# Factivity from pre-existence: evidence from Barguzin Buryat

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**Abstract**  This paper examines a factivity alternation in Barguzin Buryat (Mongolic) with a verb *hanaxa*, whose meaning depends on its complement. When *hanaxa* combines with CPs, it behaves like a non-factive verb meaning 'think'. However, when it takes nominalized clauses as its complement, it exhibits a factive inference and is naturally translated as 'remember'. I argue that the observed difference in meaning cannot be explained by positing lexical ambiguity, or by appealing to the nominal status of the complement or its definiteness (Kastner 2015; Hanink & Bochnak 2017). Instead, I assume the decompositional approach to the semantics of attitude reports (Kratzer 2016; Bogal-Allbritten 2017; Elliott 2017) and argue that the factivity alternation arises because CPs and nominalizations combine via different paths: while CPs modify the verb's event argument and provide the content of thoughts, nominalizations saturate the internal argument, which for the verb meaning 'think' denotes the topic of thoughts — what the thinking is about. I propose that there is a pre-existence presupposition associated with this *about*-argument: an entity that is the topic of thoughts is presupposed to have started existing before the time of the thinking eventuality. I argue that this presupposition is what gives rise to the factive inference with nominalizations and the 'remember' translation, and provide an account of how this presupposition projects using the trivalent system of presupposition projection (George 2008b, George 2008a, George 2014, Fox 2013).

## 1  Introduction

Factivity alternation (Moulton 2009; Abrusán 2011; Özyıldız 2017) is a phenomenon in which verbs display both factive and non-factive uses de-

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pending on the type of the complement they combine with. This paper discusses a case of such alternation in the Barguzin dialect of Buryat (Mongolic).[1] This language has a verb *hanaxa*; when it combines with indicative CPs, (1), it is naturally translated as 'think'.[2]

(1)     Dugar [_CP mi:sgəi  zagaha ədj-ə:  /ədi-xə  gəžə] han-a:.
        Dugar     cat.NOM fish     eat-PST /eat-FUT COMP think-PST
        'Dugar **thought** that a cat ate / will eat fish.'

The sentence in (1) does not have a factive inference that there is an event of a cat eating fish in the actual world. All it states is that in worlds compatible with Dugar's thoughts, there is a past/future event of a cat eating fish.

  When *hanaxa* combines with nominalizations (NMNs), (2a), or nouns, (2b), the translation of the sentence changes. In (2) I provide both a translation provided by consultants[3] and a paraphrase, which might better reflect the meaning.

(2)     a.   dugar        [_NMN mi:sgəi-n zagaha ədj-ə:ʃ-i:jə-n']   han-a:
             Dugar.NOM          cat-GEN   fish    eat-PART-ACC-3  think-PST
             Paraphrase: 'A cat ate fish, and Dugar **thought of** that.'
             Translation: 'Dugar **remembered** a cat's eating fish.'
        b.   dugar        mi:sgəi-jə han-a:
             Dugar.NOM cat-ACC     think-PST
             Paraphrase: 'There was/is a cat, and Dugar **thought of** it.'
             Translation: 'Dugar **remembered** a cat.'

The sentence with the nominalization in (2a) has a factive inference: it entails that a cat ate fish in the actual world. This is illustrated by the infelicity of (3) (cf. felicitous (4) with a CP).

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[1]  All the data in this paper were gathered in the village Baraghan (Kurumkan district, Republic of Buryatia, Russia) through elicitation sessions with approximately 10 native speakers of Barguzin Buryat during the summers of 2014—2018.

[2]  This verb can also describe other mental attitudes — for example, desire ('want') — with the help of special verbal forms and / or particles in the embedded CP. I will not discuss such uses of *hanaxa* in this paper, see Bogal-Allbritten (2016; 2017) for discussion of how such attitude meanings are built based on similiar data from Navajo. See also (Močnik & Abramovitz 2019) for discussion of another underspecified attitude verb in Koryak.

[3]  The translations provided by consultants were from Buryat into Russian and had a Russian verb *vspomnit'* 'remember', which, as far as I can see, is an equivalent of English 'remember'. I will use the translations provided by my consultants in the examples to follow.

(3)     #dugar [mi:sgəi-n zagaha ədj-ə:ʃ-i:jə-n’]    han-a:      xarin mi:sgəi
        Dugar cat-GEN    fish     eat-PART-ACC-3 think-PST but    cat
        zagaha ədj-ə:-güj
        fish     eat-PST-NEG
        #‘Dugar **remembered** a cat’s eating fish, but a cat didn’t eat fish.’

(4)     dugar [mi:sgəi zagaha əd-jə:    gəžə] han-a:      xarin mi:sgəi zagaha
        Dugar cat.NOM fish     eat-PST COMP think-PST but    cat         fish
        ədj-ə:-güj
        eat-PST-NEG
        ‘Dugar **thought** that a cat ate fish, but a cat didn’t eat fish.’

However, the sentence in (2a) seems to differ from (1) in more than just factivity. One question that arises is: why do native speakers choose ‘remember’ (as opposed to ‘know’, for example) as the translation for (2a)?

I suggest that the verb in (2) does not actually mean what English ‘remember’ means. What the translation is trying to reflect is that it is presupposed that an event described by the nominalization has started before the thinking event. I call this presupposition a **pre-existence presupposition**.[4] The inference about the temporal order between the thinking event and an event denoted by the nominalization is illustrated in (5a): Sajana remembering on Tuesday Badma’s breaking the cart is compatible with Badma starting the breaking on Monday, but not on Wednesday (given that we are talking about the same week).[5]

(5)       a.    Garag-ai xojor-to Sajana       [Badm-i:n    tərgə əmdəl-ə:ʃ-i:jə-n’]
                day-GEN two-DAT Sajana.NOM Badma-GEN cart   break-PART-ACC-3
                han-a:
                think-PST
                ‘On Tuesday Sajana remembered Badma’s breaking the cart.’

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[4] In section 2 I will show that the temporal inference indeed places only the left boundary of the time interval corresponding to an event denoted by the nominalization, while its right boundary is determined by the nominalization’s aspectual properties.

[5] In Buryat the names of the days of the week are based on numerals, and in the literary Buryat Sunday is viewed as the first day: *garag-ai nəgən* (day-GEN one), ‘Sunday’ (Cheremisov 1973: 147). In the village where we have gathered our data, however, Monday is considered to be the first day of the week, and thus *garag-ai nəgən* (day-GEN one) means ‘Monday’, *garag-ai xojor* (day-GEN two) — ‘Tuesday’, and *garag-ai gurban* (day-GEN three) — Wednesday.

    b.    ... Badma       tərgə garag-ai nəgən-də əmdələ-ʒə əxil-ə:
             Badma.NOM cart   day-GEN one-DAT  break-CVB begin-PST
        'Badma began to break down the cart on Monday.'

    c.    ... #Badma     tərgə garag-ai gurban-da əmdələ-ʒə əxil-ə:
             Badma.NOM cart   day-GEN three-DAT break-CVB begin-PST
        'Badma began to break down the cart on Wednesday.'

I propose that it is the pre-existence presupposition that gives rise to the factivity inference with nominalizations: in order to pre-exist the thinking event, an event described by the nominalization must exist. Thus, pre-existence is one of the sources of factivity.[6] In this paper I explore the question of how this presupposition arises and why it is observed in sentences with nominalizations, but not with CPs.

    In section 2 I show that the pre-existence inference is indeed a presupposition and argue that it cannot be coming from the nominalized complement itself. In section 3 I present my proposal: I argue that the pre-existence presupposition comes from the functional head $\theta_{Th}$ that introduces internal arguments. The interpretation of this head depends on the verb it combines with; when it combines with *hanaxa*, it introduces the argument which specifies the topic of thoughts — what the attitude is about (= the *about*-argument, the RES argument (Heim 1994; Moulton 2009; Deal 2018; Rawlins 2013)).[7] In section 3.1 I illustrate how my analysis applies to sentences like (1), in which *hanaxa* combines with a CP. Section 3.2 is devoted to deriving the meanings of sentences with nominalizations like the one in (2a). It also addresses the question of how the pre-existence presupposition projects. Section 4 explores one of the empirical predictions made by my proposal, and discusses some alternatives and potential extensions. Section 5 concludes the paper.

## 2   The presupposition of *hanaxa*

In (3)-(4) we have seen that denying the truth of the complement leads to a contradiction when *hanaxa* combines with a nominalization, but not when it combines with a finite CP clause. Here is another example illustrating the factive component of the presupposition:

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[6] Factive inferences, of course, could also have other sources. E.g., verbs like 'know' do not seem to place temporal restrictions on their arguments but still exhibit factive inferences.

[7] In the context of this paper, I will use the terms 'the internal argument', 'the Theme argument', 'the *about*-argument', and 'the *res*-argument' interchangeably when referring to the argument of *hanaxa*.

(6) #bi      badma      tərgə əmdəl-ə: gü gəžə mədə-nə-güi-b,
    1SG.NOM Badma.NOM cart   break-PST Q  COMP know-PRS-NEG-1SG
    (xarin) sajana      [badm-i:n    tərgə əmdl-ə:ʃ-i:jə]  han-a:
    (but)   Sajana.NOM Badma-GEN cart   break-PART-ACC think-PST
    # 'I don't know whether Badma broke the cart, (but) Sajana **remembered** that Badma broke the cart.'

(7) bi      badma      tərgə əmdəl-ə: gü gəžə mədə-nə-güi-b,
    1SG.NOM Badma.NOM cart   break-PST Q  COMP know-PRS-NEG-1SG
    (xarin) sajana      [badma      tərgə əmdl-ə:   gəžə] han-a:
    (but)   Sajana.NOM Badma.NOM cart   break-PST COMP think-PST
    'I don't know whether Badma broke the cart, (but) Sajana **thought** that Badma broke the cart.'

In (6)-(7) the speaker explicitly says that they are ignorant about the truth of the complement, which makes the NMN complement infelicitous, in contrast to the CP. Thus, we see that the speaker must believe the complement of *hanaxa* to be true when this verb combines with a nominalization.

As for the the temporal component of the presupposition, I propose that there is a restriction on the relative order of the time of the thinking event and the time of an event described by the nominalization: the left boundary of a NMN-event has to be before the time of thinking. There are two empirical facts suggesting that the temporal ordering should be formulated in terms of the left boundary only (rather than stating that one event precedes the other entirely). First, when *hanaxa* combines with entities, e.g., with proper names, (8), the sentence does not presuppose that the individual denoted by the entity has stopped existing: Badma does not need to be dead in order for (8) to be true.

(8) sajana      badm-i:jə han-a:
    Sajana.NOM Badma-ACC think-PST
    'Sajana **remembered ("thought of")** Badma.'

Provided that when the time function takes an entity, it returns its life span — the time interval corresponding to the entity's existence, (8) suggests that the temporal component does not require the right boundary of the Theme argument to precede the time of the thinking event.

Second, the placement of the right boundary of an event described by the nominalization seems to depend on the aspectual properties of the participle/form that the nominalization is based on. It is possible to find nominalized forms such that the left boundary of a NMN-event is before the

evaluation time of *hanaxa,* but the right boundary can be after the evaluation time of *hanaxa.* One such case is presented in (9), where an analytical verbal form consisting of the verb 'be' and a converb is nominalized.[8,9]

(9)     a.   Context: Ojuna was at a concert and left after Sajana started singing. Sajana is still singing now, and Ojuna is recalling her (ongoing) singing.

        b.   ojuna [sajan-i:n   du:   du:la-ʒa  bai-x-i:jə]   hana-na
             Ojuna Sajana-GEN song sing-CVB be-FUT-ACC think-PRS
             'Ojuna is remembering that Sajana is singing a song.'

If the pre-existence presupposition required the right boundary of the nominalization to be before the evaluation time of *hanaxa,* we would have expected interpretations like in (9) to not be possible.[10]

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[8] When used as a finite form, the combination of 'be' and a converb usually results in progressive and habitual meanings.

[9] I would like to note that the interpretation we see in (9) is not the only available interpretation. It is also compatible with a context where Sajana was singing and stopped singing before the time of thinking. This suggests that the future marker that we see on the auxiliary is not interpreted as future. Further investigation of aspectual and temporal properties of this nominalized form is necessary.

[10] My proposal also predicts that it should be infelicitous to use with *hanaxa* nominalizations whose left boundaries need to be placed after the matrix time. In order to test this prediction, I have elicited some data with the nominalization based on the future participle (suffix *-xA* (FUT)), but unfortunately my results are inconclusive. When this form is used as a finite form or in relative clauses, it has a future interpretation:

(i)     bi   jəxə bolo-xo-d-o:,           tomo gər   aba-**xa**-b
        1SG big  become-FUT-DAT-REFL huge house buy-**FUT**-1SG
        'When I will grow up, I will buy a huge house.'

At least for some consultants, this future-oriented meaning is lost in nominalizations when they are Themes of *hanaxa,* (iia), but is preserved when the nominalization combines via a postposition, (iib). This could indicate that the future-oriented meaning of the nominalization is incompatible with *hanaxa.*

(ii)    a.   ojuna [sajan-i:n   du:   du:la-**x**-i:jə] hana-na
             Ojuna Sajana-GEN song sing-**FUT**-ACC think-PRS
             'Ojuna is remembering how Sajana was/is singing.'
             (Sajana has begun to sing already)

        b.   ojuna [sajan-i:n   du:   du:la-**xa**] tuxai hana-na
             Ojuna Sajana-GEN song sing-**FUT**  about think-PRS
             'Ojuna is thinking about how Sajana's will be singing.'
             (Sajana hasn't begun to sing yet)

## 2.1  The presuppositional nature of the inference

The pre-existence inference behaves like a presupposition: it introduces backgrounded information which is common knowledge to the participants of the conversation, and it projects in questions and survives under negation, as illustrated in (10) and (11), respectively. I take this evidence to suggest that the inference at hand is a presupposition.

(10) #bi         badma        tərgə əmdəl-ə: gü gəžə  mədə-nə-güi-b,
     1SG.NOM Badma.NOM cart   break-PST Q   COMP know-PRS-NEG-1SG
     sajana         [badm-i:n   tərgə əmdəl-ə:ʃ-i:jə]  hana-na    gü?
     Sajana.NOM Badma-GEN cart   break-PART-ACC think-PRS Q
     # 'I don't know whether Badma broke the cart or not. Does Sajana
     remember Badma's breaking the cart?'

(11) #[badm-i:n    tərgə əmdəl-ə:ʃ-i:jə]  sajana          han-a:-güi,        badma
     Badma-GEN cart   break-PART-ACC Sajana.NOM think-PST-NEG Badma.NOM
     tərgə əmdəl-ə:-güi
     cart   break-PST-NEG
     # 'Sajana didn't remember Badma's breaking the cart, (and) Badma
     didn't break the cart.'

The projection of the pre-existence presupposition is summarized in (12).

(12)  **Projected inference:**
      there is a NMN-event that started before the time at which the think-
      ing event is evaluated.

The inference that projects in (10)-(11) is that there is an event of Badma breaking the cart in the actual world that started before the evaluation time of the verb. We would like (12) to follow from our analysis of the factivity alternation.

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The open question though is why, instead of being infelicitous, (iia) receives an interpretation that we do not usually observe for *-xA*-forms? Also, some of my consultants were able to interpret sentences like (iia) as talking about recalling events planned for some future time. This raises a question of whether a plan for existence (of an event or an entity) could somehow satisfy the pre-existence presupposition. I leave the question of how *-xA*-nominalizations are interpreted under *hanaxa* for future research.

## 2.2   Against the presupposition coming from the complement

We have seen that factivity is one of the components of the presupposition under consideration. Where is this component coming from — what part of the sentence contributes this inference? There are several hypotheses about the origin of factive presuppositions (see discussion in Özyıldız 2016); one prominent hypothesis is that factive presuppositions are contributed in one way or another by the complement of the verb (Kiparsky & Kiparsky 1970; Kratzer 2006; Kastner 2015; Hanink & Bochnak 2017).

This hypothesis is attractive in the light of cross-linguistic data, which suggest that there are correlations found between the syntactic category of the complement of attitude verbs and their factivity (Moulton 2009; Abrusán 2011; Özyıldız 2017). I will argue that, while attractive, this line of explanation cannot give a satisfying account of the factivity alternation in Buryat.

First, note that the factive inference does not always arise when otherwise non-factive verbs combine with nominalizations. For example, when verbs *ətigəxə* 'believe' and *naidaxa* 'hope' take NMNs as their complements, no factive inference arises, hence the felicity of (13)-(14).[11]

(13)   sajana [badm-i:n   tərgə əmdəl-ə:ʃ-tə-n']   ətig-ə:,   xarin badma
       Sajana Badma-GEN cart   break-PART-DAT-3 believe-PST but   Badma
       tərgə əmdəl-ə:-güi
       cart   break-PST-NEG
       'Sajana believes that Badma broke the cart (lit. 'in Badma's breaking the cart'), but Badma didn't break the cart'.

(14)   sajana [səsəg-əi xada   də:rə gar-a:ʃa-da]   naida-na, xarin
       Sajana Seseg-GEN mountain up   go.to-PART-DAT hope-PRS but
       səsəg xada   də:rə gar-a:-güi
       Seseg mountain up   go.to-PST-NEG
       'Sajana hopes that Seseg went up the mountain (lit. 'in Seseg's going up the mountain'), but Seseg didn't go up the mountain'.

This suggests that the nominal status of the argument does not suffice for the factive inference to come about. Note that the nominalizations in (13)-(14) are the same as the ones we have seen with *hanaxa*, except for one feature:

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[11] Buryat is not unique in allowing non-factive verbs to take nominalized clauses without giving rise to factive inferences. For example, the same happens in Turkish (Özyıldız 2017). This suggests that treating nominalizations as factive across the board cannot be the correct solution to factivity alternations.

they are assigned a different case. While *hanaxa* 'think' assigns accusative case to nominalizations, (2a), the verbs *ɘtigɘxɘ* 'believe' and *naidaxa* 'hope' assign a lexical case — dative. It seems then that the argument structure of the attitude verb, which is reflected in case assignment, might play a role in whether the factive inference is observed. I would like to argue that this is indeed the case.[12]

Second, the nominalization under consideration can have indefinite uses, so the factive inference cannot be blamed on the definiteness of the complement (see Kastner 2015; Hanink & Bochnak 2017 for proposals of how definiteness can lead to factivity). Buryat does not have articles, but it can be still shown that the NMN can have indefinite uses.[13] Consider the English example in (15) and a similiar example with a Buryat NMN in (16).

(15)   a.   I remembered the girl, Anton remembered the girl, Nadya remembered the girl.
        (i)   #...We remembered Julia, Lena, and Susi respectively.
        (ii)   OK ...We remembered Julia.
    b.   I remembered a girl, Anton remembered a girl, Nadya remembered a girl.
        (i)   OK...We remembered Julia, Lena, and Susi respectively.
        (ii)   OK ...We remembered Julia.

(16)   bi [sajan-iːn du: duːla-ʒa baj-gaːʃ-iːjɘ-n'] han-aː-b, sɘsɘg
    1SG Sajana-GEN song sing-CVB be-PART-ACC-3 think-PST-1SG Seseg
    [sajan-iːn du: duːla-ʒa baj-gaːʃ-iːjɘ-n'] han-aː, narana [sajan-iːn
    Sajana-GEN song sing-CVB be-PART-ACC-3 think-PST Narana Sajana-GEN
    du: duːla-ʒa baj-gaːʃ-iːjɘ-n'] han-aː
    song sing-CVB be-PART-ACC-3 think-PST
    'I remembered Sajana's singing a song, Seseg remembered Sajana's singing a song, Narana remembered Sajana's singing a song.
    a.   **OK:** The three girls each thought of a different singing by Sajana.
    b.   **OK:** The three girls all thought of the same singing by Sajana.

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[12] One could hypothesize that dative case on nominalizations in (13)-(14) has in fact the syntactic structure of a postposition combining with the NMN. If this is so, one could argue that the factivity inference emerges when attitude verbs take NMN complements directly, without the postposition being a mediator. While I have no evidence in favor of treating dative case as a postposition, note that such a view is consistent with my proposal, since it implies that it is not the meaning of the nominalization itself which contributes factivity, but rather its status as the internal argument of the verb which does so.

[13] I am grateful to Deniz Özyıldız for suggesting this diagnostic to me.

In (15) we see that definite noun phrases have a uniqueness presupposition associated with them, which makes the continuation in (15a-i) infelicitous. When indefinite noun phrases are used in the same context, there is no uniqueness presupposition arising, and the continuation in (15b-i) is fine.

(16) shows the same diagnostic applied to Buryat nominalizations. As we see, nominalizations in a similiar context are compatible with both of the presented interpretations. The fact that the speaker, Seseg and Narana could have each seen a different event of Sajana's singing a song suggests that the NMN under consideration does not have to be definite. It is either ambiguous between the definite and the indefinite readings, or is indefinite. The factive inference observed with NMNs as complements of *hanaxa* does not seem to depend on the context, which suggests that it is present irrespective of definite/indefinite interpretation of the NMN. Thus, an account of the factivity alternation in Buryat has to be able to derive the factive inference even for indefinite uses of nominalizations.

To sum up, we have seen that the factive component cannot be attributed to the meaning of the nominalization: the nominalized status itself is not sufficient for the factive inference (NMN's $\theta$-role seems to play a role), definiteness is not necessary for the factive inference (NMNs can have indefinite readings). Therefore, while in (1)-(2a) we saw that the type of the complement (CP -vs- NP) correlates with the presence of the presupposition, I would like to argue that this correlation is a result of the fact that CPs and NPs combine with attitude verbs in different ways, as opposed to the view that the meaning of the nominalization itself supplies the presupposition.

## 3   The proposal

I would like to propose that factivity alternations like the one we see in Buryat arise due to attitude verbs having pre-existence presuppositions associated with their Theme arguments.

The main intuition behind this proposal is the following. We know that verbs place restrictions on interpretations of their arguments. One such restriction is that some verbs require their Theme arguments to exist before the verb's time of evaluation. This is the case with verbs of destruction, (17a), and verbs of use, (17b), but, for example, not with verbs of creation, (17c).[14]

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[14] There is a reason to think that these inferences are not just a consequence of our world knowledge about breaking, reading, and writing: Diesing (1992: 109-126) argues that

(17)  a.  Sue broke a vase. $\Rightarrow$ There existed a vase before the time of the breaking event.

  b.  Mary read a book $\Rightarrow$ There existed a book before the time of the reading event.

  c.  Alice wrote a poem. $\not\Rightarrow$ There existed a poem before the time of the writing event.

What I would like to suggest is that attitude verbs can also place similar requirements on their arguments, and that these requirements can in certain cases lead to factive inferences.[15]

If this intuition is correct, then analyzing the factivity alternation amounts to (i) making some assumptions about the semantics of attitude verbs and (ii) analyzing the argument structure of *hanaxa*. Following the decompositional approach to semantics of attitude verbs (Kratzer 2006; 2016; Moulton 2015; Bogal-Allbritten 2016; 2017; Elliott 2017), I will assume that the complementizer of the embedded clause plays the main role in building the meaning of an attitude report by connecting the matrix verb eventuality to the embedded proposition by the Content relation.[16]

As for the argument structure of *hanaxa*, here is my proposal. I would like to argue that Buryat's *hanaxa* has three arguments: besides the eventuality argument (e) and the temporal argument (t), it also has an internal (Theme) argument, which denotes the individual which is the topic of the attitude, which the attitude is "about" — also known as the RES-argument (Heim 1994; Moulton 2009; Deal 2018; Rawlins 2013). I propose that there is a **pre-existence presupposition** associated with this Theme argument: it is presupposed to have started existing before the time t at which *hanaxa*'s eventuality argument e is evaluated. Nominalizations (and other

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such inferences correlate with certain syntactic properties of these verbs, which would be unexpected if they were not grammatically encoded.

[15] While it would be nice if the pre-existence presupposition of *hanaxa* and the inferences in (17a)-(17b) were unifiable as a single phenomenon, I have doubts that this is actually feasible, because the two inferences seem to differ in their projective behavior. While, as we have seen in section 2.1, the presupposition of *hanaxa* projects out of questions and negative sentences, inferences in (17a) and (17b) do not seem to:

(i)  a.  Sue didn't break a vase (because there were none). $\not\Rightarrow$ There existed a vase before the verb's evaluation time.

  b.  Mary didn't read a book (because there were none). $\not\Rightarrow$ There existed a book before the verb's evaluation time.

[16] See section 4.2 for discussion of whether my proposal could be implemented in a version of the Hinttikan (Hintikka 1969) framework.

nouns) and CPs combine with the attitude verb through different paths: nominalizations saturate the Theme argument, and CPs modify the event argument of the attitude verb and specify its content. The fact that NPs and CPs combine through two different paths explains the contrast in (1)-(2): NPs, which combine as the Theme argument, are subject to the pre-existence presupposition associated with it; CPs, which combine via the event argument, are not subject to the same presupposition.

My proposal that nominal arguments and CPs combine via different routes makes a prediction about their distribution: given that CPs and NMNs don't compete for the same position, it should be in principle possible for the verb to combine with both arguments at the same time. This prediction is borne out: consider (18) with NMN and CP co-occuring with *hanaxa*.

(18)    sajana [_NMN_ badm-i:n    xurumxa:n-ha: jǝr-ǝ:d        bai-ga:ʃ-i:jǝ-n']
        Sajana        Badma-GEN Kurumkan-ABL come-CVB2 be-PART-ACC-3
        [_CP_ gǝr-tǝ      xulgaiʃan or-o:      gǝžǝ] han-a:
            house-DAT burglar    go.in-PST COMP think-PST
        'Sajana remembered ("thought of") of the/an event of Badma returning from Kurumkan, (thinking) that a burglar entered the house.'

In (18) the NMN describes an event (Badma returning from Kurumkan) which is the topic of Sajana's thoughts. The finite clause describes the thoughts of the attitude holder about that topic. There is an inference that this event has occured, and it happened before the time of Sajana's thinking.

Examples like (18) are also important in another respect: they allow us to refute a hypothesis that *hanaxa* is just ambiguous between a factive nominal-selecting *hanaxa*₁ 'remember' and a non-factive CP-selecting *hanaxa*₂ 'think'. The ambiguity hypothesis would not be able to account for sentences like (18), because the verb *hanaxa* that we see in (18) could be neither *hanaxa*₁ 'remember' nor be *hanaxa*₂ 'think'.

There are many ways to implement the proposal sketched out above, and I will try to comment on the choice points while presenting my implementation. The first choice point comes about when we consider the question of how the Theme argument of *hanaxa* is introduced into the sentence: is it an inherent argument of the verb, or is it introduced by a functional projection? Although either option would in principle work, in my implementation I will assume the second option. I will take logical representations to be strictly neo-Davidsonian in nature (Castañeda 1967; Parsons 1990) and will assume that this is reflected in syntactic representations: all argu-

ments, including internal arguments of verbs, are introduced by separate functional heads.[17]

Together with the decompositional approach to the semantics of attitude verbs, the neo-Davidsonian approach to argument structure results in the following denotation for the attitude verb:[18,19]

(19)     $[\![hanaxa]\!]^{w,t,g} = \lambda e_e.think_{w,t}(e)$

As we see from (19), the attitude verb denotes a function that takes an event e as its argument, and returns true iff e is a thinking event in world w at time t (abbreviated as $think_{w,t}(e)$). Thus, the only property that distinguishes *hanaxa* as an attitude verb is that its event argument has some Content associated with it.

The next section (3.1) proposes an analysis of sentences with *hanaxa* and CPs and provides an explanation of why no pre-existence presupposition is observed in them. Section 3.2 proposes the meaning for $\theta_{Th}$ when it combines with *hanaxa* and discusses the pre-existence presupposition observed in sentences with nominalizations.

## 3.1   Hanaxa + CP

In this section I discuss the derivation of sentences in which *hanaxa* combines with CP complements, and I illustrate it with the example in (20). I propose that (20) has the LF in (21).
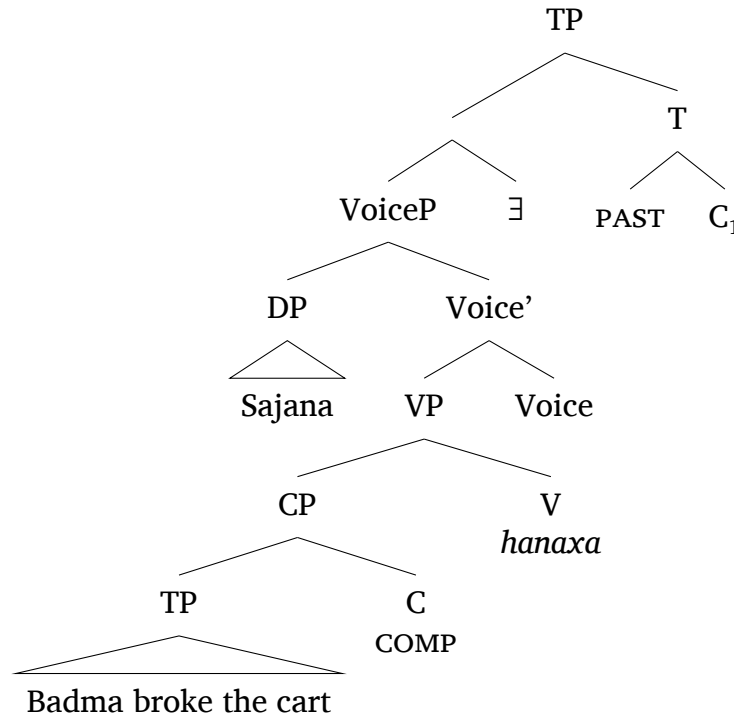
(20)     sajana        [badma        tərgə əmdl-ə:    gəžə] han-a:
         Sajana.NOM Badma.NOM cart   break-PST COMP think-PST
         'Sajana **thought** that Badma broke the cart.'

---

[17] In the footnote 42 (section 4.2) I discuss one consequence of this assumption for the absence of the presupposition in sentences with CPs.

[18] I assume that the interpretation function has a world (w), a time (t), and an assignment function (g) as its parameters. I also assume that $D_e$ is the domain of individuals, which consists of entities and eventualities ($D_e = D \cup E$), $D_i$ is the domain of time intervals, $D_s$ is the domain of worlds, and $D_t$ is the domain of truth-values.

[19] In this paper I use the notions 'eventuality' and 'event' interchangeably. I remain neutral on the issue of whether *hanaxa*'s eventuality argument is a state or not.

(21)     **The LF of *think* + CP**

TP
```
                    TP
                   /  \
                 /      \
               /          T
             /           / \
         VoiceP    ∃   PAST  C₁
          /  \
        DP    Voice'
       /  \    /  \
    Sajana  VP   Voice
           /  \
         CP    V
        /  \  hanaxa
      TP    C
           COMP
   Badma broke the cart
```

### 3.1.1 Meaning of the CP

According to the decompositional approach to attitude verbs, finite comple-
ment clauses denote functions that characterize sets of contentful events or
entities. The details of different proposals within this framework vary; here
I will adopt the proposal in (Elliott 2017) for concreteness. Elliott (2017) ar-
gues that CPs denote predicates of events whose content is the intension of a
proposition denoted by the embedded clause. This means that the meaning
for the CP in (20) is as presented in (22).[20]

(22)     $[\![$that Badma broke the cart$]\!]^{w,t,g}$
         $= \lambda e_e.\text{Cont}(e) = \lambda w'.\lambda t'.$Badma broke the cart in w' at some time
         t" that precedes t'.[21]

---

[20] I assume that the intension of a proposition is a function from world-time pairs to truth
values.

[21] A question that might arise is whether the same event could have different Content in
different worlds and at different times. I am neutral on this issue, but will assume for
simplification that Content of events cannot vary with worlds and times.

I will assume that the Content relation is introduced by the complementizer itself (*gǝžǝ* in Barguzin Buryat):[22] (23).

(23)    $[\![\text{COMP}]\!]^{w,t,g} = \lambda p_{sit}.\lambda e_e.\text{Cont}(e) = p.$

Note that under Elliott's proposal the result of Cont applying to an event stands in the equality relation to the embedded proposition (see (Elliott 2017) for arguments for this view). This is different from treating Cont(e) as a subset of the embedded proposition (Kratzer 2006; 2016). While I will adopt Elliott's meaning for CPs, nothing in my analysis hinges on the choice between equality -vs- subset relation semantics for attitudes. The meaning for the CP in (20) in the system with the subset relation is in (24).[23]

(24)    $[\![\text{that Badma broke the cart}]\!]^{w,t,g}$
        $= \lambda e_e.\ \forall w'[w' \in \text{Cont}(e) \to \text{Badma breaks the cart in } w'.]$

### 3.1.2   Combining CP with *hanaxa*

The derivation of (20) starts with the CP combining with the attitude verb as a modifier of its eventuality argument, (25). I propose that this step is achieved by Predicate Modification.[24]

(25)    $[\![\text{hanaxa that Badma broke the cart}]\!]^{w,t,g} =$
        $\lambda e_e.\text{think}_{w,t}(e) \wedge \text{Cont}(e) = \lambda w'.\lambda t'.\text{Badma broke the cart in } w' \text{ at}$
        some time t" that precedes t'.

   At the next step the external argument is introduced by Voice (*ExpA* – 'experiencer of the attitude'), which I assume to have the denotation in (26). Thus, the whole Voice phrase receives the denotation in (27).

(26)    $[\![\text{Voice}_{ExpA}]\!]^{w,t,g} = \lambda P_{et}.\lambda y_e.\lambda e_e.\ P(e)\ \&\ \text{Exp}(e) = y$

(27)    $[\![\text{VoiceP}]\!]^{w,t,g} = \lambda e_e.\text{think}_{w,t}(e) \wedge \text{Cont}(e) = \lambda w'.\lambda t'.\text{Badma broke the}$
        cart in w' at some time t" that precedes t' $\wedge$ Exp(e) = Sajana.

   Finally, I assume a quantificational analysis of tense, according to which tense is a contextually restricted existential quantifier over times (Ogihara 1995). In the LF in (21), $C_1$ is a free time variable whose value is a contex-

---

[22] In this assumption I am following Kratzer (2006; 2016), but not Elliott (2017), who proposes that the Content relation is introduced by a separate null functional projection.
[23] In (24) I follow Kratzer in assuming that the Cont function returns a set of worlds.
[24] Other semantic principles, such as Event Identification (Kratzer 1996) or Restrict (Chung & Ladusaw 2003), could also be used for this step.

tually supplied interval g(1). The meaning of the past tense, (28),[25] then takes the value of that variable and the proposition as its arguments and returns true iff there exists a time interval t' such that it falls within ("⊆") a contextually salient time g(1) at which the proposition is true, (29).

(28)    $[\![\mathrm{PAST}]\!]^{w,t,g} = \lambda C_i \lambda p_{sit}.\ \exists t' < t \wedge t' \subseteq C\ [p(w)(t') = 1]$

(29)    $[\![\mathrm{PAST}\ C_1]\!]^{w,t,g} = \lambda p_{sit}.\ \exists t' < t \wedge t' \subseteq g(1)\ [p(w)(t') = 1]$

Thus, after the existential closure applies to the predicate in (27) and [PAST $C_1$] combines with the resulting proposition by Intensional Functional Application[26], we get the meaning in (30).[27] The sentence is true relative to a world w, a time t and an assignment function g if there is a time within a salient time interval which is in the past relative to t at which there is an event of Sajana thinking whose Content is 'Badma broke the cart'.[28]

(30)    $[\![$*Sajana thought that Badma broke the cart.*$]\!]^{w,t,g}$
        $= 1\ \exists t' < t \wedge t' \subseteq g(1)\ [\exists e\ [\mathrm{think}_{w,t'}(e) \wedge \mathrm{Cont}(e) = \lambda w'.\lambda t'.\mathrm{Badma}$

---

[25] Here I disregard the presuppositional component of tense for simplification.

[26] The intension of the proposition needs to be a function that has not only a world argument, but a time argument as well, (i); so in our case the intension of the proposition is in (ii).

(i)     $[\![p]\!]^g_{\dot{C}} = \lambda w.\lambda t.[\![p]\!]^{w,t,g}$

(ii)    $[\![$*Sajana thought that Badma broke the cart.*$]\!]^g_{\dot{C}}$
        $= \lambda w.\lambda t.\exists e[\mathrm{think}_{w,t}(e) \wedge \mathrm{Cont}(e) = \lambda w'.\lambda t'.\mathrm{Badma}$ broke the cart in w' at some time t'' that precedes t' $\wedge \mathrm{Exp}(e) = \mathrm{Sajana}.]$

[27] Here I am simplifying the real picture by not discussing the contribution of aspect.

[28] If we were to adopt a view where semantics of attitude verbs is based on the subset relation, then the denotation of the attitude verb would have been as in (i), and the meaning of the whole sentence would have been as in (ii).

(i)     $[\![$*hanaxa*$]\!]^{w,t,g} = \lambda e_e.\ \mathrm{think}_{w,t}(e) \wedge \forall w'[w' \in \mathrm{DOX}_{Exp(e),w,t} \rightarrow w' \in \mathrm{Cont}(e)]$

(ii)    $[\![$*Sajana thought that Badma broke the cart.*$]\!]^{w,t,g} = 1$ iff $\exists t' < t \wedge t' \subseteq g(1)\ [\exists e\ [\mathrm{think}_{w,t'}(e) \wedge \forall w'[w' \in \mathrm{Cont}(e) \rightarrow \mathrm{Badma}$ breaks the cart in w'] $\wedge \forall w'[w' \in \mathrm{DOX}_{Exp(e),w,t'} \rightarrow w' \in \mathrm{Cont}(e)] \wedge \mathrm{Exp}(e) = \mathrm{Sajana}.]]$

According to (ii), the sentence is true if there exists a past time at which there exists an event of thinking whose Experiencer is Sajana, and all the worlds in Sajana's DOX set are in the Content of e, and all the worlds in the Content of e are such that Badma breaks the cart in them. Note that here the single instance of quantification over possible worlds from Hintikkan semantics (Hintikka 1969) is split in two: one comes from the verb (the one that relates the attitude holder's DOX with the Content of e), while another comes from the complement (the one relating worlds in Content of e and the embedded proposition).

broke the cart in w' at some time t'' that precedes t' $\wedge$ Exp(e) = Sajana.]]

The derivation I have proposed for sentences with CPs straightforwardly captures the absence of the pre-existence presupposition in them: since the pre-existence presupposition is introduced by the $\theta_{Th}$ projection, and CPs do not combine via $\theta_{Th}$, no pre-existence presupposition is expected to occur in sentences with them. *Hanaxa* in sentences with CPs just means 'think'. The CP specifies the Content of the thinking event, but nothing forces this Content of thoughts to be true in the actual world. Thus, the absence of the factive inference is predicted.

### 3.1.3  Buryat's CPs as predicates of (contentful) events

In this section I would like to provide two arguments in favor of treating Buryat's CPs with the complementizer *gəžə* as predicates of events.

The first piece of evidence comes from the morphology of the complementizer. The complementizer *gəžə* consists of two morphemes: the root of the verb *gə* 'say' and the suffix *-žə*, which is a converbial[29] suffix found with restructuring verbs, in sentential adjuncts, and in analytical verb forms. In (31) we see this suffix being used on a temporal adjunct.

(31)    [ojuna       üxibü: türə-**žə**],        badma        əsəgə bolo-bo
        Ojuna.NOM child   give.birth.to-**CVB** Badma.NOM father become-PST
        'As Ojuna gave birth to a child, Badma became a father.'

Sentential adjuncts like in (31) and other converbial clauses can be plausibly analyzed as different kinds of event modifiers. If morphology (the suffix *-žə*) reflects the denotations of these clauses, then the same morphology on the complementizer indicates that finite CPs denote functions that characterize sets of events as well. Additional evidence for *-žə* on clauses indicating that they are predicates of events comes from proform substitution. Finite CPs can be substituted by the proform used for sentential adjuncts and restructuring clauses, (32): *ti:-žə* (do.so-CVB), which is a converbial form of the proform-forming verb *ti:xə* 'do.so'. CPs cannot be substitued by a demonstrative pronoun *tərə* or an adjectival proform *ti:-mə* (do.so-ADJ), which are used for refering back to entities and predicates of entities respectivelly.

---

[29] Here I use 'converb' as a descriptive notion: a non-finite verbal form that occurs in adverbial subordinate clauses (such as *when/while*-clauses, *before/after*-clauses, among others).

(32)   badma      [sajana    bulj-a:  gə-**žə**]  han-a:,   ojuna
       Badma.NOM Sajana.NOM win-PST say-**CVB** think-PST Ojuna.NOM
       baha **ti:-žə**     / *ti:-mə    / *tərən-i:jə han-a:
       also **do.so-CVB**  do.so-ADJ   that-ACC   think-PST
       'Badma thought that Sajana won, Ojuna also thought so.'

The second piece of evidence comes from the syntactic distribution of CPs:
they pattern with adverbs with respect to the positions in the clause they
can occupy.[30] Both adverbs and CPs can be positioned quite freely with
respect to the arguments of the verb, (33).

(33)   a.   <sajana> [$_{CP}$ badma jər-ə:    gə-žə]   <sajana> mədə-nə
            Sajana        Badma come-PST say-CVB Sajana      know-PST
            'Sajana found out that Badma came.'
       b.   <za:bol> rinčin    <za:bol> ajaga  <za:bol> uga:-xa
            certainly  Rinchin certainly   dishes certainly   wash-FUT
            'Rinchin will certainly wash the dishes.'

Just like adverbs, finite CP clauses in Buryat cannot be subjects, (34).

(34)   *[$_{CP}$ badma tərgə əmdəl-hən gə-žə]   sajan-i:jə    ga:ru:l-a:
           Badma cart   break-PFCT say-CVB Sajana.-ACC anger-PST
       Intended: 'That Badma broke the cart angered Sajana.'

Under the assumption that syntactic distribution reflects the denotation of
a constituent, we can conclude that finite clauses in Buryat, like adverbs,
denote predicates of events.

## 3.2   Hanaxa + nominalization

In this section I will discuss the meanings of nominalizations like in (2a)
and of the functional head $\theta_{Th}$ when it combines with *hanaxa*. In 3.2.1
I propose that the nominalizations under consideration are predicates of
events which do not have Content. In 3.2.2 I make an informal proposal
about the pre-existence presupposition. Section 3.2.3 discusses the issue
of presupposition projection and provides my implementation of the pro-
posal, which makes use of the trivalent system of presupposition projection
(George 2008b, George 2008a, George 2014, Fox 2013) and suggests that

---

[30] There is one difference between CPs and adverbs, however: while adverbs can never be
used in the post-verbal position, CPs are in principle capable of occuring after the verb.

the existential quantifier that corresponds to the indefinite is introduced by the $\theta_{Th}$ head.

### 3.2.1 Meaning of the nominalization

The nominalization under consideration, (35), is built from the following morphological pieces: the verbal root, the participle suffix -*A:ʃA*[31], and the nominal morphology — case and optional possessive marking.[32]

(35)    sajana          [badm-i:n    tərgə əmdl-**ɔ:ʃ**-i:jə-(nʼ)]     han-a:
         Sajana.NOM Badma-GEN cart   break-**PART**-ACC-(3) think-PST
         'Sajana **remembered** that Badma broke the cart.'

In place of -*A:ʃA*, a number of different participial suffixes can be used. Participles in Buryat are often used as relative clauses; some of them can also be used in constructing finite forms. Adding case morphology to participles transforms them to event nominalizations.

Participial suffixes add aspectual and temporal specifications to the eventuality descriptions they attach to, such as information about (im)perfectivity, habituality, temporal orientation. What exactly is the contribution of different morphemes requires a thorough investigation that is beyond the scope of this paper. For the present purposes, I will make a big oversimplification and just assume that participial suffixes combine with predicates of events and return predicates of events which are supplemented by some aspectual or temporal specifications.

The participle -*A:ʃA*, which forms the nominalization in (35) that I focus on in this paper, is past-oriented:[33] it can be used when the time of the event denoted by the nominalization ($t_N$) precedes the time of the evaluation of the verb ($t_m$), (36a), but not when it co-occurs with it, (36b), or follows it, (36c).

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[31] Big letters represent vowels before harmony rules have applied to them.
[32] Nominalizations can in principle also have within them morphemes of valency alternations (passive, causative — preceed participial suffix) and negation (preceeds case morphology).
[33] This description is true only of its uses in nominalizations. In relative clauses, it is commonly used for describing "a permanent property of an individual" (Sanzheev et al. 1962).

(i)      [manai taiʃ-a:    tuxai du: garg-**a:ʃa**]      xün    ənəl    da:
          1SG.GEN taiʃi-REFL about song bring.out-PART human this-PTCL EMPH.PTCL
          'Here is that very person who composes songs about our taishi (a community
          leader in Mongolic culture).'                          (Sanzheev et al. 1962: 175)

(36)    a.    bi            [dugar-ai   baigal-ha: jər-**ɘ:ʃ**-i-jə]        mədə-nə-b
              1SG.NOM Dugar-GEN Baikal-ABL come-PART-ACC know-PRS-1SG
              'I know that Dugar returned from Baikal.'                  $t_N < t_m$

        b.    * xübü:n      [də:ʃə dəbxər-**ɘ:ʃ**-ɘ:]        orold-o:
              boy.NOM up      jump-PART-ACC.REFL attempt-PST
              Intended: 'The boy was attempting to jump high.'     $t_N \approx t_m$ [34]

        c.    * bi          [dugar-ai   du:  du:l-**a:ʃ**-i-jə]        mədə-nə-b
              1SG.NOM Dugar-GEN song sing-PART-ACC know-PRS-1SG
              Intended: 'I know that Dugar will sing a song.'        $t_N > t_m$

While this, again, might be a considerable simplification of *-A:ʃA*'s mean-
ing, I will assume that this participle suffix is just setting the right boundary
of the time interval corresponding to the nominalization event with respect
to the time of evaluation, (37): there is a time interval $t_N$ at which the event
denoted by the nominalization is evaluated, and the right boundary (RB) of
this time interval is before the evaluation time.

(37)    $[\![\text{PART.PAST}]\!]^{w,t,g} = \lambda P_{siet}.\lambda e'_e. \exists t_N [RB(t_N) < t \,\&\, P(w)(t_N)(e') = 1]$

When *-A:ʃA* combines with the verb phrase 'break the cart by Badma', (38),
by Intensional Functional Application (with the intension of the VP as in
(39)), it returns a predicate of events such that they are events of breaking
the cart by Badma whose right boundary is at some time preceeding the
verb's time of evaluation, (40). This is the meaning of the nominalization.

(38)    $[\![\text{break the cart by Badma}_{VP}]\!]^{w,t,g}$
        $= \lambda e'_e.\ break_{w,t}(e') \wedge Theme(e') = \text{the cart} \wedge Agent(e') = Badma$

(39)    $[\![\text{break the cart by Badma}_{VP}]\!]^g_{\text{Ç}}$
        $= \lambda w_s.\lambda t_i.\lambda e'_e.break_{w,t}(e') \wedge Theme(e') = \text{the cart} \wedge Agent(e') = Badma$

(40)    $[\![\text{Badma's breaking.PAST the cart}]\!]^{w,t,g} = \lambda e'_e.\ \exists t_N [RB(t_N) < t \wedge$
        $break_{w,t_N}(e') \wedge Theme(e') = \text{the cart} \wedge Agent(e') = Badma]$

In order to simplify future derivations, I introduce the abbreviation in (41):

(41)    $[\![\text{Badma's breaking.PAST the cart}]\!]^{w,t,g} = (40) =_{ABB} \lambda e'_e.\ \text{NMN}_{w,t_N < t}(e')$

---

[34] We could have expected (36b) to mean there was an attempt at $t_m$ on the part of the boy
to have it be the case that there was a jump by him at some $t_N$ before $t_m$. I suggest that
the semantics of 'attempt' is incompatible with the attempted event preceding the attempt,
thus leading to the ungrammaticality we see in (36b) .

The denotation I provide in (40) is not yet the full story: we need to know how such a nominalization combines with the verb. In particular, since we would like to derive the observed presupposition even with indefinite nominalizations, we need to know how this nominalization combines with the verb when it obtains indefinite interpretations. I address this question in section 3.2.3, where I argue that when $\theta_{Th}$ combines with *hanaxa*, it selects directly for a predicate of individuals (and thus takes the nominalization in (40) directly as its argument) and introduces an existential quantifier which binds the argument of that predicate.

For now, I would like to provide some arguments that the nominalization under consideration is a predicate of simple (Content-less) events. According to (40), the predicate of events denoted by the NMN doesn't provide the Content of the thought, it just describes what it is about. This predicts that while in principle the existence of an event of which the predicate denoted by the nominalization is true could be compatible with the beliefs of the attitude holder, it does not have to be. I would like to argue that this prediction is borne out. Consider (42):

(42)  badma [darim-i:n  dən      türgö:r maʃina:r jab-a:ʃ-i:jə]  hana-na,
      Badma Darima-GEN too.much quickly by.car    go-PART-ACC think-PRS
      xarin badma [(darima) dən      türgö:r maʃina:r jab-a:  gəžə]
      but   Badma (Darima)  too.much quickly by.car    go-PST COMP
      hana-na-güj
      think-PRS-NEG
      Paraphrase: 'Badma remembers an event of Darima's driving too
      quickly, but he doesn't think that Darima drove too quickly.'

In (42) we see two clauses with the verb *hanaxa* and the same attitude holder; in the first clause the verb combines with the nominalization, and in the second it combines with a CP with the lexical material identical to that of the nominalization. If the nominalization described Badma's beliefs, then this sentence would have been contradictory. However, (42) is felicitous: an event denoted by the nominalization is interpreted *de re* — the description 'Darima's driving too quickly' is the speaker's description, not Badma's.

Another piece of evidence comes from the fact that nominalizations cannot report false memories. In the context in (43a), while a CP can be used with *hanaxa* to describe Darima's false memory, the NMN cannot: (43c).

(43)    a.  **Context:** Darima recalled a situation that happened recently.
            She heard some unexpected noise in the back yard while she
            was alone at home. She was afraid to look who it was. Now

she is convinced that it was a thief entering the house, but I know for a fact that it was just her brother coming home earlier than expected from Kurumkan.

b.  darima          [gər-tə      xulgaiʃan or-o:       gəžə] hana-na,
    Darima.NOM house-DAT thief.NOM enter-PST COMP think-PRS
    xarin tərə axa-n'              xurumxan-ha: jərə-hən    bai-ga:
    but    that brother-3.NOM Kurumkan-ABL come-PFCT be-PST
    'Darima thinks that a thief entered the house, but it was her brother coming from Kurumkan.'

c.  #darima         [gər-tə      xulgaiʃan-ai or-o:ʃ-i:jə]        hana-na,
    Darima.NOM house-DAT thief-GEN      enter-PART-ACC think-PRS
    xarin tərə axa-n'              xurumxan-ha: jərə-hən    bai-ga:
    but    that brother-3.NOM Kurumkan-ABL come-PFCT be-PST
    Intended: 'Darima thinks that a thief entered the house, but it was her brother coming from Kurumkan.'

My proposal that the nominalization denotes a function that characterizes a set of events is also supported by the distributional facts. First, the nominalization can be referred to by the noun *uʃar* 'event, situation' and, unlike propositions, can 'happen outside', (44).

(44)  a.  sajana        [badm-i:n    tərgə əmdəl-ə:ʃ-i:jə]   han-a:
          Sajana.NOM Badma-GEN cart   break-PART-ACC think-PST
          'Sajana remembered Badma's breaking the cart.'

      b.  ... ənə uʃar  gaza:   bol-o:
          this event outside become-PST
          '...This event happened outside.'

Second, unlike CPs, the nominalization cannot combine with predicates like 'suspect', 'argue', 'deny', 'be mistaken', 'doubt'. (45) and (46) illustrate this with *ta:maglaxa* 'suspect' and *arsaldaxa* 'argue'.

(45)  a.  sajana [səsəg       xada        də:rə gar-a: gəžə] ta:magla-na
          Sajana Seseg.NOM mountain to     go-PST COMP suspect-PRS
          'Sajana suspects that Seseg went to the mountains.'

      b.  *sajana [səsəg-əi xada        də:rə gar-a:ʃ-i:jə]   ta:magla-na
          Sajana  Seseg-GEN mountain to     go-PART-ACC suspect-PRS
          Intended: 'Sajana suspects that Seseg went to the mountains.'

(46)  a.  sajana [səsəg       xada        də:rə gar-a:  gəžə] arsalda-na
          Sajana Seseg.NOM mountain to     go-PST COMP argue-PRS
          'Sajana argues that Seseg went to the mountains.'

b.  \*sajana [sǝsǝg-ǝi   xada      dǝːrǝ gar-aːʃ-iːjǝ]   arsalda-na
    Sajana  Seseg-GEN mountain to     go-PART-ACC argue-PRS
    Intended: 'Sajana argues that Seseg went to the mountains.'

I propose that the reason for the ungrammaticality of (45b) and (46b) is that the verbs *ta:maglaxa* 'suspect' and *arsaldaxa* 'argue' require an argument which specifies their propositional Content. If the nominalization could provide Content, the sentences in (45b) and (46b) would have been grammatical. However, since the nominalization is a predicate of Content-less events, it cannot satisfy this requirement, hence the ungrammaticality of (45b) and (46b).[35] Thus, I conclude that analyzing the nominalization as a predicate of events without Content is well-supported by the data.

### 3.2.2 The pre-existence presupposition

I would like to propose that the "remember" translation that *hanaxa* exhibits with nominal arguments comes from a pre-existence presupposition introduced by the functional head $\theta_{Th}$ in the context of *hanaxa*. $\theta_{Th}$ is the functional projection which introduces internal (Theme) arguments of different verbs. The interpretation of this head is subject to contextual allosemy: it differs depending on the verb $\theta_{Th}$ combines with.

I propose that when $\theta_{Th}$ combines with *hanaxa,* it introduces the argument that the thoughts are about. $\theta_{Th}$ also introduces a pre-existence presupposition associated with this *about*-argument: the left boundary of the time interval corresponding to it is before the *hanaxa*'s time of evaluation. Here is one possible entry for $\theta_{Th}$ that captures this (to be modified later):

(47)    $[\![\theta_{Th}]\!]^{w,t,g} = \lambda P_{et}.\lambda x_e.\lambda e_e: LB(\tau(x)) < t.\ P(e) \wedge \text{ABOUT}(e) = x.$
        (where LB is 'left boundary'; $\tau$ is a function which takes an individual and returns the time interval corresponding to it[36]; ABOUT is a function that takes an event with Content and returns its topic)

I would like to argue that "$LB(\tau(x)) < t$" is what gives rise to the "remember" translation: "to remember" in Buryat is to think of something that is presupposed to have started existing before the time of thinking.[37]

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[35] An open question is whether verbs as in (45)-(46) can combine with nominalizations when the requirement to specify the propositional content is independently satisfied by a CP.

[36] For eventualities the time interval is duration, for entities — life/existence span.

[37] Note that the meaning in (47) does not itself encode that the attitude holder was previously aware of the existence of the *about*-argument. Could then *hanaxa* also mean 'realize'? (I am grateful to Kai von Fintel for raising this question.) It cannot, and, I think, for the

I would like to remark that the argument that $\theta_{Th}$ introduces is not interpreted in the same way as *about*-PPs are interpreted. While both in (48a) and in (48b) the nominalization denotes the topic of thoughts, only in the former case is there a pre-existence presupposition associated with it.

(48)  a.  [Badm-i:n  tərgə əmdəl-ə:ʃ-**i:jə**]  Sajana han-a:
           Badma-GEN cart   break-PART-**ACC**  Sajana think-PST
           'Sajana **remembered** Badma's breaking of the cart.'
      b.  [Badm-i:n  tərgə əmdəl-ə:ʃə]      **tuxai** Sajana han-a:
           Badma-GEN cart   break-PART.NOM **about** Sajana think-PST
           'Sajana **thought about** Badma's breaking of the cart.'

While (48b) could receive an analysis along the lines of the one proposed by Rawlins (2013), this would not be enough to account for (48a). Thus, the $\theta_{Th}$ head which introduces accusative-marked nominals in sentences with *hanaxa* cannot be equated with the postposition *tuxai* 'about'. However, I suggest that the ABOUT-relation in (47) could receive an interpretation along the lines of the Rawlins's proposal: ABOUT(e) = x holds iff an individual x is not orthogonal to the content of e.

### 3.2.3  Analysis: existential quantifier from the $\theta_{Th}$

In this section I develop an implementation of my proposal and address the question of how the pre-existence presupposition projects. As I mentioned before, I am focusing on indefinite readings of nominalizations in order to guarantee that the pre-existence presupposition is derived with them as well. Indefinite expressions have existential quantifiers corresponding to them, and the question of presupposition projection in a sentence with an indefinite phrase thus amounts to the question of how presuppositions project from quantificational sentences. I will adopt a solution to this question that was proposed within the trivalent approach to presupposition projection (George 2008b, George 2008a, George 2014, Fox 2013).

The trivalent logic (the strong Kleene logic) provides a general recipe for transforming bivalent semantic values to trivalent ones (functions from different domains to truth values 1, 0 and #). Imagine that we have a complex sentence which contains an expression $\alpha$ that received the third value (#). The main idea of the strong Kleene approach is that the truth value of

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following reason. Buryat has a verb *oilgoxo* 'notice, realize', which seems to presuppose that the attitude holder was unaware of the individual denoted by its internal argument before. I assume that whenever the presupposition of *oilgoxo* is met it must be used due to *Maximize Presupposition*, and thus *hanaxa* will not be used in such cases.

the complex sentence will be 1 iff all the ways of assigning bivalent truth values to $\alpha$ will make it true; it will be 0 iff all the ways of assigning bivalent truth values to $\alpha$ will make it false; it will be # otherwise. In other words, # represents uncertainty about which value, 1 or 0, a certain expression has. And this uncertainty projects only if it matters for the calculation of the bivalent truth values for the bigger structure.

Within this logic, the existential quantifier can be treated as a form of disjunction (George 2014). A classical disjunction is true as long as at least one of the disjuncts is true and is false iff all of its disjuncts are false. Thus, $\exists x \phi(x)$ is true if we can find at least one x which makes $\phi$ true (even if some other values of x are presupposition failures). It is false if for every x, $\phi(x)$ is false. Here's an illustration based on (George 2014:105).

(49)     Some student has stopped smoking.
　　　a.   1 iff $\exists x$[student(x) $\wedge$ x smoked before $\wedge$ x doesn't smoke now]
　　　b.   0 iff $\forall x$[student(x) $\rightarrow$ x used to smoke before $\wedge$ x still smokes]
　　　c.   defined ($\neq$#) iff it is 1 $\vee$ 0:  [$\exists x$[student(x) $\wedge$ x smoked before $\wedge$ x doesn't smoke now]] $\vee$ [$\forall x$[student(x) $\rightarrow$ x used to smoke before $\wedge$ x still smokes]]

The sentence in (49) is true iff there is at least one student for whom it is true that they smoked before and don't smoke now. This sentence is false iff for all students it is the case that they smoked before and still smoke. The third value is an elsewhere case: the sentence in (49) will receive it when neither the truth nor the falsity conditions are met. The other way to put it is that this sentence is defined and does not result in presupposition failure if it is either true or false, (49c). As one can see, the presupposition we arrive at for quantificational sentences is a disjunctive presupposition. I will assume that all existential quantifiers have such disjunctive presuppositions.

In case of indefinite nominalizations, we face the question of where the existential quantifier comes from. A natural assumption would have been that the nominalization, (40), combines with a (morphologically null) existential quantifier with the denotation in (50).

(50)     $[\![\emptyset_a]\!]^{w,t,g} = \lambda p_{et}.\lambda q_{et}$: $\exists x$ [p(x) = 1 & q(x)=1] $\vee$ $\forall x$ [p(x)=1 $\rightarrow$ q(x)=0]. $\exists x$ [p(x) = 1 & q(x)=1]

Such an existential quantifier would take two predicates of individuals as its arguments and assert that there is an individual that makes both of these predicates true. It would also have a disjunctive presupposition derived as described above: it would presuppose that either there is an individual

which makes both predicates true or any individual who makes the first predicate true, makes the second one false.

However, it turns out that assuming that the NMN combines with an existential quantifier leads to bad predictions with respect to presupposition projection. Here I only briefly illustrate the issue, see the appendix for the detailed discussion. If we assume that the QP with the existential quantifier undergoes QR, we arrive at the configuration sketched out in (51).

(51)   $[\![ \emptyset_a \text{ NMN} ]\!]^{w,t,g}$ $(\lambda x.[\![ \textit{Sajana hanaxa } t_1 ]\!]^{w,t,g[1\to x]})$
    a.   1 iff $\exists e[\text{NMN}_{w,t_N<t}(e) \wedge [\lambda x.[\![ \textit{Sajana hanaxa } t_1 ]\!]^{w,t,g[1\to x]}](e)=1]$
    b.   0 iff $\forall e[\text{NMN}_{w,t_N<t}(e) \to [\lambda x.[\![ \textit{Sajana hanaxa } t_1 ]\!]^{w,t,g[1\to x]}](e)=0]$

The problem lies with the falsity condition in (51b). Universal statements are true when the restrictor of the universal quantifier is empty. This means that the falsity condition in (51b) will be satisfied if there are no events of the kind described by the nominalization. This is problematic: we don't want a sentence 'Sajana remembered Badma's breaking the cart', (35) repeated below as (52), to be false in case there were no events of Badma breaking the cart. We want it to be a presupposition failure.

(52)   sajana          [badm-i:n    tərgə əmdl-**ɘːʃ**-i:jə-(n')]    han-a:
    Sajana.NOM Badma-GEN cart   break-**PART**-ACC-(3) think-PST
    'Sajana **remembered** that Badma broke the cart.'

I do not see an easy, non-stipulative fix to this problem, and so I will pursue a different path: I will assume that the existential quantifier is introduced directly by the $\theta_{Th}$ head when it combines with *hanaxa*.[38] Under this approach, the nominalization is not a quantificational phrase, and thus it does not undergo QR. The LF for the sentence (52) is presented in (53).

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[38] I am grateful to Roger Schwarzschild for his suggestion to put the existential quantifier into the meaning of the thematic role head.

(53)

```
                                          TP
                                       ╱      ╲
                                    ╱            T
                                 ╱             ╱   ╲
                            VoiceP   ∃    PAST   C₁
                          ╱       ╲
                     DP              ╲
                   ╱    ╲          ╱    ╲
            Sajana     VP     Voice
                    ╱       ╲
               NMN
             ╱       ╲
        VP    PART.PAST      V       θ_Th
      ╱   ╲                think
  Badma break the cart
```

I propose that when $\theta_{Th}$ combines with *hanaxa,* its second argument is not an individual (as in (47)), but a predicate of individuals, (54):

(54)    $[\![\theta_{Th}]\!]^{w,t,g} = \lambda P_{et}.\lambda Q_{et}.\lambda e_e:\ \exists x[Q(x) \wedge \mathrm{LB}(\tau(x)) < t].\ \exists x[Q(x) \wedge \mathrm{LB}(\tau(x)) < t \wedge P(e) \wedge \mathrm{ABOUT}(e) = x].$

Thus, the nominalization, (40), which is a predicate of events, is able to directly combine with $\theta_{Th}$ as its second argument. The existential quantifier in $\theta_{Th}$'s denotation binds the event variable of the nominalization and also places a restriction that the left boundary of that event has to precede the evaluation time of the verb. This is the pre-existence presupposition. Note that the presuppositional component in this case is repeated in the assertion.

   The derivation then proceeds in the following way. At the first two steps of the derivation $\theta_{Th}$ saturates two of its arguments: it first combines with the verb and then with the nominalization, resulting in (55).

(55)    $[\![\mathrm{VP}]\!]^{w,t,g} = \lambda e_e:\ \exists e'[\mathrm{NMN}_{w,t_N<t}(e') \wedge \mathrm{LB}(\tau(e')) < t].\ \exists e'[\mathrm{NMN}_{w,t_N<t}(e') \wedge \mathrm{LB}(\tau(e')) < t \wedge \mathrm{think}_{w,t}(e) \wedge \mathrm{ABOUT}(e) = e'].$

After that Voice, (56),[39] combines with the VP and introduces the external argument, which gets saturated in (52) by DP "Sajana", (57).[40]

(56)    $[\![\text{Voice}_{ExpA}]\!]^{w,t,g} = \lambda P_{et}.\lambda y_e.\lambda e_e: P(e)\neq\#.\ P(e){=}1 \wedge \text{Exp}(e){=}y.$

(57)    $[\![\text{VoiceP}]\!]^{w,t,g}$
        $= \lambda e_e.$
$$\begin{cases} 1 \text{ iff } \exists e'[\text{NMN}_{w,t_N<t}(e') \wedge LB(\tau(e')) < t \wedge \text{think}_{w,t}(e) \wedge \text{ABOUT}(e) = e' \\ \qquad \wedge Exp(e) = \text{Sajana}] \\ 0 \text{ iff } \exists e'[\text{NMN}_{w,t_N<t}(e') \wedge LB(\tau(e')) < t] \\ \wedge\neg[\exists e'[\text{NMN}_{w,t_N<t}(e') \wedge LB(\tau(e')) < t \wedge \text{think}_{w,t}(e) \wedge \text{ABOUT}(e) = e' \\ \qquad \wedge Exp(e) = \text{Sajana}]] \\ \# \text{ otherwise} \end{cases}$$

The VoiceP combines with the existential closure, (58), which, being existential quantifier, has a disjunctive presupposition. This results in (59).

(58)    $[\![\exists]\!]^{w,t,g} = = \lambda P_{et}: \exists e[P(e){=}\ 1] \vee \forall e[P(e){=}0].\ \exists e[P(e){=}\ 1]$

(59)    $[\![\text{VoiceP} + \exists]\!]^{w,t,g} =$

$$\begin{cases} 1 \text{ iff } \exists e[\exists e'[\text{NMN}_{w,t_N<t}(e') \wedge LB(\tau(e')) < t \wedge \text{think}_{w,t}(e) \wedge \text{ABOUT}(e) = e' \\ \qquad \wedge Exp(e) = \text{Sajana}]] \\ 0 \text{ iff } \forall e[\exists e'[\text{NMN}_{w,t_N<t}(e') \wedge LB(\tau(e')) < t] \wedge \neg[\exists e'[\text{NMN}_{w,t_N<t}(e') \wedge LB(\tau(e')) < t \\ \qquad \wedge \text{think}_{w,t}(e) \wedge \text{ABOUT}(e) = e' \wedge Exp(e) = \text{Sajana}]]] \\ \# \text{ otherwise} \end{cases}$$

Simplifying this by using the equivalence $\forall x[\psi \wedge \phi(x)] \equiv \psi \wedge \forall x[\phi(x)]$, which holds provided that $\psi$ contains no free occurrences of x and that the domain $D_e$ is not empty, and the equivalence $\forall x[\neg\psi(x)] \equiv \neg\exists x[\psi(x)]$, we get (60).

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[39] This denotation for Voice is equivalent to the denotation in (26) we had in section 3.1.2 with the addition of the presupposition that the P argument is defined.

[40] Here and in the discussion to follow I will sometimes use single-bracket notation for better readability.

(60)    $[\![\text{VoiceP} + \exists]\!]^{w,t,g} =$

$$\begin{cases} 1 \text{ iff } \exists e[\exists e'[\text{NMN}_{w,t_N<t}(e') \wedge LB(\tau(e')) < t \wedge \text{think}_{w,t}(e) \wedge \text{ABOUT}(e) = e' \\ \qquad \wedge Exp(e) = \text{Sajana}]] \\ 0 \text{ iff } \exists e'[\text{NMN}_{w,t_N<t}(e') \wedge LB(\tau(e')) < t] \\ \qquad \wedge \neg \exists e[\exists e'[\text{NMN}_{w,t_N<t}(e') \wedge LB(\tau(e')) < t \wedge \text{think}_{w,t}(e) \wedge \text{ABOUT}(e) = e' \\ \qquad \wedge Exp(e) = \text{Sajana}]] \\ \# \text{ otherwise} \end{cases}$$

Finally, the proposition in (60) is combined with the contextually restricted tense by Intensional Functional Application. Since I assume an analysis of tense where it introduces an existential quantifier over times, it will have a disjunctive presupposition, (61). The result of combining the contextually restricted tense, (62), with the proposition is in (63).

(61)    $[\![\text{PAST}]\!]^{w,t,g} = \lambda C_i \lambda p_{sit}$: $[\exists t' < t \wedge t' \subseteq C \ [p(w)(t') = 1]] \vee [\forall t' < t \wedge t' \subseteq C \ [p(w)(t') = 0]]$. $\exists t' < t \wedge t' \subseteq C \ [p(w)(t') = 1]$

(62)    $[\![\text{PAST C}_1]\!]^{w,t,g}$
        $= \lambda p_{sit}.$
$$\begin{cases} 1 \text{ iff } \exists t' < t \wedge t' \subseteq g(1) \ [p(w)(t') = 1] \\ 0 \text{ iff } \forall t' < t \wedge t' \subseteq g(1) \ [p(w)(t') = 0] \\ \# \text{ otherwise} \end{cases}$$

(63)    $[\![\text{TP}]\!]^{w,t,g} =$

$$\begin{cases} 1 \text{ iff } \exists t' < t \wedge t' \subseteq g(1) \ [\exists e[\exists e'[\text{NMN}_{w,t_N<t'}(e') \wedge LB(\tau(e')) < t' \wedge \text{think}_{w,t'}(e) \\ \qquad\qquad \wedge \text{ABOUT}(e) = e' \wedge Exp(e) = \text{Sajana}]]] \\ 0 \text{ iff } \forall t' < t \wedge t' \subseteq g(1) \ [\exists e'[\text{NMN}_{w,t_N<t'}(e') \wedge LB(\tau(e')) < t'] \\ \qquad\qquad \wedge \neg \exists e[\exists e'[\text{NMN}_{w,t_N<t'}(e') \wedge LB(\tau(e')) < t' \wedge \text{think}_{w,t'}(e) \\ \qquad\qquad \wedge \text{ABOUT}(e) = e' \wedge Exp(e) = \text{Sajana}]]] \\ \# \text{ otherwise} \end{cases}$$

(63) states that the sentence is true iff there exists some past time interval t' within a contextually salient time and there exist events e and e' such that e' is Badma's breaking the cart and e is an event of Sajana thinking about e', and the left boundary of e' is before t'. This seems right.

(63) also gives the correct falsity condition: in order for it to be met there needs to exist an event denoted by the NMN such that its left boundary is before all times within the contextually given past time interval. This means

that if the pre-existence requirement is not met, the sentence will receive the third value (#), and thus be a presupposition failure.[41]

To sum up, we have seen that treating the nominalization as a predicate of events and having the existential quantifier be introduced by $\theta_{Th}$ gives us the projection behavior of the pre-existence presupposition which is empirically correct, (12), repeated here as (64).

(64)     **Projected inference:**
         there is a NMN-event that started before the time at which the thinking event is evaluated.

However, this implementation raises the question of how $\theta_{Th}$ that combines with *hanaxa* takes simple individuals like proper names (see (8)) as its arguments, which, I assume, denote individuals and not functions that characterize sets of individuals. I propose that individual-denoting DPs need to be shifted to predicates by an operator like IDENT (Partee 1986) in order to combine with $\theta_{Th}$ in the context of *hanaxa*.

The meaning I proposed for $\theta_{Th}$, (54), is the meaning that this Theme-introducing head receives when it combines with *hanaxa*. This brings about the question of whether this case of contextual allosemy is unique to this verb, or whether the condition for $\theta_{Th}$ having the meaning in (54) is broader, and, for example, it includes a class of verbs. This is an open issue that requires investigation. One tentative hypothesis I can suggest is that $\theta_{Th}$ always has the meaning in (54) when it combines with attitude verbs and

---

[41] "Unwrapping" the meaning of NMN results in (i) (c = the cart, B = Badma, S = Sajana). As one can see, this does not affect presupposition projection.

(i)          $[\![$Sajana thought of Badma's breaking the cart$]\!]^{w,t,g} =$

$$
\begin{cases}
1 \text{ iff } \exists t' < t \wedge t' \subseteq g(1) \\
\quad [\exists e[\exists e'[\exists t_N[RB(t_N) < t' \wedge \text{break}_{w,t_N}(e') \wedge Theme(e') = \text{c} \wedge Agent(e') = \text{B}] \\
\qquad \wedge LB(t_N) < t' \wedge \text{think}_{w,t'}(e) \wedge \text{ABOUT}(e) = e' \wedge Exp(e) = \text{S}]]] \\
0 \text{ iff } \forall t' < t \wedge t' \subseteq g(1) \\
\quad [\exists e'[\exists t_N[RB(t_N) < t' \wedge \text{break}_{w,t_N}(e') \wedge Theme(e') = \text{c} \wedge Agent(e') = \text{B}] \\
\qquad \wedge LB(t_N) < t'] \\
\quad \wedge \neg\exists e[\exists e'[\exists t_N[RB(t_N) < t' \wedge \text{break}_{w,t_N}(e') \wedge Theme(e') = \text{c} \wedge Agent(e') = \text{B}] \\
\qquad \wedge LB(t_N) < t' \wedge think_{w,t'}(e) \wedge \text{ABOUT}(e) = e' \wedge Exp(e) = \text{S}]] \\
\# \text{ otherwise}
\end{cases}
$$

that accusative subjects that we see in sentences with CP clauses, (65), are such *about*-arguments introduced by $\theta_{Th}$.[42]

(65)     sajana [badma      / **badm-i:jə** tərgə əmdəl-ə:   gəžə] han-a:
           Sajana Badma.NOM / **Bada.ACC** cart   break-PST COMP think-PST
           / məd-ə:     / xəl-ə:    / ojlg-o:
           / know-PST / say-PST / realize-PST
           'Sajana thought of Badma / {found out / said / realized} about Badma that he broke the cart.'

If the pre-existence presupposition is present with all verbs that take accusative subjects, then *hanaxa* is special only in that the presence of this presupposition is easy to indicate by the 'remember' translation. Note also that if this hypothesis is correct, then the co-occurence of *about*-arguments introduced by $\theta_{Th}$ and CPs is a widely attested phenomenon.

# 4   Predictions & discussion

In this section I examine a prediction of my analysis about nominalized CPs, 4.1, discuss whether my proposal can be implemented under Hintikkan (Hintikka 1969) approach to attitude verbs, 4.2, and provide some evidence that Buryat is not unique in having the argument structure of an attitude verb giving rise to factive inferences, 4.3.

## 4.1   Nominalized CPs

I argued that participle-based nominalizations like (2a), denote functions that characterize sets of (simple) events. Barguzin Buryat also has a different kind of nominalizations: nominalized CP clauses, (66).

(66)     [badma üstər      nom unʃ-a:   **g-ə:ʃə**]        buru:
           Badma  yesterday book read-PST **say-PART.NOM** false
           'That Badma read a book yesterday is false.'

---

[42] There is a question of whether accusative arguments like in (65) originate in the embedded clause or in the matrix clause. Bondarenko (2017a) argues that accusative subjects can originate within the CP; Bondarenko (2017b) shows based on matrix passivization that both raising and control structures are in principle available. If this is so, then it might be that some accusative subjects are directly introduced by $\theta_{Th}$, while others raise to the argument position of $\theta_{Th}$ from the embedded clause.

The nominalization in (66) involves a finite clause embedded under the complementizer *gə* 'say' with the participial morphology and case marking on it. Since I assume that complementizers introduce Content relations, this suggests that the nominalization in (66) is a predicate of individuals with Content 'Badma read a book yesterday' (rather than predicate of events of Badma reading a book yesterday). Thus, I make a prediction that when a nominalization like (66) is an object of *hanaxa*, there should be no factive inference about the existence of an event of the kind described by the clause under *gə* 'say' (Badma's reading a book yesterday in case of (66)) in the real world. This is so because an event of the embedded proposition is not itself an object of *hanaxa*. This prediction is borne out, (67).

(67)     dugar [mi:sgəi-n zagaha ədj-ə:   g-ə:ʃ-i:jə]    han-a:,    xarin
         Dugar cat-GEN    fish     eat-PST say-PART-ACC think-PRS but
         mi:sgəi zagaha ədj-ə:-güi
         cat     fish    eat-PST-NEG
         'Dugar remembers (the claim) that the cat ate fish, but the cat didn't
         eat fish.'

Note that the verb in (67) is still translated as 'remember'. In this example, what Dugar recalls is a claim/rumor/thought that has been previously made.[43] This is not surprising under my proposal: $\theta_{Th}$'s pre-existence presupposition is still present in (67), but, since $\theta_{Th}$'s argument is a predicate of individuals with Content 'The cat ate fish', it presupposes that an individual with this propositional Content pre-exists the verb's evaluation time. I propose that it is this presupposition that makes examples like (68) infelicitous.

(68)     # mi:sgəi zagaha ədj-ə:  gə-žə    xən-ʃjə   xəzə:-ʃjə   han-a:-güi,
            cat     fish    eat-PST say-CVB who-PTCL when-PTCL think-PST-NEG
         (xarin) dugar [mi:sgəi-n zagaha ədj-ə:   g-ə:ʃ-i:jə]    han-a:
         (but)  Dugar cat-GEN    fish     eat-PST say-PART-ACC think-PST
         # 'Noone has ever thought that the cat ate the fish, (but) Dugar
         remembered (the claim) that the cat ate the fish.'

To sum up, the pre-existence presupposition is observed with all nominalized clauses, which combine with *hanaxa* via the $\theta_{Th}$ projection. The pre-existence presupposition will lead to a factive inference only if the nominalization denotes a predicate of simple (Content-less) events, but not when it denotes a predicate of individuals with propositional content.

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[43] See (Bogal-Allbritten & Moulton 2016) for discussion of a nominalization with similiar semantics in Korean.

## 4.2  Alternative: Hintikkan semantics for attitudes

This section addresses the question of whether my proposal can be implemented under more standard Hintikkan semantics for attitude verbs (Hintikka 1969), according to which embedded clauses denote propositions and semantics of attitude verbs involves quantification over worlds compatible with the beliefs of the attitude holder.

Here I will consider a version of Hintikkan semantics for attitudes which is enriched by events. According to this version, the verb takes a proposition p and an event e as its arguments, and returns true iff e is a thinking event and in all worlds compatible with the beliefs of the attitude holder ( = Experiencer of the event) in w the proposition p is true. *Hanaxa*'s meaning under this approach would have been as in (69).

(69)      $[\![hanaxa]\!]^{w,t,g} = \lambda p_{st} \lambda e_e . \text{think}_{w,t}(e) \wedge \forall w'[w' \in DOX_{Exp(e),w,t} \rightarrow p(w') = 1]$

Let us assume that the propositional argument p is not the Theme argument. The propositional argument is a true argument of the verb, while the Theme is introduced by the functional projection $\theta_{Th}$ which also places the pre-existence presupposition on it. Then the semantics in (69) would correctly predict sentences with CPs to lack the pre-existence presupposition. The meaning of the sentence in (20), e.g., would be in (70).

(70)      $[\![Sajana\ thought\ that\ Badma\ broke\ the\ cart.]\!]^{w,t,g}$
          = 1 iff $\exists t' < t \wedge t' \subseteq g(1)$ $[\exists e\ [\text{think}_{w,t'}(e) \wedge \forall w'[w' \in DOX_{Exp(e),w,t'}$
          $\rightarrow$ Badma broke the cart in w'] $\wedge$ Exp(e) = Sajana.] ]

However, note that if one wants to maintain a single, unambiguous lexical entry for *hanaxa*, one would need to have the propositional argument existentially closed in sentences with nominalizations and simple nouns. This would add to the meanings of those sentences an additional inference that 'there exists some proposition p such that in all worlds compatible with the beliefs of the experiencer of the thinking event ( = of the attitude holder) in w, this proposition is true'. This component seems harmless, but its presence will be very difficult to test, given that all attitude holders probably have some beliefs.[44]  A way to avoid having this component be present in sen-

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[44] A similiar issue has made me assume strictly neo-Davidsonian representations in my analysis. If I assumed that the Theme argument is a true argument of the verb, then I would have predicted the pre-existence presupposition to always be part of the denotation of the verb. I would have then needed to assume that in sentences with CPs the internal argument of the attitude verb is existentially closed. This would predict that the pre-existence presupposition is present even in sentences with CPs, but is very weak: 'Something which

tences with NPs would be to introduce the propositional argument through a special functional projection as in (71).

(71)     $[\![\theta_{CONT}]\!]^{w,t,g} = \lambda P_{et}.\lambda p_{st}.\lambda e_e.P(e) \wedge \forall w'[w' \in DOX_{Exp(e),w,t} \rightarrow p(w') = 1]$.

The move to (71), however, seems to be a step towards the decompositional analysis of attitude verbs: the quantification over possible worlds in this case is separated from the meaning of the verb and is incorporated into a special proposition-introducing projection. Thus, it seems that a Hintikkan implementation of my proposal might need at least some decomposition of the meaning of the attitude verb.

Nominalized CPs discussed in the previous section present another challenge for the Hintikkan approach: in such nominalizations we see that complementizers establish the relation between an individual and an embedded proposition. Assuming that complementizers have the same meaning in all of their uses, this suggests that in sentences with finite CPs it is also complementizers which establish the relation between the event described by an attitude verb and the embedded proposition. This suggests that the attitude verbs themselves do not introduce Content relations or quantification over possible worlds, and thus provides an argument in favor of the decompositional approach to attitude reports.[45]

### 4.3   *Beyond Buryat*

One broader implication that arises from my proposal is that some factivity inferences that we observe in sentences with attitude verbs are reducible to

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the attitude is about pre-exists a thinking event with Content p.' Importantly, such a weak presupposition would not lead to factivity, since the *about*-argument in this case need not be related in any way to the embedded proposition. However, I find it undesirable to postulate presuppositions that we have no empirical evidence for. The neo-Davidsonian approach allows us not to postulate these weak existential presuppositions in cases when one of the verb's arguments is not present.

[45] There is another argument one could make against the Hintikkan approach (I thank Patrick Elliott for discussion of this issue). Under the Hintikkan semantics, the propositional argument and the Theme argument are both arguments of the attitude verb (whether they combine with the verb directly or via a functional projection does not matter here). Given that arguments can have presuppositions associated with them, it should be equally easy to find verbs which are presuppositional on the propositional argument and non-presuppositional on the Theme argument as finding verbs like *hanaxa* which are presuppositional on the Theme argument and non-presuppositional on the propositional argument. However, all factivity alternations seem to go only in one direction: verbs have presuppositions when they combine with nominal arguments but not when they combine with CPs. If CPs, unlike nominal arguments, are modifiers that combine by Predicate Modification, as assumed by the decompositional approach, then this asymmetry is expected.

restrictions that predicates place on their internal arguments. My proposal facilitates the view according to which there are no significant differences between predicates of events without propositional Content and attitude verbs — predicates of events with propositional Content: both can presuppose that their internal argument pre-exists the event described by them.

Some support for this view comes from languages which use simple, non-attitude verbs in order to describe attitudes: we see that the restrictions these verbs place on their arguments carry over into their attitudinal uses.

Here is an example of this from Balkar.[46] The verb 'drop' ('cause to fall') requires that its direct object pre-exists the dropping, (72). When what is being dropped is an event (denoted by the nominalization) and the location of the dropping is one's memory, we arrive at an attitude report meaning 'remember', (73). Naturally, this attitude report has the factive inference: there has to exist an event of Fatima winning the contest.

(72)    alim-de    alma-la zoqe-le. # alim alma-nɨ    tüš-ür-gen-di
        Alim-LOC apple-PL exist-PL    Alim apple-ACC fall-CAUS-PFCT-3
        'Alim had no apples. # Alim dropped an apple.'

(73)    alim [fatima-nɨ  sabij-i erišü-de       qat-xan-i-n]      es-i-ne
        Alim Fatima-GEN child-3 contest-LOC win-PFCT-3-ACC memory-3-DAT
        tüš-ür-gen-di,      #alaj fatima-nɨ sabij-i erišü-de       qɨtdɨr-ʁan-dɨ
        fall-CAUS-PFCT-3 but   F.-GEN    child-3 contest-LOC lose-PFCT-3
        'Alim remembered that Fatima's child won the contest (lit. 'dropped Fatima's child's winning the context into his memory'), # but Fatima's child lost the contest'.

Thus, it seems that the pre-existence requirement that we see in (72) with respect to the internal argument of 'drop' is retained in case the internal argument is an event-denoting nominalization and the resulting meaning is that of an attitude report.[47]

Banerjee et al. (2019) observe similiar behavior with the predicate *mone pore* (mind.LOC fall.PRS.3) 'recall' in Bangla, and discuss some other non-attitude verbs that the language uses for attitude reports and their relation to factivity. They conclude that "it is the semantics of 'mind-predicates'

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[46] Balkar (also known as Malkar) is a dialect of the Karachay-Balkar language (Kipchak branch of the Turkic family). These Balkar data have been elicited in the village Verkhnyaya Balkaria in Kabardino-Balkar Republic of Russia.

[47] For my consultants, both the inference in (72) and the inference in (73) project, and thus seem to behave like presuppositions.

which is crucial to impose (non)presuppositionality...".[48] I agree with this conclusion: the argument structure of embedding verbs, and in particular, the presuppositions associated with their internal arguments, is what stands behind (at least some, but potentially, all) factive inferences.

# 5   Conclusion

In this paper I have examined a case of factivity alternation in Barguzin Buryat: this language has a verb *hanaxa* which is naturally translated as 'think' when it combines with CPs, but as 'remember' when it combines with nominalizations. I have argued that this is not a case of ambiguity. The two different translations reflect the two different paths that CPs and nominals take when combining with the verb: CPs combine by modifying the event argument of *hanaxa* and specifying the Content of thoughts, while nominal arguments combine via a functional head $\theta_{Th}$ which introduces internal arguments. In the context of *hanaxa*, the internal argument is interpreted as the topic of thoughts (what the thinking is about); $\theta_{Th}$ places a pre-existence presupposition on this argument: the *about*-argument is presupposed to have started existing before the time of thinking. I have argued that this presupposition is what is behind the 'remember' translation and provided an analysis of how this presupposition projects. Since CPs do not combine as Theme arguments, no pre-existence presupposition is present in sentences with them. Thus, my proposal suggests that one source of factive inferences is verbs' presuppositions about their internal arguments and that one source of factivity alternations is the availability of several paths for combining with the verb.

# 6   Appendix: Indefinite NMNS as GQS

This appendix discusses in more detail the problem with presupposition projection that arises when indefinite nominalizations are analyzed as generalized quantifiers. Under this approach, indefinite NMNs are formed by combining participles like in (40), repeated here as (74) and abbreviated later as $\lambda e'_e.NMN_{w,t_N<t}(e')$, with null existential generalized quantifiers as in (50), repeated here as (75).

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[48] I was made aware of Banerjee et al. (2019)'s work on Bangla only after I have came up with my proposal for Buryat's *hanaxa*. Given that my knowledge of their proposal is limited to the slides of their presentation (as far as I know, the paper based on it has not yet been published), I refrain from comparing their proposal to mine.

(74)     ⟦Badma's breaking.PAST the cart⟧$^{w,t,g}$ $= \lambda e'_e.$ $\exists t_N[RB(t_N) < t \wedge$ $break_{w,t_N}(e') \wedge Theme(e') = the\ cart \wedge Agent(e') = Badma]$

(75)     ⟦$\emptyset_a$⟧$^{w,t,g}$ $= \lambda p_{et}.\lambda q_{et}$: $\exists x\ [p(x) = 1\ \&\ q(x) = 1] \vee \forall x\ [p(x) = 1 \rightarrow$ $q(x) = 0]$. $\exists x\ [p(x) = 1\ \&\ q(x) = 1]$

The NMN saturates the first argument of $\emptyset_a$, giving rise to the DP in (76).

(76)     ⟦$\emptyset_a$ NMN⟧$^{w,t,g}$
         $= \lambda q_{et}.$
$$\begin{cases} 1 \text{ iff } \exists e'[\text{NMN}_{w,t_N<t}(e') = 1 \wedge q(e') = 1] \\ 0 \text{ iff } \forall e'[\text{NMN}_{w,t_N<t}(e') = 1 \rightarrow q(e') = 0] \\ \text{\# otherwise} \end{cases}$$

This DP is a quantificational phrase, so I assume that it needs to undergo QR from its base-generated position as the Theme argument. In that case, sentences like (35), repeated below as (77), have LFs like in (78).

(77)     sajana        [badm-iːn   tərgə əmdl-**ɔːʃ**-iːjə]     han-aː
         Sajana.NOM Badma-GEN cart   break-**PART**-ACC think-PST
         'Sajana **remembered** that Badma broke the cart.'

(78)
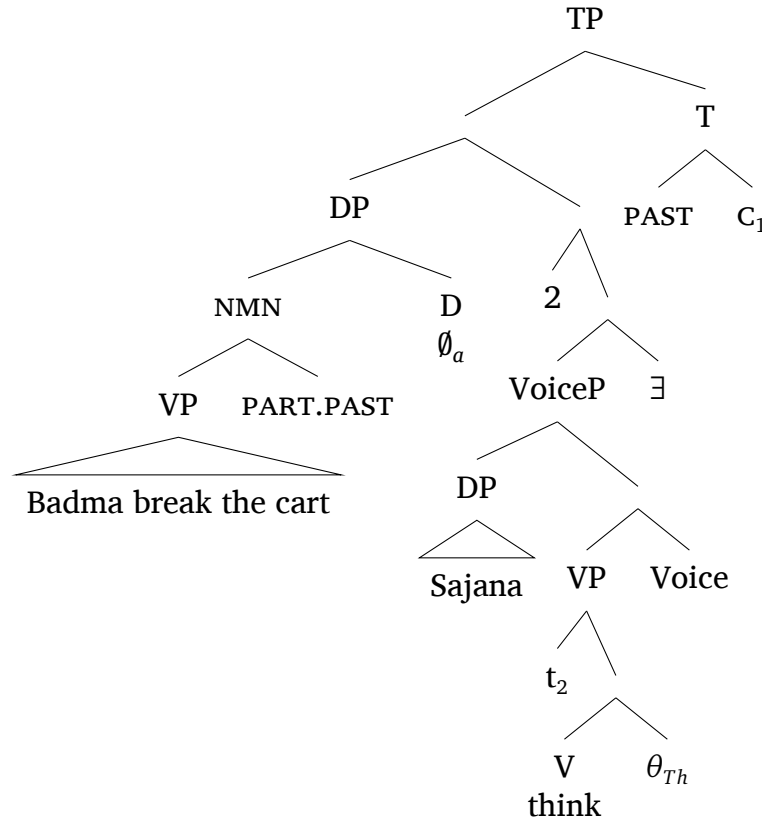


Under this implementation, the meaning of the functional $\theta_{Th}$ head when it combines with *hanaxa* is as in (47), repeated below as (79).

(79)     $[\![\theta_{Th}]\!]^{w,t,g} = \lambda P_{et}.\lambda x_e.\lambda e_e:$ LB$(\tau(x)) <$ t. P$(e) \wedge$ ABOUT$(e)=$x.

$\theta_{Th}$ takes a predicate of events P and an individual x as its arguments and returns a predicate of events such that P is true of them and they are about x. It also introduces the pre-existence presupposition: the left boundary of the *about*-argument has to be before the (matrix) evalutaion time.

   To show the problem that arises with this analysis, I will go through the derviation of (77) step by step. First, the attitude verb, (19), repeated below as (80), combines with the $\theta_{Th}$ head and then with the trace of the QR-ed nominalization, (81).

(80)     $[\![hanaxa]\!]^{w,t,g} = \lambda e_e.$ think$_{w,t}(e)$

(81)     $[\![VP]\!]^{w,t,g} = \lambda e_e:$ LB$(\tau(g(2))) <$ t. think$_{w,t}(e) \wedge$ ABOUT$(e)=$g(2).

Then Voice, (56), repeated as (82), combines with the VP and introduces the external argument. This individual is saturated by "Sajana", (83).

(82)    $[\![\text{Voice}]\!]^{w,t,g} = \lambda P_{et}.\lambda y_e.\lambda e_e: P(e)\neq\#.\ P(e)=1 \wedge \text{Exp}(e)=y.$

(83)    $[\![\text{VoiceP}]\!]^{w,t,g}$
        $= \lambda e_e: \text{LB}(\tau(g(2))) < t.\ \text{think}_{w,t}(e) \wedge \text{ABOUT}(e)=g(2)\ \&\ \text{Exp}(e)=\text{Sajana}.$

Existential closure, (58), repeated as (84), combines with VoiceP, (85).

(84)    $[\![\exists]\!]^{w,t,g} = \lambda P_{et}: \exists e[P(e)=1] \vee \forall e\ [P(e)=0].\ \exists e[P(e)=1]$

(85)    $[\![\text{VoiceP}\ \exists]\!]^{w,t,g} =$

$$\begin{cases} 1\ \text{iff}\ \exists e[LB(\tau(g(2))) < t \wedge \text{think}_{w,t}(e) \wedge \text{ABOUT}(e) = g(2) \wedge Exp(e) = \text{Sajana}] \\ 0\ \text{iff}\ \forall e[LB(\tau(g(2))) < t \wedge \neg[\text{think}_{w,t}(e) \wedge \text{ABOUT}(e) = g(2) \wedge Exp(e) = \text{Sajana}]] \\ \#\ \text{otherwise} \end{cases}$$

Predicate Abstraction happens over g(2), which creates a predicate of individuals out of (85). This predicate then saturates the argument of the QR-ed existential quantifier in (76), resulting in (86).

(86)    $[\![\text{NMN Predicate}]\!]^{w,t,g} =$

$$\begin{cases} 1\ \text{iff}\ \exists e'[\text{NMN}_{w,t_N<t}(e') = 1 \wedge \exists e[LB(\tau(e')) < t \wedge \text{think}_{w,t}(e) \wedge \text{ABOUT}(e) = e' \\ \qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad \wedge Exp(e) = \text{Sajana}]] \\ 0\ \text{iff}\ \forall e'[\text{NMN}_{w,t_N<t}(e') = 1 \rightarrow \forall e[LB(\tau(e')) < t \wedge \neg[\text{think}_{w,t}(e) \wedge \text{ABOUT}(e) = e' \\ \qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad \wedge Exp(e) = \text{Sajana}]]] \\ \#\ \text{otherwise} \end{cases}$$

This can be simplified as in (87), provided that the domain $D_e$ is not empty and given that "$LB(\tau(e')) < t$" contains no free occurences of "e".[49]

(87)    $[\![\text{NMN} + \text{Predicate}]\!]^{w,t,g} =$

$$\begin{cases} 1\ \text{iff}\ \exists e'[\text{NMN}_{w,t_N<t}(e') = 1 \wedge LB(\tau(e')) < t \wedge \exists e[\text{think}_{w,t}(e) \wedge \text{ABOUT}(e) = e' \\ \qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad \wedge Exp(e) = \text{Sajana}]] \\ 0\ \text{iff}\ \forall e'[\text{NMN}_{w,t_N<t}(e') = 1 \rightarrow LB(\tau(e')) < t \wedge \neg\exists e[\text{think}_{w,t}(e) \wedge \text{ABOUT}(e) = e' \\ \qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad \wedge Exp(e) = \text{Sajana}]] \\ \#\ \text{otherwise} \end{cases}$$

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[49] The equivalence statements used for the simplification are: (i) $\exists x[\psi \wedge \phi(x)] \equiv \psi \wedge \exists x[\phi(x)]$; (ii) $\forall x[\psi \wedge \phi(x)] \equiv \psi \wedge \forall x[\phi(x)]$; (iii) $\forall x[\neg\psi(x)] \equiv \neg\exists x[\psi(x)]$.

Finally, contextually restricted tense, (62), repeated here as (88), combines with the proposition in (87). This results in (89).

(88)     $⟦\text{PAST } C_1⟧^{w,t,g}$
         $= \lambda p_{sit}.$
$$\begin{cases} 1 \text{ iff } \exists t' < t \wedge t' \subseteq g(1) & [p(w)(t') = 1] \\ 0 \text{ iff } \forall t' < t \wedge t' \subseteq g(1) & [p(w)(t') = 0] \\ \# \text{ otherwise} \end{cases}$$

(89)     $⟦\text{TP}⟧^{w,t,g} =$
$$\begin{cases} 1 \text{ iff } \exists t' < t \wedge t' \subseteq g(1) \quad [\exists e'[\text{NMN}_{w,t_N<t'}(e') = 1 \wedge LB(\tau(e')) < t' \\ \quad \wedge \exists e[\text{think}_{w,t'}(e) \wedge \text{ABOUT}(e) = e' \wedge Exp(e) = \text{Sajana}]]] \\ 0 \text{ iff } \forall t' < t \wedge t' \subseteq g(1) \quad [\forall e'[\text{NMN}_{w,t_N<t'}(e') = 1 \rightarrow LB(\tau(e')) < t' \\ \quad \wedge \neg\exists e[\text{think}_{w,t'}(e) \wedge \text{ABOUT}(e) = e' \wedge Exp(e) = \text{Sajana}]]] \\ \# \text{ otherwise} \end{cases}$$

(89) states that the sentence "Sajana remembered Badma's breaking the cart", (77), is true iff there is a past time within a salient interval such that there is a thinking event by Sajana at that time and there is an event e' which the thinking is about, and e' is an event of Badma's breaking the cart which has pre-existed the thinking event. This result seems correct.[50]

However, (89) gives us a problematic falsity condition. The problem stems from the universal quantification over events. Whenever the restrictor of a universal quantifier is empty, the whole statement is true. This means that if there are no events of Badma breaking the cart, the falsity condition of (89) will be satisfied, and the sentence "Sajana remembered Badma's breaking the cart", (77), will be predicted to be false.

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[50] If we "unwrap" the abbreviated meaning of the NMN, the result will be the following:

(i)          $⟦\text{Sajana thought of Badma's breaking the cart}⟧^{w,t,g} =$
$$\begin{cases} 1 \text{ iff } \exists t' < t \wedge t' \subseteq g(1) \\ \quad [\exists e'[\exists t_N[RB(t_N) < t' \wedge break_{w,t_N}(e') \wedge Theme(e') = \text{the cart} \\ \quad \wedge Agent(e') = \text{Badma}] \wedge LB(t_N) < t' \\ \quad \wedge \exists e[\text{think}_{w,t'}(e) \wedge \text{ABOUT}(e) = e' \wedge Exp(e) = \text{Sajana}]]] \\ 0 \text{ iff } \forall t' < t \wedge t' \subseteq g(1) \\ \quad [\forall e'[\exists t_N[RB(t_N) < t' \wedge break_{w,t_N}(e') \wedge Theme(e') = \text{the cart} \\ \quad \wedge Agent(e') = \text{Badma}] \rightarrow LB(t_N) < t' \\ \quad \wedge \neg\exists e[\text{think}_{w,t'}(e) \wedge \text{ABOUT}(e) = e' \wedge Exp(e) = \text{Sajana}]]] \\ \# \text{ otherwise} \end{cases}$$

This is a bad prediction. We have seen in section 2 that the inference about the existence of a NMN-event projects over negation and in questions. If there is no event of Badma breaking the cart, the sentence in (77) is considered by native speakers to be infelicitous, not false.[51]

A way to save (89) is to assume that the null existential quantifier that the NMN combines with comes with the presupposition that its restrictor is not empty. It has been argued (Diesing 1992; von Fintel 1998) that some indefinites are presuppositional, maybe $\emptyset_a$ produces such indefinites.

A problem with this solution is that the nominalization under consideration is not presuppositional across the board. For example, when it occurs as a direct object of verbs like *xaraxa* 'see', the inference about the existence of an event denoted by the nominalization does not project over negation, suggesting that it is not part of the presuppositional component in this case.

(90)　　bi　[badm-i:n　tərgə əmdəl-ə:ʃ-i:jə]　xar-a:-güj-b,　　ju:n-də-b
　　　　1SG Badma-GEN cart　break-PART-ACC see-PST-NEG-1SG what-DAT-Q
　　　　gə-xə-də　　　badma tərgə əmdəl-ə:-güj
　　　　say-FUT-DAT Badma cart　break-PAST-NEG
　　　　'I didn't see Badma's breaking the cart, because Badma didn't break the cart.'

The sentence in (90), according to my consultants, has a different status with respect to the similiar sentence with *hanaxa* in (11): while the latter is perceived as being contradictory, the former does not. However, (89) predicts them to have the same status.

Of course, it could be the case that verbs like 'see' select for non-presuppositional indefinites, while verbs like *hanaxa* select presuppositional ones. However, postulating this accidently co-occuring difference in selectional requirements of verbs seems like missing a generalization: the presuppositional nature of the existential inference is dependent on the verb.

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[51] This bad prediction might be a more general problem that arises within the trivalent approach to quantificational sentences. Whenever the object is an indefinite with an empty restrictor, the sentence is predicted to be false irrespective of whether there are presuppositions associated with that object. E.g., it is predicted that both (ia) with presupposition-less 'open' and (ib) with presuppositional 'reopen' should be false if it is common knowledge that there are no magical portals. This seems like a wrong prediction.

(i)　　　a.　　I didn't open a magical portal, because magical portals don't exist.
　　　　　b.　　# I didn't reopen a magical portal, because magical portals don't exist.

## Abbreviations (mandatory)

1 — 1st person, 3 — 3rd person, ABL — ablative, ACC — accusative, ADJ — adjective, CAUS — causative, COMP — complementizer, CVB — converb, CVB2 — another converb, DAT — dative, EMPH — emphatic, FUT — future, GEN — genitive, LOC — locative, NEG — negation, NMN — nominalization, NOM — nominative, PART — participle, PFCT — perfect, PL — plural, PRS — present, PST — past, PTCL — particle, Q — question particle, REFL — reflexive, SG — singular

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The author declares that they have no competing interests.

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