

Thanks for coming along! This webinar will begin shortly.



The webinar will be recorded so it is accessible to others after the live session.

Please remember to turn off your camera and microphone.

Feel free to post your questions into the chat box. I will attempt to answer them at the end of the presentation.

Webinar Series:  
Webinar 1: SALT – The Basics

Marleen Westerveld, PhD



# SALT: The Basics

Marleen Westerveld, PhD

# Overview

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- Why LSA?
- What is SALT?
- SALT compared to SUGAR and CLAN
- Choosing the sampling context
- SALT conventions refresher (Quizzes):
  - Utterance segmentation, mazes, and bound morphemes
  - Coding for errors at word- and sentence-level - introduction
- Questions & Answers



# Why Language Sample Analysis?

1. To determine performance at word- and sentence-level?
2. To determine performance at discourse level? Conversation, narration, expository, persuasion?
3. To set goals for intervention?
4. To assist in monitoring progress over time?
5. To compare results to typical peers [at word-, sentence- and/or discourse level] to confirm/refute/complement standardized test results?
6. To create performance reports for reporting back to family, teachers, other professionals?

# What is SALT?

Systematic Analysis of Language Transcripts (SALT) is software that:

- **standardizes the process** of eliciting, transcribing, and analyzing language samples.
- includes a transcription editor, standard reports, and **reference databases** for comparison with typical peers.

Developed in the 1980s, the SALT Team's mission has always been "*to improve the assessment of language acquisition and disorders by developing **easy-to-use software with comparison data from typical speaker***".

# What about coding??

```
C:\> sl .\git\authservices
C:\git\authservices [master]> git lg
* 93bbc8c Fri Aug 28 09:17:46 2015 +0200 (HEAD, upstream/master, master) Anders Abel
| Moved contributing.md to project root. - With the contributing.md file in the project root, it is automatically display
* 4e22135 Fri Aug 28 09:13:48 2015 +0200 Anders Abel
| Updated docs on ClaimsAuthenticationManager. - Added info on how to use ClaimsAuthenticationManager with code based cont
* 6a5b525 Thu Aug 27 09:18:03 2015 +0200 Anders Abel
| \ Merge pull request #299 from henningjensen/patch-1
|
| * 3f65c82 Thu Aug 27 09:12:31 2015 +0200 (upstream/pr/299) Henning Jensen
| / Add link to example MVC web.config
* be9dc09 Tue Aug 25 18:11:19 2015 +0300 (upstream/pr/298) Andrei Larionescu
| \ Merge remote-tracking branch 'KentorIT/master'
| /
```



# What about coding??

- You will need to transcribe your sample
- Segment your utterances (~ affects MLU)
- Identify bound morphemes (or not!)
- Identify repetitions, unfinished utterances, reformulations
- Identify pauses (or not!)
- Identify errors at Word- and Sentence-level



# Let's compare SALT to....

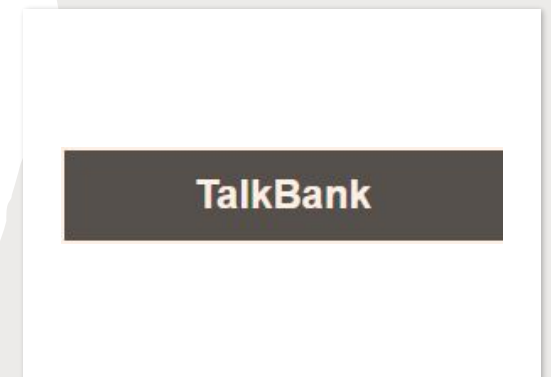
CLAN: <http://dali.talkbank.org/clan/>

- Computes LSA measures across 49 languages
- No manual 'coding' of morphemes needed
- Requires 'coding' for repetitions, fillers, intelligible segments, abandoned utterances, grammatical errors.
- Can link to audio and/or video
- Some published measures available for MLU, NDW < 6 years

SUGAR: <https://www.sugarlanguage.org/> is a protocol- using MS Word.

Minimal coding required – although identification of morphemes is needed.

- Transcribers omit filler words, repetitions, and reformulations
- No procedures for error coding
- Comparison data available for conversation samples (3-7 years)





# So it depends on your LSA questions...

- Types of measures you are interested in:  
MLU, NDW, Grammatical Errors, Rate,  
Verbal Fluency, Turntaking, etc
- Depth of your planned analysis
- Age of your client
- Intelligibility
- Discourse context
- Describing and/or comparing to typical speakers



# Comparison of database features

**Table 1.** Comparison database features across CLAN, SALT, and SUGAR.

Feature	Category	CLAN	SALT	SUGAR
Age	Early childhood	✓	✓	
	Preschool (3–5)	✓	✓	✓
	Early school age (up to 7)		✓	✓
	Later school age (8+)		✓	
Type of sample	Play	✓	✓	
	Conversation		✓	✓
	Narrative		✓	
	Expository		✓	
	Persuasion		✓	
Languages	English	✓	✓	✓
	Bilingual English/Spanish		✓	
	Spanish		✓	
Cost	Free	✓	US\$209	✓

*Note.* CLAN = Computerized Language Analysis; SALT = Systematic Analysis of Language Transcripts; SUGAR = Sampling Utterances and Grammatical Analysis Revised.

## Using Computer Programs for Language Sample Analysis

Mollee J. Pezold,<sup>a</sup> Caitlin M. Imgrund,<sup>b</sup> and Holly L. Storkel<sup>a</sup>  
[https://doi.org/10.1044/2019\\_LSHSS-18-0148](https://doi.org/10.1044/2019_LSHSS-18-0148)

## Analysis features

Measures	CLAN	SALT	SUGAR
MLU (m)	yes	yes	yes
CPS		yes	yes
TTR	yes	yes	Yes L
Mazing		yes	x
Gramm. Acc		yes	
Examiner behaviour	Turns	yes	

# Remember:

Miller, Andriacchi & Nockerts (2016).

Students with language disorders are not alike:

- a. **General developmental delay**- low mean length of utterance, number of different words, total words and words per minute.
- b. **Word finding and utterance formulation problems**- high number of repetitions and revisions at the word or phrase level.
- c. **Discourse deficits**- trouble maintaining topic, failure to respond to examiner questions.
- d. **Slow speaking rate**- low words per minute, high number of pauses
- e. **Fast speaking rate with low semantic content**- high words per minute with circumlocution and mazing.
- f. **Disordered language**- high percentage of errors and omissions.

Measures of fluency, narrative macrostructure, articulation and written language can also be obtained.

LSA, when done properly, is a “standardised assessment”.

# Let's consider some 'coding'

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**Original utterance**

**Child: And sometime um whenever it's time for us to put them in bed we put the horse in here.**

---

CLAN  
SALT  
SUGAR

CHI<sup>a</sup>: and <sometime> [//] &-um whenever it's time for us to put them in bed we put the horse in here.  
C<sup>a</sup> And (sometime um) whenever it's time for us to put them in bed we put the horse in here.  
And whenever it's time for us to put them in bed we put the horse in here.

---

*Note.* CLAN = Computerized Language Analysis; SALT = Systematic Analysis of Language Transcripts; SUGAR = Sampling Utterances and Grammatical Analysis Revised.

<sup>a</sup>CHI and C are the speaker codes for the child speaker in CLAN and SALT, respectively.

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From Pezold et al. 2020

# How long does it take?



**Table 3.** Transcription and coding procedures in CLAN, SALT, and SUGAR.

Measure	CLAN	SALT	SUGAR
Coding completed	Trailing off, self-interruption, retracing, filled and unfilled pauses, omissions, and errors	Trailed off or abandoned utterances, bound morpheme omissions, and errors	Bound morphemes
Time to code	5–11 min	5–15 min	2–4 min
Percentage of utterances with coding disagreements	5%–10%	11%–17%	2%–6%
Summary of disagreements	Most involved coding omissions (e.g., “so it be [: is] [*] soft.” vs. “so it 0will be soft.”)	Error and omission coding, morpheme coding (e.g., let’s vs. let/us)	Morpheme coding
Impact of disagreements	No impact on our analyses	Error and omission coding does not impact our analyses; morpheme coding does impact analyses	Impacts MLU results

*Note.* CLAN = Computerized Language Analysis; SALT = Systematic Analysis of Language Transcripts; SUGAR = Sampling Utterances and Grammatical Analysis Revised; MLU = mean length of utterance.

Preschool conversation sample...

(Pezold et al., 2020)

# Choosing your elicitation context

Depends on:

- *Child's ~ MLU*

# Transcription???

Try: <https://azure.microsoft.com/en-us/services/cognitive-services/speech-to-text/#features>

Try: [www.otter.ai/](http://www.otter.ai/)

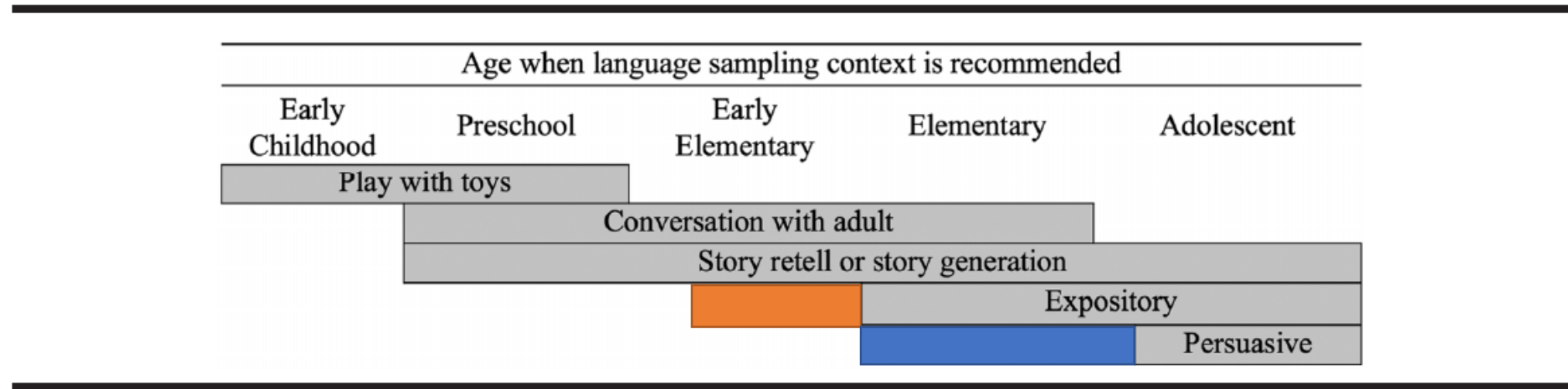
Or dictate the child's sample into: <https://dictation.io/speech>

*Or: Send to SALT*

*SLP students?*

# A rough guide

**Figure 1.** Recommended language sample contexts by age.

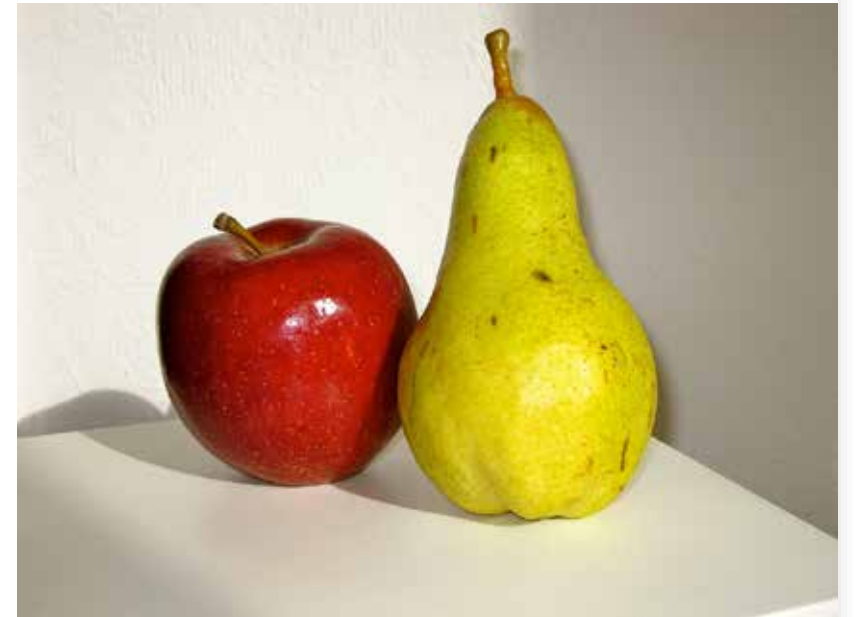


(Pezold et al., 2020)



# My suggestion

- Check why you want to do LSA ...
- Do you have access to SALT?
- Do you want to compare to typical peers?
- If so, check out the built-in reference databases as you cannot compare:



(See Westerveld et al., 2011)

# Built-in Reference Databases

## Databases of English-fluent Speakers

- Play
  - ages 2;8 - 5;8 (grades Pre-K and K)
- Conversation
  - ages 2;9 - 13;3 (grades Pre-K, K - 3, 5, 7)
- Narrative SSS (student selects story)
  - ages 5;2 - 13;3 (grades K - 3, 5, 7)
- Narrative Story Retell
  - based on 4 stories
  - ages 4;4 - 12;8 (grades Pre-K, K - 6)
- Expository
  - ages 10;7 - 18;9 (grades 5 - 7, 9 - 12)
- Persuasion
  - ages 12;10 - 18;9 (grades 9 - 12)

## Databases Contributed by Colleagues

- TNL2 Narrative Samples
  - narratives from TNL-2 (Gillam & Pearson, 2017)
  - ages 4;0 – 14;11
- TNL Narrative Samples
  - narratives from TNL (Gillam & Pearson, 2004)
  - ages 5;0 – 11;11
- New Zealand/Australia databases
  - conversation, personal narrative, story retell, and expository
  - ages 4;0 - 8;9
- ENNI
  - narratives from ENNI (Schneider, Dube & Hayward, 2005)
  - ages 4;0 - 10;0

<https://www.saltsoftware.com/resources/databases>

# Let's get into some 'coding'

1. Utterance segmentation
2. Bound morphemes
3. Mazes
4. Errors at Word- and Sentence-level

There will be a quiz after each section to check your knowledge.



# Utterance segmentation – why and how

We use \_\_\_\_\_ :

- a) *Independent clause with its modifiers;*
- b) *can be 'incomplete' (missing subject) e.g., answers to questions.*

*Consider the following:*

*E Where did you go?*

*C I went home and she went to the Zoo.*

*In SALT we segment this into 2 Communication Units*

*C I went home.*

*C And she went to the zoo.*



## **HINTS:**

Know your coordinating conjunctions:

- And
- But
- So (not so that...)

Check if there is a new subject after the conjunction.

# Utterance segmentation



1. I went home when she went to school.
2. I went home but she went to school.
3. I went home to see my sick brother while she went to school.
4. My friend and I went to school.
5. Mum says I need to eat vegies so I stay healthy.
6. I like soccer so I go every day.

How many CUs?

Answers: 1, 2, 1, 1, 1, 2

## HINTS:

Know your coordinating conjunctions:

- And
- But
- So (not so that...)
- Or

Check if there is a new subject after the conjunction.

# Utterance segmentation – one more

E where do you go to school?

C Redlands.

Notice the 'incomplete' grammatical utterance in response to a question (elliptical responses). This is a CU

E Do you like it?

C yeah.

Separate the yes/no response from the utterance that follows.

C I do.

E Why?

C I hate maths I guess.

Do not separate tag phrases

C :03 although I like reading!

Consider pause time / intonation

# Utterance segmentation – last one

C He found the boy.

C And he said I'm ready.

C And then the boy said be quiet!

C But a little while later the boy who was afraid of the dark went into the cave that seemed very scary because he had promised his friend he would rescue the baby dragon. (33 words)



Embedded dialogue quotes



# How to start utterances... and why?

We need to tell the program who did the talking AND what type of utterance it is – IF you are interested in analysing that kind of information!

Start of sentences: C, E, =, +

+ McDonalds photo

E Can you tell me about it?

C Sure.

= Child leaves the room

: :05

; :03



Comment line - does not get analysed



Pauses between utterances – needed?



# How to end utterances... and why?

Code for the following - IF you are interested in analysing that kind of information!

End of Line Punctuation	What does it mean?
E What was it?	Question. How many questions were asked / answered.
E It was a ~	Intonation prompt.
C I think a >	Abandoned utterance. The speaker does not complete the utterance
E why did you ^	Interrupted utterance. Speaker is interrupted
C I love it!	Surprise / exclamation!
C We went to the zoo.	Statement comment. Do NOT use for abbreviations.

# Few more easy codes – promise J

## { } Comments within an utterance

E what have you got?

C {shrugs shoulders}.

E is that a caterpillar?

C {holds toy up} yes!

Nonverbal with communicative intent




## X unintelligible segments (X words; XX segment; XXX utterance)

C I love X.

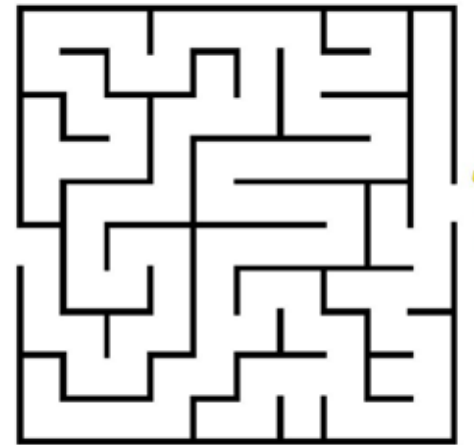
C I went to X X.

C XXX

Utterances with unintelligible segments are typically excluded from analysis when using SALT



# What are mazes? (uhm)



## Filled pauses, false starts, repetitions and reformulations

- Combine adjacent mazes
- Assume child's last attempt is what s/he said.
- Do not nest mazes
- When removed, the utterance can stand alone
- Do not count towards MLU
- May indicate utterance formulation difficulties / formulation load / fluency

C He uhm went to went to the market to buy a b book from this lovely no old lady.





# What are mazes? (uhm)

C He (uhm went to) went to the market to buy a (b) book from this (lovely no) old lady.



Try this one

C and the monster almost took and the monster took her into his uhm his uhm cave.



# What are mazes? (uhm)

C (and the monster almost took) and the monster took her into (his  
uhm) his (uhm) cave



# Coding of Morphemes in SALT

- Most of SALT's conventions for marking bound morphemes are based on Brown (1973)
- Code (most) inflectional morphemes, not derivational morphemes
- Do not code comparative morphemes –er and –est.
- Do not mark irregulars

<http://saltsoftware.com/blog/2018/12/11/why-do-we-mark-some-bound-morphemes-and-not-others/>

# Coding of Morphemes & Contractions

Inflectional Morphemes		Contractions	
/s	plural	/'t, /n't	negation
/z	possessive	/'s, /'re, /'m	is, are, am
/3s	3 <sup>rd</sup> person singular	/'ll, /'d	will, would
/ed	past tense	/'ve, /h's, /h'd	have, has, had
/en	past participle	/d's, /d'd	does, did
/ing	progressive tense	/'us	us

Do not mark irregular forms or plurals which do not have a singular form

# Coding bound morpheme/s in SALT (if needed)

Remember bound morphemes cannot stand alone + change the meaning of the root word  
Write down the root word followed by a '/ bound morpheme'

Coding	explanation	Examples
/s	Regular plural	C I like egg/s.
	DO NOT code irregular forms / or when sound changes	C Look at the leaves. C I love geese.
/z	Possessive	C Daddy/z shoe/s.
	DO NOT code possessive pronouns	C his shoes.
/3s	Third person singular	C He like/3s daddy/z shoe/s.
/s/z	Combining plural and possessives	C The baby/s/z toy vs the baby/z toy.



# Coding bound morpheme/s (if needed)

Few more

We use a: / to indicate an inflection or a contraction.

Write down the root word followed by a '/ bound morpheme'

Coding	explanation	Examples
/ed	Regular past tense -ed	C I like/d him. C He bore/d me.
	WATCH OUT!	C He was bored. C He was scared.
/ing	Present/past progressive -ing	C I am swim/ing. C Where are you go/ing?
	WATCH OUT!	C I love swimming. C Swimming is my fave.
/en	Past participle	C he has take/en my bike.
	WATCH OUT	C he has seen or spoken or been ...

# Contractions

Coding	explanation	Examples
/n't /t	Negative contractions	C I can't do that. He does/n't know me.
	WATCH OUT! Irregular OR sound of the root changes.	C Don't do that. C he won't do that.
/ll /m /d /re /s /ve	Contracted forms  /d is for WOULD	C I'll see you on Sunday. C I've had a nice day. C She's so mean. C You're the best! C He'd do it if he could.
	WATCH OUT! Plural vs contracted 's	C He's my best friend.
/h's /h'd /d'd / 'us	HAS HAD DOES DID US	C He/he's been sick. C We/h'd better go. C Let/us go.



# Test your knowledge!

Number	Child says	A	B	C
1	He likes me.	He like/3s me.	He like/z me.	He like/s me.
2	I walked the dog.	I walk/ed the dog.	I walked/ed the dog.	I walk/3s the dog.
3	I'd love to go swimming.	I/'d love to go swimming.	I/'d love to go swim/ing.	I'd love to go swimming.
4	We tied the dogs to the tree.	We tie/ed the dog/s to the tree.	We tied the dog/s to the tree.	We tied the dog/z to the tree.
5	He's my best friend's brother.	He/'s my best friend/'s brother	He/s my best friend/s brother.	He/'s my best friend/z brother.

# Answers!



Number	Child says	A	B	C
1	He likes me.	He like/3s me.	He like/z me.	He like/s me.
2	I walked the dog.	I walk/ed the dog.	I walked/ed the dog.	I walk/3s the dog.
3	I'd love to go swimming.	I/'d love to go swimming.	I/'d love to go swim/ing.	I'd love to go swimming.
4	We tied the dogs to the tree.	We tie/ed the dog/s to the tree.	We tied the dog/s to the tree.	We tied the dog/z to the tree.
5	He's my best friend's brother.	He/'s my best friend/'s brother	He/s my best friend/s brother.	He/'s my best friend/z brother.

# But what if the child omits words etc.

You code omissions with an \*

- C He/\*'s my best friend. = **omitted contraction**
- C He/'s \*my best friend. = **omitted obligatory word**
- C He/'s go/\*ing home. = **omitted bound morpheme**
- C he (w\* w\*) want/3s to go. = **word was left unfinished.**

# Word- and Utterance errors

a) Codes used to mark errors in the reference database samples:

[EO: __] marks overgeneralization errors.	C He falled fall[EO:fell].
[EP: __] marks pronoun errors.	C And them[EP:they] found the frog.
[EW] marks extraneous words.	C He were[EW:was] look/ing.
[EW: __] marks other word-level errors.	C And then the boy is a[EW] sleep/ing.
[EU] marks utterance-level errors.	C And they came to stop/ed [EU].

Watch the use of spaces!

# [E ] examples

Codes	Examples
Overgeneralisation [EO]	C He goed  go[EO:went] home. NOTE- No space between word and code.
Pronoun Errors [EP]	C Me[EP:I] like biscuits.
Word errors [EW]	C She go[EW:went] to the shops. OR She go/*3s to the shops.
Word Errors [EW]	C We can go to[EW] home.
Utterance level [EU]	C she not do anymore [EU]. NOTE – space between word and EU code.

Watch the use of spaces! It tells SALT  
to count is as a word- or sentence level error

# Enough coding – for now J

Codes	Examples
Overgeneralisation [EO]	C He goed go[EO:went] home. NOTE- No space between word and code.
Pronoun Errors [EP]	C Me[EP:I] like biscuits.
Word errors [EW]	C She go[EW:went] to the shops. OR She go/*3s to the shops.
Word Errors [EW]	C We can go to[EW] home.
Utterance level [EU]	C she not do anymore [EU]. NOTE – space between word and EU code.

Watch the use of spaces! It tells SALT  
to count is as a word- or sentence level error





# Test your knowledge!

Number	Child says	A	B
1	Me love swimming.	Me[EP:I] love swimming	Me[EP:I] love swim/ing.
2	I not go there no more.	I not go there no more [EU]	I *do not go there no[EW: any] more.
3	He comed to visit me last night.	He come/ed to visit me last night.	He comed   come[EO:came] to visit me last night.
4	Let's go to mummy home.	Let/'s go to mummy/z home.	Let/'us go to mummy/*z home
5	I'm the best transcriber ever.	I'm the best transcribe/er ever.	I/'m the best transcriber ever!

# Answers!



Number	Child says	A	B
1	Me love swimming.	Me[EP:I] love swimming	Me[EP:I] love swim/ing.
2	I not go there no more.	I not go there no more [EU]	I *do not go there no[EW: any] more.
3	He comed to visit me last night.	He come/ed to visit me last night.	He comed   come[EO:came] to visit me last night.
4	Let's go to mummy home.	Let/'s go to mummy/z home.	Let/'us go to mummy/*z home
5	I'm the best transcriber ever.	I'm the best transcribe/er ever.	I/'m the best transcriber ever!

# Where to go for more?



The image shows a screenshot of the saltsoftware.com website. A large, 3D red tag with the word "FREE" in white capital letters is overlaid on the page. The tag is attached to a grey string that loops around the browser's address bar. The address bar shows the URL "saltsoftware.com/training/self-paced-online-training". The website header includes the Salt Software logo (a blue circle with a white megaphone and the text "SALT SOFTWARE") and the text "computerized language sample analysis". A navigation menu below the header lists: HOME, COMPANY, PRODUCTS, TRAINING (highlighted), TRANSCRIPTION, RESOURCES, DOWNLOADS, ORDERING, SUPPORT, and BLOG. Below the navigation menu, there is a breadcrumb trail: Home > Training > Self-paced Online Courses, followed by the heading "SELF-PACED ONLINE COURSES".

1300 series: Transcription online courses

# Webinar 2 – Friday 19 March, 10am AEST

## Webinar 2 – SALT: Just beyond the basics

- Overview of additional conventions: pausing, nonverbal turns, overlapping speech, timelines
- Conventions summary: choosing wisely (and saving time)
- Analysing language samples – which measures to choose
- Interpreting the results – and what to do next

<https://www.eventbrite.com.au/e/webinar-two-salt-just-beyond-the-basics-tickets-144533221757>

# Questions/comments

- You will receive an email with a link to the recording + slides
- Visit [www.marleenwesterveld.com](http://www.marleenwesterveld.com) – go to eLearning
- Post questions here: <https://forms.gle/VP1nPkTeegFV8z7w7>

