Demonstratives in ʔayʔaǰuθəm: Managing joint attention through gesture and salience[1]

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Abstract. In this paper, we provide the first detailed description and analysis of the demonstrative system in ʔayʔaǰuθəm (a.k.a. Comox-Sliammon; ISO 639-3: coo), a Coast Salish language spoken in British Columbia, Canada. Drawing from original fieldwork with five speakers, we show that the demonstratives in ʔayʔaǰuθəm not only encode deictic distance, evidentiality, gender, and number, but also whether or not joint attention (cf. Diessel, 2006) has been established between the speech participants. The gesture demonstratives rely on the use of co-speech gesture to establish joint attention, while the salience demonstratives are used where joint attention is already established and, consequently, do not require gesture. To analyze the former, we incorporate gesture into the semantic analysis as the means of identifying the referent (following Ebert, Ebert and Hörnig, 2020). We analyze the latter as relying on contextual salience to establish reference (inspired by Roberts, 2002; Schwarz, 2009). In more provisional terms, we also present less common uses of demonstratives, where gesture is used to refer to manners, qualities, or degrees (cf. König & Umbach, 2018). This research adds to the growing body of super-semantic literature which argues that the contribution of gesture belongs within the compositional semantics, indicating that certain demonstrative forms may even require gesture to establish reference.

Keywords: ʔayʔaǰuθəm (Comox-Sliammon), demonstratives, gesture, joint attention, salience, evidentiality, deixis

1. Introduction

In this paper, we examine how demonstratives and co-speech gesture are used to establish and track joint attention in ʔayʔaǰuθəm (a.k.a. Comox-Sliammon; ISO 639-3: coo), a Coast Salish language. ʔayʔaǰuθəm is traditionally spoken in the Tla'amin, Homalco, Klahoose, and K'ómoks First Nations along the Northern Georgia Strait in British Columbia; currently there are less than 47 first language speakers, all over 60 years of age (FPCC 2018). Despite a long history of documentary fieldwork on this language, its complex demonstrative system remains not well understood. Previous descriptions (cf. Boas, 1890; Davis, 1978; Harris, 1981; Watanabe, 2003) rarely go beyond providing grammatical labels or approximate English translations for individual demonstrative forms. In this paper, we hope to remedy this gap in the literature and explore in more detail what kind of information the different forms encode, building an analysis based on original fieldwork with five fluent speakers.

[1] We are extremely grateful to the elders who have shared their language with us, especially Elsie Paul, Betty Wilson, Freddie Louie, Randolph Timothy, and the late Karen Galligos. *čɛčɛ̓hatanapɛšt!* Additional thanks go out to the members of the Salish Working Group and the Semantics Reading Group at UBC, the audiences at ICSNL 56 and SuB 26, and the audience at the Frankfurt Colloquium series for their helpful feedback, questions, and suggestions. Research for this project was supported through a SSHRC Insight grant (435-2016-1694) awarded to Henry Davis, a Jacobs Research Funds individual grant held by Marianne Huijsmans, and a Jacobs Research Funds group grant held by members of the ʔayʔaǰuθəm Lab.

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We propose that ʔayʔaǰuθəm has two paradigms of demonstratives, which overall encode similar paradigmatic distinctions but exhibit different distributions in discourse. The **gesture demonstratives** (GDEMs) rely on co-speech gesture to identify referents and establish joint attention between the speech participants, while the **salience demonstratives** (SDEMs) pick out referents that already are in joint attention.

Apart from their different discourse functions, the two paradigms also differ in the types of referents they can pick out. The GDEMs are restricted to exophoric referents (i.e., entities that can be located via gesture in the external world, e.g., ***this*** *cookie*), whereas SDEMs can also refer to non-exophoric referents (i.e., entities that cannot be localized in the external world, e.g., ***this*** *morning*, ***this*** *is what she said…*).[2]

We develop an analysis where gesture contributes to the compositional semantics of the GDEMs, playing a critical role in newly establishing reference (cf. Ebert, Ebert and Hörnig, 2020). In contrast, we argue that the SDEMs refer to an already established discourse referent, drawing on Schwarz's (2009) analysis of anaphoric definites and Roberts's (2002) work on pronouns. This difference in how reference is established captures their different roles in managing joint attention in discourse.

2. Demonstrative distinctions in ʔayʔaǰuθəm

The demonstrative systems in Salish languages are notoriously complex, often involving several dozen distinct forms (cf. Suttles, 2004; Montler, 2007). In ʔayʔajuθəm, at least 17 different demonstratives are currently still in use. As might be expected, this relatively high number reflects paradigmatic distinctions not found in simpler demonstrative systems, as in English or German. Most notably, ʔayʔaǰuθəm demonstratives encode evidentiality in addition to deictic distance, gender, and number – a property they share with the language's determiner system (Reisinger, Huijsmans and Matthewson, 2020). Both the GDEMs and the SDEMs involve – to varying degrees – distinctions within each of these categories. The following paragraphs provide a brief overview of the individual distinctions. For a more thorough discussion of the different categories, we refer the reader to Reisinger and Huijsmans (2021).

With respect to **deictic distance** (i.e., the relative distance between the speaker and the referent), the GDEMs distinguish proximal, near-distal, and distal forms. The SDEMs, in contrast, are less specified, differentiating only between proximal and distal referents. In addition, the SDEM paradigm also includes a number of forms that do not encode deictic distance at all. The three-way deictic distance contrast in the GDEM paradigm is illustrated in (1) to (3) below.[3] Typically, the proximal demonstratives are used for referents that are within

[2] For a more detailed discussion of the terms *exophoric* and *non-exophoric*, see for instance Grosz (2019).

[3] The first line of each example is given in the orthography, the second line is a phonemic representation showing morpheme breaks, the third line provides a gloss, and the fourth line gives the translation. Infelicitous examples are marked with a hashtag (#), and marginal uses are marked with a question mark (?). The abbreviations used in this paper follow the Leipzig Glossing Rules, with the following additions: CDE = current direct evidence, CLF = cleft, CTR = control transitive, DIM = diminutive, DP = determiner phrase, DPRT = discourse particle, GDEM = gesture demonstrative, INFER = inferential, INT = intensifier, NDIST = near-distal, NP = noun phrase, QUEX = quexistential, PDE = previous direct evidence, RPT = reportative, SDEM = salience demonstrative, STAT =

reach (1), the near-distal forms for referents that are out of reach, but still near (2), and the distal forms for referents that are considered far away (3).[4] Of course, these characterizations are only approximations. As Diessel and Coventry (2020) point out, deictic distance distinctions are in general heavily context dependent.

(1) *Context: A and B are seated at the kitchen table. A asks B for the salt, which is in front of B. B says:*
niš {**tɛʔɛ** / #**tita**}.
niš {**tiʔi** / #**təy̓ta**}
be.here {PROX.DEM / NDIST.DEM}
'Here it is.' [PROXIMAL]

(2) *Context: A and B are seated at the kitchen table. A has forgotten where she left her purse. A says, thinking out loud, "I wonder where I left my purse". B replies pointing to a purse on the kitchen counter:*
nɛʔ {**tita** / #**tɛʔɛ**}.
niʔ {**təy̓ta** / #**tiʔi**}
be.there {NDIST.DEM / PROX.DEM}
'There it is.' [NEAR-DISTAL]

(3) *Context: You're pointing me in the general direction of Freddie's house. We can't see his house from here, but we're looking towards the general area. You say:*
nɛʔ {**taʔa** / #**tita**} šɛ ʔayɛʔs.
niʔ {**taʔa** / #**təy̓ta**} šə=ʔayaʔ-s
be.there {DIST.DEM / NDIST.DEM} DET=house-3POSS
'His house is over there.' [DISTAL]

For **evidentiality** (i.e., the encoding of the kind of evidence the speaker has for the existence of the referent), the SDEMs make more distinctions than the GDEMs. The SDEMs encode a contrast between current direct evidence (CDE) and previous direct evidence (PDE), and also include some evidence-neutral forms. The GDEMs lack the PDE category, having only CDE and evidence-neutral forms. Usually, speakers use the CDE forms when they see the referent at the time of speaking, and the PDE forms when they have seen the referent prior to the utterance time, but no longer see it at the utterance time. The evidence-neutral forms are used if the speaker does not have direct evidence for the referent – perhaps relying on indirect evidence instead. The three-way evidential distinction encoded by the SDEMs is illustrated in (4) to (6) below. The CDE form *tiṅ* is used when the referent is visible (4), while the PDE form *šiṅ* is used if the speaker has seen the referent previously but no longer sees it at utterance time (5). The evidence-neutral form *kʷšiṅ* is used when the speaker has only indirect evidence for the referent (here, inferential) (6).

stative. A hyphen (-) is used to mark an affix, an equal sign (=) a clitic, a tilde (~) a reduplicant, and angle brackets (< >) for infixation into the root; + is used where two or more morphemes are fused.

[4] At this point, it should be noted that almost all demonstrative forms in ʔayʔaǰuθəm can refer to both entities and locations. In this regard, they differ from English or German, where we find distinct forms for nominal and adverbial uses (e.g., *this* vs. *here; dies* vs. *hier*).

(4) *Context: My brother and I are looking through an old picture album. There's a picture of a guy I kind of recognize but can't quite place. I say:*

qʷayın	hɛł	{**tiɲ̓** / #**šiɲ̓** / #**kʷšiɲ̓**}	ʔəms ǰɛʔǰɛ.
qʷayin	hił	{**tiɲ̓** / #**šiɲ̓** / #**kʷšiɲ̓**}	ʔəms=ǰaʔǰa
maybe	COP	{CDE.DEM / PDE.DEM / DEM}	1PL.POSS =relative

'I think this one's our relative.' [CURRENT DIRECT EVIDENCE]

(5) *Context: Someone shows up at the lodge that I don't know but everyone else does. After he gets in his car and leaves, I ask:*

gɛt ga	{**šiɲ̓** / #**tiɲ̓** / #**kʷšiɲ̓**}?	
gat=ga	{**šiɲ̓** / #**tiɲ̓** / #**kʷšiɲ̓**}	
who=DPRT	{PDE.DEM / CDE.DEM / DEM}	

'Who was that?' [PREVIOUS DIRECT EVIDENCE]

(6) *Context: Marianne hears a male voice outside at night. She says to Daniel:*

čiyítč	kʷ tumıš	ʔəkʷ ʔasqič.	gɛt čɛ
čiy-í-t=č	kʷ=tumiš	ʔə=kʷ=ʔasqič	gat=ča
hear-STAT-CTR=1SG.SBJ	DET=man	OBL=DET=outside	who=INFER

{**kʷšiɲ̓** / #**taɲ̓** / #**šiɲ̓**}?
{**kʷšiɲ̓** / #**taɲ̓** / #**šiɲ̓**}
{DEM/CDE.DEM/PDE.DEM}

'I hear someone outside. Who could that be?' [INDIRECT EVIDENCE]

Gender and **number** are encoded for only a subset of each paradigm, namely the feminine singular forms – a common feature across the Central Salish languages (cf. Gillon, 2006; Montler, 2007; Beaumont, 2011; Gerdts, 2013). The use of these highly specialized feminine singular forms is illustrated in (7), where the CDE proximal feminine singular forms *θɛʔɛ* and *θiɲ̓* are used since the referent is a singular woman.

(7) *Context: My brother and I are looking through an old picture album that my parents have. I have it in my lap.*

I:	tugútačxʷ				**θɛʔɛ**?
	tug-út=a=čxʷ				θiʔi
	recognize-CTR<STAT>=Q=2SG.SBJ				F.SG.DEM
My brother:	xʷaʔ.				
	xʷaʔ				
	NEG				
I:	qʷayın	hɛł	**θiɲ̓**	tuwa	qʷoχomıš.
	qʷayin	hił	θiɲ̓	tuwa	qʷuχʷumiš
	maybe	COP	F.SG.DEM	from	Sḵwx̱wú7mesh

I: 'Do you recognize that lady?' My brother: 'No.' I: 'I think she's from Squamish.'
[FEMININE SINGULAR]

The remaining demonstratives, on the other hand, are gender- and number-neutral. Consequently, they can be freely used for masculine, neuter, and even plural feminine

referents. The number sensitivity of the feminine forms *θɛʔɛ* and *θiṅ* and the corresponding number and gender neutrality of *tɛʔɛ* and *tiṅ* are illustrated in (8), where *tɛʔɛ* and *tiṅ,* but not *θɛʔɛ* and *θiṅ,* are felicitous since the speaker is referring to multiple women.

(8) *Context: I find a picture of a couple of ladies in a collage of pictures on my parents' wall. I ask my brother:*

ṫoṫgutačx^{w}	{#**θɛʔɛ** / **tɛʔɛ**}	nəgəptey?	q^{w}ayın	hɛyʔɛw	
ṫu<ṫ>g-út=a=čx^{w}	{#θiʔi / tiʔi}	nəgəptəy	q^{w}ayin	hiɬ-iw	
recognize<PL>-CTR<STAT>=Q=2SG.SBJ	{F.SG.DEM / DEM}	women	maybe	COP-PL	

{#**θiṅ** / **tiṅ**} ʔəms ǰɛʔaǰɛ.
{#θiṅ / tiṅ} ʔəms=ǰaʔaǰɛ
{F.SG.DEM / DEM} 1PL.POSS=relatives
'Do you recognize those women? I think those are our relatives.'
[GENDER- AND NUMBER-NEUTRAL]

The ways that the evidential, deictic, gender, and number components divide up the two paradigms are summarized in Tables 1 and 2 below. While there are notable differences between the paradigms – the GDEMs encode richer deictic distinctions and the SDEMs encode richer evidential distinctions – certain forms encode exactly the same set of features for all the distinctions we have discussed in this section, such as the CDE proximal feminine singular forms *θɛʔɛ* and *θiṅ*.

Table 1: Gesture demonstratives

		Proximal	Near-Distal	Distal
CDE	Gender/Number-Neutral	*tɛʔɛ*	*tita*	*taʔa*
CDE	Feminine Singular	*θɛʔɛ*	*θiθa*	—
Evidence-Neutral	Gender/Number-Neutral	*k^{w}ıši*	*k^{w}ik^{w}a*	*k^{w}aʔa*

Table 2: Salience demonstratives

		Proximal	Distal	Distance-Neutral
CDE	Gender/Number-Neutral	*tiṅ*	*taṅ*	—
CDE	Feminine Singular	*θiṅ*	*ɬaṅ*	—
PDE	Gender/Number-Neutral	—	—	*šiṅ*
PDE	Feminine Singular	—	—	*ɬɛṅ*
Evidence-Neutral	Gender/Number-Neutral	—	—	*k^{w}šiṅ*
Evidence-Neutral	Feminine Singular	—	—	*k^{w}ɬɛṅ*
Discourse Demonstrative		—	—	*k^{w}aṅ*

Despite the fact that there are forms overlapping in deictic, evidential, gender, and number properties between the paradigms, the distribution of these forms in discourse is quite different. The factors conditioning this difference in distribution are the focus of the remainder of this paper.

3. Gesture vs. salience demonstratives

In addition to encoding information about evidentiality, deictic distance, gender, and number, the demonstratives in ʔayʔaǰuθəm also serve an important communicative purpose: they help the speech participants manage **joint attention**. Diessel (2006:465) defines joint attention as

> "a complex phenomenon that involves three basic components: the actor, the addressee, and an object of reference. In order to communicate, actor and addressee must jointly focus their attention on the same entity or situation."

This is where the difference between the GDEMs and the SDEMs seems to lie. Specifically, we propose that the GDEMs *create* joint attention via co-speech gesture (e.g., manual pointing gestures, head movements, gazes, etc.), while the SDEMs *assume* that joint attention has already been established between the speech participants. This contrast emerges quite clearly when looking at different discourse contexts.

GDEMs are commonly used with an accompanying co-speech gesture to introduce a new referent, to single out an entity from a group, or to contrast multiple referents. In all of these contexts, the use of SDEMs is not licensed. We contrast the felicity of the GDEM *tɛʔɛ* and the SDEM *tiṅ* for these purposes in (9) to (11) below.

(9) *Context: Felipe and I visit a garage sale to look for a new pot. He finds one, holds it up for me to see, and says:*

čum̓ ga	{**tɛʔɛ** / #tiṅ}?	ʔɛnɛtegənčx^{w}?	ʔisx^{w}ačx^{w}?
čəm̓=ga	{tiʔi / #tiṅ}	ʔinit-igan=čx^{w}	ʔəy̓-sx^{w}=a=čx^{w}
QUEX=DPRT	{GDEM / SDEM}	say.what-inner.self=2SG.SBJ	good-CAUS=Q=2SG.SBJ

'How about this one? What do you think? Do you like it?'

[INTRODUCING A NEW REFERENT]

(10) *Context: Pointing to one man in a picture of a men's soccer team.*

gɛt ga	{**tɛʔɛ** / #**tiṅ̓**}	tumıš?
gat=ga	{**tiʔi** / #**tiṅ̓**}	tumiš
who=DPRT	{GDEM / SDEM}	man

'Who is this?' [SINGLING OUT AN ENTITY]

(11) *Context: Marianne and Daniel have picked out some flowers for Gloria for her birthday. Then, before they've taken the flowers to the till to pay for them, Marianne notices some others that she thinks are better. She says:*

»hɛ səm	**tita**	t̓at̓^{θ}ɛm	q^{w}asəm.	q^{w}ayın	hɛł	**taṅ̓** k̓^{w}ɛhɛt ʔi.«
hiɬ=səm	**təy̓ta**	t̓at̓^{θ}im	q^{w}asəm.	q^{w}ayin	hiɬ	**taṅ̓** k̓^{w}ihit ʔəy̓
COP=FUT	GDEM	red	flower	maybe	COP	SDEM more good

'»Let's get those red flowers. I think those are better.«'

»x^{w}aʔ,	ʔi ʔot	{**tɛʔɛ** / #**tiṅ̓**}«,	hotk̓^{w}a	Daniel.	
x^{w}aʔ	ʔəy̓=ʔut	{**tiʔi** / #**tiṅ̓**}	hut=k̓^{w}a	Daniel	
NEG	good=EXCL	{GDEM / SDEM}	say=RPT	Daniel	

'»No, these are good,« says Daniel.' [CONTRASTING MULTIPLE REFERENTS]

In contrast, the SDEMs are used when the speaker wants to talk about a referent that is already unique and salient in the context. Crucially, the GDEMs cannot be used for this purpose. In (12), the speaker first uses the GDEM *tɛʔɛ* with a pointing gesture to introduce a new referent (i.e., the pot), then they anaphorically refer back to the same referent with the SDEM *tiṅ*. Since the pot is already salient at this point, the GDEM *tɛʔɛ* cannot be used any longer.

(12) *Context: Marianne and Felipe are buying a new pot at a garage sale…*

»kʲʷɛnos ga	**tɛʔɛ**$_1$,«	hotkʲʷa	Marianne…	»ʔi ʔot,«	hotkʲʷa	Marianne,
kʲʷinus=ga	**tiʔi**	hut=kʲʷa	Marianne	ʔəyʲ=ʔut	hut=kʲʷa	Marianne
how.much=DPRT	GDEM	say=RPT	Marianne	good=EXCL	say=RPT	Marianne

»hɛ səm {**tiṅ**$_1$ / #**tɛʔɛ**$_1$} yɛqtat.«
hiɬ+səm {**tiṅ** / #**tiʔi**} yəq-t-at
COP+FUT {SDEM / GDEM} buy-CTR-1PL.ERG
'»How much is this?«, says Marianne… »Oh good«, says Marianne, »we'll buy this.«'
[UNIQUE AND SALIENT REFERENT]

While typically salience and uniqueness are established through previous mention, there are scenarios where joint attention can also emerge through other means. In (13), for instance, the dog makes itself salient for both speech participants by barking.

(13) *Context: You're at my place for the first time, so you don't know my dog, and we're chatting in the living room, and my dog walks into the room and barks. I tell you:*

ʔətᶿ naʔ **tiṅ** čɛṅo.
ʔətᶿ=naʔ **tiṅ** čaṅu
1SG.POSS=own SDEM dog
'This is my dog.'

Finally, GDEMs and SDEMs not only differ in their usage contexts, but also in the kinds of referents that they can identify. Since GDEMs require gesture, they can only pick out entities located in the external world (i.e., exophoric referents). In contrast, SDEMs – since they don't *require* gesture – are also compatible with abstract entities that defy localization (i.e., non-exophoric entities). Thus, they can be used to refer to temporal entities(14), propositions (15), and other intangible referents.

(14) *Context: Late at night, I come in from outside and say to you:*

hɛhɛw čṵmčṵmmot {**tiṅ** / #**tɛʔɛ**} nanat.
hihiw čəṁčəm-mut {**tiṅ** / #**tiʔi**} nanat
really cold-INT {SDEM / GDEM} evening
'It's really cold this evening.' [ABSTRACT REFERENT: TEMPORAL CONCEPT]

(15) *Context: A guest staying with us comments on our neighbor who's already out gardening early in the morning: "Look, he's out gardening already." I reply:*

hɛɬ {**taṅ** / #**tita**} ʔəxʷ naṁs.
hiɬ {**taṅ** / #**tita**} ʔə=xʷ=nəṁ-s.
COP {SDEM / GDEM} CLF=CLF.NMLZ=be.like-3POSS
'That's how he is.' [ABSTRACT REFERENT: PROPOSITION]

Table 3 summarizes the different dimensions in which the GDEMs and the SDEMs differ.

Table 3: Comparing GDEMs and SDEMs

	GDEMs	SDEMs
Introducing a new referent via gesture	✓	—
Contrasting multiple salient referents	✓	—
Referring back to an already unique & salient referent	—	✓
Compatible with concrete entities in the external world	✓	✓
Compatible with abstract entities (temporal terms, etc.)	—	✓

4. Analysis

In this section, we will formalize the different distinctions that have been presented above. In Sections 4.1 and 4.2, we develop a situational analysis which can account for both the evidential and deictic contributions of the different demonstrative forms, while Section 4.3 briefly discusses how we encode gender and number. Once these components are in place, Section 4.4 will show how concepts like joint attention, gesture, and salience can be incorporated into the formalism. Finally, Section 4.5 illustrates how all the components come together into the demonstratives' denotations.

4.1. Evidentiality

To capture the evidential contribution of the demonstratives, we develop a situational analysis, following Speas (2010), Kalsang, Speas and Villiers (2013), and Reisinger et al. (2020). This analysis pivots on two situations in particular:

(16) The **information situation** (IS / s_I) constitutes the minimal, contextually salient situation in which the speaker accesses evidence for the referent's existence.

(17) The **discourse situation** (DS / s_D) constitutes the salient situation in which the speaker utters p.

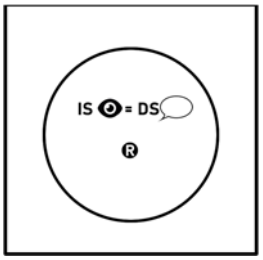
For the current direct evidence (CDE) forms, the referent x has to be part of the IS (= direct evidence), and the DS has to be equal to or part of the IS as well (= current evidence), resulting in the denotation in (18).

(18) $[\![\text{CDE}]\!]^{s_D}(x)(s_I) = 1$ iff $[(x < s_I) \wedge (s_D \leq s_I)]$

To illustrate this with a concrete example, in (19), the referent (i.e., the man in the picture) is part of the IS (i.e., the situation in which the speaker looks at the picture), and the DS is overlapping the IS, since the speaker utters the proposition while looking at the picture. The relationships between the different situations are visualized in (20).

(19) *Context: My brother and I are looking through an old picture album. There's a picture of a guy I kind of recognize but can't quite place.*
qʷayın hɛł **tiṉ** ʔəms ǰɛʔǰɛ.
qʷayin hił **tiṉ** ʔəms=ǰaʔǰa
maybe COP CDE.DEM 1PL.POSS=relative
'I think this one's our relative.'

(20)



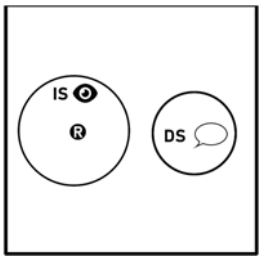
For the previous direct evidence (PDE) forms, the referent *x* has to be part of the IS (= direct evidence), and the DS is not equal to or part of the IS (= previous evidence), as formalized in (21).

(21) $[\![\text{PDE}]\!]^{s_D}(x)(s_I) = 1$ iff $[(x < s_I) \wedge (s_D \not\leq s_I)]$

For instance, in (22), the referent (i.e., the man who was at the lodge) is part of the IS (i.e., the situation of the speaker seeing the man at the lodge). However, this time, the DS is removed from the IS, since the speaker utters (22) after the man is out of sight, thus giving rise to a PDE reading. Example (23) provides a visualization of the situations in this scenario.

(22) *Context: Someone shows up at the lodge that I don't know but everyone else does. After he gets in his car and leaves, I take advantage of a break in the conversation to ask:*
gɛt ga **šiṉ**?
gat=ga **šiṉ**
who=DPRT PDE.DEM
'Who was that?'

(23)



The evidence-neutral forms lack an evidential component altogether.

4.2. Deictic distance

Loosely following Diessel and Coventry (2020), we extend the situational analysis to account for the deictic component as well. We propose that for the proximal demonstratives, the referent *x* has to be part of the DS, as formalized in (24).

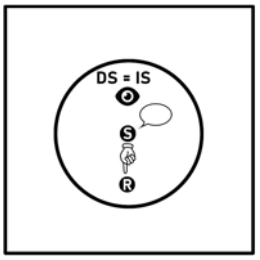
(24) $[\![\text{PROX}]\!]^{s_D}(x) = 1$ iff $(x < s_D)$

In (25), for instance, the proximal CDE demonstrative *tɛʔɛ* is used since the referent (i.e., the salt) is held by the speaker and hence located within the DS. Since the speaker also has direct evidence for the referent at the time of speaking (i.e., they are holding the salt), the IS will be the same DS.[5] Example (26) provides a visualization of the situations for this context.

[5] The IS would not be encoded for corresponding evidence-neutral forms.

(25) *Context: A and B are seated at the kitchen table. A asks B for the salt, which is in front of B. B says:*
niš **tɛʔɛ**.
niš **tiʔi**
be.here PROX.DEM
'Here it is.'

(26)



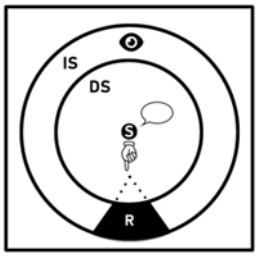
Conversely, for distal demonstratives, the referent *x* has to be outside of the DS, as sketched in (27).

(27) $[\![\text{DIST}]\!]^{s_D}(x) = 1$ iff $(x \not\leq s_D)$

In (28),for instance, the distal form *taʔa* is used since the referent (i.e., the area where the house is found) is far away from the speaker, putting it outside the spatial boundaries of the DS. The referent is nevertheless within the IS, since it is visible at the utterance time, allowing the CDE form to be used. The IS therefore encompasses both the referent and the DS. Accordingly, the arrangement of the situations can be schematized as in (29).

(28) *Context: You're pointing me in the general direction of Freddie's house. We can't see his house from here, but we're looking towards the general area.*
nɛʔ **taʔa** šɛ ʔayɛʔs.
niʔ **taʔa** šə=ʔayaʔ-s
be.there DIST.DEM DET=house-3POSS
'His house is over there.'

(29)



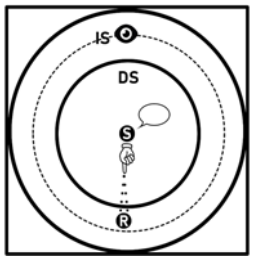
Finally, for the near-distal forms, the referent is in a situation *s* that is immediately adjacent to the DS. We capture this through introducing an additional adjacency relation ∞ between situations (adopting notation from Krifka (1998)). The adjacency relation and distal relation together give rise to the deictic component of the near-distal forms, as shown in (30).

(30) $[\![\text{ADJACENT}]\!]^{s_D}(x) \wedge [\![\text{DIST}]\!]^{s_D}(x) = 1$ iff $\exists s(s \infty s_D) \wedge (x < s) \wedge (x \not\leq s_D)$

In (31), for instance, the near-distal CDE form is used since the referent (i.e., the purse) is out of reach of the speaker, putting it just beyond the DS, but nevertheless adjacent to it since the purse is still within the same room as the discourse taking place. Again, the IS encompasses both the DS and the referent as the speaker sees the referent at the time of speaking. The relationships between the different situations are visualized in (32).

(31) *Context: A and B are seated at the kitchen table. A has forgotten where she left her purse. A says, thinking out loud "I wonder where I left my purse". B replies pointing to a purse on the kitchen counter:*
nɛʔ **tita**.
niʔ **təy̓ta**
be.there NDIST.DEM
'There it is.'

(32)



4.3. Gender and number

For the feminine singular forms, we need to incorporate two further components. SING requires the referent to be a single individual (33), while FEM requires the referent to be feminine (34).

(33) $[\![\text{SING}]\!]^{Sp}(x) = 1$ iff $\#x = 1$ (following Sauerland, Anderssen and Yatsushiro, 2005)

(34) $[\![\text{FEM}]\!]^{Sp}(x) = 1$ iff x is feminine

We use the term 'feminine' rather than 'female' because the feminine demonstratives can also be metaphorically extended to sexless referents that are small, as for instance the basket in (35). This extension seems to be part of a cross-linguistically common conceptual metaphor which links gender and size, namely SMALL THINGS ARE WOMEN (Jurafsky, 1996).

(35) *Context: I'm holding a small, cute basket and say:*
ʔɛʔaǰitɛnmot **θɛʔɛ** pɪpču.
ʔiʔaǰitin-mut θiʔi p<ip>ču
cute-INT F.SG.DEM basket<DIM>
'This little basket is so cute.'

4.4. Gesture, salience, and joint attention

For the GDEMs, we adopt an analysis where gesture is a crucial component of their semantics. Following Ebert et al. (2020), we propose that the gesture identifies a gesture referent: a rigid designator ⌜ ☛ *I* ⌝. The gesture referent is equated with x, the referent picked out by the demonstrative (see also Roberts, 2002). For now, we ignore the other components of the demonstratives' meaning.

(36) Denotation for the GDEM *tɛʔɛ* + NP (without evidential and deictic components)

Presupposition: there is a unique entity in the context which is identical to the gesture referent and meets the description of the demonstrative and NP.

a. $[\![tɛʔɛ\ \text{NP}]\!]$ POINTING TO $\boldsymbol{x}$

b. $\iota x\ .\ ⌜ ☛ I ⌝ = x \wedge \text{NP}(x)$

While the demonstratives can occur independently or in the company of an NP, we assume that an NP is always present – a null NP pronoun follows the demonstrative in the absence of an overt NP.
In contrast to the GDEMs, the SDEMs identify referents not via gesture, but through contextual salience. We capture this by adapting Roberts's (2002) work on pronouns and Schwarz's (2009) work on anaphoric definites. More specifically, we propose that SDEMs presuppose a contextually salient discourse referent that satisfies the descriptive content of the demonstrative plus NP and further presuppose that this individual is the most salient such discourse referent. Following Schwarz, we argue that the SDEMs come with a syntactically represented but null index argument: [1 [SDEM [NP]]]. This index argument identifies the discourse referent with which the demonstrative is associated.

(37) Denotation for *tiˀ*+ index 1 + NP (w/o deictic and evidential components)

Presupposition:
i. The index 1 is associated with a salient discourse referent in the context.
ii. Of all the salient discourse referents, the discourse referent associated with the index 1 is the most salient discourse referent to meet the descriptive content of the demonstrative and the NP.

a. $[\![1\ tiˀ\ NP]\!]^{s_D,c,g} = 1 \in Sal_C \wedge NP(g(1)) \wedge \forall n\ [[n \in Sal_C \wedge NP(g(n))] \longrightarrow [n <_{sal} 1 \vee n = 1]]\ .\ g(1)$

b. $g(1)$

Where $Sal_C \subseteq Dom_C$, the set of salient discourse referents in the context C
Where $Dom_C \subseteq N$ (the set of natural numbers), the set of familiar discourse referents in the context C (following Roberts 2002: 18, 23)

If the presuppositions are met, the SDEM refers to the unique discourse referent that satisfies these conditions.

We can illustrate how the contributions of the GDEMs and SDEMs predict their distribution in discourse by looking at a short dialogue, such as that in (38).

(38) *Context: My brother and I are looking through an old picture album that my parents have. There's a picture of a guy I kind of recognize but can't quite place.*

I:	ṯogútačx^{w}			**tɛʔɛ$_1$**?
	ṯug-ut=a=čx^{w}			**tiʔi**
	recognize-CTR<STAT>=Q=2SG.SBJ			DEM
My brother:	x^{w}aʔ.			
	x^{w}aʔ			
	NEG			
I:	q^{w}ayın	hɛł	[1 **tiṉ**]	ʔəms ǰɛʔǰɛ.
	q^{w}ayin	hił	**tiṉ**	ʔəms=ǰaʔǰa
	maybe	COP	CDE.DEM	1PL.POSS=relative

I: 'Do you recognize [this guy]$_1$?' My brother: 'No.' I: 'I think this$_1$ is our relative.'

Here, the GDEM *tɛʔɛ* first introduces a new discourse referent (i.e., the man in the picture) through gesture, and this new referent is associated with the index 1:

(39) $[\![tɛʔɛ_1\ NP_{pro}]\!]^{s_D,c,g[x/1]} = \exists!y : \ulcorner$ ☛ $I \urcorner \ulcorner y \wedge NP(y)\ .\ \iota x\ [\ulcorner$ ☛ $I \urcorner\ \ x \wedge NP(x)]$
POINTING TO $\boldsymbol{x}$

Since this discourse referent is now the most salient in the context – having just been introduced – the presuppositions of the SDEM are satisfied, and *tiṅ* can be used to refer to this referent anaphorically.

(40) $[\![1\ tiṅ\ NP_{pro}]\!]^{s_D,c,g} = 1 \in Sal_C \wedge NP(g(1)) \wedge \forall n\ [[n \in Sal_C \wedge NP(g(n))] \longrightarrow [n <_{sal} 1 \vee n = 1]]\ .\ g(1)$

GDEMs always introduce a new gesture referent, and so cannot be anaphoric, while SDEMs typically require an antecedent since they refer to a discourse referent that is already salient in the context.

While the analysis so far captures the main distributional contrasts between the GDEMs and the SDEMs, the latter require slightly more discussion. In particular, there are certain uses of the SDEMs where previous mention of the referent is not necessary. This is often the case when talking about temporal entities, as in (41).

(41) *Context: Late at night, I come in from outside and say to you:*
hɛhɛw čʼṁčʼɪmmot {**tiṅ** / #**tɛʔɛ**} nanat.
hihiw čʼəṁčʼəm-mut {**tiṅ** / #**tiʔi**} nanat
really cold-INT {SDEM / GDEM} evening
'It's really cold this evening.'

Examples like this are compatible with our analysis if we assume that entities that are unique and salient in the discourse context may be associated with discourse referents even without previous mention (cf. Roberts, 2002 and 2015, on weak definites). In the case of (41), there is only one salient evening in the context, namely the evening the speaker is located in. This is enough to satisfy the presupposition of the SDEM, and consequently licenses the use of *tiṅ*.

On the other hand, having a unique and salient referent in the discourse context is not always sufficient for licensing an SDEM. In (42), for instance, the flowers meet these criteria, and yet a regular determiner is used instead of the SDEM *tiṅ*. Here, the crucial factor seems to be that joint attention has not been established.

(42) *Context: Daniel and I get to Gloria's house. She goes to get us something to drink and we're standing around her table where there is a lovely vase of flowers. I remark:*
hɛhɛw ʔaǰumɪšmot {**tə** / #**tiṅ** / #**tɛʔɛ**} qʷasəm.
hihiw ʔəǰ-umiš-mut {**tə**= / #**tiṅ** / #**tiʔi**} qʷasəm
really good-appearance-INT {DET= / SDEM / GDEM} qʷasəm
'These flowers are really beautiful.'

We can contrast this with similar cases where the use of an SDEM is licensed because joint

attention has already been established. Such a case is given in (43) (repeated from (13) above), where the unique and salient referent (i.e., the dog) has not been mentioned by any of the speech participants, and yet has managed to elicit joint attention through its barking. Here, the use of the SDEM *tiṅ* is felicitous.

(43) *Context: You're at my place for the first time, so you don't know my dog, and we're chatting in the living room, and my dog walks into the room and barks. I tell you:*
ʔətᶿ naʔ **tiṅ** čɛṅo.
ʔətᶿ=naʔ tiṅ čaṅu
1SG.POSS=own SDEM dog
'**This** is my dog.'

Considering this, we assume that joint attention is necessary to establish a discourse referent, in addition to contextual salience and uniqueness. With these refinements in place, the analysis correctly predicts the distribution of the SDEMs.

4.5. The denotations

We can now examine how the different components we have introduced so far come together into one denotation. We illustrate this here only for the proximal CDE demonstratives from each paradigm, though the computations for the other demonstrative forms would be similar.

As shown in (44(44), the GDEM *tɛʔɛ* presupposes a unique individual that is equated with the gesture referent and meets the description of the NP. The speaker must also have CDE for this referent and consider it proximal. If these conditions are met, the demonstrative will refer to this individual.

(44) $[\![tɛʔɛ\ \text{NP}]\!]^{s_D,c,g} = \lambda s_I : !\exists y\ .\ ⌜ ☛ \text{I} ⌝ = y \wedge CDE(y)(s_I) \wedge PROX(y) \wedge NP(y)\ .\ \iota x\ [⌜ ☛ I ⌝ = x \wedge CDE(x)(s_I) \wedge PROX(x) \wedge NP(x)]$

Where $[\![CDE]\!]^{s_D,c,g}(x)(s_I) = 1$ iff $[(x < s_I) \wedge (s_D \leq s_I)]$
Where $[\![PROX]\!]^{s_D,c,g}(x) = 1$ iff $(x < s_D)$

As shown in (45), the SDEM *tiṅ* introduces an index 1 and presupposes that the discourse referent associated with this index is salient and matches the description of the NP. The speaker must also have CDE for this referent and consider it proximal. Finally, it presupposes that the discourse referent matching these requirements is the most salient such individual in the context.

(45) $[\![1\ tiṅ\ \text{NP}]\!]^{s_D,c,g} = \lambda s_I : 1 \in Sal_C \wedge NP(g(1)) \wedge CDE(g(1)(s_I) \wedge PROX(g(1)) \wedge \forall n\ [[n \in Sal_C \wedge NP(g(n))] \longrightarrow [n <_{sal} 1 \vee n = 1]]\ .\ g(1)$

Where $Sal_C \subseteq Dom_C$, the set of salient discourse referents in the context C
Where $Dom_C \subseteq N$ (the set of natural numbers), the set of familiar discourse referents in the context C

The corresponding feminine singular forms (i.e., *θɛʔɛ* and *θiṅ*) can be formalized in the same manner. However, in contrast to their gender- and number-neutral counterparts *tɛʔɛ* and *tiṅ*, they must also include additional presuppositions for the feminine and singular components.

(46) $[\![\theta\varepsilon\text{ʔ}\varepsilon\ \text{NP}]\!]^{s_D,c,g} = \lambda s_I : !\exists y\ .\ \ulcorner \text{☛ I} \urcorner = y \wedge CDE(y)(s_I) \wedge PROX(y) \wedge NP(y) \wedge FEM(y) \wedge SING(y)\ .\ \imath x\ [\ \ulcorner \text{☛ } I \urcorner = x \wedge CDE(x)(s_I) \wedge PROX(x) \wedge NP(x) \wedge FEM(y) \wedge SING(y)]$

(47) $[\![1\ \theta i\dot{n}\ \text{NP}]\!]^{s_D,c,g} = \lambda s_I : 1 \in Sal_C \wedge NP(g(1)) \wedge CDE(g(1)(s_I) \wedge PROX(g(1)) \wedge FEM(y) \wedge SING(y) \wedge \forall n\ [[n \in Sal_C \wedge NP(g(n))] \longrightarrow [n <_{sal} 1 \vee n = 1]]\ .\ g(1)$

Gricean principles — in particular Maximize Presupposition (Heim, 1991) – will ensure that the most specified demonstrative form will be preferred over its less specified counterparts whenever its presuppositions are met.

5. Further uses

So far, we have only looked at pointing gestures, which are usually used with demonstratives to identify a referent in the external world (e.g., *Give me **this** cup!* + [pointing at a cup]). However, co-speech gestures can also be used to illustrate the physical **qualities** of the referent (e.g., its shape), to illustrate a **degree** property of the referent (e.g., its size), or to demonstrate the **manner** something is done (e.g., complex movements), as shown in Figures 1 to 3. For a detailed discussion of these often neglected uses, see König and Umbach (2018).[6]

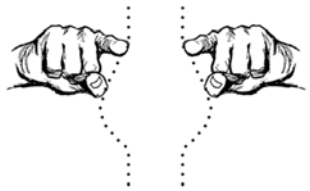


Figure 1: Quality use
(*The cup looks **like this**.*)

Figure 2: Degree use
(*The box is **this** big.*)

Figure 3: Manner use
(***This** is how he whistled.*)

Languages like English and German boast specialized demonstrative forms that can be used for these content dimensions (see Table 4; adapted from König & Umbach, 2018: 290).

Table 4: Demonstratives of quality, degree, or manner in English and German

	Quality	Degree	Manner
English	*(such)*	*so*	*(thus)*
German	*so / solch*	*so*	*so*

[6] König and Umbach (2018:288) note that speakers can employ either iconic *or* pointing gestures with these special demonstrative uses. We will only focus on the former in this section.

Our fieldwork suggests that ʔayʔaǰuθəm lacks such dedicated demonstrative forms. Instead, speakers resort to complex demonstrative constructions, consisting of an equative or similative predicate (e.g., *θuxʷɛn* 'be equal'; *naṁ* 'be like') and a GDEM, when describing the quality, degree, or manner of a referent via co-speech gestures.[7] Examples illustrating these complex demonstratives are given in (48) to (50) below.

(48) *Context: Describing a special mug that Felipe got for drinking mate, a tea from South America. I tell you, »He bought a new mug...*
naṁ [ʔə] {**tɛʔɛ** / **taʔa** / #**kʷɪši**}.«
naṁ ʔə= {**tiʔi** / **taʔa** / #**kʷəši**}
be.like OBL= {CDE.PROX.DEM / CDE.DIST.DEM / PROX.DEM}
'...It looks like this. «' + [indicates shape] [QUALITY USE]

(49) *Context: Someone comes walking down the road, whistling and calling. He says »I'm looking for my little dog. You haven't seen it, have you? It's small, ...*
θuxʷɛn {**tɛʔɛ** / #**taʔa** / #**tita** / #**kʷɪši**}«
θəxʷin {**tiʔi** / #**taʔa** / #**tita** / #**kʷəši**}
be.equal {CDE.PROX.DEM / CDE.DIST.DEM / CDE.NDIST.DEM / PROX.DEM}
'... like this... «' + [indicates size] [DEGREE USE]

(50) *Context: I'm demonstrating how to shuck oysters. As I'm demonstrating, I say:*
naṁsxʷčxʷ ʔə {**tɛʔɛ** / **taʔa / kʷɪši**}.
naṁ-sxʷ=čxʷ ʔə={**tiʔi** / **taʔa / kʷəši**}
be.like-CAUS=2SG.SBJ OBL={CDE.PROX.DEM / CDE.DIST.DEM / PROX.DEM}
'You do it like this.' + [mimicking movements] [MANNER USE]

We propose that in cases like these, the gesture made by the speaker creates an abstract but nevertheless locatable entity (= the gesture referent) that carries the quality, degree, or manner features that are relevant for the comparison (cf. Ebert et al., 2020: 165). The demonstrative refers to this abstract entity, and is then related to the argument by the similative or equative predicate. Abstracting away from the contribution of the oblique marker *ʔə* for simplicity, and giving the similative predicate *naṁ* the denotation in (51), the 'mug' example in (51) above can be formalized as shown in (52).[8]

(51) $[\![naṁ]\!]^{s_D,g} = \lambda x\, \lambda y\, [\text{be-like}(x)(y)]$

(52) $[\![naṁ\ ʔə\ tɛʔɛ]\!]^{s_D,g} = [\text{be-like}(\iota x\, [\ulcorner \text{☛ I} \urcorner = x \wedge CDE(x)(s_I) \wedge PROX(x) \wedge NP(x)])\, (g(i))]$

Our preliminary study of these special uses, however, has also raised some questions. In particular, we have found that the choice of the GDEM is not always predictable in these

[7] A similar approach is also available in English (cf. *like this* or *like that*).

[8] Note that the abstract entity in (48) is in the IS and proximal to the speaker, which explains the use of the proximal CDE demonstrative *tɛʔɛ*. In the denotation in (52), the IS (s_I) is provided by a situation pronoun adjoined to the DP, following Elbourne (2013), Renans (2016). For simplicity's sake, the presupposition of the demonstrative is not included.

constructions, as summarized in Table 5. For instance, while the proximal CDE form *tɛʔɛ* is always licensed, the distal CDE form *taʔa* seems only to be available in quality or manner contexts, but not when mimicking the degree of an entity. Near-distal forms like *tita* are rejected across the board. Likewise, the evidence-neutral forms are generally deemed infelicitous, except for *kʷɪši* which can be used in manner contexts. While these observations don't necessarily conflict with our analysis of the demonstratives, more research will be necessary to explain what motivates the distribution of these forms.

Table 5: Compatibility of the GDEMs with the different content dimensions

	tɛʔɛ	*tita*	*taʔa*	*kʷɪši*	*kʷikʷa*	*kʷaʔa*
Quality	✓	—	✓	—	—	—
Degree	✓	—	—	—	—	—
Manner	✓	—	✓	✓	—	—

6. Conclusion

In addition to filling a gap in documentation for ʔayʔaǰuθəm, this investigation has shown how demonstratives interact with co-speech gestures and contextual salience to establish and track joint attention between speech participants. Thus, this research adds to the growing body of super-semantic literature which argues that gesture should be incorporated into the compositional semantics of demonstratives (e.g., Lascarides & Stone, 2009; Ebert et al., 2020). A small pilot study on demonstratives of quality, degree, and manner (cf. König & Umbach, 2018) concludes our survey and signals a potential avenue for future research.

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