

TELLING FORTIS AND LENIS APART IN ENGLISH OBSTRUENT CLUSTERS

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acoustic correlates of fortis (F) and lenis (L) obstruents

- aspirated vs nonaspirated (*p^hen* vs *Ben*; *kiss P^henny* vs *kiss Benny*)
- preceding vowel short vs long (*pēnce* vs *pens*; *mōp* vs *mob*)
- voiceless vs voiced (*viper* vs *Viber*, *simple* vs *symbol*)

take-home message: a voiceless obstruent is not necessarily F, a lenis obstruent is voiceless if adjacent to a fortis on either side

the F/L contrast is neutralized after F

- *spill* *spil* = *sbil* (Twaddel 1935: 31)
- *box* *boks* = *bokz* (Jones 1967: 47ff)

question: is the contrast neutralized *before* F?

ratios of singleton Fs and Ls in E

	initial	medial	final	total
plos.	1.3	1.5	1.2	1.4
fric.	6.8	2.1	0.4	1.5
all	1.9	1.6	0.7	1.4

(so word-initially there are 1.3 times more singleton fortis plosives, 6.8 times more fortis fricatives, and 1.9 times more fortis obstruents than lenis, etc; a singleton obstruent is not adjacent to an obstruent on either side)

ratios of FF and LL clusters in E

	initial	medial	final	total
plos.+plos.	—	6.3	3.2	4.9
plos.+fric.	(2.6)	5.8	3.1	3.7
fric.+plos.	—	23.8	4.4	15.3
fric.+fric.	—	11.2	0.8	1.9
all	(837)	10.5	3.1	6.2

(further details in Szigetvári 2020)

question: why do FF clusters overwhelm LL clusters vis-à-vis singletons?

further questions

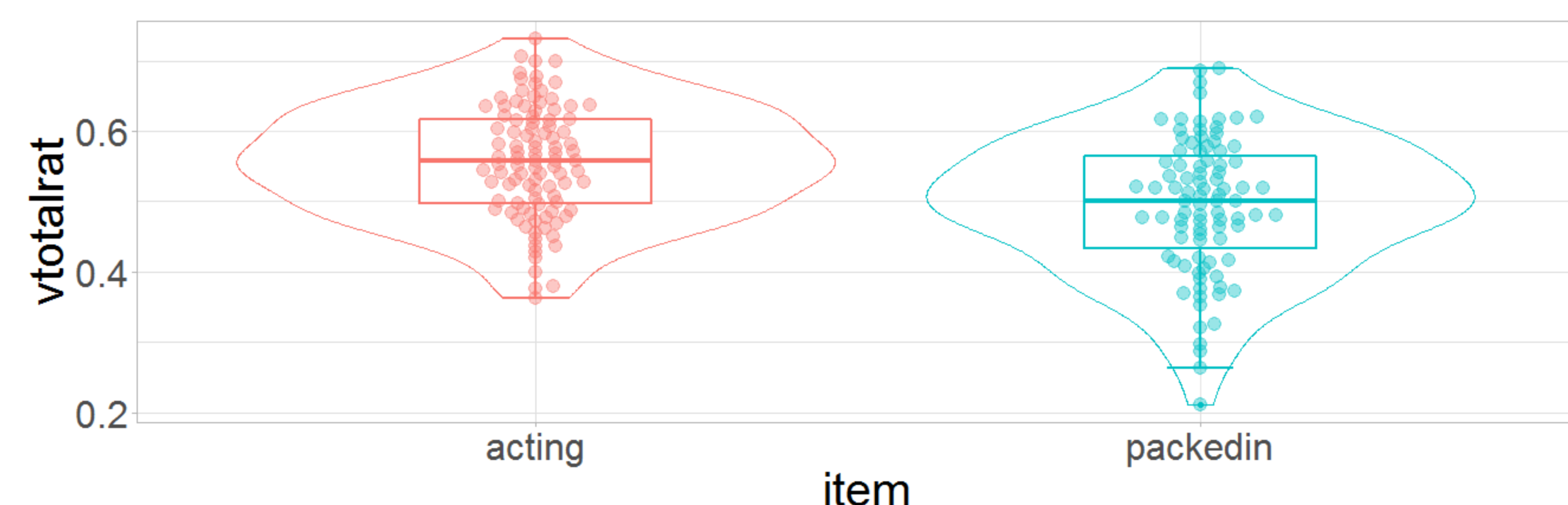
- is *act* *akt* or *agt* or *akd*?
- is *packed* *pakt* or *pagt* or *pakd*?
- note, both obstruents are voiceless in all three analyses

phonetic analysis: method & results

- test words: *acting* (101) and *packed in* (91)
- data collected from <https://youglish.com> automatically, 5-sec. files
- random sampling, independent data points
- accents: AmE: 164; BrE: 21; other: 7
- no pause between *packed* and *in*
- prepared & segmented in Praat (v. 6.1.16) manually
- measured: vowel duration, cons. (CC) duration, total duration, **vowel's duration ratio to total duration (vtotalrat)**, **voicing duration in CC (voidur)**, voicing ratio in CC, **VOT (absolute) (vot)**, VOT (ratio to CC)
- statistical test: independent-samples *t*-test (Welch's), effect size: Cohen's *d* (all done in R)

vowel's duration ratio to total

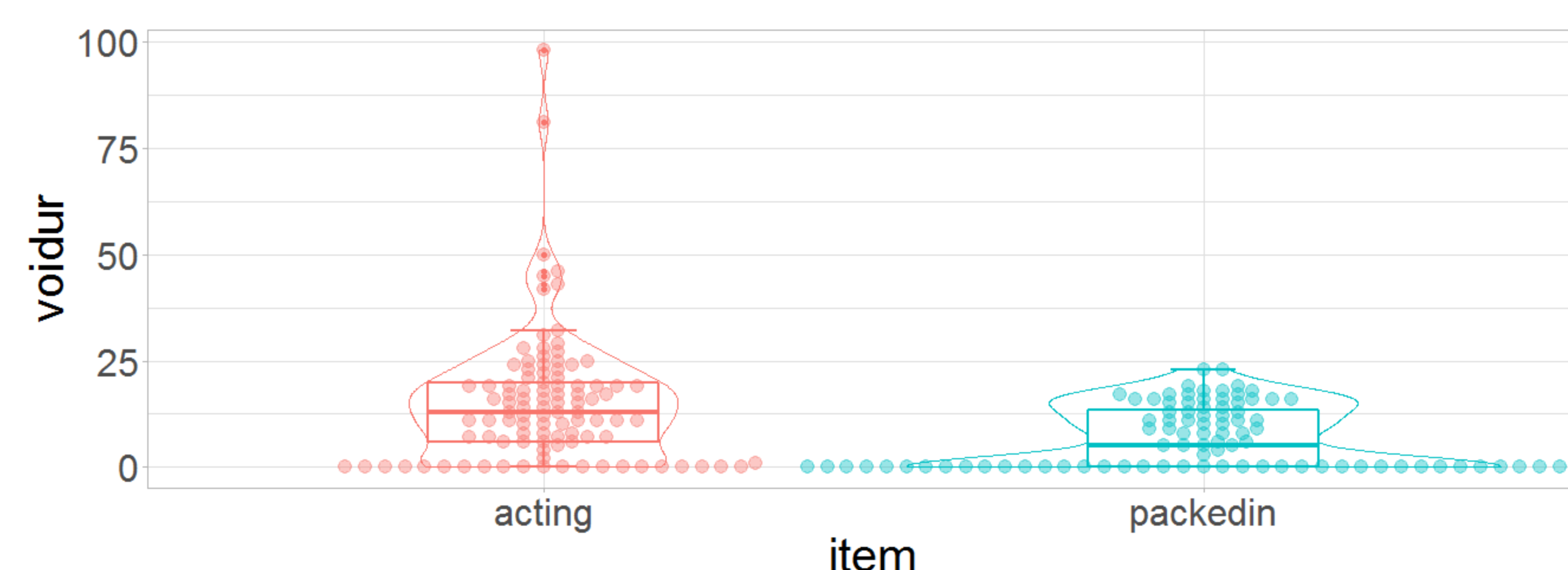
item	N	Mean	SD	Median	Min	Max	SE
acting	101	0.56	0.08	0.56	0.36	0.73	0.01
packedin	91	0.49	0.10	0.50	0.21	0.69	0.01



$t(175.01) = 4.82, p < 0.001, CI_{95}: [0.036-0.087], \text{effect size} = 0.70$

voicing duration in CC

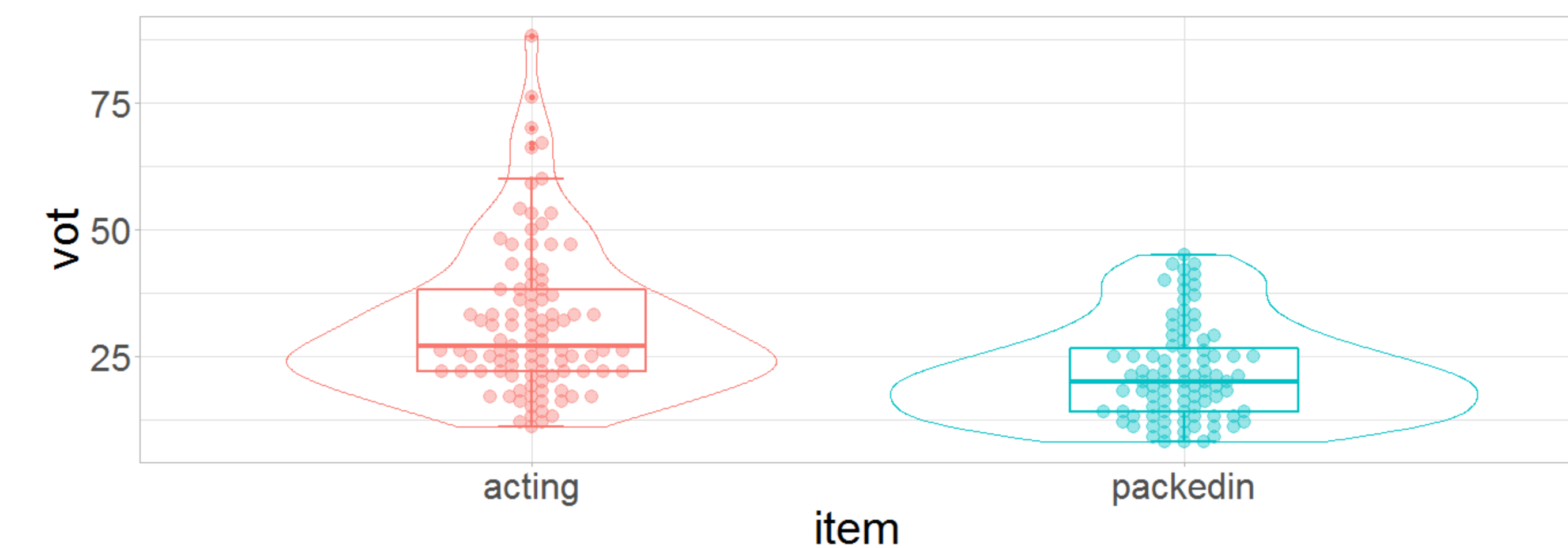
item	N	Mean	SD	Median	Min	Max	SE
acting	101	15.26	15.65	13	0	98	1.56
packedin	91	6.89	7.26	5	0	23	0.76



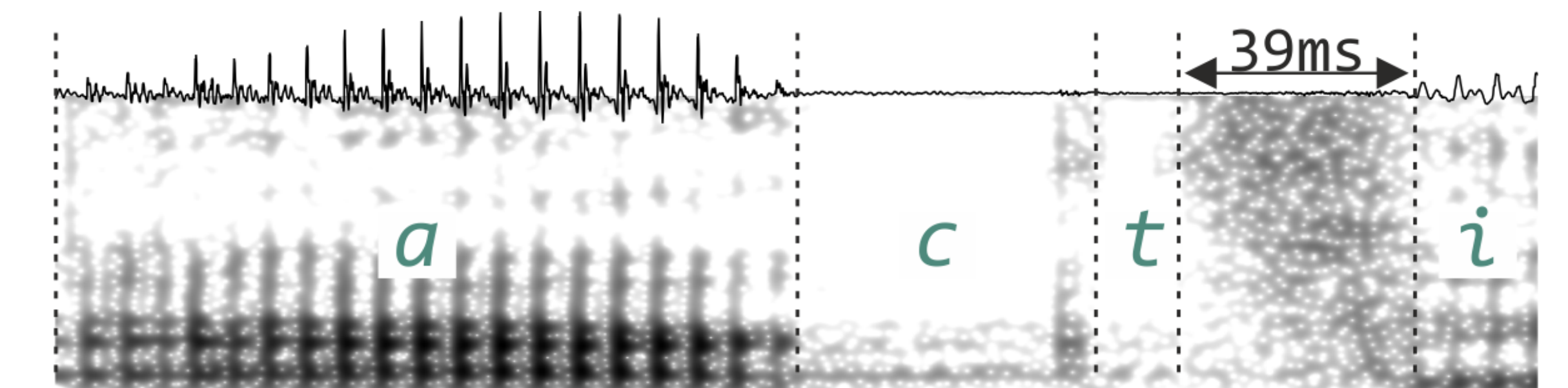
$t(144.33) = 4.82, p < 0.001, CI_{95}: [4.94-11.79], \text{effect size} = 0.69$

vot

item	N	Mean	SD	Median	Min	Max	SE
acting	101	31.42	14.82	27	11	88	1.47
packedin	91	21.65	9.52	20	8	45	1.00



$t(172.39) = 5.48, p < 0.001, CI_{95}: [6.25-13.28], \text{effect size} = 0.78$



conclusions

- although both are assumed to contain *kt*, in *acting* and *packed in* there is a statistically significant difference in
 - the length of the [a]
 - the voicing duration in the consonant cluster
 - the aspiration of the "[t]"

accordingly we conclude that

- *act* is *agt* and *packed* is *pakd*
- the two clusters undergo incomplete neutralization (cf Port & Crawford 1999 and Jansen 2004 for German singleton obstruents)

references

- Jansen, W. 2004. Laryngeal contrast and phonetic voicing. PhD thesis, Rijksuniversiteit Groningen.
- Jones, D. 1967. The phoneme: Its nature and use. Cambridge: Heffer&S.
- Port, R. and P. Crawford. 1999. Pragmatic effects on neutralization rules. *Journal of Phonetics* 17: 257–282.
- Szigetvári, P. 2020. Emancipating lenes: A reanalysis of English obstruent clusters. *Acta Linguistica Academica* 67: 39–52. DOI: 10.1556/2062.2020.00004
- Twaddel, W. F. 1935. On defining the phoneme. *Language* 11: 5–62.