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MODALS WITHOUT SCALES

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Abstract. Some natural languages do not lexically distinguish between modals of possibility and modals of necessity. From the perspective of languages like English, modals in such languages appear to do double duty: they are used both where possibility modals are expected and where necessity modals are expected. The Nez Perce modal suffix *o'qa* offers an example of this behavior. I offer a simple account of the flexibility of the *o'qa* modal centered on the absence of scalar implicatures. *O'qa* is a possibility modal that does not belong to a Horn scale; its use is never associated with a scalar implicature. Accordingly, in an upward entailing environment, ϕ -*o'qa* is appropriate whenever there are accessible ϕ -worlds, even if indeed *all* accessible worlds are ϕ -worlds. In a downward entailing environment, the flexibility of the *o'qa* modal is seen no more. Here, neither *o'qa* nor English possibility modals are associated with scalar implicatures, and the use of *o'qa* exactly parallels the use of English modals of possibility.

Given that *o'qa* is a possibility modal that does not contrast with a modal of necessity, just how do you talk about necessities in Nez Perce? Speakers translating into Nez Perce rely on a variety of techniques to paraphrase expressions of simple necessity away. Their strategies highlight an area where Nez Perce and English plausibly differ in the range of propositions they convey. The data cast doubt on any strong form of effability as a language universal.

MODALS WITHOUT SCALES

Some of our students passed the class, you say—and thus is born a scalar implicature. Theories of scalar implicature which diverge in major respects nevertheless agree that the generation of the implicature is in some way tied up with the existence of an alternative to what you have said. The quantifier you chose, *some*, stands in an asymmetric relation of logical strength to a different quantifier of English, *all*. The scalar implicature tied to the Horn scale $\langle \text{some}, \text{all} \rangle$ keeps your utterance weak.

The all-important details are cashed out in different ways according to differing schools of thought on scalar phenomena. According to the well-known Gricean view, the process goes by way of my reasoning about the informativeness and relevance of various possible contributions you could have made to our conversation. Since I trust in your sincerity, cooperativeness and expertise, I make my way pragmatically to the conclusion that *not all* of our students were successful.¹ According to the alternative, "grammatical view" of scalar implicatures, no such cooperative spirit is required. In a move inspired by Rooth's classic alternative semantics for focus, scalar items like *some* are taken to invoke alternatives, with the particulars to be specified by a lexically given scale. In the system Gennaro Chierchia has developed, a covert exhaustification operator akin to *only* adds to the meaning of your utterance that the stronger alternative – *all of our students passed the class* – is false.²

The central role of scales on both views leads to shared set of predictions about a special type of logically possible quantifier system. What would happen if a language had a quantifier system consisting only of *some*, or only of *all*? Quantifiers in such a language would not generate scalar implicatures; the lexicon would simply not support appropriate scales.

Here is a thought experiment to help us think about how such a system would work. Let us imagine a newly discovered variety of English – English_∅ – which lexically contains only a single quantifier over individuals, *some*. The English_∅ sentence *Some students passed*, lacking a scalar implicature, would equally well describe a scenario in which the passing rate was 50% *and* a scenario in which the passing rate was 100%. In a downward

¹ Gazdar 1979, Hirschberg 1991, Gamut 1991, Sauerland 2004, Russell 2006

² Chierchia 2004, 2006, Chierchia, Fox, and Spector 2008.

entailing context, however, the English_∃ quantifier *some* would behave like its counterpart in regular English: in both English_∃ and regular English, *It's false that some students passed* (or more colloquial paraphrases with the appropriate scopal interpretation) is faithful only to a scenario in which the passing rate was 0%.

We could further imagine how a regular English-speaking linguist discovering such a variety for the first time might describe its special properties. This would likely be described as a language where a single quantifier can “mean *some*” or “mean *all*”. Asked to translate quantifiers in upward entailing environments, speakers who spoke both regular English and English_∃ would translate both regular English *some* and regular English *all* as English_∃ *some*. Likewise, in an elicitation task, English_∃ speakers would produce *some* across upward entailing environments of all types, including those where regular English speakers would produce *all*. Troubles in translation would arise for English_∃ speakers faced with regular English *all* in a downward entailing context, where English_∃ *some* is not appropriate; and likewise in other forms of elicitation involving downward entailing environments.

In remainder of the paper I provide a sort of existence proof for a system of this type from the realm of actual natural languages. The case comes from the domain of quantification not over individuals, but over possible worlds – from the semantic domain of modals. (This is no surprise, as languages generally possess less articulated scales for modal quantification than for individual quantification. There is no analogue of numeral quantifiers in the modal domain, for instance.) It comes in particular from a modal suffix of Nez Perce (*Niimiipuutimt*), a highly endangered Sahaptian language of the Columbia River plateau.³ This suffix, *o'qa*,⁴ has indeed been described in terms closely tracking how a regular-English speaking linguist might describe English_∃: in upward entailing environments, one form apparently varies in terms of expressing existential quantification (possibility) or expressing universal quantification (necessity) (Deal 2008). This impression is particularly striking in tasks of translation, where in some cases both exis-

³ Nez Perce is currently spoken by about 30 individuals. Most of the data reported here comes from my field notes, collected from four speakers over a series of field trips from 2007 to 2010. Wherever possible, multiple speakers were consulted on any particular point. Certain examples, as noted, were drawn from published sources, in particular Phinney (1934) and Cataldo (1914). The former is available in many university libraries; the latter is available in the special collections of the University of Idaho.

⁴ Additional allomorphs are *yo'qa* and *no'qa*; I indicate all forms of the suffix in bold. On allomorphy and morpheme segmentation in the Nez Perce inflectional suffix system, see Deal (2010, ch 2).

tential and universal translations are appropriate for the same sentence in the same context. The examples below were translated in both directions with the same result.⁵

- (1) Context: a friend is preparing for a camping trip. I am taking this person around my camping supplies and suggesting appropriate things. I hand them two blankets and say:

'inéhne-**no'qa** 'ee kii lepít cíckan
take-MODAL you DEM two blanket

- a. You can take these two blankets.
b. You should take these two blankets.

- (2) Context: I am watching people clean out a cooler and throw away various things.

hi-wqíi-cix-∅ 'iléxni hipt
3SUBJ-throw.away-IMPERF.PL-PRES a.lot food

ke yoâ hi-pá-ap-**ó'qa**
REL DEM 3SUBJ-S.PL-eat-MODAL

- a. They are throwing away a lot of food that they could eat.
b. They are throwing away a lot of food that they should eat.

These data group Nez Perce *o'qa* with a class of so-called *quantificationally variable modals*, which semanticists have learned about most extensively from languages which (like Nez Perce) are indigenous to the greater Pacific Northwest. Groundbreaking work by Matthewson et al. (2007), Rullmann et al. (2008) and Davis et al. (2009) focused on the Salish language St'át'imcets, where apparent quantificational variability is seen across a wide range of modal expressions. Recent work by Peterson (2010) on the epistemic vocabulary of the Tsimshianic language Gitksan reveals interpretations there that seem flexible in a similar way. This phenomenon stands

⁵ Abbreviations in Nez Perce glosses are: CISLOC cislocative, DEM demonstrative, DESID desiderative, DIST distributive, ERG ergative case, GEN genitive case, HAB.PRES present habitual, HUM human classifier, IMPER imperative, IMPER.PL plural imperative, IMPERF imperfective, IMPERF.PL portmanteau for imperfective and plural subject, INFER inferential, LOC locative case, MOD modal suffix *a'x*, MODAL modal suffix *o'qa*, OBJ objective case, O.PL plural object, P P aspect (roughly: perfect/perfective), PART1 first participle, PART2 second participle, PRES present, PROSP prospective, REL relative clause particle, REC.PAST recent past, REM.PAST remote past, SF stem formative, S.PL plural subject, 3GEN 3rd person genitive subject, 3OBJ 3rd person object, 3SUBJ 3rd person subject, 3/3 portmanteau for 3rd person subject and 3rd person object.

A sketch grammar of Nez Perce may be found in Deal (2010, ch 1).

in contrast with the typical situation in English, where modals' quantificational force is clearly fixed.

What sort of linguistic variation could be at stake here? What is it about the *o'qa* modal that makes it flexible in just this way, in contrast to modals of English? The straightforward difference in lexical inventory between Nez Perce and English should not be overlooked. The *o'qa* modal, like the quantifier *some* of our fictional English_∃, is without a dual in the lexicon of the language. It is a quantifier without a scale. My primary goal here is to show that this fact, together with a possibility meaning for *o'qa*, provides an extremely simple explanation of its apparent variability in modal strength. No special manipulations of the meanings of modal quantifiers are necessary: we can treat the flexibility of *o'qa* with respect to English modal quantifiers just as we could treat the flexibility of English_∃ *some* with respect to regular-English individual quantifiers.

This view rests on a simple diagnostic for scalar phenomena. Just as we imagined for the fictional English_∃ quantifier *some*, the apparent variability of interpretations of *o'qa* comes entirely from upward entailing environments. In an upward entailing context, *o'qa* is used both where English possibility modals are expected and where English necessity modals are expected. Outside of such contexts, *o'qa* is used only where English possibility modals are expected. The attempted expression of necessity in a non-upward-entailing environment calls for circumlocution in Nez Perce.

These circumlocutions lead us to a series of questions which touch on *translatability* and the long-debated matter of expressive equivalence across languages. My secondary goal in this project is to demonstrate how the Nez Perce modal system casts light on certain questions in this domain. A venerable tradition holds that all languages are the same in the range of propositions they can express. Roman Jakobson put it succinctly:

All cognitive experience and its classification is conveyable in any existing language. ... No lack of grammatical device in the language translated into makes impossible a literal translation of the entire conceptual information contained in the original. (Jakobson 1959, 234-235)

Now certainly, given that *It's possible that ϕ is true* is equivalent to *It's not necessary that ϕ is false*, a possibility-only modal quantifier system is perfectly capable in principle of matching a possibility-plus-necessity modal quantifier system in expressive capacity. But it turns out that Nez Perce imposes restrictions on the scope of negation which render impossible any such equivalence. Therefore, there is a lacuna in the range of meanings the language can express using its modal system. It is doubtful, furthermore, whether the various paraphrases speakers provide to plug this gap truly

express the same propositions that may be expressed in a language whose lexicon contains basic modals of necessity. If this finding can be upheld, it poses a severe challenge to strong views of translatability like Jakobson's. In challenging the Jakobsonian view, the investigation of the Nez Perce modal system joins a growing body of work demonstrating and fleshing out the increasingly unavoidable fact of semantic variation.

In the sections to follow, I'll first demonstrate the apparent quantificational variability of *o'qa* in upward entailing environments. I will then argue that *o'qa* should indeed be treated as a quantifier without a scale. Subsequently I turn to non-upward-entailing environments, where *o'qa* behaves entirely parallel to an English possibility modal. This raises the question of how necessity in non-upward-entailing contexts is to be discussed at all in Nez Perce. Thus we return to the concerns of translation and expressive potential whose shadows we have begun to see. My focus here will be the different periphrastic means by which Nez Perce speakers, given an existential-only modal system, are able to come close to talking about simple necessity. I conclude with a discussion of the place of the Nez Perce system in comparative perspective, and the consequences of the overall picture for the semantics and pragmatics of quantification and the question of effability as a language universal.

1 Upward entailing environments: flexibility and a preference

Here is the initial puzzle the *o'qa* modal raises: speakers provide this modal when asked to translate both possibility and necessity claims from English into Nez Perce, and they translate Nez Perce sentences containing the modal with a wide range of English modal vocabulary.⁶ When provided with examples like (1) and (2) along with possibility and necessity paraphrases (as shown above), speakers reported that the two paraphrases "sound the same" or "mean the same thing." This comment presumably concerns not the English sentences themselves (as these very much do *not* mean the same thing), but the relation between these and their joint Nez Perce counterpart. The distinction between possibility and necessity that is made in English is not preserved upon translation into Nez Perce. This puzzle shows its face in the treatment of *o'qa*-verbs in upward entailing environments.

The following Nez Perce sentences were provided by speakers translating English to Nez Perce. (Speakers then translated their Nez Perce rendition of (6) back into English.)

⁶ These translation tasks were initially undertaken orally, and were repeated with written materials (which were distributed to consultants and read aloud) in the course of checking the judgments reported. In general, speakers had clearer intuitions when presented with oral stimuli.

- (3) Prompt: The cat can catch mice, but she never does. She's able to catch them, but she never does.

laqáas-na picpíc-nim páa-capaqick-**o'qa**
mouse-OBJ cat-ERG 3/3-catch-MODAL

mét'u wéet'u máwa páa-capaqick-tato- \emptyset picpíc-nim.
but not when 3/3-catch-HAB.PRES-PRES cat-ERG

- (4) Prompt: You are travelling with somebody and the two of you can't decide whether to spend the night there or to go home. You want to say, "Well, look, we could stay here, or we could go tonight; we could stay or go, either way."

kiye kine pa-wc'áa-**yo'qa** 'íitq'o kiye pa-ckilii-toq-**o'qa**
we here S.PL-stay-MODAL or we S.PL-return-back-MODAL

- (5) Prompt: We have to get home before it gets dark.

kiye pe-ckilii-toq-**o'qa** kulaawit-'ásx.
we S.PL-return-back-MODAL dark-before

- (6) Prompt: To speak well, you have to know a lot of words.

c'alawí 'ee ta'c c'îx-n'ipéecwi-se- \emptyset niimiipuutímt,
if you good speak-DESID-IMPERF-PRES Nez.Perce.language

ilxni-ne c'íiqin 'ee 'a-cóokwa-**no'qa**.
many-OBJ word you 3OBJ-know-MODAL

Consultant 1: "In order to know the language well, you need to know a lot of words."

Consultant 2: "In case you want to speak, you need to know a lot of words."

In translation from Nez Perce to English (still restricting our attention to upward entailing environments), the same flexibility is seen, along with a notable preference.⁷ Speakers sometimes do translate *o'qa* with necessity modals (e.g. *should* in (10)), but they show a general preference for possibility translations.

- (7) pícpic ha-'ac-**ó'qa** mét'u wéet'u ha-'ac-ó'.
cat 3SUBJ-enter-MODAL but not 3SUBJ-enter-PROSP
The cat could go in, but it won't go in.

⁷ Sentences (7)-(9) were collected from elicitations. Sentence (10) was uttered in casual conversation. After uttering this *o'qa* sentence, the speaker translated it into English using *should*.

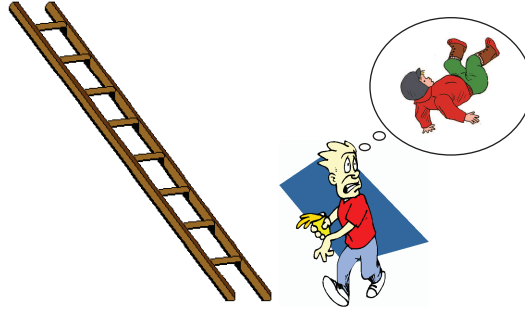


Figure 1: Scared climber cartoon

- (8) Context: You're tossing a coin and somebody keeps saying, tails, tails, tails! Every time, they say tails. And you ask them, "Why do you keep saying tails?" They respond:

'étke hi-tqiik-ó'qa tu'ynúu-pe.

because 3SUBJ-fall-MODAL tail-LOC

Consultant: "You're saying because it *could* fall [tails], *hitqiiko'qa*."

- (9) Context: You are commenting on the scenario shown in Figure 3.⁸

hi-híca-yo'qa.

3SUBJ-climb-MODAL

He's able to climb.

- (10) Context: a discussion of how young people speak quickly, making them hard to understand.

'i'yéwki hi-pa-c'íiġ-no'qa.

slowly 3SUBJ-S.PL-speak-MODAL

They should speak slowly.

Speakers' preference for possibility translations of *o'qa* is confirmed by judgments of two related types. First, in certain cases, *o'qa*-sentences are felt to provide inadequate translations for necessity claims in upward entailing environments. In this case, the *o'qa*-sentence is felt to suggest a weaker, possibility meaning.

- (11) Prompt: According to the rules, I should leave.

tamáalwit-ki 'aat-ó'qa

rule-INST go.out-MODAL

⁸ This cartoon was designed to contrast with another cartoon in which a boy is shown as being not only physically able to climb a ladder, but also likely to do so. In the Figure 3 scenario, the consultant felt that the boy was unlikely to climb – "he's thinking about his friend falling off" – but nevertheless physically able.

Consultant: “That’s not really saying I should go out. It’s just saying I *could* go out.”

In other cases, *o’qa*-sentences are used where necessities are at stake, even though speakers do not feel that the translation is perfectly accurate. The following discussion with a (different) consultant underlines the point.

- (12) Context: discussion of a woman’s house rules regarding the entry of dogs.

’éemtii hi-wc’áa-yo’qa
outside 3SUBJ-stay-MODAL

Consultant: It [the dog] could be kept outside. It can stay outside.

ARD: Could you say that for it *has* to stay outside, ’éemtii hiwc’áayo’qa?

Consultant: Uh-huh. That would pertain to staying outside. It could be kept outdoors, outside.

ARD: If you say ’éemtii hiwc’áayo’qa, are you just saying that’s okay, or that that has to happen?

Consultant: That would be, that was her rule: dogs stay outside. But there was no mention of any kind of rule there, just mentioning that the dog can stay outside.

By contrast, so long as the modality in question is of the appropriate type (a matter we turn to in the next section), speakers do not object to the translation of *o’qa* with English possibility modals – *can*, *could*, *may* – and vice versa.

What is behind the flexibility of the *o’qa* modal, and the curious preference speakers show in its interpretation? And what is it that makes this modal system, with its flexibility along these lines, different from the modal system of English? I argue for a simple answer: *o’qa* is a possibility modal lacking a logically stronger counterpart. Speakers prefer possibility translations for *o’qa* because *o’qa* is a possibility modal. They accept and produce necessity translations in cases where a possibility meaning, deprived of any scalar implicature, remains appropriate. But bilingual speakers know that something is lost in translations of this type.

2 A quantifier without a scale

The claim that *o’qa* does not form part of any modal Horn scale requires justification by reference to the rest of the modal system of Nez Perce. A tour through the organization of this system will introduce us to a range

of meanings for the *o'qa* modal, as well as some restrictions on those meanings. These restrictions concern not quantificational force *per se*, but the type of modality expressed. What I have in mind here is a notion made precise by Kratzer's (1977, 1981) theory of conversational backgrounds, which provides the background to my exposition.

2.1 The organization of the Nez Perce modal system

The key organizing principle behind the Nez Perce modal system concerns a split between *epistemic* expressions – expressing possibilities in view of evidence and belief – and *non-epistemic* expressions – expressing possibilities in view of facts of other types.⁹ In partitioning its modal system in this way, Nez Perce is very similar to two other languages whose modals apparently vary in quantificational force: St'át'imcets (Interior Salish), as described by Matthewson et al. (2007), Rullmann et al. (2008) and Davis et al. (2009), and Gitksan (Tsimshianic), as described by Peterson (2010). These languages' modal systems sit on the opposite side of a typological cline from European-type modal systems, where particular modal expressions can be used both epistemically and non-epistemically. Survey work by van der Auwera and Ammann (2008) reveals that modal systems of the latter (more familiar) type are for the most part an areal feature of European languages. van der Auwera and Ammann did not discover any mainland American language where modal expressions generally admit both epistemic and non-epistemic interpretations.

The specialization of modals according to type of modality is important to demonstrate here in view of its consequences for scalar implicatures among modal quantifiers. For two quantifiers to form a Horn scale, they each have to be applicable to the same domain. We do not expect quantifiers over possible worlds and quantifiers over individuals to form scales; similarly, if each modal expression in a language *L* were uniquely specified for a distinct type of modality, there could be no question of modals of *L* forming scales with one another. Therefore, a language with both existential and universal modal quantifiers – say, an existential epistemic modal and a universal deontic modal – could still be a language where modals operate without scales.

To demonstrate that *o'qa* does not belong to a scale, then, it will suffice to clarify the types of modality for which it is specified, and to demonstrate that no logically stronger or logically weaker quantifier intrudes on this range. We do not need to demonstrate (and indeed I have no ambition to show) that Nez Perce is a language without scalar implicatures *in general*;

⁹ Illuminating discussion of this distinction, with special reference to German, can be found in Kratzer (1981).

we do not even need to show that there are no scalar relationships among Nez Perce modals at all. (The first point is almost certainly false, and the second remains for the moment unconfirmed, though I suspect that it is true. Owing to difficulties in embedding certain epistemic expressions in downward entailing contexts, the intricacies of the epistemic system are not yet fully understood.)

With this prologue, let me sketch the outlines of the Nez Perce modal system in the following, *o'qa*-centric way. First, I will single out three types of readings for *o'qa* sentences: deontic readings, pure circumstantial readings, and counterfactual readings. These interpretations have in common that they are not epistemic in character. They fit into the general rubric of Kratzer (1991)'s *circumstantial modality*, in that "we are interested in the necessities implied by or the possibilities opened up by certain sorts of facts ... the modality of rational agents like gardeners, architects and engineers." Second, I will show that the meaning of *o'qa* does not extend onto epistemic turf. Third, I will argue that the two other major means of expressing non-epistemic modality in Nez Perce do not form a scale with *o'qa*.

2.2 Deontics

The first of three subtypes of *o'qa* sentences to be singled out are the deontics. When Nez Perce speakers want to grant or discuss permission, expressing deontic possibility, they use *o'qa* sentences.

Here a mother uses an *o'qa*-sentence to give permission to a child, informing him what is possible in light of her rules.

- (13) tepelwéeku's-ne 'aa-p-**ó'qa** hip-naaq'í-t-pa.
 candy-OBJ 3OBJ-eat-MODAL eat-finish-PART1-LOC
 You can eat candy after the meal.

Similarly, when a student asks a teacher to be excused, he asks about what is permitted by her rules.

- (14) Context: How a student should ask a teacher for permission:
 wéet-eex kiy-**ó'qa** 'áatinwas-x?
 Y.N-1 go-MODAL bathroom-to
 Can I go to the bathroom?

In the following example the instrumental phrase *tamaalwitki* 'according to the rule' emphasizes the deontic nature of the possibility claim.

- (15) tamáalwit-ki kíye 'e-pe-hiteeme-**nó'qa** tíim'es-ne.
 rule-INST we 3OBJ-S.PL-read-MODAL paper-OBJ
 According to the rule, we can read the paper.

Speakers also use *o'qa* in upward entailing contexts to talk about matters that we expect to fall under deontic necessity, the modality of legal requirement and prohibition.

- (16) 'óyakala ciq'áamqal hi-pa-wc'áa-**yo'qa** 'imíit ciikéet-pe.
all dog 3SUBJ-S.PL-stay-MODAL inside night-LOC
All dogs must be kept inside at night.
- (17) náqc-wa hi-pa-ác-**o'qa**.
one-HUM 3SUBJ-S.PL-enter-MODAL
People must go in one at a time.

Clear necessity uses of this type are rarer than possibility uses, however, and speakers are less confident of the appropriateness of the translation – findings in keeping with a strict, implicature-less possibility meaning for *o'qa*.

2.3 Pure circumstantials

The second subtype of *o'qa*-sentence is what I will call “pure circumstantials”, following Kratzer (1981). Modal claims of this type are based on inherent characteristics of persons and things, in view of which certain outcomes are possible. In the following sentence, based on a classic example from Kratzer (1991), the inherent characteristics of roses and the soil make it possible for roses to grow in the yard.

- (18) Context: You want to plant some flowers in your yard where there aren't any flowers. Roses could grow there; the soil is good.
- teminik-**ó'qa** táamsas koná
plant-MODAL rose there
- kaa hi-pe-p'ím-**no'qa**.
and 3SUBJ-S.PL-grow-MODAL

You could plant roses there and they could grow.

Circumstantial uses of this type make *o'qa* sentences appropriate to the task of encouraging someone. Here, I cheer my sister on by reminding her of her ability to complete a difficult climb.

- (19) Context: I am on the top of the cliff, having climbed up, and my sister is below. I call down to her:
- 'e-q'uyím-**no'qa**!
3OBJ-climb-MODAL
You can climb up!
Consultant: "You can do it!"

They can also be used to discuss one's limitations, what is not possible (or what is the limit of the possible) in light of one's physical and/or mental makeup.

- (20) Context: a discussion of the size of Whoppers at Burger King

hiinaq'i-yó'qa kúckuc.

finish-MODAL small

I can finish a small one.

Just like their counterparts used deontically, pure circumstantial *o'qa*-sentences are sometimes provided to translate English necessity claims. Here, in view of the distance to Boise and one's human needs as a traveller, it is a necessity to stop twice.¹⁰

- (21) Context: Boise is a 6 hour drive away.

lep-éhem watalq-ó'qa 'ee hipt-'áyn

two-times stop-MODAL you food-for

ke-m kaa kiy-ó'qa pásâa-px.

REL-2 then go-MODAL Boise-to

You have to stop twice for food when you go to Boise.

Putative necessity claims from the realm of the pure circumstantials are extremely difficult to elicit using *o'qa*. Speakers generally prefer to translate pure circumstantial *o'qa* sentences using the language of possibility.

2.4 Counterfactuals

Finally, *o'qa*-sentences play an important role in the expression of counterfactual statements and conditionals. In the following case, Orofino did not beat Lapwai; nevertheless, it was possible for them to have done so.

- (22) Context: Tournament bracket picture, Figure 4

'úuyit-pa hi-naas-his-nó'qa lépwei-ne tewéepu-m.

beginning-LOC 3SUBJ-O.PL-beat-MODAL Lapwai-OBJ Orofino-ERG

In the first (game), Orofino could have beaten Lapwai.

In the following case, we know that certain plants were flowering four days ago. We could have watered them at that time, but we failed to do so.

¹⁰Note that the *o'qa* suffix appears twice in this example—once in the main clause, where it is rendered in English with circumstantial *have to*, and once in the *when*-clause, where its contribution is less clear. This may be a case of concordial marking of some type, perhaps akin to sequence of mood or tense. Further investigation is needed on this point. Similar remarks apply to (25).

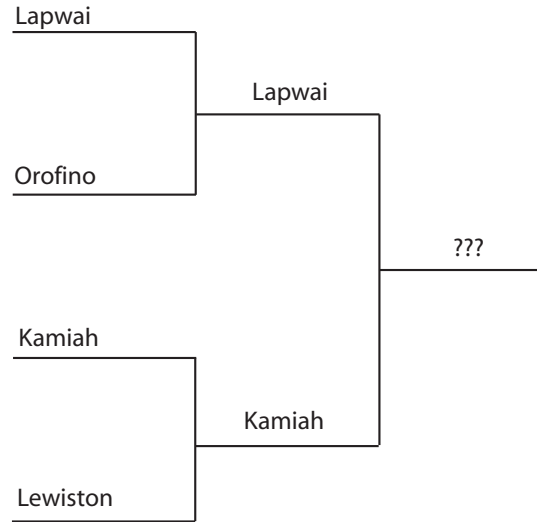


Figure 2: Tournament brackets

- (23) sapa-wala-**nó'qa** lepíti-pe léehey-pe
CAUSE-flow-MODAL four-LOC day-LOC

mét'u wéet'u ku'ús pe-kú-Ø-ye.
but not thus S.PL-do-P-REM.PAST

We could have watered them four days ago, but we didn't do so.

Again, consultants also use *o'qa*-sentences to translate claims of counterfactual necessity.

- (24) kii méeywi picpíc-nim páa-p-**o'qa** cu'yéem-ne
DEM morning cat-ERG 3/3-eat-MODAL fish-OBJ

mét'u cúu'yem hi-wa-qá yow'íic'ayn-pa.
but fish 3SUBJ-be-REC.PAST fridge-LOC

This morning the cat would have eaten the fish but the fish was in the fridge.

- (25) 'iin watíisx kiy-**ó'qa**
1SG 1.day.away go-MODAL

c'alawí ta'c watíisx hi-wak-**ó'qa**.
if good 1.day.away 3SUBJ-be-MODAL

I would have come yesterday if the weather had been good.

Across all three types of *o'qa*-sentence, possibility uses and translations remain the norm (even restricting our attention to upward entailing environments); yet consultants produce and accept *o'qa*-sentences as translations of

English necessity modal claims in upward entailing environments, and vice versa.

2.5 Epistemic modality

O'qa-sentences are systematically *not* volunteered in contexts favoring epistemic claims. In a context where the facts that matter are the pieces of evidence available and the belief states of individuals and groups, consultants volunteer sentences with particles such as:

- (26) a. *pay's* 'maybe'
 b. *páalwit* 'maybe, perhaps'
 c. *'éete* 'surely, I guess'
 d. *ku'(nu) weet* 'dunno whether'

These particles relate to evidence, inference, ignorance and belief. Following are some examples of scenarios that elicit these epistemic particles, but never *o'qa*.

Hearing a knock at the door gives a piece of evidence about what is the case outside. In light of this evidence, the speaker uses the particle *pay's* 'maybe'.

- (27) Context: You hear a knock at the door and you think it's Scotty. You say, "That'll be Scotty."
pay's hii-we-s-0 Scotty.
 maybe 3SUBJ-be-P-PRES Scotty
 Maybe it's Scotty.

The fact that a dog ran away is consistent with a number of possibilities, described by sentences containing *pay's*. The evidence is consistent with each, but does not decide between them.

- (28) *'itúu-wecet yô pit'íin' hi-nekí-se-0*
 what-reason DEM girl 3SUBJ-think-IMPERF-PRES

ciq'áamqal 'e-wúuy-n-e
 dog 3GEN-run.away-P-REM.PAST

Why does the girl think her dog ran away?

- a. *pay's he-eyéê-n-e*
 maybe 3SUBJ-be.hungry-P-REM.PAST
 Maybe it was hungry
 b. *pay's picpíc-ne pée-twe'-ke'y-k-0-e*
 maybe cat-OBJ 3/3-follow-go-SF-P-REM.PAST
 Maybe it chased a cat

Particle *páalwit* ‘maybe, perhaps’ is used under similar conditions. Here a painter uses *páalwit* to suggest that his job may be finished tomorrow.

- (29) Context: a homeowner is conversing with workmen who are painting his house. The owner asks:

máwa pa-híinaq’i-yo’?
 when S.PL-finish-PROSP
 When will you be done?
 weet pa-híinaq’i-yo’ kii taqc?
 Y.N S.PL-finish-PROSP DEM today?
 Will you finish today?

A painter replies:

ku’-x máwa, páalwit pa-híinaq’i-yo’ watíisx.
 DUNNO-1SG when perhaps S.PL-finish-PROSP 1.day.away
 Dunno when, perhaps we will finish tomorrow.

Particle *’éete* ‘I guess, surely’ is used where an inference is drawn from evidence. The evidence can take a variety of forms. An obscured visual image, peeping through a small space, is evidence of who is outside; it takes an inference to conclude that the one so glimpsed is Scotty.

- (30) Context: you are looking through a keyhole.

’éete híi-we-s-Ø Scotty.
 INFER 3SUBJ-be-P-PRES Scotty
 I guess it’s Scotty.

Bones scattered about are evidence of mass suffering. Coyote infers from these clues that many people have died inside the monster’s belly.

- (31) [From *Coyote and Monster*, Phinney 1934, 21] The monster has just swallowed all the people; Coyote was the last. Coyote is walking along inside the monster.

pipís-ne pée-wye-x-n-e.
 bone-OBJ 3/3-as.one.goes-see-P-REM.PAST
 He saw bones as he went along.
 “’éete hi-pe-wíi-tin’x-n-e ’ilxníi-we titóoqan.”
 INFER 3SUBJ-S.PL-DIST-die-P-REM.PAST many-HUM person
 “Surely many people have died.”

The compound particle *ku’ weet* or *kú’nu weet* ‘dunno whether’ is used where the evidence is inconclusive regarding a particular possibility. It is made up of *ku’* or *kú’nu*, an ignorance marker, plus yes/no question particle *weet*. In the following case the speaker has no way of knowing the precise timing of the cat’s death.

- (32) Context: My consultant tells me that her cat was hit by a car in the road. I ask when. She replies:

kii k'áyk'in. ku' weet halxpáawit-pa.

DEM week DUNNO Y.N Monday-LOC

This week. Maybe Monday. / I don't know whether it was Monday.

Political contests are notoriously unpredictable. The speaker uses *kú'nu weet* to make clear that she does not know how the primary contest will turn out.

- (33) Context: It is June of 2008. Hillary Clinton and Barack Obama are locked in a drawn-out primary contest.

kú'nu weet pée-his-nu' Clinton-ne Obama-nim.

DUNNO Y.N 3/3-win.over-PROSP Clinton-OBJ Obama-ERG

Obama might or might not win out over Clinton.

Notably, the means we have just reviewed for expressing epistemic and evidential notions do not include *o'qa*-sentences. This is no accident. When consultants are questioned about *o'qa*-sentences in contexts favoring epistemic modal claims, they offer a correction to a form including an epistemic particle. In the following case, the use of an *o'qa* form without an epistemic particle is judged to make an epistemically unwarranted assertion. The consultant offers a corrected form which includes both *kú'nu weet*, expressing epistemic modality, and *o'qa*, expressing non-epistemic modality.

- (34) Context: someone asks me:

Weet picpíc-nim páa-himkasayq-sa-Ø ciq'áamqal-nim

Y.N cat-ERG 3/3-like.taste-IMPERF-PRES dog-GEN

hipt

food

Does the cat like dog food?

Since I don't have a dog around the house, I don't know the answer to the question. I reply:

- a. #paa-himkasayq-ó'qa

3/3-like.taste-MODAL

Intended: She could_{epistemic} like it.

Consultant: "You don't know that for a fact."

- b. kú'nu weet paa-himkasayq-ó'qa

DUNNO Y.N 3/3-like.taste-MODAL

I don't know if she would like it.

In other cases, speakers reject *o'qa* entirely, replacing it with an epistemic particle.

- (35) Context: you see the foundation of a house in the grass.
- a. # hi-pe-tew'yenik-**ó'qa**
 3SUBJ-S.PL-live-MODAL
 Intended: People could_{epistemic} have lived here.
 - b. 'éete waqípa kíne 'iníit hi-wéek-**0-e**
 INFER long.ago here house 3SUBJ-be-P-REM.PAST
 A long time ago there must have been a house here.
- (36) Context: A detective notices a broken window and says: He could have come in through the window!
- a. 'ipewi-ye'wéet hi-nées-**0-n-e**:
 look.for-AGT 3SUBJ-O.PL-say-P-REM.PAST
 'éete pay's ha-'ác-**0-a** 'ipneexne's-payí
 INFER maybe 3SUBJ-come.in-P-REM.PAST window-through
 The detective [lit: seeker] told them: Maybe he came in through the window.
 - b. # ha-'ac-**ó'qa** 'ipneexne's-payí
 3SUBJ-come.in-MODAL window-through
 Intended: He could_{epistemic} have come in through the window

These judgments confirm that *o'qa* cannot be used as an epistemic modal.¹¹

2.6 Other non-epistemic modal expressions

The rigid divide between epistemic and non-epistemic modal expressions disqualifies epistemic modals from forming Horn scales with non-epistemic modal *o'qa*. The two groups of quantifiers do not apply to the same domain. What about other non-epistemic modals? Non-epistemic modalities can be expressed in Nez Perce with the help of two additional pieces of closed-class vocabulary: a participial form, and an additional type of verbal suffixation. While current speakers of Nez Perce recognize both forms, neither of these forms is as productive as are verbs in *o'qa*.

The participial modal construction involves a deverbalizing suffix (*n/t*)*e's* and a copular verb. In an upward entailing context, it prominently expresses a type of circumstantial possibility, perhaps akin to that expressed by English *-able*.

- (37) paasx hii-we-s-0 hip-'és
 sunflower 3SUBJ-be-P-PRES eat-PART2
 Sunflowers are edible.

¹¹It is also possible to show that Nez Perce epistemic modals cannot be used non-epistemically. See Deal (2011, §3.1).

- (38) tíim'es híi-we-s-0 hitéeme-n'es
 book 3SUBJ-be-P-PRES read-PART2
 The book is readable. The book is legible.

It is also used for teleological modality – the modality of function and design. When (38) is used this way, consultants prefer a translation with a non-finite construction: *The book is there to read*. Other examples are translated in a parallel way.

- (39) célli 'u-u-s-0 'iníi-t'es Frances-ne
 jelly 3GEN-be-P-PRES give-PART2 Frances-OBJ
 Her jelly is for giving to Frances.
- (40) híi-we-s-0 núun-im tak'áy-n'as wéet'u hip-'és
 3SUBJ-be-P-PRES 1PL-GEN watch-PART2 not eat-PART2
 It's for us to look at, not to eat.

These data suggests two reasons to doubt that the *e's* suffix could form a Horn scale with *o'qa*. First is the fact that *e's* appears to express possibility (as is especially clear in (37) and (38)), suggesting it is not logically stronger than *o'qa*. Second is the question of modal flavor. If the two modal suffixes are specialized for non-overlapping subtypes of circumstantial modality, this will disqualify them from forming a scale. And indeed it seems that these modals may well be specialized in this way: teleological modality is never expressed with *o'qa*, and deontic and counterfactual modalities are never expressed with *e's*. For the types of (pure) circumstantial modality expressed either with *o'qa* or with *e's*, consultants' translations are consistently distinct: *e's* forms are translated with *-able* adjectives, and *o'qa* forms are not. If this reveals a subtle but real distinction among subflavors of circumstantial modality, it is safe to count the participial modal construction out of the picture for scale formation.

The final closed-class modal element is a verbal suffix, *'aâ*, which is not productive among today's Nez Perce speakers. This limits the degree to which it is possible to probe the fine semantics of this suffix. It is nevertheless interesting to note that those speakers with judgments about *'aâ* consider it essentially equivalent to *o'qa* in meaning; and it appears that this equivalence might have held for several generations. Aoki (1970, 114), discussing counterfactual expressions, remarks that *o'qa* and *'aâ* are interchangeable. In Cataldo's 1914 bible portions, modal statements expressed with *'aâ* are sometimes footnoted with alternative, *o'qa* forms. In (41) we see this interchangeability for an expression of ability; (42) shows the same interchangeability in a counterfactual context.

- (41) kaa hi-pe-timiyuu-n-e
 and 3SUBJ-S.PL-think-P-REM.PAST

ku'nen mana Jesus-na poo-pciyaw'-can-'a \hat{x}
 DUNNO how Jesus-OBJ 3/3-kill-IMPERF-MOD

('a-p-oopciyaw'-no'qa)
 (3OBJ-S.PL-kill-MODAL)

And they conspired as to how they might destroy Jesus. (Matthew 12:14; Cataldo 1914, 60)

- (42) 'etke ku'-pem 'eetx 'ikuuyn-u 'e-pe-mic'kuynek-t-aa \hat{x}
 for DUNNO-2PL 2PL true-EMPH 3OBJ-S.PL-believe-PART1-MOD

('a-pa-mic'kuynak-o'qa) Moses-na,
 (3OBJ-S.PL-believe-MODAL) Moses-OBJ

kawa 'inen-k'e pay's pe-mic'kuynek-ta-m- \hat{x}
 then me-too maybe S.PL-believe-PART1-CISLOC-MOD

(pa-mic'kuynak-o'komqa)
 (S.PL-believe-MODAL.CISLOC)

For had ye believed Moses, ye would have believed me (John 5:46; Cataldo 1914, 57)

If *o'qa* and *a \hat{x}* formed a scale, we would not expect this interchangeability. What we might expect instead is not found – there do not appear to be any systematic differences in the use of *o'qa* between those speakers who retain the *a \hat{x}* modal suffix and those who do not. This suggests that the grammar containing *a \hat{x}* and the grammar lacking it do not differ concerning the membership of *o'qa* in a Horn scale. Our last contender, like the expressions before it, does not occupy a position of logical strength or weakness with respect to the *o'qa* modal quantifier.

The conclusion: *o'qa* is a quantifier without a scale.

3 Non-upward-entailing environments

In a non-upward-entailing environment, possibility modals are not weaker than necessity modals. This means that they do not trigger the scalar implicature found in upward entailing environments in a language like English. We expect, then, that in non-upward-entailing environments, *o'qa* should behave *exactly akin* to a possibility modal of English. And this is just what we do in fact find. We find it across all such environments it has been possible to test with Nez Perce speakers: in the scope of negation, in the restriction of universal quantifiers, and in the antecedent of conditionals.

3.1 Negation

Sentential negation is expressed in Nez Perce by a particle, *wéet'u*, which always appears to the left of the verb.

- (43) a. 'inpeew'etúu-nm ('iin-e) wéet'u hi-pa-'yaaġ-nó'qa
 police-ERG (1SG-OBJ) not 3SUBJ-S.PL-find-MODAL
 The police could never find me.
- b. *'inpeew'etúu-nm hi-pa-'yaaġ-nó'qa wéet'u
 police-ERG 3SUBJ-S.PL-find-MODAL not
- (44) a. wéet'u 'e-sukí-se-∅ ko-nyá
 not 3OBJ-recognize-IMPERF-PRES DEM-OBJ
 I don't recognize that one.
- b. *'e-sukí-se-∅ wéet'u ko-nyá
 3OBJ-recognize-IMPERF-PRES not DEM-OBJ

The scope of negation is the material to its right. We see this in patterns of negative polarity item (NPI) licensing. Nez Perce is a language where the same series of indefinite pronouns is used across NPI and question environments. In (45a), where the indefinite pronoun (or "*wh*-word") appears to the right of negation, it can be used as an NPI. In (45b), where the pronoun appears to the left of negation, it cannot be so used.

- (45) a. wéet'u 'itúu-ne 'aa-p-sá-qa
 not what-OBJ 3OBJ-eat-IMPERF-REC.PAST
 I didn't eat anything
- b. *'itúu-ne wéet'u 'aa-p-sá-qa
 what-OBJ not 3OBJ-eat-IMPERF-REC.PAST
 intended: as above

If the structural relation required for NPI licensing is c-command, then such patterns suggest that linear order corresponds to structural height in Nez Perce, at least so far as negation is concerned.¹²

The semantic intuitions of speakers concerning negated *o'qa* sentences are unambiguous. Such sentences have only $\neg\Diamond$ (not-possible) readings. A good way to elicit negated *o'qa* sentences is to ask for negated possibility claims. The examples below were elicited via translation prompts in this way.

- (46) Context: the referee is talking to an injured player.

¹²Patterns of this type can also be found English, as discussed by Johnson (1997) in connection with the proposal of Kayne (1994). According to Kayne, linear precedence in fact maps quite generally onto asymmetric c-command.

tamáalwit-wecet wéet'u 'ee xeeleewi-yó'qa
 rule-reason NEG you play-MODAL

'étke k'omáy'c 'ee wee-s-Ø 'áatim.
 because hurt you be-P-PRES arm

According to the rules, you can't play, because your arm is injured.

- (47) wéet'u kíye kine pa-w'cáa-yó'qa,
 not we here S.PL-stay-MODAL

kíye ciklíi-six-Ø.
 we go.home-IMPERF.PL-PRES

We can't stay here, we are going home.

Negation does not permit scope ambiguity with respect to the *o'qa* modal: speakers firmly reject $\Diamond\neg$ (possible-not) and logically equivalent $\neg\Box$ (not-necessary) translations of negated *o'qa* sentences, and reject *o'qa* sentences when presented with $\Diamond\neg$ or $\neg\Box$ scenarios as elicitation prompts.

- (48) Wéet'u máwa hi-pa-'yáaâ-no'qa 'inpeew'etúu-nm
 not when 3SUBJ-S.PL-find-MODAL police-ERG

- a. The police would never find me
 b. # It's possible that the police won't ever find me.

- (49) Context: you are explaining to someone who thinks they have to leave that they are not in fact required to do so. It's not necessary for them to leave.

wéet'u 'ee kiy-ó'qa
 not you go-MODAL

Consultant: "That's a different conversation, not this one. You're just saying *wéet'u 'ee kiyó'qa*, 'you can't go.'"

- (50) Context: I tell someone my number and I see that they are trying to remember it. I say, "You don't have to remember it, here's my card."

wéet'u 'ee timiipni-yó'qa
 not you remember-MODAL

Consultant: "You're just saying, 'you wouldn't remember.'"

Speakers use a variety of means to approximate the meanings that these negated *o'qa* sentences lack, $\Diamond\neg$ and $\neg\Box$. We return to their choices in section 4. Let me emphasize in advance that one logically possible choice of paraphrase – indeed the most obvious one – will *not* figure among the strategies to be reviewed. Given that negation *must scope over the verb* in Nez Perce, it is not possible to arrive at $\Diamond\neg$ interpretations via scopal rearrangements.

It is for this reason that we are forced to conclude that Nez Perce does not permit exact translations of English simple necessity statements.¹³

3.2 Restrictions of universals

Universal quantifiers are downward entailing with respect to their restriction. Existential quantifiers are upward entailing with respect to their restriction. We expect, therefore, that *o'qa* can be translated with an English necessity modal when in the restriction of an existential quantifier, but not when in the restriction of a universal quantifier. This is what we find. Our first example, involving existential quantifier *'iléxni* 'a lot', is repeated from above.

- (51) Context: I am watching people clean out a cooler and throw away various things.

hi-wqíi-cix-0 'iléxni hipt
3SUBJ-throw.away-IMPERF.PL-PRES a.lot food

ke yoʔ hi-pá-ap-o'qa
REL DEM 3SUBJ-S.PL-eat-MODAL

- They are throwing away a lot of food that they could eat.
- They are throwing away a lot of food that they should eat.

When we change the quantifier to a universal, the necessity translation is no longer acceptable.

- (52) Context: I am watching people clean out a cooler and throw away various things.

hi-wqíi-cix-Ø ’óykala hipt
3SUBJ-throw.away-IMPERF.PL-PRES all food

ke yõx hi-pá-ap-o'qa
REL DEM 3SUBJ-S.PL-eat-MODAL

- They are throwing away all the food that they could eat. They are throwing away all their food.
- # They are throwing away all the food that they should eat (but keeping some junk food).

¹³Restrictions on the scope of negation may in general engender differences in expressive power across languages. See Givón (1978) for a demonstration of similar facts in the modal-aspectual system of Yaqui.

In this case the suggested possibility and necessity translations differ in the degree to which they suggest deontic modality. Importantly, speakers do not correct translations like (52b) to highlight non-deontic modality; they reject them. The problem is not modal flavor, but modal force.

The pattern recurs with *o'qa* in the restriction of the bare universal quantifier '*óykala* 'everything, all' and in free relatives with universal force.

- (53) 'e-hitéeme-0 'óykala-na ke-m 'a-hitáama-**no'qa**
 3OBJ-read-IMPER everything-OBJ REL-2SG 3OBJ-read-MODAL
 a. Read everything you can read!
 b. # Read everything you should read! / Read everything you are supposed to read!
- (54) ke-m 'itúu 'iim kiy-**ó'qa** 'iin wáaqo' kúu-0-ye
 REL-2SG what you do-MODAL I already do-P-REM.PAST
 a. Whatever you can do, I already did.
 b. # Whatever you have to do, I already did.

Speakers once again fall back on a variety of periphrastic means to convey meanings akin to simple necessity in such contexts. In a downward entailing environment, *o'qa* is compatible with a strict possibility reading only.

3.3 Conditional antecedents

A third environment in which *o'qa* sentences behave strictly like possibility claims is in the antecedent of conditionals. Conditionals in Nez Perce are expressed via an adjunct clause headed by *c'alawí* 'if'.

- (55) Context: I am giving instructions to a catsitter.
c'alawí pícpic he-eyéeq-ce-0, 'e-kíiwyex-0
 if cat 3SUBJ-be.hungry-IMPERF-PRES, 3OBJ-feed-IMPER
 If the cat is hungry, feed it!
- (56) Context: The light is fixed.
c'alawí wéet'u Angel-nim páa-lawlimq-0-a 'ilaká'wit-ne
 if not Angel-ERG 3/3-fix-P-REM.PAST light-OBJ

 kú'nu 'isíi-nm páa-lawlimq-0-a
 DUNNO who-ERG 3/3-fix-P-REM.PAST
 If Angel didn't fix the light, someone else (I dunno who) did.

Consequents of conditionals are upward entailing. Antecedents of conditionals are not.¹⁴ This difference in upward entailingness corresponds to a striking asymmetry in the acceptability of necessity translations for *o'qa*. In (57), *o'qa* appears in the consequent of the conditional, and is felt to appropriately translate English *needs to*.

- (57) c'alawí wéeyuû 'u-u-s-Ø k'omáy'c,
 if leg 3GEN-be-P-PRES injured
 saykiptaw'atoo-nm háamti'c páa-x-no'qa
 doctor-ERG quickly 3/3-see-MODAL

If he has an injured leg, the doctor needs to see him right away

But when this same clause is found in the antecedent of a conditional, the necessity translation is ruled out.

- (58) c'alawí saykiptaw'atoo-nm háamti'c páa-x-no'qa,
 if doctor-ERG quickly 3/3-see-MODAL
 simíinikem-x hi-kiy-ó'qa
 Lewiston-to 3SUBJ-go-MODAL

- a. If the doctor can see him in a hurry, then he should head over to Lewiston
- b. # If the doctor needs to see him in a hurry, then he should head over to Lewiston

The pattern is quite general: consultants reject *o'qa* sentences translating necessity modals in conditional antecedents.

- (59) c'alawí 'ac-ó'qa, kaa 'ac-ó'
 if enter-MODAL then enter-PROSP
 a. If I can go in, I will go in.
 b. # If I have to go in, I will go in.

- (60) Prompt: If I have to call the doctor, I will.

- # c'alawí 'a-múu-no'qa saykiptaw'atoo-na,
 if 3OBJ-call-MODAL doctor-OBJ
 kaa 'e-múu-nu'
 then 3OBJ-call-PROSP

¹⁴The monotonicity of conditional antecedents is a matter of some delicacy. On the non-monotonic view, see Lewis (1973), Schlenker (2004); on the downward entailing view, see Kadmon and Landman (1993), von Stechow (2001).

Consultant: “You could say that, but I don’t know how you would say that to mean if you *needed* the doctor... you’re just saying that if I could call the doctor, I would.”

Outside of upward entailing environments, translation of *o’qa* with necessity modals is ruled out.

4 Talking about necessity

In a non-upward-entailing environment, how do you talk about those varieties of necessity that correspond to the possibility modal *o’qa*? In an upward entailing environment, how do you make clear a distinction between possibility of the type *o’qa* expresses, and the corresponding flavor of necessity? The latter question is similar to what could be asked of any of a number of contrasts which are grammatically encoded in one language but not in another. It is akin to asking how, in English, you make clear to your addressee whether or not you are intimates (a distinction grammatically encoded in languages such as French), or how, in English, you make clear to your addressee whether you intend a modal claim to be epistemic or non-epistemic (a distinction grammatically encoded in Nez Perce). These are all questions which spring from a concern for the *translatability* of one language into another.

In practical terms, the answer to such questions is always the same: speakers rephrase, they paraphrase, they make do. On a theoretical level, what is of central concern is *how accurately* periphrastic means are able to communicate a meaning that the grammar does not especially encode. For translators, this is the question of *equivalence*.¹⁵ Philosophers concerned with equivalence have argued for a long time about whether, and to what degree, languages necessarily provide for fully equivalent translation.¹⁶ A strong view on the question was advanced by Jerry Katz (1976, 1978) as the *Translatability Thesis*:

For any pair of natural languages and for any sentence *S* in one and any sense σ of *S*, there is at least one sentence *S'* in the other language such that σ is a sense of *S'*.

Katz’s thesis leads us to expect that any language will have a sentence *S'* which counts among its meanings the proposition expressed by English *You don’t have to go* or *If I have to go, I will*. Looking at the various turns of phrase speakers substitute for *o’qa* in such sentences, we will see that it is far from

¹⁵Kenny 2009

¹⁶Quine 1960, Davidson 1974, Bar-On 1993

apparent that this is so. A finding of this work is therefore that the Translatability Thesis is unlikely to be maintainable in its strongest form. Indeed, this is a conclusion also reached by Keenan (1978) and Givón (1978) (in the same volume as Katz 1978), by Bar-On (1993) in a survey of work on translation, and by von Stechow and Matthewson (2008) in work on semantic universals. This body of work amounts to an unambiguous assault on the Jakobsonian view of *expressive equivalence* as a language universal.

What we will see most strikingly is that there is no one single magic solution for talking about simple necessity in Nez Perce. Speakers come up with paraphrases of all sorts. Consultants usually feel that these paraphrases “explain the meaning” intended by an English simple necessity statement, though it will be clear that the match-up with the intended necessity meanings is never quite perfect. Many instances of this imperfect match share a common characteristic: speakers choose to tamper with the flavor of modality in question, or with other aspects of sentential force and meaning, in order to take advantage of a lexical item whose semantics achieves or approximates a meaning of necessity.

The paraphrases provided by my consultants can be sorted into at least four major categories: (simulated) speech acts, indicative sentences, causatives, and paraphrase as possibility. I do not propose that this typology exhausts the range of devices speakers could potentially come up with to make their message clear, but reviewing it casts light on the range of variation in techniques they sometimes try.

4.1 (*Simulated*) speech acts

I group under the category of (*simulated*) *speech acts* several substrategies which involve rephrasing the necessity claim as though it has been proposed or ordered. In the simplest case, speakers use imperatives (and thus *actual* speech acts) to convey something akin to simple deontic necessity.

- (61) Prompt: A bathroom sign: Everyone must wash their hands.

’óykalo, wapa’áya-kitx ’ípsus
everyone wash-IMPER.PL hand
Everyone, wash your hands!

- (62) Prompt: You have to eat the meat.

nukú-ne ’e-híp-x
meat-OBJ 3OBJ-eat-IMPER
Eat the meat!

Whether imperative sentences themselves rest on a semantics of necessity is a question I will not attempt to answer here.¹⁷ What is clear is that the

¹⁷Some relevant discussion can be found in Portner 2007.

imperative paraphrases consultants sometimes give for necessity modals are *commands to action* in ways that the necessity statements they purport to translate need not be. This may be a case where speakers choose a construction with a necessity meaning at the cost of significant tampering with other aspects of what is requested by the prompt.

In other cases, imperatives are used for *simulated* speech acts.¹⁸ Speakers rely on this strategy in the following two examples from non-upward-entailing contexts – a universal free relative restrictor, and a conditional antecedent.

- (63) ke-m 'isíi-nm hi-hí-n-e ku'ús ku-y
REL-2SG who-ERG 3SUBJ-say-P-REM.PAST thus do-IMPER

'iin wáaqo' kúu-Ø-ye
I already do-P-REM.PAST

Whatever you have to do, I already did. (cf. (54))
lit. Whatever anyone said to you, Do thus!, I already did.

- (64) c'alawí tamáalwit hi-hí-ce-Ø 'áac-im,
if rule 3SUBJ-say-IMPERF-PRES enter-CISLOC.IMPER

kaa 'aac-ó'
then enter-PROSP

If I have to go in, I will. (cf. (59))
lit. If the rule says, Enter!, then I will enter.

In another downward entailing context, the scope of negation, a consultant used a negated speech verb construction not involving an imperative. In this case a doctor is talking to his patient.

- (65) Prompt: You can stay in bed, but you don't have to.
'imee-nik-ó'qa mét'u wéet'u 'ee hí-ce-Ø
2SG.REFL-lay.down-MODAL but not you tell-IMPERF-PRES

kúnk'u 'ee 'imee-nik-ó'qa
always you 2SG.REFL-lay.down-MODAL

You could lay down, but I'm not telling you you could stay in bed all the time.

¹⁸This strategy is made considerably more flexible with the help of what appear to be embedded (non-quoted) imperatives, of which (63) is likely an example. True embedding of imperative clauses is a phenomenon that, while rare, does appear to be attested in a number of other languages: see Rus (2005) on Slovenian, Platzack (2007) on Old Icelandic, Portner (2007) on Korean, Crnič and Trinh (2010) on (dialects of) English.

In this case, the doctor points out that he has not made a certain claim: no permission has been granted to the patient to stay in bed all the time. He contrasts his actual speech act with an alternative.

4.2 Indicative paraphrase

A second popular strategy involves rephrasing with an indicative sentence. This is sometimes a simple present tense sentence, as in the following cases.

- (66) Prompt: We can't stay here; we have to go home.

wéet'u kíye kine pa-wc'áa-yo'qa.
not we here S.PL-stay-MODAL

kíye ciklíi-six-Ø.
we go.home-IMPERF.PL-PRES

We can't stay here. We are going home.

- (67) Prompt: According to the rule, I should leave.

tamáalwit-ki 'át-sa-Ø
rule-INST go.out-IMPERF-PRES
Because of the rule, I am going out.

It is sometimes a future claim expressed with the prospective aspect suffix *u'*.¹⁹ The following examples were given as translations of English deontic necessity sentences.

- (68) Prompt: if a kid has an injured leg, you have to tell the doctor

c'alawí miyá'c wéeyu'x 'u-u-s-Ø k'omáy'c,
if child leg 3GEN-be-P-PRES injured

ku'ús 'ee 'e-w-nú' saykiptaw'atoo-na
thus you 3OBJ-tell-PROSP doctor-OBJ

If a child has a hurt leg, you will tell the doctor.

- (69) Prompt: They don't have to wait.

wéet'u hi-pa-yooxo-yo'
not 3SUBJ-S.PL-wait-PROSP
They won't wait.

¹⁹This suffix has allomorph *nu'* in (68) and *yo'* in (69).

These sentences diverge from the English prompts they aim to translate in that they make claims about the future instead of talking about deontic necessities.²⁰ In these contexts, this substitution is felt to come close enough.

It is also sometimes the case that speakers make use of indicative paraphrases which differ quite markedly from the original prompt. In a first example, a speaker translates *needs to* using a verb marked with a desiderative suffix, sacrificing the impersonal circumstantial modality of the prompt for a personal bouletic expression.

- (70) Prompt: If the doctor needs to see him in a hurry, then he should head over to Lewiston

c'alawí saykiptaw'atóo-nm pee-x-nipéecwi-se-Ø kii kaa,
if doctor-ERG 3/3-see-DESID-IMPERF-PRES right.now

kaa hi-kiy-ó'qa
then 3SUBJ-go-MOD

If the doctor wants to see him right now, then he should go. (cf. (58))

It is again not unreasonable to think that the desiderative suffix (and lexical verbs like *wewluq* 'want') expresses necessity; but if the speaker does succeed in conveying necessity in (70), this comes at the cost of a switch in modal flavor.

Example (71) shows a final, even more radical indicative paraphrase of a conditional antecedent containing a modal of necessity.

- (71) Prompt: If I have to call the doctor, I will.

c'alawí páayo k'óomay-ca-Ø kaa 'e-múu-nu'
if really be.sick-IMPERF-PRES then 3OBJ-call-PROSP
If you're really sick, then I will call him. (cf. (60))

Here, as in (70), the speaker comes up with a way to rephrase the antecedent, at the cost of changing the message in a subtle or more obvious way.

4.3 Causatives

Two final major strategies crop up especially in non-upward-entailing environments, where the need to paraphrase away necessity modals is most

²⁰As is the case with the imperative, it is perhaps the case that the semantics of prospective is built on a core necessity meaning; such an analysis corresponds to a popular view of other future expressions, in particular English *will* (i.a. Enç 1996, Condoravdi 2001; cf. Kissine 2008). I won't attempt to settle the matter here. See Deal (2010, ch 3) for discussion of the prospects of a modal treatment of prospective aspect in Nez Perce.

pressing. The first is the use of causative verbs. Both of the examples below come from prompts involving negated necessity claims.

- (72) Context: you are explaining to someone who thinks they have to leave that they are not in fact required to do so.

wéet'u 'ee hi-sepee-ku-síix-Ø;
not you 3SUBJ-CAUSE-go-IMPERF.PL-PRES

kiney-níx 'ee wic'ée-yu'
here-EMPH you stay-PROSP

They are not making you go; you will stay here. (cf. (49))

- (73) Context: I tell someone my number and I see that they are trying to remember it. I say, "You don't have to remember it, here's my card."

wéet'u 'ee sepée-tmipni-se-Ø
not you CAUSE-remember-IMPERF-PRES

kii wee-s-Ø tíim'es
DEM be-P-PRES paper

I'm not making you remember it; here you have a paper. (cf. (50))

By pointing out that a person is not being made to do a particular action, speakers suggest that the action is not obligatory.

4.4 Paraphrase as possibility

Finally, speakers sometimes paraphrase necessity claims in a way that only requires modals of possibility. This is seen in the following example in a conditional antecedent.

- (74) Prompt: If I need to call the doctor, I will.

c'alawí saykiptaw'atoo-nm hi-wapata-yó'qa
if doctor-ERG 3SUBJ-help-MODAL

kaa 'e-múu-nu'.
then 3OBJ-call-PROSP

If the doctor could help me, then I will call him. (cf. (60))

A version of the same strategy is seen in an upward entailing environment: instead of saying water *has to* be consumed, speakers say that *only* water *can* be consumed.

- (75) Context: Somebody offers you some coffee or tea, and you want to say, "No thanks. I'm sick, and I have to drink water."

Consultant 1:

qet'u k'oomaynín' wee-s-Ø kaa kuus-ne-cím
very sick be-P-PRES and water-OBJ-only

'a-kóo-yo'qa

3OBJ-drink-MODAL

lit. I'm very sick and I can drink only water.

Speaker's gloss: "I'm sick and I'm just drinking water – or else, I need water."

Consultant 2:

qe'ciyéw'yew', kuus-ne-cím 'a-kóo-yo'qa
thanks water-OBJ-only 3OBJ-drink-MODAL

lit. Thanks, I can drink only water.

Speaker's gloss: "That's explaining it's all the person can drink, it's just water."

5 The typology of modals without scales

The picture we have arrived at on the interpretation of Nez Perce *o'qa* suggests a range of possibilities for comparative work:

On one hand, it is easy to imagine environments in which modals with scales (in English or languages like it) and modals without scales (in Nez Perce or languages like it) could fruitfully be compared. Such comparisons could help isolate those aspects of the grammar and processing of scalar items in a language like English which are truly due to the existence of a scale.

On the other hand, even from the relatively small body of previous work on single-membered modal quantifier systems, it appears that it might be fruitful to compare modals without scales as in Nez Perce with modals without scales in other languages. In complement to existential-only modal subsystems, as we find for *o'qa*, are there universal-only (sub)systems of modal vocabulary to be found in the languages of the world? What are the properties of such systems? To what degree do they show us the mirror image of the *o'qa* pattern in upward and downward entailing environments?

Interesting leads come from recent work on St'át'imcets and Gitksan. The phenomena of these languages are sufficiently similar to what we find with *o'qa* to merit "microparametric" comparison. The basic setup is the same: various types of modals in St'át'imcets, and epistemic modals in Gitksan, do not come in possibility/necessity scalar pairs.²¹ Like *o'qa*, scaleless St'át'imcets and Gitksan modals are appropriate both in upward entailing

²¹Matthewson et al. 2007, Rullmann et al. 2008, Davis et al. 2009, Peterson 2010

environments where English possibility modals are appropriate, and in upward entailing environments where English necessity modals are appropriate. We see this here for the ‘deontic/irrealis’ St’át’incets modal *ka*, one of several modals explored in depth by Rullmann et al. (2008).

- (76) zikt **ka** láti7 ku srap, lh-gelgel-ás ta sk’éxem-a
 fall IRR DEIC DET tree COMP-strong-3CONJ DET wind-DET
 That tree would / could fall, if the wind got strong. (Rullmann et al. 2008, 331)

- a. Context 1: You are saying that the tree needs to be chopped down because it’s a danger; it’s gonna fall in the first strong wind; it *would* fall.
- b. Context 2: You are the paranoid type who doesn’t put things on high shelves in case of earthquakes, doesn’t drive behind logging trucks in case a tree falls off the back, etc., and you don’t want to pitch your tent underneath a tree because the tree *could* fall if the wind got strong. (I.e., it’s not that the tree looks particularly weak.)

Can St’át’incets *ka* be treated just like *o’qa*, then: a possibility quantifier without a scale? Could St’át’incets and Gitksan modals without duals be treated quite generally in this way?

The analysis by Rullmann et al. (2008) turns out to move the opposite way. These authors propose that the modal quantifiers of St’át’incets are strictly universal. Their flexibility therefore is *not* due to the mere absence of scalar implicatures. Rather, as Rullmann et al. argue, the flexibility of St’át’incets modals is a form of flexibility in domain restriction. As the domain of a universal quantifier shrinks, the universal claim becomes logically weaker: where S_1 is a proper subset of S_2 , what is universally the case among the members of S_1 is only guaranteed to hold of *some* of the members of S_2 . The special feature of necessity modals in St’át’incets according to Rullmann et al. is that they do not require the domain of universal quantification to be as large as do necessity modals in English. A similar style of analysis is pursued by Peterson (2010) for Gitksan epistemic expressions, which are proposed to be possibility modals strengthened by domain restriction. Peterson proposes that this domain restriction be tied to Kratzer (1981)’s notion of *ordering source*.

How can we tell apart these two styles of analysis? For St’át’incets in particular, how can we show whether modals like *ka* are basically universal, subject to weakening, or basically existential in the *o’qa* way? The most crucial facts will have to come from non-upward-entailing environments. If St’át’incets modals derive their flexibility from variably stringent restrictions on the domains of necessity quantifiers, we expect this flexibility to

Inventory	\diamond, \square	\diamond	\square
	<i>Modals with scales</i>	<i>Modals without scales</i>	
Example	English	Nez Perce	St'át'imcets
Profile	Inflexible modals. SI for \diamond in UE context; SI for \square in DE context.	Modals flexible in UE contexts. Barring other factors: modals inflexible in DE contexts.	Modals flexible in DE contexts. Barring other factors: modals inflexible in UE contexts.

Table 1: Three types of modal systems

persist in non-upward-entailing contexts where the flexibility of *o'qa* vanishes. Unfortunately, Rullmann et al. report difficulties with this test, owing in part to syntactic restrictions in St'át'imcets. At the same time, however, another finding they report does provide some support to the idea that St'át'imcets *ka* might be truly universal – and therefore that St'át'imcets modals and Nez Perce *o'qa* might turn out to derive their flexibility by means that are fundamentally different. The evidence comes from the sometimes slippery realm of speakers' gradient preferences: modal sentences in St'át'imcets are preferentially interpreted universally. This is unlike *o'qa*, which is preferentially interpreted existentially (§1).

If the Rullmann et al. analysis is the correct one for St'át'imcets, the "microparametric" comparison of these two languages where modals work without Horn scales leads to consequences of two types:

The first consequence is a negative universal. There are no implicational universals to be stated over modal lexica, at least in terms of quantificational force: languages may have possibility modals (\diamond), necessity modals (\square), or both, without constraint. If we presume that all languages have modal quantifiers of some type, the typology we arrive at is three-way.²² An outline of what we might expect is presented in Table 1.

The second consequence concerns the profile of behaviors expected of modal paradigms based on their position in our typology. Simply belonging to a modal paradigm without scales is sufficient to predict flexible uses of possibility modals in languages like Nez Perce in upward entailing contexts, and flexible uses of necessity modals in languages like St'át'imcets in downward entailing contexts. For Nez Perce *o'qa*, no more than this need be said; the *o'qa* modal is indeed only flexible in an upward entailing environment. But for St'át'imcets, the story cannot end here: some type of special

²²I am glossing over the possibility of treating certain modal expressions as expressing neither possibility nor necessity, as Stalnaker (1991) famously proposed for *would* and Kratzer (To appear) has recently proposed for St'át'imcets inferential modal *k'a*.

mechanism is needed in order to derive flexibility for necessity modals in upward entailing contexts, too. This is why Rullmann et al. propose a mechanism of domain restriction. And this means that the profile we expect of a language's modal system based on its position on our three-way typology is subject to an important *ceteris paribus* condition. We expect inflexibility for scale-free possibility modals in downward entailing contexts and scale-free necessity modals in upward entailing contexts only provided no other tampering with the modal quantifier and its domain has taken place. Nez Perce is a language that cleanly shows us a possibility modal without such tampering. The picture in St'át'imcets is a more complicated one. Quantificational force variability in the two languages is not one but two overlapping phenomena.²³

6 Further consequences

What does it mean for the theory of natural language semantics that there should be modal systems of the *o'qa* variety – single-membered quantifier systems, quantifiers deprived of scales? The general picture cannot fail to count as a vindication of the general view of the meaning of existential quantifiers embraced by all sides in the ongoing scalar implicature debate. In a language like English, the full meaning of a *might*, *may*, *can* or *could* sentence in an upward entailing environment involves both existential quantification and an additional ingredient contributed by a scale. Nez Perce provides a model of what the first piece looks like without the second piece. The picture is reassuring: we find just the behavior we expect for an existential quantifier on logical grounds.

This empirical domain, as it continues to unfold, holds unavoidable consequences for the question of translatability and the related matter of semantic variation. In recent work, von Stechow and Matthewson (2008) propose:

Even if we anticipate finding a checkered result on universality and variation in semantics, we think that sound methodology in semantic work on any given feature of grammar has to start from a null hypothesis of universality and proceed to rigorous testing of that hypothesis by looking at that feature in as many diverse languages as possible.

In keeping with the initial universalism von Stechow and Matthewson propose, I have not been forced to conclude that there is any difference in the

²³This point is also made, from a different angle, by Kratzer (To appear).

meaning of non-epistemic existential modal *o'qa* in Nez Perce and existential modals used non-epistemically in a language like English.²⁴ This result is consistent with a number of different perspectives on what if anything makes modals in these two languages special. If, as Rullmann et al. (2008) suggest, languages may vary parametrically in the degree to which they allow contextual domain restriction of their modals, Nez Perce and English possibility modals can be specified for this parameter in the same way. The major difference between the two languages comes from the domain of necessity, and here the switch is exceedingly simple: English has simple non-epistemic necessity modals, and Nez Perce does not.

This gap in the lexicon of a natural language helps us distinguish two types of questions to be asked about semantic variation. For any notional or formal category *X* (e.g. *necessity*), we ask:

- i. How do languages express *X*?
- ii. Do all languages express *X*? Are languages required to express *X*?

It is a question of the second type that the Nez Perce modal subsystem investigated here most clearly answers. Nez Perce is not the language to investigate to find out what necessity modals in natural languages can be like. It *is* the language to look at to find out whether simple necessity modals can be done without. From the standpoint of Keenan's *Weak Effability Hypothesis*,

Anything that can be thought can be expressed with enough precision for efficient communication. (Keenan 1978, 162)

the option of doing without certain expressions of simple necessity, or equivalent paraphrases, tells us something about how precise a language must be to facilitate efficient communication.

In this way the Nez Perce modal system provides a follow-up to Bitner's (2005) work on future temporality in Kalaallisut, and Matthewson's (2006) work on presupposition in St'át'imcets. These authors have discovered striking semantic variation in core domains of linguistic encoding (e.g. *time*) and core means by which this encoding is accomplished (e.g. *presupposition*). The absence of a clearly logical piece of vocabulary in Nez Perce adds to this "checkered" picture of lexical variation and gappiness. At the same time, Nez Perce speakers' sensitivity to the distinction between upward and non-upward entailing environments affirms the core logicity of the language even provided such gaps exist.

²⁴The only difference is perhaps the considerations that go into singling out *non-epistemic* modals in English. See Brennan (1993), Condoravdi (2001), Hacquard (2006) for relevant discussion on the syntax and semantics of epistemic/non-epistemic distinctions in English and French.

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