Language dominance in Turkish German bilinguals: methodological aspects of measurements in structurally different languages

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The study

- The aim of the present study is to operationalize language dominance in bilinguals with structurally different languages

- The measurement of fluency is one aspect of language dominance

Language dominance

- Grosjean (1997: 165) complementary principle:

  Bilinguals normally use their languages in different domains with different people

  Bilinguals usually have one stronger and one or more weaker languages

Language dominance

- Even with simultaneous exposure to two languages bilinguals can develop dominance in one language (Bosch & Sebastián-Gales 2001:73)

Fluency

- There are various definitions of fluency (for an overview see Hilton 2008)

- Segalowitz (2003) relates it to “automaticity”
- Wood (2001) sees “automaticity” and “formulaic competence” as the two main factors
- According to Chambers (1997) temporal measures of fluency are a “useful anchorage”

The participants

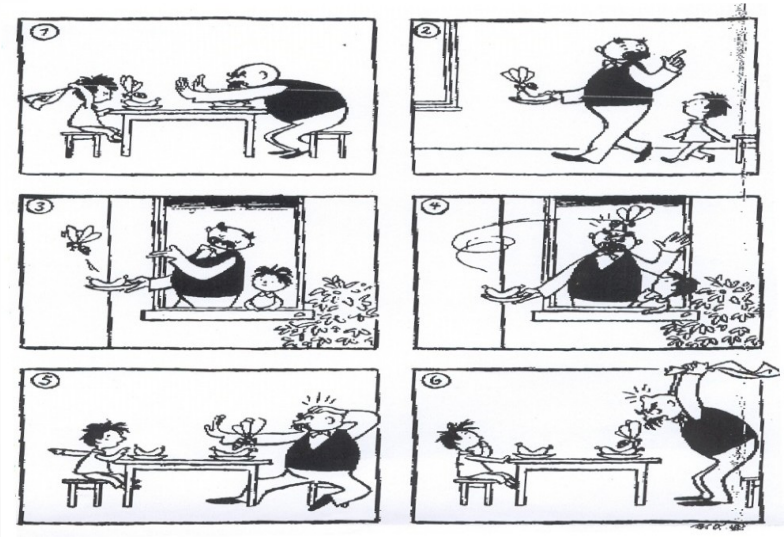
- Turkish-German bilinguals who grew up in Germany and went back to Turkey (N = 60). They were exposed to German and Turkish simultaneously from a very early age.

- Turkish monolinguals (control group) who learned German as a foreign language (N = 56). They had about 400 hours of teaching in German.

The data

- Oral picture descriptions (father-and-son stories)
- A C-test in both languages (Gap filling test)

The tools (C-test/ father-and-son stories)



1. Geography

The UK is located on a group of islands known as the British Isles, which lie between the Atlantic Ocean and the North Sea, northwest of France. At i_____ widest t_____ UK i_____ 300 mi_____ across a_____ 600 mi_____ from No_____ to So_____. It sha_____ a sin_____ land bor_____ with the Irish Repu_____. Despite i_____ relatively sm_____ size t_____ UK boa_____ incredibly var_____ and of_____ very beau_____ scenery, fr_____ the mountains and valleys of the North and West to the rolling landscape of the South, and from downland and heath to Fens and marshland.

The measures

- For the analysis of the picture description we used a manual and an automated analysis with Praat.

- The manual analysis includes “words per minute” and total text length (number of tokens)

Methodological issues

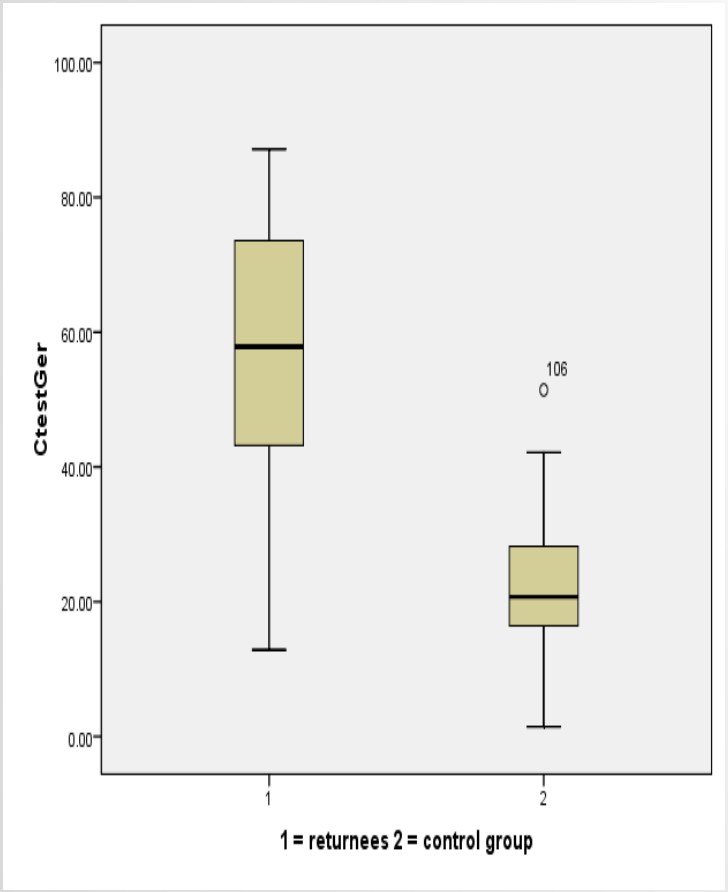
- A comparison of proficiency and fluency in two structurally different languages is problematic since the unit of counting (word, syllable) is not comparable.

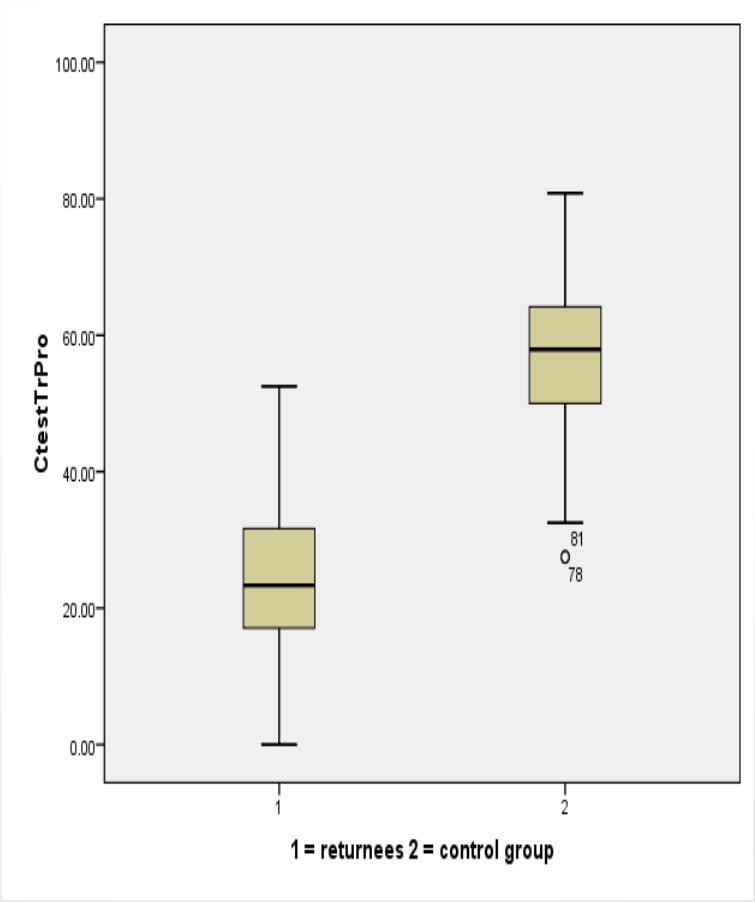
- A word in Turkish may be the equivalent of two or more words in English

Hypotheses

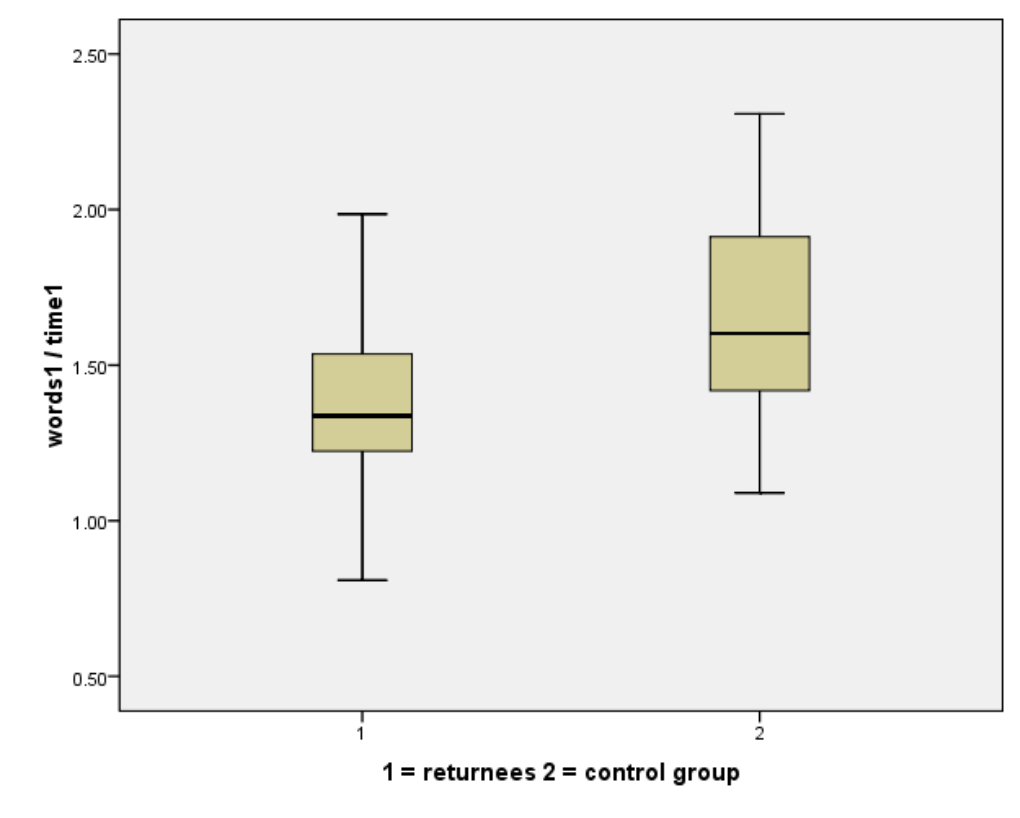
- The control group of Turkish L2 learners will have much lower C-test scores for German when compared with the bilinguals but will have higher scores in Turkish
- The C-tests scores in Turkish and German will show differences in language dominance patterns between the two bilingual groups
- The development of fluency indices will be a useful tool for the measurement of dominance in structurally different languages
- Automated fluency analyses will lead to similar results as manual measures (such as words per minute).

Results (C-test)





Manual measures of fluency



(t-test, t = 4.138, df = 69, p < .001).

Difference between the text lengths (tokens in German – tokens in Turkish)

measure	*Group*	*Mean*	*Std.Dev.*
Difference 1 (based on raw scores)	*Returnees (n = 15)*	*163.87*	*119.00*
	Control group (n = 20)	*-36.90*	*79.42*
Difference 2 (based on adjusted scores for German)	*Returnees (n = 15)*	*131.32*	*101.43*
	Control group (n = 20)	*-44.43*	*74.04*

“Difference” as measure of language dominance

correlations (adjusted scores in brackets, n = 35 where not stated otherwise)

	“difference”	German C-test	Turkish C-test
“difference”	-	.694** (.690**)	-.635** (-.633**)
German C-test		-	-.689** (n = 116)[i]

**. Correlation is significant at the 0.01 level (2-tailed).

[i] N is much higher for the comparison between the C-tests as only a subset of the total sample did the picture descriptions.

How good is the measure?

Classification table for “difference” and group membership

Observed	Predicted		
	Returnees	Control group	Percentage
Returnees (n = 15)	14	1	93.3
Control group (n = 20)	2	18	90.0
Overall percentage			91.4

Automated measures (Praat)

- The total length speaking time excluding pauses (totrun)
- The total number of pauses (Npause)
- The total length of pausing time (totpause)
- The total length of performance (tot = totrun + totpause)
- The mean length of utterance in seconds between two pauses (Mlutt)
- The" phonation time ratio" which is the ratio between the total length of speaking time without pauses and the total length of performance
- The total number of syllables (Nsyl)
- Speech rate 1: the number of syllables per second over the total length of speaking time excluding pauses
- Speech rate 2: the number of syllables per second over the total length of performance including pauses..

Results of the automated measures

- For the returnees:
- “speech rate 2” for Turkish correlates significantly with the Turkish C-test results ($r = .536$, $p < .01$, $n = 25$).
- The German C-test scores correlate significantly with measures that are related to length of performance in the German descriptions, such as total length of speech without pauses ($r = .502$, $p = .02$, $n = 21$), mean length of utterance between pauses ($r = .562$, $p < .01$, $n = 21$)

- For the returnees speech rate is an indication for higher proficiency in Turkish and text length an indication of higher proficiency in German.

For the control group (only Turkish)

- Speech rate in Turkish shows no significant correlation with the C-test scores in Turkish.

- But there are significant correlations between the C-test scores and pausing, such as the total length of pauses ($r = .419$, $p = .012$, $n = 35$)

Summary

- The two groups have a clearly different language dominance profile which is in line with the expectation given the different language acquisition history of the groups.
- The returnees are relatively more dominant in German which can be shown by the C-test results and the manual measures (text length)

Summary

- It is possible to develop indices of language dominance based on fluency measures (words per second) or measures of general oral proficiency (total number of words).
- These indices have a highly predictive power for group membership (loglinear regression)

Summary

- The results for the automated measures are generally in line with the manual measures and the C-test scores.

Summary

- Both approaches can give additional insights into fluency patterns:

  the number of (appropriate?) pauses is an indication of proficiency for the control group.

  speech rate as such is no indication of higher proficiency for the (monolingual) control group (which is in line with the literature on fluency)

Summary

- However, speech rate seems to be a significant predictor of language proficiency in Turkish for the returnees.

Conclusion

- Fluency (speech rate) is **no** indicator of proficiency for monolinguals and for the dominant language of bilinguals
- It is an indicator for the proficiency in the **non-dominant** language of bilinguals
- It can therefore be used to define language dominance in bilinguals

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