The structure of silence: A look at children's comprehension of sluicing

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A consistent finding for the acquisition of A-bar dependencies is that children find headed object dependencies harder to comprehend than subject dependencies (e.g., Friedmann et al., 2009; Yoshinaga, 1996). Grammatical accounts such as Relativized Minimality (RM; Rizzi, 1990) capture this behavior in terms of intervention effects –for children, moving an object past the subject is harder when the two share certain morphosyntactic features (Friedmann et al., 2009). This study tests children's comprehension of two constructions: sluiced *wh*-questions (e.g., *The girl is pushing someone, can you see who <~~the girl is pushing~~ _>?*) and relative clauses (e.g., *Point to the boy that the girl is pushing _*).

Various syntactic theories of sluicing posit that the ellipsis site has a fully articulated (but unpronounced) TP structure from which the *wh*-phrase has been extracted (e.g. Merchant 2001). These theories contrast with certain semantic/pragmatic theories that posit no such structure (e.g. Culicover & Jackendoff 2005). The purpose of this study is two-fold: (i) to provide experimental evidence for theoretical analyses that posit structure (and movement), and which consequently predict a subject>object asymmetry in the comprehension of sluices in child language, (ii) to further examine the role of animacy in the comprehension of these two A-bar constructions. Various studies have shown that performance on object relatives (OR) improves significantly when the object is inanimate and the subject is animate (e.g., Bentea et al. 2016; Brandt et al., 2009). These results are compatible with the notion of intervention. That is, provided that [animacy] is part of the computation of RM, a mismatch in animacy features should improve children's performance in object sluices and object relatives. The possible intervention effects of animacy have not previously been tested in English.

Sixty children aged 3-6 were tested using a character-selection task in a 2×2×2 design (subject/object extraction × animate/inanimate subject × animate/inanimate object) for both sluiced *wh*-questions (1) and relative clauses (2).

(1) a. Someone is pushing the boy/car, can you see who <_ is pushing the boy/car>?
b. Something is pushing the boy/car, can you see what <_ is pushing the boy/car>?
c. The boy/car is pushing someone, can you see who <the boy/car is pushing _>?
d. The boy/car is pushing something, can you see what <the boy/car is pushing _>?

(2) a. Point to the girl that _ is pushing the boy/car.
b. Point to the train that _ is pushing the boy/car.
c. Point to the girl that the boy/car is pushing _.
d. Point to the train that the boy/car is pushing _.

Results from the sluicing task confirm that children show a subject>object asymmetry with this construction as well, $F(1,224) = 25.82$, $p < .001$ (Table 1), consistent with analyses that posit structure and movement at the ellipsis site (Merchant, 2001). Additionally, we find that children do better with object sluices when subject and object are mismatched in animacy features, $p = .001$ –but they do not show this disparity with subject sluices, $p = .905$.

Table 1. Results from the character-selection task testing Sluicing. The first ± sign within the square brackets refers to the subject, the second one refers to the object.

	SLUICES							
	Subject				**Object**			
	Matched		**Mismatched**		**Matched**		**Mismatched**	
	[+] [+]	[-] [-]	[+] [-]	[-] [+]	[+] [+]	[-] [-]	[+] [-]	[-] [+]
3yo	90.00	73.33	80.00	86.67	60.00	60.00	86.67	70.00
4yo	100.00	83.33	96.67	90.00	66.67	73.33	93.33	76.67
5yo	100.00	96.67	90.00	96.67	80.00	76.67	93.33	83.33
6yos	100.00	93.33	93.33	100.0	90.00	83.33	96.67	80.00
AVEs	**97.50**	**86.67**	**90.00**	**93.33**	**74.17**	**73.33**	**92.50**	**77.50**
	92.08		**91.67**		**73.75**		**85.00**	
	91.88				**79.38**			

Our relative clause results replicate previous findings in languages such as Italian and Hebrew (Friedmann et al. 2009; Adani et al. 2010) that showed a subject>object asymmetry, $F(1,224) = 42.746$, $p < .001$ (Table 2). We also find that OR comprehension improves significantly when the subject and object mismatch in animacy features, $p = .01$, but not in the case of SR, $p = .387$.

Table 2. Results from the character-selection task testing Relative Clauses. The first ± sign within the square brackets refers to the subject, the second one refers to the object.

	RELATIVE CLAUSES							
	Subject				**Object**			
	Matched		**Mismatched**		**Matched**		**Mismatched**	
	[+] [-]	[-] [+]	[+] [-]	[-] [+]	[+] [+]	[-] [-]	[+] [-]	[-] [+]
3yo	79.	74.36	89.74	76.92	64.44	51.11	88.89	48.89
4yo	89.	89.74	97.44	84.62	53.33	55.56	82.22	62.22
5yo	97.	93.33	95.56	100.0	71.11	60.00	91.11	73.33
6yos	84.	91.11	95.56	84.44	84.44	88.89	91.11	71.11
AVEs	**87.**	**87.14**	**94.57**	**86.50**	**68.33**	**63.89**	**88.33**	**63.89**
	87.50		**90.53**		**66.11**		**76.11**	
	89.02				**71.11**			

Notably, children performed better with object-extracted constructions containing an animate subject and inanimate object/head than in sentences with an inanimate subject and animate object/head, a result that cannot be accounted for under RM assumptions alone. Instead, one could appeal to frequency effects (e.g. Brandt et al., 2009) or the Animacy Hierarchy (Silverstein, 1976) to explain this difference.

However, we also found that children performed equally poorly on the two matching conditions: animate subject–animate object/head sentences, the second most frequent combination in the input data, as on inanimate subject–inanimate object/head sentences, a highly infrequent combination (Diessel, 2009), and at ceiling in all the subject-extracted sentences, irrespective of frequency and animacy. Neither frequency nor the Animacy Hierarchy alone can explain these results. Rather, we show that animacy mismatches aid the comprehension of crossing dependencies, and specifically, we propose that [animacy] should be included in the computation of intervention.

References:

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