

Future reference and covert modality in Khalkha Mongolian

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Abstract. An open question in semantic theory is whether the future is best characterized as a temporal operator or as a future-oriented modal operator (see Bochnak 2019). Based on original field data from Khalkha Mongolian (Eastern Mongolic), I argue that the temporal reference of the tense morpheme *-n* and its morphosyntactic interaction with negation support an analysis of future reference as the combination of two morphemes: a covert modal, which is overtly realized under negation, and a prospective aspect, which is covert. This work adds to cross-linguistic analyses of future reference, expanding our existing typology of future marking (Matthewson et al. 2022; Mucha 2016; Pancheva & Zubizarreta 2023; Tonhauser 2011).

Keywords. aspect; tense; future; modality; Khalkha Mongolian

1. Introduction. The aim of the current paper is to analyze the expression of future temporal reference in Khalkha Mongolian (Eastern branch, Mongolic) and, in doing so, contribute to our existing typology of future marking (e.g., Mucha 2016). To this end, I argue that Khalkha Mongolian provides an example of a previously unattested pattern in which the modal and temporal morphemes that lead to future shifting are both covert, with the modal only surfacing in particular morphosyntactic environments, such as under negation.

I focus on future reference in sentences where the verb is inflected with the tense suffix *-n*. In Khalkha Mongolian, when verbs are marked with *-n* as in (1), either a future or present interpretation may arise. Because of this, previous descriptions of Khalkha Mongolian describe *-n* as a non-past tense marker (e.g., Binnick 2011; Song 1997; Svantesson 1991), wherein *-n* introduces a reference time *t* that is equivalent to or follows the evaluation time. However, (1) demonstrates that the precise nature of its temporal reference is dependent upon the Aktionsart of the verb it attaches to: (1a), which has an eventive verb, can only be interpreted as future-oriented, while (1b), which has a stative verb, can be interpreted as either present- or future-oriented.

- (1) a. Tselmeg shüleg **unsh-in**
 Tselmeg poem read-*n*
 ‘Tselmeg *reads/will read a poem.’
- b. Bat minii nuuts-iig **med-n**
 Bat 1SG.POSS secret-ACC know-*n*
 ‘Bat knows/will know my secret.’

I capture the behavior of examples like (1) by proposing that they are structurally ambiguous: one structure results in a present reading, and the other in a future reading. For the future-oriented structure, this future interpretation stems not from *-n*, which I analyze as a present tense,

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but from the contributions of two other morphemes: a covert modal, which is overtly realized under negation, and a covert prospective aspect, which is present in a high aspectual position (e.g., Mucha 2016). I provide evidence that a modal element is present in sentences like (1) from negation: in the negated counterparts of these sentences, the verbs in (1) are inflected not with *-n*, but with the verbal suffix *-x*, which I propose is a modal quantifier.

By treating *-n* as present, this captures the other, present-oriented structure, which I argue possesses a present tense morpheme (i.e., *-n*) and a perfective morpheme. Present-oriented readings for the eventive verbs are ruled out due to the interaction between the present tense and the perfective aspect (Bennett & Partee 1972; De Wit 2016). By considering the interaction of tense, aspect, and negation in Khalkha Mongolian, this analysis adds to cross-linguistic work on future reference (Matthewson et al. 2022; Mucha 2016; Pancheva & Zubizarreta 2023; Tonhauser 2011) and provides an example of a language where the prospective aspect is covert and the modal, though typically covert, can overtly appear in specific environments.

The uncited data presented in this paper are the result of fieldwork with a native speaker of Khalkha Mongolian. Following Matthewson (2004) and Cover (2015), tasks used for the elicitation of semantic data included discussion of acceptability, truth value, and felicity judgments within discourse contexts, as well as translation between English and Khalkha Mongolian.

The structure of the paper is as follows: In **Section 2**, I present data that illustrates the semantic contribution of *-n*, focusing on its temporal reference and interaction with the perfective aspect. In **Section 3**, I describe morphosyntactic interactions between tense and negation in Khalkha Mongolian that result in the overt realization of the suffix *-x*, which I demonstrate behaves like a modal quantifier. In **Section 4**, I present my analysis of the semantics of future-shifting for sentences containing *-n*. **Section 5** concludes.

1.1. THEORETICAL PRELIMINARIES. I will presuppose a neo-Reichenbachian framework for tense and aspect throughout this analysis (Klein 1994; Reichenbach 1947). Under this framework, tense determines the temporal relation between the utterance time (UT) and reference time (RT). Aspect, on the other hand, is concerned with temporal relations such as those between the RT and event time (ET). For the purposes of illustration, I will be using a quantificational semantics for tense throughout this paper (see Ogihara & Kusumoto 2020). While I am using quantificational tenses in this paper, the analysis discussed here is also compatible with a pronominal theory of tense (Kratzer 1998; Partee 1973, 1984).

Additionally, my discussion of modality assumes a Kratzerian approach (Kratzer 1981). As such, I assume that a modal involves quantification over possible worlds, which is then constrained in terms of its modal base and ordering source.

2. Future temporal reference with *-n*.

2.1. AKTIONSART AND *-n*. As illustrated in (1), the interpretation of *-n* interacts with the Aktionsart. The temporal reference of the sentence depends on whether the verb *-n* attaches to is eventive or stative. For eventive verbs like in (2), sentences with *-n* lead only to future readings. They cannot receive present readings and are incompatible with present-oriented temporal adverbials like *odoo* ‘now’ as in (2a) and (2c), but future-oriented temporal adverbials like *margaash* ‘tomorrow’ in (2b) and (2d) are felicitous.

- (2) a. #Tselmeg odoo shüleg **unsh-in**
 Tselmeg now poem read-*n*
 Intended: ‘Tselmeg reads a poem now.’
- b. Tselmeg (margaash) shüleg **unsh-in**
 Tselmeg (tomorrow) poem read-*n*
 ‘Tselmeg will read a poem (tomorrow).’
- c. #Xulan odoo urgamal **ucal-n**
 Xulan now plant water-*n*
 Intended: ‘Xulan waters the plants now.’
- d. Xulan (margaash) urgamal **ucal-n**
 Xulan (tomorrow) plant water-*n*
 ‘Xulan will water the plants (tomorrow).’

In contrast, stative verbs that appear with *-n* can be interpreted as either present- or future-oriented, as in (3). Unlike eventives, the availability of present temporal reference results in these statives being compatible with present-oriented temporal adverbials in (3a) and (3c), in addition to the future-oriented temporal adverbials in (3b) and (3d).

- (3) a. Bat odoo minii nuuts-iig **med-n**
 Bat now 1SG.POSS secret-ACC know-*n*
 ‘Bat knows my secret now.’
- b. Bat margaash minii nuuts-iig **med-n**
 Bat tomorrow 1SG.POSS secret-ACC know-*n*
 ‘Bat will know my secret tomorrow.’
- c. Xöshöö odoo uul-in oroi-d **bairla-n**
 statue now mountain-GEN top-DAT be.placed-*n*
 ‘The statue is placed at the top of the mountain now.’
- d. Xöshöö margaash uul-in oroi-d **bairla-n**
 statue tomorrow mountain-GEN top-DAT be.placed-*n*
 ‘The statue will be placed at the top of the mountain tomorrow.’

2.2. ASPECT AND *-n*. I will now discuss the relationship between the interpretation of *-n* and aspect. First, in **Section 2.2.1**, I propose that Khalkha Mongolian sentences like those in (2) and (3), where no aspectual morphology is present on the surface, are interpreted as perfective. I then show that the future-oriented readings in examples like (1-3) are unavailable with other aspectual categories in **Section 2.2.2**. In **Section 2.2.3**, I connect these findings to the ‘present perfective paradox’ (Bennett & Partee 1972; De Wit 2016).

2.2.1. THE PERFECTIVE ASPECT. The perfectivity of sentences like (2) and (3), which are bare with regards to aspectual morphology, can be demonstrated by the diagnostic in (4), adapted from Wurmbrand (2014). In (4), a punctual RT is explicitly provided by a *when*-clause. In (4a), Xulans watering of the plants cannot be interpreted as happening at the same time as Tuyas arrival.

The only available reading is one in which these events are sequenced (i.e., an ‘inchoative’ reading), which is characteristic of the perfective aspect. In (4b), which is marked as imperfective, the events are instead interpreted as simultaneous.

- (4) a. Tuya tsetserleg-t xüreelen-d ochi-x üye-d, Xulan urgamal **ucal-n**
 Tuya garden-LOC park-DAT arrive-MOD time-DAT Xulan plant water-*n*
 ‘When Tuya arrives at the garden, Xulan will water the plants.’ (Sequenced only)
- b. Tuya tsetserleg-t xüreelen-nd ochi-x üye-d, Xulan urgamal **ucal-j**
 Tuya garden-LOC park-DAT arrive-MOD time-DAT Xulan plant water-CVB
bai-x bol-n
 AUX-MOD become-*n*
 ‘When Tuya arrives at the garden, Xulan will be watering the plants.’

This contrast arises because, following Partee (1984), a *when*-clause introduces an RT for the main clause that is shortly after the one it specifies. For example, in (4), the RT of the main clause closely follows the RT of the *when*-clause (the time of Tuya’s arrival at the garden). Because the semantics of the perfective aspect necessitates that the duration of the eventuality is contained within the RT, when the RT introduced by the *when*-clause precedes the RT of the main clause in this way, it is not possible for the two eventualities to overlap in time. This results in the unavailability of a simultaneous reading with the perfective aspect, with only sequenced interpretations being possible.

Following the same logic, other diagnostics for the future can be used to assess the aspectual nature of sentences with *-n*. For example, it has been found that English WOLL¹ is, too, infelicitous in contexts where a punctual RT has been specified by an adverbial in a preceding question context (Mucha 2016). The sentences in (5) illustrate the test in Khalkha Mongolian. Because the context specifies a punctual RT (i.e., 5:00pm), only the imperfective aspect in (5a) is felicitous. (5b), where *-n* appears on its own, is infelicitous in comparison. The unacceptability of (5b) indicates that, like with the English WOLL examples, a covert perfective aspect is present in the structure and is what is responsible for the sentence’s infelicity.

(5) *Speaker A: Can I visit Oyuun tomorrow at 5:00pm sharp?*

- a. Ügüi, Oyuun Ulaanbaatar luu **ayal-aj bai-x bol-n**
 No, Oyuun Ulaanbaatar towards travel-CVB AUX-MOD become-PRS
 ‘No, Oyuun will be traveling to Ulaanbaatar.’
- b. #Ügüi, Oyuun Ulaanbaatar luu **ayal-an**
 No, Oyuun Ulaanbaatar towards travel-PRS
 Intended: ‘No, Oyuun will travel to Ulaanbaatar.’

Based on the diagnostics in (4-5), I conclude that when the verb is aspectually bare, it is interpreted as perfective. Under this view, examples with *-n* like (1) possess a covert perfective aspect morpheme.

¹ The term WOLL is used throughout this paper in reference to the English future marker *will*. WOLL differs from *will* in that WOLL lacks a tense specification itself, while *will* is the realization of WOLL when it is specified for present tense (e.g., Wurmbrand 2014).

2.2.2. THE INTERPRETATION OF *-n* WITH OTHER ASPECTS. Unlike the aforementioned perfective sentences, *-n* can only result in future temporal reference for other aspectual categories. For example, an ambiguity between present and future reference does not arise for the perfect, like in (6). In these constructions, regardless of whether the verb is eventive or stative, only present readings are possible, as shown by (6). Future-oriented adverbials are disallowed in both cases.

- (6) a. Tselmeg (#margaash) shüleg **unsh-saj bai-n**
 Tselmeg (tomorrow) poem read-*sAŋ* AUX-*n*
 ‘Tselmeg has read a poem (#tomorrow).’
 ≠ ‘Tselmeg will have read a poem tomorrow.’
- b. Bat (#margaash) minii nuuts-iig **med-sej bai-n**
 Bat (tomorrow) 1SG.POSS secret-ACC know-*sAŋ* AUX-*n*
 ‘Bat has known my secret (#tomorrow).’
 ≠ ‘Bat will have known my secret tomorrow.’

In sum, I demonstrated in **Sections 2.1-2.2** that for the perfective aspect, the temporal reference of *-n* depends on whether the verb it attaches to is eventive or stative: bare eventives always lead to future readings, and bare statives to either present or future readings. For other aspectual classes, unlike with the perfective, only present temporal reference is available for sentences with *-n*, regardless of the verb’s Aktionsart.

2.3. THE PRESENT PERFECTIVE PARADOX IN KHALKHA MONGOLIAN. I argue that the data in **Sections 2.1-2.2** indicate that *-n* should be treated as a present tense marker. This is because if *-n* is a present tense, its behavior in perfective sentences can then be readily explained by the cross-linguistic incompatibility between the perfective and present tense (Bennett & Partee 1972; De Wit 2016). To illustrate this phenomenon, also referred to as the ‘present perfective paradox’, semantic entries for $\llbracket \text{PRFV} \rrbracket$ and $\llbracket \text{PRS} \rrbracket$ are displayed in (7).

- (7) a. $\llbracket \text{PRFV} \rrbracket^{\text{g.c}} = \lambda P. \lambda w. \exists e [\tau(e) \subseteq t \ \& \ P(e)(w)]$
 b. $\llbracket \text{PRS} \rrbracket^{\text{g.c}} = \lambda p. \exists t' [t' = t_c \ \& \ p(t')(w_c)]$

The semantics of the perfective in (7a) states that the duration of the event is located within a time *t*. This time *t* is contributed by the present tense (7b), and it is equivalent to the UT. However, under an approach like Bennett & Partee (1972), the UT is an instantaneous and fleeting point in time. Thus, in order for the UT to contain the duration of the event per the semantics of the perfective aspect in (7a), the event would, too, need to be instantaneous. Outside of certain perception verbs such as *see* (Dieuleveut 2023), few verbal predicates are able to meet this condition. This has led to the widespread infelicity of the present perfective across languages.

3. Covert modality and -x. I have proposed that *-n* is a present tense marker. However, this raises a new question: if *-n* is strictly present tense, then what is contributing the future shifting in sentences like (1)? To answer this question, in **Section 3.1**, I summarize the current approaches to future reference in semantic theory discussed in the introduction (Bochnak 2019; Kratzer 2011; Mucha 2016). I provide evidence from negation to argue for the presence of a covert modal in sentences like (1) in **Section 3.2** and demonstrate the behavior of this modal in **Section 3.3**.

3.1. THE SEMANTICS OF FUTURE REFERENCE. In recent work on the semantics of the future, it has been argued that future-shifting requires both an aspectual and a modal morpheme to be present within a given syntactic structure (see Bochnak 2019). One example of a modal morpheme that is implicated in future temporal reference is English WOLL (e.g., Abusch 1997). As illustrated in (8), under this approach, WOLL and similar morphemes are treated as modal quantifiers, which themselves do not introduce a future RT.

$$(8) \quad \llbracket \text{WOLL} \rrbracket = \lambda p. \lambda t. \lambda w. \forall w' \in \text{Acc}(w, t) [p(t)(w)]$$

Because this modal quantifier is temporally unspecified, for there to be the forward temporal shifting that is associated with the future, the modal in (8) must scope over a prospective aspect like (9). This prospective aspect is what contributes the future shifting by quantifying over times, specifying a time t' that is in the future relative to a time t that was introduced by tense.

$$(9) \quad \llbracket \text{PROSP} \rrbracket = \lambda p. \lambda t. \lambda w. \exists t' [t < t' \ \& \ p(t')(w)]$$

This treatment of the prospective aspect as a type of high aspect is consistent with prior literature on future temporal reference (Pancheva & Zubizarreta 2023). A conceptual benefit of the prospective aspect being a high aspect is that it positions the prospective as a mirror to the perfect aspect: the perfect can be captured as an inverse to the prospective, instead introducing a precedence relation between the two RTs². Additionally, by analyzing the prospective as high aspect, this allows for the layering of other viewpoint aspects beneath it. The way that the prospective aspect interacts with viewpoint aspect will be discussed further in **Section 4**. There, I propose that the prospective aspect takes scope over the perfective aspect in sentences with $-n$, following the results of the diagnostics for perfectivity in **Section 2.2.1**.

Because the decompositional approach outlined here necessitates two separate morphemes for future shifting, Mucha (2016) proposes that languages may be parameterized as to which of these elements surfaces in future-marked sentences. In other words, languages are predicted to vary based on whether the modal, the prospective aspect, or both surface overtly. For example, a language can achieve future reference via a covert modal and an overtly marked prospective aspect, as with *dim*³ in Gitksan (Matthewson et al. 2022) and *ta* in Paraguayan Guaraní (Pancheva & Zubizarreta 2023). Other languages are instead analyzed as realizing the modal morpheme overtly, such as English WOLL and Medumba *á'* (Mucha 2016), with the prospective aspect appearing covertly. Finally, it is also possible for both morphemes to surface overtly: Mucha (2013) argues that Hausa overtly encodes both the modal and prospective aspect. This is evidenced by the future-shifting requirements of the modal morpheme *zā* and its obligatory co-occurrence with

² This description holds true under a weak-XN semantics for the perfect (Pancheva & Von Stechow 2004) and related approaches. However, other semantic theories of the perfect aspect are present in the literature, due in part to the various readings associated with the perfect (see Grønn & Von Stechow 2020).

³ I note that in languages like Gitksan, it is possible to overtly realize both a modal and prospective aspect as two separate morphemes (Matthewson et al. 2022). For example, though future temporal reference can be achieved in Gitksan with only the prospective *dim* appearing on the surface (hence its placement in Table 1) and no overt modal, *dim* also appears alongside the circumstantial possibility modal *daakhlxw*. However, the crucial distinction here between Gitksan and a language like Hausa (Mucha 2013) is that in Gitksan, futurity can be marked when only the prospective aspect surfaces, whereas in Hausa, the surface co-occurrence of the prospective and modal is the only means of future marking.

a low tone on weak subject pronouns, which are marked with TAM morphology in Hausa. Mucha (2013) analyzes this low tone as encoding the prospective aspect. This typology is summarized in Table 1.

However, another logical possibility is predicted by the future-marking typology described above: a language in which future shifting is achieved through a modal and prospective aspect that are both unpronounced in the structure. In the sections that follow, I argue that Khalkha Mongolian provides an example of such a language. Khalkha Mongolian thus marks futurity with two morphemes which are covert in unrestricted syntactic contexts: a modal, which is only overtly realized under negation, and a prospective aspect, which is covertly present in a high aspectual position. This analysis adds to the aforementioned cross-linguistic work on future reference (Matthewson et al. 2022; Mucha 2016; Pancheva & Zubizarreta 2023; Tonhauser 2011) by contributing an example of a language where the prospective aspect is always covert and the modal, though typically covert, can overtly appear in specific environments.

	Overt Modal	Covert Modal
Overt PROSP	Hausa (Mucha, 2013)	Gitksan (Matthewson et al., 2022); Paraguayan Guaraní (Tonhauser, 2011; Pancheva & Zubizarreta, 2023)
Covert PROSP	English (e.g., Kratzer, 2012; Mucha, 2016) Medumba (Mucha, 2016)	–

Table 1. A typology of future marking across languages, adapted from Mucha (2016).

In **Section 3.2**, I next discuss patterns of negation in Khalkha Mongolian, which I take as evidence for the presence of a covert model in sentences with *-n*. This expands our typology of future-marking to include the additional type of language mentioned above, where both the modal and aspectual component may appear covertly.

3.2. INTERACTIONS WITH NEGATION. In the current section, I overview the morphosyntax of negation in Khalkha Mongolian. Sentential negation in Khalkha Mongolian involves morphological alternations that, I argue, indicate the presence of a modal under *-n*. In Khalkha Mongolian, the morphological realization of tense and aspect interacts with negation. Namely, verbs often bear different inflectional morphology in the presence of negation than in their affirmative counterparts (Brosig 2015).

Sentential negation is achieved through the negative operator *-güi*, which is involved in verbal inflection alongside tense and aspect markers. *-güi* is morphologically licensed only by certain verbal suffixes. For example, the negator *-güi* may appear above aspectual morphemes, as illustrated with the habitual *-dAg*⁴ in (10). In the affirmative sentence in (10a), the habitual marker appears directly above the verbal root *tsewerle-* ‘clean’. When this sentence is negated in (10b), *-güi* attaches above the habitual marker. It is ungrammatical for *-güi* to appear directly on a verbal

⁴ For (10a-10b), the only possible temporal interpretation is present-oriented. Due to the morphosyntactic restrictions regarding TAM inflection and negation in Khalkha Mongolian, as outlined throughout this section, I suggest that the present tense possesses two allomorphs, *-n* and a covert form. In habitual examples like (10a-10b), the covert form is realized.

root, as in (10c)⁵, with or without *-dAg* scoping above it. Thus, the overt presence of a suffix like *-dAg* is a requirement for sentential negation to proceed, and the negator must take higher scope.

- (10) a. Shinee (ödör бүр) tsonx-oo **tsewerle-deg**
 Shinee (day every) window-REFL.POSS clean-HAB
 ‘Shinee cleans his windows (every day).’
- b. Shinee (ödör бүр) tsonx-oo **tsewerle-deg-güi**
 Shinee (day every) window-REFL.POSS clean-HAB-NEG
 ‘Shinee doesn’t clean his windows (every day).’
- c. *Shinee (ödör бүр) tsonx-oo **tsewerle-güi(-deg)**
 Shinee (day every) window-REFL.POSS clean-NEG(-HAB)
 Intended: ‘Shinee doesn’t clean his windows (every day).’

In both affirmative sentences and their negative counterparts, like (10a) and (10b) respectively, tense is not overtly realized when the verb is inflected with an overt aspectual suffix. This stems from a morphosyntactic restriction against multiple TAM morphemes attaching to a single verbal root in Khalkha Mongolian. More complex TAM inflection (i.e., the overt realization of more than one TAM category) instead requires an additional auxiliary verb in the structure, which itself is inflected with the additional TAM morpheme. Khalkha Mongolian is not unique in this respect: similar behavior of verb periphrasis is attested cross-linguistically (dubbed the overflow pattern by Bjorkman (2011)), with relevant examples including Kinande (Bjorkman 2011) and Turkish (Kim 2024).

As seen with the habitual marker in (10b), certain verbal suffixes may host negation. However, negation is not licensed by all verbal suffixes. Crucially, *-güi* may not appear with verbal suffixes that appear at higher structural positions, including tense markers like *-n*. When negating an affirmative sentence that contains *-n* like in (11a), it is ungrammatical for negation to appear with tense, regardless of whether the tense marker is in a higher or lower position. This is demonstrated by the sentences in (11b) and (11c) respectively, which are both judged as ungrammatical.

- (11) a. Margad (margaash) zurag **aw-n**
 Margad (tomorrow) photo take-*n*
 ‘Margad will take a photo (tomorrow).’
- b. *Margad (margaash) zurag **aw-n-güi**
 Margad (tomorrow) photo take-*n*-NEG
 Intended: ‘Margad won’t take a photo (tomorrow).’
- c. *Margad (margaash) zurag **aw-güi-n**
 Margad (tomorrow) photo take-NEG-*n*
 Intended: ‘Margad won’t take a photo (tomorrow).’

⁵ Even outside of negation, it is ungrammatical for a verbal root to appear without any sort of inflectional marking. This more general restriction against verbal roots appearing bare is the source of the ungrammaticality of (10c), rather than the presence of the negator.

I also point out that the morphological incompatibility between tense markers and negation is not due to the aforementioned restriction against complex TAM inflection. In both (11b) and (11c), only one TAM morpheme surfaces in the structure, and thus would not be ruled out as an instance of complex inflection.

In order to negate affirmative sentences with *-n* like (11a), negation must instead follow the suffix *-x*. An example of this is shown in (12). Despite their morphological asymmetries on the surface, (12) maintains an interpretive relationship with (11a) (i.e., *p* vs. $\neg p$).

- (12) Margad (margaash) zurag **aw-ax-güi**
 Margad (tomorrow) photo take-*x*-NEG
 ‘Margad wont take a photo (tomorrow).’

In the grammatical negated sentence in (12), the identity of the morpheme *-x* is unclear at first glance. Further, the *-x* morpheme appears in various syntactic environments outside of these negated sentences, suggesting it is not simply an allomorph of *-n* under negation. In **Section 3.3.**, I probe the semantic contribution of this morpheme and argue for its status as a modal.

I suggest that the reason for the incompatibility between *-n* and sentential negation stems from the position that the negator *-güi* can occupy. In sentences with *-n*, *-güi* must attach at a NegP above an overt TAM morpheme (i.e., higher than an AspP), but this NegP is lower in the structure than TP⁶. The proposed structure illustrating this is displayed in (13). Given that *-güi* is available above the *-x* morpheme, which I analyze as modal, I depict the relevant NegP as higher than a ModP in (13).

- (13) [TP [NegP [ModP [AspP [vP ...] Asp] Mod] Neg] T]

Further evidence that *-güi* appears at a lower NegP comes from sentences with the perfect aspect, like in (14). The affirmative example is provided in (14a). Negation may only appear on the participle under the auxiliary, as in (14b), and is ungrammatical when it appears on the higher auxiliary itself, as in (14c).

- (14) a. Uyanga id-se bai-saŋ
 Uyanga eat-*sAŋ* AUX-*sAŋ*
 ‘Uyanga had eaten.’
 b. Uyanga **id-ee-güi** bai-saŋ
 Uyanga eat-(*G*)AA-NEG AUX-*sAŋ*
 ‘Uyanga hadn’t eaten.’
 c. *Uyanga id-seŋ **bai-gaa-güi**
 Uyanga eat-*sAŋ* AUX-(*G*)AA-NEG
 Intended: ‘Uyanga hadnt eaten.’

⁶ While it is true that negation may not appear above most TAM markers that are at higher positions than AspP (including *-n*, the past-oriented tense marker *-v*, etc.), the morpheme *-sAŋ* appears to be an exception: *-sAŋ*, which has been described as either past tense or perfect (e.g., Binnick 2011), may host negation, but it leads to an additional inference that an event did not occur against speaker expectations. This inference is not present in its affirmative counterparts. I leave the behavior of *-sAŋ* under negation to future work.

If we take it that this higher auxiliary is at T, the ungrammaticality of *-güi* can be explained as follows: the only licit NegP projection where *-güi* can appear is above the participle, and it is thus unable to attach higher above T.

3.3. A FAMILY RESEMBLANCE WITH MODALS. As previously discussed, when affirmative sentences with *-n* are negated, a different morpheme, *-x*, surfaces under negation instead. The *-x* morpheme has been given various descriptive labels in the Mongolic literature, as an irrealis mood (e.g., Song 1997; Svantesson 1991) or an infinitival/future (e.g., Binnick 2011). Drawing from these past characterizations, I propose that *-x* is a modal quantifier.

To argue for this, I will now present a series of data which shows that *-x* possesses a family resemblance with other modal quantifiers. In particular, outside of negation, *-x* appears in constructions which implicate modality. One such construction is counterfactual conditionals. In order for a counterfactual interpretation to obtain, the *-x* morpheme must be present in the consequent. This is shown by (15). While (15a) is interpreted as a counterfactual, (15b) is interpreted as an indicative conditional.

- (15) a. Uyanga em uu-saŋ bol ter ilüü **deerde-x** bai-saŋ
 Uyanga medicine take-*sAŋ* COND 3.SG more improve-*x* AUX-*sAŋ*
 ‘If Uyanga took the medicine, she would’ve felt better.’
- b. Uyanga em uu-saŋ bol ter ilüü **deerde-seŋ**
 Uyanga medicine take-*sAŋ* COND 3.SG more improve-*sAŋ*
 ‘If Uyanga took the medicine, she felt better.’

The finding in (15) is not unexpected if *-x* is thought to have a similar semantics to WOLL. For conditionals in English, as well as Modern Greek, a counterfactual interpretation is only possible with a WOLL-like morpheme in its consequent (Iatridou 2000). The presence of WOLL in the antecedent of counterfactuals is typically thought to introduce quantification over possible future worlds, which stem from the past RT introduced in the antecedent (Arregui 2007; Ippolito 2003).

In addition to its behavior in counterfactuals, the position of *-x* determines its interpretation: when *-x* appears in a high syntactic position, it gives rise to an epistemic reading, as in (16). This positional difference⁷, too, is captured if *-x* is a modal quantifier. Cross-linguistically, epistemic modals are argued to appear in a high syntactic position, scoping over tense, while root modals take scope under tense (e.g., Cinque 1999; Hacquard 2009).

- (16) *Context: Every day at noon, Enxjin takes a break from work to go on a walk. Right now, it is noon. Thus, ...*
 Enxjin alxa-j bai-gaa **bai-x**
 Enxjin walk-CVB AUX-IPF AUX-EPIST
 ‘Enxjin must be walking.’

⁷ The ways this positional difference between epistemic and root modals has been derived in the literature has varied, with relevant analyses involving event-relative interpretations of modals (Hacquard 2010) or semantic type constraints (Kush 2011). I leave the precise derivation of how the position of *-x* alters its modal flavor to future work.

Further, negation is unable to scope above *-x* when it is in a high position, like in (17). This is consistent with other epistemic modals cross-linguistically, wherein quantifiers, including negation, cannot take higher scope above them (e.g., Fintel & Iatridou 2003). Thus, examples like (17) provide additional evidence that *-x* is compatible with an epistemic modal flavor.

(17) *Context: Enxjin is your co-worker who is a bit lazy. You know that every day at noon, Enxjin takes a break from work to take a long nap. Right now, it is noon. Thus, ...*

a. *Enxjin alxa-j bai-gaa **bai-x-güi**
 Enxjin walk-CVB AUX-IPF AUX-EPIST-NEG

Intended: ‘Enxjin must not be walking.’

b. Enxjin alxa-j **bai-x-güi** **bai-x**
 Enxjin walk-CVB AUX-x-NEG AUX-EPIST

‘Enxjin must not be walking.’

Based on the fact that the modal flavor for *-x* is flexible, as it can receive circumstantial and epistemic readings, I propose that *-x* has an unspecified modal base. This assumption follows naturally from the treatment of modality by Kratzer (1981), wherein a modal base receives specification from the context through its conversational background.

I also point out that future-shifting is not required by *-x*, indicating that *-x* as a marker of modality rather than futurity. This is demonstrated by the presence of *-x* in the backward counterfactuals in (18). In (18), both counterfactuals involve backward temporal shifting, made explicit by the inclusion of a present-oriented temporal adverbial in their antecedents and a past-oriented temporal adverbial in their consequents. If *-x* itself were specified for a future RT (i.e., contributing temporal shifting forwards), it would be predicted to mismatch with the temporal reference of the adverbials and be infelicitous with these constructions. Thus, the fact that *-x* is acceptable in (18) suggests that *-x* itself does not enforce future-shifting, providing further support for the analysis that *-x* is a modal quantifier which lacks temporal specification.

(18) a. Xervee önöödör gazar möstei bai-saŋ bol öchigdör xuitei **bai-x** bai-saŋ
 if today ground icy AUX-sAŋ COND yesterday cold AUX-x AUX-sAŋ

‘If there was ice on the ground today, it would have been cold yesterday.’

b. Xervee önöödör gadaa chiigtei bai-saŋ bol öchigdör boroo **oro-x** bai-saŋ
 if today outside wet AUX-sAŋ COND yesterday rain enter-x AUX-sAŋ

‘If it was wet outside today, it would have rained yesterday.’

In sum, because tense (i.e., *-n*) cannot appear overtly with negation, the morpheme *-x* surfaces in order to morphologically license the verbal negator. In the current section, I have argued that *-x* is a modal quantifier which is unspecified in its modal flavor.

4. Analysis. To achieve future reference with *-n* in Khalkha Mongolian, I propose that both a temporal and modal element are necessary. Because future-shifting is not required with *-x*, as evidenced by its felicity in backshifted counterfactuals like (18), I argue that a decomposition of future marking into separate temporal and modal morphemes is necessary.

As discussed in **Section 2**, I have proposed that *-n* is a present tense marker rather than a non-past tense marker. The semantics for $\llbracket \text{PRS} \rrbracket$ are repeated below in (19). Under the formalism in (19), the present tense provides a time *t* that is equivalent to the utterance time.

$$(19) \quad \llbracket \text{PRFV} \rrbracket^{\text{g.c}} = \lambda P. \lambda w. \exists e [\tau(e) \subseteq t \ \& \ P(e)(w)]$$

In the absence of a non-past tense, the semantic contribution of the present tense *-n* is unable to provide future temporal reference on its own. In light of this, I conclude that a temporal component, specifically a null prospective aspect morpheme, is needed to introduce a future time interval. A semantic entry for the prospective aspect is displayed in (20). Following cross-linguistic work on the future (Mucha 2016; Pancheva & Zubizarreta 2023), I treat the prospective aspect in (20) as high aspect, thus relating the RT introduced by *-n* to a future temporal interval.

$$(20) \quad \llbracket \text{PROSP} \rrbracket^{\text{g.c}} = \lambda p. \lambda t. \lambda w. \exists t' [t < t' \ \& \ p(t')(w)]$$

This treatment of the prospective as high aspect follows from the distribution of *-n* because, as illustrated by the diagnostics in **Section 2**, a perfective⁸ aspect morpheme is present in the structure. The semantics for $\llbracket \text{PRFV} \rrbracket$ are repeated below in (21).

$$(21) \quad \llbracket \text{PRFV} \rrbracket^{\text{g.c}} = \lambda P. \lambda w. \exists e [\tau(e) \subseteq t \ \& \ P(e)(w)]$$

I analyze *-x* as a modal quantifier, as in (22a). Because both epistemic and circumstantial readings are available with *-x*, I treat it as having an unspecified modal flavor. In the relevant future-shifting cases with *-n*, it is interpreted as circumstantial as in (22b). As explored in **Section 3**, the overt realization of *-x* under negation provides evidence that a modal component is part of the make-up of the future.

$$(22) \quad \begin{array}{l} \text{a.} \quad \llbracket -x \rrbracket^{\text{g.c}} = \llbracket \text{MOD} \rrbracket^{\text{g.c}} = \lambda p. \lambda t. \lambda w. \forall w' \in \text{Acc}(w, t) [p(t)(w)] // \\ \text{b.} \quad \llbracket -x_{\text{CIRC}} \rrbracket^{\text{g.c}} = \llbracket \text{MOD}_{\text{CIRC}} \rrbracket^{\text{g.c}} = \lambda p. \lambda t. \lambda w. \forall w' \text{ compatible with all the circumstances in } w \\ \text{at } t [p(t')(w')] \end{array}$$

Under this account, both the modal and prospective aspect are covertly present in perfective sentences with *-n*, thus resulting in a future reading. Structures depicting the current account for the semantics of *-n* is shown in (23) for eventive verbs. (23a) shows the felicitous structure, which results in future-shifting due to the contributions of the covert modal and prospective aspect. (23b) displays the infelicitous present perfective structure.

$$(23) \quad \begin{array}{l} \text{a.} \quad [_{\text{TP}} [_{\text{ModP}} [_{\text{AspP}} [_{\text{AspP}} [_{\text{vP}} \text{Margad take photo}]_{\text{Asp}} \text{PRFV}]_{\text{Asp}} \text{PROSP}]_{\text{Mod}} \text{MOD}]_{\text{T}} \text{PRS}] \\ \text{b.} \quad \# [_{\text{TP}} [_{\text{AspP}} [_{\text{vP}} \text{Margad take photo}]_{\text{Asp}} \text{PRFV}]_{\text{T}} \text{PRS}] \end{array}$$

The relevant truth conditions for the felicitous structure in (23a) are shown in (24), which yield the expected interpretation.

⁸ While the present analysis derives the truth conditions of the eventive examples like (1a), its applicability to the stative examples would require the perfective aspect to be available with statives. Though statives are thought to be incompatible with the perfective in many languages (e.g., Bary 2009; Dieuleveut 2023; Homer 2021; Mari & Martin 2007), whether this extends to Khalkha Mongolian remains to be seen. If stative verbs can appear with the perfective, it is possible that a similar approach could be applied, except that the present perfective structure is not ruled out as infelicitous due to statives possessing the subinterval property (Bennett & Partee 1972).

- (24) $\llbracket (23a) \rrbracket^{g,c}$ is true iff $\exists t' [t' = t_c \ \& \ \forall w' \text{ compatible with all the circumstances in } w_c \text{ at } t_c [\exists t'' [\exists e [\tau(e) \subseteq t'' \ \& \ t' < t'' \ \& \text{take}(e, \text{Margad, photo, } t'', w')]]]]$
There exists a time t' that is equivalent to the UT, and for all worlds compatible with the circumstances of the actual world, there exists a time t'' that is after t' and contains the duration of a taking-a-photo event by Margad.

Because of the restrictions on the realization of TAM morphemes in Khalkha Mongolian, discussed in **Section 3.2**, tense is covert for negated constructions. This interacts with the need for an overt TAM morpheme to license negation, resulting in the modal *-x* being overtly realized under negation. (25) displays the proposed structure for negated sentences.

- (25) $[_{TP} [_{NegP} [_{ModP} [_{AspP} [_{AspP} [_{vP} \text{Margad take photo}]_{Asp} \text{PRFV}]_{Asp} \text{PROSP}]_{Mod} \text{MOD}]_{Neg} \text{NEG}]_T \text{PRS}]$

The relevant truth conditions are shown in (26). In (26), the negative marker *-giii* negates the quantification over times⁹ introduced by the prospective aspect. It is worth noting that no reading is available where negation takes scope over the universal quantifier that is introduced by the modal, despite negation taking syntactic scope over the modal.

- (26) $\llbracket (25) \rrbracket^{g,c}$ is true iff $\exists t' [t' = t_c \ \& \ \forall w' \text{ compatible with all the circumstances in } w_c \text{ at } t_c [\neg \exists t'' [\exists e [\tau(e) \subseteq t'' \ \& \ t' < t'' \ \& \text{take}(e, \text{Margad, photo, } t'', w')]]]]$
There exists a time t' that is equivalent to the UT, and for all worlds compatible with the circumstances of the actual world, there exists a time t'' that is after t' and contains the duration of a taking-a-photo event by Margad.

The negated structure in (25) differs only from the affirmative in (23a) in the presence of negation. Thus, this analysis captures the interpretive relationship between affirmative and negative constructions in Khalkha Mongolian, despite their morphological asymmetry on the surface.

5. Conclusion. In this paper, I have argued for an analysis of Khalkha Mongolian in which future-shifting stems from the contributions of a covert prospective aspect and a covert modal, the latter of which surfaces only under negation. This analysis accounts for the distribution of future readings of *-n* in Khalkha Mongolian, while maintaining its status as a tense marker. Further, it derives the interpretive relationship between affirmative sentences with *-n* and their negated counterparts, despite their morphological asymmetry on the surface. More broadly, the current work adds to the cross-linguistic typology of the future (Matthewson et al. 2022; Mucha 2016; Pancheva & Zubizarreta 2023; Tonhauser 2011) by contributing a previously unattested pattern of future marking.

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⁹ While verbal negation is often thought to scope over times cross-linguistically, I note that other negators are possible: in Bengali, while the negator *ni* behaves similarly to the above, it has been proposed that *na* negates quantification over events (Ramchand 2001).

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