Compounds, learning mechanisms, and the continuity hypothesis in language acquisition

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Recently a series of studies has suggested that the acquisition of syntactic principles does not require innate knowledge (Perfors *et al.* 2011, Tenenbaum *et al.* 2011). This stands in opposition to research suggesting that innate knowledge (UG) is necessary for linguistic development due to insufficient input (Poverty of the Stimulus) (Chomsky 1980, Berwick *et al.* 2011). Tenenbaum's research also questions the validity of the continuity hypothesis (Pinker 1984): if children do not have access to UG and learn based solely on statistical reasoning, why should acquisition mirror adult derivations? In this paper we compare the acquisition of synthetic compounds in Dutch (*appel-eter*) and English (*apple-eater*). In spite of differences in word-order between the two languages, children appear to have similar acquisition paths, suggesting that it is not the frequency of particular word orders in the input that explains the non-adult forms, but rather some more basic knowledge (UG). The developmental path in both languages supports a strong version of the continuity hypothesis.

Acquisition of synthetic compounds in Dutch and English. Synthetic compounds are productive in both Dutch and English and become adult-like around 5-6 y.o. (Dutch: Brisard *et al.* 2008, English: Clark *et al.* 1986, Nagpal & Nicoladis 2009, Gamache & Schmitt to appear). The non-adult forms that children produce during acquisition are similar in both languages (1). Importantly, children produce verb-object (VO) order forms, despite the OV order of the elements in the compound. In fact, Dutch children produce VO order forms more often than English children (28% vs. 12%, respectively), despite the prompts used (2) and the word-order being different across languages (SOV in Dutch, SVO in English). OV word order in child-directed Dutch is reported to range from 20% to over 50% of utterances (Brisard *et al.* 2008 and Klein 1974, respectively).

(1) Proportion of forms produced by Dutch and English children in production studies.

Form		Dutch (Brisard *et al.* 2008)	English (Gamache & Schmitt to appear)
OV*er*	*apple-eater*	.56	.44
V*er*O	*eater-apple*	.08	.06
VO	*eat-apple*	.20	.06
OV	*apple-eat*	.03	.01
Other	---	.13	.43

(2) Dutch prompt: Dis is [$_S$ een machine] die [$_O$ appels] [$_V$ eet].
English prompt: This is [$_S$ a machine] that [$_V$ eats] [$_O$ apples].

Analyzing non-adult forms. In this paper we hypothesize that children's adherence to certain trajectories in learning reflects learning driven by core linguistic principles rather than domain general learning. First, children's VO forms reflect a common VO underlying structure for synthetic compounds in English and Dutch, (Harley 2009, Gamache & Schmitt to appear). Additionally, children appear to know that the object cannot raise to an OV order until *–er* has merged into the structure (Clark *et al.* 1986, Gamache & Schmitt to appear). This explains the

presence of VO and V*er*O forms and the lack of OV forms. Based on the Dutch children's lack of OV forms, we argue it is not the case that children's non-adult forms reflect tracking of clausal order (contra Clark *et al.* 1986) or other deverbal structures in the input (contra Nagpal & Nicoladis 2009).

Theories of language acquisition. Theories of language acquisition exist on a continuum between purely domain general learning (e.g., Tomasello 2003) and purely domain specific learning (e.g., Gibson & Wexler 1994). It is unlikely that a purely domain general approach can explain why English and Dutch children go through the same steps when acquiring synthetic compounds, given their different input; based on purely statistical reasoning, children's non-adult forms should reflect the rate of OV vs. VO word order usage in the language, which is not the case. Moreover, there is nothing in the input, especially in Dutch, that would suggest that OV forms should be avoided. This study, much in the vein of recent proposals (e.g., Gagliardi 2012, Yang 2002, 2004), moves towards the center of this domain-general/domain-specific continuum, suggesting that learning is both guided by UG and proceeds in a manner conducive to domain-general learning principles (e.g., Bayesian inference).

Conclusions. Given that English- and Dutch-speaking children produce the same non-adult forms while acquiring synthetic compounds, it is likely (i) that the structures in the two languages are the same (containing a VO, not OV initial structure) and (ii) that UG is mediating the acquisition process, as is shown through similar acquisition stages despite differing input.

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