition-Utterance (PCU) verbs: <i>see, know, think, say</i>	<p style="text-align: center;">Weakest bond..... Strongest bond</p>
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Table 2. Givón's event integration scale (2001: 41)

Givón proposes a series of cognitive/functional criteria relevant for determining the degree of independence of the predicate-complement relation, i.e. the participant's referentiality and subject control, the spatio-temporal, success/implicative, epistemic values of the main predicate. For instance, highly-emotive, implicative, and self-induced verbs -modality (*want, begin*) and manipulation (*make, force*)- are ranked higher in the event integration scale than verbs of perception-cognition and utterance (PCU, *decide, know, think, say*). The assumptions that PCU predicates exhibit a weaker semantic bond than the one established by modality and manipulation verbs, on one hand, and the idea that knowledge, propositional attitude and utterance verbs constitute a single -although heterogeneous- group, on the other, are maintained in the revised version proposed by Cristofaro (2003: 122): phrasal > modals > manipulatives > desideratives, perception > knowledge, propositional attitude, utterance.

There are several arguments in favor for these kinds of semantic scales. Firstly, the iconic relation between the meaning of the clause and its morfo-syntactic realization (Silverstein 1976; Haiman 1985; Givón 1980): the closer the semantic bond between the main predicate and its complement, the tighter its syntactic combination. Again, there is a series of morpho-syntactic features distinguishing the degree of syntactic integration (e.g. the verb form employed, the coding of the participants, the presence of clause linkage markers). That is, the less a clause is independent in its expression of asserted information, the less it is going to resemble an independent clause and the more it is going to exhibit syntactic/structural integration into the main clause; the ultimate status being co-lexicalization

of both verbs as one complex predicate (Givón 1980: 371). Secondly, the semantic scale helps to determine which predicates may allow the omission of certain information within the dependent unit, i.e. “Syntagmatic economy” (Haiman 1985), omission of obligatory shared arguments (Haspelmath 2003); the “Principle of information recoverability” (Cristofaro 2003). Since verbs like *try*, *want*, *begin* pre-determines the identity of the subject and certain TAM values in the complement, it is more likely such information is omitted. And, finally, semantic scales also allow a natural explanation for the fact that languages are more likely to undergo diachronic changes that lead to iconic and/or economic patterns rather than vice versa (Haiman & Thompson 1984; Ohori 1992; Givón 2006).

The establishment of more elaborated semantic scales together with the evaluation of different degrees of syntactic integration has resulted in a better understanding of the relation between the main predicate and its complements. Complications arise, however, when trying to formalize the linking between certain semantic functions and specific syntactic coding devices of the complement construction. The third approach explicitly proposes a theory of clause linkage considering both the semantic and syntactic dimension of complementation.

3. The theory of clause linkage in Role and Reference Grammar

Role and Reference Grammar (RRG; Foley & Van Valin 1984; Van Valin & LaPolla 1997 (henceforth VV&LP); Van Valin 2005) proposes three main components for the study of clause union: the theory of juncture, the theory of nexus, and the theory of the interclausal semantic relation. The theory of juncture deals with the units which make up complex sentences: nucleus, core and clause. In a nuclear juncture, there is a single core containing two nuclei taking a single set of core arguments. In a core juncture, there is a single clause containing more than one core, each with its own set of arguments. In a clausal juncture, whole clauses are joined and each clause may be fully independent of the others. The theory of nexus concerns the syntactic relationship between the units in the juncture, subordination, coordination, and co-subordination, each type distinguished on the basis of structural or operator dependencies as illustrated in Figure 1. In subordination, the linked unit functions either as an argument (as in complementation), or as a modifier. In coordination, the two units are ‘added together in a sequence’ in a relationship of equivalence and independence at the level of the juncture. Cosubordi-

nation shows properties of both: there are two equivalent units joined together (as in coordination), but one unit depends on the other (as in subordination), in terms of operators. What distinguishes cosubordination from coordination is operator sharing: in the former, the linked verb must be dependent upon the matrix verb for expression of one or more operators at the level of juncture, whereas in the latter, the two verbs can, but do not need to be independently specified for the relevant operators.

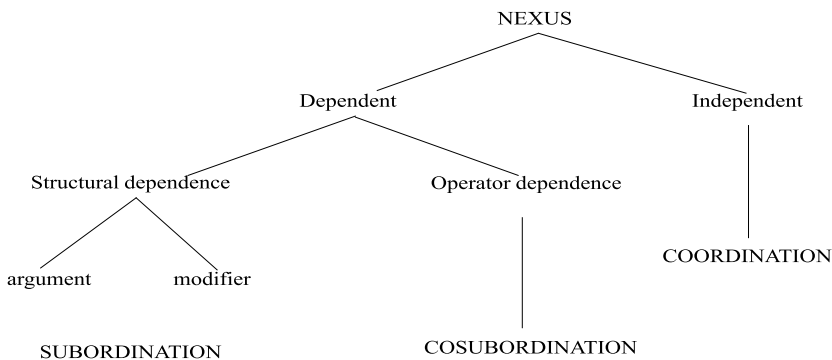


Figure 1: Nexus Relations (VV&LP: 454)

These syntactic combinations are organized into the Syntactic Relations Hierarchy in Figure 2, ranked in terms of their syntactic tightness. The linkage types at the bottom are combinations of whole clauses constituting sentences, e.g. clausal coordination. As one goes up the hierarchy, the linked units lose more and more features of an independent clause until they are reduced to a bare nucleus or predicate, e.g. nuclear co-subordination. It is important to keep in mind that these juncture-nexus types are abstract linkage relations, not grammatical constructions types. This means that each of these linkage types may be realized by more than one grammatical construction in a particular language, and vice versa, the same grammatical construction may involve different linkage types.

The syntactic combinations express a wide variety of semantic relations between the units in the juncture. For the semantic side, RRG adopts the work of Silverstein (1976) and Givón (1980) in relation to the degree of semantic integration and iconicity. RRG juxtaposes the syntactic and the semantic hierarchies to create the Interclausal Relations Hierarchy in Figure 2.

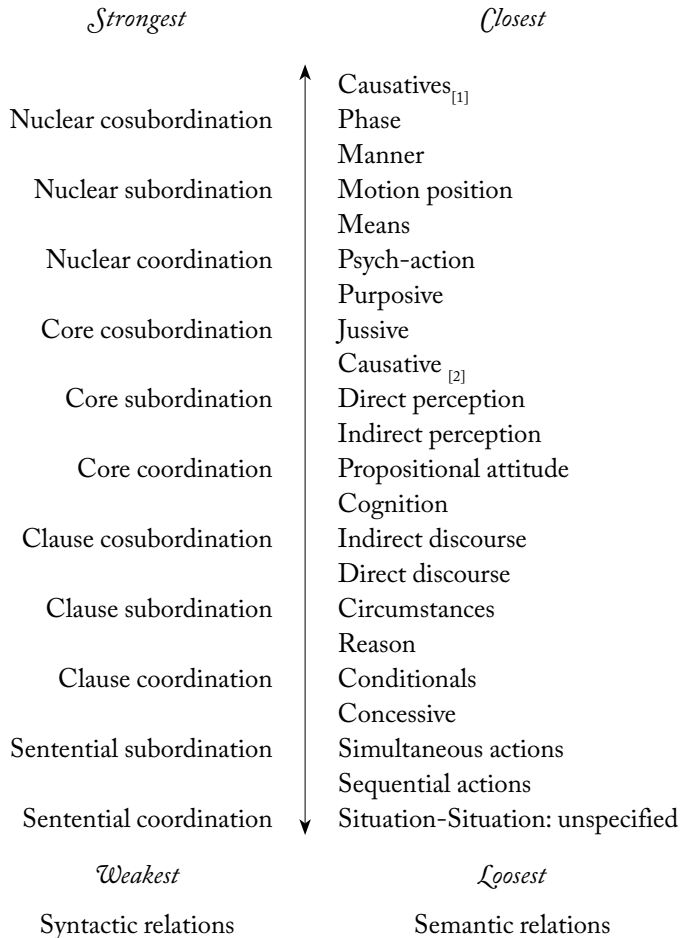


Figure 2: Interclausal Relations Hierarchy (VanValin 2005: 209)

Because there are fewer juncture-nexus types than distinct semantic relations, a language invariably has some syntactic linkages expressing more than one semantic relation. It is also the case that a given semantic relation can be conveyed by more than one juncture-nexus type, and also a single mental verb may be capable of taking more than one juncture-nexus combination (see Van Valin & Wilkins's 1993 analysis for the English verb *remember*). Since there is no one-to-one relation

between the type of semantic relation instantiated by the predicate and the linkage chosen to encode it, RRG explicitly states a general principle reflecting some strong universal constraints on which semantic types can be realized by which syntactic linkage: “the tightest syntactic linkage realizing a particular semantic relation should be higher than or as high on the Interclausal Relations Hierarchy as the tightest syntactic linkage realizing semantic relations lower on the Interclausal Relations Hierarchy (VV&LP: 483).”

Regarding the semantic side of complementation, the RRG theory proposes a more elaborated Semantic Relation Hierarchy (1) which seeks to reflect the interaction of a set of semantic sub-hierarchies including, but not limited to, those in (2).

(1) Semantic scale based on predicate meanings:

Direct Causatives > Phase > Psych-action > Jussive > Indirect Causative > Direct perception > Indirect perception > Propositional attitude > Cognition > Indirect discourse > Direct discourse

(2) Semantic sub-hierarchies

a. Temporal hierarchy:

phase of a single event > simultaneous events > sequential events > unspecified

b. Causal hierarchy:

physical > verbal > underspecified_[non-defeasible] > inferred_[defeasible]

c. Necessarily shared participant [NSP]: Yes > No

d. Participant's mental disposition [PMD]:

intention > perception > belief > knowledge

Roughly speaking, direct causation and phase predicates involve a high degree of semantic bond, since they attest the highest values on each of the semantic sub-hierarchies in (2). The general principle would predict that these semantic relations at the top end should be realized by the strongest syntactic combination (e.g. nuclear/core junctures & cosubordination/subordination nexus). At the other end, perception, cognition and discourse predicates which are at the bottom of the

scale, should be realized by the loosest syntactic linkage (i.e. core/clausal junctures & subordinate/coordinate nexus).

Focusing on mental verbs, psych-action predicates can be defined as a mental disposition regarding a possible action on the part of a participant in the state of affairs (e.g. *Nicole wants to play in the park*). This type of semantic notion is characterized by selecting the higher values on the necessarily shared participant [NSP] and the participant's mental disposition [PMD] sub-hierarchies (3a). In turn, propositional attitude predicates lexicalize the participant's attitude, judgment or opinion regarding a state of affairs (e.g. *I think Nicole is in the park*). These predicates have mixed values on the scales (3b). Finally, cognition predicates, as the expression of knowledge or mental activity (e.g. *I realized that Nicole has gone to the park*) have the lowest values on the sub-hierarchies (3c). The general principle also predicts about the types of syntactic-semantic relations which should not be attested in any language: if psych-action can be realized by core subordination, for instance, it should not be possible for, say, propositional attitude predicates to be realized by some type of nuclear juncture.

(3) Interaction of the sub-hierarchies for mental predicates

a. Values for psych-action

lowest value on temporal; **higher value** on NSP; **first value** on PMD; causal irrelevant

b. Values for propositional attitude

lowest value on temporal and NSP; **third value** on PMD; causal irrelevant

c. Values for cognition/speech act verbs

lowest value on temporal and NSP; **fourth value** on PMD; causal irrelevant

Attitude and cognition verbs are only distinguished by the PMD scale; psych action verbs are distinguished from the two because of the necessarily shared (actor) participant value. Actually, as is, the PDM sub-hierarchy reflects the assumption that assertion verbs and those that reports assertions are alike across languages (Traugott & Dasher 2002; Dahl 1997; Noonan 2007). But languages usually have syntactic (or pragmatic) strategies distinguishing the private vs. public cognitive

domain involved in mental and speech act verbs (Shinzato 2004: 861).²

In order to better account for the relations between the mental predicate and its complement, we need a semantic scale based on both the inherent epistemic properties of the predicate and the notion of subjectivity or speaker's relatedness. The revised version of the participant's mental disposition hierarchy in (4) was originally presented in Guerrero (2004, 2006), and part of the motivation that lie behind it is the idea that any mental state/activity predicates presupposes that the participant is, at least at some degree, conscious or aware at the time she engages in this mental experience (Fortescue 2001: 17). The scale captures properties previously established for mental predicates, such as whether the verb (i) presupposes/implies the truth of the complement, (ii) encodes weak or strong assertion (Karttunen 1971; Hopper 1975; Guitart 1978; Ransom 1986, among others) and, crucially, (iii) reflects the speaker's influence, commitment, closer/remote attitude toward the content of the complement (Givón 1982; Langacker 1990, Wright 1995).

(4) Participant's mental disposition hierarchy (Guerrero 2006)

Intention > internal/direct experience > mental experience: commitment > mental experience: reasoning > non-mental experience: report

Guerrero (in press) provides evidence for the first two values based on desiderative (psych-action) expressions. Now, the analysis focuses on the next three positions evoking experiences generated in the speaker's mind. In what follows, the basic predicates of "thinking" in Southern Uto-Aztecan languages are analyzed. In these languages, one basic word covers more than one central domain on the epistemic/cognitive scale in (4).

The discussion focuses mainly on the semantic side of the predicate-complement combinations, but comments on the syntactic linkages are also included. In the analysis, syntactic tightness is based on the use of certain clause linkage markers, operator dependency, the syntactic status of the complement, and coreferen-

²For a detailed discussion on a different approach of the semantics of complex clauses in RRG, see Otori (1992, 2001, 2005). The author establishes the feature ANCHORING (the process of locating a predicate in a mental model having its own epistemic status, e.g. tense and mood), meaning that propositional complements are defined as p1 COMP p2, where p1 is fully anchored while p2's anchoring is relative to p1 (2005: 10). Since ANCHORING encodes "[features] predetermined by the main predicate" (2005: 11), the distinction among psych-action, attitude and cognitive predicates is, again, lexically determined.

tiality vs. argument sharing (for a better comprehension of the syntactic side see Guerrero 2004). The exposition begins with the Tepiman sub-branch, and follows with the Yaqui language (Tarachita sub-branch).

4. Characterizing mental predicates in Southern Uto-Aztecan languages³

Several Southern Uto-Aztecan languages make use of some cognates of the proto-Uto-Aztecan **i(r)a* ‘feel, think, wish’ (Miller & Hill 2003) to express the semantic notion of thinking. In most of the languages, this predicate may combine with more than one complement type. In Eudeve (extinct), for instance, the cognate *era* takes two types of complements, expressing two related but not identical senses. The construction in (5a) expresses desire or personal intention; the two cores obligatorily share a semantic argument (the actor *ne’e* ‘I’), and the dependent verb is marked by the desiderative suffix *-ba*. The construction in (5b) expresses the cognitive action of thinking; here, each core expresses its own actor, the dependent subject is non-nominative, the dependent verb takes a tense suffix and the linked unit, as a whole, is marked by the accusative suffix *-ta*. For simplification, in the examples I use “think” as a general gloss only (i.e. not a semantic primitive). The complement is between square brackets.⁴

- (5) a. *ne’e* [*hioswa-ba*] *era-m*
 1.SG.NOM write-DESID think-PRES
 ‘I want to write.’ (Eudeve; Lionett 1986: 56)

³The Uto-Aztecan family is one of the largest and most widely distributed in North America. The family is grouped into a Northern and a Southern branch, the latter consisting of four subgroups: Aztecan (classical and modern Nahuatl), Pimic (Tohono O’odham, Southern and Northern Tepehuan, Tepecano and Pima), Corachol (Cora and Huichol) and Tarachita (Tarahumara, Guarijío, Yaqui and Mayo). Because of the space, this study focuses on Tepiman and Tarachita languages.

⁴Abbreviations used in this paper. ACC: accusative, COM: comitative, COMPL: completive, CLM: clause linkage marker, DIR: directional, GEN: genitive, IMPF: imperfective, IRR: irrealis, LOC: locative, NEG: negation, NOM: nominative, NMZ: nominalizer, NS: non-subject, PASS: passive, PASTC: past continuative, PFV: perfective, PL: plural, POT: potential, PRES: present, PRESU: presumable, REFL: reflexive, S: subject, SG: singular.

- b. [eme] = ne [hioswa-n-ta] era-m
 2.SG.NS = 1.SG write-PRES-ACC think-PRES
 'I think you write.' (Eudeve; Lionett 1986: 60)

In terms of juncture-nexus relations, the linking in (5a) is core cosubordination —the two cores necessarily share both the operator marking and the actor NP— and the one in (5b) is clause subordination —the content of the proposition functions as the object of the main predicate, but the two units are independent in terms of operator and argument sharing. The tightest syntactic linkage (core cosubordination) correlates with the strongest semantic bond (psych-action), whereas the less tight linkage (clausal subordination) correlates with a looser semantic relation (propositional attitude). We see, then, that the same predicate may be used with slightly different meaning and it may enter into different kinds of linkage structures. However, the syntactic-semantic correlation is not always as obvious.

4.1. *The Tepiman cognates* ilid ~ ilidʷi

The Tepiman languages share the cognate *ilid* ~ *ilidʷi* (*i(r)a plus the applicative *-dʷi*). This lexical predicate also appears in an array of constructions expressing mental activities: the participant's intention and wishes (6a), the expression of a state of affairs as a thought (6b), and some sort of mental process or evaluation of an external situation (6c).

- (6) a. *ka = kilí-ʷu* *ááni* [*ka = óón-ʷa*] *iñ-ilidʷi*
 already = man=become 1.SG.S already= wife-CAUSE 1.SG.NS-think
 'Now that I am a man, I want to get married.' (N. Tepehuan; Bascom 1984: 282)
- b. [*kugádo*] *ilidyí* *ááni* [*iš = gí-oo hí-dya-gi*]
 good think 1.SG.S CLM= 2.SG-write-APL-IRR
 'I thought that it would be good to write you.' (N. Tepehuan; Bascom 1984: 281)
- c. *ba=ñ ilid* [*g* *toolo* *m=a=tp* *hu* *g* *uan*]
 thus B=1.SG think DET bull CLM=B=likely threw DET Juan
 'I think that the bull may have thrown John.' (O'odham; Langacker 1977: 171)

The situations expressed in (6a-b) convey a wish on the part of the main participant, that the event encoded in the complement be realized; in the two, the dependent event would be brought about by the experiencer herself. The meaning of volition in (6a) is only possible when the main and dependent subjects are coreferential, and so the dependent subject is omitted; the two cores are adjacent, and the dependent verb must be unmarked for TAM operators, all factors which indicate a core cosubordination linkage. Although the actor NP is also shared in (6b), the dependent verb is marked by a TAM operator; hence core coordination. The clause subordination in (6c) expresses an external situation in which the participant consciously thinks about a state of affairs in which she is not involved. Here, the content serves as a syntactic and semantic argument of the complement-taking verb.

The examples below are from Pima Bajo. Again, in (7a-b), the person who has a mental disposition towards some action is involved in doing it. The examples in (7c-e) express a more elaborated mental experience (*remembering*, *recalling*, and *thinking*). In Pima, the experiencer is always expressed twice in the main predicate; thus, the literal meaning of (7a) would be something like ‘I think on my staying.’ All the examples are from Estrada (1988: 87-89).

- (7) a. *aan* [i'a vo'oiia] *in* *ilid*
 1.SG.S here stay.POT 1.SG.NS think
 ‘I want to stay here.’
- b. *aan im in ilid* [puertat kuupa-it]
 1.SG.S NEG 1.SG.NS think door close-DESID
 ‘I didn’t remember to close the door.’
- c. *aan im in ilid* [api ab duvia]
 1.SG.S NEG 1.SG.N think 2.SG.S DIR come.PROB
 ‘I didn’t remember that you would arrive.’
- d. *am-ilid-a aapi*, [ko ap ki gasik-an]
 2.SG.NS-think-FUT 2SG.S CLM 2.SG.S house sweep-IRR
 ‘Recall you will sweep the house.’
- e. *ani in ilid* [ko-va higai huaan-viin hiim]
 1.SG.S 1.SG.NS think CLM-COMPL 3.SG.S Juan-COM go.PFV
 ‘I think that he went with Juan.’

In (7a-b), *ilid* functions as a psych-action predicate being a sign of a mental disposition to act; in the two, the actor participant is shared and omitted in the linked unit, and the two can be optionally marked by TAM operators. In the latter, however, the NP *puertat* 'door' is an argument of the dependent verb only, whereas in the former, the two verbs share all the arguments; so, there is a nuclear and core coordination respectively. In (7c-d) the mental predicate evokes a kind of perceptual or cognitive interpretation, i.e. one can only remember things one knows. In (7e), the predicate has a propositional attitude/cognition function, that is, it describes the speaker's attitude towards the propositional content of the report. Although the main and the dependent subjects are different in (7c, e) and the same in (7d), the dependent verb expresses all its core arguments in the three instances, i.e. there is no equi-deletion. What is clear is the fact that, as soon as the meanings get more complex, and the second semantic argument involves a propositional clause rather than a core, the dependent unit gains more properties of a finite clause: nuclear coordination (7a), core coordination (7b), core subordination (7c), and clause coordination (7d-e). In fact, the dependent unit is introduced by *ko* in the last two, the same CLM used in conjoined constructions and adverbial constructions (Estrada y Guerrero 2005).

Then, the Tepiman **ira* cognates commonly express intentions and mental experiences evoking the speaker's own actions; they also encode a proposition involving another participant when the thought has already been acquired through experience and/or it is been reported. As a conscious analytic process, this predicate disfavors the expression of personal commitment and judging. The correlation among the tighter syntactic linkages realizing the closer semantic relations is even more transparent in Yaqui, where the cognate *'ea* covers a wide range of semantic domains from thinking, believing, feeling and considering, to judging and verbally reporting a thought.

4.2. The Taracahita cognate *'ea*

In Yaqui, there are, at least, five grammatical complement types, and the predicate *'ea* is the only one which seems to combine with all of them. While clause coordination and subordination correspond closely to the most traditional notions, the two differ significantly when applied to nuclear and core junctures, since the syntactic structures may not be recognized as coordinate or subordinate

in most approaches. Let's begin with the tightest syntactic linkage. In (8) the mental predicate and the dependent verb are morphologically linked together. Yaqui data come from oral texts.

- (8) a. *tua ne ino i'a-'ea-n kaa mana sim-tua-ko*
 good 1.SG.NOM REFL ungrateful-think-PASC NEG there go-CAUSE-COND
 'I would feel ungrateful if I wouldn't go there.' (Buitimea 8: 5)
- b. *bweta junuentuk juni'i jiba empo nee bit-ne-'ea-n*
 but this way thus always 2.SG.NOM 1.SG.ACC see-POT-think-PASC
 'But anyway, would you consider possible to look at me?' (Buitimea 11: 54)
- c. *aapo jiba nee jia-k-nok-jikkai-pe-'ea-n*
 3.SG.NOM always 1.SG.ACU yaqui-word-listen-DESID-think-PASC
 'She always enjoys hearing me speaking Yaqui.' (Buitimea 7: 223)
- d. *enchi ne yoi-t-'ea-n*
 2.SG.ACC 1.SG.NOM yori-CLM-think-PASC
 'I thought you were a yori (white man, foreigner).' (Hilario: 249)

Syntactically, no referential restrictions hold between the linked unit and the main predicate which is immediately adjacent to the non-matrix event. When the subjects are coreferential, the dependent subject is omitted or a reflexive pronoun appears (8a-b), otherwise the subject must be accusative (8c-d), as it is the case for most dependent (non-main) subjects in Yaqui. There is also no restriction on the relevant TAM operators on the dependent verb (8d); the occurrence of the CLM *-t* between the two cores is optional. Although a semantic argument of the matrix predicate, the complement and the main predicate within this syntactic combination do not figure a subordinate nexus relationship, among other reasons, because the main verb cannot be passivized, e.g. **hearing me speaking Yaqui was enjoyed* (8c). Hence core coordination.

Most regularly, core junctures makes use of two less common CLMs *-bae-kai* (9a) as well as *-benasi* (9b-c), where the dependent unit appears embedded before the main predicate, i.e., in the preferred position for direct core arguments. In (9a) there is an obligatorily argument sharing and there is also obligatory sharing of the core operators, these factors yield a core cosubordination linkage. Other verbs

taking this syntactic linkage are those meaning ‘hope’, ‘dream’ and ‘imagine’, all encoding some sort of self-intentional, future-oriented activity, involving a strong commitment on the part of the participant about the realization of the event. In (9b-c) the subjects must be different, the dependent verb can be independently marked by the relevant operators and the clausal complement as a whole serves as a core argument of the matrix predicate, resulting in a core subordination structure. In fact, it is possible to encode the source of such mental activities as a core argument in (9c) e.g. ‘I think about you, because I have seen you, that you enjoy to be here’. That is, the tighter construction involves a self-oriented interpretation, whereas the less tight linkage expresses the speaker’s attitude about a proposition involving another party.

- (9) a. *aapo* [ae-mak tawa-bae-ka] 'ea-n
 3.SG.NOM 2.SG.-COM stay-DESID-CLM think-PASC
 ‘He thought of keeping it (lit. want to stay with it).’ (Buitimea 7: 51)
- b. [bwia-ta]=ne [ne-mak kuate-taite-ka-benasi] e'ea-k
 land-ACC 1.SG.NOM 1.SG-COM trembling-begin-PFV-CLM think-PFV
 ‘I felt like the land began trembling with me.’ (Buitimea 6: 1)
- c. [im] = ne [enchi ujyoi-le-benasi] ne enchi eeiya
 here 1.SG.NOM 2.SG.ACC like-PRESU-CLM 1.SG.NOM 2.SG.ACC think
 ‘I can see you enjoy to be here (lit. I think on you, that you like it)’ (Buitimea 6: 94)

Most clausal subordinated linkages make use of the general CLM *-’u*. As the examples above, in (10) the dependent subject is marked accusative, the whole construction can be passivized and the content of the complement can be pronominalized. What distinguishes core subordination (9b-c) from clausal subordination (10) is the position of the complement. For these constructions, there is an overwhelming preference for different subjects, and the complement unit is fully subordinated to the main predicate.

- (10)a. *ne* junuen'ea-Ø [enchi kari-ta tute-ne-'u]
 1.SG.NOM thus.think-PRES 2.SG.ACC house-ACC clean-POT-CLM
 ‘I wish (agree) that you would clean the house.’

b.	<i>ian</i> = 'e	<i>jaibu</i>	<i>ju'unea</i>	[<i>junum itom</i>	<i>jo'aa-ka-u</i>]
	now = 2.SG.NOM	already	that.think	there	1.PL.ACC
	'Now you know that we live here.'			(Buitimea 2: 275)	

Although most of the senses expressed by *'ea* are related in some way, it is not always easy to establish the nature of such relationship. By exploring the contexts in which these constructions appear in texts, it is possible to motivate certain distinctions based on the speaker's attitude. For instance, in (8b) the speaker was sick and tired of looking for a cure, so he went to visit the main healer to ask for help; although he is making a request, he attempts to soften the force of it in order to receive a positive answer. In (8d), after a series of incidents between the speaker (narrator) and his interlocutor, the later tries to apologize for his harsh attitude arguing that he just realized he is not a *yori*. In both cases, the construction expresses the interlocutor's attitude towards the truth of the propositional content. In contrast, in (9b-c) *'ea* expresses a mental experience as a reaction from an external source, i.e. thinking as the result of a corporal sensation, having seen some facts, or having made some inferences from external circumstances. As part of two derived epistemic predicates, *'ea* not only encodes the speaker's positive opinion about the content of the complement—as in *junuen-'ea* 'think like this, wish this, agree to' in (10a)—, but it also can mean that such information is (or is not) in the speaker's mind at this time, without any degree of commitment, judgment or evaluation—as in *ju'unea* 'know about' (lit. 'think-this') in (10b).

The semantic meanings of *'ea* may be also expanded by way of phrasal collocations to highlight the participant's awareness. Differently from the previous examples, the propositional content in (11) is expressed as a report, meaning the linked unit shares most of the features of an independent clause. The position of the complement-taking predicate in relation to the dependent unit has changed: instead of clause finally, the main predicate appears clause initially; the dependent subject is nominative rather than accusative, and there is no CLM. All these factors together yield clausal coordination. In relation to its semantics, the presence of the particle *jumak* 'maybe, possibly' seems to reduce the degree of the speaker's involvement by expressing the current thought as an opinion, cautious comment. Interestingly enough, all data I have using this syntactic structure involve first person singular present tense, suggesting the mental verb is acting as an epistemic formulaic marker (Thompson 2002).

- (11) *inepo inen 'ea jumak [u taji-∅ a-u yuy-yuma-taite-k]*
 1.SG.NOM like.this think maybe DET fire-NOM 3.SG-DIR RED-reach-begin-PFV
 'I think like this, maybe the fire reaches it (its tale).' (Buitimea 9: 52)

In fact, Yaqui provides good evidence for the cognitive shift from internal mental experiences to external speech (cf. Traugott & Dasher 1987; Dahl 1997; Shinzato 2004; Givón 2001; Cristofaro 2003), since *'ea* has literally adopted the structure of indirect quotations used by verbs like *jiia* 'say' (12a) to express some sort of 'verbalized thoughts'. In (12b), the dependent subject is nominative, the propositional complement comes first, followed by the citative CLM *-ti*.

- (12) a. [*bweta inepo kaa into aman wee-bae*]=*ti bea ne au jiia-∅*
 but 1.SG.NOM NEG and there go-DESI=CLM thus 1.SG.NOM 3.REFL say-PRES
 'And I say 'but I don't want to go there.'" (Hilario: 221)
- b. *jumak juni'i [nee to'o-siika] =ti ne 'ea*
 maybe this 1.SG.ACC road-go:PFV = CLM 1.SG.NOM think
 "Maybe she abandoned me' I thought.'" (Buitimea 8: 14)

In (12b), the mental predicate does not express worry, concern, judgment, or a cautious opinion regarding the content of the proposition, but it purely reports the thought as an assertion. Actually, most occurrences of *'ea* involve first person singular in simple present tense, i.e. "egocentric" clauses (Dahl 1997). This preference and the use of the indirect discourse structure suggest the predicate here may function as a subjectivity marker (Scheibman 2002:167).

Therefore, in contrast to the Tepiman use of the mental predicate in favor of volition and internal experiences on the part of the participant, the Yaqui cognate favors the expression of the participant's attitude, commitment, reasoning or opinion in relation to a state of affairs or a proposition. In any case, the cognates evenly encode different values within a cognitive /epistemic domain.

5. Discussion

As a way of summary, Table 3 (page 339) reports the juncture-nexus types found in these Uto-Aztecan languages, as well as the interaction of the relevant semantic

sub-hierarchies. On the syntactic side, column 1 indicates the linkage type; column 2 reflects whether the dependent subject must be left implicit or be marked accusative or nominative; column 3 indicates the operators dependency, whether the dependent verb must be unmarked, marked by a special form (potential, irrealis, subjunctive) or fully marked; column 4 indicates the occurrence of a clause linkage marker. The more arguments and operators are shared between the two units, and the more restricted the use of CLMs, the tighter the predicate-complement construction will be.

On the semantic side, column 5 specifies the temporal relationship among the events. Simultaneous actions must be actual (i.e. ongoing events), but at least the second action may be actual or potential for all other temporal relations; unspecified temporal ordering of the events represents the loosest semantic cohesion between the units. Column 6 indicates whether or not there is a necessarily shared participant [NSP]; the 'no' value does not mean they cannot be coreferential. And the last column conveys the revised version of the participant's mental disposition scale: intention > internal/direct experience > mental experience: commitment > mental experience: reasoning > non-mental experience: report.

The closest semantic notions are realized by the tightest syntactic linkages. When the mental predicate encodes intention and internal experiences regarding a state of affairs—the highest values in the PMD—the construction conveys the participant's mental disposition to act in the event brought about by herself, and the main and dependent events are sequential (usually but not necessarily a future-oriented event). When the speaker expresses her attitude, commitment, judgment of an event involving herself, or evaluates the propositional content of the complement, the next value in the PMD, languages tend to allow more than one option depending on the degree of speaker's commitment. As soon as the predicate entails the experiencer's consciousness (i.e. reasoning, evaluating, understand something previously experienced or learn), the syntactic linkages get less tight, as in the case of core subordination, clausal subordination. A final shift from mental experiences to external speech is the reporting of a previous thought or assertion adopting the structure of indirect discourse. Then, by including the revised participant's mental disposition scale as part of the other semantic sub-hierarchies, the Role and Reference Grammar theory of clause linkage may account for such correlations involving mental predicates.

6. Conclusion

Southern Uto-Aztec languages provide good evidence for the general principle governing the interaction of the semantic and syntactic relations observed in mental complement constructions. The essential claim was that all these senses codify what originates in the subject's mind: from personal desires and less conscious internal experiences to mental activities as the result of observation, evaluation or judgment, to the reporting of thoughts. The closer semantic relations are embodied by the tightest syntactic linkages in the particular language. Indeed, the Uto-Aztec family is not unique, since the semantic extensions of "thinking" verbs and the multiple alternatives for complement types, have been attested elsewhere. Similar constructions involving mental predicates have been observed in other languages, i.e., English (Thompson & Mulac 1991; Brinton 1996); Japanese (Shinzato 2004), Swedish (Dahl 1997), German and Dutch (Nuyts 2000), Spanish (García-Miguel & Comesaña 2004, Vázquez Rozas 2006), as well as on the cross-linguistic study of thinking terms by Goddard (2003).

Syntactic integration				SEMANTIC INTEGRATION			
Juncture-nexus	Dependent subject	TAM	CLM	Temporality	NSP	PMD	
<u>Eudeve</u> <i>era</i>							
core coordination (5a)	∅	Special	∅	Sequential	Yes	Intention	
clausal subordination (5b)	ACC	Full	- <i>ta</i>	Unspecified	No	Mental Experience: ^{reasoning}	
<u>N. Tepehuan</u> <i>iláʔi</i>							
core cosubordination (6a)	∅	Unmarked	∅	Sequential	Yes	Intention	
core coordination (6b)	∅	Special	<i>iš-</i>	Sequential	No	Internal experience	
<u>O’odham</u> <i>ilid</i>							
clause subordination (6c)	NOM	Special	<i>m-</i>	Unspecified	No	Mental Experience: ^{reasoning}	
<u>Pima Bajo</u> <i>ilid</i>							
nuclear coordination (7a)	∅	Special	∅	Simultaneous	Yes	Intention	
core coordination (7b)	∅	Special	∅	Sequential	Yes	Intention	
core subordination (7c)	NOM	Special	∅	Sequential	No	Internal experience	
clause coordination (7d-e)	NOM	Full	<i>ko</i>	Unspecified	No	Mental experience: ^{reasoning}	
<u>Yaqui</u> <i>èa</i>							
core cosubordination (9a)	∅	Unmarked	- <i>baekai</i>	Simultaneous	Yes	Internal experience	
core coordination (8a-d)	ACC	Special	∅, - <i>t</i>	Sequential	No	Mental experience: ^{commitment}	
core subordination (9b-c)	ACC	Full	- <i>benasi</i>	Unspecified	No	Mental experience: ^{commitment}	
clause subordination (10)	ACC	Full	- <i>’u</i>	Unspecified	No	Mental experience: ^{reasoning}	
clause coordination (11)	NOM	Full	∅	Unspecified	No	No-mental experience: ^{report}	
sentence subordination (12)	NOM	Full	- <i>ti</i>	Unspecified	No	No-mental experience: ^{report}	

Table 3. Some syntactic-semantic correlations involving the mental complement-taking predicate

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