

On the emergence of ellipsis in child language

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Introduction

- Language acquisition is often viewed as a process correlated with an increase in the child's MLU (going back to Brown, 1973).
- Nonetheless, one of the important components of adult linguistic competence is actually the ability to use *elliptical* utterances when context so allows.
- This competence is perhaps at its most pronounced in the case of *Non-Sentential Utterances* (NSUs) – utterances that lack a verbal (more generally predicative) constituent.

Introduction

(1) A: Wasn't he refused the chair in Oxford?

B: **Who?**

A: **Skeat.** Wasn't he refused

B: That's Meak.

A: **Oh Meak, yes.**

(London-Lund S.1.9, p. 245)

NSU frequency

- de Waijer 2001 provides figures of 40%, 31%, and 30% respectively for the percentage of *one word utterances* in the speech exchanged between adults and infant, adult and toddler, and among adults in a single Dutch speaking family consisting of 2 adults, 1 toddler and 1 baby across 2 months.
- Fernández and Ginzburg 2002 cite a figure of 11% for the percentage of utterances lacking a verbal predicate, based on random sampling from (by and large) adult speech in the British National Corpus (BNC); (Omitted: interruptions or overlaps and formulaic uses – greetings and partings). (See also Schlangen 2003.)

Today's Talk

- Two corpus studies of the emergence of certain classes of NSUs.

Findings:

1. The **Delayed Short Question Effect**: in both English and Greek subjects, the main classes of non-sentential questions (NSQs) are acquired much later than non-sentential answers (NSAs). At a stage where the child has productive use of sentential questions, and has mastered elliptical declaratives and the polar lexemes 'yes' and 'no', non-sentential questions are virtually absent.
2. The **Echo Avoidance Effect**: Sluicing is acquired before Clarification Ellipsis (CE) despite the fact that CE should win out both in terms of simplicity and frequency in the available input.

Today's Talk

- Significant implications for the grammatical analysis of NSUs and, more generally, for the issue of how context needs to be integrated with grammar.
- The two effects are problematic for an approach to NSUs in terms of a generalized mechanism of *phonological reduction*, be it syntactically or semantically driven.
- An explanation for the two effects in terms of a notion of combinatorial/contextual complexity.

Today's Talk

Introduction

Adult NSUs in Dialogue

The Delayed Short Question Effect

NSU emergence in Greek

The Echo Avoidance Effect

Theoretical Account

Classifying sentential fragments in dialogue

- Corpus studies of ‘sentential fragments’ (fragments which express a complete meaning, e.g. assertion, query etc.) show that such NSUs are well classifiable (Fernández and Ginzburg 2002, Schlangen 2003).
- Relatively few kinds – about 20 classes that can be reliably annotated.
- This taxonomy was used to manually classify a randomly selected section of 200-speaker-turns from 54 BNC files. The examined sub-corpus contains 14,315 sentences. A total of 1299 NSUs were found. Of these, 1283 (98.9%) were successfully labelled according to the taxonomy.

A corpus study of NSUs

NSU class	Example	Total
Plain Acknowledgement	<i>A: ... B: mmh</i>	599
Short Answer	<i>A: Who left? B: Bo</i>	188
Affirmative Answer	<i>A: Did Bo leave? B: Yes</i>	105
Repeated Ack.	<i>A: Did Bo leave? B: Bo, hmm.</i>	86
C(larification) E(llipsis)	<i>A: Did Bo leave? B: Bo?</i>	79
Rejection	<i>A: Did Bo leave? B: No.</i>	49
Factive Modifier	<i>A: Bo left. B: Great!</i>	27
Repeated Aff. Ans.	<i>A: Did Bo leave? B: Bo, yes.</i>	26
Helpful Rejection	<i>A: Did Bo leave? B: No, Max.</i>	24
Sluice	<i>A: Someone left. B: Who?</i>	24
Check Question	<i>A: Bo isn't here. Okay?</i>	22
Filler	<i>A: Did Bo ... B: leave?</i>	18
Bare Mod. Phrase	<i>A: Max left. B: Yesterday.</i>	15
Propositional Modifier	<i>A: Did Bo leave? B: Maybe.</i>	11
Conjunction + frag	<i>A: Bo left. B: And Max.</i>	10
Total dataset		1283

A corpus study of NSUs

Our focus in studying the emergence of NSUs will be on five subclasses of NSUs, *short answers*, (*plain and repeated*) *affirmative answers*, (*plain and helpful*) *rejection answers*, *CE*, and *Sluicing*, which constitute the majoritarian classes of NSUs used to query and answer.

NSU class	Total
Affirmative + Rejection	204 (41%)
Short Answer	188 (38%)
C(larification) E(llipsis)	79 (16%)
Sluice	24 (5%)
Total dataset	495

A corpus study of NSUs: short answers

- **Short answers:** elliptical answer-conveying responses to *wh*-questions, though the question can also potentially be elliptical, as in (2b):

(2) a. A: Who's that?

B: My Auntie Peggy [*last or full name*]. My dad's sister.
[G58, 33-35]

b. A: What's plus three time plus three?

B: Nine.

A: Right. And minus three times minus three?

B: Minus nine. [J91, 172-176].

A corpus study of NSUs: 'yes'/'no'

- *Affirmative + Rejection* The typical context of this superclass is a polar question, as in (3a); we include also answers to *implicit* polar questions, e.g. CE questions like (3b):

- (3) a. A: Did you bring the book I told you?
B: Yes./No.
- b. A: That one?
B: Yeah. [G4K, 106-107]

A corpus study of NSUs: sluicing

- Although there is a large generative literature on *sluicing*, it has almost without exception ignored the fact that bare *wh*-phrases are systematically ambiguous between distinct uses (Fernández, Ginzburg, & Lappin, 2004):

Direct sluice – it queries for additional info:

- (4) a. A: Can I have some toast please?
B: Which sort? [BNC, KCH, 104-105]
b. Caroline: I'm leaving this school.
Lyne: When? [BNC, KP3, 538]

Reprise sluice – the utterer of the sluice cannot understand some aspect of the previous utterance:

- (5) a. Pat: You might find something in there actually.
Carole: Where? [BNC, KBH, 1817]
b. Geoffrey: What a useless fairy he was.
Susan: Who? [BNC, KCT, 1753]

A corpus study of NSUs: Clarification Ellipsis (CE)

- As with sluicing, CEs are ambiguous between a number of readings, the two most prominent being the *clausal confirmation* reading and the *intended content* or *constituent* reading, illustrated in (6):

(6) a. Marsha: Yeah that's it, this, she's got three rottweilers now and

Sarah: three? (= **clausal confirmation reading**: *Are you saying she's got THREE rottweilers now?*)

Marsha: yeah, one died so only got three now.

b. Tim: Those pink things that af after we had our lunch.

Dorothy: Pink things? (= **intended content reading**: *What do you mean by saying 'Pink things'*)

Tim: Yeah. Er those things in that bottle.

A corpus study of NSUs: sluicing and CE

- Sluices make up approx. 33% of all *wh*-interrogative queries in the BNC.

	<i>what</i>	<i>why</i>	<i>who</i>	<i>where</i>	<i>when</i>	<i>which (N)</i>	<i>how</i>	Total
sluice	3045	1125	491	350	107	175	50	5343
sentential interrog.	7965	1328	1696	1877	420	225	1640	15151

- Clarification requests (CRs) constitute approx. 4% of all dialogue moves in the BNC (Purver, Ginzburg, & Healey, 2001) and this proportion is somewhat higher in task oriented dialogue;
- Clarification ellipses (CE) make up approx. 29% of all clarification requests in the BNC (Purver et al., 2001).

Explicating NSUs: with and without constructions

- How should NSUs be incorporated in grammatical analysis?
- This depends to a large extent on whether NSUs are to be assimilated to another grammatical phenomenon such as phonological reduction or anaphora.
- In theories that follow this route (*unitarian* theories), ellipsis resolution is associated with a single, typically extra-grammatical mechanism.
- Alternatively, NSUs are in some significant way *sui generis*: in *constructionist* theories, NSUs are incorporated in the grammar as distinct constructions which specify a.o. the contextual characteristics which govern their use.

Underlying NSU sententialism

- The commonest generative approach – NSUs such as *sluicing* and *short answers* are analyzed as underlyingly *sentential* constructions (see e.g. Ross, 1969; Chung, Ladusaw, & McCloskey, 1995; Merchant, 2001, for short answers see Morgan, 1973; Merchant, 2004.)
- On this view, which has attracted a variety of implementations, the grammar does not need to reify NSUs as such – no new rules or principles need to be posited for individual NSU constructions, lexical types etc.
- A non-grammatical module serves –under appropriate conditions– to recover material that is phonologically redundant and remains unpronounced.

Underlying NSU sententialism

- This type of approach attempts to reduce parallelism phenomena that are exhibited by NSUs (such as the case parallelism between source and target pointed out by Ross for sluicing and Morgan for short answers) to well-formedness principles of ‘canonical sentences’.

(7) a.

A: Pjon epenesan ? B: Ton Jani/#Ston Jani.

Se pjon edosan sigxaritiria ? Ston Jani/#Ton Jani.

A: Who did they praise?/Who did they give congratulations to?

B: Janis./To Janis.

b.

A: Lemi hixmeta? B: #Moti/Le-Moti.

to-who flattered-2sg? Moti/to-Moti

A: Who did you flatter? B: Moti.

c.

A: Et mi šibaxt? B: Et Moti/#Le-Moti.

def-acc who praised-2sg? def-acc Moti/to-Moti

A: Who did you praise? B: Moti.

Dialogue Oriented Constructionism

The *constructionist* alternative:

- Inspired by developments in construction grammar (see e.g. Fillmore & Kay, 1999; Sag, 1997) and in the modelling of dialogue context (Ginzburg, 1996; Larsson, 2002; Asher & Lascarides, 2003; Ginzburg, 2012) is the approach of *dialogue oriented constructionism* (DOC) (see e.g. Ginzburg 2012, Ginzburg & Sag, 2000; Ginzburg & Cooper, 2004; Schlangen, 2003; Purver, 2004; Fernández, 2006).
- Incorporating dialogue context (including the context that arises in metacommunicative interaction such as *grounding* and *clarification interaction*) in the grammatical component has enabled the development of analyses for 16 of the 18 classes postulated in the NSU taxonomy.

NSU/recon. sentence mismatches

- One motivation for pursuing a DOC approach is that the role of the context in the interpretation of NSUs is directly spelled out.
- A second argument for adopting DOC over *Underlying NSU sententialism* are the pervasive syntactic and semantic divergences between NSUs and their putative sentential correlates (see Ginzburg & Sag, 2000; Stainton, 2006; Fernández, 2006; Sag & Nykiel, 2011; Ginzburg, 2012)

Short answers:

- (8)
- a. A: Who left? B: HIM. (*Him left)
 - b. Who Likes Bill? B: Not Millie. (*Not Millie likes Bill)
 - c. A: Pjos efaje sokolata? B: Kanenas. (*Kanenas efaje sokolata).

Punctual NSU emergence

- One key entailment of the *unitarian* approach to NSUs is **Punctual NSU emergence**:
Once a canonical (sentential) structure is acquired (declarative or interrogative sentential structures) and a mechanism for phonological elision exists, the corresponding NSUs (short answers, sluicing) are available to the grammatical system.
- However, there are strong indications that **Punctual NSU emergence** fails. This is a serious problem for a *unitarian* approach that intends to formulate a theory of the acquisition of NSUs.
- On the other hand, **Punctual NSU emergence** is not expected within *dialogue oriented constructionism* (Ginzburg & Kolliakou, 2009).

NSU distribution for 2 year olds

- We conducted a study of NSUs in child English based on the Manchester corpus in CHILDES (Theakston et al., 2001; Rowland et al., 2003), a longitudinal study of 12 monolingual English-speaking children between the ages of approximately two and three years.
- The children are engaged in normal play activities with their mothers at home and the hourly (audio) recordings took place on two separate occasions every three weeks.
- We studied the transcript files of 4 children: Aran, Becky, Carl, and Dominic. Our data comes primarily from the manual coding of a subcorpus of the Manchester corpus consisting of 25060 turns (111969 words), including at least 6 files per child (average size of file: 830 turns).

NSU distribution for 2 year olds

- 3 of the 4 children (Aran, Becky, Carl) are at Brown's stage III (MLU 2.5-2.99) during the first half of the period covered and attain stage IV/V (MLU 3+) subsequently; Dominic was correspondingly at stage II (MLU 2-2.49) and subsequently attained stage III.
- There is significant evidence that short answers are by now also acquired by all four subjects. 3 of the 4 subjects show a preference for using NSUs over sentential answers, though the sentential option is clearly a robust option.

Answer distribution for 2 year olds

subject	period	decls	yes + no	sh-ans	non-sentential total	Total
Aran	2;3-2;6	125 (29%)	207	100	307 (71%)	432
Becky	2;3-2;7	88 (25%)	210	55	265 (75%)	353
Carl	2;1-2;8	99 (50%)	41	58	99 (50%)	198
Dominic	2;4-2;10	85 (25.5%)	130	108	238 (74.5%)	323

Non-Sentential Answers: examples

- (9) a. Mother: He's been eating the what? Aran: The bad food. (aran20b)
b. Mother: Who ate it? Aran: Pippin. (aran20b)
c. Mother: Where is it? Aran: In the box. (aran20b)
d. Mother: What colour is that one? Aran: Green. (aran18b)
e. Mother: What is it? Aran: A hen. (aran16b)
f. Mother: Did you have one of these this morning? Aran: Yeah.
g. Mother: Shall we move it? Aran: No. (aran20b)

Sentential Answers: examples

- (10) a. Investigator: What is it? Aran: That's Bumbo. (aran18b)
- b. Mother: Where is the other shoe? Aran: It is lost. (aran16b)
- c. Mother: What have you got there? Aran: I have got a hair in my mouth. (aran16b)
- d. Mother: Oh is he climbing right to the top? Aran: He can't. (aran20b)

2 year olds: sentential *wh* acquired

- According to the criteria of Rowland et al., 2003, all four children had acquired the *wh*-words ‘what’ and ‘where’ by the beginning of the period we studied, whereas two of the children (Aran and Becky) had also acquired ‘who’. Some examples from Aran are given in (11):

- (11) a. Where is Dolly? (aran16b)
b. What is that? (aran16b)
c. What did you have this morning? (aran20b)
d. What does he eat? (aran20b)

- The different sentential/non-sentential distributions for answers v. questions is of high statistical significance (Aran: $p \leq .001$, $\chi^2 = 86$; Becky: $p \leq .001$, $\chi^2 = 241$).

Question distribution for 2 year olds

Subject	wh	polar	sent. total	sluicing	CE	non-sent. total	qs total
Aran	45	4	49 (96%)	2	0	2 (4%)	51
Becky	106	98	204 (92%)	14	4	18 (8%)	222
Carl	47	5	52 (96%)	2	0	2 (4%)	54
Dominic	15	2	17 (85%)	1	1	2 (15%)	19

Parental input

- We manually coded the input provided by Aran and Becky's mothers, based on the first and last file in the examined period (files 12b, 22b).
- One obvious difference, a clear consequence of the fact that the mothers are in charge of keeping the conversation moving along, is the fact that the mothers ask significantly more than they answer.

Parental input

- The mothers' ANSWERS are less NSU-oriented than the children's, but this is a matter of degree. (No significant difference between Aran and his mother: $\chi^2 = 0.5$, Fisher one tailed $p = .23$; significant difference between Becky and her Mother: $\chi^2 = 11.42$ $p \leq .001$).
- Whereas for QUESTIONS there is what seems to be a categorical difference: both mothers use NSQs productively, whereas these are entirely absent from Aran's productions and rare for Becky (Statistical significance for Becky v. her Mother: $\chi^2 = 2.43$, $p \leq .05$.)

Averaged distribution of kids and mothers' answers per conversation

Subject	decl	yes/no	sh-ans	total non-sent	total ans
Aran	21 (29%)	34	17	51 (71%)	72
A's mother	6 (38%)	8	2	10 (62%)	16
Becky	15 (24%)	35	9	44 (76%)	59
B's mother	20 (62%)	8	4	12 (38%)	32

Averaged distribution of kids and mothers' questions per conversation

Subject	wh	polar	total sent	sluice	ce	total non-sent	total qu
Aran	8	1	9 (100%)	0	0	0 (0%)	9
A's Mother	40	68	108 (86%)	8	10	18 (14%)	126
Becky	18	16	34 (92%)	2	1	3 (8%)	37
B's Mother	27	44	71 (78%)	6	14	20 (22%)	91

Averaged distribution of NSUs per conversation

Subject	yes /no	sh-ans	sluice	CE	total NSU
Aran	34 (67%)	17 (33%)	0 (0%)	0 (0%)	51
A's mother	8 (29%)	2 (7%)	8 (29%)	10 (35%)	28
Becky	35 (75%)	9 (19%)	2 (5%)	1 (1%)	47
B's mother	8 (25%)	4 (12%)	6 (19%)	14 (44%)	32
BNC pct	41%	38%	5%	16%	100%

Interim Summary

- Empirical generalization I (the **Delayed Short Question Effect**):
With short answers *and* sentential interrogatives acquired, non-sentential queries (sluicing and clarification ellipsis) are, on the whole, absent.
- Empirical generalization II: NSQs are common in the speech of the child's carers.
- The **Delayed Short Question Effect** is evidence against **Punctual NSU emergence**.

Establishing the Delayed Short Question Effect

The **Delayed Short Question Effect** could be explained in two ways, pragmatically or mechanistically.

- A pragmatic explanation would see the absence of NSQs as a consequence of two factors:
 - (a) the *contextual unavailability* of antecedents for NSQs and/or
 - (b) the *semantic undesirability* of the contents that NSQs express in the type of conversational interaction recorded in this corpus.
- A mechanistic explanation ties the absence of NSQs to the absence of appropriate linguistic/conversational competence.

Establishing the Delayed Short Question Effect

- What is needed is evidence that children ignore the presence of triggering context for NSQs. Moreover, evidence that this happens at a likelihood which is significantly distinct from the corresponding behaviour of adult speakers.
- We manually searched 6 more files (21a-23b, Aran) (20a-22b, Becky), collating for both child and mother all questions.

Ignoring triggering context

- From these we categorized as a potential NSQ context any case where either a) an NSQ was produced or b) a sentential question was produced, even though the corresponding NSQ wouldn't have increased ambiguity.
- Note that the test is a conservative one as it *underestimates* the potential for producing NSQs: it evaluates this merely from the pool of questions that were produced, ignoring other contexts where an NSQ could have been produced.

Ignoring triggering context

- (12) a. Mother: He is crying.
Becky: Why is he crying? (becky20b) \mapsto Why?
- b. Mother: I think you can put this one wherever you like, Becky, in the picture. Put him next to that other mouse.
Becky: Where does he go? (becky20b) \mapsto Where?
- c. Mother: There's a bag of something there, Becky.
Becky: Where's bag? (becky20b) \mapsto Where?
- d. Mother: All gone.
Becky: Are they all gone now? (becky20b) \mapsto All gone?
- e. Mother: Somebody's made something already, look. Haven't they?
Becky: Who was that, Mum? (becky 21b) \mapsto Who?
- f. Mother: It goes anywhere.
Becky: Does it go there? (becky 21b) \mapsto There?

Rate of NSQ production given triggering context

Subject	Pot. NSQ contexts	NSQs produced
Aran	6	0 (0%)
Aran's mother	35	28 (80%)
Becky	16	4 (25%)
Becky's mother	36	30 (83%)

- Here the distribution of Becky compared with her mother is statistically significant ($\chi^2 = 14.18, p \leq .0001$). With Aran vs. his mother, applying χ^2 is not possible given the null count of NSQs produced by Aran; applying the Fisher Exact Probability Test yields $p \leq .0004$ (one-tailed).

Rate of NSQ production given triggering context

- Indeed the mothers' NSQ usage here is still conservative relative to that which occurs in adult conversation. We produced a rough lower bound estimate of this by sampling the BNC: using SCoRE, we searched the K block of the BNC for all contexts where an indefinite was followed by a wh-question. The ratio of NSQ production in these contexts was 77% ($n = 82$), suggesting that the mothers significantly *underuse* NSQs relative to regular adult usage.

Later distribution of NSQs, at (2;8-2;9), (2;9-2;10)

	wh	polar	inton	sent. total	sluice	CE	non-sent. total	qs total
Aran	57	23	1	81 (82.5%)	17	0	17 (17.5%)	98
Becky	106	60	8	174 (77%)	52	0	52 (23%)	226

Distribution of NSQs

Subject	repetition what	why sluice	reprise sluice	direct sluice	CE
Aran	0	6	4	7	0
Becky	30	17	5	0	0

- These data about the somewhat later productions of Aran and Becky indicates that there is nothing specific to the nature of interactions occurring in this corpus which biases *against* the production of NSQs by the children.
- This suggests that their earlier absence is due, in part at least, to insufficiently developed competence.

NSU emergence in Greek

- The DSQE is not due to language-specific factors: there is evidence that NSQs emerge late also in child Greek.
- Distribution of sentential/non-sentential answers for Mairi and Mairi's mother in the Stephany Corpus (first file for each period of investigation):

Period/ Subject	Sent.	yes/no	Short ans.	Total Non-sent.	Total Ans.
21 months:					
Mairi	36 (51%)	0	35	35 (49%)	71
Mairi's mother	4 (67%)	1	1	2 (33%)	6
27 months:					
Mairi	40 (51%)	11	27	38 (49%)	78
Mairi's mother	4 (67%)	2	0	2 (33%)	6
33 months: Mairi	19 (29%)	2	44	46 (71%)	65

NSU emergence in Greek

- Distribution of sentential/non-sentential questions for Mairi and Mairi's mother in the Stephany Corpus (first file for each period of investigation).

Period/ Subject	wh	Polar	Total Sent.	Sluice	CE	Total Non-sent.	Total Questions
21 months:							
Mairi	14	0	14 (100%)	0	0	0 (0%)	14
Mairi's mother	68	38	106 (80%)	9	17	26 (20%)	132
27 months:							
Mairi	41	22	63 (97%)	1	1	2 (3%)	65
Mairi's mother	115	46	161 (92%)	6	8	14(8%)	175
33 months:							
Mairi	50	21	71 (86%)	6	6	12 (14%)	83

The Echo Avoidance Effect

- **The Echo Avoidance Effect:** the emergence of reprise sluices strictly precedes that of Clarification Ellipsis (CE).
- *prima facie* CE should win out both in terms of simplicity and frequency in the available input:
 - **Contextual Availability:** CE is by most plausible measures the most readily available CR form: it involves mere repetition of material *primed* by the previous utterance. (Tendency to *align* with previous utterances see e.g. Garrod & Pickering, 2004).
 - **Predominance in the input:** as we will see, CE predominates, in some cases vastly so, over sluicing in the input of fragmentary CRs available to the child.
- Further evidence for extended, non-punctual emergence of NSUs and against *Underlying NSU sententialism* or any other theory of NSUs tied to a single mechanism.

Materials

- For this study we examined the Clarification Ellipsis (CE) and sluicing production of [all] eight subjects of the Belfast corpus (Henry, 1995; Wilson & Henry, 1998) as well as eight subjects of the Manchester corpus (Theakston et al., 2001, Rowland et al., 2003), from the CHILDES database.
- Both corpora emerged from longitudinal study of monolingual British English speaking children in free play situations and in the presence of a carer –typically their mother– at home.

Materials

- The children's starting age in Belfast ranges from 2 years to 3;8. They were studied for roughly one year to one year and a half, and their recordings range from 9 hours (Courtney) to 22 hours (Conor).
- We employed the search engine SCoRE (Purver, 2001) to identify all instances of CE, *what*, *where*, *who*, *why* sluicing produced by both children and adults in all transcripts of the Belfast and Manchester corpus.

Findings

- Adults' usage of CE in interaction with children (and elsewhere) significantly exceeds their usage of sluicing.
- On the whole children go through long periods where sluicing is productive and CE is *absent*.
- This applies also to sluices that express *specific* CRs (CRs that target only part of previous utterance)
- There is some variability in the Manchester data: no cases of CE < sluicing; one case of possibly simultaneous emergence.

Abundance of CE in the children's input

- Absence of CE in the children's data can hardly be attributed to an influence of the input.
- CE and sluicing data for PARENTS of children with no CE, from Manchester corpus, mean and totals over 68 conversations:

Carer	Anne's	Aran's	Becky's	Joel's	John's	Liz's
Mean Sluice	2	1	1.5	3	.5	.5
Mean CE	4	.5	5.5	6	.5	3
Total Sluice	143	53	104	210	28	44
Total CE	292	43	369	393	47	163

Abundance of CE in the children's input

- The corresponding data for parents of the younger children in the Belfast corpus, who in the period under observation produced no CE (Barbara: 15 conversations, David: 13, Michelle: 14, Rachel: 9).

Sluice and CE distribution in young Belfast group adults:

Carer	Barb's	David's	Michelle's	Rachel's
Mean Sluice	1	2	1.5	.5
Mean CE	2	2	1.5	1
Total Sluice	16	26	19	6
Total CE	29	27	24	9

Absence of CE while sluicing present

- Sluicing and CE productions for 6 children from the Manchester corpus – the period considered is from the production of the first sluice till the final data provided by the corpus. While most subjects produce sluices productively, CE is almost without exception absent:

	Anne	Aran	Becky	Joel	John	Liz
age	1;10.07- 2;7.28	2;7.14- 2;10.28	2;1.30- 2;11.15	2;4.22- 2;10.11	2;5.06- 2;10.24	2;0.14- 2;10.18
Dialogues	60	20	58	36	34	60
Mean Sluice	1.5	6	5.5	0.5	0	.5
Mean CE	0	0	0	0	0	0
Total Sluice	92	133	310	18	2	39
Total CE	0	0	2	0	0	1

Absence of CE while sluicing present

- The Belfast corpus confirms this general trend:

	Barbara (2;4.9-4;1.18)	David (2;0.3-4;2.3)	Michelle (2;4.28-4;4.19)	Rachel (2;5.25-3;2.03)
Dialogues	15	13	14	9
Sluice Mean	2.5	1	1.5	0.5
Sluice Total	36	15	21	3
CE Total	0	2	0	0

The Strengthened Echo Avoidance Effect

- The interest of the *Echo Avoidance Effect* increases in so far as it ‘survives’ once one filters away certain uses of sluicing that one might view as high frequency, rote learned instances.
 - (13) a. **Direct:** A: Can I have some toast please?
B: Which sort? [BNC, KCH, 104-105]
 - b. **Reprise:** Pat: You might find something in there actually.
Carole: Where? [BNC, KBH, 1817]
 - c. **Repetition what:** June: Only wanted a couple weeks.
Ada: What?
June: Only wanted a couple weeks.
 - d. **Wh-anaphor:** Cathy (In): Where do Rosey and Jim live? I know
(pause) I know where they live.
Barbara (Ch): Where?

The Strengthened Echo Avoidance Effect

- ‘Repetition **what**’ can be produced after any utterance, regardless of its content; the WH-anaphor use does not constitute a genuine query (let alone a Clarification Request), but merely functions as a continuation gesture towards the previous speaker.
- The ultimate issue concerning the *Echo Avoidance Effect* is **whether children are capable of producing reprise sluices before they start producing CE**: both reprise sluices and CE have equivalent semantic uses – to pose CRs about sub-utterances of a prior utterance.

The Strengthened Echo Avoidance Effect

- Strongest evidence from Anne, Aran, Becky and Liz (Manchester corpus), who up to 2;10 approximately produce no CE, but produce the following distribution of sluices:

Type	Aran	Becky	Anne	Liz
Rept. <i>what</i>	3	127	44	1
Why?	90	139	15	33
Direct sluice	12	0	2	0
Reprise	25	33	31	5
WH-anaphor	5	3	0	0
Total	135	302	92	39

The Strengthened Echo Avoidance Effect

Word	Aran	Becky	Anne	Liz
<i>what</i>	16	138	50	1
<i>where</i>	9	22	24	5
<i>who</i>	7	2	0	0
<i>how</i>	4	0	0	0
<i>which N</i>	9	1	3	0
<i>why</i>	90	139	15	33
Total	135	306	92	39

The Strengthened Echo Avoidance Effect

- (14) a. Mother: I think this car's Gumdrop. It's got some hens roosting in the back seat.
Aran: **What? Where?**
Mother: There. (Aran26b.cha)
- b. Mother: Get me that top from over there please.
Aran: Yes. Course. **Which top?** (aran28b, 2;8.19)
- c. Mother: Well we're not going to play this game if you're going to be silly. Aran: **Why?** (aran28b, 2;8.19)
- d. Mother: Does PC Selby know you've got his handcuffs in your toolbox?
Aran: **Who?**
Mother: Arthur Selby. (Aran33a.cha)
- e. Mother: That bit's fallen off, hasn't it?
Aran: **Which bit?** (Aran34b.cha)

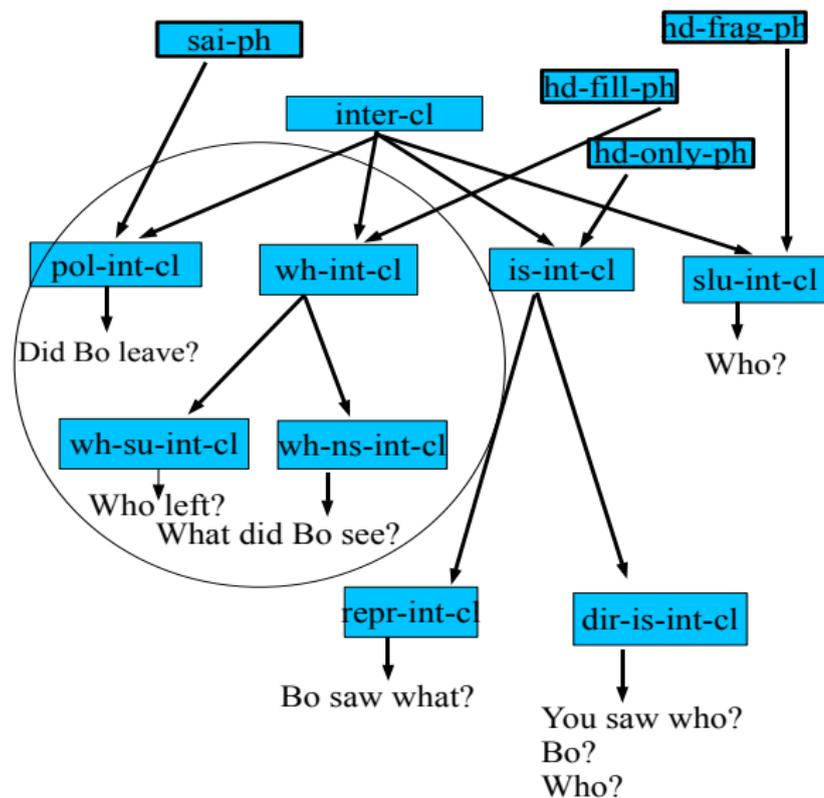
Theoretical explanation

- *Short answer* \prec *Sluice* \prec *CE*
- A mechanistic explanation of the **Delayed Short Question Effect** and the **Echo Avoidance Effect** is required.
- It is not possible to give such an explanation within the *Underlying sententialism* approach, given that it enforces **Punctual NSU Emergence**.
- Sketch an account of the two effects using a dialogue-oriented construction grammar.
- **The order of NSU acquisition:** An explanation for the emergence of NSAs before NSQs and sluices before CE in terms of a notion of combinatorial/contextual complexity.

Dialogue Oriented Constructionism

- Within the dialogue oriented constructionism (DOC) approach, NSUs are grammatical words (as e.g. ‘yes’, ‘no’) or constructions (e.g. short answers, sluicing), where semantic composition is primarily driven by context rather than syntax (see e.g. Ginzburg & Sag, 2000; Fernández, 2006; Sag & Nykiel, 2011; Ginzburg, 2012)
- Constructions (both sentential declaratives/interrogatives and the various NSUs discussed above) are organized into a type hierarchy. This enables higher level types to be posited which allows relevant cross-cutting generalizations to be captured.

NSUs in a constructional hierarchy



NSUs in a constructional hierarchy

- The crucial point about a grammar organized in terms of such a hierarchy is that its acquisition can be modelled in a straightforward monotonic way (as pointed out originally by Green, 2000 – see also Goldberg, 1995; Tomasello, 2003).

The semantic complexity of NSUs

- When considering the semantic complexity of NSUs, we need a notion of complexity that combines combinatorial complexity and contextual accessibility.
- We assume a notion of complexity that gives contextual complexity priority, ties to be broken by combinatorial complexity:

(15) $C1 \leq C2$ iff either $C1$ has a simpler contextual background than $C2$, or $C1$ and $C2$ have equivalent contextual backgrounds but $C1$ is combinatorially simpler than $C2$.

Contextual parameters involved in NSU contents

- max-qud: Maximal Question Under Discussion
- FEC: Focus Establishing Constituent (=sub-utterance in antecedent parallel to NSU)

NSU	contextual params involved
yes, short-ans	max-qud
direct sluice	max-qud, FEC
CE, reprise sluice	max-qud, FEC via clarification context accommodation rule on partially understood utterance

Content construction complexity for NSUs in a DOC grammar

NSU type	Content Spec	Content Construction Operations
yes	max-qud.prop	1 proposition extraction
short-ans	max-qud(frag.cont)	1 function application
dir sluice	$\lambda\text{frag.dom}$ (max-qud.prop(FEC.cont \mapsto frag.cont))	1 λ -abstraction + 1 substitution + 1 proposition extraction
reprise-sluice	max-qud	
CE _{confirmation}	?max-qud(frag.cont)	?-op + function application
CE _{intended-cont}	max-qud	via utterance anaphora to repaired sub-utterance

Combinatorial/contextual complexity and the late short query effect

- short answer $\leq_{CCC*ACP}$ direct sluice
- short answer $\leq_{CCC*ACP}$ reprise sluice, CE

Combinatorial complexity and the echo avoidance effect

- Comparing the complexity of Reprise sluicing v. Clausal confirmation CE we have:
 - Reprise sluicing:
Content = max-qud
 - CE :
Content = ?max-qud(content(fragment))
- The reprise sluice ends up as being combinatorially *less* complex than the CE.

Conclusions

- Two generalizations concerning the acquisition of NSUs.
 1. The *Delayed Short Question Effect*: the absence of NSQs (sluicing and clarification ellipsis) at a point where a mechanism for NSUs is well established—short answers and yes/no are used productively—and sentential interrogatives have been acquired.
 2. The *Echo Avoidance Effect*: Clarification Ellipsis (CE), the majoritarian clarification request construction among adults, emerges with significant delay in comparison with reprise sluices, bare wh-phrases used to request clarification.

Conclusions

- The two effects are inconsistent with the *Underlying sententialism* approach, given that it enforces **Punctual NSU Emergence**.
- Accounts for the two effects in a Dialogue Oriented Constructionism approach to grammar, which integrates phonological/syntactic/semantic information with detailed specification of dialogue context: NSUs are treated as constructions, which *inter alia* carry a specification of the contextual conditions regulating their resolution.
- Order of acquisition correlated with combinatorial/contextual complexity.

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