Co-speech gesture and semantic fieldwork: A case study of aspectuals in Crow*

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Abstract: This paper proposes that co-speech gesture constitutes a type of semantic data that can be used when investigating particular semantic phenomena, to provide additional clues about the semantics of elicited utterances. Drawing from data that involve video recordings of an elicitation session exploring aspect in Crow, a Siouan language of Montana, USA, we employ discourse analysis and gesture analysis to examine the discursive practices and patterns (verbal and nonverbal) of the linguist and the consultant. The claim is that during semantic elicitation, consultants sometimes employ gestures as an embodied resource to concretize and convey abstract grammatical notions, such as aspect. As such, clues to the semantics of the consultant's speech may also be found within the gestural component, and documenting and analyzing gestures that are co-produced with speech can be a useful addition to a semantic fieldworker's toolkit.

Keywords: co-speech gesture, aspect, semantic fieldwork, multimodality, Crow

1 Introduction

Fieldworkers who investigate the semantic grammar of a language have a range of tools and techniques at their disposal. One standard approach is to provide a discourse context (verbally or nonverbally) to language consultants and then ask for one of three things: a suggestion for a sentence in the target language that is based on the context ('What would you say...'), a translation of a sentence from the contact language (or meta-language) into the target language ('How would you say...'), or an acceptability judgment of a specific utterance in the target language ('Could you say...').[1] Because information about the semantics of an utterance can often be difficult to ascertain, approaches to exploring the semantics of a language help to provide us with important clues to truth conditions and felicity conditions. Moreover, while consultants often have clear and crisp judgments about certain sentences, the reasons for these judgments are almost always inaccessible to them (Matthewson 2004). Thus, semantic fieldwork faces distinct challenges, and the range of available tools and techniques helps to facilitate the collection and analysis of semantic data.

The main proposal of this paper is that co-speech gesture constitutes a type of semantic data that can be used when investigating particular semantic phenomena, to provide additional clues about the semantics of elicited utterances. Although we may be the first to make this claim explicit in a paper

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[1] See Bochnak and Matthewson 2020 for an overview of the common strategies used to present contexts to language consultants.

about semantic methodology, examining gesture as semantic data is not a novel practice among fieldworkers. For example, in Enfield's investigation of the semantics of demonstratives (Enfield 2003a) and kinship (Enfield 2003b) in Lao, he places co-speech gesture in a central role in his analysis to indicate spatial meanings and relations. Dingemanse (2015) also analyzes gestures, describing how they can be used to shed light on multimodal folk definitions and illuminate the elusive meaning of ideophones in Siwu, a Niger-Congo language. Lastly, Defina (2016) examines gesture in a study on serial-verb constructions in Avatine, also a Niger-Congo language, and finds that these constructions tend to occur with single gestures, suggesting that these constructions describe single events. Our paper therefore contributes to the ongoing discussion on how documenting and analyzing gestures co-produced with speech can shed light on properties of the language's semantic grammar.

However, the elicitation session itself is a situated, interactional setting that represents a site in which to study the moment-by-moment unfolding of social interactions between the co-participants, the linguist and the consultant. We therefore consider, unlike previous studies, the actions performed by both the linguist and the consultant, rather than just focusing on the latter. Our case study involves an elicitation session that investigates aspect in Crow, a Siouan language of Montana, USA. Utterances elicited during fieldwork are not typically regarded as 'naturally occurring' language.[2] Data for this study are drawn from video recordings of the elicitation session that were collected by the first author. By combining discourse analysis and gesture analysis, we argue that during elicitation, consultants sometimes employ gestures as an embodied resource to concretize and convey abstract grammatical notions, such as aspect. As such, clues to the semantics of the consultant's speech can also be found within the gestural component.

2 The alignment between speech and gesture

Language is inherently multimodal, consisting not only of the verbal mode but also of a kinesic mode in which such movements as facial expressions, posture, and, most prominently, co-speech gesture contribute directly to linguistic meaning (Stivers and Sidnell 2005). As we speak we are constantly moving our hands and bodies, contributing semantic, pragmatic, and social meaning through both modalities. Early work by McNeill (1985; 1992) and Kendon (1980; 2004) popularized and emphasized the intertwining of co-speech gesture with human language. In these works, and in subsequent works that span different research disciplines, it has been shown time and time again that co-speech gesture aligns in both time and meaning with accompanying verbal utterances.

In particular, gesture scholars have increasingly observed that speakers often concretize grammatical notions, such as aspect and transitivity, in the form of co-speech gestures (e.g. Boutet, Morgenstern, and Cienki 2016; Cienki and Iriskhanova 2018; Duncan 2002; McNeill 2003; Parrill, Bergen, and Lichtenstein 2013; Wu and Cienki 2019). Central to the study of aspect and gesture is the idea that aspect involves how speakers construe the (internal) structures of events. For example, as Comrie (1976:3) puts it, aspect involves the "different ways of viewing the internal temporal constituency of a situation." While aspect encompasses a wide range of temporal phenomena, gesture research has primarily focused on the distinction between imperfective and perfective, in which the former involves viewing the situation from within (i.e. internally) and the latter involves viewing the situation as a whole (i.e. externally).

[2]This is not to say that translation practices are strictly an artifact of linguists interacting with speakers. As an anonymous reviewer points out, individuals who are learning their heritage language may frequently ask more fluent speakers to translate certain words or phrases into the heritage language.

In describing gestures and their associations with accompanying verbal utterances, there is a bevy of kinesic features that can be considered, such as hand shape, position of the hands relative to the speaker's and interlocutor's bodies, movement schemas, speed, duration, repetition, and handedness (one- vs. two-handed). In previous studies, differences in complexity of movement, duration, and repetition of gestures have been linked to different aspects (e.g. Duncan 2002; Parrill et al. 2013). For example, longer-lasting, more complex gestures tend to be produced with the imperfective rather than the perfective. Other studies have analyzed gesture in terms of 'boundedness' (e.g. Boutet et al. 2016; Cienki and Iriskhanova 2018). Bounded gestures, which are characterized by accelerated, ballistic, and energetic movements, have been found to correlate with perfective aspect, whereas unbounded gestures, which are described as smooth, controlled, and continuous, tend to occur with imperfective aspect. While greater complexity of a gesture reflects the relatively complex internal event structure of the imperfective, greater care and control in producing the gesture reflects the greater amount of information about the internal structure of the event speakers have access to when they employ the imperfective.

This paper focuses on the semantic contribution of co-speech gesture during semantic elicitation. In particular, we discuss the ways in which co-speech gesture iconically depicts properties of an event's structure, either concretely by tracing the trajectory of movement involved in an event, or metaphorically by treating an event's duration and temporal structure as a virtual timeline in the gesture space.[3] By incorporating the notion of gesture complexity into our investigation of aspect in Crow, we find that whereas iterative aspect occurs with kinesically complex gestures that involve repeated movements, continuative aspect may be associated with simpler, uni-directional gestures, produced slowly and with greater control.[4] In fact, many of the gestures we observe and discuss are well-documented in the literature, including those that indicate time, duration (Cooperrider, Núñez, and Sweetser 2014), and manner and path of certain motions (Ozyurek and Kita 1999), as well as those that contribute pragmatic information, such as emphasis (Loehr 2012) and illocutionary force (Kendon 1995). Nevertheless, considering gestures as a fundamental part of the meaning-making process, specifically between fieldworkers and consultants, remains underutilized.

This case study therefore aligns with previous studies on gesture and aspect by describing ways in which gesture reflects event structures. It also serves as an illustration of how the alignment between gesture and speech can be helpful in documenting and describing a language, especially when the semantic grammar is not yet well understood. Furthermore, in contrast to previous studies, the focus is not on perfectives and imperfectives, but on grammatical expressions that encode iterative and continuative aspect in Crow.

3 Aspectuals in Crow

Crow is a highly polysynthetic, head-marking language of Montana belonging to the Siouan language family. While there have been significant efforts to document and describe the language since the early 20th century (Graczyk 2007; Kaschube 1978; Lowie 1941, 1960; Old Horn 1975; Wallace

[3] By 'iconicity', we mean that some physical feature of the gesture, such as movement or shape, resembles some feature of the event described. See Mittelberg 2014 for a summary of the use of 'iconicity' in gesture studies, and debates therein.

[4] Since the data we analyze in this paper is limited, we do not make any claims about whether aspect is associated with complexity or boundedness of co-speech gesture. Instead, we focus our efforts on the iconicity of gestures as they pertain to the representation of the event structure.

1993, among others), its semantics remains understudied in comparison to other areas, especially morphosyntax.

Data used in this paper, unless otherwise indicated, come from the first author's fieldwork from 2018 to 2020 on the Crow Indian Reservation. Our investigations into aspectuals in Crow primarily involve Crow consultants Felice Big Day, Jack Real Bird, and Cyle Old Elk. The data are currently archived with the Survey of California and Other Indian Languages at the University of California, Berkeley (Alden, Day, Medicine, Deputy, Elk, Bird, Bird, Bird, Home, Singer, Ice, Jr., Yarlott, and Ko n.d.). The data we cite from other sources maintain their original orthography and interlinear glossing. In all other cases, the orthography used in this paper follows the conventions employed in Graczyk (2007:9–12), and the list of IPA correspondences can be found therein.

3.1 Earlier descriptions: Wallace (1993) and Graczyk (2007)

In our investigation of aspect in Crow, we examine the semantic differences between *-dahku* and *-daachi*, which have both been roughly translated as 'keep on' by speakers and linguists alike. Brief descriptions for these two morphemes have previously been provided by Wallace (1993) and Graczyk (2007) who refer to the two morphemes as 'continuative' aspectuals.[5] In her dissertation on Crow, Wallace (1993:129) notes that *-dahku* and *-daachi* have "subtle semantic variations (for example, continuous vs. intermittent activity)." Unfortunately, she does not provide any clarification as to which meaning corresponds to which morpheme. What she does provide are the two examples in (1a) and (1b) with the respective morphemes *-dahku* and *-daachi*.[6,7] However, not only are the two morphemes glossed in the same way, but the example given in (1a) also contains the habitual *-ii* which makes it more challenging to obtain a clear understanding of the differences between *-dahku* and *-daachi*.[8]

(1) a. B-iikukku-waa-**káhku**-ii-k.
1A-listen-1A-**continue**-HAB-DECL
'Once in a while I listen.' (Wallace 1993:129, Ex. 186a, emphasis ours)

b. Baakáat-kaate aw-iassia-waa-**lichi**-k.
child-DIMIN 1A-watch-1A-**continue**-DECL
'I kept on watching the kids.' (Wallace 1993:129, Ex. 186b, emphasis ours)

On the other hand, Graczyk (2007:307–308) writes that *-daachi* has the meaning "continue in a position or activity voluntarily," while *-dahku* "suggests more of an iterative activity than does *daachi*."[9] To illustrate the uses of *-dahku* and *-daachi*, Graczyk provides a set of example sentences,

[5]Lowie (1941:9–10) provides an even more brief and vague description of the two aspectuals, describing them as denoting "continuation of a state or action."

[6]The forms of the two suffixes undergo suppletion when inflected for first- and second-person singular.

[7]In Crow, obstruents often undergo intervocalic laxing. Therefore, *b* and *d* may occur as *w* and *l*, respectively, in environments where they occur between vowels.

[8]The abbreviations used in the glosses are as follows: 1: first person, 3: third person, A: active, B: stative, DECL: declarative, DEF: definite, DIMIN: diminutive, HAB: habitual, INSTR: instrumental, JUNCT: juncture, POS: possessive, and REL: relativizer.

[9]While we do not represent the aspectual morphemes as bearing any accent/stress, Graczyk (2007) considers them to be auxiliaries that undergo obligatory verb incorporation and represents them as *dahkú* and

two of which are provided in (2a) and (2b).[10] Just like Wallace, Graczyk glosses the two aspectual suffixes as 'continue'. The accompanying English translations also use the aspectually vague English construction 'keep V-ing' which fails to discriminate between the two meanings.

(2) a. hinne shikáak-kaatee-sh baap-taatchée iseé ii ihchilasshihk-a-**lahkú**-k
this boy-DIMIN-DEF day-every his.arrows INSTR practice-JUNCT-**continue**-DECL
'everyday this boy kept practicing with his arrows.'
(Takes Gun 1984:8, as cited in Graczyk 2007:308, Ex. 33, emphasis ours)

b. íahk is-ak-baa-íassee-sh óotchia-lak baapí-lak
those 3POS-REL-INDEF-watch-DEF night-and day-and
kam-maa-íassii-a-**kaa**-u-k
then-INDEF-watch-JUNCT-**continue**-PL-DECL
'those watchmen of his kept watching night and day'
(Old Coyote 1980:7, as cited in Graczyk 2007:308, Ex. 37, emphasis ours)

In sum, the descriptions and the examples present at least two issues. First, despite their differences in meaning being acknowledged, the two morphemes are glossed in the same way. Second, without specific discourse contexts to target continuative or iterative meanings, it is not entirely clear how to interpret the example sentences and how they distinguish between *-dahku* and *-daachi*.[11]

Part of the reason there is a lack of precise descriptions and illustrative examples may involve the issue of translation. If Wallace's and Graczyk's claims about the two morphemes having distinct aspectual meanings are correct, then speakers of Crow who are asked to translate sentences with either *-daachi* or *-dahku* into English face a dilemma. Although it is possible for speakers of English to express continuative and iterative aspect (e.g. by using adverbials), the language lacks the same grammatical resources that Crow possesses to do so in a straightforward way. As Deal (2015:169) remarks in her discussion about eliciting modality (and past tense) in Nez Perce, "[w]here speakers can't give translations that are equivalent in both content and implicature, they sacrifice equivalence of content to make sure that certain types of implicatures are avoided." Therefore, one possibility is that speakers of Crow who choose to translate both *-daachi* or *-dahku* using the aspectually vague English construction 'keep on' may do so to avoid implicatures produced by more precise English sentences. Another possibility is that speakers may simply be unable to easily pin down the precise meanings. Given the uncertainties of the descriptions, the two aspectual markers warrant further investigation and the initial insights and observations of Graczyk provide an ideal place to start.

3.2 Towards documenting co-speech gesture as semantic data

In initial investigations, the first author provided hypothetical scenarios in English before asking for acceptability judgments of selected Crow sentences to distinguish between *-daachi* and *-dahku*. Examples (3a) and (3b) come from Cyle Old Elk. Here, Cyle was provided a discourse context and

daachí in parallel with their verbal counterparts, both of which occur as independent words and are glossed as 'remain'.

[10]The suffix *-daachi* has the suppletive plural form *-kaa*.

[11]Most of the data that Graczyk (2007) provides in his grammar of Crow come from texts and so occur within context. However, many of the texts that he uses are not easily accessible, meaning that other researchers are not able to look at the surrounding context.

then asked, based on the given context, if he could say *xaláalaachik* (with *-daachi*), *xaláalahkuk* (with *-dahku*), or both.

(3) Context: I wake up in the morning and I see that it is raining. Throughout the entire day, the rain does not stop at all. When I go to bed at midnight, I see that it is still raining. I tell my mom, "It keeps on raining."

a. chiláakshee-sh b-itchée-m kukáa kan-xaláa-**laachi**-k.
morning-DEF 1A-wake-up-DS from now-rain-daachi-DECL
'It has been raining since I woke up this morning.'

b. chiláakshee-sh b-itchée-m kukáa kan-xaláa-**lahku**-k.
morning-DEF 1A-wake-up-DS from now-rain-dahku-DECL
'It has been raining since I woke up this morning.'

(Cyle Old Elk; Cyle_070219_000.wav: 1:05:37–1:07:40)

In what was a single elicitation, Cyle indicated that "you could do both"; that is, both *-daachi* and *-dahku* are compatible with the discourse context. However, this is just one context and therefore does not prove that they are synonymous; it only means that we still have work to do in understanding exactly how the two forms differ. Even in this single context, as Bochnak and Matthewson (2020:266) writes, "[t]here is always the risk that the consultant could still envision extra context beyond what the fieldworker verbally describes." As such, the data in (3) represents one of the first steps towards testing additional and perhaps more precise contexts, and supplying a context and then asking for speaker judgments is only one of several elicitation tools a fieldworker has access to, so it may be worth considering other methods as well.

In particular, our investigation on aspect continues with an eye towards co-speech gesture. In an elicitation session with another Crow speaker, Jack Real Bird, the verb *awáache* 'sit down' was first elicited. Jack was then asked whether it is possible to employ *-daachi* and *-dahku* for that verb and if so, what meanings arise. Jack indicated that *ámmaache* 'I sit down', inflected for first person, can indeed occur with *-daachi* and *-dahku*, as in (4a) and (4b). The translations he provided for both phrases were 'I keep on sitting', which do not help to distinguish between the two sentences.

(4) a. ámmaat-**baa(l)ichi**-k
1A.sit.down-1A.daachi-DECL
'I keep on sitting' (Jack Real Bird; Jack_072519_002.mov)

b. ámmaat-**baakuhku**-k
1A.sit.down-1A.dahku-DECL
'I keep on sitting' (Jack Real Bird; Jack_072519_002.mov)

By examining co-speech gesture and the organization of conversation, we obtain important clues into the differences in semantics between (4a) and (4b). Our claim is that the use of iconic gestures represents different abstract grammatical meanings of the two aspectuals: (i) *-daachi*, which expresses continuative aspect, is associated with gestures that represent a single sitting event over an extended period of time, and (ii) *-dahku*, which denotes iterative aspect, is punctuated by gestures that are comprised of small vertical movements. Thus, our analysis is in concordance with the descriptions of the two aspectuals provided by Graczyk. In what follows, we examine the interactions

during the elicitation session between the first author and Jack and provide empirical support for our claims.

4 Data and methodology

4.1 Data collection

The elicitation session with Jack Real Bird described above took place outdoors in his yard in Lodge Grass, Montana. During the session, a Sony FDR-AX53 video camera was mounted on a tripod and positioned facing Jack at a slight angle. The first author was seated directly opposite Jack with a pen and notebook. However, as seen in Figure 1, only Jack can be viewed within the frame of the video. Jack was also fitted with a lapel microphone that was connected to a Zoom H4n Pro recording device, providing audio from which to transcribe Jack's speech more accurately than via the use of video cameras alone. In total, there are approximately sixty-two minutes of video recordings and seventy-four minutes of audio recordings collected of this particular elicitation session.

Figure 1: A still image from the video recording featuring Jack Real Bird.

The video data feature the first author as a participant, which has several distinct advantages. By being a participant, he is familiar with the setting in which the interactions take place. Although he is not seen within the frame of the video, he is able to recall a portion of his own embodied actions that may have affected Jack's own actions, verbal or otherwise (see Goodwin 2017 on how new actions are built from existing ones).[12] He also has an awareness of the types of meanings that he intended to convey and how he interpreted Jack's speech and gestures. Moreover, if there are any questions about a particular video segment, he can ask Jack for his insights.

4.2 Methods

To analyze the data and provide support for our claims, we employ discourse analysis and gesture analysis. To our knowledge, these methods have not yet been applied to study the discourse practices and patterns between the linguist and the language consultant during direct linguistic elicitation sessions. Although linguistic elicitation sessions target constructions that are in isolation or prompted

[12] Still, it is not possible to completely rule out gesture mimicry as a confounding factor.

by a visual or verbal stimulus and not typically regarded as 'naturally occurring' language, the elicitation itself is a situated, interactional setting which serves as the semiotic and contextual field in which actions and interpretations are (co-)constructed (see Gumperz 1982 on contextualization and Goodwin 2000 on semiotic fields). Regarded as such, the elicitation session constitutes a rich site to study how meanings are conveyed and understood between the co-participants of the speech activity – that is, the linguist and the language consultant – through gesture and speech. Therefore, while recording gesture enables one to analyze data better because gesture can provide clues into meaning, it is also important to consider how meaning is conveyed between the consultant and linguist in interaction.

Much of the gesture literature is concerned with treating communication as a fundamentally embodied phenomenon; that is, how people organize and employ their bodily resources (e.g. facial expressions, gaze, posture, and manual movements) and their material surroundings to construct meaning. Although discourse analysis has traditionally focused on the micro-level details of a verbal interaction (e.g. overlapping speech, timing of pauses, management of prosody; see Gordon 2015 for an overview of discourse analysis), increasing attention has been paid to the alignment of gesture with discourse structure. For example, eyebrow raises have been shown to reliably align with sentence focus, much like pitch accents (Flecha-García 2010), and mutual gaze has been shown to be a reliable predictor of turn transitions (Jokinen, Nishida, and Yamamoto 2009; Jokinen, Furukawa, Nishida, and Yamamoto 2013). Despite the emergent turn toward multimodal discourse analysis, the field has yet to take full advantage of considering the contribution of gesture to semantics.

To present the alignment between gesture and grammatical meaning as clearly and carefully as possible, we restrict our focus to gestures that co-occur with elicited Crow constructions involving the verb *ámmaache* 'sit down'. This case study provides a three-minute episode of verbal and embodied interactions between the linguist and the language consultant, Jack Real Bird. The verbal interactions are transcribed using an adapted version of the 'Santa Barbara School' transcription conventions (Du Bois, Schuetze-Coburn, Cumming, and Paolino 1993; see Appendix A).

Gestures – specifically hand and arm movements – were coded for GESTURE PHASE, ORIENTATION, HAND SHAPE, and MOVEMENT. We follow Kendon (1980) and McNeill (2005) in dividing each gesture into several phrases that maximally include PREPARATION, PRE-STROKE HOLD, STROKE, POST-STROKE HOLD and RETRACTION. The stroke is considered the nucleus of the gesture in which most of the gesture's energy and meaning is concentrated. Pre- and post-stroke holds denote still portions of the gesture immediately preceding and following the stroke. Preparations are non-meaningful movements performed in order to appropriately position the hands for a proceeding gesture stroke. Retractions are also non-meaningful movements that return the hands to a neutral or rest position.[13] Gesture segmentation and speech alignment were transcribed using ELAN (Wittenburg, Brugman, Russel, Klassmann, and Sloetjes 2006), a time-alignment annotation software that allows researchers to use a series of tiers for different gesture and speech variables. Our transcription included two tiers for speech (one for each participant), three tiers for gesture phase (one for each form of handedness – left, right, both), and three for gesture description. A screenshot demonstrating a full annotation of a left-handed gesture sequence is given in Figure 2.[14] Lastly, hand shape and movement are described qualitatively following the tradition of considering gesture as simulated action (see Hostetter

[13] See Bressem and Ladewig 2011 for a comprehensive description of gesture phases and best practices for annotation.

[14] The gesture annotation scheme employed in our study is a simplified version of the three-tiered system used in Kipp, Neff, and Albrecht 2007.

and Alibali 2008).

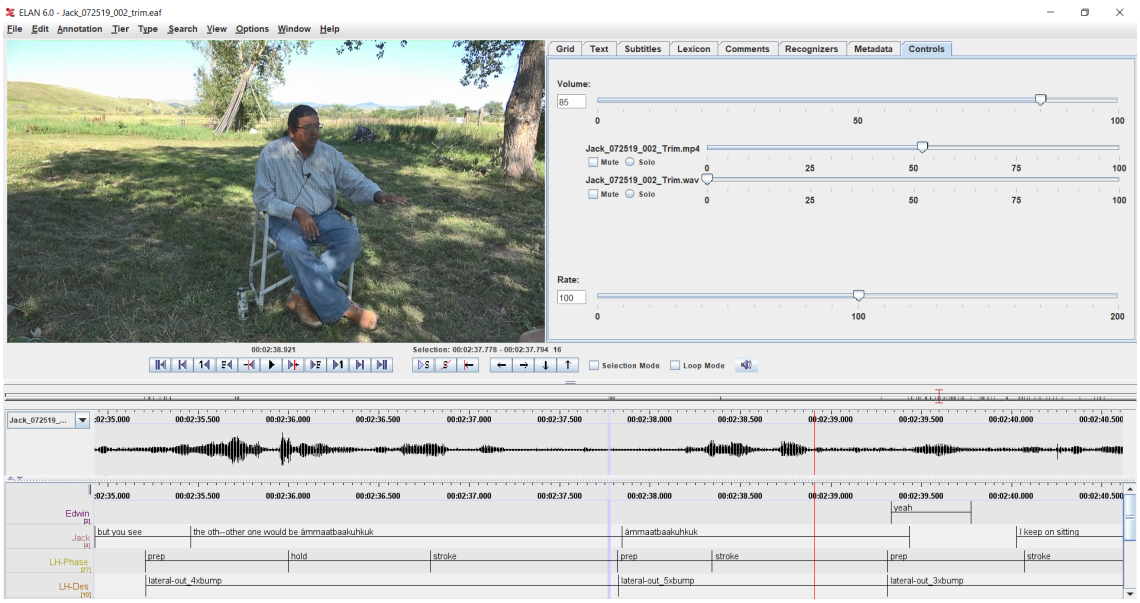

Figure 2: A screenshot of a portion of our annotations in ELAN, demonstrating the use of speech tiers and the gesture phase and description tiers for left-handed gestures. The alignment between the LH_Phase (left-hand phase) and LH_Des (left-hand description) tiers shows how a single gesture, as segmented in LH_Des, includes multiple gesture phases, as segmented in LH_Phase.

In total, there are eight gestures that overlap with either a Crow utterance involving the relevant aspectuals or an English translation. The elicitation session with Jack was selected because it was one of the few video recordings of an elicitation session and the only one that involved investigating aspect in Crow; the first author was eliciting place names and terms for specific geographical features at the beginning of the session with Jack (for which video recording was particularly helpful), and the choice to study co-speech gesture had not yet been made. Thus, future work should examine co-speech gestures produced by the same speaker as well as other speakers of Crow in investigations of aspect so as to further assess the reliability and validity of the claims presented in this paper. Despite this shortcoming, the focus on the gestures of a single consultant can still be a fruitful endeavor.

Meaning-making is a situated and dynamic phenomenon that is located within a participant framework alongside specific communicative goals (Goffman 1974, 1981; Goodwin and Goodwin 2004). In an elicitation session, a linguist works with a speaker to accomplish specific tasks and each individual takes up specific roles and alignments that allow them to make sense of the speech event. Thus, even if certain gestures are infrequent, we should not be quick to disregard them as random, one-off movements, just as speech is not typically regarded as random, one-off utterances. Instead, co-speech gestures constitute a type of "deliberately expressive movement" (Kendon 2004:12) that elaborate on other important meaning-making resources, such as speech and the artifactual environment (Goodwin 2017).

5 Semantic elicitation: A look at co-speech gesture

To begin, we contrast and compare two interactions in 5.1, one in which a discourse context was not provided at all (i.e. an 'out-of-the-blue' context) and one in which a discourse context was supplied. Specifically, we analyze the elicitation techniques and discourse strategies of the linguist and the language consultant within these two interactions. In 5.2, we turn our attention to interactions where gestures are produced in the context of the aspectuals *-daachi* and *-dahku*. We suggest that *-daachi* corresponds with gestures that iconically depict a single sitting event over an extended period of time – that is, a continuous state or activity. On the other hand, *-dahku* corresponds with more complex gestures that are comprised of repeated vertical movements and serve as iconic depictions of the way in which Jack construes the structure of the event – one that involves iteration rather than continuity. Thus, clues to the abstract grammatical meaning of individual sentences may be found in the way speakers gesture.

5.1 Eliciting with and without a discourse context

In the interaction given in (5), Edwin and Jack had just been discussing the Crow word *ámmaat-baaichik* 'I keep on sitting', which contains the continuative aspectual suffix *-daachi* inflected for first person. (The Crow aspectuals *-daachi* and *-dahkuk* appear in bold within the transcripts.)

(5)

1 Edwin: (4.0) And then can I also say (0.6) *ámmaat* (3.2) *baa*: (1.0) how would you say that?
2 (.) Like *baalahkuk*. (0.7) or *ba-* (0.7) *bakuk*. (1.2) Like /t^{h}ə:/- (.) You know how (.)
3 so /x/- there's *xaláa**laachi**k* and *xaláa**lahku**k*. (1.2) How would I say (0.7) I- I kept
4 on sitting with the- the: (1.6) /l/ (.) *akuk* something like that.
5 Jack: (1.3) Mm, no.
((Shakes his head.))
6 Edwin: =No.
7 Jack: (0.8) *Ámmaachi- ámmaat**baaichi**k*.
8 Edwin: So I can't say something like *ámmaatbaa-* (0.9) ***baakuhku**k* or something.
9 Jack: Mm you can?
((Squints his eyes and produces a wry expression.))
10 Edwin: Uhuh.
11 Jack: *Ámmaat**baakuhku**k*. (1.3) Yeah, I guess you can say it like that.
((Nods slightly.)) ((Nods more energetically.))
12 Edwin: (2.7) The meaning
13 Jack: It's still the same.
14 Edwin: Yeah (1.7) so-
15 Jack: It's a certain way of saying it?
((Raises his left hand with his palm facing up and lowers it onto his knee.))
16 Edwin: I see.

(Jack_072519_002.mov: 00:53–01:44; Video 1)

At lines 1–4, Edwin attempts to conjugate the verb *awáache* 'sit down' with the suffix *-dahku* for first person, but stumbles and is unable to formulate the Crow form. (The agreement pattern of

-dahku is highly irregular.) The "like"-prefaced design of his utterances (line 2) attempts to first approximate the form ("*baalahkuk*") and then to approximate the meaning; these non-commitments along with his lengthy pauses signal his uncertainty. However, Edwin abruptly shifts to discussing *xaláalaachik* and *xaláalahkuk* 'it keeps on raining' (lines 2 and 3), accompanied by the sentence-initial discourse marker "you know" indicating shared knowledge between the two participants (Schiffrin 1987:267–274). (At the beginning of the elicitation, Edwin had recalled a previous session over a month ago that was only audio recorded (Jack_060619_000.wav) and involved *xaláalaachik* and *xaláalahkuk* 'it keeps on raining', in which the former was characterized by Jack as "a continuous rain" and the latter as "hit-and-miss".)

Edwin endeavors to proceed with eliciting Jack's judgments on the target construction even though he is unable to provide the Crow form or the specific English meaning without influencing Jack's responses. Note that Edwin also does not provide a discourse context. Instead, he assumes that Jack has picked up on the differences in form between *xaláalaachik*, with the continuative *-daachi*, and *xaláalahkuk*, with the iterative *-dahku*, and trusts that Jack can infer the form he has in mind (line 4) – that is, *awáache* 'sit down' and iterative *-dahku* with first-person subject agreement. However, Jack responds negatively (line 5), Edwin repeats his response (line 6), and then Jack follows up by providing the Crow form (line 7) that was discussed just prior to this interaction ("*ámmaatbaaichik*") to indicate its monopoly over the general meaning of 'I keep on sitting'.

A commonly recurring discourse pattern that is found throughout this and other data is the quadripartite sequence that we refer to as Initiation-Response-Repetition-Evaluation (IRRE).[15] First, Edwin initiates by asking a question (lines 3 and 4) and then Jack responds (line 5). At this point, the question-answer sequence can be viewed as complete – but not quite yet. Once Jack provides a response, Edwin repeats it (line 6) and this is followed by Jack providing an evaluation of Edwin's animation of his own response (line 7), such as adjusting Edwin's pronunciation if the utterance is in Crow or providing additional (meta-linguistic) commentary. In this way, Edwin's repetition serves to extend the sequence of turns rather than closing it (Schegloff 2007:126). As a fluent speaker of Crow, Jack holds claim to the epistemic rights and authority to assess and declaratively respond to Edwin's questions about Crow (Heritage and Raymond 2005). Edwin acknowledges this difference, and his latched utterance and respeaking of Jack's response (line 6) display his alignment towards and deference to Jack's speech as authoritative.

Even though Jack already provided a negative response, Edwin tries to verify his judgment by replicating it using another Crow form. Again, Edwin's use of hedges ("something like" and "or something") displays his non-commitment to the form ("*ámmaatbaakuhkuk*") as an actual Crow word. At first, Jack hesitates (line 9), marked not only by the rising intonation but also by his facial expressions. Yet as Jack utters *ámmaatbaakuhkuk* at line 11, his slight nod indicates his affirmation towards its ostensible validity. His nods then intensify as he concretizes his affirmation by stating it verbally ("Yeah, I guess you can say it like that."). As Randolph Graczyk (p.c., 2021) points out, the expected first-person singular form of *dahku* is *baa**ka**hku* and not *baa**ku**hku*.[16] When we reached out to Jack Real Bird (p.c., 2021), he noted that he prefers the form *ámmaatbaakahku* over *ámmaatbaakuhku* suggesting that during the session, he may have been accommodating for Edwin's pronuncation of *ámmaatbaakuhkuk*.

[15]The IRRE pattern is reminiscent of the tripartite sequence Initiation-Response-Evaluation commonly found in classroom discourse (Cazden 2001).

[16]In fact, later in the same elicitation session, Jack employs the expected form, *baakahku*, with the verb *ishtáxpua* 'close eyes'.

At line 12, Edwin's utterance, which noticeably lacks a rising intonation typical of questions, still carries the illocutionary force of one as evident by Jack's response at line 13 ("It's still the same."). Here, the function of "still" presupposes the existence of a specific meaning that can be understood as the one associated with *ámmaatbaaichik* (see 7) – that is, within the general semantic realm of 'I keep on sitting'. Just as Edwin was about to follow up on his response (line 14), Jack offers a speculation on the usage of *ámmaatbaakuhkuk* (line 15). In this case, the subject pronoun "it" refers to the form, while the object "it" refers to the meaning.

The significance of (5) is twofold. First, it highlights the importance for fieldworkers who attempt to produce utterances in the target language and ask for judgments to first double-check the accuracy of the form.[17] Second, it emphasizes the challenge of eliciting sentences in isolation and asking the language consultant directly for its meaning relative to other forms that may be semantically similar. Directly eliciting meta-linguistic commentary can sometimes be insightful, but it is often not sufficient. While Jack acknowledges that *ámmaatbaakuhkuk* fits within the domain of 'I keep on sitting', he is unsure how it is distinguished from the other forms, such as *ámmaatbaaichik*; again, his uncertainty is signaled by the rising intonation he employs.

In the stretch of talk given in (6), which takes place shortly after (5), Edwin provides Jack with a scenario and asks if he prefers *ámmaatbaaichik* or *ámmaatbaakuhkuk* within the given context.

(6)

1 Edwin: So (.) for (0.7) for the, for the I keep on sitting? (1.6) Is there one that describes where
2 (.) you know let's say you're just like sitting here: and you've /sə/- you've sat here
3 for like an entire day.
4 Jack: Mhm.
((Nods.))
5 Edwin: And someon- and you say oh (.) you know (.) I've kept on sitting. Or I- like I stayed
((Dog whines.)) ((Jack nods.))
6 seated. (0.8) Would you say (0.5) *ámmaat**baaichi**k* or would you say *ámmaat**baakuhku**k*.
7 Jack: (0.6) *Ámmaat**baaichi**k*.
((Shifts his gaze slightly to the left.))
8 Edwin: =*Ámmaat**baaichi**k*.
9 Jack: =Would be easier?
((Hands move out from center palms up.))
(Jack_072519_002.mov: 02:07–02:34; Video 2)

At lines 1–3, Edwin begins to construct the context and continues at line 5, marked by prefacing the turn with the connective *and*. Here, Edwin shifts between two animation tiers. In one tier, Edwin speaks as himself as he places Jack within a fabricated, but realistic, scenario ("you've sat here for like an entire day"). In the other tier, Edwin speaks as Jack as a figure within the scenario and by

[17] An anonymous reviewer notes that "[c]onsultants may also accept infelicitous or even flatly ungrammatical constructions, cop to inaccurate glosses, or the like simply to appease a researcher or be regarded as especially helpful." The anonymous reviewer further suggests that the question 'Could I say...' posed by a linguist who is not fluent in the target language may elicit a different response from a question framed using the second person 'Could you say...'. Thus, it is worth considering how viewpoint may affect a speaker's response when formulating elicitation questions.

animating Jack, Edwin highlights the target construction ("I've kept on sitting"). Moreover, in addition to the more general sense of 'I've kept on sitting', Edwin provides another target construction as an option, prefaced with "or" – "I stayed seated", which can be understood as more specific than the ambiguous "I've kept on sitting".[18]

In English, the disjunct "or" can give rise to inclusive and exclusive meanings. Within this interaction, however, "or" has an inclusive reading (see Schiffrin 1987:177–181). Thus, the options that are made available to Jack are the ambiguous 'I've kept on sitting' or the more specific 'I stayed seated', or both.[19] This is followed by Edwin presenting Jack a choice between two forms: *ámmaatbaaichik* or *ámmaatbaakuhkuk*. By virtue of being a language expert and being familiar with working with the first author, Jacks holds the epistemic authority and agency to construct his own responses to questions even if they may be in the form of a forced-choice task. As in previous elicitation sessions, Jack will sometimes indicate whenever both or neither forms are appropriate. In this way, there are implicitly at least two other choices: both and neither.

After a brief pause, Jack responds with *ámmaatbaaichik* (line 7), Edwin repeats his response (line 8), and then Jack provides additional commentary (line 9). As in (5), we again find the quadripartite IRRE sequence (lines 6–9). At line 9, Jack frames his assessment ('Would be easier?") in terms of relative ease, but his utterance is accompanied by rising intonation, which again indicates a degree of uncertainty. As this interaction shows, Jack asserts his preference for *ámmaatbaaichik* over *ámmaatbaakuhkuk*, and supplying a scenario allows us to gain a clearer understanding of the meaning of *ámmaatbaaichik*; that is, the use of *-daachi* seems to be compatible with a continuous activity or state. To briefly summarize, these two interactions serve to illustrate how context can aid in providing a common ground.

5.2 Gesture iconicity and grammatical aspect

Having discussed particular issues that arise during semantic elicitation as well as some notable discourse patterns that emerge within interactions between Edwin and Jack, we now examine interactions that involve iconic gestures that represent abstract grammatical notions of Crow utterances. In the interaction provided in (7) below, Edwin and Jack have just finished investigating quantification and Edwin elicits the construction 'I keep on sitting' in Crow.

(7)

1 Edwin: Um and I wanted to ask about (.) um so let's say that (0.6) um (1.2) for the word to sit
2 (2.3) *awáachik*. (1.5) If I said (1.7) */awa:la:ʔə/- (1.2) what was it? (1.0) How would
((Jack nods.))

[18]The construction *keep on* appears to be ambiguous between two readings: a continuative and an iterative. In the continuative reading of *Logan keeps on sleeping*, Logan remains asleep for some period of time. In the iterative reading, there are multiple sleeping events. In an earlier version of this paper, we indicated that *keep on V-ing* is a hypernym of *stay V-ing*, but this is not the case. For example, the sentence *Logan stays sleeping, but Logan does not keep on sleeping* is not necessarily contradictory if (a) *Logan does not keep on sleeping* is understood as involving multiple sleeping events, and (b) Logan fell asleep once and remained asleep. If, on the other hand, *Logan does not keep on sleeping* is understood to involve a stative reading, then the entire sentence is indeed interpreted as a contradiction.

[19]The option for both is distinct from the other two options because it is possible that Jack may have interpreted 'I've kept on sitting' with an iterative reading.

3 you say to (.) like (.) to keep on sitting?
4 Jack: (2.3) *Ámmaat**baaichi**k*.
5 Edwin: (1.8) *Ámmaat**baaichi**k*.
6 Jack: That's to keep on [sitting. (1.9) I've sat a long time. *Ámmaache shíak*. (1.5)
7 Edwin: [So I keep on sitting.
8 Jack: [*Ámmaache* is to sit, (1.5) *shíak* is long.
((Palms lower.)) ((Left arm extends leftward.))
↳See Figure 3. ↳See Figure 4.
9 Edwin: [*Ámmaache*. =*Shíok*.
(Jack_072519_001.mov: 16:45–17:05, Jack_072519_002.mov: 00:00–00:29; Video 3)

Figure 3: Pre-stroke hold and post-stroke hold of the two-handed push down gesture aligned with an English translation of *ámmaache*, "to sit" (Ex.7, line 7).

Figure 4: Pre-stroke hold, stroke, and post-stroke hold of the lateral sweep aligned with an English translation of *shíak*, "long" (Ex.7, line 7).

At the beginning of the episode, Edwin introduces the Crow word 'to sit' using the form *awáachik*, a combination of *awáache* 'sit down' and declarative *-k* (lines 1 and 2). After he attempts (and fails) to produce the well-formed Crow form *awalaachik* 'he/she keeps on sitting' (he wrongly produces */awa:la:ʔə/-), Edwin asks Jack how to say "keep on sitting" in Crow (lines 2 and 3). Jack responds with the Crow *ámmaatbaaichik* 'I keep on sitting', which contains the continuative aspectual suffix *-daachi* and both the verb and the suffix are inflected for first person (line 4). Edwin repeats his

response (line 5) and Jack follows up by providing an English translation at line 6 ("That's to keep on sitting."). However, Jack later offers a different Crow sentence *ámmaache shíak* 'I've sat a long time'. He decomposes the sentence into what he conceives as distinct linguistic units – *ámmaache* and *shíak* – and proceeds to supply an English translation for each one ("*Ámmaache* is to sit, *shíak* is long."). At the same time, Edwin partially repeats Jack's speech in his overlapping and latched utterances which altogether displays his alignment towards Jack's speech as authoritative (lines 8 and 9).

At first blush, the sudden shift from talking about *ámmaatbaaichik* 'I keep on sitting' to *ámmaache shíak* 'I've sat a long time', which ostensibly bears a different meaning, seems unexpected. Why does Jack suddenly offer a different Crow phrase from the one under discussion? We highlight two key properties of the interaction that shed some light on this question. The first involves the way in which Jack's utterances at lines 6 and 7 are organized and unfold over time. At the start of line 6, Jack offers a meta-linguistic evaluation – a translation – in English of the Crow form *ámmaatbaaichik* ("That's to keep on sitting."). The translation serves to approximate the meaning of *ámmaatbaaichik* in English. After a short pause, Jack offers a similar but different English sentence ("I've sat a long time."). Note that the meaning of this sentence is one of the possible interpretations of the ambiguous "I've kept on sitting". In other words, Jack's utterance of "I've sat a long time" is an attempt to elucidate the meaning of *ámmaatbaaichik*. Finally, he translates "I've sat a long time" into Crow as *ámmaache shíak*. Jack's utterances therefore consist of a series of small steps traversing through a semantic space that gets mapped onto English and Crow forms along the way. In this way, each member of the sequence "*Ámmaatbaaichik*" > "I've kept on sitting" > "I've sat a long time" > "*Ámmaache shíak*" is constructed using the semantic resources of the preceding utterance.

The second key property involves the position of Jack's turn within the the larger sequence of turns. Specifically, the exchanges in lines 2–6 correspond to the familiar IRRE sequence also found in excerpts (5) and (6) and point to the relevance of Jack's utterances in lines 6 and 7 within the interaction whose overarching goal is to answer the question posed by Edwin. First, Edwin initiates by asking a question (lines 2 and 3) and then Jack responds with an utterance in Crow (line 4). After Edwin repeats Jack's response (line 5), Jack then provides additional commentary (lines 6 and 7). In this way, the Crow sentence that Jack provides ("*Ámmaache shíak*") at lines 6 and 7 should not be interpreted as irrelevant and a violation of Grice's (1975:46) Maxim of Relation: "Be relevant." Rather, his utterance should be understood as being relevant by way of constituting part of his evaluation of *ámmaatbaaichik* and by way of being semantically similar to *ámmaatbaaichik*.[20]

Having discussed the verbal component of lines 6 and 7, we now turn to the gestures Jack coproduces while uttering "*Ámmaache* is to sit, *shíak* is long". Like his speech, his gestures depict the manner and duration of the sitting event. The first gesture aligns with Jack's utterance "*Ámmaache* is to sit". Here, he performs a two-handed open palm gesture, lowering down-turned hands to his lap (Figure 3). The gesture's stroke (indicated by the red arrows) iconically represents the downward movement involved in sitting, and the post-stroke hold is self-referential to Jack's own sitting position. It is important to note that this gesture portrays only a single sitting event.

The second gesture occurs with the utterance "*shíak* is long". As shown in Figure 4, Jack performs an asymmetric two-handed tracing gesture, beginning with his index fingers held together in front of his body, and moving his left hand outward in a lateral sweep to its full extension. His

[20]In fact, in a follow-up, Jack shares the same interpretation after viewing the video segment: that *ámmaache shíak* is indeed semantically similar to *ámmaatbaaichik* and more so than between *ámmaache shíak* and *ámmaatbaakuhkuk*.

right hand remains in the initial position (indicated by the red circles in the images), held up directly in front of his body as his left hand metaphorically traces the event's duration along a right-to-left virtual timeline.[21] Therefore, this gesture is considered to be kinesically simple: it is uni-directional and occurs with slow, controlled movement. Together, these two gestures represent the manner and temporality of *ámmaache shíak* – a single sitting event spanning some period of time. Although the gestures are co-produced with *ámmaache* and *shíak* (and into the English translations), we have discussed how *ámmaatbaaichik* and *ámmaache shíak* are in fact semantically alike. Thus, we suggest that the iconic representation produced by the pair of gestures also corresponds with *ámmaatbaaichik*, either directly or indirectly. We leave it for future investigation to determine whether such gestures may directly co-occur with *ámmaatbaaichik*.

The excerpt in (8) immediately follows the interaction in (6) and in the following exchanges, Jack and Edwin are seen contrasting *ámmaatbaaichik* with *ámmaatbaakuhkuk*. Here, Jack employs the vivid use of gestures to convey his construal of the event of *ámmaatbaakuhkuk*.

(8)

Jack: But you see the oth- the other one would be
*ámmaat**baakuhku**k*.
((Left arm extends leftward as left hand pulses up and down.))
[*Ámmaat**baakuhku**k*.
((Left arm extends leftward as left hand pulses up and down.))
↳See Figure 5.
Edwin: [*Ámmaatba-*
Yeah.
Jack: I keep on sitting.
((Left arm extends leftward as left hand pulses up and down.))
Edwin: So it's kind of like if I (.) got up, (.) and then [sat back down, (.) got up, (.) [and sat
((Raises from his chair and sits back down twice.))
Jack: [Yep. [Yep.
((Nods.)) ((Nods.))
Edwin: back down?
Jack: =Yeah, [that's, that's *ámmaat**baakuhku**k*.
((Left hand raises then moves leftwards palm center, pulses up and down.))
Edwin: [Okay. =O:kay.
Jack: That's the act of (0.9) [sitting up, sitting [up, standing up, sitting up, s- that's (.) that's
((Energetically raises and lowers, left hand palm up.))
↳See Figure 6.
Edwin: [Of. [Mm.
Jack: how you explain that part.
((Both palms up in front, beats for emphasis.))
Edwin: Yeah.

[21]English speakers typically move their hands from left-to-right to express a change in time (Casasanto and Jasmin 2012). Here, Jack does the opposite. There are two potential factors at play: First, Jack is left-handed, making movement from the center leftward more natural. Second, the gesture may be influenced by the dimensional use of *shíak* by depicting a physical length (see Cooperrider et al. 2014 for discussion of cross-linguistic variation in time gestures).

16 Jack: But the other one would be *ámmaache shíak*. (.) I sat a long time.
((Again, palms up front with beats))

17 Edwin: =Okay.
(Jack_072519_002.mov: 02:34–02:59; Video 4)

At line 1, Jack prefaces his utterance with "but you see", signaling a shift in focus of the conversation – that is, a shift in attention from *ámmaatbaaichik* to *ámmaatbaakuhkuk*. In saying "the other one", Jack also acknowledges that the elicitation task at hand involves a comparison between at least two grammatical forms. The form *ámmaatbaakuhkuk* is uttered two consecutive times and each time, it is accompanied by a series of repetitive outward lateral sweeps. The first is relatively small, while the second, which is shown in Figure 5, is performed more confidently and involves a full extension of the arm. Unlike the slow and flat lateral sweep performed with *shíak*, these sweeps are fast and punctuated by small vertical movements, as if moving across a bumpy surface. Also unlike the *shíak* gesture, Jack performs this series of gestures with an open down-turned palm. Therefore, this series of gestures simultaneously depicts the manner and duration of the sitting event: the lateral movement metaphorically conveys a span of time, whereas the downward facing palm and small vertical movements iconically depict the up and down motion of sitting multiple times.

Figure 5: Pre-stroke hold, stroke, and post-stroke hold of the punctuated lateral sweep aligned with *ámmaatbaakuhkuk* 'I keep on sitting' (Ex. 8, line 3).

At line 6, Jack offers the familiar English translation "I keep on sitting". Although the translation itself does not reveal much in terms of grammatical meaning of *-dahku*, Jack again provides gestures that share striking similarities to those that co-occur with *ámmaatbaakuhkuk*. In this particular repetition, Jack is using the gesture to convey information about the event to elaborate on the translation. Once again, Jack's verbal interaction alone provides little indication as to the semantics of the Crow phrase. Instead, his gestures carry an abundant amount of semantic information about the temporal properties of *ámmaatbaakuhkuk*.

Edwin attempts to put his reading of Jack's gestures into words and his rising intonation invites Jack to assess it (lines 7 and 8). Jack's overlapping and latched utterances as well as his head nods display his agreement towards and acceptance of Edwin's interpretation (lines 9 and 10). Again, Jack performs another series of gestures alongside the phrase "that's, that's *ámmaatbaakuhkuk*", where the demonstrative "that" refers to Edwin's reading of Jack's gestures ("it's kind of like if I got up, and then sat back down, got up, and sat back down"). However, at the start of line 12, "that" has a different reference – namely, *ámmaatbaakuhkuk* in his previous utterance – and directly following

Jack's explanation of the meaning of *ámmaatbaakuhkuk* ("That's the act of sitting up, sitting up, standing up, sitting up") are two additional instances of the same demonstrative ("that's how you explain that part"). The first is used as a subject pronoun and references Jack's explanation, which the demonstrative immediately follows. The second is used as a determiner, as in "that part", which has as its referent the meaning of *ámmaatbaakuhkuk*.

Note that Edwin's interpretation of Jack's earlier gestures (line 7) specifically targets the occurrence of repeated sitting events rather than their temporal property, which is indicated by the lateral movements as seen in Figure 5. As Jack explicates the meaning of *ámmaatbaakuhkuk* (line 12), he moves his arm in large vertical pulses, flexing and extending at the elbow, as seen in Figure 6. Unlike the first series of *ámmaatbaakuhkuk* gestures which conveyed information about the manner and duration of the sitting events, the repetitive vertical pulses in this instance depict only manner – that is, the iterative nature of sitting down multiple times. Hence, this gesture can be regarded as less complex than his previous gestures that also encode temporality via movement across the lateral axis. Crucially, this gesture does not reflect Jack's own unprompted interpretation of *ámmaatbaakuhkuk*, and at no point align with the Crow word itself. Jack only simplifies his gesture when asked to clarify a particular part of the event.

Figure 6: Pre-stroke hold, stroke, and post-stroke hold of the large vertical pulse aligned with "that's the act of sitting up, sitting up, standing up, sitting up" (Ex. 8, line 12).

Finally, at line 16, which is prefaced with "but", Jack contrasts *ámmaatbaakuhkuk* with an alternative – *ámmaache shíak*. Note that the earlier comparison was between *ámmaatbaaichik* and *ámmaatbaakuhkuk*.[22] (Again, the interaction in (8) occurs directly after (6).) Why does Jack refer back to *ámmaache shíak* 'I've sat a long time' but not *ámmaatbaaichik*, which was mentioned just prior to this particular interaction? As we have suggested, *ámmaatbaaichik* and *ámmaache shíak* are semantically alike and, perhaps, so much so that Jack appears to employ both forms interchangeably. As such, the comparison in meanings is between (a) both *ámmaatbaaichik* and *ámmaache shíak*, and (b) *ámmaatbaakuhkuk*. The former set encodes a continuative meaning, whereas the latter encodes iterative meaning.

Our analysis shows that the difference between *ámmaatbaaichik* and *ámmaache shíak* on the one hand and *ámmaatbaakuhkuk* on the other can be observed when attention is paid to how the

[22] In contrast to the other interactions, the exchanges in (8) consist of noticeably fewer silent pauses within and in between turns. It is likely that Edwin's verbal interpretation of Jack's gestures instills some excitement within Jack since he was previously unable to spell out the meaning of *ámmaatbaakuhkuk* in words.

language consultant gestures as they attempt to explain the meaning of the different forms. The right-to-left lateral sweeps that accompany both *shíak* and *ámmaatbaakuhkuk* metaphorically convey that both events are durative, occurring over a span of time. However, the difference in complexity of the lateral movements illustrates a difference in the internal structure of the two events that is not captured in speech until after several attempts at clarification. The lateral movements aligned with *ámmaatbaakuhkuk* are punctuated by small vertical beats, iconically depicting the iterative internal structure of the event. By contrast, although *ámmaatbaaichik* and *ámmaache shíak* are not accompanied by semantic gestures to the same degree of frequency, in the one instance of a clearly associated semantic gesture, the lateral movement is deliberate, slow, and flat, iconically depicting a continuous state of sitting. In sum, co-speech gesture ultimately functions as an additional type of indirect clue that can enrich the verbal interaction and may be helpful for (semantic) fieldworkers investigating particular semantic phenomena.

5.3 Gesture and discourse structure

There are also several points during the video segment where Jack performs what Kendon (2004) refers to as 'pragmatic gestures'; that is, gestures that relate to the social interaction rather than the content of the discourse.[23] Though pragmatic gestures may share formal features with semantic gestures, such as hand shape, their functions are distinct. Common pragmatic gestures include the 'palm-up open hand' gesture in which speakers present an idea as a virtual object (Müller 2004), and 'beats' which are small vertical movements often considered to be a gestural form of emphasis (e.g. McNeill 2005). Two examples of palm-up open hand gestures that are accompanied by emphatic beats are given in Figure 7.

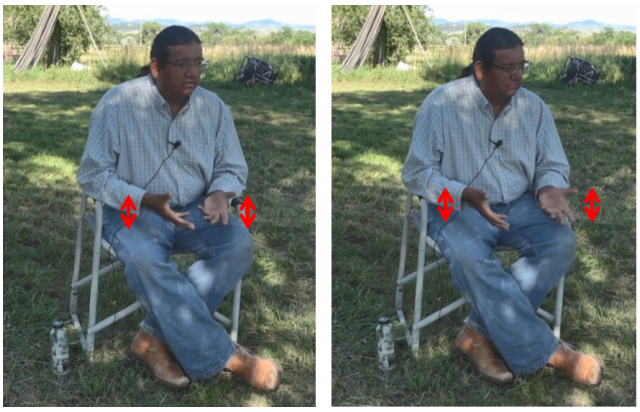

Figure 7: Hand shrugs with beats accompanying "that's how you explain that one" (left; Ex. 8, line 14) and "I sat a long time" (right; Ex. 8, line 16).

The gesture that appears in the left pane of Figure 7 aligns with Jack stating at line 14 in (8), "that's how you explain that one". The gesture that is shown on the right pane of Figure 7 takes place seconds later at line 16 where Jack says "I sat a long time" – here, he repeats the English translation of the contrasting grammatical form. These gestures are nearly identical, consisting of symmetric up-turned palms and small rhythmic vertical movements. Note that while the gesture overlaps with a

[23] See also Bavelas, Chovil, Lawrie, and Wade 1992 for similar discussion of 'interactive gesture'.

translation of the Crow utterance, this particular gesture form, which has been described as a 'hand-shrug', is associated with expressions of obviousness (Debras 2017; Jehoul, Brône, and Feyaerts 2017). In other words, the gesture expresses a discourse-pragmatic meaning rather than a semantic one. As these two gestures occur as Jack summarizes his description of the contrasting grammatical forms, we suggest that these pragmatic gestures – in particular, hand shrugs – indicate the conclusion and coda of Jack's remarks about the differences between *ámmaatbaakuhkuk* and *ámmaache shíak* at that moment, rather than reflecting the semantics of the utterance.

6 Conclusion

Following the works of other field linguists and gesture researchers, we have argued that co-speech gesture provides another angle from which to investigate particular semantic phenomena. By focusing on aspectuals in Crow, we have suggested that gesture constitutes a form of semantic data that can lend insight into speakers' construal of the event structure – and thus, the semantics of the utterances. In Crow, continuative aspect may be associated with gestures that iconically depict a single event that is extended over a period of time, while iterative aspect co-occurs with gestures that involve more complexity and represent repeated events. While this paper is concerned with semantic meaning, co-speech gesture may also be useful in investigating pragmatic meanings (e.g. conversational implicatures) as well as discourse and information structures (e.g. topic- and focus-marking) of utterances. Since gestures are known to be multifunctional (Kok, Bergmann, Cienki, and Kopp 2016), the researcher is thus tasked with disentangling the semantic and pragmatic meaning of a particular gesture.

Naturally, the collection and analysis of co-speech gesture necessarily involve video recording. In fact, as Himmelmann (1998:168) remarks, "[g]iven the holistic view of linguistic behavior, the ideal recording device is video recording" and increasingly, there have been calls for fieldworkers to document video recordings (e.g. Ashmore 2008; Margetts and Margetts 2012; Seyfeddinipur 2012; Seyfeddinipur and Rau 2020). Good (2011:215) describes that some of the choices that are made in recording equipment "may be mostly pragmatic in nature." Others, he reckons, that involve sessions being "deemed to be visually 'uninteresting' may actually be informed by an underlying, if only implicit, theory of recording." As we have argued, documenting and analyzing gestures that are co-produced with speech can be a useful addition to a semantic fieldworker's toolkit. Therefore, elicitation sessions can actually be visually interesting as they contain not only information about the physical appearance of a person's material environment, but also embodied displays of participation that are involved in the meaning-making process. Although it is not always possible to video record, doing so allows for a more enriched documentation record that would provide information, linguistic or otherwise, that would otherwise be lost if only audio were recorded. Thus, we advocate for (semantic) fieldworkers to consider video documentation as a part of their linguistic elicitation workflow.

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Appendix A Transcription conventions

Table A1: Transcription conventions (adapted from Du Bois et al. 1993)

.	falling, or final, intonational contour followed by noticeable pause
?	rising intonation followed by noticeable pause
,	'continuing' intonation
*	grammatically incorrect (restricted to Crow utterances)
-	(self-)interruption, abrupt stop in speech
:	elongated syllable, additional colons indicate longer elongation
/ /	phonetic transcription
Capital letter	start of sentence
(.)	pause (< 0.5 seconds)
(0.5)	pause, timed (in seconds)
(())	researcher's comments
=	'latching', no discernible pause between one speaker and the next
[	separate left square brackets, one above the other on successive lines with utterances or gestures by different or the same speakers, indicate onset of conversational overlap
italics	words spoken in the Crow language
bold	significant portions of the transcript