

The acquisition of numerals and ordinals

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This Ph.D. project

My project revolves around language and number, and how number is represented in language. I am focusing on how Dutch children acquire number-related language and how this ties in with their developing concepts of number. The idea is to carry out a series of experiments that show how (a part of) this development happens. As a linguist, I am especially interested in the systems that underlie language, but I am excited to be able use methods and insights from other fields, too.

What we (don't) know about cardinal acquisition

Previous research on number development has focused predominantly on the acquisition of cardinal numerals (*one, two, three*, etc.) in English. Many of these studies show that children learn the exact meanings of cardinals in a tiered fashion. First, they learn the meaning of *one* (all the other numerals are *more than one*): children in this stage are called 'one-knowers'. 'Two-knowers' are in the next phase: they know the exact meanings for *one* and *two*, and that other cardinals are not *one* or *two*. Similarly, children may go through three-knower and maybe even four-knower stages, but are then argued to somehow be able to see that by going up one in the count list, they are also adding one. (American) English speakers are usually around 3.5 years old when they reach this stage, though there's quite a bit of variation. However, we don't know much about the exact pattern or timing of cardinal acquisition in children who speak other languages or grow up in different cultures.

What we (don't) know about ordinal acquisition

What about ordinal numerals, like *first, second* and *third*? We know even less about how children acquire these. Ordinals are pretty tricky. On the one hand, they are conceptually related to cardinals, and linguistically, seem to be built on cardinals: *four-th*. But then why aren't all ordinals formed the same way? (We don't say *oneth, twoth, threeth*!) Ordinals don't share all properties with cardinals, and in fact, they (sometimes) show similarities with superlatives. In Dutch, the ordinal suffix *-ste* is also used to make superlatives: *acht-ste* ('eight-th') vs. *hoog-ste* ('high-est'), and indefinite ordinals like *middel-ste* (lit: 'middle-th') and *laat-ste* ('last'). Do these things affect children's ordinal acquisition? Is ordinal acquisition tiered, like cardinal acquisition? In other words: questions aplenty!

The first step

In the first part of my project, I hope to fill part of the gap I described above. I am running a modified version of a so-called "Give X" task, to test the perception of cardinals, ordinals and (to a lesser extent) the degrees of comparison in Dutch. Three-, four- and five- year olds are asked to help a toy monkey going on a trip: all of his things are waiting in line to jump into his suitcase, but Mr. Monkey can't possibly fit everything in! Children are asked to help him pack the right things, for example, *eight banana's*, and *the fourth bus*, but also *a jar with more lollipops* and *the smallest tv*. This experiment allows for a comparison between (i) cardinal acquisition in Dutch and the patterns described in the literature, (ii) cardinal acquisition and ordinal acquisition, and (iii) acquisition of ordinals and the degrees of comparison.

Further steps

The results of this first experiment will influence what happens next, but a production task is a good candidate: what is the relationship between children's perception and production of numerals? And can production data shed light on children's underlying analyses of ordinals and superlatives? For example, anecdotal evidence shows that some children say things like *tussen-ste* ('in-between-th/-est') and *daarna-de* ('after-th/-est'), neither of which is grammatical in adult Dutch. Do children see these as ordinals or superlatives? How come child grammars allow these forms, while adult grammars don't? Stay tuned for answers and more questions!