

Session 4: „*More than meets the eye*“

(Please note: The background story for the following example was inspired by recent work on the L2 processing of complex nominal compounds conducted by Shanley Allen, John Gamboa and colleagues. However, the results are entirely made up by me. Also, the rather severe methodological and statistical problems contained in the example below are not present in their work, but were added by me for teaching purposes.)

A research group wants to investigate the processing of complex nominal compounds such as (1a) versus otherwise similar phrasal constructions such as (1b) in L1 and L2 speakers of English:

(1a) *The results from the latest evaluation suggest that the recent **pharmaceutical market size increase** had consequences for the economy as a whole.*

(1b) *The results from the latest evaluation suggest that the recent **increase in the size of the pharmaceutical market** had consequences for the economy as a whole.*

To allow for a direct comparison between the two constructions, the authors construct 28 sets of minimal pairs such as (1a) and (1b), in which the two versions of the sentence are exactly identical except for the experimental manipulation. As a literature review indicates that the number of constituents within the compound may also play a role, the authors decide to manipulate this factor as well, by adding two more conditions with additional constituents, such as in sentences (1c) and (1d):

(1c) *The results from the latest evaluation suggest that the recent **pharmaceutical market size increase discussion** had consequences for the economy as a whole.*

(1d) *The results from the latest evaluation suggest that the recent **discussion about the increase in the size of the pharmaceutical market** had consequences for the economy as a whole.*

For their L2 sample, the authors decide to test native speakers of German, because the fact that complex nominal compounds are very common in German makes this particular L2 group interesting with regard to possible effects of L1 influence. They rely on eye-tracking during reading as a research method. 40 native English speakers and 40 native German L2 speakers of English participated in the study. The authors determine first-pass reading time, total reading time, and the proportion of regressions (out) for the critical segment which contains the complex nominal compounds vs the phrasal constructions, and compare these measures between the four conditions. Means for these three eye-movement measures by condition are shown in Table 1 below.

Table 1. Mean first-pass reading time, total reading time, and proportion of regression (out) by condition and participant group.

		Short compounds	Short phrases	Long compounds	Long phrases
L1	First-pass rt	2241 (219)	2632 (228)	3030 (278)	3910 (299)
	Total rt	3250 (319)	4021 (340)	3652 (341)	4615 (463)
	Regressions (out)	.23	.31	.22	.35
L2	First-pass rt	3209 (281)	4010 (289)	4212 (401)	4921 (409)
	Total rt	4213 (409)	5211 (421)	4729 (411)	5718 (451)
	Regressions (out)	.15	.24	.14	.23

For each participant group and measure, the authors conducted one-way ANOVAs comparing the four conditions with each other. The ANOVAs for first-pass reading times and regressions (out) did not show any significant differences in either the L1 or the L2 group. For total reading time, in contrast, the ANOVA for the L1 group showed a significant effect; $F(3, 37) = 5.31$, $p < .05$, while the ANOVA for the L2 group did not. The authors conclude that information about the grammatical function of each constituent is denser (i.e. concentrated in one place) in compounds, which makes compounds easier to process than phrases, in which the grammatical information is contained in a variety of different function words. L2 speakers, however, as shown by previous work, struggle to compute a hierarchical tree representation for compounds, which makes compounds harder to process and thus eliminates the difference between compounds and phrases in the L2 group. With regard to the issue of L1 influence, as complex nominal compounds are very common in German, L1 influence should have led to a significant difference in the L2 data, with shorter reading times for compounds than for phrases. However, the L2 group did not show any significant differences between compounds and phrases. The authors thus argue against an influence of the L1 in L2 compound processing.

- 1) Which independent variables do you think are experimentally manipulated in this study? Thus, which main effects and interactions should we include in the inferential analyses?
- 2) Does the experimental design contain any major confounds? When looking at the means in Table 1, which numerical trends in the differences between the condition means can be explained by these confounds as well?
- 3) If we ignore any confounds for the moment, what do you think about the inferential analyses reported in the above abstract? Do these analyses fit in with the experimental

design, and do they allow for any conclusions about the research question? Try and come up with an alternative analysis which is more suitable for this type of design and data.

- 4) Do you agree with the authors' conclusions about L1 influence? Are these conclusions justified on the basis of the results from the inferential analysis? How could you modify or extend the experimental design so that it is informative with regard to a possible influence of the L1?