

Fieldwork Game Play: Masterminding Evidentiality in Desano

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In this paper, we propose a methodology for collecting naturally occurring data on evidentials and epistemic modals. We use Desano (Eastern Tukanoan) as a case study. This language has a complex evidential system with six evidential forms. The methodology in question consists of having Desano speakers to play a logic game, *Mastermind*. In this game one player (the codemaker) places colored pegs behind a screen and the other player (the codebreaker) tries to guess the code, receiving partial feedback from the codemaker through clues after each intermediate guess. In order to offset the unnaturalness of the codemaker's exclusive knowledge of the actual code, we adapt the task to have two codebreakers playing the game jointly and discussing what they know, what the code could/must be, etc. We found that there are several benefits to this method. It provides naturalistic dialogue between multiple speakers, rather than just monologue; utterances naturally vary as to whether speakers in the scenario have access to and interest in what kind of information source the speaker has or simply the conclusion they draw from this information; finally, an important point is that speakers find the task enjoyable. We hope that this study can add the body of literature on methods for collecting naturalistic speech for language documentation and description.

1. Introduction¹ Recent decades have seen a burgeoning interest in the properties of evidentials by descriptive grammarians, typologists, and formal semanticists alike. These works rely principally on data collected either via elicitation (typically felicity judgment tasks relative to context) or naturally occurring examples from narrative or other texts. While elicitation often plays a vital role (e.g., it is the only way to collect *negative* judgments), it is extremely difficult to capture all of the richness of naturalistic discourse in this way, as discussed, for example, by Haviland (2002) and Michael (2008).

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While naturalistic discourse also plays a vital role, it too has some important drawbacks, most notably that its context is often *too* rich. For example, it is often difficult or impossible to know what information source(s) a speaker has for a given claim, how certain they are, and how these and other factors led the speaker to use a particular evidential or modal form. This is especially so in contexts where multiple evidentials are possible in principle (see e.g., Peterson 2010, Faller 2012) or where there are interactions between the use of an evidential and other elements with propositional content, such as lexical expressions of information source and/or epistemic modality.

In this paper, we propose a supplementary methodology which acts a middle ground of sorts: using a relatively constrained task—playing a board game—to encourage natural dialogue. Unlike in elicitation, speakers are free to choose their utterances in accordance with the discourse context. Yet unlike naturally occurring examples, the context is sufficiently constrained that relatively clear conclusions about the speaker’s information source, certainty, etc. can be made. In this way, the proposed methodology allows for data to be collected that is not possible with either traditional technique.

Empirically, we illustrate the value of this method by investigating the evidentials and epistemic modals in Desano, an endangered Eastern Tukanoan language spoken in communities in the Vaupés Region of Brazil and Colombia. The data collected is from Desano speakers from the San José de Viña community (Paca River, Colombia).

This paper is organized as follows: §2 provides a brief overview of the best practices for data collection and a summary of the Desano evidentials. In §3 we describe the use of games for obtaining a constrained naturalistic dialogue targeting evidential and epistemic modals in Desano. In §4 we present some of the data elicited with this task. Finally, in §5, we offer concluding thoughts.

2. Background In this section, we provide a brief overview of the best practices for data collection (§2.1), by showing some limitations in principle and in practice of using only elicitation or only naturalistic speech as source for documenting and analyzing the evidential system. We show that, for Desano at least, it is important that we use a combination of the three in order to comprehensively document the evidential system. We also present a brief overview of the evidential system of Desano as it has been described in Silva (2012).

2.1 Best practices for data collection: to elicit or not to elicit There are a wide variety of methodologies employed by researchers in (formal) semantics/pragmatics, descriptive linguistics, and language documentation. Each of these methods have their strengths and weaknesses and nearly all researchers recognize the need for a diversity of different methodologies, even when approaching a single research question. In this section, we review some of the leading methods, highlighting their various strengths and weaknesses both for linguistic research in general and for the study of evidentiality and epistemic modality in Desano in particular.

In literature on language documentation, these methods are often categorized by the type of ‘communicative event’ that produced the data. For example, Himmelmann (1998:185) distinguishes between three different kind of communicative events, summarized in (i)–(iii) below:

- (i) ‘observed’ communicative events such as narratives, conversations, and other speech where the researcher’s intervention is minimized as much as possible;
- (ii) ‘staged’ communicative events in which the researcher provides a primarily non-linguistic stimulus but otherwise allows for unconstrained monologue or dialogue to take place;
- (iii) ‘elicitations’ in which the researcher is themselves a conversational participant and exhibits a relatively high degree of influence over the content of the event (see also Lüpke 2010).

While this typology is, in principle based on the type of ‘communicative event,’ there is another dimension along which data collection techniques may vary: the kind of task being performed (e.g., telling a story, playing a game, translating words or paradigms). The choice of task is in principle at least somewhat separable from the type of communicative event. In practice, however, the choice in one dimension greatly influences the choice in the other. For example, one is clearly unlikely to encounter an ‘observed’ translation task or completion of a morphological paradigm. This said, it is important for the researcher to keep in mind that, within the category of elicitation, there are important differences between tasks which the communicative event typology alone can obscure.

One commonly used form of elicitation is the translation task, in which words, phrases, sentences, or even larger units of discourse are translated from a language of wider communication into the language being studied. Translation tasks are often accompanied by grammaticality or well-formedness judgments, as these are often used to assess the viability of potential alternative translations. While more or less all researchers recognize the utility of these elicitation-based methods, their limitations are equally well-known. For example, Mithun (2001), Chelliah (2001), and others give numerous examples of cases where translation tasks yield at best an impartial picture.² Among formal semantics/pragmatics researchers too, a similar view of translation tasks is common, with Matthewson (2004), for example, stating that they “should be regarded as a clue rather than a result.”

Such criticisms have led some researchers to more or less write off elicitation as anything but a preliminary method used to supplement ‘observed’ and other more naturalistic data. While sometimes couched at least implicitly as arguments against ‘elicitation’ generally, these critiques, are primarily about the specific task of translation, than about the kind of communicative event per se.

As such, many researchers in semantics/pragmatics have made use of elicitations that instead use a different task: truth-value or felicity judgments relative to a dis-

²As Matthewson (2004) discusses in detail, many of the most egregious cases of elicitation’s limitations arise in translation tasks of units smaller than the sentence.

course context. This method, described in detail by Matthewson (2004), involves describing a (possibly hypothetical) scenario to as speaker either in the language of wider communication or in the language under study (see AnderBois & Henderson 2015 for discussion of this aspect of this task) and a sentence in the language being studied which is already known to be well-formed. This sentence itself can come from a translation task, a native-speaker linguist, a natural occurrence in a text, or anywhere else so long as it is known independently to be possible in *some* context for the the individual speaker in question. The data that is collected, then, is the consultant's judgment of whether or not the sentence is felicitous/true if uttered in the given scenario.

Relative to the tasks more common in observed data and other more naturalistic methods, this type of elicitation has a key advantage: it allows for the researcher to control very fine-grained details of the discourse context. In principle, then, this method is the ideal one to answer the research question we aim to address here: i.e., what combination of epistemic modality, evidentiality, and other elements is encoded and conveyed by evidentials in Desano. This method allows us as researchers to deliberately construct scenarios which manipulate the speaker's degree of certainty and information source independently. Moreover, it allows us to readily test combinations of these factors that are too infrequent to appear in a small or medium-sized corpus of 'observed' data.³ In principle, then, elicitation using context-relative felicity and truth-value judgments is in theory the ideal method for investigating this question (again, see Matthewson 2004 for detailed discussion).

While there is no clear argument in the literature against relying primarily (or even entirely) on felicity judgments in a case like this, we nonetheless believe there are two good reasons why this method is not ideal for present purposes. First, elicitations of felicity judgment tasks are far less useful for a concomitant goal of language documentation (roughly in the sense of Himmelmann 1998, 2006). The sentences the task uses must be already known to be grammatical and so only the pairing of the sentence and context adds to the record of the language. Furthermore, the sentences and contexts are chosen by the researcher and therefore have no claim to being representative of the language, even within a particular domain or genre.

Second, and more fundamentally, elicited felicity judgments can only be fruitfully used if we as researchers already know what factors we want to vary both in the context and in the sentence itself. This is in essence the flip side of the main benefit of the felicity judgment method discussed above. While her critique is not specifically aimed at this method, Mithun (2001:45) makes the following point: "An obvious value of the documentation of natural connected speech is that it permits us to notice distinctions and patterns that we might not know enough to elicit, and that might not even be sufficiently accessible to the consciousness of speakers to be volunteered or retrievable under direct questioning." We illustrate this problem with regards to evidentiality and epistemic modality in Desano presently.

³This is based on thirty-one annotated Desano narratives of different genres (short stories, anecdotes, dialogues, and monologues) in Silva's project database. Audio and video materials for the Desano project are being archived at Museu do Índio/FUNAI-Rio de Janeiro, <http://prodclin.museudoindio.gov.br/index.php/etnias/desano/catalogo>.

Previous descriptions of Desano’s evidential system (discussed in detail in §2.2) document a ‘reasoning’ evidential, *-ka*. To test exactly what kinds of reasoning are consistent with its use, we constructed several scenarios, like (1), to see whether a sentence with *-ka* is judged felicitous.

- (1) Reasoning Scenario: You are sitting inside (and cannot see or hear outside). Your friend Guaho normally comes to see you at this time every day unless she has to chop wood.

While this method yields important data, it only gives us data regarding the combinations we thought to ask about. For example, after thinking for a few seconds about the scenario in (1), the speaker volunteered an extension of the scenario provided by saying, “If someone asks me where Guaho is, I could say [sentences (2) and (3)]”:⁴

- (2) Guaho peatabego wa’boyũmō⁵

Guaho pea-tabe-go wa’a-bo-~**yu**-~bo⁶
 Guaho firewood-chop-3SG.F go-SPEC-**REP**-3SG.F.PFV
 ‘Guaho might have gone to chop firewood (I was told)’

- (3) Guaho peatabego iboyũmō

Guaho pea-tabe-go i-bo-~**yu**-~bo
 Guaho firewood-chop-3SG.F do-SPEC-**REP**-3SG.F.PFV
 ‘Guaho might be chopping firewood (I was told).’

In these examples above, the speaker uses the same evidential in both sentences. The only difference between the two sentences is in the auxiliary verb used *wa’a* ‘go’ in (2) and *i* ‘do’ in (3). Although the scenario was designed to elicit the reasoning evidential, coded by *-ka*, the speaker uses ~**yu**, a morpheme coding “indirect, reported” evidence, usually found in narratives (Silva 2012:258). Both sentences express the speaker’s uncertainty about the proposition, coded by the SPECULATIVE morpheme *-bo*. Other possible sentences provided by the speaker for the *Reasoning Scenario* in (1) are shown in (4) and (5).

⁴Abbreviations used herein are in accordance with the Leipzig glossing conventions. Some additional abbreviations are as follows: ADMON ‘admonition,’ AN ‘animate,’ ASSER ‘assertive,’ CONC ‘concave,’ DEIC ‘deictic,’ DIM ‘diminutive,’ DUB ‘dubitative,’ EMPH ‘emphatic,’ EVID ‘evidential,’ EXIS ‘existential,’ HSAY ‘hearsay,’ INAN ‘inanimate,’ INFER ‘inference,’ INTER ‘interrogative,’ LOC ‘locative,’ NVIS ‘non-visual,’ REAS ‘reason,’ REF ‘referential,’ REP ‘reported,’ SPEC ‘speculative.’

⁵The first line of the Desano four-line examples is given in the practical orthography used by the Desano people.

⁶A tilde ‘~’ before a morpheme indicates that the morpheme is inherently nasal. Nasality in Desano is a property of the morpheme (see Silva 2012).

(4) Guaho peatabego ikumō

Guaho pea-tabe-go i-**ku**-~bo
 Guaho firewood-chop-3SG.F do-**NVIS**-3SG.F.PF
 ‘Guaho might be chopping firewood (I hear the noise of wood being chopped).’

(5) Guaho peatebego ibokumō

Guaho pea-tabe-go i-bo-**ku**-~bo
 Guaho firewood-chop-3SG.F do-SPEC-**NVIS**-3SG.F.PF
 ‘Maybe Guaho is chopping firewood.’ (The speaker hears the noise of wood being chopped.)

In these examples, the speaker uses the non-visual evidential *-ku*, which codes direct information acquired by senses other than sight (i.e., hearing, touch, smell). It remains unclear why this evidential was used in this context. Notice that in (5) the speaker uses the speculative morpheme to express doubt about whether Guaho is in fact chopping wood (she could be doing something else). As examples (2)–(5) show, it is very hard to target a specific evidential using translation tests. Given the relatively understudied nature of evidentiality in Desano, and the fact that evidentiality potentially interacts with other aspects of the grammar as we have seen, we conclude that the primary use of elicited felicity judgment data at this stage of the investigation of Desano evidentials is premature.

At the same time, however, ‘observed’ naturalistic data also suffers from a fundamental problem: naturalistic contexts are often *too rich*, so that we as researchers cannot draw clear conclusions regarding the speaker’s degree of certainty, information source, and their relative roles. For example, if we want to know if the morpheme ~*yu* in (6) encodes both a degree of certainty and an information source, it may be difficult to tell what combination of these led to the speaker’s choice of morpheme—according to our consultant, the sentence in (6) is used if the speaker sees the man with the monkey, but he or she is not certain whether the man himself killed the monkey—that is, it could have been someone else who killed it. Beyond their complex interactions, these are mind-internal phenomena which may have no clear corresponding mind-external evidence, making it difficult or impossible to know what information source(s) a speaker has for a given claim. Asking the speaker essentially amounts to asking them to perform linguistic analysis, and is therefore problematic for different reasons.

(6) ũmũgã gahkiare wēhēayūmī

~**abu-gu** gaki-a-de ~wee-a-~*yu*-~bi
 man-3SG.M monkey-PL.AN-REF kill-PF-**EVID**-3SG.M
 ‘The man killed the monkeys (I see the man with the monkeys, but I am not sure if the man was the one who killed them).’

Another concern with relying primarily on texts for documenting evidentiality is that some evidentials might occur more in one genre of text than in others. In Desano,

it is possible to find visual, non-visual, and reported evidentials in abundance in many texts, whereas reasoning evidentials almost do not occur in narratives of different genres.⁷

We have seen in this section that the most frequently used methodologies—translation tasks, elicitation of felicity judgments, and ‘observed’ naturalistic data from texts—all have significant limitations. For translation tasks, these limitations are well-known and widely agreed upon by researchers across various traditions. The limitations of naturalistic texts in this domain are somewhat more underappreciated, but nonetheless quite real given the complexity of this empirical domain. While no clear, principled argument against elicitations with felicity judgment tasks has been heretofore articulated, they too are fraught with practical drawbacks to act as a primary method of data collection given the current state of knowledge on evidentiality and epistemic modality in Desano.

Taken together, these concerns lead us below to propose a novel method using game play, a particular instance of Himmelmann (1998)’s category of ‘staged’ communicative events. Although Himmelmann characterizes these tasks as “not ‘really’ communicatively functional, i.e., they do not serve any specific communicative purposes other than producing the data” (p. 185), we show that the method we use provides naturalistic language data rich in content serving various communicative purposes, including exchanging information about cooperative problem solving, questioning, and explaining.

There is a growing body of literature reporting on the use of stimulus-based techniques for eliciting structured naturalistic data for linguistic description and language documentation. For example, Lüpke (2010) provides an overview of some of these tasks and the type of data they provide. Majid (2012) provides a guide for constructing stimulus sets for investigating semantic categories. There are many stimulus-based techniques which have been used for semantic investigations (e.g., Bohnemeyer 2015, Burton & Matthewson 2015, San Roque et al. 2012, Evans et al. 2011, Levinson & Wilkins 2006, to mention a few), including investigation of evidentiality. San Roque et al. (2012), for example, describes the use a narrative problem-solving task to elicit, among other things, evidentiality and epistemic modals. These authors show how the use of a semi-controlled task can facilitate the elicitation of language materials which are difficult to elicit in other settings, or constructions which do not occur in other genres. Although these tasks are not meant to replace other elicitation methods, they provide valuable additional language material that can complement those elicited through other methods.

We use the board game *Mastermind*⁸ as a stimulus for eliciting data targeting epistemic notions and evidentials based on reasoning in Desano. This contrasts with other problem-solving tasks that can be used for eliciting evidentiality, like the “narra-

⁷This includes hunting stories, where one would expect that people may talk about things based on reasoning. For example, ‘the monkey must be there (because they are usually there)’. This, type of utterance, does not occur in the samples of hunting stories we have, including a couple of stories about hunting monkeys. Even in these genres, we can not really predict that certain sentences/structures will be uttered, because the person telling the story chooses which events he wants to emphasize in the narrative.

⁸The use of the game (and images) for research and scholarship is in compliance with Fair Use.

tive problem-solving task” (San Roque et al. 2012) in which there’s no right or wrong way to solve the problem. Rather, this gameplay task provides a problem-solving task in which participants have to work collaboratively to find the right solution based on logical reasoning. This method is, of course, tailored to elicit inferential/reasoning evidentials more than other kinds of evidentials.

As we discuss below, this method combines much of the open-ended naturalness of texts and ‘observational’ methods generally with a task which constrains the relevant aspects of context sufficiently to allow for relatively clear conclusions to be drawn about the speakers’ degree of certainty, information source, etc. Ideally, this method will ultimately be combined with others to draw robust conclusions about the grammar of this domain in Desano.

2.2 Desano evidentials: an overview Using a combination of elicitation and narratives, previous literature on Desano (Kaye 1970, Silva 2012) has shown that Desano has a complex evidential system with six evidential forms: ‘visual,’ ‘auditory,’ ‘reported,’ ‘quotative/folklore,’ ‘inference: results,’ and ‘inference: reasoning.’ According to Silva (2012), Desano has five evidentials that are overtly marked with a suffix on the verb, plus an unmarked (visual) evidential. Table 1 shows the types of evidentials in Desano, following Willett’s (1988) typological framework for evidential systems.

Table 1. Types of Evidence in Desano (Silva 2012:203)

Direct			Indirect				
Attested			Reported			Inferring	
<i>Visual</i>	<i>Audi-tory</i>	<i>Other sensory</i>	<i>Second-hand</i>	<i>Third-hand</i>	<i>Folklore</i>	<i>Results</i>	<i>Reasoning</i>
-∅	-ku		-~yo	-~yu		-ya	-ka
	EVID:NVIS		EVID:HSAY	EVID:QUOT/FOLK		EVID:RES	EVID:REAS

In Desano, visual evidence is unmarked. Thus, sentences with no overt marker of evidentiality indicate that the speaker has seen the event taking place, as illustrated in (7):

- (7) *ĩgũ* *pea* *tabegũ* *imĩ*
 ~*igũ* *pea* *tabe-gũ* *i-~bi*
 3SG.M firewood chop-3SG.M do-3SG.M.IPFV
 ‘He is chopping the firewood (I see it).’

The nonvisual evidential, marked with *-ku* is used to code information acquired by auditory and other senses (taste, smell, touch), i.e., direct evidence other than sight. For example, if the speaker is inside his home and hears the noise of firewood being chopped, but he does not see the event, he says the sentence in (8):

(8) ĩgũ pea tabegũ ikũmĩ

~igũ pea tabe-gũ i-ku-~bi
 3SG.M firewood chop-3SG.M do-EVID:NVIS-3SG.M.IPFV
 ‘He is chopping the firewood (I hear the noise).’

Silva (2012) identifies two reported evidentials. The first one, marked by the morpheme *-~yo* encodes hearsay information, i.e., information acquired from someone who might have directly witnessed the event described. Example (9) shows a sentence used when the speaker is talking about a school in a nearby village. The speaker has not seen the school, but was told about it by someone who had been to the village and saw the school. Note that this is different from a quotative/folklore evidential in Table 1.

(9) yuhu eskola iayōrã ĩrã

yuu eskola i-a-~yo-~da ~ida
 one school do-PF-EVID:HSAY-3PL.AN.PF 3PL
 ‘They built a school (I heard from someone who saw the school).’

The second reported evidential, marked by the morpheme *-~yo*, encodes information obtained from someone who has not directly witnessed the event. This evidential often occurs in traditional narratives. This is shown in (10), from a narrative about Desano mythology:

(10) wirinũgāyã ĩgũ mērũ uhupuri iyũmĩ

widi-~dega-~ya ~igũ ~bũda uu-pudi-i-~yu-~bi
 leave-stand.up-see 3SG.M tobacco suck-blow-do-EVID:REP-3SG.M.IPFV
 ‘He left from home looking around (and) smoking tobacco (I heard this story).’

There are also two *inferring* evidentials. The first one, marked by the morpheme *-ya*, is used to express the speaker’s conclusion about an event or state based on some type of indirect, observed results (i.e., the speaker observes results, rather than the actual event causing the result). The sentence in (11), for example, was said when the speaker noticed that, in the morning, the plants and the ground outside were wet, and inferred based on the observable evidence that it rained during the night:

(11) dopa yāmīrē dehko mērāyã

dopa=~yabi-de deko ~beda-ya
 today=night-REF water fall-EVID:RES
 ‘It rained last night (I see the ground is wet).’

The second inferring evidential is based on reasoning, and is marked with the morpheme *-ka*. It is used in situations in which the speaker expresses her own previous experience, general cultural/historical/physical knowledge, or logical reasoning based on her own previous experience. For example, in sentence (12) the speaker infers based on previous knowledge that the rapid in question can be dangerous, as she has seen many accidents taking place there:

(12) ǎhtāmūgere wabita gūya ārika

~utabu-ge-de wa-bidi-ta gūya-~adi-ka
rapids-LOC-REF go-NEG-ADMON be.dangerous-be-EVID:REAS

‘Don’t go on the rapids because it is dangerous (I know because of previous experience).’

As mentioned before, inferred evidentials do not frequently occur in texts and the data collected from elicitation are not reliable because, in many cases, we do not know what influenced the speaker’s choice of the morpheme used. A detailed examination of the morphosyntax and semantics of evidential markers will provide more information on the Desano evidential system. This is an area of ongoing investigation.

3. A case study: constrained naturalistic dialogue using games In order to collect reliable data on inferring evidentials and epistemic modals that is as naturalistic as possible, we take our inspiration from elicited *Mastermind* examples in recent literature on English epistemic modals (e.g., von Stechow & Gillies 2007) and evidentials in St’át’imcets, illustrated in examples (13), from Matthewson et al. (2007) (here, the reasoning evidential/modal is *k’a* INFER). For these authors, the *Mastermind* scenario is specifically designed to elicit judgments about whether assenting or dissenting responses target the scope of the evidential or the entire utterance including the evidential. Matthewson et al. described a hypothetical scenario within the game and tested the felicity of dialogues within that scenario. Specifically, they provided A’s utterance (already known to be felicitous in the context) and tested the felicity of different B responses. Their methodology, then, is a traditional context-relative felicity judgment task of the sort described in Matthewson (2004).

- (13) a. wá7 k’a i tseqwtsíqw-a
be INFER DET.PL red-EXIS
‘There might be some reds.’
b. wenácw; wá7 k’a
true be INFER
‘That’s right; There might be.’

While this method is quite well-suited to the specific aims of these authors, it has all the limitations noted above in our case. Our approach draws its inspiration from these scenarios, but we instead have speakers actually playing the game, using this to collect naturally occurring sentences. We describe our methodology for using the game in detail below.

3.1 The game *Mastermind* is a logic game originally designed for two players. One player (codemaker) secretly places four colored pegs behind a screen and the other player (codebreaker) tries to guess the code, receiving partial nonverbal feedback/clues from the codemaker after each intermediate guess (see summary of the basic rules in Figure 1). The game does not require that the players engage in a conversation about

the moves, thus it is not possible to obtain naturalistic speech data regarding the codemaker's reasoning for guessing the solution of the code.⁹



Figure 1. *Mastermind* basic rules

- (a) The codemaker secretly creates a code by secretly placing four colored pegs behind a shield in the decoding board.
- (b) The codebreaker has up to ten turns to figure out the correct code.
- (c) On every turn, the codebreaker puts down a line of colored pegs; the codebreaker uses the previous lines and the clues given by the codemaker to make logical guesses to uncover the code.

3.2 Participants and procedures In order to offset the unnaturalness of the codebreaker's knowledge of the actual code in previous elicited versions (as well as the potential for a silent codebreaker) we adapt the task to have two codebreakers playing the game jointly and discussing what they know, what the code could/must be, etc. Figure 1 gives the basic rules and description of *Mastermind*. This provides a naturally constrained context with naturalistic discourse. With the topic of conversation naturally constrained, speakers are able to choose their utterances with freedom, while their information sources remain apparent to the researcher.

The two participants in this trial, Frank and Zuela, are cousins, and know each other well. They are from the same community (San José de Viña, Colombia).¹⁰ San Roque et al. (2012) suggest that, for the narrative problem-solving tasks, researchers should “work with pairs or groups of people who know each other well and do not have typical asymmetrical roles” so that this arrangement “encourages people to offer an unconstrained and engaged response to the stimuli and each other” (p. 144). For this task, we also suggest that participants should know each other and have a chance to become familiar with the game before playing together. Both Frank and Zuela played the game individually as the codebreaker, with the researcher (Silva),

⁹This highlights a pragmatic oddity in the original dialogues in English and St'át'imcets. In those dialogues, the codemaker is the B speaker and so responses about the actual code will be true, but nonetheless inappropriate given the purpose of the game. Conversely, responses about the entire modal/evidential proposition like the one in (12b) are consistent with the purpose of the game, but somewhat odd since they require the speaker to be deliberately underinformative, disregarding their knowledge about the actual configuration. The ‘two codebreakers’ approach we employ here avoids these confounds.

¹⁰Frank is a trained language consultant and has been involved in the Desano language documentation activities since 2009.

as the codemaker, in order to become familiar with the game previous to the trial recorded for this study.

3.3 Set-up The decoding board can be set on a table or on the floor. The two codebreakers sit next to each other (see Figure 2) while the codemaker sits on the opposite side so the codebreakers cannot see the four-peg code behind the shield on the decoding board. The codemaker gives the color pegs to the two participants. Before the game starts, the codebreakers are given the following instructions:

- (i) that they will take turns trying to guess the code, and they are allowed to help each other each turn (i.e., they can ask/give each other's suggestions);
- (ii) that the codemaker will not provide any verbal clues (all the clues will be given with the code pegs);
- (iii) that they have up to ten turns total to guess the right code, but that they should try to solve it in as few rounds as possible.



Figure 2. Set-up for the task

If possible, it is important to set up the task in a quiet place, and preferably with no audience watching, as it can interfere with the flow of the task.

3.4 Recording and data management We video recorded the speakers playing the game so as to include both the conversation and the state of the board throughout.¹¹ We also used a digital audio recorder (Zoom H4n Handy Recorder) to provide an additional backup recording. The video camera was set up behind the codemaker and operated by another Desano research assistant. The focus was on the two codebreakers, at an angle that also showed the decoding board and the clues given by the codemaker (as the codemaker does not provide verbal clues and does not participate in the dialogue, he is not in the shot). In addition to a shotgun microphone attached to the video camera, an overhead hanging microphone (OHCM-200) attached to the digital audio-recorder was placed close to the two participants.

If possible, the video camera should be placed on a tripod, to make sure the focus remains on the codebreakers. In our case, the assistant holding the camera accidentally pressed the stop button in the middle of the recording. Although only a few seconds were missed, this should be avoided. The material was transcribed in the field, with the assistance of Desano speakers, using ELAN (Brugman & Russel 2004),¹² shown in Figure 3.

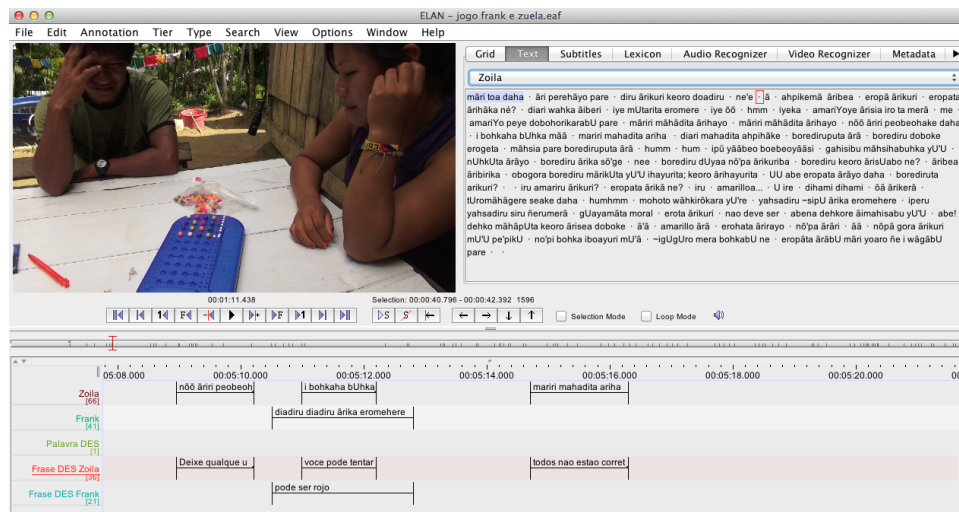


Figure 3. *Mastermind* dialogue video annotation on ELAN

The advantage of using video is that we can have access to the participants' movements and gestures while playing the game, which can provide valuable information in addition to their speech. For example, during the game, speakers make use of deictic expressions such as 'this/that one,' 'here,' or 'there' to refer to the pieces (pegs) and locations on the board. The video allows us to know the exact reference for such expressions.

¹¹Sony 96GB HXR-NX30 Palm Size NXCAM HD camcorder with projector.

¹²Max Planck Institute for Psycholinguistics, The Language Archive, Nijmegen, The Netherlands: <http://tla.mpi.nl/tools/tla-tools/elan/>

4. A sample of the data collected Our primary goal in using this game is to collect naturalistic data with samples of the inferring reasoning evidential *-ka*, which does not occur often in narratives and is not easy to elicit using the constructed scenario elicitation technique. We present here a sample of the data collected with the type of linguistic phenomena they reveal, including the use of evidential markers.¹³

In the very beginning of the game played by the cousins Frank and Zuela, we already encounter an example of the use of evidentials coding inference. While the board game was being set up on the table (with the video-camera already recording), Zuela is not sure whether they are playing together as a team or individually, and she asks Frank the question in (14a). Before any answer, Zuela continues with the statement in (14b). Notice that there is no overtly marked evidential in (14b), even though she is still making a guess regarding who will be playing.

- (14) a. māṛi perā birari kuri
 ~bari pee-~ra bida-ri kuri
 1PL.INCL two-PL.AN play-PL.INAN INTER
 ‘Are we both playing?’
 [Frank e Zoela mastermind jun06-14 00:00:00–00:00:01]
- b. nē māṛi perā birarā
 ~de ~bari pee-~ra bida-~ra
 right 1PL.INCL two-PL.AN play-PL.AN
 ‘Right? We are both playing (I see).’
 [Frank e Zoela mastermind jun06-14 00:00:01.5–00:00:03]

When Frank notices that the first author is separating the pegs into two piles, he guesses (infers) that two people will be playing as codebreakers, and says the sentence in (15a). He continues with sentence (15b) expressing that he is not certain, as he was also waiting for directions. Example (15b) also reveals examples of language phenomena previously undocumented in the language: the morphemes *#ba* expressing ‘doubt’ and *=bu* expressing ‘mutual access to information.’

- (15) a. perā birarāka
 pee-~ra bida-~ra-ka
 two-PL.AN play-PL.AN-EVID:REAS
 ‘We (may be) both playing (The speaker infers).’
 [Frank e Zoela mastermind jun06-14 00:00:03.5–00:00:04.4]
- b. *uba*, īgū ahpiamību da’a
 uba ~igū api-a-~bi=*bu* daa
 DUB 3SG.M allow-ASSER-3SG.M=*as.you.see* again
 ‘But I don’t know, he’s determining (who will play) again.’
 [Frank e Zoela mastermind jun06-14 00:00:04.4–00:00:05.7]

¹³We do not intend to provide a full analysis of the data in here; this is a topic of another study for a more comprehensive analysis of evidentiality of Desano.

When Frank is informed that both he and his cousin are playing together, he tells her using the reported evidential $\sim yu$, as in (16). This is expected because he is reporting information he received from a third party. Notice that this is the same evidential that occurs in traditional narratives (‘quotative/folklore’) in Table 1. Sentence (16) also introduces an expression previously undocumented in the language, a mirative morpheme $\sim ba$, which occurs when Frank realizes he is in fact playing with his cousin.

- (16) mā biraro ārāyūro mārī irinū biradea
 $\sim ba$ bida-do $\sim ara\sim yu$ -ro $\sim bari$ idi- $\sim d\bar{u}$ bida-de-a
 that’s.that play-NMLZ be-EVID:REP-1/2PL 1PL DEIC-CLF:day play-PF-ASSER
 ‘That’s it, we are (playing) the game (we) played the other day (I was told).’
 [Frank e Zoela mastermind jun06-14 00:00:11.9–00:00:14]

For the first move in the game, the players have no clue available in order to make an educated guess. After putting down the color pegs in the first line, starting the game, Frank says sentence (17) to Zuela, using the inferring reasoning evidential $-ka$. In this case, his inference is based on the absence of a clue in the game:

- (17) māta wihsia wa’aguka yu’u
 $\sim ba=ta$ wisi-a waa-gu- ka yu’u
 that’s.that=EMPH be.wrong-asser go-3SG.M-EVID:REAS 1SG
 ‘That’s that, I might be wrong (I infer).’
 [Frank e Zoela mastermind jun06-14 00:00:28–00:00:29.5]

After a few minutes playing the game, with enough lines on the board with pegs, the players start to make guesses based on logical inferences. For example, based on the lines of color pegs from previous guesses and the clues provided by the codemaker, Zuela figures out that at least two color pegs are in the correct position on the board. She tells Frank sentence (18), which has no overt evidential marker. Frank replies by providing his own guess, using the inferring evidential $-ka$, as shown in (19):

- (18) diru wā’ārō ahpia kuri pe’ru keoro āribea nē?
 diru $\sim waa$ -do api-a kudi pee-du keo-do $\sim ari$ -be-a
 peg be.good-NMLZ leave-PF INTER two-CLF:CONC correct-NMLZ be-NEG-ASSER
 $\sim de$
 right
 ‘Two pegs are correct, the other two aren’t, right?’
 [Frank e Zoela mastermind jun06-14 00:01:29.6–00:01:31.9]

(19) āā peru keoro ārika yu'uru mārābu

~aa pee-du keo-do ~ari-**ka** yuu-du
 yes two-CLF:CONC correct-NMLZ be-**EVID:REAS** one-CLF:CONC
 ~bara=bu
 not.exist=as.you.see

‘Yes, two pegs are correct; one isn’t, and it isn’t in the code either, as you see (I infer).’

[Frank e Zoela mastermind jun06-14 00:01:31.7–00:01:34.6]

Later on in the game, the players know that there is one color peg that is in the wrong position. Frank tries to guess which color is in the wrong position and says sentence (20a), using the inferring evidential *-ka*. He indicates that the green peg might be in the wrong position, but he is not entirely sure. His guess is based on logical reasoning based on the visual clues available on the board; however, he is not certain if he is correct, and thus he uses the morpheme *~bee* to express his uncertainty. This is another morpheme previously undocumented in the language. In (20b), Frank indicates that he is certain that three of the pegs are in the correct position on the board (and they are indeed!), and here no overt evidential marker is used.

(20) a. yahsadiru mārīka eromērē

yasa-diru ~bari-**ka** edo-~bere
 green-peg not.be-**EVID:REAS** there-uncertainty

‘The green might not be (correct) there (I infer).’

[Frank e Zoela mastermind JAN20-14-1 00:01:06.3–00:01:08]

b. ʉrerugāta kēōrota ārā

ʉde-du-~ga=ta ~keo-do=ta ~ara
 three-CLF:CONC-DIM=EMPH right-NMLZ-EMPH be.ASSER

‘Three pegs are correct (I see).’

[Frank e Zoela mastermind JAN20-14-2 00:01:57.7–00:01:59]

This method, which requires participants to make logical guesses and collaborate in a problem-solving task, makes it possible to record naturalistic data including miratives and evidential markers which rarely occur in Desano narratives. In this trial, the participants uttered 75 sentences within the 17 minutes they took to complete the task. Eleven of these sentences contain the target inferring evidential marker *-ka*, and four sentences contain miratives and other morphemes with epistemic meanings previously unattested in narratives.

5. Discussion and conclusions This paper proposes a methodology for collecting naturalistic data on evidentiality and epistemic modality using Desano as a case study. This methodology has provided naturalistic dialogues in a constrained situation making it easier for the linguist and consultant to use the utterances from these dialogues for eliciting other sentences.

Documenting pragmatics is a challenge in language documentation. Grenoble (2007) points out that “contextualized language use requires long access to the community, including access to a wide variety of situations in which language is used” (p. 147). The use of a game as described in this paper, however, provides easy access to contextualized (constrained) dialogues, even when the researcher does not have long-term access to the community. Furthermore, utterances naturally vary as to whether their ‘main point’ in discourse concerns what is possible/necessary or what is in fact the case.

The use of this task for documenting evidentiality on Desano revealed some issues regarding the expression of evidentiality not discussed on previous description of the system (e.g., Kaye 1970, Silva 2012). The dialogues reveal that speakers freely choose both what evidential (if any) to use and whether to use modals, attitude verbs, discourse particles, etc. For example, the corpus contains constructions with no overt marker for evidentiality being used to express a speaker’s knowledge based on inference—overt unmarked sentences have been described as expressing speaker’s direct visual evidence, as shown in (18) and (29b). The approach also revealed previously undocumented linguistic phenomena, including epistemic expressions.

While we focus here on one subtype of evidentiality in one language, the basic idea is extensible to other languages (e.g., to compare the usage of evidentials, modals, first person attitude verbs, and discourse particles). Furthermore, while many prompts and stimuli used for elicitation in a given language may not be easily applied to other languages, the game provides an interactive stimulus which is more or less universally applicable. The role of game-external world knowledge is minimal, making clear in theory both the speaker’s degree of certainty and source of information. Beyond this, there are several further benefits this method provides, including: prompting naturalistic dialogue between multiple speakers, rather than just monologue; utterances which naturally vary as to whether speakers in the scenario have access/interest in the kind of evidence itself as opposed to just the fact of the matter; finally and importantly, providing a task that speakers find enjoyable.

Additionally, while *Mastermind* is adept at targeting inferring evidentials and epistemic modals, other games may similarly target a broader range of information sources. Preliminary work adapting Clue/Cluedo to this task is underway. We hope that the work as described here can add to the body of literature on methods for collecting naturalistic speech for language documentation and description.

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