

Comparing microsystem feature importance

The second analysis of the internal testing protocol relied on the logistic regression model and aimed at investigating the relative importance of microsystem variables across the aggregated A, B and C CEFR levels. We measured the impact of microsystem features in each level. There are two types of features. Figures 1, 2 and 3 show features that indicate occurrences of specific variables and others (with the MS prefix) that show microsystems composed of specific variables. The figures show the strongest features of each level in terms of z-score. A highly negative red¹ z-score indicates a high tendency towards the x1 level (x referring to A, B or C) when a highly positive² z-score shows a high preference for the x2 level. A z-score greater than 2 or lower than -2 is equivalent to $p < 0.05$. Thus z-score is used to test the significance of the variables.

For level A writings, the strongest variables are shown in Figure 1. MD_WILL was the strongest positively associated variable. For every unit increase in MD_WILL there was a 91% increased odds of being an A2 writing (odds ratio 1.91, 95% CI [1.79, 2.03]). On the other hand, N_PREP_N was the strongest negative microsystem variable, with lower values more likely in A2 than A1 writing on average. For every unit increase in N_PREP_N there was a 26% decreased odds of being an A2 writing (odds ratio 0.74, 95% CI [0.71, 0.78]).

Results regarding the A level reveal four significant microsystems. Nominal constructions (i.e. prepositional, genitive and compound constructions) relative to each other appear to be significant predictors of the A2 level as opposed to the A1 level. The obligation microsystem composed of modals *have to* and *must* also appears as a significant predictor of A2. Likewise, the duration microsystem (based on *for* and *ago*) as well as the quantification microsystem (based on quantifiers *much*, *most* and *many*) both show preference for A2 rather than A1 writings. As the microsystems implement forms of a specific language function, these results may indicate that writings are likely to implement the nominal, obligation, duration and quantification functions as a first step in their progress. Even more so as A1 tasks are mostly with the present tense, so that *for/since/ago* is probably not tested at this stage.

¹ On the left of the $y=0$ variable strength axis

² On the right of the $y=0$

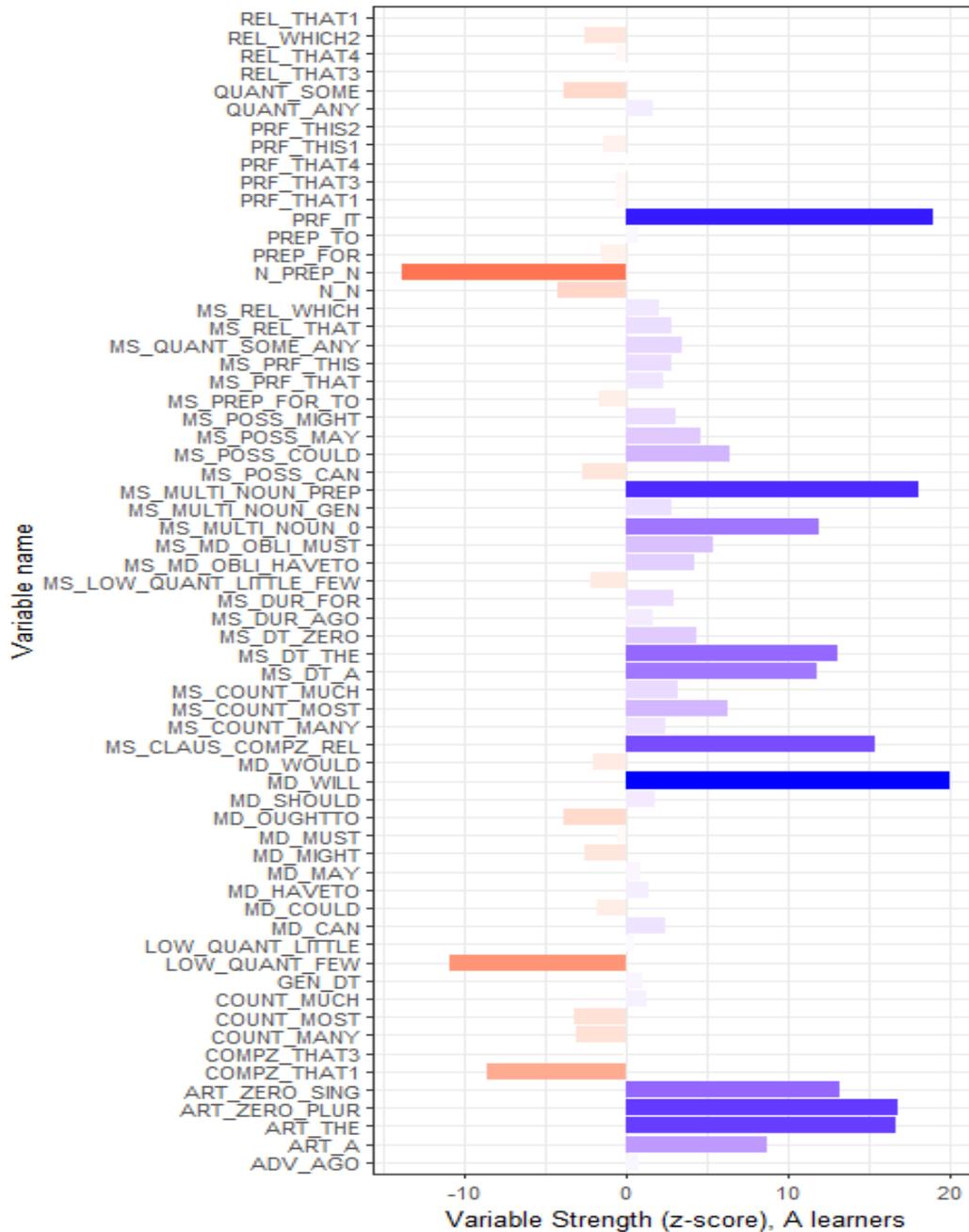


Figure 1: Variable Importance for Level A writings

Figure 2 shows that the B level is influenced by two microsystems. The determination microsystem tends to be indicative of the B1 level. MS_DT_A, 0 and THE are the strongest negative microsystem ratios, with lower values more likely in B2 than B1 writings on average. For every unit increase in MS_DT_A, for instance, there was an 88% decreased odds of being a B2 writing (odds ratio 0.12, 95% CI [0.05, 0.24]). Higher values of each variable tend to appear in B1. This means that when occurrences of the forms occur evenly, the values tend to drop. This

leveling off pushes towards the B2 level. In other terms, as all three variables appear more evenly in a text, the level tends to be B2.

The quantification microsystem with *most* and *many* appears to be indicative of the B1 level. This trend is to be compared with that of the A level, in which the quantification microsystem is favoured in A2. The level adjacency may indicate that the quantification language function appears and consolidates between A2 and B1 levels. The small quantification microsystem, with *little* and *few*, shows that higher values tend to appear in B1 indicating that high but imbalanced use of either of the variables leads to the B1 level. As all the values conjointly drop towards the average, B2 is expected.

In functional terms, B learners seem to be developing their proficiency by implementing determination and quantification language functions. The B2 level tends to appear as these microsystems stabilise in terms of variable proportions.

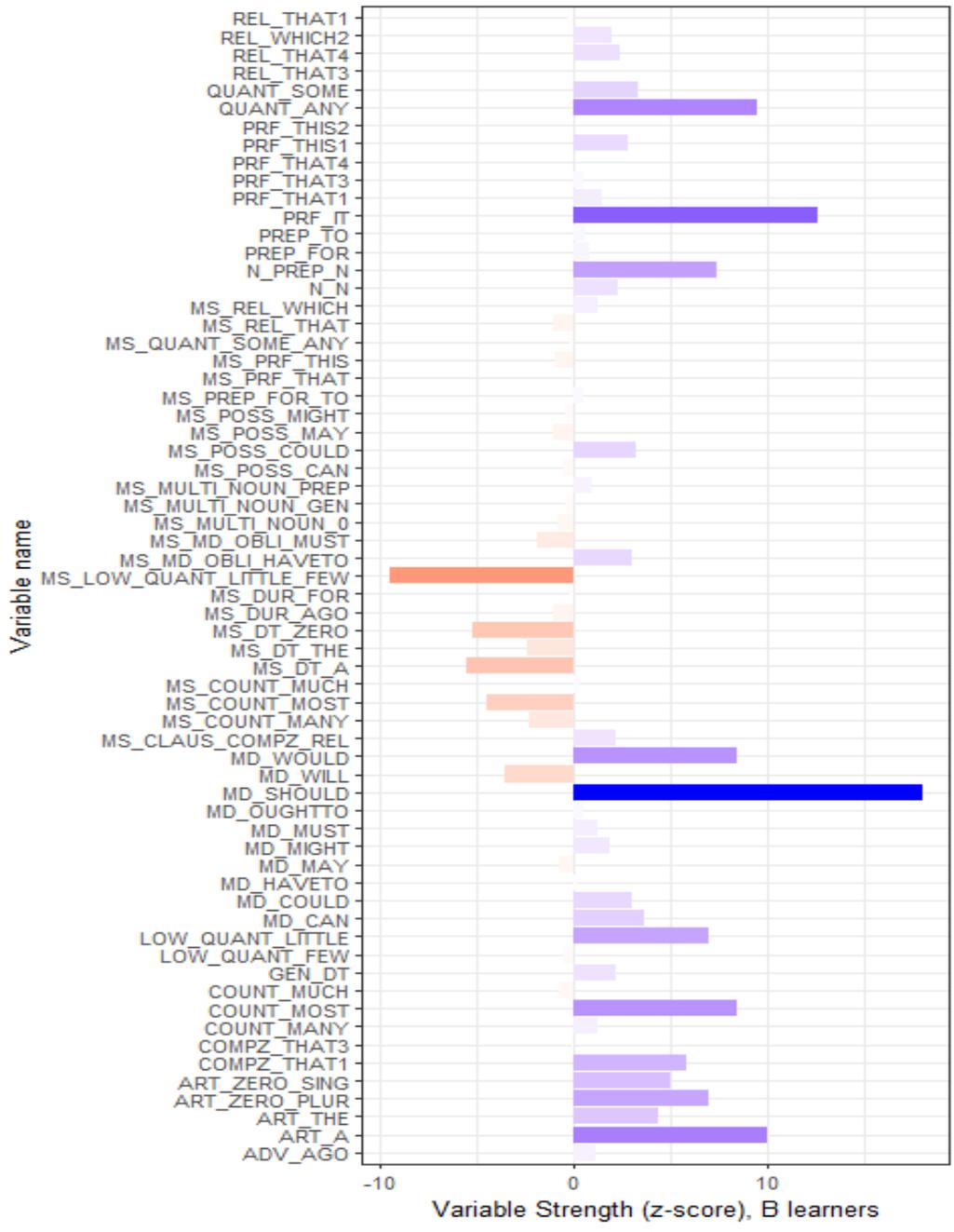


Figure 2. Variable Importance for Level B writings

For level C writings (Figure 3), the proform microsystem and several specific constructions appear to be significant. The proform microsystem tends to predict C1 as learners overuse *this* compared with *it* and *that*, whereas the microsystem tends to predict C2 as learners increase the relative importance of *that*. This microsystem suggests the onset of anaphoric and deictic reference processes, which corresponds to more complex discourse. With higher discourse complexity, learners tend to increase their use of referential expressions leading to variability in

the proform microsystem. The modals *should* and *will* also appear to be significant. This may indicate more elaborate discourse in writing as learners diversify their stance in terms of epistemic or radical modality.

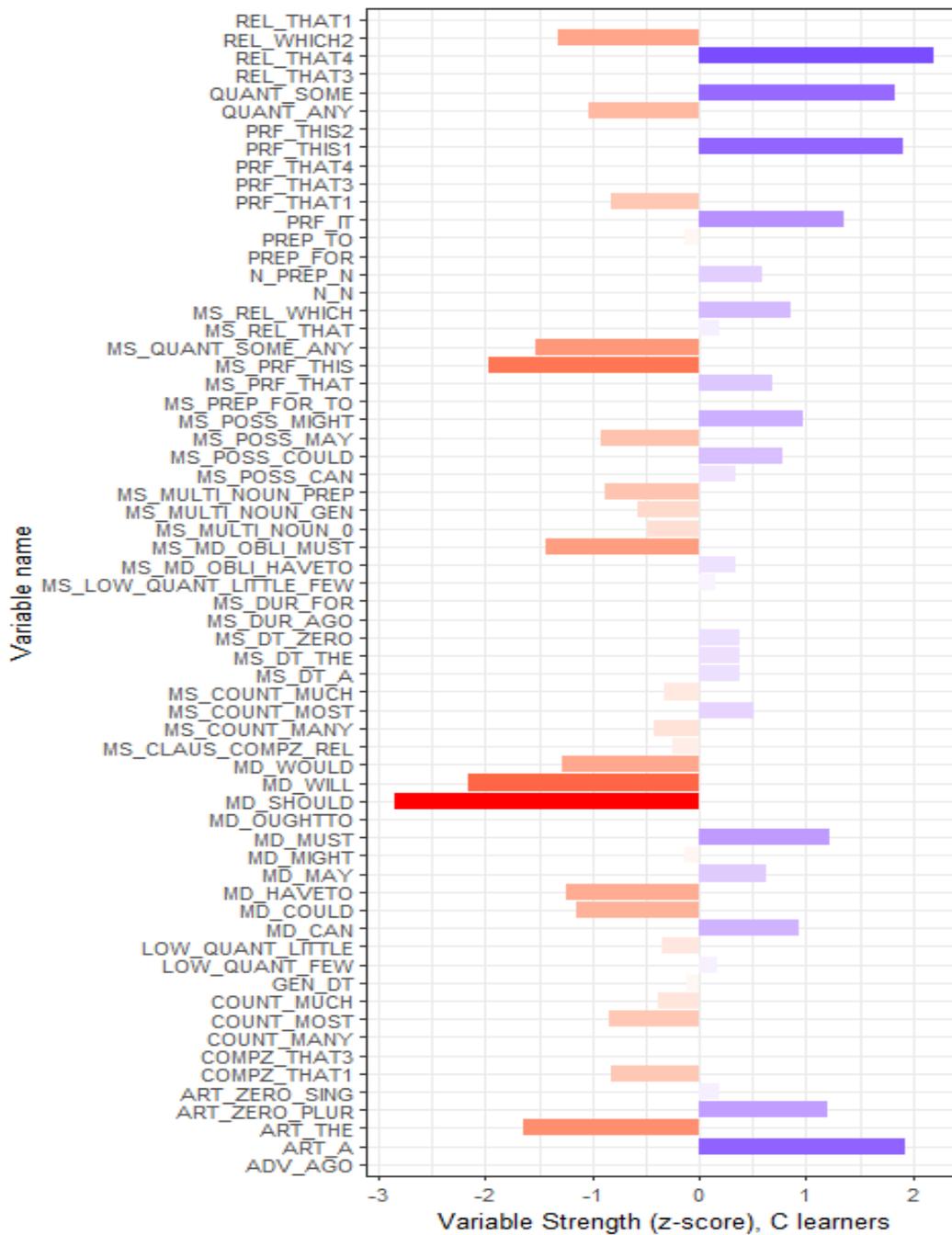


Figure 3. Variable importance for level C writings