Clausal embedding in Washo: Complementation vs. modification

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Abstract

This paper concerns the embedding properties of two classes of verbs that are generally taken to differ with respect to factivity. Adding to this line of work, we contribute novel data from Washo, a highly endangered Hokan/isolate language spoken around Lake Tahoe in the United States, to the debate on why – and how – attitude predicates differ in the types of clauses they embed. The core of our claim is that the clausal embedding strategies of certain predicates follow from independent properties of clause types in the language, and is not tied to factivity *per se*. On the one hand, clausal complements of factive verbs come in the form of clausal nominalizations, whose DP-layer is responsible for encoding familiarity in a general sense (along the lines of Kastner 2015) both in factive complements and beyond. Clauses embedded by non-factive verbs on the other hand are not selected at all; they are instead adjunct modifiers, which follows from the fact that the attitude verbs they modify are always intransitive. This aspect of the analysis lends support to the property-analysis of 'that'-clauses (e.g., Kratzer 2006, Moulton 2009, Elliott 2016), but only in certain instances of embedding. The overarching goal of the paper is to rethink the relationship between factivity and clausal embedding from a more global perspective of a given language, and to elucidate the distinction between complementation and modification as available modes of embedding.

1 Introduction

This paper concerns the embedding properties of two classes of verbs that are generally taken to differ on the basis of factivity. Semantically, a factive predicate presupposes the truth of its complement, while non-factive predicates carry no such presupposition. On the syntactic side of this distinction, it has been widely demonstrated through a range of studies that factive and non-factive predicates behave differently with respect to how they embed clausal complements (i.a. Kiparsky & Kiparsky 1970; Zubizarreta 1982; Adams 1985; Rooryck 1992; Abrusán 2011, 2014; Kastner 2015). This paper contributes novel data from Washo, a highly endangered Hokan/isolate language spoken around Lake Tahoe in the United States, to the debate on why – and how – attitude predicates differ in the types of clauses they embed. As we will show, the distinction between factive and non-factive predicates in Washo is overtly signalled by the morphosyntactic shape of the clauses they embed, which correlates with other characteristics of these clause types.

The core of our claim is that the clausal embedding strategies of certain predicates follows from independent properties of the language, and is not tied to factivity *per se*. As we show, Washo displays a general two-way distinction in embedded clause type: Clauses embedded by factive verbs come in the form of nominalizations, while clauses embedded by non-factive verbs are bare and never nominalized. We argue that the shape of these clauses signals a further difference in mode of embedding: Clausal nominalizations are

selected as complements, while bare clauses are verbal modifiers. The structural differences between clausal complementation vs. modification that we propose for Washo are schematized in (1) and (2), respectively.

(1) *Complementation*

VP
├── DP
│   └── *'that'-clause*
└── V

(2) *Modification*

VP
├── MoodP
│   └── *'that'-clause*
└── VP
     └── ...
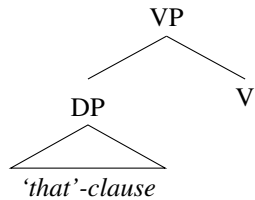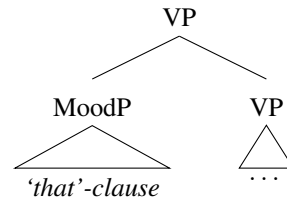
We argue moreover that the DP-layer in selected clauses is responsible for encoding familiarity (in the sense of Heim (1982)) in a general sense. This is much in line with recent work by, e.g., Kastner (2015), who argues that factive complements are selected for by either a covert or overt D head before composing with the factive predicate itself. This DP serves as the internal argument selected by the verb. The adjunct status of clauses of the second type follows from the fact that the class of verbs that embed them is always intransitive. This aspect of the analysis lends support to the property-analysis of 'that'-clauses (e.g., Kratzer 2006, Moulton 2009, Elliott 2016), but only in certain instances of embedding, as it shown not to extend to the complements of transitive predicates.

In our account, the factivity effects then fall out from independent interpretive effects of these different modes of embedding. Apparent factivity is encoded by direct reference to an established proposition in the Common Ground; this reference is established via an assignment function, which maps an index to the individual whose content is specified by that proposition (along the lines of Moulton 2009), and is facilitated by the presence of larger, selected DP structure. The lack of factivity with other predicates follows from the absence of a DP layer in the adjuncts that modify them. The proposed analysis further accounts for the difference in mood markers found in these embedded clauses, assimilating this distinction to the distribution of mood elsewhere in the language. As we show, the different mood markers reflect differences in the semantics of the embedded clause, and mirror the patterns observed in further types of embedded clauses as well, lending evidence to the proposed distinction in complementation vs. modification.

The outline of this paper is as follows. In Section 2 we present the data in question from two morphosyntactic types of embedded clauses in Washo. In Section 3 we propose a syntactic analysis of these embedded clause types: complement clausal nominalizations and adjunct bare clauses. In Section 4 we introduce the ingredients of our semantic analysis, briefly summarizing previous work on attitude verbs and clausal embedding. In Section 5 we present our analysis and draw a broader connection to embedding in Washo, and Section 6 concludes.

2   Two strategies for clausal complementation

In this section we lay out the two distinct strategies that Washo employs for clausal embedding by verbs of both the factive and non-factive type. In the examples to follow, we adopt the taxonomy of verb types

in Catell (1978: 77) in the description of a verb as factive or non-factive (see also Kastner 2015; Bogal-Allbritten & Moulton 2017).[1]

(3) a. **Non-factive**: The embedded clause introduces novel content.
      believe, say, assume, think, claim, suppose, etc.

   b. **Factive**: The embedded clause refers to familiar content.
      remember, regret, know, forget, realize, etc.

The clausal complements of factive verbs exhibit two characterizing traits, both of which are exemplified below in (4), where the embedding verb is *ašašé:s* 'know'.[2] First, they are always nominalized and bear the suffix *-gi/ge*.[3] Second, they occur with the 'independent' mood suffix *-i*, which is the default mood in Washo; for example, this is the obligatory mood marker in matrix clauses, as shown in (5).

(4) *t'éliwhu lí:yuŋil*   *ʔí:biʔayšge*   *lášašé:si*
     [t'eliwhu li:-uŋil   ʔ-i:biʔ-ayʔ **-i** -š **-ge**] l-ašaš-e:s-i
       man   then-DEFUNCT 3.come-INT.PAST **-IND** -DS **-NM.ACC** 1/3-not.know-NEG-IND
     'I know that the man came a long time ago.'

(5) *gawáyɨʔ Múʔušuweʔi*
     gawayɨʔ ∅-Muʔuš-uweʔ **-i**
     horse   3-run-hence **-IND**
     'The horse is running away.'

Other examples of nominalizations exhibiting these traits follow in (6-8), embedded by the factive verbs 'remember', 'forget', and 'see', respectively.[4]

(6) *Adele dí:meʔ sú:bišge*   *dihámup'ayé:si*
     [Adele di:meʔ ∅-su:biʔ-i-š-ge]   di-hamup'ay-e:s-i
       Adele water 3/3-bring-IND-DS-NM.ACC 1/3-forget-NEG-IND
     'I remember that Adele brought the water.'

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[1]Catell (1978) also discusses a third class of verbs called 'response-stance' verbs, which include entries such as 'agree' and 'accept'. To our knowledge, Washo does not lexicalize any of the verbs in this class.

[2]Glosses: ACC: accusative; ADV: adverbial; ATTR: attributive; CAUS: causative; DEFUNCT: defunctive; DEP: dependent mood; DIST: distal; DS: different subject; DU: dual; DUR: durative; INCH: inchoative; IND: independent mood; INST: instrumental; INT.FUT: intermediate future; INT.PAST: intermediate past; NEAR.FUT: near future; NC: negative concord; NEG: negation; NM: clausal nominalizer; NOM: nominative; NMLZ: deverbal nominalizer; OBL: oblique; PLUPF: pluperfect; POSS: possessive; Q: question particle; REC.PST: recent past; REFL: reflexive; SS: same subject. Washo makes use of a portmanteaux prefix agreement system, indicated here as SUBJ/OBJ. For more on this, see Douros (2019). The orthography adopted is from Jacobsen (1964); symbols deviating from the IPA are: L: [l̥]; M: [m̥]; š: [ʃ]; y: [j]; Y: [j̊]. All data without a citation come from the authors' fieldwork. Examples labeled with 'Washo Archive' are taken from the corpus of examples available online at <washo.uchicago.edu>.

[3]The difference in the form of the suffix is a reflex of a nominative/accusative case distinction. As the clauses under discussion are always objects, they surface with *-ge*. We return to this in Section 3.1.

[4]The verbs 'know' and 'remember' in Washo are part of a small class of verbs that are inherently negative, i.e., the positive interpretation of this verb requires morphological negation. Other members of this class include 'understand' and 'know how (to do something)'.

(7) *hášayšge*   *dihámup'ayi*
   [∅-haʔaš-ayʔ-i-š-ge]   di-hamup'ay-i
    3-rain-INT.PAST-IND-DS-NM.ACC 1/3-forget-IND
   'I forgot that it rained.'

(8) *ditugíbeweʔšda*   *há:bišge*   *lí:giyi*
   di-tu-gib-eweʔ-i-š-da   [∅-ha:biʔ-i-š-ge] l-i:gi-i
   1-look-arrive-hence-IND-DS-ADV 3-rain-IND-DS-NM.ACC 1/3-see-IND
   'I just looked around outside and I saw that it rained.'

As will become important later in the paper, clausal nominalization is a robust strategy for subordination elsewhere in the language. For example, the complements of perception verbs likewise come in the form of clausal nominalizations (9), as do internally headed relatives (10) (Hanink 2016, 2018). We return to the significance of nominalization in the complements of factive verbs and beyond in Section 5.2.

(9) *Complements of perception verbs*

   háʔašayišge   *didámali*
   [∅-haʔaš-ay **-i** -š **-ge**]   di-damal-i
    3-rain-INT.PAST **-IND** -DS **-NM.ACC** 1/3-hear-IND
   'I heard it raining.'

(10) *Internally headed relatives*

   mé:hu géwe ʔí:giyišge   *lé:saʔ lí:giyi*
   [me:hu gewe   ʔ-i:gi **-i** -š **-ge**]   le:-saʔ l-í:gi-i
    boy   coyote 3/3-see **-IND** -DS **-NM.ACC** 1.PRO-also 1/3-see-IND
   'I also saw the coyote that the boy saw.'   Hanink (2016: 122)

Clauses embedded by non-factive verbs on the other hand differ from those embedded by factive verbs in two ways. First, they surface with the 'dependent' mood marker *-aʔ*, rather than with the independent mood marker *-i* as above. (We return to arguments for the classification of these suffixes as mood markers in Section 5.) Second, they are never nominalized; as noted by Jacobsen (1964), this mood marker never co-occurs with nominalizing morphology. Both of these traits can be seen in the embedded clause in (11), which in this case is subordinate to the non-factive verb *hámu* 'think':

(11) *béverli démlu dibegúweʔé:saʔ   hámuyi*
   beverli [demlu di-beguweʔ-e:s **-aʔ**] ∅-hamu-i
   Beverly food   1/3-buy-NEG **-DEP**   3-think-IND
   'Beverly thinks that I didn't buy the food.'   Washo Archive

These traits are further corroborated by the examples below, demonstrated alongside the non-factive verbs 'say', 'dream', and 'believe':

(12) *dip'áyt'igimuwet'aʔ*   *ʔí:di*
   [di-p'ayt'iʔ-gim-uweʔ-tiʔ-aʔ]   ʔ-i:d-i
    1-play-go.out-hence-INT.FUT-DEP 3-say-IND
   'She said I could go play.'   Washo Archive

(13) *diyéʔešaʔ*   *digumsuʔúšiʔi*
    [di-ye-iʔiš-aʔ]   di-gum-suʔuʔuš-iʔ-i
     1-fly-forward-DEP 1-REFL-dream-ATTR-IND
    'I dreamt that I was flying.'   Washo Archive

(14) *mitgí:bìlé:si*   *dí:meʔ ʔilélegiʔetiʔaʔ*
    ∅-mitgi:bil-e:s-i   [di:meʔ ∅-ʔil-leleg-iʔ-etiʔ-aʔ]
    3-disbelieve-NEG-IND   water 3-ATTR-red-ATTR-INCH-DEP
    'He believes the water turned red.'   Washo Archive

Outside of clauses embedded by non-factive verbs, the dependent mood marker *-aʔ* is also found in adjuncts, which generally encode cotemporaneous events, as in (15) below:

(15) *Temporal adjunct*

    mé:hu ʔélšimaʔ   *ʔémc'igaʔlamé:s-i*
    [me:hu ʔ-elšim **-aʔ** -∅] ʔ-emc'i-gaʔlam-e:s-i
     boy   3-sleep **-DEP** -SS 3-wake.up-want-NEG-IND
    'The boy doesn't want to wake up while he's sleeping.'

In Section 5.5, we return to the discussion of adjuncts in order to show that the use of the dependent mood marker in both contexts is not an accident, but rather falls out from the meaning of this morpheme.

Below, Table 1 summarizes the descriptive morphological differences between clauses embedded by factive and non-factive verbs in Washo, which differ both in the choice of mood marker and in the presence or absence of the nominalizing suffix *-gi/ge*. This table will be updated in the following section after we justify the syntactic structures we propose for these clauses.

Table 1: Embedded clauses by matrix verb type in Washo (to be expanded)

	nominalizer	mood marker
factive	*-gi/ge*	*-i*
non-factive	—	*-aʔ*

Going forward, both the presence of nominalizing morphology and the difference in mood markers will play an important role in the semantics we assign to the two types of clauses. In the next section, we offer the proposed corresponding syntactic structures for both embedded clause types and argue for a difference in embedding strategy – complementation vs. modification – before moving on to the semantic analysis.

3 The syntax of clausal embedding

The aim of this section is to elaborate on the respects in which the morphological and structural properties of clauses embedded by factive verbs differ from those embedded by non-factive verbs. In the case of nominalizations, we argue that the embedded clause is housed inside a larger DP structure in which the

suffix *-gi/ge* is the spell out of a syntactically-encoded index (e.g., Elbourne 2005; Schwarz 2009), which introduces the flavor of 'familiarity' of this clause type. Clauses embedded by non-factive verbs then differ in their lack of nominalization as well as mood marker choice. Crucially, we argue that these differences in morphosyntax correlate with whether the embedded clause is selected as the thematic object of the matrix verb (*-i*-marked nominalizations), or occurs instead as an adjunct modifier (*-aʔ*-marked clauses).

3.1 Clausal nominalizations are DPs

The hallmark of clausal nominalizations in Washo is the presence of the final suffix *-gi/ge* at the right periphery of the embedded clause, which we treat as the realization of a functional head within a larger, nominalizing DP structure. We further build on the claim that nominalized complements are full CPs encased inside this DP layer (Peachey 2006). While Washo lacks a definite article, there is independent evidence from Hanink (2018) that Washo does make use of a DP layer, and that *-gi/ge* may occupy a part of its extended projection, more specifically an index head 'idx', which itself is selected by a silent D head (based on e.g., tests for the presence of D from Bošković (2008)). The role of idx is to introduce a familiar/anaphoric referent within the DP in the sense of Elbourne (2005) and Schwarz (2009); we propose in the next section that it is this index that gives rise to the factive 'flavor' of certain clausal nominalizations, in that the index is able to pick out contextually salient propositional content via an assignment function.

Before moving to this discussion, we first provide evidence that clausal nominalizations are truly DPs, based on both their case and distributional properties. First, the suffix *-gi/ge* is found elsewhere in the language in the form of a third-person pronoun, where its form co-varies with case: *-gi* is the nominative form of the pronoun, while *-ge* is the accusative form.[5] An example of a nominative use of the pronoun is shown below in (16a), while an example of a non-nominative use is given in (16b):[6]

(16) a. *gí:*   *pélew*   *ʔíʔwi*
         gi: pélew   ∅-íʔiw-i
         3.PRO.NOM jackrabbit 3/3-eat-IND
         'He's eating the jackrabbit.'   Jacobsen (1979: 151)

      b. *ʔló:t*   *gé:ŋa*   *ʔí:giyé:sayt'iʔi*
         ʔlo:t   **ge:**-ŋa   ∅-i:gi-e:s-ayt'iʔ-i
         yesterday   **3.PRO.ACC**-NC 3/3-see-NEG-PLUPF-IND
         'She hadn't seen it yesterday.'

The case distinction in pronouns is moreover mirrored in clausal nominalizations in that the suffix *-gi* occurs when the argument resulting from the nominalization is the subject of the matrix verb, and surfaces otherwise as *-ge*. To exemplify this contrast, consider the use of *-gi* in the internally headed relative clause in (17). In this case, the entire nominalization refers to the stick being used to kill something; as this stick is the thematic subject of the matrix verb *gɨlgayi* 'break', the nominative form of the suffix surfaces:

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[5]We differ here from Jacobsen (1964), who refers to *-gi/ge* as the *subject/objective* forms.

[6]For phonological reasons, the vowel is long and stressed when *gi/ge* stands alone, i.e., in pronominal uses.

(17)　　*máʔak t'í:yelilu　geyúlihayišgi*　　　　　　　*gɨ́lgayi*
　　　　[DP [CP maʔak t'i:yeliʔ-lu ge-yuli-ha-i-š] **-gi**]　　∅-gɨlgay-i
　　　　　　stick　large-INST 3/3.UN-die-CAUS-IND-DS **-NM.NOM** 3-break-IND
　　　　'The big stick he killed it with broke.'　　　　　　　　　　　Washo Archive

In all other cases, the accusative form *-ge* surfaces. The example in (18) shows a nominalized clause that acts as the object of the matrix verb, here 'see', in which accusative case is duly assigned.

(18)　　*t'é:liwhu ʔíšmišge*　　　　　*lí:giyi*
　　　　[DP [CP t'e:liwhu ʔ-išim-i-š] **-ge**]　l-i:gi-i
　　　　　　man　　3-sing-IND-DS **-NM.ACC** 1/3-see-IND
　　　　'I saw the man who was singing.'　　　　　　　　　　　　　Washo Archive

Accordingly, the complements of factive verbs always surface with *-ge*, as they act as objects of the matrix verb (in a way to be made more precise below). We note here that the language does not allow nouns to embed complements (e.g., constructions of the form 'the fact that . . . '), which are the focus of investigation in some recent work on factivity and embedding (e.g., Moulton 2009, 2015; Kastner 2015; Elliott 2016).

Aside from the above case properties, the DP-status of clausal nominalizations is supported by their distribution: For example, they can be arguments of postpositions (see also Peachey 2006), which always select nominal complements. We show this below with the instrumental postposition *-lu*, which in (19) selects for the DP *ditulíc'ik* 'my finger':

(19)　　*ditulíc'iklu*　　*digumc'í:geyi*
　　　　[DP di-tulic'ik] **-lu**　di-gum-c'i:ge-i
　　　　　　1.POSS-finger **-INST** 1-REFL-scratch-IND
　　　　'I'm scratching myself with my finger.'　　　　　　　　　Washo Archive

The same postposition can instead select for a clausal nominalization, as in (20):

(20)　　*gó:beʔ lé:meʔáŋawigelu*　　　　　*dip'ímeweʔgiši*
　　　　[DP go:beʔ l-e:meʔ-aŋaw-i-∅-ge] **-lu**　di-p'im-eweʔ-giš-i
　　　　　　coffee　1-drink-well-IND-SS-NM.ACC **-INST** 1-go.out-hence-DUR-IND
　　　　'I keep going out because of the coffee that I drank.'
　　　　='With all the coffee I drank, I keep going out.'　　　　　(Hanink 2019: 15)

Taken together, the case and distributional properties of clausal nominalizations indicate that they are DPs. We now turn to lay out in more detail the assumptions we make about the structure of the DP in Washo.

3.1.1　The structure of DP

In the approach we adopt, familiarity in definite descriptions (in Heim's (1982) sense) is divorced from the semantics of D, and is instead encoded by an idx head that projects its own phrase (Simonenko 2014; Hanink 2018) within the extended projection of D. This approach to DP structure builds on Elbourne (2005) and Schwarz (2009), the latter of whom argues that anaphoric DPs differ from non-anaphoric (e.g., merely

uniqueness-encoding) DPs not only semantically but also syntactically: Non-anaphoric DPs lack an index in their functional structure.[7] The structurally-encoded index in anaphoric DPs is then interpreted along the lines of a pronoun, for example by the Traces and Pronouns Rule of Heim & Kratzer (1998) (21), allowing it to be mapped back to an antecedent or to pick out a referent deictically (e.g., on a demonstrative use).

(21) **Traces and Pronouns Rule**

If α is a pronoun or trace, g is a variable assignment, and $i \in \text{dom}(g)$, then $[\![\alpha_i]\!] = g(i)$

Going forward, we adopt in particular the following implementation of this type of account found in Hanink (2018), according to which idxP intervenes between the DP and NP-layers in order to give rise to an anaphoric meaning (cf. Simonenko (2014) on Bavarian).

(22) *Unique DP*
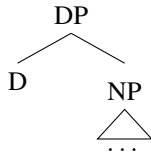
(23) *Familiar DP*
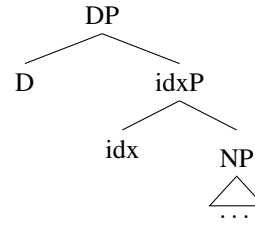
In (23), the meaning of idx is property-denoting, on a par with an IDENT type shift (Partee 1986) of the individual-denoting index in Schwarz's (2009) proposed DP structure, while D has a Strawsonian meaning encoding uniqueness alone:

(24)   a. $[\![D]\!]$: $\lambda P_{\langle e,t \rangle}$: $\exists! x(P(x)).\iota x_e[P(x)]$

   b. $[\![idx]\!]^g$: $\lambda y_e[y = g(i)]$

The index then acts essentially as a modifier that undergoes Predicate Modification with the NP (Heim & Kratzer 1998), contributing the anaphoric meaning to the entire DP:

(25) $[\![23]\!]^g$: $\iota x_e[[\![NP]\!](x) \ \& \ x = g(i)]$

In support of this proposal, Simonenko (2014) argues for this view of the DP based on the behavior of referential definites in Bavarian, while Hanink (2018) further motivates the structure in (23) for Washo in particular by showing that the suffix *-gi/ge* in clausal nominalizations such as internally headed relatives is best treated as a realization of idx, rather than D. She points out that, aside from nominalizations, *-gi/ge* is also observed in independent pronominal forms (26), as well as in the structure of demonstratives (27):

(26)   *gí: pélew   ʔíʔwi*
       gí: pélew   ʔ-íʔw-i
       3.PRO.NOM jackrabbit 3-eat-IND
       'He's eating the jackrabbit.'   =(16a)

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[7]For both Elbourne (2005) and Schwarz (2009), the index does not project its own phrase.

(27)   *hádi**gi**   pélew   Mú:biʔi*
       hadi-**gi**   pelew   ∅-Mu:biʔ-i
       DEM-3.PRO jackrabbit 3-run-IND
       'That jackrabbit ran.'

Hanink argues that the distribution of this morpheme is indicative of the interpretation of *-gi/ge* as a variable meaning of precisely the kind proposed to be encoded by idx. Crucially moreover, *-gi/ge* is shown to be a head separate from D in that it can occur with another type of D head in the case of demonstratives, as in (27), adopting the structure of demonstratives as proposed by, e.g., Elbourne (2008). Going forward, we adopt this proposal for the structure of anaphoric/referential DPs in Washo.

3.1.2   The structure of CP

Turning now to the clausal level, we follow Peachey (2006) in the proposal that the syntax of embedded nominalizations contains a fully spelled-out CP structure. Evidence that the material below this nominal layer constitutes a complete, independent clause comes from various morphological clues. First, these clauses are able to host tense information, which we treat as a realization of T (though tense is optional; see Bochnak 2016 for a detailed analysis of tense and temporal interpretation in the language). This is exemplified in the following example through the presence of the intermediate past suffix *-ayʔ* in (28):

(28)   *dáwligaŋa mí:giyayišge*   *lé:saʔ*   *lí:giyi*
       [DP [CP dawligaŋa m-i:gi **-ayʔ** -i-š]-ge]   le:-saʔ   l-i:gi-i
         movie   2/3-see **-INT.PAST** -IND-DS-NM.ACC 1.PRO-also 1/3-see-IND
       'I also saw the movie that you saw.'

Second, these clauses require the presence of the independent mood suffix, which, as discussed in the previous section, is always realized as *-i* in nominalizations, and is accordingly observed in (28). Here we adopt the assumption that mood markers are housed in their own projection, MoodP, which surfaces below CP (following e.g., Giannakidou 2009 for Greek). As mentioned above, we return to arguments for the classification of this suffix as a mood marker in Section 5.

Finally, further evidence for a CP layer comes from the fact that nominalized clauses exhibit switch reference morphology (Jacobsen 1967) where appropriate. Switch reference morphology is common in languages of North America (McKenzie 2015) and refers to grammatical markers that appear to track whether subjects of two clauses are coreferent. Switch reference in Washo is overtly realized only when these subjects are *not* coreferent, and is realized by the suffix *-š*, which indicates that the subject of an embedded clause differs from the one in the clause it is embedded in (Jacobsen 1964, 665; Jacobsen 1998). Taking the same example again, consider (29). The subject of the embedded clause is the addressee, while the subject of the matrix clause is the speaker of the sentence. As these subjects are not coreferent, the different subject marker *-š* appears at the edge of the embedded verb, as the final morpheme before the nominalizer *-ge*.

(29)   *dáwligaŋa mí:giyayišge*   *lé:saʔ*   *lí:giyi*
        [$_{\text{DP}}$ [$_{\text{CP}}$ *pro$_j$* dawligaŋa m-i:gi-ayʔ-i **-š**]-ge]   le:$_i$-saʔ   l-i:gi-i
              movie   2/3-see-INT.PAST-IND **-DS** -NM.ACC 1.PRO-also 1/3-see-IND

        'I$_i$ also saw the movie that you$_j$ saw.'   =(28)

We follow Finer (1985) on the proposal that the different subject marker in Washo is hosted in C (see also Watanabe 2000; Arregi & Hanink 2018), constituting evidence for the presence of a CP layer in these nominalizations. We note that there are no other overt complementizers in the language.

Taking these points together, we schematize the structure we adopt for clausal nominalizations in (30b), in which the entire clause is selected for by idx, a functional head in the extended projection of D. The entire DP is then selected for by the matrix verb, as its complement (see Hanink 2019 for a treatment of the realization of case on these nominalizations). Note that because Washo is a largely head-final language, the structure is left-branching aside from the DP, in which nominal modifiers are largely initial.[8]

(30)   a.   *hášayšge*   *dihámup'ayi*
          [∅-haʔaš-ayʔ-i-š-ge]   di-hamup'ay-i
          3-rain-INT.PAST-IND-DS-NM.ACC 1/3-forget-IND

          'I forgot that it rained.'   =(7)

   b.
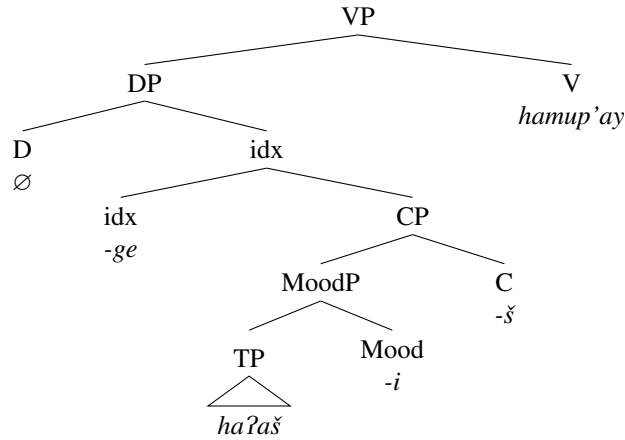
3.1.3   Factive verbs select their complements

As indicated in the proposed structure for clausal nominalizations in (30b), the nominalization of the embedded clause results in the selection of a DP argument by the matrix verb *hámup'ay* 'forget'. This is consistent with the transitive nature of these verbs elsewhere in the language: Verbs in this class select thematically for an internal argument and are observed to mark case on the nominalizations they select for. This case-assigning behavior is mirrored in the case of non-clausal arguments, as in (31), where the object of 'know' is 'that man'. While case-marking in Washo is never realized on bare nominals, it is the accusative form of

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[8]The suffixal nature of *-ge* can be captured either through head movement, or by Lowering (Embick & Noyer 2001) of idx to C.

the pronoun that surfaces as the direct object of 'see' in (32).[9]

(31) *hádigi t'éliwhu   lášašé:si*
      [DP hadigi t'eliwhu] l-ašaš-e:s-i
          that   man   1-not.know-NEG-IND

      'I know that man.'

(32) *ʔló:t   gé:ŋa   ʔí:giyé:sayt'iʔi*
      ʔlo:t   [DP ge:-ŋa]   ∅-i:gi-e:s-ayt'iʔ-i
      yesterday   3.PRO.ACC-NC   3/3-see-NEG-PLUPF-IND

      'She hadn't seen it yesterday.'   =(16b)

We take the case-marking of nominalized clauses –both in nominative subjects and accusative objects – to be uncontroversial evidence of their status as complements.

3.2   The structure of bare clausal embedding

Clauses embedded by non-factive verbs differ first and foremost from their factive counterparts in that they are not nominalized and therefore lack a DP layer altogether, though they also differ in two further ways. First, clauses embedded by non-factive verbs lack a CP-layer. Instead, we treat these clauses as MoodPs headed by the dependent mood marker *-aʔ*, constituting a type of semi-reduced clause in the language (though not much hinges on this, as it seems to be merely a quirk of the language). More importantly, the behavior of clauses embedded by non-factive verbs reveals that these *-aʔ* clauses are not complements at all, but are better understood as adjuncts. We therefore argue instead that these clauses are not selected but serve as verbal modifiers, much in line with recent proposals for English by e.g., Elliott (2016).

3.2.1   Motivating the lack of CP

The first piece of evidence for the lack of a CP layer in clauses embedded by non-factive verbs comes from the fact that clauses embedded by non-factive verbs are the only subordinate construction in the language where the switch reference marker *-š* doesn't surface in an embedded clause (noted also by Jacobsen (1964: 639-641)). As discussed above for the case of clausal nominalizations, the switch reference marker surfaces in any embedded clause whose subject differs from the one in the clause embedding it. This means that we should, in principle, expect the switch reference morpheme *-š* to surface in the following example, in which the subjects of the two clauses differ:

(33) *dip'áyt'igimuwet'aʔ*   *ʔí:di*
      [MOODP di-p'ayt'iʔ-gim-uweʔ-tiʔ-aʔ]   ʔ-i:d-i
              1-play-go.out-hence-INT.FUT-DEP 3-say-IND

      'She said I could go play.'   =(12)

---
[9] We note moreover that the status of clausal nominalizations as true arguments of the matrix verb is also reflected in the agreement prefix on the matrix verb, which comes in the form of a portmanteau reflecting the person features of the subject and object in transitive contexts (see Douros 2019).

Though the subject of the matrix clause is some female individual and that of the embedded clause is the speaker, the different subject suffix does not appear. We therefore argue that these clauses do not contain a CP layer, thereby explaining the otherwise puzzling lack of switch reference morphology.

Corroborating this argument is the fact that, aside from clausal nominalizations with the mood marker *-i*, there are other clauses that surface with the dependent mood marker *-aʔ*, but which nevertheless *do* display switch reference morphology where expected. Such cases are found in the temporal adjuncts discussed above in Section 2, which convey a simultaneous reading. Adjuncts of this kind are exemplified below in (34) and (35):

(34) *t'éliwhu delkáykayiʔ*   *k'éʔi*
    t'eliwhu de-ʔil-kaykay-iʔ   k'-eʔ-i
    man   NMLZ-ATTR-tall-ATTR 3-COP-IND

        daʔmóʔmoʔ delkáykayé:s   *k'áʔaš*]
    [CP daʔmoʔmoʔ de-ʔil-kaykay-i-e:s   k'-aʔ-a **-š**]
        woman   NMLZ-ATTR-tall-ATTR-NEG 3-COP-DEP **-DS**

    'The man is taller than the woman.'
    ='The man is tall, while the woman is not tall.'   Bochnak (2015: 64)

(35) *lémluyaš*   *ʔí:meʔlegi*
    [CP l-emlu-aʔ **-š**] ʔ-i:meʔ-leg-i
        1-eat-DEP **-DS** 3-drink-REC.PAST-IND
    'While I was eating, he was drinking.'   Jacobsen (1964)

Such examples show that the different subject marker is not simply incompatible with the dependent mood marker for independent reasons; its absence in clauses embedded by non-factive verbs is therefore a signal for the lack of C in the structure. We conclude this argument with the following minimal pair, which highlights the correlation between meaning difference and presence/absence of different subject morphology:

(36) a.   *súkuʔ legít'iya*   *digumsuʔúʔušlegi*
    [MOODP sukuʔ le-git'i-aʔ] di-gum-suʔuʔuš-leg-i
        dog   3/1-bite-DEP 1-REFL-dream-REC.PST-IND
    'I dreamt that the dog bit me.'   Washo Archive

    b.   *súkuʔ legít'iyaš*   *digumsuʔúʔušlegi*
    [CP sukuʔ le-git'i-aʔ **-š**] di-gum-suʔuʔuš-leg-i
        dog   3/1-bite-DEP **-DS** 1-REFL-dream-REC.PST-IND
    'The dog bit me while I was dreaming.'   Washo Archive

Aside from the switch reference pattern, an additional piece of evidence for the lack of C comes from fronting behavior. One characteristic of clauses embedded by non-factive verbs is that they generally remain in their clause-internal position, as exemplified by the typical SOV order in (37) (repeated from 11), as well as in (38):

(37) *béverli   démlu dibegúweʔé:saʔ   hámuyi*
beverli [_MOODP_ demlu di-beguweʔ-e:s-aʔ] ∅-hamu-i
Beverly   food   1/3-buy-NEG-DEP   3-think-IND
'Beverly thinks that I didn't buy the food.'   =(11)

(38) *géwe   dótighayaʔ   hámuyaʔ*
gewe [_MOODP_ dotig-ha-aʔ]   ∅-hamu-aʔ
coyote   burn-CAUS-DEP 3-think-DEP
'Coyote thought he burned him [the lizard] to death.'   Coyote & Lizard Story

This behavior differs from that of clausal nominalizations, which strongly prefer to front – a common trait of CPs and heavy NPs such as clausal nominalizations. To exemplify this, consider the following example in (39), in which the matrix clause subject *daʔmóʔmoʔ* 'woman' appears in a non-canonical position following the nominalization, rather than in its expected initial position in an SOV language such as Washo:

(39)   *k'ák'aʔ dá: gé:gelišge   daʔmóʔmoʔ yá:maʔ*
[_DP_ [_CP_ k'ak'aʔ da: ∅-ge:gel-i-š] -ge]   daʔmoʔmoʔ ∅-ya:m-aʔ
        heron   there 3-sit-IND-DS-NM.ACC woman   3/3-speak-DEP
'The woman spoke to a heron who was sitting there.'   Jacobsen (1998: 111)

Other instances exemplifying the fronting of CPs include, for example, adverbializations of clauses formed with the suffix *-da* as in (40) and (41), which receive a serial interpretation:[10]

(40)   *dewdíʔiš ʔélmu digé:gelida   léšımgaʔlámigi   Léʔi*
[_ADVP_ [_CP_ dewdiʔiš ʔelmu di-ge:gel-i-∅]-da] l-ešim-gaʔlam-i-∅-gi   L-eʔ-i
        tree   under 1-sit-IND-SS-ADV   1-sing-like-IND-SS-NM.NOM 1-be-IND
'When sitting under a tree, I like to sing.'

(41)   *ŋàwa ʔeʔíŋawišda   t'ánuhe:š yúliyayt'iʔi*
[_ADVP_ [_CP_ ŋawa ∅-ʔeʔiŋaw-i-š]-da] t'anu-he:š ∅-yuli-yayt'iʔ-i
        earth 3-move-IND-DS-ADV person-Q 3-die-PLUPF-IND
'Did anyone die in the earthquake?'
='When the earth moved, did anyone die?'   Washo Archive

Taken together, the facts from switch reference and fronting behavior suggest that there is no CP layer within clauses anchored by *-aʔ*. We therefore propose the structure in (42b) for this type of complement, in which MoodP adjoins to VP (we turn immediately to the proposal of adjunction in Section 3.2.2).

(42)   a. *dip'áyt'igimuwet'aʔ   ʔí:di*
           [di-p'ayt'iʔ-gim-uweʔ-tiʔ-aʔ]   ʔ-i:d-i
            1-play-go.out-hence-INT.FUT-DEP 3-say-IND
           'She said I could go play.'   =(12)

---

[10]The nominalization seen in (40) represents a strategy in Washo for expressing generic statements (Bochnak, 2015).

b.

```
                        VP
                       /    \
                  MoodP      VP
                 /    \        △
               TP     Mood    i:d
              /  \     -aʔ
       p'ayt'igimewet'
```
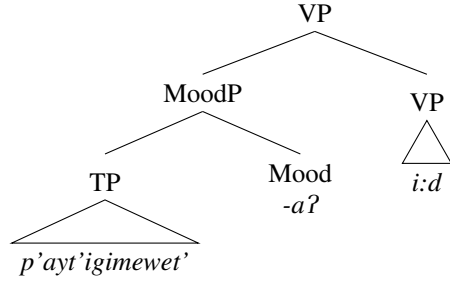
3.2.2 Non-factive verbs do not select

As the structure in (42b) makes clear, our proposal is that non-factive verbs differ from their factive comple-ments in that they do not subcategorize for a DP complement. In fact, they do not select for a complement at all, but are modified instead by MoodP adjuncts. This proposal is motivated by the behavior of non-clausal arguments of non-factive verbs: The same verbs that embed MoodPs do not select complements elsewhere in the language.

That non-factive verbs do not select is made clear for example from the behavior of *wh*-questions in the language. In Washo, the *wh*-pronoun 'what' is *hút'aŋahé:š*, and is able to be selected for by the verb *iʔiw* 'eat' as in (43):

(43)   *hút'aŋahé:š   míʔwi*
        [WH hut'aŋa-he:š] m-iʔiw-i
            what-Q   2/3-eat-IND
        'What did you eat?'

However, in similar questions involving non-factive verbs such as 'think' (44) and 'say' (45), the *wh*-pronoun *huŋa* 'how' is used instead, indicating that these verbs may not select for DP arguments.

(44)   *húŋa   ʔumhámuhe:ši*
        [WH huŋa] ʔum-hamu-he:š-i
            how   2-think-Q-IND
        'What (=how) do you think?'

(45)   *húŋa   míthe:ši*
        [WH huŋa] m-i:d-he:š-i
            how   2-say-Q-IND
        'What (=how) did you say?'

Crucially, the cut here follows precisely the adjunct vs. argument distinction of *wh*-words (Huang 1982), revealing that non-factive verbs cannot select for argument *wh*-words such as 'what', but only adjunct *wh*-words, such as 'how'. The behavior of clausal embedding by both verb types is therefore mirrored in the domain of *wh*-questions as well.

14

Another piece of evidence that non-factive verbs do not select for *-aʔ* clauses comes from the behavior of reflexives. Reflexivization in Washo is realized by the verbal prefix *gum-* (invariant for person and number). The presence of the reflexive prefix unsurprisingly removes the possibility of an additional internal argument, as the reflexive object must fill this thematic role. This effect is demonstrated in (46), which shows that the verb *yášu* 'wash' is reflexive in Washo, and thus cannot take a direct object. The notional 'object' is therefore expressed with the oblique case marker, *-a*; the reflexive prefix cannot co-occur with another internal argument unless this oblique case-marking is present.

(46) a. *dimáyaba*   *digumyášuyášaʔi*
      di-mayab **-a**   di- **gum-** yašu-ašaʔ-i
      1.POSS-foot **-OBL** 1- **REFL-** wash-INT.FUT-IND
      'I'm going to wash my feet.' (=‘I'm going to wash myself on my feet.’)   Washo Archive

      b. **dimáyab*   *digumyášuyášaʔi*
      di-mayab   di- **gum-** yašu-ašaʔ-i
      1.POSS-foot 1- **REFL-** wash-INT.FUT-IND
      Intended: 'I'm going to wash my feet.'

Crucially, certain non-factive verbs are also inherently reflexive in Washo, but may nevertheless embed *-aʔ* clauses. Take for example the verb 'dream', as in (47). The fact that the prefix *gum-* is present rules out the possibility that the *-aʔ* clause is selected as the object of the matrix verb.

(47)   *diyéʔešaʔ*   *digumsuʔúšiʔi*
      [di-ye-iʔiš-aʔ]   di- **gum-** suʔuʔuš-iʔ-i
       1-fly-forward-DEP 1- **REFL-** dream-ATTR-IND
      'I dreamt that I was flying.'   =(13)

The reflexive use of 'dream' in (47) can be contrasted moreover with the verb in (48), which lacks the reflexive prefix, and is therefore able to take the second person direct object in this case.

(48)   *wá:laš disuʔúšlegi*
      wá:laš di-suʔuʔuš-leg-i
      bread   1/3-dream-REC.PST-IND
      'I dreamt of/about bread.'   Washo Archive

This line of reasoning predicts that without the reflexive moreover, non-factive verbs can select for nominalizations.[11] This prediction is born out, as shown by the contrast between (49) and (50). The verb 'dream' in (49) is reflexivized, and takes a reduced MoodP adjunct, while in (50) it is not reflexive and is able to select for a nominalized clause. Crucially, the two have different meanings: The embedded clause in (49) is interpreted as a 'that'-clause, while in (50) it is interpreted as an internally headed relative.

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[11]We also then predict that reflexive factive verbs could be modified by *-aʔ* clauses, or else would have some kind of oblique marking on the nominalized *-ge* clause. At this point, we do not know of any inherently reflexive factive verbs.

(49) Context: You were sleeping and you woke up suddenly. You say:

sísu šéšıma?   *digumsu?úši*
[sisu šešim-a?]   di **-gum** -su?uš-i
 bird 3.sing.PL-DEP 1 **-REFL**-dream-IND

'I just dreamt the birds were singing.'

(50) Context: I ask you if you dreamt about the birds that were singing yesterday. You say:

sísu šéšmišgeŋa   *disu?úšé:si*
[sisu šešim-i-š-ge-ŋa]   di-su?uš-e:s-i
 bird 3.sing.PL-IND-DS-NM.ACC-NC 1/3-dream-NEG-IND

'I didn't dream about the birds that were singing.'

In sum, clauses embedded by non-factive verbs are not selected, but are better understood as VP modifiers, as represented in the structure in (42b). These types of clauses are therefore different from the complements of factive verbs in both their size, in their choice of mood marker, and in their mode of embedding.

3.3 Summary

The aim of this section has been to show that there are clear syntactic differences between the clausal embedding strategies of factive and non-factive verbs in Washo. We have shown that factive verbs select directly for full, nominalized clauses marked with the independent mood *-i*, while clauses embedded by non-factive verbs are smaller MoodPs, and headed by the dependent mood marker *-a?*. Importantly, we have also shown that non-factive verbs do not select for the clauses they embed; we have argued that MoodP in these cases is an adjunct to VP. Table 2 below expands on Table 1, giving a further classification of the differences between clauses embedded by both verb types.

Table 2: Embedded clauses by matrix verb type in Washo

	nominalizer	mood marker	clause size	clause type
factive	*-gi/ge*	*-i*	CP	complement
non-factive	—	*-a?*	MoodP	adjunct

Having laid out the syntactic properties of clausal embedding in Washo, we turn in the next section to the discussion of the semantic differences correlated with the two structures, and give a complete picture of how the syntax and semantics work together in Washo in order to derive the difference between both types of embedded clauses with mechanisms that are independently required by the language.

4   The role of clausal embedding in factivity

We show in this section that the interpretation of the two types of embedded clauses described above is directly informed by differences in their underlying structures. The differences in the meanings of these

clauses is conditioned both by the verbs that embed them, as well as characteristics of the embedded clauses themselves. In this section, we lay out the background for approaches to the meanings of attitude verbs, and elaborate on how these assumptions can inform approaches to factivity effects in embedded clauses.

4.1 Decomposing attitude verbs

A version of the classical Hintikkan semantics for propositional attitude verbs (Hintikka 1969) is given in (51). The attitude verb relates a proposition p, denoted by the complement clause, and an individual x, the subject. The relation encoded in *believe* is that p is true in all of x's doxastic alternatives.

(51) $[\![believe]\!]^w = \lambda p \lambda x. \forall w'[w' \in \mathrm{Dox}_x(w) \to p(w') = 1]$

This picture can be augmented to accommodate factive verbs by simply adding the presupposition that p is true in the evaluation world to the lexical entry directly. In this way, *know* can be modeled similarly to *believe* with an extra presupposition, as in (52).[12]

(52) $[\![know]\!]^w = \lambda p \lambda x : \underline{p(w) = 1}. \forall w'[w' \in \mathrm{Dox}_x(w) \to p(w') = 1]$

Thus, on this view, the attitude verb selects directly for its complement, and factivity is built in directly to its lexical semantics.

More recently, however, a strand of research has developed that revises this classical view. In the work of Kratzer (2006), Moulton (2009, 2015) and Elliott (2016), propositional attitude verbs are analyzed instead as simple predicates of events, on a par with other classes of verbs more generally under a neo-Davidsonian view. Under this analysis, *believe* simply describes believing events (or states), as in (53).

(53) $[\![believe]\!]^w = \lambda s.\mathbf{believe}_w(s)$

Given that the only argument position is for an event or state, the content of the belief, i.e., the complement clause, must be integrated into attitude reports in a different way. Under this type of analysis, the composition of an attitude verb and its complement is accordingly more complicated than the analysis in (51)-(52). Let us begin to unpack this here.

Building on Kratzer (2006), Moulton (2009, 2015) argues that complement clauses, and more generally *that*-clauses in English, do not denote propositions (i.e., sets of possible worlds) directly; rather, they denote sets of individuals of a certain kind. Moulton takes examples like (54) as evidence for this view.

(54) The idea/story/rumor/fact is that Bob is a fraud.   Moulton (2015)

If the predication in (54) is equative (cf. Potts 2002), then subject DPs and *that*-clauses must denote the same type of object. Thus, if *that*-clauses denote sets of worlds, then content nouns should too. Moulton argues however that this conclusion is not on the right track: Content nouns should not be equated with the

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[12]This semantics equates knowledge with true belief, which is much too simplistic. See von Fintel & Heim (2011) and references therein for discussion.

proposition that Bob is a fraud. Instead, Moulton proposes that *that*-clauses denote sets of individuals whose *content* is a certain proposition, as in (55). The link between the embedded proposition and its content is mediated by a function CONT_w, which takes an individual x and returns the set of worlds compatible with the content of x, as in (56).

(55) $[\![\textit{that Bob is a fraud}]\!]^w = \lambda x.\text{CONT}_w(x) = \lambda w'.\text{Bob is a fraud in } w'$

(56) $\text{CONT}_w(x) = \{w' : w' \text{ is compatible with the intentional content determined by } x \text{ in } w\}$

<div align="right">Moulton (2015: 312)</div>

The compositional glue is a functional head in the high periphery of embedded clauses that transforms propositions into properties of individuals. We refer to this head as F_{PROP} and give its denotation in (57). The result of combining F_{PROP} with the proposition denoted by the complement clause is a predicate of individuals whose content is equated with the proposition denoted by the clause, as in (58).[13]

(57) $[\![F_{\text{PROP}}]\!]^w = \lambda p_{\langle s,t\rangle} \lambda x_e[\text{CONT}_w(x) = p]$ (cf. Kratzer 2006; Moulton 2009, 2015; Elliott 2016)

(58) $[\![F_{\text{PROP}} \, [\text{CP}] \,]\!]^w = \lambda x_e[\text{CONT}_w(x) = [\![\text{CP}]\!]]$

One extra step is needed in order to combine the meaning in (58), which is of type $\langle e, t\rangle$, with the attitude verb in (53), which is a predicate of events of type $\langle v, t\rangle$. Here we follow Lasersohn (1995) and Elliott (2016) in positing no model-theoretic type distinction between individuals and events/states. This move now makes it possible for the matrix predicate to combine semantically with the complement clause via Predicate Modification (Heim & Kratzer, 1998). The result is that a sentence containing an attitude ascription can be given the semantics in (59).[14] Stated in prose, (59) says that there is a state of believing, the holder of which is Abby, and the content of which the proposition that Bob is a fraud.

(59) $[\![\textit{Abby believes that Bob is a fraud}]\!]^w$
      $= \exists s[\textbf{believe}_w(s) \ \& \ \textbf{holder}_w(s) = \text{Abby} \ \& \ \text{CONT}_w(s) = \lambda w'.\text{Bob is a fraud in } w']$

An important question that emerges from this view of attitude predicates is the relationship between the matrix verb and the clause it embeds. The reduction of attitude verbs to event predicates as well as the view of *that*-clauses as property-denoting leads to a view according to which clauses embedded by these verbs are always modifiers, and selectional relationships are not necessary. Elliott (2016) builds on this idea and makes the strong claim that *that*-clauses and DP arguments of the types in (60) and (61) differ fundamentally in that the latter are always selected, while the status of the former as modifiers means that they are not.

(60) Angela explained [$_{\text{CP}}$ that Boris resigned].

(61) Angela explained [$_{\text{DP}}$ the fact that Boris resigned].   Elliott (2016: 171)

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[13]Under this analysis, the meaning in (58) acts as the predicate in examples like (54), where the subject DP (e.g., *the idea*) denotes an individual, which saturates the type e argument slot of the *that*-clause.

[14]We assume that the external argument is introduced by a little-v head that denotes the **holder** relation (i.e., the subject is the holder of the state of believing).

This revised view also suggests that factivity distinctions are not to be found in the lexical semantics of attitude verbs, for these are simply predicates of events or states. On this decompositional view, factivity would need to be integrated through composition with the complement clause. We now turn to some recent ideas on how this could be done.
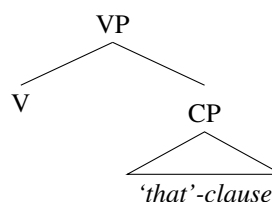
4.2 Embedded complement clauses

The idea that *that*-clauses are always modifiers in the sense described above is at odds with recent proposals regarding the syntax of clausal embedding. For example, Kastner (2015) proposes a direct syntax to semantics mapping in that factive and non-factive verbs have different selectional requirements: The former select a DP (62), while the latter select for a complement clause directly (63).

(62) *Factive verbs*:

```
        VP
       /  \
      V    DP
          /──\
       'that'-clause
```
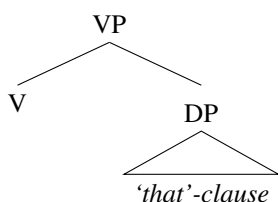
(63) *Non-factive verbs*:

```
        VP
       /  \
      V    CP
          /──\
       'that'-clause
```

Kastner argues that the difference in interpretation of factive and non-factive verbs reflects this difference in structure. Specifically, he adopts Heim's (1982) approach to familiarity and argues that the D head in (62) introduces a presupposition that there is a familiar entity in the discourse. Meanwhile, complements without D have no familiarity restrictions, as in (63). His evidence comes from well-known extraction asymmetries between factive and non-factive complements (Kiparsky & Kiparsky, 1970), as well as morphological evidence from Hebrew that demonstrates the different categorial status of complements overtly. In factive complements, the demonstrative *ze* 'this' introduces the *that*-clause, as in (64).[15] In non-factive complements, no such definite morphology is present (65).

(64) *Bill zoxer* [DP *et* *ze* [CP *še-dani*   *ganav et*   *ha-ugiot*]]
      Bill remember   ACC this   COMP-Danny stole   ACC the-cookies
      'Bill remembers that Danny stole the cookies.'   Hebrew: Kastner (2015: 162)

(65) *ani xošev* [CP *še-dani*   *ganav et*   *ha-ugiot*]
      I   think   COMP-Danny stole   ACC the-cookies
      'I think that Danny stole the cookies.'   Hebrew: Kastner (2015: 164)

A consequence of this analysis is that factivity is not a semantic property of attitude verbs, but is derived from the presence (or absence) of D in the embedded clause, which introduces a familiarity presupposition.[16]

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[15] On this basis, Kastner also rejects the approach of Sheehan and Hinzen (2011), which is that the clausal complements of factive verbs are definite and referential *CPs*, which get their familiar flavor from C, not D.

[16] Note however, that a familiarity presupposition is not by itself enough to guarantee factivity, which requires the *truth* of the embedded proposition in the evaluation world. We return to the issue later in Section 5.3.

Independent cross-linguistic support for the view that the 'nouny-ness' of the complement correlates with a presuppositional requirement of familiarity comes from Bogal-Allbritten & Moulton (2017), who build on Kim (2009) and argue for a notion of familiarity implicated in nominalized clauses in Korean, as in (66), in which the complement of factive 'know' is likewise nominalized:

(66)   *John-un* [$_{\text{DP}}$ *totwuk-i* *tomangka-n-un*   *kes-ul*] *al-ess-ta*
      John-TOP   thief-NOM run.away-IMPF-ADN KES-ACC know-PST-DEC
      'John knew (the fact) that the thief was running away.'   Kim (2009: 3)

This is similar to what we find in Hebrew and Washo insofar as nominalized clauses in these languages are to be found with factive verbs only. The problem that arises then from the treatment of *that*-clauses and their cross-linguistic kin uniformly as modifiers (as on their property analysis) is how to account for the differences between clauses embedded by factive and non-factive verbs: There is no way to treat the embedded clause in (62) as a modifier, given its status as an individual-denoting DP.

While similar to Kastner's, our syntactic analysis of factive vs. non-factive complements in Washo is slightly different. Like Kastner, we propose that factive complements are larger than non-factive complements. The former come with DP material encasing a CP, in which the suffix *-gi/ge* is the realization of the functional head idx, which encodes familiarity. Further, our non-factive complements lack a DP layer. Crucially however, there are two important differences. First, while Kastner does assume that there is a silent N head in the DP structure (see also Elbourne (2013)), this is not motivated for Washo. Recall crucially that in Washo, there is no overt nominal: Clause-embedding nouns such as 'fact' or 'rumor' are unattested in the language. In Washo, nominalizing morphology is simply a suffix on the verb, and no noun is ever pronounced between this morphology and the CP it embeds. Unless we want to rely on the claim that such a noun is always silently encoded in the structure – which is unattested in Washo – the treatment of the clauses embedded by factive verbs as modifiers is untenable.

Second, the Washo data reveal not only a difference in size, but also a difference in embedding strategy: Clauses embedded by factive verbs are selected, while those embedded by non-factive verbs are modifiers, contra Kastner's proposal. The picture that emerges from Washo yields two important results. First, it provides novel and cross-linguistic support for Kastner's proposal that factive verbs select for DPs. Second however, it challenges the view that non-factive verbs select for embedded clauses at all, and in doing so lends evidence to a property analysis of *that*-clauses according to which certain (but not all) embedded clauses are not selected, along the lines of Elliott's (2016) proposal.

In the next section, we derive the two modes of embedding that have been discussed for Washo. We show that the apparent factivity of clauses embedded by certain verbs falls out more generally from the familiarity introduced by a nominalizing layer, while the lack of factivity effects in other embedded clauses is due to an alternate mode of embedding: modification. We show that these are the two strategies for embedding more generally throughout Washo.

5 Deriving clausal embedding in Washo

We present in this section an analysis of clausal embedding in which the syntax and semantics work together to derive the behaviors that we have discussed above. First, the DP material in clausal nominalizations contributes familiarity to the content expressed by the proposition denoted by the embedded clause, giving rise to factivity effects. Non-factive embedded clauses carry no such presupposition, and are adjuncts to the intransitive attitude predicates they modify. Second, the mood markers *-i* and *-aʔ* in Washo have different meanings, which reflect the different roles played by the clauses they occur in. These roles govern (in part) whether an embedded clause is a complement or a modifier of the verb that embeds it.

5.1 The semantics of independent and dependent mood markers

Let us begin with a modest proposal for the semantics of the mood markers *-i* and *-aʔ*, which appear in clauses embedded by factive and non-factive verbs, respectively. First, given its wide distribution and default status for matrix clauses (e.g., (5), repeated in (67)), we propose that the independent mood marker *-i* denotes the identity function, i.e., it is semantically vacuous, as shown in (68).

(67)   *gawáyiʔ MúʔušuweʔI*
       gawayɨʔ ∅-Muʔuš-uweʔ **-i**
       horse   3-run-hence **-IND**
       'The horse is running away.'   =(5)

(68)   Independent mood marker
       $[\![\text{-}i]\!] = \lambda x_\alpha[x]$

Meanwhile, we propose that the dependent mood marker *-aʔ* has the semantics of conjunction. Specifically, in the case of clauses embedded by non-factive verbs, *-aʔ* conjoins predicates of individuals, as in (69).

(69)   Dependent mood marker
       $[\![\text{-}aʔ]\!] = \lambda P_{\langle e,t\rangle}\lambda Q_{\langle e,t\rangle}.\lambda x_e[P(x) \,\&\, Q(x)]$

This semantics explains two crucial characteristics of *-aʔ* clauses. First, it explains why clauses of this type cannot take on factive or familiar interpretations: They lack the DP layer containing both D and the idx head found in the structure of clausal nominalizations. On our analysis, an $\langle e, t\rangle$-type embedded clause combines directly with the attitude predicate, leaving no room for an intervening D to contribute familiarity (as we will see in more detail below). Second, it explains why clauses with this mood marker cannot stand alone, i.e., why *-aʔ*-marking is restricted to subordinate clauses. In section 5.5, we show that the conjunction semantics of *-aʔ* can be generalized to conjoin other types of semantic objects, which provides an explanation for its distribution in other types of subordinate clauses, particularly adjunct clauses. In the rest of this section, we detail the semantic composition of factive and non-factive complements in Washo, based on the syntax we put forward in section 3 and the aspects of the semantic analyses of attitude predicates and *that*-clauses introduced in Section 4.

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5.2 Factive complements and the role of nominalization

We now turn to the derivation of the clausal complements of factive verbs. We adopt the idea introduced in Section 4 that the role of a functional element F_{PROP} is to turn the proposition-denoting embedding clause into a property of individuals whose content is expressed by that proposition. In our implementation, we treat F_{PROP} as an optional type-shift as in (70), which applies at the level of TP, instead of as an obligatory syntactic node in the clausal periphery.

(70) **F_{PROP} type-shift**

$$P_{\langle s,t \rangle} \rightarrow \lambda x_e[\text{CONT}(x) = P]$$

Adopting the assumptions about the structure of the DP and CP outlined in Section 3, the nominalizing DP-layer hosts a silent D head as well as the head idx, which is overtly realized as *-gi/ge*. This idx head selects for its complement clause directly. The derivation of a clausal nominalization embedded by the factive verb 'know' is given in (71). First, the embedded clause is formed and undergoes the F_{PROP} type-shift, returning a set of individuals whose content is specified by the proposition 'the man came long ago.' Second, this embedded clause composes with both Mood and C, both of which denote the identity function in this case. Third, the resulting property denoted by the CP undergoes Predicate Modification with idx, resulting in a property of individuals that are anaphoric/familiar. Finally, this property is ι-bound by D, resulting in the unique individual whose content is specified by the embedded proposition, and which is identical to the referent mapped to 1 by the assignment function g.

(71) **Factive complement:**

a. *t'éliwhu lí:uŋil*　　*ʔí:biʔayšge*　　　　　　　*lášašé:si*
    [DP[CP t'eliwhu li:-uŋil　∅-i:biʔ-ayʔ-i-š]-ge]　l-ašaš-e:s-i
    man　　then-DEFUNCT 3.come-INT.PAST-IND-DS-NM.ACC 1/3-not.know-NEG-IND
    'I know that the man came a long time ago.'　　　　　　　　　　　　　=(4)

b.

DP
t'éliwhu lí:uŋil ʔí:biʔayišge
$\iota x_e.\text{CONT}_w(x) = \lambda w'_s[\text{man came long.ago}_{w'}] \;\&\; x = g(1)$

D
$\lambda P_{\langle e,t\rangle}\iota x_e[P(x)]$

idxP
$\lambda x_e.\text{CONT}_w(x) = \lambda w'_s[\text{man came long.ago}_{w'}] \;\&\; x = g(1)$

idx
-ge
$\lambda z_e[z = g(1)]$

CP
t'éliwhu lí:uŋil ʔí:biʔayiš
$\lambda x_e.\text{CONT}_w(x) = \lambda w'_s[\text{man came long.ago}_{w'}]$

MoodP
t'éliwhu lí:uŋil ʔí:biʔayi
$\lambda \text{x}_e.\text{CONT}_w(x) = \lambda w'_s[\text{man came long.ago}_{w'}]$

C
-š
$\lambda y_\alpha[y]$

TYPE SHIFT: F$_{\text{PROP}}$
$\lambda x_e.\text{CONT}_w(x) = \lambda w'_s[\text{man came long.ago}'_w]$

Mood
-i
$\lambda z_\alpha[z]$

TP
t'éliwhu lí:uŋil ʔí:biʔayʔ
$\lambda w'[\text{man came long.ago}'_w]$
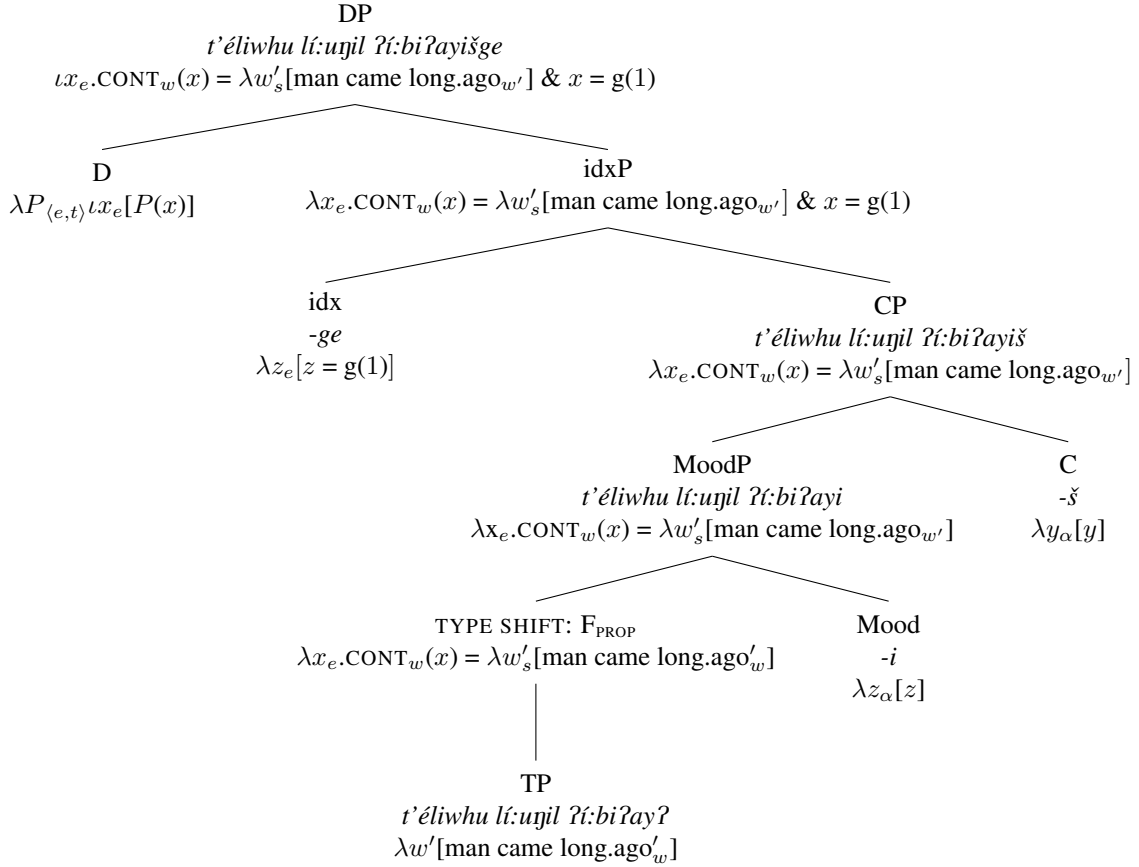
Diverging from Kastner (2015) and related claims in Bogal-Allbritten & Moulton (2017), we take the presence of idx to be responsibility for encoding familiarity of the content expressed by the embedded clause, which is present in clauses embedded by factive verbs, but absent in those embedded by non-factive ones. The idea is that the assignment function will map the index (1, in the above example) to the salient individual whose content expressed the same proposition as the nominalized clause. The result is that the complement of the verb is an individual of type e, rather than a proposition of type $\langle s, t\rangle$. It can now combine with the transitive matrix verb via function application, just like any other individual-denoting DP would.[17] The truth conditions for (71) are then those in (72).

(72) $\exists \text{s}[\text{knowing}_w(\text{s}) \;\&\; \text{HOLDER}_w(\text{s}) = \text{speaker} \;\&\; \text{THEME}_w(\text{s}) = \iota x[\text{CONT}_w(x) =$
     $\lambda w'[\text{Emily is a good singer}_{w'}]] \;\&\; \text{x} = g(1)]$

In parallel, examples in which 'know' selects for a simple anaphoric DP work as follows. Consider again the example in (73), repeated from (31):

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[17]In Elliott's (2016) Neo-Davidsonian account, this argument is introduced as the specifier of the thematic role head THEME.

(73) *hádigi t'é:liwhu   lášašé:si*
      [DP hadigi t'e:liwhu] l-ašaš-e:s-i
      that   man   1-not.know-NEG-IND
      'I know that man.'   =(31)

For an example such as (73), the theme of the matrix verb 'know' is not the unique, familiar content of a proposition, but rather some salient man in the discourse:

(74) $\exists s[\text{knowing}_w(s) \ \& \ \text{HOLDER}_w(s) = \text{speaker} \ \& \ \text{THEME}_w(s) = \iota x[\text{man}(x) \ \& \ x = g(1)]]$

Adopting this analysis for clausal nominalizations unifies both the structure and interpretation of simple anaphoric DPs as in (75) as well as the nominalized complements of factive verbs, as in (76).

(75) *Familiar DP*

```
        DP
       /  \
      D    idxP
          /   \
        idx    NP
               /\
              ...
```
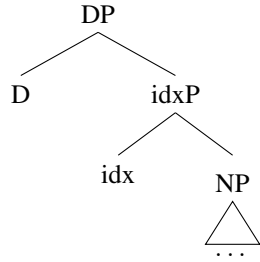
(76) *Factive complement*

```
        DP
       /  \
      D    idxP
          /   \
        idx    CP
               /\
              ...
```
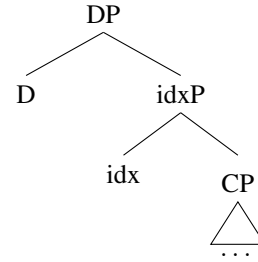
5.3   Where is factivity?

At this point we return to the notion of factivity as generally described in the literature. In our analysis, idx is only present in factive clauses, and so the presence or absence of D can explain the presence or absence of factivity, and furthermore unifies the other uses of anaphoric/familiar DPs such as demonstratives. However, factivity does not reduce to mere familiarity alone: Factivity as we typically know it presupposes the truth of the complement. But there are many individuals, familiar or not, whose propositional content is not a fact, for instance, rumors. We consider two established options for encoding factivity in the structure proposed above, and discuss problems for each of these options.

5.3.1   Factivity is not just familiarity

In effect, Kastner (2015) assimilates factivity to familiarity: Factive complements are familiar, and their truth is presupposed. His account however does not derive this directly, as there is nothing in the semantics of D that enforces this latter characteristic. We could in principle stipulate a presupposition that x is a fact in the definition of D (or of C, as in Kratzer (2006)), but in addition to being an *ad hoc* fix, it is not clear that we want such a presupposition generally associated with clausal nominalizations.

Recall that clausal nominalizations are also used in Washo for internally-headed relatives (77a-77b), as well as so-called perception readings in the language (78a-78b), shown below.

(77) Internally-headed relatives

    a.   *mé:hu géwe   ʔí:giyišge   lé:saʔ   lí:giyi*

        [$_{DP}$[$_{CP}$ me:hu gewe   ʔ-i:gi-i-š]-ge]   le:-saʔ   l-í:gi-i

        boy   coyote 3/3-see-IND-DS-NM.ACC 1.PRO-also 1/3-see-IND

    'I also saw the coyote that the boy saw.'   =(10)

    b.   *máʔak t'í:yelilu   geyúlihayišgi   gɨlgayi*

        [$_{DP}$ [$_{CP}$ maʔak t'i:yeliʔ-lu ge-yuli-ha-i-š]-gi]   ∅-gɨlgay-i

        stick   large-INST 3/3.UN-die-CAUS-IND-DS-NM.NOM 3-break-IND

    'The big stick he killed it with broke.'   =(17)

(78) Perception readings

    a.   *háʔašayišge   didámali*

        [$_{DP}$[$_{CP}$ ∅-haʔaš-ayʔ-i-š]-ge]   di-damal-i

        3-rain-INT.PAST-IND-DS-NM.ACC 1/3-hear-IND

    'I heard it raining.'   =(9)

    b.   *t'é:liwhu ʔíšmišge   didámali*

        [$_{DP}$[$_{CP}$ t'e:liwhu ʔ-išim-i-š]-ge]   di-damal-i

        man   3-sing-IND-DS-NM.ACC 1/3-hear-IND

    'I heard the man's singing.'

All of the above clausal nominalizations make use of a DP-layer, but we do not necessarily want to build factivity into their meaning. Instead, the referents that all of these nominalizations pick out (i.e., individuals or events) are simply *familiar* to interlocuters in a given context. That is to say, a semantics invoking familiarity is not limited to simple anaphoric DPs and the complements of factive verbs alone.

For instance, Hanink (2018) argues that the function of *-gi/ge* in clausal nominalizations giving rise to perception/events readings such as (78b) is likewise to pick out a referent in the immediate context through the introduction of idx into the structure of the DP. Building on a proposal for event nominalizations in Northern Paiute of the kind in (78b) put forward by Toosarvandani (2014), Hanink argues that the role of idx in the perception reading is to map the index it introduces to a familiar event through the assignment function, while the role of the D layer is to ι-bind the *event* variable introduced by the verb, returning an individual meaning for the whole DP. As proposed by Toosarvandani, the key to achieving this meaning is to leave the event variable in the proposition denoted by the vP unbound, as in (79), with the crucial result that existential closure of the event variable does not take place.

Consider the example in (78b) as derived in (79). First, the property denoted by the embedded clause does not undergo ∃-closure, leaving an event variable unbound. Second, this property undergoes Predicate Modification with [[idx]], which denotes the property of being anaphoric, just as it does in the clausal complements of factive verbs under the present proposal, as well as in simple anaphoric DPs in e.g., Schwarz's (2009) analysis of German and Hanink's (2018) analysis of Washo demonstratives. Finally, D ι-binds this property, with a resulting meaning of a unique singing event that is equivalent to a familiar event in the context. Crucially, no reference to factivity is required for familiarity to be achieved.

(79)

DP
ʔišimišge: e
$\iota e_e[\text{sing}(e)\ \&\ \text{agent(man)}(e)\ \&\ e = g(1)]$

D
$\langle\langle e,t\rangle, e\rangle$
$\lambda P_{\langle e,t\rangle}\iota y_e[P(y)]$

idxP
ʔišimišge : $\langle e,t\rangle$
$\lambda e_e[\text{sing}(e)\ \&\ \text{agent(man)}(e)\ \&\ e = g(1)]$

idx
-ge: $\langle e,t\rangle$
$\lambda x_e[x = g(1)]$

CP
ʔišimiš: $\langle e,t\rangle$
$\lambda e_e[\text{sing}(e)\ \&\ \text{agent(man)}(e)]$

MoodP

C
-š
$\lambda y_\alpha[y]$

TP
$\ldots$
ʔišim: $\langle e,t\rangle$
$\lambda e_e[\text{sing}(e)\ \&\ \text{agent(man)}(e)]$

Mood
-i
$\lambda z_\alpha[z]$

Hanink (2018) further argues that an index is required in internally headed relatives in order to derive the correct meaning, though for reasons of space we do not discuss IHRCs in any detail here.[18] Crucially however, we argue that the clausal complements of factive verbs are just like event nominalizations of this kind, in that both pick out an individual via an assignment function. In the case of the former, the index refers to an event. In the case of the latter, it refers to a familiar individual whose content is described by some proposition.

5.3.2 Factivity is not lexically specified

Kastner proposes moreover that factivity may be lexically specified. Given that, in our analysis, factive verbs in Washo already differ in their argument structure from non-factive verbs (only the former select an individual-denoting direct object), they plausibly could also be special in lexicalizing a factivity presupposition directly, just as the classical Hintikkan-style analysis would have it.

We do however find contexts where a proposition that is false in the actual world can appear as a nominalized complement of a factive verb, such as (80-81).

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[18]See also Kim (2009), who describes nominalizations in Korean that may likewise encode events, relative clauses, or the complements of factive verbs.

(80) Context: Talking about a world in which Hillary Clinton was elected president while living in Washo Country.

Hillary Clinton P'au Wa Lu ʔáŋališge   *Adele hámup'ayé:s-i*

[DP[CP Hillary Clinton P'au Wa Lu ʔ-aŋal-i-š]-ge]   Adele ∅-hámup'a-é:s-i

Hillary Clinton P'au Wa Lu 3-live-ATTR-IND-DS-NM.ACC Adele 3.forget-NEG-IND

'Adele remembers that Hillary Clinton lives in Pau Wa Lu.'

(81) Context: Playing make-believe with a child in a world in which the sun is blue.

dí:beʔ delp'ílp'iliʔ   *ʔéʔišge*   *lášašé:si*

[DP[CP di:beʔ de-ʔil-p'ilp'il-iʔ   ʔ-eʔ-i-š]-ge]   l-ašaš-e:s-i

    sun   NMLZ-ATTR-blue-ATTR 3-be-IND-DS-NM.ACC 1/3-not.know-NEG-IND

'I know that the sun is blue.'

To be sure, these contexts involve make-believe, where a speaker's beliefs about the actual world are suspended to make room for what is happening in the make-believe world. Perhaps then we could keep a factivity presupposition in the lexical semantics of the verb, but tied to the evaluation world, which may not necessarily be the actual world. Converging evidence to reject this approach come from recent work on Korean (Bogal-Allbritten & Moulton 2017), who show that the familiarity presupposed in nominalized clauses may be just that – familiarity – and not factivity.

Furthermore, if we build factivity directly into certain attitude predicates, then we have to assume that they are ambiguous between a factive and non-factive meaning. That is, while we might want to encode a presupposition of truth to the meaning of 'see' in (82), we surely do not want this presupposition to be encoded in the meaning of the same verb in (83).

(82) *ditugíbeweʔšda*   *há:bišge*   *lí:giyi*

     di-tu-gib-eweʔ-i-š-da   [DP[CP ∅-ha:biʔ-i-š]-ge]   l-i:gi-i

     1-look-arrive-hence-IND-DS-ADV   3-rain-IND-DS-NM.ACC 1/3-see-IND

     'I just looked around outside and I saw that it rained.'   =(8)

(83) *hádigi daʔmóʔmoʔ lí:giyi*

     [DP hadigi daʔmóʔmoʔ] l-i:gi-i

     that   woman   1/3-see-IND

     'I see that woman.'

Given that the complements of such verbs are always DPs, we can maintain a unified denotation for verbs such as 'see' or 'know' if we do not build a factive presupposition to their meaning in cases in which it is not warranted, as in (83), but rather appeal to the familiarity introduced by both DP complements. Consider a similar argument for Turkish made by Özyıldız (2017), who shows that the same predicate can give rise to both a factive and non-factive interpretation, depending on the shape of the clause it embeds:

(84) a. *Tunç [Hilary'nin kazan-dığın-ı] biliyor*

       Tunç   Hilary   win-NMZ-ACC knows

       'Tunç knows that Hilary won.' → Hilary won.

b. *Tunç [Hilary'nin kazan-di diye] biliyor*
   Tunç Hilary   win-PST DIYE knows

   'Tunç knows that Hilary won.' $\not\to$ Hilary won.   Özyıldız (2017: 397)

Based on the fact that the same attitude predicate can give rise to different truth conditions, Özyıldız argues that factivity cannot be tied to the verb, but is instead better understood as the result of the entire composition of the predicate with the clause it embeds (see also Schulz (2003)).

In sum, our analysis for factive complements uses the same ingredients that are independently motivated in the language for other types of clausal complements like IHRCs and event nominalizations. The only difference between a factive complement and the other types of nominalizations is that the former additionally includes the F_{PROP} type shift, in order for the resulting individual DP to refer to the content of the proposition, rather than to the proposition itself. While this analysis elegantly accounts for the morphological similarity of these constructions in Washo, it does not directly derive factivity, which is typically encoded as a presupposition of the matrix verb under traditional accounts of propositional attitudes. However, given examples like (80-81), as well as recent developments in the analysis of other languages thay behave similarly (e.g., Korean, Turkish), we believe this to be a good result.

5.4 Non-factive modifiers

We now turn to instances of clausal embedding by non-factive verbs. Structurally speaking, clauses embedded by non-factive verbs in Washo lack a DP-layer. Given that the function of the nominalizing D head is to transform properties into individuals, it follows then that the absence of D in non-factive clauses means that these clauses denote properties. Following our analysis of embedded clauses in the previous section, we apply the F_{PROP} type shift at the TP level, transforming a proposition into a property of individuals. This property then combines with the dependent mood marker *-aʔ*. Given the conjunction semantics we proposed for *-aʔ* in (69), the result is a function from properties of individuals to properties of individuals. Assuming that events and individuals are both type of type e (as introduced in Section 4.1), this meaning can combine directly with the matrix verb it modifies via Function Application. The composition of non-factive clauses thus proceeds as in (85).

(85) **Non-factive modifier**

   a. *Beverly démlu dibegúweʔé:saʔ   hamuyi*
      Beverly demlu di-beguweʔ-e:s-aʔ ∅-hamu-i
      Beverly food   1-buy-NEG-DEP   3-think-IND
      '*Beverly thinks that I didn't buy the food.*'   =(11)

b.

VP
démlu dibegúwe ʔé:saʔ hámuyi
$\lambda x_e[\text{CONT}(x)_w = \lambda w'_s[\,\text{I didn't buy the food}_{w'}] \,\&\, \text{thinking}(x)]$

MoodP
démlu dibegúwe ʔé:saʔ
$\lambda Q_{\langle e,t\rangle}.\lambda x_e[\text{CONT}_w(x) = \lambda w'_s[\,\text{I didn't buy the food}_{w'}] \,\&\, Q(x)]$

TYPE SHIFT: F_{PROP}
$\lambda x_e[\text{CONT}_w(x) = \lambda w'_s[\,\text{I didn't buy the food}_{w'}]]$

TP
démlu dibegúwe ʔé:s
$\lambda w'_s[\,\text{I didn't buy the food}'_w]$

Mood
-aʔ
$\lambda P_{\langle e,t\rangle}\lambda Q_{\langle e,t\rangle}.\lambda x_e[P(x) \,\&\, Q(x)]$

VP

V
hámuyi
$\lambda s_e.\text{thinking(s)}$
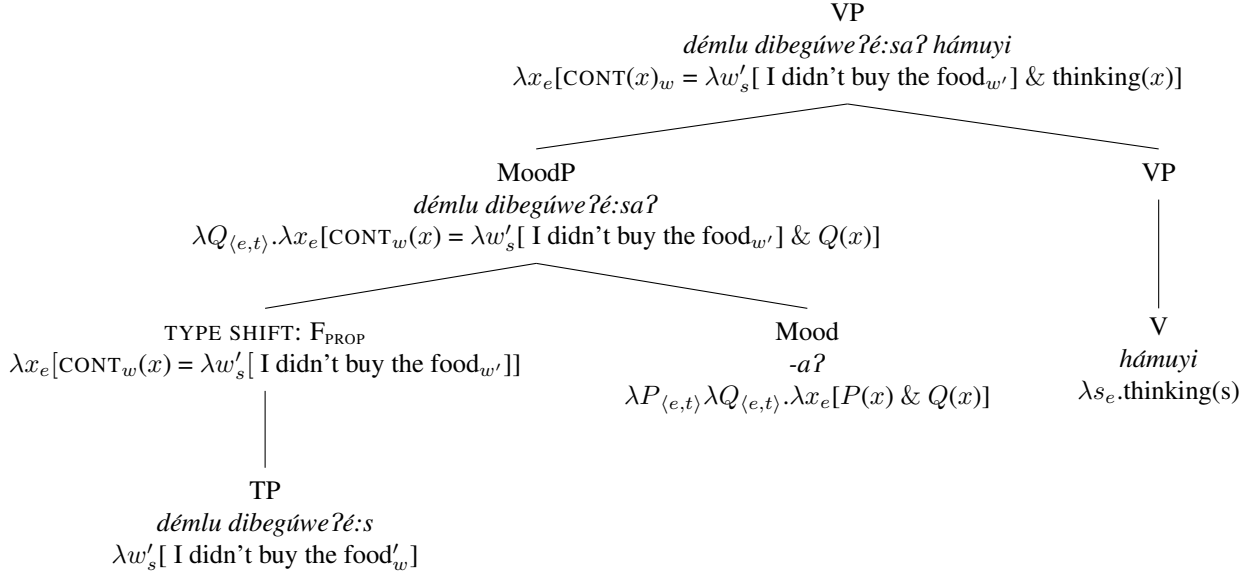
After adding in the attitude holder argument and existentially closing the matrix event variable, we arrive at the truth conditions in (86). The content of the attitude is equated with the attitude event itself via the conjunction semantics of the dependent mood.

(86) $[\![$*Beverly démlu dibegúwe ʔé:saʔ hámuyi*$]\!]^w =$
        $\exists s[\text{thinking}_w(s) \,\&\, \text{HOLDER}_w(s) = \text{Beverly} \,\&\, \text{CONT}_w(s) = \lambda w'[\,\text{I didn't buy the food}_{w'}]]$

5.5   The mood marker difference generalized

We now step back and discuss how the semantics for the mood markers *-i* and *-aʔ* that we proposed in section 5.1 can be leveraged to account for their distribution beyond clauses embedded by factive and non-factive verbs. In particular, the dependent mood *-aʔ* appears in several types of adjunct clauses, and we sketch how our account can be extended to those cases.

Recall that for the independent mood *-i*, we propose that it denotes the identity function, i.e., it is semantically vacuous. For factive complements, it simply passes up the meaning of an F_{PROP}-type-shifted TP, which later combines with the idx head *-ge* and then D; see (71). A similar situation obtains in the case of internally-headed relative clauses and event nominalizations, modulo the absence of F_{PROP}; see e.g., (77a-77b) and (78a-78b), respectively. Recall as well that outside of complement and relative clauses, the independent mood *-i* occurs as a default mood marker in matrix clauses, as in (87). This fact makes sense in view of our proposal that *-i* introduces no semantic content.

(87)   **Matrix use of independent *-i*:**

        ʔémluyi
        ʔ-emlu-**i**
        3-eat-**IND**
        'She's eating.'   adapt. Jacobsen (1996)

This meaning for the independent mood stands in contrast to the dependent mood marker -aʔ, which we have proposed denotes conjunction of properties. This semantics immediately explains why dependent -aʔ doesn't occur in matrix clauses: The application of -aʔ to a clause does not deliver a propositional type. Given that modification generally involves a conjunctive semantics (Heim & Kratzer 1998), we can understand why the dependent -aʔ occurs in many types of adjunct clauses. In particular, two types of adjunct clauses that we focus on here are (i) "concessive" or "contrastive" adjunct clauses, exemplified in (88); and (ii) temporal adjunct clauses, where the -aʔ-clause receives a "simultaneous" interpretation (often translated by speakers as "when" or "while" in English), exemplified in (89). As we already noted in Section 3.2.1, unlike -aʔ-marked clauses embedded by non-factive verbs, both types of adjunct clauses exhibit switch reference morphology when the subjects of both clauses are different, telling us that these adjunct clauses are full CPs.

(88) **Concessive adjunct clause**

      rí:noya   *léyeweášaʔuŋilaš*   *dipú:lul* *Múʔušéːsetiʔaygi*
     [CP ri:no-a   le-iyeweʔ-ašaʔ-uŋil-aʔ-š] di-pu:lul ∅-Muʔuš-eːs-etiʔ-ayʔ-i
     Reno-OBL 1-go-PROSP-PAST-DEP-DS 1POSS-car 3-run-NEG-INCH-INT.PAST-IND

     'I was going to go to Reno, but my car broke down.'   (Washo Archive)

(89) **Simultaneous temporal adjunct clause**

      lémluyaš   *ʔímelegi*
     [CP l-émlu-**aʔ**-š] ʔ-ímeʔ-leg-**i**
     1-eat-**DEP**-DS 3-drink-REC.PAST-**IND**

     'While I was eating, he was drinking.'   (adapt. Jacobsen 1964)

Let us first take a look at the concessive adjunct clauses in more detail, another example of which is in (90). The main clause contains the independent mood -i, while the adjunct clause contains the dependent mood -aʔ, as well as switch reference morphology. As (90) also shows, both clauses contain their own tense and aspect layers.

(90)   *rí:noya*   *léyeweʔášaʔuŋilaš*   *dipú:lul* *MúʔušetiʔayʔgI*
     [CP rí:no-a   l-iyeʔ-uweʔ-ašaʔ-uŋil-aʔ-š] di-pu:lul ∅-Muʔuš-etiʔ-ayʔ-i
     Reno-OBL 1-go-hence-PROSP-PAST-DEP-DS 1-car 3-run-INCH-INT.PAST-IND

     'I was going to go to Reno, but my car broke down.'   (Washo Archive; =(88))

We propose that concessive adjunct clauses adjoin high in the main clause structure, at TP. At this height in the structure, the main clause denotes a proposition. Given our analysis of the semantics of -aʔ as generalized conjunction, the adjunct clause itself should also denote a proposition. This is of course plausible since the adjunct clause also contains its own tense. These two propositions are conjoined by the version of -aʔ in (91).

(91) $\llbracket -a\textit{ʔ} \rrbracket = \lambda p_{\langle s,t \rangle} \lambda q_{\langle s,t \rangle}.\lambda w[p(w) \,\&\, q(w)]$

Our full analysis of the sentence in (90) is given below in (92) and (93). Unlike attitude complement clauses, we do not posit an instance of the F$_{\text{PROP}}$ type shift in this case: These clauses to not make reference to an object with propositional content, and no type shift is necessary for the composition. To facilitate a comparison with simultaneous temporal adjunct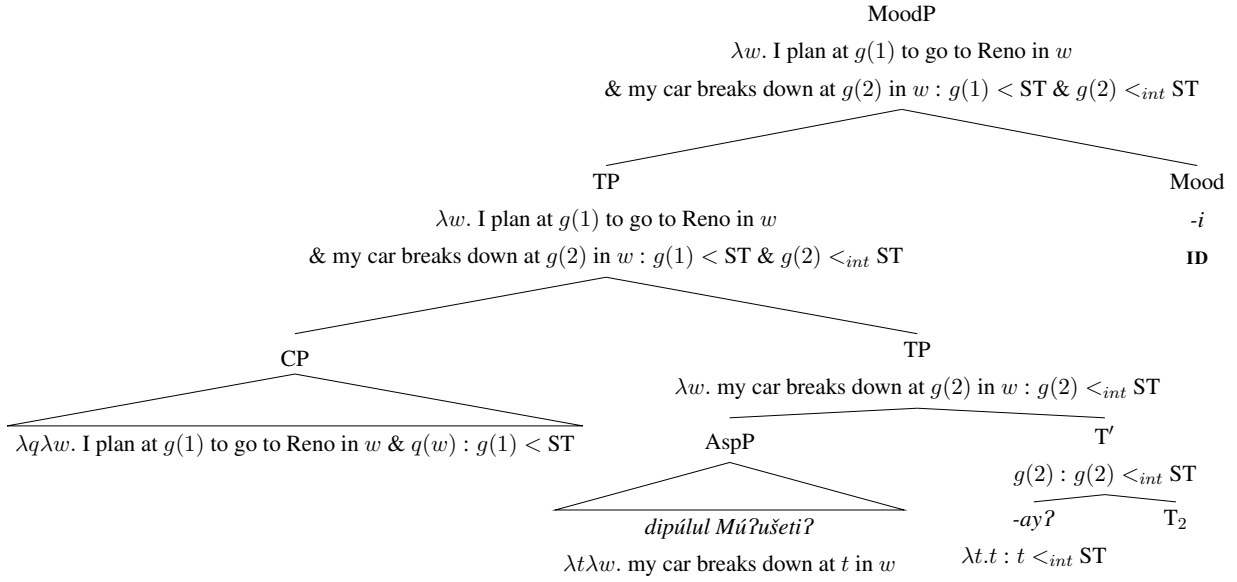 clauses below, we fully spell out our assumptions about tense here. Following Bochnak (2016), we assume that tenses modify a reference time pronoun located in T. Like other free variables, the reference time pronoun receives its value from the assignment function g. It saturates the temporal argument of AspP, returning a proposition. The general past marker *-uŋil* restricts the value of the temporal pronoun to a time prior to the speech time; the intermediate past *-ayʔ* restricts this value to a time in the intermediate past of the speech time.

(92) *Composition of concessive adjunct*

$$\text{CP}$$
$$\lambda q \lambda w. \text{ I plan at } g(1) \text{ to go to Reno in } w \ \& \ q(w) : g(1) < \text{ST}$$

$$\text{MoodP} \qquad \text{C}$$
$$\lambda q \lambda w. \text{ I plan at } g(1) \text{ to go to Reno in } w \ \& \ q(w) : g(1) < \text{ST} \qquad \textit{-š}$$
$$\textbf{ID}$$

$$\text{TP} \qquad \text{Mood}$$
$$\lambda q \lambda w. \text{ I plan at } g(1) \text{ to go to Reno in } w : g(1) < \text{ST} \qquad \textit{-aʔ}$$
$$\lambda p_{\langle s,t \rangle} \lambda q_{\langle s,t \rangle}. \lambda w [p(w) \ \& \ q(w)]$$

$$\text{AspP} \qquad \text{T}'$$
$$\qquad \qquad g(1) : g(1) < \text{ST}$$

$$\textit{lí:nuya léyeweʔášaʔ} \qquad \textit{-uŋil} \qquad \text{T}_1$$
$$\lambda t_i \lambda w_s. \text{ I plan at } t \text{ to go to Reno in } w \qquad \lambda t_i.t : t < \text{ST}$$

31
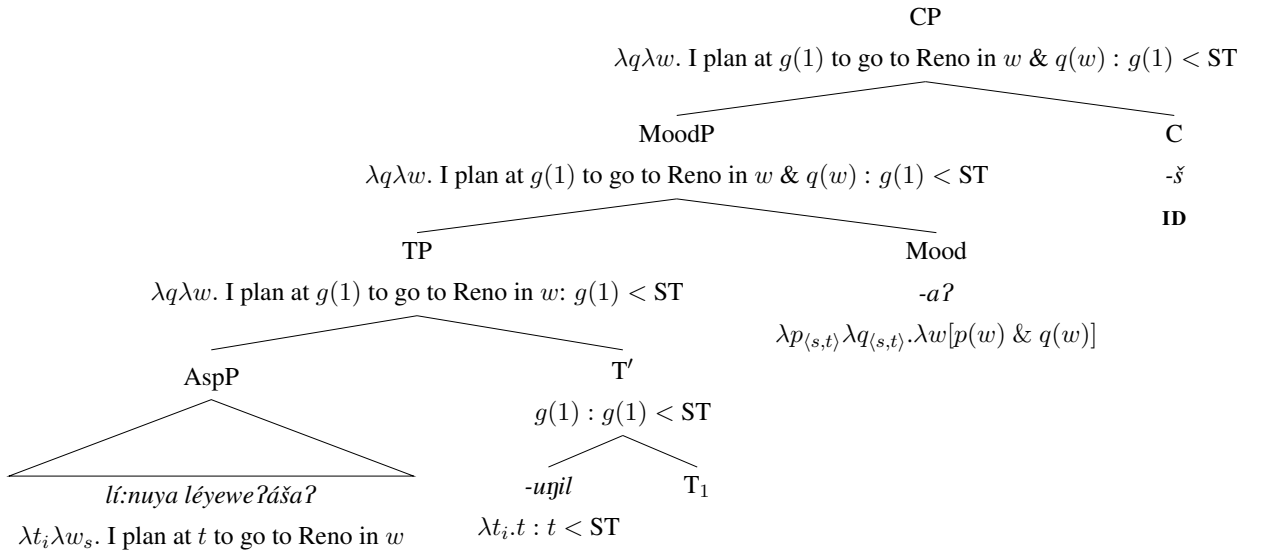
(93)   *Composition of matrix clause with concessive adjunct*[19]

MoodP
$\lambda w.$ I plan at $g(1)$ to go to Reno in w
& my car breaks down at $g(2)$ in $w : g(1) < $ ST $\& \ g(2) <_{int}$ ST

TP
$\lambda w.$ I plan at $g(1)$ to go to Reno in w
& my car breaks down at $g(2)$ in $w : g(1) < $ ST $\& \ g(2) <_{int}$ ST

Mood
-i
ID

CP

$\lambda q \lambda w.$ I plan at $g(1)$ to go to Reno in $w \ \& \ q(w) : g(1) < $ ST

TP
$\lambda w.$ my car breaks down at $g(2)$ in $w : g(2) <_{int}$ ST

AspP

T′
$g(2) : g(2) <_{int}$ ST

dipúlul Múʔušetiʔ
$\lambda t \lambda w.$ my car breaks down at t in w

-ayʔ
$\lambda t.t : t <_{int}$ ST

T$_2$

Turning now to simultaneous temporal adjuncts, we observe that these adjunct clauses do not and cannot contain their own tense. This is true whether the main clause contains a past or future tense, as shown in (94) and (95).

(94)   Context: This morning I came to the Senior's Center to do fieldwork, and you were sitting outside when I arrived.

> *lé:bi(#leg)aš*   *baŋáya ʔumgé:gelegi*
> le-i:biʔ(#-leg)-aʔ-š   baŋaya ʔum-ge:gel-leg-i
> 1-come-REC.PAST-DEP-DS outside 2-sit-REC.PAST-IND
> 'When I arrived, you were sitting outside.'

(95)   *Friday-lu*   *ʔumóndegí:biʔaš*   *ʔumó:ni*   *dimíłitgabigi*
        Friday-lu   ʔum-mondeʔ-gi:biʔ-aʔ-š   ʔum-mo:ni di-mɨ:lit-gab-i-gi
        Friday-INS 2-play.cards-come-DEP-DS 2-money   1-win-DIST.FUT-IND-SUBJ.REL
        'When you come to play cards on Friday, we will win all your money.'

We propose that simultaneous adjunct clauses attach to AspP in the main clause. Since AspP denotes a predicate of times (e.g., Kratzer 1998), the dependent marker *-aʔ* thus conjoins predicates of times for this type of adjunct clause, as in (96). This means that the material that *-aʔ* embeds also denotes a predicate of times. We propose that in this case, the Mood head *-aʔ* directly embeds an AspP, which has two welcome consequences. First, we get the correct semantic type (i.e., *-aʔ* conjoins two predicates of times), and second, this explains why simultaneous adjunct clauses cannot host a tense morpheme.[20] We get temporal

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[19]There is not definitive evidence for a CP-layer in matrix clauses in Washo, and so we omit it here. Note that C denotes the identity function and, if present, would not affect the truth conditions.

[20]This solution requires Mood to directly embed AspP in this case only, whereas it generally embeds TP. The alternative would be to have Mood still embed TP, but then λ-abstract over the temporal variable, in order to create a predicate of times. This solution, however, doesn't explain why an overt tense is not possible in such clauses, and requires an otherwise unmotivated λ-abstraction.

simultaneity from the fact that the temporal variable from the main clause will be filled in for the temporal argument of both clauses after they are conjoined. Just as with concessive adjunct clauses, we do not posit an instance of the F_{PROP} type shift for simultaneous adjunct clauses.

(96) $[\![\text{-}a\textipa{P}]\!] = \lambda P_{\langle i,t \rangle} \lambda Q_{\langle i,t \rangle}.\lambda t_i[P(t) \ \& \ Q(t)]$

(97) *Composition of matrix clause with simultaneous adjunct*

Note that this analysis predicts that such clauses may stack (without an overt coordinator). We also predict this in the case of *-aʔ* modifiers, given that the meaning of this mood morpheme should allow for recursion. This prediction is borne out, as exemplified in (98):

(98) Context: Coyote and Lizard are having an argument about what shape human hands should be.

dá: gišam gumt'éšuyaʔ,   t'á:gɨmlu   gumLiʔdúwaʔaʔ, má:maŋaʔ
da: gišam gum-t'ešuy-aʔ   t'a:gɨm-lu   gum-Liʔduwaʔ-aʔ má:maŋ-aʔ
there around REFL-be.jealous-DEP pinenut-INST REFL-argue-DEP 3-disagree-IND

'...While there they argued, they disagreed, they were jealous.'

Coyote and Lizard Story; Washo Tribe

To sum up, our analysis of the dependent mood marker *-aʔ* as denoting generalized conjunction can help shed light on why this marker can be used in certain complement clauses and adjunct clauses. Note that for the adjunct clauses, we do not include the relations of contrast or simultaneity anywhere in the

semantics directly. We believe this is a good thing, since it can account for the wide range of uses of *-aʔ*-marked clauses. We suggest that the more specific interpretations come about pragmatically, though we do not propose a full analysis here.[21] Building these meanings into *-aʔ* directly would not explain why these meanings are not present in *-aʔ*-marked complement clauses. The generalized conjunction semantics of the dependent mood may also help to explain why *-aʔ*-marked clauses appear with a fairly high frequency in narratives – *-aʔ*-marking just denotes conjunction (albeit with a subordination syntax), but has a a variety of pragmatic functions, expressing various discourse relations. While we leave a full analysis of all the functions of *-aʔ*-marking in Washo to future research, we believe our analysis already goes a long way to account for many of the uses of *-aʔ*-marked clauses in the language.

6 Conclusion

We have argued in this paper for a language-wide distinction between complementation and modification as modes of embedding in Washo. This distinction is most clearly visible in the embedding strategies of two classes of verbs that are largely taken to differ according to factivity: Factive verbs directly select for DP complements in the form of nominalizations, while non-factive verbs do not select but are instead modified by the clauses they embed. We have argued that this is explained by independent factors in the language, tied both to the morphosyntactic shape of the embedded clause, selectional properties of attitude predicates, and the semantics of the independent and dependent mood markers in the language.

The emerging picture yields two important results contributed by the data from Washo. First, while it is in line with Kastner's (2015) proposal that factive verbs select for DPs, it challenges the view that non-factive verbs select for embedded clauses directly: We argue that embedded clauses in this context are better understood as verbal modifiers. Second, the status of the MoodP in Washo as an adjunct to non-factive verbs supports Elliott's (2016) claim that attitude verbs are intransitive – but only in the case of this verb class – and is untenable for describing the way that factive predicates embed clauses.

This picture has larger consequences for theories of clausal embedding across verb types. First, it is crucial that selection does play a role for some verbs, contra strong theories of clausal complementation (e.g., Kratzer 2006, Moulton 2009) where embedded clauses are not selected, and also contra Elliott (2016), for whom clausal embedding by verbs is always adjunction. The Washo evidence suggests that 'factive' verbs select for their complements both syntactically and semantically, while 'non-factive' verbs do not select in any way, but are simply good candidates for modification. Secondly, the behavior of clauses embedded by factive verbs is not a product of factivity directly, though it's related through reference to familiarity. Other languages that make similar (though possibly slightly different) distinctions that support this state of affairs come from recent work on e.g., Korean and Turkish, suggesting wider-reaching implications from this work.

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[21]Interestingly, English *while* also has both concessive and simultaneous readings:

(1)   a. While George R R Martin's books are long, the writing style is highly engaging.   (concessive)

          b. While we were in Reno, it started to snow.   (simultaneous)

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