

A simple test for the three 'd' sounds of Kulisusu

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ABSTRACT

According to my preliminary analysis, the Kulisusu language contrasted three voiced stops in the dento-alveolar region—what could be described in layman’s terms as three ‘d’ sounds. Against this analysis, however, some Kulisusu speakers insisted that their language had only two ‘d’ sounds. In order to test these competing hypotheses, as well as look for possible variation between speakers in this regard, I developed a simple exercise using flash cards. This test, described herein, proved easy to administer and yielded insightful results.

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Introduction

In the waning days of our two and an half month stay in the Kulisusu area,¹ I knew that I had a problem. As my ears became attuned to the language, it was becoming apparent to me that speakers of this language contrasted three 'd' sounds: an interdental *d*, an alveolar *d* and an alveolar imploded *d*.² Or to be more precise, it was becoming apparent that maybe some speakers did, while other speakers told me plainly that Kulisusu had only two *d* sounds. All too quickly, our period of field research was over, and I returned to my study program at a U.S. university.

As I combed through our data and began to write up our results, this aspect of our research remained perplexing. For one thing, no other surrounding language had been described as having three contrastive *d* sounds. There are two prestige languages in the area, Muna and Wolio, both of which have had a clear influence on Kulisusu word stock. Of these two languages, Muna is described as having only two contrastive *d* sounds, a dental *d* found primarily in loan words,³

¹Kulisusu is an Austronesian language. In 1988 the number of Kulisusu speakers was estimated at 22,000 (Mead 1999:43). The Kulisusu homeland area, and where the vast majority of speakers live, lies in the northeastern quadrant of Buton Island, just off the coast of mainland southeastern Sulawesi, Indonesia. The research referred to here was conducted under the auspices of the Indonesian Institute of Sciences (LIPI) in February to April 1996, and was partially funded by a grant from Rice University

²In phonetic terms, these could be symbolized and described as follows. For a full list of all Kulisusu phonemes, see Appendix 1.

- /d/ voiced interdental oral stop with egressive lung air
- /ḍ/ voiced apico-alveolar oral stop with egressive lung air
- /ɖ/ voiced apico-alveolar oral stop with ingressive mouth air

³Where it often represents a native phonemicization of *j* (palatal affricate) found in loan words, compare (data from Van den Berg 1996:s.v.):

- dhaga* 'guard, watchman' < Malay *jaga*
- dhago* 'gamecock' < Malay *jago*

and an alveolar *d* of native provenance (Van den Berg 1989:11 ff.). However, Van den Berg also describes this latter sound as having an imploded allomorph [ɗ] which occurs regularly before front vowels, often before /a/, seldom before /ɔ/, and never before /u/.

In Wolio, the other prestige language of the area, a different situation obtains. There are two descriptions of Wolio phonology, and both concur that this language has only two contrastive *d* sounds. Alberth (2000) succinctly describes the contrast as between a dental unimploded *d* and an alveolar imploded *d*. Anceaux (1988:5) uses compatible terminology, describing the difference as between “a voiced alveolar stop of high muscular tension” (corresponding to Alberth’s /d/) and a “voiced alveolar stop of little muscular tension with simultaneous slight retroflexion of the tongue and lowering of the larynx” (corresponding to Alberth’s /ɗ/).⁴ The voiced stop of high muscular tension, Anceaux further notes, occurs primarily in loan words of Arabic origin, where “in some words [it is] actualized by educated speakers as a voiced dental stop according to their Arabic models” (1988:6).

To summarize, Muna speakers contrast two *d* sounds, one dental, the other alveolar, the latter with an imploded allomorph. Wolio speakers on the other hand contrast two alveolar *d* sounds, one imploded, the other not—and the latter with a dental allomorph! Could one of these also be a fitting description of Kulisusu?

I became tempted to believe that Kulisusu resembled Wolio in this respect. From my own field notes it was clear that of Kulisusu words containing any *d* sound, most were articulated with an imploded *d*, and unlike Muna (but like Wolio) this imploded *d* was as common before back vowels as it was before front vowels. Second, both the interdental and the unimploded alveolar *d* sounds were for the most part restricted to recognizable loan words. Perhaps also in Kulisusu only educated speakers maintained a dental articulation, and that was to account for why some people had insisted to me that Kulisusu had only two *d* sounds.

On the other hand, an Indonesian research team reporting on the Kulisusu language (Salombe, Sabandar, et al. 1983) also wrote about a three-way contrast of *d* sounds. However, they characterized the differences strictly according to point of articulation—dental, alveolar and palatal—and when you got down to particular words, their and my data did not agree on which words contained

<i>dhiwa</i> ‘inhabitant’	<	Malay <i>jiwa</i>
<i>idho</i> ‘green’	<	Malay <i>hijau</i>

⁴See further Greenberg (1970:127, 129) regarding the universal correlation of implosion with laxness and retroflexion.

which *d* sound. For that matter, though, there were also duplicities in my own field notes!

A test conceived and executed

As I edged toward a more authoritative description of the Kulisusu phonological system and began to prepare a tentative orthography proposal, the pressure to resolve these questions increased. I began to plan what I might do on a return trip. Particularly, I wanted to test for possible dialectal or idiolectal differences. Because we had limited access to the Kulisusu area, however, I was likely to be able to spend no more than two weeks there.

In the end I decided on a simple flashcard test. On each index card a single word was printed in large black letters, with the letter ‘d’ chosen to represent all three *d* sounds—regardless of which *d* sound I thought was actually articulated in any particular word. To resolve ambiguity and/or to aid word recognition, an Indonesian gloss was added in smaller print in the lower, right hand corner.



kadondo

kedondong

On the back of each card, which was not shown to the language respondent, was printed a number. This number served two purposes: to aid me in keeping records, and to ensure that in every test the cards were presented in the same order.

To obtain a set of words for testing, I used every word from our small, draft dictionary which contained a *d* sound, supplemented by a handful of additional words obtained from the phonology section of Salombe, Sabandar, et al. (1983:20 ff.). This resulted in 121 cards. It seemed best to test as full a set of data as possible, since it was impossible to predict ahead of time where variation between speakers might occur.

At the same time, I also prepared a similar test for *b* sounds. According to my analysis, and in keeping with what had been described for surrounding languages such as Muna and Wolio, Kulisusu speakers contrasted a voiced unimploded bilabial stop with an imploded counterpart (except preceding the vowel *u*, where the imploded *b* sound never or only rarely occurred). Since this aspect of the sound system was less controversial, I would begin each testing session by getting a respondent to discriminate between the two *b* sounds, before moving on to the main section of the test involving *d* sounds. At the same time, however, I also wanted to see whether we might uncover any variation between speakers in the use of the two *b* sounds.

The *b* portion of the test was introduced by presenting the minimal pair *boku* /boku/ ‘book’ and *boku* /ʙoku/ ‘desire, longing’ and discussing how Kulisusu had two *b* sounds—in layman’s terms a hard or heavy *b* sound (*b tebal*) and a soft or light *b* sound (*b ringan*), and that these sounds could make a difference in

meaning. The respondent was then presented with the flashcards in turn, and asked to place each card in the appropriate pile depending on how the *b* in that word was pronounced. The test for *d* was conducted similarly, except that in the introduction I simply explained that I had been told in Kulisusu there were two and possibly three different *d* sounds, and asked the respondent to group the cards as he or she deemed appropriate.

This test was executed informally over the course of four days in late November, 2000. I was able to conduct the test in six different locations with a total of eight respondents (three respondents from the town of Ereke, and one respondent each from five surrounding villages). Although I always made sure that for each performance of the test one person was the primary respondent, it was rare for the test to be conducted one on one. The usual case was to have several people in the room observing the test, whose collective intuition was then relayed by the primary respondent. I say the test was informal because in addition to the small number of data points, we made no attempt to overcome sample bias. In two locations respondents were chosen because they were prior acquaintances of mine; in two other locations they were acquaintances of my traveling companion.

Results

Among those we interviewed—and almost all results discussed herein need to be prefaced with those four words—we found both the two-way *b* distinction and the three-way *d* distinction to be very robust, with speakers highly consistent in regard to which words contained which sounds. The compiled results are presented Appendix 2.

The test was also satisfying in that we discovered why some speakers maintain that Kulisusu has only two *d* sounds. This is because although the contrast between the three *d* sounds is robust, it is not always *recognized* as such. For example, although respondent no. 2 clearly articulated the interdental and unimploded alveolar *d* sounds differently, in the test she combined words which contained these sounds into a single category. Respondent no. 5, on the other hand, combined the interdental and imploded *d* sounds as a single category, even though (again) he clearly articulated these differently. Finally, respondent no. 6 began the test by treating the alveolar and imploded *d* sounds as a single category distinct from the interdental *d* sound, but by the end of the test had switched to treating the interdental and alveolar *d* sounds as a single category, distinct from the imploded *d* (but all the while articulating the three sounds differently). Therefore, even in this small sample size we were presented with all three possibilities of subsuming two *d* sounds under a single category.

Having observed this, when on first pass two other respondents distinguished only two *d* sounds, I pressed both of them to further divide the relevant category. This they did ably, once the distinction had been pointed out and recognized. The three remaining respondents made a three-way division on their own.

These results confirmed three things. First, Kulisusu speakers do indeed contrast three *d* sounds. One sound is not simply a variant of one of the others, either allomorphically (according to phonetic environment or free variation) or according to speech register.

Second, however, some teaching will be necessary to educate Kulisusu speakers about this aspect of their language. Perhaps what they know about the Muna and Wolio languages have conditioned them to report that Kulisusu likewise has only two *d* sounds.

Third, the testing confirmed in an impressionistic way that undersymbolization may be the correct orthographic decision in this case. During the flashcard test I rarely observed instances where word recognition seemed to be hindered by writing all three sounds the same way,⁵ nor when queried did anyone offer an opinion that these sounds should be symbolized differently. Writing all three sounds the same way is also a common practice among native authors.⁶

Beyond impressions, with the results of our test in hand I was finally able to go back and calculate the frequency with which each phoneme occurred in natural texts. Kulisusu has twenty-nine consonant phonemes, and in frequency of occurrence the interdental and alveolar *d* sounds ranked twenty-sixth and twenty-ninth respectively. In the texts on which I based my calculations, overall only one out of every two thousand consonants was an interdental *d*, while alveolar *d*'s occurred three times less frequently than that. The imploded *d* sound on the other hand was the fourteenth most frequently occurring consonant, accounting for 2.7% of the total number—in other words roughly one out of every thirty-seven consonants was an imploded *d*.

Undersymbolization—that is, writing the interdental, alveolar and imploded *d* sounds the same way—would certainly also aid inexperienced writers. During testing, persons who responded to the flashcards on their own took longer to

⁵ Respondent no. 2 asked aloud: *dudu* (= [dudu]) what is *dudu* ([dudu])? Oh, *dudu* (= [ɗuɗu]), breast! Presumably such cases would be even more rare when words are read in context.

⁶ This may change, however, as more people become exposed to the Muna writing system (which uses *b* and *bh*, *d* and *dh*), which is being taught to school children.

decide on a classification for the card than did people who were aided by an audience. Since by its very nature writing is usually an individual task, beginning writers might struggle if they have to differentiate the three *d* sounds orthographically. One respondent, no. 6, who worked individually, came up with a number of results at variance with our other respondents. For persons like her, having to write the three *d* sounds differently might be a continual struggle with misspelling.

Apart from this one respondent, and apart from the tendency described above to subsume two *d* sounds into one category, we found a high degree of consistency among our respondents. Nonetheless, just as the word for ‘sweet’ is usually *mesiu* but some speakers say *misiu*, so also the following words were identified as *possibly* having two valid pronunciations, the difference lying in the quality of the the *d* or *b* sound employed. This might have been confirmed had we tested more people, but as it stands presently these forms require further investigation.

/danda/	?? variant /danda/	‘rice pot’ (< Malay <i>dandang</i>)
/kadera/	?? variant /kadera/	‘chair’ (< Portuguese <i>cadeira</i>)
/laade/	?? variant /laade/	‘generic name for a baby boy’
/waade/	?? variant /waade/	‘generic name for a baby girl’
/mođene/	?? variant /mođene/	‘with one’s feet in mud’
/bene/	?? variant /bene/	‘nummularia yam’

Considering the above results, the informal testing for three *d* sounds in Kulisusu was a success. It is also possible to mention three other, subsidiary results.

For one thing, the test confirmed that the imploded *b* sound does not occur preceding the vowel *u*. In the few cases where I had written /*bu*/ sequences, these turned out to be errors in transcription on my part.

On the flashcards, no symbol was employed to represent glottal stop. However no cases were noted where this seemed to hinder word recognition, and in fact speakers appeared to have no problem articulating glottal stops in their correct positions. During the entire testing, only one respondent suggested, for a single word, that we should have symbolized glottal stop.

Finally, a serendipitous result was that I had ample opportunity to hear the contrast between unimploded and imploded *b*, and between interdental, alveolar and imploded *d*, and this was a great help in tuning my ear to this ‘foreign’ distinction.

How the test could have been improved

Despite the success of the test, there are ways it could have been improved had I had both access to Kulisusu speakers and time to make the necessary adjustments.

First, some items were sometimes or regularly not recognized as Kulisusu words, for example *bantu* ‘help’ (felt to be Indonesian), *monsoda* ‘hit’ and *kabaebae* ‘rice porridge’ (both felt to be Wolio words) and *babe* ‘wobbly’ (taken from Salombe, Sabandar, et al. 1983 but not recognized by our respondents). Nonetheless, other words—which were clearly loans, such as *baterei* ‘battery’ and *dunia* ‘world’ (from Indonesian *dunia*)—passed muster without comment. Had the test been prepared in consultation with Kulisusu speakers, we could have avoided including words which were felt to be foreign.

It also turned out that a few words had been misspelled (*baeu* for *beau* ‘candlenut’, *buobi* for *borubi* ‘dorsal fin’), but these were quickly caught and replacement cards were made.

The test was probably overly long, and the same results could have been obtained using a shorter list. The length made it impractical to always go back over the test, for example when a respondent had combined two *d* sounds under one category. On the other hand, we didn’t know ahead of time where we might encounter variation between speakers, and it was this consideration which argued for including a fuller amount of data in the test.

Another difficulty concerned the Indonesian gloss which was written in the corner of each card. Discussions—sometimes long discussions—arose as to whether this brief gloss was the correct or best rendition of the meaning of the word. Rather than supplying an Indonesian gloss, it would have behooved us to have simply placed the word within the context of a Kulisusu phrase or clause.

Perhaps the most serious difficulty of the test was that when a respondent simply read the word on a card, picked it up and placed it in one of the growing piles before him, there was no way to know whether he had indeed apprehended the target word. He could have misread the card; he could have been thinking of a homograph; he could have been inattentive or distracted from the task at hand; or he could have simply been guessing. Although it was clear in many cases that the respondent had indeed apprehended the correct word, ultimately there was no consistent way to tell why a speaker responded the way he or she did.

Again, placing each word in an appropriate, unambiguous context would have helped. Fortunately for our purposes, the high degree of consistency in responses itself constituted a form of cross-checking, and made us feel we could trust the test results. It is thus only in cases where we note variation between speakers that we might still want to ask, now why did they respond that way?

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Appendix 1: Kulisusu phoneme inventory

Kulisusu is an open-syllable language, and the only two allowable syllable patterns are CV and V. Kulisusu has a typical five-vowel system (i, e, a, o, and u), and there are twenty-nine consonants. Phonemes in parentheses occur predominantly or solely in loan words. For a more precise description of each phoneme, its articulation and its distribution, see Mead (2001) whence this chart was taken.

		inter-		alveo-			
	bilabial	dental	dental	alveolar	palatal	velar	glottal
prenas vl stops	/mp/		/nt/		/ntʃ/	/ŋk/	
vd stops	/mb/			/nd/	(/ndʒ/)	(/ŋg/)	
fricative				/ns/			
stops vl	/p/		/t/		/tʃ/	/k/	/ʔ/
vd	(/b/)	(/d/)		(/d/)	/dʒ/	/g/	
vd impl	/b/			/d/			
fricatives	/β/			/s/			/h/
nasals	/m/			/n/		/ŋ/	
lateral				/l/			
trill/flap				/r/			

In the present paper, the bilabial fricative /β/ is written as *w*, the affricates /ntʃ/, /ndʒ/, /tʃ/ and /dʒ/ as respectively *nc*, *nj*, *c* and *j*, and the velars /ŋk/, /ŋg/ and /ŋ/ as respectively *ngk*, *ngg* and *ng*. Glottal stop has been left unsymbolized.

Appendix 2: Summary of responses

To ensure respondent anonymity, two-letter abbreviations have been used in place of full names.

- | | | |
|---|---|--|
| 1 | <i>Informant:</i> HT
<i>Age:</i> ~60
<i>Sex:</i> male
<i>Location:</i> Ereke | <i>Occupation:</i> retired sailor
<i>Formal Education:</i> elementary school
<i>Other languages:</i> English, Indonesian |
| 2 | <i>Informant:</i> SL
<i>Age:</i> 42
<i>Sex:</i> female
<i>Location:</i> Ereke | <i>Occupation:</i> housewife
<i>Formal Education:</i> 6th grade
<i>Other languages:</i> Indonesian |
| 3 | <i>Informant:</i> MR
<i>Age:</i> 23
<i>Sex:</i> male
<i>Location:</i> Wadeburi | <i>Occupation:</i> fisherman
<i>Formal Education:</i> high school
<i>Other languages:</i> Indonesian |
| 4 | <i>Informant:</i> AR
<i>Age:</i> 27
<i>Sex:</i> male
<i>Location:</i> Tomoahi | <i>Occupation:</i> unknown
<i>Formal Education:</i> high school
<i>Other languages:</i> Indonesian |
| 5 | <i>Informant:</i> MH
<i>Age:</i> 32
<i>Sex:</i> male
<i>Location:</i> E'elehaji | <i>Occupation:</i> farmer
<i>Formal Education:</i> junior high school
<i>Other languages:</i> Indonesian |
| 6 | <i>Informant:</i> SD
<i>Age:</i> 30
<i>Sex:</i> female
<i>Location:</i> Ereke
<i>Other:</i> born in Surabaya, moved to Ereke when 5 yrs old | <i>Occupation:</i> housewife
<i>Formal Education:</i> high school
<i>Other languages:</i> Indonesian |
| 7 | <i>Informant:</i> NR
<i>Age:</i> 22
<i>Sex:</i> male
<i>Location:</i> Bone Lipu | <i>Occupation:</i> farmer
<i>Formal Education:</i> high school
<i>Other languages:</i> Indonesian |

8 *Informant:* YS
 Age: 28 *Occupation:* driver
 Sex: male *Formal Education:* junior high school
 Location: Bone Rombo *Other languages:* Indonesian

On the following charts a dash (—) indicates the respondent did not recognize that word as a valid Kulisusu form. The circle (○), dot (●), delta (Δ) and no symbol indicate groupings of cards as decided upon by that respondent. These symbols are to be understood as follows. On the first chart (first four pages), unimploded bilabial stop *b* is symbolized by the circle, while no symbol is used for its imploded counterpart. On the second chart (remaining pages), roughly the dot symbolizes alveolar unimploded stop *d*, the delta symbolizes the interdental *d*, while again the imploded *d* is left unsymbolized. This is not true, however, of respondents 2, 5 and 6; see the discussion of their responses to the test in the main text.

		1	2	3	4	5	6	7	8
1	<i>dahu</i> 'dog'								
2	<i>daida</i> 'father'	△	●	△	△		●	△	△
3	<i>dali</i> 'earring'								
4	<i>dampi</i> 'sticky'								
5	<i>danda</i> 'rice kettle'							●	●
6	<i>dandanga</i> 'rice kettle'								
7	<i>daoa</i> 'market'								
8	<i>dara-dara</i> 'k.o. plant'								
9	<i>dawo</i> 'brother/sister-in-law'								
10	<i>dawulu-wulu</i> 'k.o. caterpillar'								
11	<i>edede</i> 'expression of surprise'	●			●	●		●	
12	<i>deede</i> 'slowly, a bit'								
13	<i>dempa</i> 'rocky expanse along shore'								
14	<i>dete</i> 'level stretch of land'								
15	<i>doa</i> 'prayer'	●	●	△	△		●	●	△
16	<i>dodo</i> 'slander'	—		—			—		—
17	<i>doi</i> 'money'	●	●	●	●	●		●	
18	<i>doloma</i> 'darkness'								
19	<i>domi</i> 'domino'								
20	<i>dongka-gongkala</i> 'egg yolk'								
21	<i>dongkulo</i> 'corn cob'								
22	<i>dopi</i> 'plank'								
23	<i>dotoro</i> 'doctor'								
24	<i>dudu</i> 'breast'	△	●	△	△		●	△	△
25	<i>duka</i> 'also'								
26	<i>dumaa</i> 'exist, come into being'								
27	<i>dundu</i> 'k.o. cockroach'					—			
28	<i>dunia</i> 'world'		●	△	△		●	△	△
29	<i>duria</i> 'durian'	●	●	●	△	●		●	●
30	<i>da lumense</i> 'be dancing'								
31	<i>daasisi</i> 'let it be'								
32	<i>hiina idaa</i> 'there is none'								
33	<i>adati</i> 'custom'	●	●	●	●	●	●	●	●
34	<i>ade</i> 'chin'								
35	<i>ahadi</i> 'Sunday'	△	●	△	△			△	△
36	<i>bada</i> 'body'	△	●	△	△		●	△	△
37	<i>bede</i> 'bedding (for plants)'	●	●	●	●	●	●		●
38	<i>bodi</i> 'k.o. boat'	●	●	●	●	●	●	●	●
39	<i>podaga</i> 'trader'								
40	<i>kadampo</i> 'baked sago/cassava cake'								
41	<i>gode</i> 'rice porridge'								
42	<i>gode-gode</i> 'sitting platform'	●	●	●	●	●	●	●	●
43	<i>hadiri</i> 'attend'	●	●	●	●	●	—	—	—
44	<i>inade</i> 'he/she'								
45	<i>indade</i> 'they'								
46	<i>ungkude</i> 'I'								
47	<i>kacidaki</i> 'crowbar'								
48	<i>kadadi</i> 'animal'								
49	<i>kadea</i> 'k.o. leaf'								
50	<i>kadera</i> 'chair'	●	●	●		●	●	●	

		1	2	3	4	5	6	7	8
101	<i>monsadi</i> 'set/serve on a plate'								
102	<i>monsidu</i> 'spoon'								
103	<i>monsoda</i> 'hit'	—	—			—	—	—	—
104	<i>monsodo</i> 'poke'								
105	<i>monsudu</i> 'prod from below'						●		
106	<i>mompidiki</i> 'squirt on'								
107	<i>mompadurako</i> 'stuff in, eat'								
108	<i>mompada</i> 'extinguish'								
109	<i>moudo</i> 'swallow'								
110	<i>cinada</i> 'hanging down'								
111	<i>dansio</i> 'pinch it'								
112	<i>dedehio</i> 'peel it'								
113	<i>dekeo</i> 'hit it with one's knuckles'								
114	<i>dekuo</i> 'tap it'								
115	<i>didiuo</i> 'threaten it'								
116	<i>doao</i> 'count it'								
117	<i>dodoo</i> 'cut it off'								
118	<i>cudao</i> 'pelt it'								
119	<i>podoho</i> 'fell it (tree)'								
120	<i>harodo</i> 'exclamation of surprise'								
121	<i>pada malala</i> 'lemon grass'	●							