

Using Matching Tasks in Semantic Fieldwork *

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Abstract: We discuss an elicitation technique we call a *matching task*, a type of acceptability judgment task. In this task, the consultant is asked to judge a target language sentence under an intended (“matching”) interpretation given in the contact language. This is particularly useful for eliciting polysemous items when the contact language contains more specific lexical items. The matching task has been crucial to the results in our joint semantic fieldwork (Močnik and Abramovitz 2019), where we needed to control the interpretation of a polysemous verb in order to study its individual readings. In this paper we discuss the “behind the scenes” problems with eliciting a polysemous item, how the matching task fares compared to the standard elicitation tasks, and speculate as to why it was necessary for us to use it, suggesting a set of circumstances under which this task could be useful to other linguistic fieldworkers.

1 Introduction

As formal semanticists have paid more attention to data from understudied languages (Bittner 1987, et. seq.), the question of how to collect data from naïve native speakers has played an increasingly significant role in work on semantics. Matthewson (2004) was the first to draw explicit attention to this question, showing that the text-based methods of American structuralist linguistics were inadequate for answering many of the questions of interest to formal semantics. Further, she offered a then-novel (though now widely accepted) defense of the feasibility of doing semantic fieldwork through a contact language. Since then, work employing the techniques argued for by Matthewson has become standard, and further work explicitly discussing methodological points in semantic fieldwork has also been forthcoming.¹

In much of the work in this tradition, judgments obtained in tasks involving translations have been deemphasized: while acknowledging their usefulness in certain situations, Matthewson nonetheless notes that “translations should always be treated as a clue rather than a result...The only real evidence about truth conditions is truth value judgments in particular contexts” (Matthewson 2004, 389). What can linguists do, then, in situations where speakers are unable or unwilling to give truth value judgments in contexts? In this paper we discuss a technique that we were able to use in this situation. This technique, which we call a *matching task*, is a modification of the acceptability judgment task with features of the translation task. In the matching task, the consultant is asked to judge a target language sentence under an intended (“matching”) interpretation given in the contact language. Because the matching sentence is not (necessarily) presented in the target language, the matching task arguably implicates translation.

* Our transcription uses the IPA, except that we use *č* for the voiceless alveolo-palatal affricate. Our glossing schema follows the Leipzig Glossing Rules, except for: AP - antipassive, CF - counterfactual, CS - causative, E - epenthetic vowel, IRR - irrealis, RLS - realis, VB - verbalizer. Thanks to Benjamin Bruening and Roger Schwarzschild for comments on the draft.

¹ For discussions of methodologies, see Bochnak and Matthewson (2020), Cable (2019), Deal (2015), Tonhauser and Matthewson (2015), Vander Klok (2014, 2019), Vander Klok and Connors (2019), among others.

The matching task can be especially useful for eliciting polysemous items when the contact language contains more specific lexical items. We report here on our experience working on the polyfunctional attitude verb *ivək* (‘say’, ‘suggest’, ‘think’, ‘allow for the possibility’, ‘hope’, ‘fear’, ‘wish’, etc.) in Koryak, a highly endangered Chukotko-Kamchatkan language of northeastern Russia. We were able to use the matching task to gauge the interpretations of *ivək* because Russian, our contact language, contains more specific attitude verbs distinguishing, for example, beliefs from desires. Our consultants seemed uncomfortable with more standard techniques like contextual acceptability judgments, and using this task was the only way that we were able to fix the interpretation of *ivək*.

We first give some background information on Koryak and our prior work (§2). In §3, we introduce the matching task and illustrate it with some examples. We then say what the formal role of the matching sentence is, and discuss its similarity to certain other acceptability judgment found in the literature. In §4, we compare the matching task with standard fieldwork methodologies, pointing out certain shortcomings we encountered in using them. In §5, we reflect on the circumstances (language-inherent factors as well as sociolinguistic and cultural factors) that led to it being necessary for us to employ matching tasks.

2 Background

2.1 Koryak

Koryak is a highly endangered Chukotko-Kamchatkan language that is spoken by several hundred people in and around the northern part of the Kamchatka Peninsula in the Russian Far East. It is a pluricentric language made up of at least two dialect continua with limited mutual intelligibility between one another: our work has exclusively been with speakers of the Chawchoven dialect, traditionally spoken by the nomadic reindeer herders of central and northern Kamchatka. Our consultants are eight female native speakers of Koryak aged 50-85 who were raised in herding communities where little to no Russian was spoken; most of our consultants’ parents, while multilingual, spoke only indigenous languages of the area.² The implementation of Soviet colonial policies in the Russian Far East saw our consultants sent to Russian-medium boarding schools, and they are consequently fluent L2 speakers of and literate in Russian (our contact language). We suspect that some of them even have a near-native command of Russian.³ Author Abramovitz has intermediate proficiency in Koryak and fluent L2 proficiency in Russian, and has been carrying out fieldwork on Koryak since 2014. The data for the joint semantic fieldwork was collected between August 2018 and the present, via electronic communications (video/audio and messages) as well as during three fieldwork trips by Abramovitz (August-September 2018, July-September 2019, and November 2019).

² All of the consultants that we have worked with extensively are female as there are very few male native speakers of Koryak left. The two male native speakers who were capable of consultant work that we found were too busy fishing and foraging to meet regularly.

³ None of the consultants know more than a few words of English. Some of our consultants have knowledge of Chukchi, a close relative of Koryak’s, including one speaker who is a native bilingual, and at least one other speaker who was one as a child. Another consultant is a native bilingual of Koryak and Even, an unrelated language of the Tungusic family spoken in central Kamchatka, and at least one further consultant has passive knowledge of that language.

2.2 Močnik and Abramovitz (2019)

Attitude verbs have traditionally (Hintikka 1969) been treated as modal entities (that is, as quantifiers over possible worlds) with a (lexically) fixed flavor (epistemic, bouletic, desiderative, etc.) and quantificational force (traditionally, universal). For example, *believe* has been analysed as saying something about all the worlds (universal/necessity force) consistent with the attitude holder's beliefs (doxastic flavor). This view is also summarized by Anand and Hacquard (2009):

“In the Hintikkan tradition, attitude verbs are treated uniformly as universal quantifiers over possible worlds, where the sole difference between various attitudes is in the accessibility relation that determines the set of worlds they quantify over.” (Anand and Hacquard 2009, p.37)

Recent work on understudied languages has shown that this view of attitude verbs is incomplete. For example, Navajo *nízin* (Bogal-Allbritten 2015, 2016) appears to vary in flavor since it can express thoughts (doxastic flavor), in (1a), as well as desires (bouletic uses), in (1b).

- (1) a. Hastiin [nahodoołtʃíł sha'shin] nízin.
man 3S.rain.FUT MODAL 3S.ATT
'The man thinks it will probably rain.'
(Bogal-Allbritten 2015, ex. 15a)
- b. Alice [nahodoołtʃíł (laanaa)] nízin.
Alice 3S.rain.FUT DESIRE 3S.ATT
'Alice wants, wishes it to rain.' (ibid., ex. 24)

The traditional view is also incomplete because certain attitudes express existential, rather than universal force. This has been proposed for the Romance attitude verbs expressing doubt, hope, and fear (Anand and Hacquard 2009) and for Slovenian *dopuščati* 'allow for the possibility' (Močnik 2019a,b).⁴ The latter verb merely conveys that the embedded clause is consistent with the attitude holder's beliefs and there is no preference with respect to the embedded clause (as with hoping) or negative bias (as with doubting).

- (2) Dopuščam da je vaša laž posledica neznanja in ne
I.allow COMP is your lie consequence ignorance and not
zlonamernosti
malevolence
'I allow for the possibility that your lie follows from ignorance and not malevolence.' (Močnik 2019a, naturally occurring example)
- (3) Dopušča, da dežuje, in dopušča, da ne dežuje.
he.allows COMP rains and he.allows COMP not rains
'He allows for the possibility that it's raining and he allows for the possibility that it's not raining.' (adapted from Močnik 2019a)

The Navajo and Slovenian data given above suggest that attitude verbs and canonical modals are similar in a way that was not traditionally envisaged: attitude verbs can have multiple flavors

⁴ See also Heim (1992) for *doubt* as *not believe*.

- (7) ?ewŋəto ∅-k-iv-ə-ŋ-∅ əno
Hewngyto.ABS.SG 2/3.S/A.IND-PRS-ivək-VBLZ-E-PRS-3.S.IND COMP
∅-ku-muq-et-ə-ŋ-∅, ?am ?opta
2/3.S/A.IND-PRS-rain-VBLZ-E-PRS-3.S.IND but also
∅-k-iv-ə-ŋ-∅ əno uŋe e-muq-et-ke.
2/3.S/A.IND-PRS-ivək-VBLZ-E-PRS-3.S.IND that NEG.RLS NEG-rain-VBLZ-E-NEG
‘Hewngyto allows that it is raining but also allows that it is not raining.’ (Močnik and Abramovitz 2019)

By contrast, a verb whose quantificational force is restricted to a high credence in the embedded proposition will not be felicitous in such a conjunction. This is the case with Koryak *ləmalavək* (‘believe’), as in (8), which literally translates as *Hewngyto believes that it is raining and he also believes that it is not raining*.

- (8) #?ewŋəto ∅-ko-lmal-av-ə-ŋ-∅ əno
Hewngyto.ABS.SG 2/3.S/A.IND-PRS-believe-VBLZ-E-PRS-3.S.IND COMP
∅-ku-muq-et-ə-ŋ-∅, ?am ?opta
2/3.S/A.IND-PRS-rain-VBLZ-E-PRS-3.S.IND but also
∅-ko-lmal-av-ə-ŋ-∅ əno uŋe e-muq-et-ke.
2/3.S/A.IND-PRS-believe-VBLZ-E-PRS-3.S.IND that NEG.RLS NEG-rain-VBLZ-E-NEG
‘Hewngyto allows that it is raining but also allows that it is not raining.’ (intended) (Močnik and Abramovitz 2019)

In Močnik and Abramovitz (2019), we modeled this flexibility of flavor and strength in a way that is parallel to the analyses in the modal verb domain. We followed Rullmann et al. (2008) in positing a universal quantifier over possible worlds with a domain restriction that derives the weaker readings.

The distinction between the assertive (‘say’ and ‘suggest’) and the doxastic (‘think’ and ‘allow for the possibility’) flavor was modelled with a free variable, like a modal base. Unlike the doxastic-assertive distinction, the bouletic flavor (‘hope’, ‘fear’, and ‘wish’) was shown to arise because of further material in the embedded clause, which is overtly signaled by the counterfactual mood with ‘wish’ and which we proposed is covert with ‘hope’ and ‘fear’. This material combines with the doxastic interpretation of *ivək*, yielding the bouletic reading of the sentence and giving the illusion that *ivək* is itself a bouletic verb. The conclusion of our investigation was that *ivək* is underspecified in flavor (doxastic and assertive flavors) and underspecified in force (encoding a strong force with a weakening mechanism).

For concreteness, we repeat the lexical entry proposed in Močnik and Abramovitz (2019, p. 500):

- (9) $[[ivək]]^{c:s,w} = \lambda i \lambda C \lambda p \lambda x : \left(i(x)(w) = \mathcal{B}_w^x \vee i(x)(w) = \mathcal{S}_w^x \right)$
 $\wedge \left(C = \{f \mid f(i(x)(w)) = i(x)(w)\} \vee C = \{f \mid f(i(x)(w)) \subseteq i(x)(w) \wedge f(i(x)(w)) \neq \emptyset\} \right)$.
 $\exists f \in C [\forall w' \in f(i(x)(w)) [p(w') = 1]]$

The attitude verb takes the following four arguments: a modal-base-like variable i (which is either doxastic \mathcal{B}_w^x or assertive \mathcal{S}_w^x), a cover C (to which we return in a moment), the embedded proposition p , and the attitude holder x . The modal base and the cover are free variables at LF, so

the assignment function maps them to their appropriate value. *Ivək* specifies that the modal base (the domain of quantification) is doxastic or assertive but not, for example, bouletic (the apparent bouletic flavor of *ivək* is derived from a doxastic modal base in *ivək* and further material in the embedded clause). The cover *C*, whose role is to say more about what kind of selection function *f* is at play, also has two options: *f* is either an identity function or *f* is a function to a non-empty subset of the modal base. The choice between the two has implications for quantificational force. If *f* is the identity function, then the truth-conditions involve the ordinary universal quantification over the set of doxastic/assertive worlds. By contrast, if *f* is the kind of function that selects a non-empty subset of the domain, then the universal claim over it is in comparison weaker.⁵ In particular, the second type of *f* makes sentences of the sort ‘*ivək* φ \wedge *ivək* $\neg\varphi$ ’ felicitous, because there are two *f*s (one in each conjunct), and they are allowed to map to non-overlapping proper subsets of the attitude worlds.

For the purposes of a discussion of methodology, it is not important to understand all the details. The essential take-away is that what determines the flavor (doxastic, assertive) and force (universal, restricted universal) of *ivək* is determined by the choice of *i* and *C*. While the attitude verb restricts this choice somewhat in its denotation (to the two options mentioned for each), the value of *i* and *C* is at the end of the day contextually determined (via the assignment function).

3 Matching task

The matching task presents the consultant with a situation *c*, described either in the target or in the contact language, and two sentences: a sentence *p* in the target language and a sentence *p'*, typically in the contact language.⁶ We refer to *p'* as the matching sentence. The goal is to elicit a judgment of *p* in *c* under the intended interpretation given by the matching sentence *p'*. Below, we first explain the intuitive idea behind the matching task and illustrate it with some examples, and then discuss how the individual pieces of the task might be understood from a theoretical perspective.

The core idea of the matching task is to ask the speaker to judge whether a target language sentence can be interpreted in a context in a particular way, the latter being specified using a sentence in the contact language. The consultant is essentially asked to judge a target language sentence under an intended (“matching”) interpretation given in the contact language.

We can (but need not) build up to the matching task by first asking the speaker to perform an acceptability judgment for *p* in *c*. The advantage of doing so is that this makes the speaker familiar with some of the material (namely, *p* and *c*). It also provides us with an opportunity to obtain volunteered information and commentary about *p*.⁷ We have in the past learned from this that a particular reading is salient, or that the sentence as we proposed it is syntactically ill-formed or describes a situation that does not occur in the consultant’s speech community. The actual matching task itself involves checking whether *p* can be interpreted as *p'* in *c*. The way this task is executed depends heavily on the properties of the contact language (in particular, its lexical inventory) and possibly on

⁵ See Rullmann et al. (2008), who use this to model variable-force modals.

⁶ As an anonymous reviewer points out, *p'* could also be given in the language under investigation, assuming it has a relevant lexical item. It could even be given in a third language, distinct from the contact and the target language. Perhaps we should consider the following common practice to be an instance of the matching task: an English-speaking semanticist asks their non-native-English-speaking colleague whether a particular sentence in their native language can mean “this” (pointing to a formula on the board).

⁷ Such comments are also relevant data points in semantic fieldwork (Matthewson 2004).

other cultural factors. For our work with Koryak speakers, we used the Russian expression ‘thought’ (*mysl’*) and asked whether “*p* can express the same thought as *p’* in *c*.” We found this to be a good way of checking whether *p* can be understood as *p’* in *c* since it yielded consistent and intelligible results, and also produced negative answers. By contrast, if we mentioned ‘meaning’ (*značeniye*) to try to ask whether “*p* can express the same meaning as *p’* in *c*,” speakers tended to provide a word-for-word translation.

Our matching sentences contain linguistic material that seeks to disambiguate or resolve some aspect of the target sentence. In the case of Koryak *ivək*, we have used Russian attitude verbs that specify the quantificational force and the quantificational flavor of the reading of the verb that we were trying to investigate.⁸

3.1 Two examples

Here is a toy example from French to illustrate the matching task. Suppose that we are interested in knowing whether the French feminine pronoun *elle* imposes gender restrictions on its referent. Let our contact language be English. In order to probe for how *elle* behaves, we could set up a situation with two potential referents, one male and one female, and use the matching task to see whether *elle* can refer to the female one:⁹

- (10) a. Ann and Bob are fighting on the playground. (*c*)
 b. *Elle est fâchée.* (*p*)
 she is angry.FEM.SG
 ‘She is angry.’
 c. Ann is angry. (*p’*₁)
 d. Bob is angry. (*p’*₂)

We ask the consultant to imagine a situation where Ann and Bob are fighting on the playground (*c*). We ask whether *elle est fâchée* is acceptable in this situation. Suppose they respond with ‘yes’ and offer no further comments. We then proceed to ask whether *elle est fâchée* can express the same thought as the matching sentence ‘Ann is angry’ in this situation. Presumably the answer is

⁸ One might object that the presence of the matching sentence influences the speaker to accept Koryak-Russian pairings more readily, and that the variety of interpretations of *ivək* that we have obtained follows from a methodological error. This makes the prediction that consultants should not consistently reject certain readings when they are presented in the matching task, which is incorrect. Furthermore, as Roger Schwarzschild (p.c.) suggests, one could carry out an experiment to test whether the presence of the matching sentence has an effect on speakers’ judgments by using matching tasks on a well-studied language and with consultants who additionally speak a foreign language fluently, and comparing the data gathered via the matching task with the data gathered via acceptability judgment tasks reported in the literature.

⁹ It is obvious in this case that there are simpler ways of checking what *elle* means because English pronouns make gender distinctions. This is a lucky fact of English – if the contact language had been Koryak, which does not have a gender distinction in its pronouns, we would not be able to do a simple translation or matching task to check whether *elle* means ‘she.’ Conversely, sometimes English is the less specific variety. For example, modern English does not make a distinction between dual and plural. If our target language was English but our contact language was Slovenian, which has a dual, we could easily construct matching sentences like *kregata se* (they (two) are arguing) and *kregajo se* (they (three) are arguing) to probe at the meaning of *they are arguing*.

affirmative. If we had asked whether *elle est fâchée* could express the same thought as ‘Bob is angry’ here, the answer would have been negative.

To illustrate this more precisely with an actual example, the sentence below was accepted in a matching task using the Russian verb *nadejat’s’a* (‘hope’).

- (11) Context: A person has taken an exam, but they don’t know their score yet. They say:

t-ə-k-iv-ə-ŋ-∅, amu janʔaw t-ə-kali-n ekzamen
 1SG.S/A-E-PRS-*ivək*-E-PRS-1SG.S might? correctly 1SG.S/A-E-write-3(SG).O test.ABS.SG

‘I hope that I did well on the test.’

By this point in our fieldwork, we had established that *ivək* had doxastic and some bouletic readings (‘wish’, ‘hope’), and that in order to get the ‘hope’ reading, at least some of the speakers preferred for the embedded clause to contain *amu*, an epistemic modal whose meaning is close to English ‘maybe’ or ‘probably.’ This example was used to test again whether a sentence with *ivək* can receive the ‘hope’ reading with *amu*. The three components of the matching task were thus as follows:

- (12) a. situation *c*, given in the contact language (Russian): *Človek sdal ekzamen, i ješčë ne polučil ocenku. On govorit:* (‘A person has taken an exam, but they don’t know their score yet. They say:’)
 b. sentence *p* in the target language (Koryak): *təktivəŋ, amu janʔaw təkalin ekzamen*
 c. sentence *p'* in the contact language (Russian): *‘ja nadejus’, čto ja pravil’no sdal ekzamen’* (‘I hope I did well on the test’)

We presented the speaker with the situation in (12a) and the target sentence (12b). We asked the speaker whether the Koryak sentence in (12b) can express the same thought as the contact-language sentence in (12c) in the situation described in (12a), and the speaker answered affirmatively.

Here are two more examples we have used in matching tasks in order to probe at the existential versions of ‘say’ and ‘think’ with *ivək*. We return to these in more detail in the following section.

- (13) Context: Two people have gone out hunting and haven’t come back. Hewngyto said that it’s possible that they got lost, but he also said that it’s possible that they hadn’t.

ʔewŋəto ∅-iv-i əno tayəjŋiŋ-ə-lʔ-ə-t
 Hewngyto.ABS.SG 2/3.S/A.IND-*ivək*-AOR COMP hunt-E-S/O.PTCP-E-ABS.DU
 ∅-təmŋew-γəʔe. əno ʔopta ∅-iv-i əno əčč-i
 2/3.S/A.IND-get.lost-3DU.S.AOR 3SG.ABS also 2/3.S/A.IND-*ivək*-AOR COMP 3NSG-ABS.DU
 jatan ∅-ko-pel-aŋ-ŋ-e
 only 2/3.S/A.IND-PRS-remain-VBLZ-PRS-3DU

‘Hewngyto suggested that the hunters had gotten lost. He also suggested that they are just late.’¹⁰

¹⁰ The consultant also noted that it was unlikely for Koryak hunters to get lost given how skilled they are, but that perhaps the weather was bad, which caused them to get lost. This is the kind of non-linguistic information that consultants sometimes provided that helped us come up with culturally-relevant scenarios.

- (14) ?ewŋəto ∅-k-iv-ə-ŋ-∅ əno
 Hewngyto.ABS.SG 2/3.S/A.IND-PRS-ivək-VBLZ-E-PRS-3.S.IND COMP
 ∅-ku-muq-et-ə-ŋ-∅, ?am ?opta
 2/3.S/A.IND-PRS-rain-VBLZ-E-PRS-3.S.IND but also
 ∅-k-iv-ə-ŋ-∅ əno ujŋe e-muq-et-ke.
 2/3.S/A.IND-PRS-ivək-VBLZ-E-PRS-3.S.IND that NEG.RLS NEG-rain-VBLZ-E-NEG
- ‘Hewngyto allows that it is raining but also allows that it is not raining.’ (repeated from (7))

3.2 What is the role of the matching sentence?

As outlined above, the consultant in a matching task is ultimately asked to verify whether the sentence p (in the target language) can, in a situation c , express the “same thought” as p' (in the contact language) in c . What are we actually asking the consultant to do from a formal perspective?

A plausible way to understand what the matching task does is to say that the contact language sentence p' serves to enrich the context by specifying (some of) what is left open by the target sentence p . Take example (10): the matching sentence ‘Ann is angry’ contains reference to a particular female individual. By asking whether *elle est fâchée* can express “the same thought” as ‘Ann is angry’, the consultant is in effect asked to evaluate whether *elle* can refer to the entity designated by ‘Ann’. In this case, the presence of the matching sentence allows us to set the assignment function to one where the pronoun refers to Ann. While we could have chosen a different method to achieve this, such as pointing to the entity Ann in a visually-depicted situation, it is sometimes challenging (if not impossible) to use other means to control for underspecification, as we discuss in §4.

Setting aside example (11), due to the less clear role of *amu* (‘might?’), a case in point are examples (13) and (14), where we cannot point to (or visually depict, see §4.3) the distinction between suggesting and saying, in (13), or allowing for the possibility and believing, in (14). The Russian matching sentences contained attitude verbs meaning ‘suggest’ and ‘allow for the possibility’, which have weak force (one can suggest/allow A and one can also suggest/allow not-A, and the two are not in conflict) and are also specified for flavor (assertive and doxastic, respectively). By asking whether the Koryak sentence with *ivək* can express ‘the same thought’ as p' , the consultant was asked to evaluate whether *ivək* can be interpreted in the weaker assertive/doxastic way. Technically speaking, p' allows us to set the assignment function to one that fixes two free variables in the denotation of *ivək*. One is the domain variable, which the assignment function maps to a function that yields the assertive flavor with ‘suggest’ in (13) and the doxastic flavor with ‘allow for the possibility’ in (14). The second variable is one that affects the size of the domain of universal quantification. For example, the sentence in (13) conveys that there is a subset of the assertive worlds where (in all of those worlds) the hunters had gotten lost and there is a subset of the assertive worlds where the hunters are just late. In sum, the assignment function is fixed via p' to one that yields a weak assertive / a weak doxastic reading of *ivək*.

From this perspective, the matching task is not intended to directly test the equivalence of meaning between two sentences, which can be a problematic starting point (Deal 2015). Instead, it should be viewed as a refinement of the acceptability judgment task, with the matching sentence influencing the resolution.

3.3 Is the matching task new?

One of the reasons we have found an explicit discussion of the matching task to be necessary is that there does not appear to be agreement in the field about the status of this methodology. On the one hand, the matching task does not appear in any surveys of tools in formal semantic fieldwork, such as Bochnak and Matthewson (2020). Lisa Matthewson (p.c.), for example, has also informed us that she was not previously aware of such a task being used in semantic fieldwork, nor had she considered using it in her own work. On the other hand, something like this task seems to be standard practice in investigating meaning for others (Maria Polinsky and Seth Cable, p.c.). Polinsky (p.c.), for example, has pointed out that matching sentences have been employed in acceptability tasks by linguists from Moscow State University since the 1960s, when Aleksandr Kibrik first began to lead linguistic field trips to the North Caucasus. An anonymous reviewer also provides an example from the literature that looks a lot like our matching task, given in (15).

- (15) a. Context: Kii looks outside and sees dark clouds in the distance. The air smells like rain is on the way. Kii has to drive this afternoon, however, so he does not want it to rain.

Kii [nahodoołtʃʃ] nízin.
Kii ArealS.rain.FUT 3S.ATT.IMPF

‘Kii thinks it’ll rain.’ (Bogal-Allbritten 2016, p. 87)

- b. Context: Kii is a farmer. It has been very dry recently and rain is badly needed. Kii’s desire is for it to rain. He looks at the sky and sees it is clear, however, so he doesn’t think it will rain.

Kii [nahodoołtʃʃ] nízin.
Kii ArealS.rain.FUT 3S.ATT.IMPF

‘Kii wants it to rain.’ (ibid.)

The examples in (15a-15b) show that the Navajo attitude verb *nízin* is compatible with both a doxastic (‘think’) and a desiderative (‘want’) interpretation. In eliciting the sentence in (15b), Bogal-Albritten used the English sentence ‘Kii’s desire is for it to rain,’ which specifies the intended interpretation of the attitude verb. This is nearly identical to what we call a matching task, the difference being that the matching sentence is given as part of the context in (15b), rather than being presented separately, as we have done. We do not consider (15b) to be meaningfully different from the matching task we define in this paper. However, as will be discussed in §4.1, our consultants often ignore the discourse contexts that we provide when giving their judgments, which makes separating the matching sentence from the discourse context more reliable than integrating them. An anonymous reviewer suggests that the task may become more ‘digestible’ to the consultant when the matching sentence is separated from its context, which is consistent with our experience.

4 Comparison with other tasks

In this section we consider some cases where the matching task has given us an advantage over the standard elicitation methods, making it a useful supplement to the existing tools in fieldwork. We compare it with three types of elicitation methods (Bochnak and Matthewson 2020): acceptability judgment tasks, elicited production tasks, and translation tasks.

4.1 Acceptability judgment tasks

In an acceptability judgment task, the consultant is asked whether a sentence in the target language is acceptable in a given situation (presented verbally or visually). Here, we set aside the accessibility judgment tasks discussed above in §3.3 (where a matching sentence is integrated into the context), since we do not take these to be meaningfully different from our matching task. In the rest of this section, we illustrate how acceptability judgments (without matching sentences) have been insufficient for our semantic fieldwork on Koryak.

Consider the following example, initially presented as an acceptability judgment task. In this task, the consultant was read the story in (16).¹¹

- (16) Hewngyto is walking down the street. Melljo sees him and asks: ‘Menno ʏənin ɲevətqet? Metke kotavareŋjaŋəŋ jajak?’ (Where is your wife? Is she making jam at home?) He replies:

qoo. t-ə-k-iv-ə-ŋ-∅ əno
dunno 1SG.S/A-E-PRS-*ivək*-E-PRS-1SG.S COMP
∅-ko-ta-vareŋja-ŋ-ə-ŋ-∅ jaja-k
2/3.S/A.IND-PRS-make-jam-make-E-PRS-3.S.IND house-LOC

‘I don’t know. I allow for the possibility that she’s making jam at home.’
He continues walking. Qechghylqot sees him and asks: ‘Menno ʏənin ɲevətqet? Metke keluŋ umkək?’ (Where is your wife? Is she picking berries in the forest?) Hewngyto replies:

qoo. t-ə-k-iv-ə-ŋ-∅ əno ∅-k-elu-ŋ-∅
dunno 1SG.S/A-E-PRS-*ivək*-E-PRS-1SG.S COMP 2/3.S/A.IND-PRS-pick.berries-E-PRS-3.S.IND
umk-ə-k.
forest-E-LOC

‘I don’t know. I allow for the possibility that she’s in the forest picking berries.’ (Močnik and Abramovitz 2019)

The consultant was asked to judge the felicity of this story, and at first rejected it, presumably having interpreted *ivək* with its strong quantificational force, which makes Hewngyto’s replies contradictory. When she was asked explicitly whether the two sentences could express the same thought (stated in Russian with *dopuskat*) as ‘I allow for the possibility that she’s making jam at home’ and ‘I allow for the possibility that she’s in the forest picking berries’, the consultant readily confirmed this and added that the story was acceptable on this reading of Hewngyto’s replies.¹² Hence, the matching task revealed a different acceptability judgment from the simple acceptability task.

It is convenient that Russian lexicalizes a weak doxastic verb *dopuskat* (‘allow for the possibility’) in addition to the stronger *dumat* (‘think’).¹³ Using *dopuskat* in a matching task enabled us to isolate the weaker construal of *ivək*. While our consultants were sometimes able to access the

¹¹ The following parts of the situation were read in Russian: *Hewngyto is walking down the street. Melljo sees him and asks, He replies, He continues walking, Qechghylqot sees him and asks, and Hewngyto replies.* The parts in the parentheses in (16) were not read, they merely provide the translation from Koryak for the reader.

¹² We agree with an anonymous reviewer that it would be beneficial to familiarize the consultant with the task by first using two sentences in the contact language in order to make sure they understand what it means to express the same ‘thought’.

¹³ That being said, we do not think it would be impossible to carry out this work in the absence of a weak doxastic verb in the contact language. Since the word *dopuskat* as a doxastic attitude is somewhat literary

weaker interpretation in an acceptability judgment (especially if they had been exposed to *dopuskat'* earlier in the session), this access was not sufficiently stable, as shown above. We were therefore hesitant to rely exclusively on acceptability judgments in further tasks. Given the many interpretations of sentences with *ivək*, it was very important that we be sure of which reading was being accessed by the consultant in a given context.

A more general issue we have had with acceptability judgments is that our consultants often seemed to ignore the discourse contexts we provided, and instead give judgments as to whether the sentence is an acceptable sentence of the language.¹⁴ One type of interaction with our consultants that has caused us to come to this conclusion is that, upon being asked for an acceptability judgment, instead of giving a 'yes' or 'no' answer, consultants will often simply provide a translation into Russian, and that translation may be incompatible with the context we presented them with. This could be the result of the consultant not paying attention to the context, or it could be an artifact of their non-native knowledge of Russian (we suspect both play a role), but either way it is clear that their translation cannot simply be taken at face value. Trying to insist that speakers not respond to queries on the acceptability of sentences in context by translating the sentences into Russian is uncomfortable for the elicitor, and, doubtless, the speaker too: in the few cases we attempted to do this, they would often respond to this by remaining silent and ignoring our question. Contextual acceptability judgments therefore proved not useful in eliciting judgments on attitudes in Koryak, both for reasons specific to the verb *ivək*, and because of our consultants' reactions to contextual acceptability judgment queries themselves.

It is very striking that the existence of the weak reading does not in and of itself render the dialogue in (16) acceptable (that is, non-contradictory). Usually, when we suspect that a sentence may have two readings, A and B, and wish to isolate reading B, we propose a context that excludes reading A, assuming that this will force the speaker to consider reading B. In other words, we give reading B 'a fair "pragmatic chance" of being recognized' (Matthewson 2004, p. 406). If the speaker rejects the sentence in that context, we take this as evidence against the existence of reading B. What our experience with (16) and others like it suggests is that we should not always take this data as evidence against the existence of an additional reading: in (16), the consultant declared the sentence incoherent instead of accessing the coherent reading. We might wonder whether this is an artifact of the fact that Koryak is highly endangered and no longer used as the language of daily communication. However, we think that judgments like this do not only arise in highly endangered languages. Consider, for example, the garden path sentence in (17).

(17) ? The horse raced past the barn fell. (Bever 1970, p. 316)

The grammatical interpretation of (17) contains a reduced relative clause with a transitive *race* (equivalent to *The horse that was raced past the barn fell*). This parse is hard to access, though; most naturally, *raced* is interpreted as a matrix intransitive verb, which clashes with the actual ma-

in Russian (it is more commonly used to express the deontic meaning 'allow'), we wanted to be sure that our consultants were correctly understanding the reading of *dopuskat'* that we had in mind. We would therefore sometimes check with our consultants that the Koryak sentences that had been accepted with *dopuskat'* were also acceptable on the meaning of 'think that maybe' (R. *dumat' čto vozmožno / dumat' čto možet byt'*), which they were. The combination of a strong doxastic attitude with an embedded weak epistemic modal could therefore stand in for a weak doxastic attitude in a language that does not lexicalize one.

¹⁴ We did not manage to resolve this issue with visual stimuli. There are also some independent difficulties with pictorial representations, see §4.3.

trix clause verb *fell*. Even though (17) is ungrammatical with intransitive *race*, the existence of a grammatical parse does not make the sentence easily acceptable. This contrasts with the completely natural (18): unlike *raced* in (17), *sent* in (18) is easily understood as a passive participle.

(18) The horse sent past the barn fell. (Bever 1970, p. 316)

The parallel that we see between (16) and (17) is that the sentence allows for two possible parses and the “good” parse (grammatical and felicitous) may not be easily recognized.

For (16), we speculate that partial belief is less commonly expressed than full belief, and hence the existential interpretation of *ivək* is less obvious. This is suggested by the fact that there are very few languages reported to have a lexicalized verb for existential belief, and even in a language like Slovenian, *dopuščati* (‘allow for the possibility’) is substantially less common than *verjeti* (‘believe’) or *misлити* (‘think’).¹⁵ Since there are a variety of factors (syntactic, semantic, prosodic, statistical) that can influence how real-time parsing proceeds (Crain and Steedman 1985, Spivey, Tanenhaus, Eberhard, and Sedivy 2002, Trueswell 1996, Trueswell, Tanenhaus, and Garnsey 1994 a.o.), we speculate that there may also be factors privileging certain flavors of *ivək* over others. We did not explore this with plain acceptability judgments because of our reservations with our speakers’ responses to them. The matching task enabled us to bring attention to the less prominent parse (partial belief or whatever it may be) and to elicit a judgment on it.

A note is in order about the complexity of the context in (16). One might object that the difficulty with (16) is that the verbally-presented context requires the speaker to remember too much information at once. Could the issue have been avoided if we had presented our situations pictorially? Bochnak and Matthewson (2020) suggest that it might have been, arguing that with content pertaining to the interlocutors’ belief states it is insufficient to present descriptions of the context verbally, and that more involved stimuli, such as storyboards, are likely to be necessary. However, it is difficult to imagine a simple way to express the distinction between strong (‘think’) and weak (‘allow for the possibility’) doxastic attitudes pictorially. This is especially so because, as discussed in greater detail in §4.3, our consultants had issues with thought bubbles, which we tried to use to represent the non-assertive uses of *ivək*. They instead interpreted what we had intended to be thought as speech.

4.2 Translation tasks

Translation tasks in semantic fieldwork do not enjoy the same good reputation as acceptability judgment tasks (Deal 2015, Matthewson 2004, Tonhauser and Matthewson 2015). A difficulty arises when the contact and the target language lack a one-to-one mapping between linguistic forms.¹⁶ As should be clear from our discussion, there is no lexical item in Russian (or any other language we are familiar with) that Koryak *ivək* can be translated into in the absence of a context. In the absence of a discourse context (which is not part of the translation task per se), the lack of a one-to-one mapping makes translating a sentence with an underspecified item either too broad or overly specific. In this

¹⁵ A search of the Gigafida corpus of written standard Slovenian (<https://viri.cjvt.si/gigafida/>) finds 829 occurrences of *dopuščam* (‘I allow for the possibility’), in contrast to 51,564 occurrences of *verjamem* (‘I believe’), and 164,259 occurrences of *mislim* (‘I think’).

¹⁶ We set aside the situation of monolingual fieldwork (Sarvasy 2016), where we might ask the speaker to try to paraphrase our target sentence.

section we discuss two further issues that we encountered using translation tasks and explain how the matching task remedied them.

4.2.1 Contact-to-target translation

The contact-to-target translation task consists of asking the consultant to produce a target language translation, given some contextual information and a contact language sentence. This task is not particularly useful when the fieldworker wishes to conduct research on a particular lexical item in the target language, and the target language contains other ways of expressing approximately the same meaning, as the fieldworker has little control over which item is used by the consultant. For example, when we asked a southern Koryak consultant how to say ‘I hope it will rain’, she offered the sentence in (19).

- (19) t-ə-ko-məčwənan-at-ə-ŋ-∅ ∅-je-muq-et-ə-ŋ-∅
 1SG.S/A-E-PRS-hope-VBLZ-E-PRS-1SG.S 2/3.S/A.IND-FUT-rain-VBLZ-E-FUT-3.S.IND
 ‘I hope it will rain.’

This sentence uses the lexical verb *məčwənatək*, which is a verb of hoping in the southern dialect that is not recognized by our northern Koryak consultants.¹⁷ While we eventually found out via matching tasks that southern Koryak speakers accept *ivək* on the ‘hope’ reading, the verb *məčwənatək* was usually produced (by the speakers who had it) in contact-to-target language translations. Similarly, the existence of *četkejujka* (‘think (about?)’) and *yajmatək* (‘wish’) hindered the investigation of *ivək*. Because we had access to so few speakers (§5.2), we had to gather data even from the speakers who, for example, produced *məčwənatək* in Russian to Koryak translations. The matching task allowed us to circumvent this issue since it fixed the lexical item that we wished to obtain judgments for.

Despite these disadvantages, we echo Matthewson (2004) in stressing that the translation task can provide fieldworkers with important clues. In fact, we discovered some of the readings of *ivək* because we asked the consultants to translate Russian sentences with attitude verbs into Koryak. Additionally, speakers’ providing Koryak sentences with *ivək* in response to a Russian-to-Koryak translation query provided independent confirmation of the existence of the various interpretations of that verb. Nevertheless, given the issues we have encountered with translation, the matching task was needed to confirm any information we got from translations.

4.2.2 Target-to-contact translation

Consider now the case where a translation into the contact language is requested. The main issue that we have encountered with this task is that the consultants sometimes imported features of the target language into the contact language. To illustrate, consider (20).¹⁸

- (20) Situation: People are talking about whether God exists. They ask Qechghylqot, who says:

¹⁷ In addition to the ‘hope’ meaning, southern consultants have also offered that *məčwənatək* can mean ‘be sure’ (Russian *uveren*) and ‘doubt’ (Russian *ne verit’/somnevat’s’a*). We have not had a chance to explore this in more detail.

¹⁸ The weaker force of *ivək* happened to be accessible to the consultant in this case. As mentioned in §4.1, the weaker reading is sometimes accessible outside of the matching task.

of a felicitous sentence with *amu*, an epistemic modal that we think may have variable force, but when asked to explain what the sentence meant, the speaker provided the contradictory translation below.

- (23) amu ∅-ku-muq-et-ə-ŋ-∅ peterburg-a-k to amu
 might? 2/3.S/A.IND-PRS-rain-VBLZ-E-PRS-3.S.IND St.Petersburg-E-LOC and might?
 uŋŋe e-muq-et-ke ŋanko
 NEG.RLS NEG-rain-VBLZ-NEG there

Speaker’s translation: *Naverno dožd’ idět v Peterburge, i naverno dožd’ ne idět tam* (‘It’s probably raining in St. Petersburg and it’s probably not raining there’)

Our interpretation: ‘It might be raining in St. Petersburg, and it might not be raining there.’

A general problem we have encountered with Koryak-to-Russian translation tasks involving *ivək* is that *ivək* almost exclusively leads to the ‘say’ translation, and occasionally leads to the ‘think’ translation, but almost never leads to a translation of the other meanings we have uncovered for it.²⁰ Given that other elicitation tasks (matching, Russian-to-Koryak translation) have established the existence of additional interpretations of this verb, we did not find Koryak-to-Russian translation tasks to be adequate for investigating the meaning of *ivək*.²¹

4.3 Elicited production task

One technique that has recently gained attention among linguists doing semantic fieldwork on understudied languages is the elicited production task. In this task, the consultant is asked to talk about a stimulus, e.g. a picture or a coherent series of pictures (a storyboard). This provides a more natural way of setting up the situation, in particular for those speakers whose traditional culture includes writing or pictures.²²

In our fieldwork we have attempted to use storyboards to elicit sentences with attitude verbs, as well as to set up situations for acceptability judgment tasks that involve attitude verbs. As argued by Bochnak and Matthewson (2020), storyboards are useful for precisely this type of semantic content (see §5 below). In this section we speculate as to why this has failed in our case.

²⁰ Another example of this is that expressions where *ivək* embeds a counterfactual complement, which correspond to English ‘wish’ (5), were often translated as ‘say if only’ or ‘think if only’ (Rus. *dumajet/govorit, xotja by*) which is a locution that is not recognized by native Russian speakers. By contrast, when asked to translate ‘wish’ (Rus. *želat’*) into Koryak, the speakers had no trouble using *ivək*.

²¹ The contradictory translations are interesting in their own right, and we might wonder how exactly the consultants understand the Russian lexical items, since their translations are non-contradictory to them. In the case of *ivək*, we suspect that our consultants simply think that the Russian verbs ‘say’ (R. *govorit’*) and possibly also ‘think’ (R. *dumat’*) have variable flavor and variable force. Our impression is that the consultants have, by contrast, a native-like understanding of the attitude verbs that correspond to the other flavors of *ivək*. In part, we suspect this because some of the meanings are also independently lexicalized in Koryak (see the discussion in §4.2.1), and in part because we have tested some of the consultants by asking to describe them, e.g., the Russian *nadejat’s’a* (‘hope’) means and they correctly described a hoping attitude. However, their understanding of the force of Russian attitude verbs appears to be sketchier, and we have therefore relied on contradiction tests to determine the existence of weak readings.

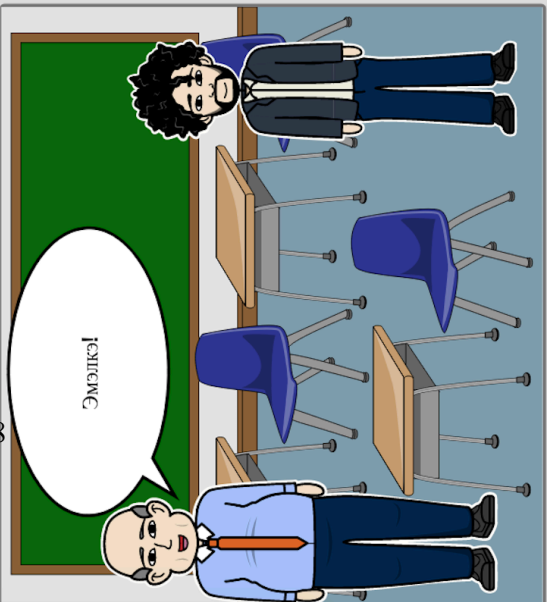
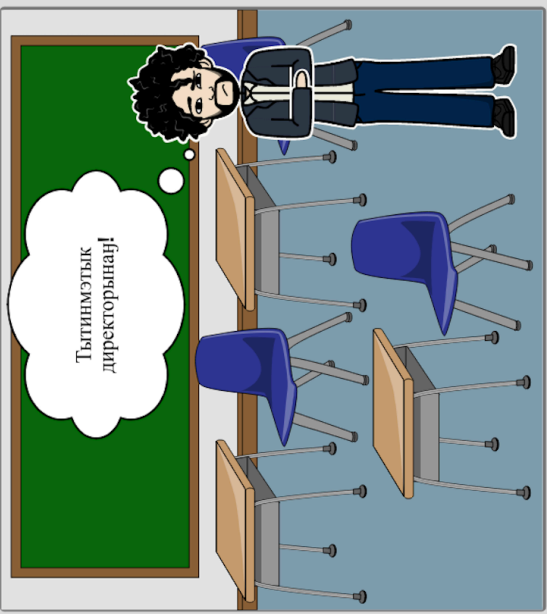
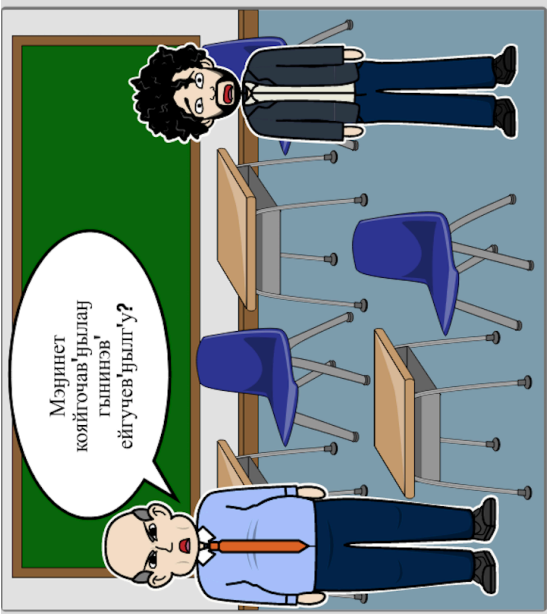
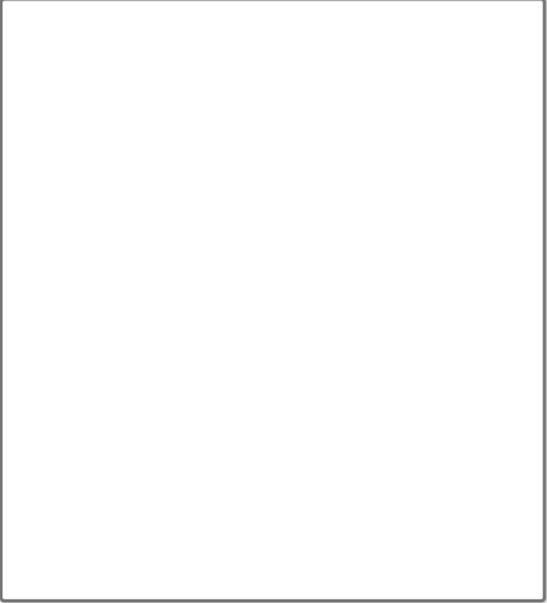
²² Traditional Koryak culture does not, admittedly, make use of either writing or drawing. However, all of our consultants are literate in Russian and have at least a middle-school level of education, such that the written medium would be very unlikely to be cause them problems.

Consider the storyboard in Figure 1, with a glossed translation of the text in (24). This storyboard sets up a situation where the teacher thinks one thing (that his students are doing very poorly in school), but tells the principal the opposite (that they are doing very well) since he is afraid that the principal might get mad at him. Given that the verb *ivək* can mean both ‘think’ and ‘say’ (§2.2), we have used this type of situation to test whether certain conjunctive structures with *ivək* can be interpreted as being about both thinking and saying eventualities. See Močnik and Abramovitz (2019) for details.

- (24) a. qok ečwej! ʎəm-nine-w jejyučewη-ə-lʔ-u tətteɫ qewwa-η
 alas 1SG-POSS-3PL study-E-S/O.PTCP-ABS.PL very bad-ADV
 ø-ko-jajyočawη-ə-la-η-ø! direktor-ə-na-k
 2/3.S/A.IND-PRS-study-E-PL-PRS-3.S.IND principal-E-OBL.SG-ERG
 ø-j-ena-kətʔajŋa-η-ø!
 2/3.S/A.IND-FUT-1SG.O-scold-FUT-3.S.IND
 ‘Alas! My students are doing very badly! The principal will scold me!’
- b. meŋiŋet ø-ko-jajyočawη-ə-la-η-ø ʎə-nine-w
 how.well 2/3.S/A.IND-PRS-study-E-PL-PRS-3.S.IND 2SG-POSS-ABS.PL
 jejyučewη-ə-lʔ-u?
 study-E-S/O.PTCP-ABS.PL
 ‘How are your students doing?’
- c. əčč-u metʔa-η ø-ko-jajyočawη-ə-la-η-ø!
 3NSG-ABS.PL beautiful-ADV 2/3.S/A.IND-PRS-study-PL-PRS-3.S.IND
 ‘They are doing very well!’
- d. e-mel-ke!
 ADV-good-ADV
 ‘Good!’
- e. t-ə-tinm-et-ə-k direktor-ə-na-η!
 1SG.S/A-E-lie-VBLZ-E-1SG.S principal-E-OBL.SG-DAT
 ‘I lied to the principal!’

Using this storyboard with our consultants has proven to be very difficult, as the consultants that we tested this with did not seem to be able to follow the narrative arc of the story. Specifically, it did not seem that they had grasped the distinction between what the characters were saying and what they were thinking. Subsequently, we realized that it was likely that our consultants did not understand what the difference was between thought bubbles and speech bubbles.²³ Western people (and, nowadays, likely most literate non-Western people) are familiar with the conventional interpretation of a cloudy bubble with circles (the person is thinking) and an elliptical bubble with straight lines (the person is speaking), which we suspect to be due to the pervasiveness of comic books. However, comics did not become popular in the Soviet Union until well into our consultants’ adult years, and the examples of earlier Soviet comics that we have been able to find do not employ thought bubbles at all. We suspect that a lack of familiarity with the relevant distinction is what confused our consultants. Given that the difference between thought and speech is crucial for testing the meaning of

²³ The possibility that they were simply unable to see the difference between thought and speech bubbles also exists, though we consider that unlikely as they were able to read the Koryak text.



an attitude verb that can mean both ‘think’ and ‘say,’ storyboards failed to give us usable results in acceptability tasks and elicited production tasks.²⁴

5 User’s guide: When might you use this task?

Semantic and pragmatic phenomena are widely acknowledged to be among the most challenging fieldwork domains. As noted by Matthewson (2004), a consultant might reject a target item in an acceptability judgment task because it is false, infelicitous, pragmatically odd for independent reasons, or even simply ungrammatical; a positive response requires the target item to pass with respect to these various dimensions: it needs to be morpho-phonologically and syntactically well-formed, it needs to be true in the situation, and it needs to be pragmatically felicitous.²⁵ As discussed in §4.1, the relevant reading needs to be sufficiently prominent to the consultant as well. Conversely, a consultant may accept a target item because it is well-formed on some reading, even if this is not the reading that the elicitor intends (§4.1). In sum, judgments of semantic and pragmatic phenomena build on other aspects of the grammar, which is reflected in the widely-shared experience of linguistic fieldworkers that not all of the native speakers who are reliable consultants for fieldwork targeting morpho-syntactic questions are reliable consultants for fieldwork targeting semantic questions.²⁶

Furthermore, certain areas of semantic/pragmatic fieldwork can be more difficult to investigate than others. Bochnak and Matthewson note:

After surveying a number of elicitation methods that have been used for specific phenomena, we advance the hypothesis that certain types of content can be probed easily enough by using verbal context descriptions or single images, while content that relates to the belief states of interlocutors is far more likely to require more complex presentation techniques such as storyboards. These include, for example, presupposition triggers, information-structuring elements, epistemic modals, attitude verbs, and discourse particles. (2020, pp. 262–263)

Judgments on mental states are difficult to elicit because they require consultants to keep track of complex discourse situations that not only involve a situation in the actual world but also individuals’ representations of certain aspects of the actual world. Bochnak and Matthewson (2020, p.13) suggest employing storyboards to counteract the difficulty that speakers may have with mental states, as they allow the entire situation to be laid out for the speaker, and also allow the distinction between thought and speech to be easily visible to the consultant with the use of thought bubbles. As discussed in 4.3, this was not sufficient in what we investigated, for reasons that we only began to understand after leaving the field site.

²⁴ We only developed this hypothesis regarding thought and speech bubbles after leaving the fieldwork site, and therefore never thought to train the consultants on the relevant distinction. Perhaps such training of the consultants would yield reliable results with tasks involving visually-depicted situations.

²⁵ Even positive responses are not always reliable, as Benjamin Bruening (p.c.) reminds us. Sometimes the speaker assents to something you say but repeats it back to you in a different way, potentially because the original sentence was not actually acceptable. Consequently, neither a positive nor a negative response by a speaker to a prompt is fully reliable on its own.

²⁶ Dmitry Privoznov (p.c.) reports the same observation from his fieldwork with speakers of Uralic, Turkic, and Mongolic languages in Central Siberia, as does Luiz Fernando Ferreira (p.c.) from his work with Karitiana (Tupian) speakers in the Brazilian Amazon.

In addition to these general difficulties of doing semantic fieldwork on mental states, there are at least two other factors that influenced our need for the matching task: language-specific internal factors (§5.1) and sociolinguistic and cultural factors (§5.2). Other linguists might therefore find this task advantageous when working under similar circumstances.

5.1 Language-inherent difficulties

Languages differ in their lexical and functional inventories, which can pose a problem for some elicitation methodologies (e.g. translation). As mentioned in §3, we have found the matching task to be particularly useful when the target language contained linguistic material with several construals and the contact language had explicit ways of bringing out the individual construals.

The matching task is, however, not confined in its usefulness to research that specifically targets phenomena relevant to questions in formal semantics: the first author has found it useful in answering morphosyntactic questions, too. For example, the Koryak exponents of the unwitnessed past tense and the resultative participle are homophonous, as in (25a)–(25b). As in many languages, the resultative participle can only have the internal argument as a pivot, making it an important test for unaccusativity in Koryak (Williams 1981 et seq.): compare the unaccusative verb ‘fall’ in (25) with the unergative ‘dance’ in (26). Without a matching task, most speakers translate and interpret utterances in elicitation with this morphology as past tense finite clauses (25a). Even when the syntactic environment privileges the reading in (25b), such as when the phrase *ɣajallen uttəut* is an argument of a finite verb, this was often interpreted as two sentences joined without an overt conjunction.

- (25) a. γ -ajal-len- \emptyset utt-ə-ut
 UW.PST-fall-3.UW.PST-SG tree-E-ABS.SG
 ‘The/A tree fell.’ (R. *derevo upalo*)
- b. γ -ajal-len- \emptyset utt-ə-ut
 RES.PTCP-fall-3.RES.PTCP-SG tree-E-ABS.SG
 ‘a fallen tree’ (R. *upavšeje derevo*)
- (26) γ a-ml-aw-len- \emptyset kəmiŋ-ə-n
 UW.PST-dance-VBLZ-3.UW.PST-SG child-E-ABS.SG
 acceptable as: ‘The/A child danced.’ (R. *rebēnok stanceval*)
 unacceptable as: ‘a child who has danced’ (R. *tancevavšij rebēnok*)

Using the matching task, which brought to the forefront the less prominent participial reading of this circumfix, made investigating unaccusativity in Koryak substantially less time-consuming, and, seemingly, easier for the consultants, as it was immediately clear to them what they were being asked about.

5.2 Sociolinguistic and cultural factors

One significant sociolinguistic factor in our work is the poor state of preservation of Koryak, which has given us a rather small pool of consultants to draw from, none of whom use Koryak as their primary language anymore. The total number of fluent native speakers of Koryak is unknown, though we suspect it is somewhere in the vicinity of 600, most of whom are at least 65 years old. In Palana, which is the largest village in Koryakia and the place where most of our fieldwork was

conducted, there are only fifteen or so fluent native speakers of the Chawchuvén dialect of Koryak, of which only six were able to work with us regularly. Additionally, Koryak is rarely used anymore even by fluent native speakers who speak it better than they speak Russian: all of our consultants are the only remaining members of their household to speak Koryak, and some of them have health issues that make it difficult or impossible for them to leave the house to interact with other speakers. Even when two native speakers interact in Palana, it is far from certain that they will speak Koryak to each other.²⁷ The infrequency with which they use the language is plausibly a factor in their difficulty with giving semantic judgments.

The challenge of having such a small number of possible consultants means that it is not possible to simply exclude those speakers who have trouble with the more standard fieldwork methods, such as providing contextual felicity judgments (see §4.3). Luiz Fernando Ferreira (p.c.), for example, began working with a variety of consultants that he had worked with on morphosyntactic topics on a questionnaire that required the speakers to judge the felicity of Karitiana modals in various contexts. He ran a pilot version of his questionnaire with all of these consultants to see whose judgments on the modal expressions were sensitive to the contexts provided, and whose weren't. Only the first group of consultants were asked the full questionnaire, and the results on the pilot study from the second group of speakers were not taken into account in developing the analysis.

Finally, we think that we have encountered difficulties with visual materials due to the speakers being unfamiliar with or uncomfortable with the visual stimuli (see also Bochnak and Matthewson 2020, p. 164, fn. 7). In particular, we suspect that this was at issue in our consultants' inability to make sense of the storyboard that relied on a distinction between thought bubbles and speech bubbles (see §4.3).

Any (and possibly all) of these sociolinguistic issues may have contributed to our consultants' difficulty in giving judgments through more standard elicitation methods. The matching task gives semantic fieldworkers an additional tool that they can use to get around sociolinguistic and cultural issues that impede hypothesis testing.

6 Conclusion

In this paper, we have discussed an elicitation technique we call a matching task, which is an acceptability judgment task where the consultant is asked to judge a target language sentence under an intended ("matching") interpretation, typically given in the contact language. Because the matching sentence is not (necessarily) presented in the target language, the matching task arguably implicates translation. To our knowledge, this is the first explicit discussion of the matching task in semantic fieldwork, even though some semantic fieldworkers have used matching sentences in their acceptability judgment tasks before (see §3.3).

Our main goal was to demonstrate that there are certain research situations where using matching sentences is necessary for successful fieldwork. Put differently, sometimes the more standard methodologies, like plain acceptability judgments (without matching sentences), translation tasks, and elicited production tasks, turn out to be insufficient. In our case, we have found the matching task to be necessary in investigating underspecified or polysemous modals and attitudes in Koryak

²⁷ In the first author's experience, native speakers of Koryak usually speak either entirely in Russian or code-switch between Koryak and Russian when speaking to each other in public, though in private Koryak (without code-switching) is heard much more frequently. The effect that the presence of a linguist had on the language used in the conversations, i.e. the observer's paradox (Labov 1972), is unknown.

because the other techniques did not result in judgments that we could work with. In the later sections of the paper, we speculated as to why this was the case, pointing to the nature of the phenomenon and to certain sociolinguistic and cultural factors. We have also considered the formal role of the matching sentence, which we discussed primarily in the context of the highly-underspecified Koryak attitude verb *ivək*. There, the matching sentence served to resolve two free variables in the denotation of *ivək*, fixing its modal force and modal flavor.

The matching task provides another tool for eliciting data in fieldwork situations. Hopefully, this technique will allow other linguists to expand the empirical domains that they can do research on, and thereby extend the scope of research in the semantics of understudied and endangered languages.

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