

# Bridging phonology, meaning, and written form across time:

## Introducing a database of Chinese ideophones — CHIDEOD

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# Ideophones: a typologically widespread phenomenon

## **Dingemanse's definition**

**marked**

**words**

that **depict**

**sensory imagery** (2011; 2012)

[and that belong to an **open lexical class**] (2019)

# What we know about Chinese ideophones

Some cross-linguistically notable features of ideophones  
(cf. a.o. Dingemanse & Akita 2016)

- prosodic foregrounding
- often less integrated in sentences
- often marked by reduplication
- expands on the phonological system of prosaic words
- gesture
- variable written forms

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(1) 她 咻地一聲 跑過去了。  
tā **xiū**=de=yì-shēng pǎo-guò-qù=le  
she **IDEO**=ADV one-sound run-past-go=PFV  
“Shoow, she ran by.”

(2) 飛機 咻咻咻 飛過去。  
fēijī **xiū xiū xiū** fēi-guò-qù  
airplane **IDEO IDEO IDEO** fly-over-go.  
The planes whizzed over.

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Actor Jackie Chan performing newly coined ideophone  
*duāng* 'very black, thick and smooth hair' > 'wow!'

**成龍** 成龍 Cheng Long 'Jackie Chan'

# What we know about Chinese ideophones

Chinese research on Chinese ideophones is mostly concentrated on onomatopoeia (ideophones that depict sound).

Zhao Aiwu 赵爱武 (2008)

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However, there are some broader discussions of ideophones

- phonology
- Beijing dialect
- Southern Sinitic
- Cantonese (vs. Dagaare)
- Mandarin (vs. Japanese)
- Japanese (vs. Mandarin)
- reduplication in Old Chinese
- Middle Chinese

Mok (2001); Thompson (2018)  
Meng (2012)  
Wu (2014)  
Bodomo (2006)  
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These studies often append data to their work (good!)  
but the data is not standardized so not always reusable (less good).



# How can we unify what we know about Chinese ideophones?

We need to centralize these data so they can be reused

- Dedicated studies
- Dictionaries
- (scattered examples)

Our answer: **CHIDEOD** — **the Chinese Ideophone Database**

Collecting data from these sources,  
storing them in a user-friendly dataset and repository,  
provide a number of formal and semantic variables that can be explored

# Similar databases: BCCWJ's word profiler

Balanced Corpus of Contemporary Written Japanese (NINJAL 2016) has a word profiler (LWP)

The word profiler looks up words in the BCCWJ and provides sketch grammar-like statistics.

NINJAL-LWP for BCCWJ

fuwafuwa 絞り込み 元に戻す

all noun verb adj. conj. adv. mimetic  
すべて 名詞 動詞 形容詞 連体詞 副詞 オノマトベ

見出し	読み	ローマ字表記	頻度
ふわふわ	フワフワ	fuwafuwa	414

The goal of CHIDEOD is to collect all TYPES,

which later could be used in a corpus study

# Similar databases: MEJaM

The Multimedia Encyclopedia of Japanese Mimetics (Akita 2016)

*bururu*  
[collocation]  
verb  
adjective  
nouns

## Body movement / 体の動き

ぶるぶる

[コロケーション]

動詞：震える / shiver

形容詞：寒い / cold

名詞：手 / hand、唇 / lip、身体 / body、眼 / eye

[Google画像]



*buru~buru*

**CHIDEOD might eventually evolve into a Multimedia CHIDEOD**

**Which would include pictures and video clips to illustrate the depictive nature.**

**However, given the diachronic and synchronic scope, this may not be realizable for all items.**

# Similar databases: Quechua Real Words

Audiovisual ANTI-dictionary of expressive Quechua ideophones

(Nuckolls 2017; Nuckolls & Swanson 2019)

The goal is to study the multimodal interaction between Quechua ideophones and gesture through video clips

**Subsets of data provided in CHIDEOD can aid in researching how multimodality(gesture) interacts with Chinese ideophones.**



*polan*

# CHIDEOD: why and where



- digitization of data
- centralization of data
- exploration
  - semantics
  - phonology
  - ortography
  - historical
- expandable research resource rather than the finalized tool
- type frequencies  
(not yet token frequencies)

Open source project available at OSF  
<https://osf.io/kpwgf/>

Available as online app  
<https://simazhi.shinyapps.io/Chineseideophone/>

Also available as an R package  
(see osf website)

# CHIDEOD is structured in a *tidy* format

- Ever growing resource
- Modeled after the recent [Chinese Lexical Database](#) Sun et al. (2018)
- Lives mostly as a large *tidy dataframe*
  - R (but also other programming languages like python)
  - Export to csv, excel, pdf

1 character: 3,913  
2 characters: 34,233  
3 characters: 7,143  
4 characters: 3,355  
Total: 48,644  
(>200 variables)

country	year	cases	population
Afghanistan	1999	31745	19987071
Afghanistan	2000	2666	20095360
Brazil	1999	31737	17200362
Brazil	2000	80488	174504898
China	1999	210258	127201272
China	2000	210766	128002583

variables

country	year	cases	population
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China	1999	210258	127201272
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observations

country	year	cases	population
Afghanistan	99	75	98071
Afghanistan	00	66	09360
Brazil	99	737	00362
Brazil	00	488	50898
China	99	258	272
China	00	766	2583

values

Wickham (2014);  
Wickham & Grolemund (2016);  
Forkel et al. (2018)

# CHIDEOD (the online app version)

CHIDEOD Table About

Phonology

- Pinyin without tones
- Pinyin with tones
- Pinyin with numbers
- Middle Chinese
- Old Chinese

Orthography

- Traditional Chinese
- Simplified Chinese
- Traditional 1
- Traditional 2
- Traditional 3
- Traditional 4
- Simplified 1
- Simplified 2

Copy CSV Excel Search:

pinyinnone traditional Kroll

1	xu	吁	gasp, onom. of surprise, whew!, or dismay, oh no!; to sigh, ahh
2	fei	吠	onom. Dog's bark
3	zha	咤	onom. of eating noisily and with gusto, smacking the lips; onom. of exclamatory admiration or sighing regret
4	zi	咨	onom. of weariness, discouragement, heartache: ah me!
5	wa	哇	vomit, retch (onom.)
6	xi	唏	onom. for sighing in sadness or grief, syeeh!
7	kui	喟	onom. Sighing, heaving a sigh
8	xiao	嗥	onom. Bamboo flute
9	sou	嗾	onom. of sound by which one calls or commands a dog
10	xu	嘘	onom. of exhaling serenely, in a satisfied and unhurried manner; a sigh of ease and contentment

Showing 1 to 10 of 4,662 entries

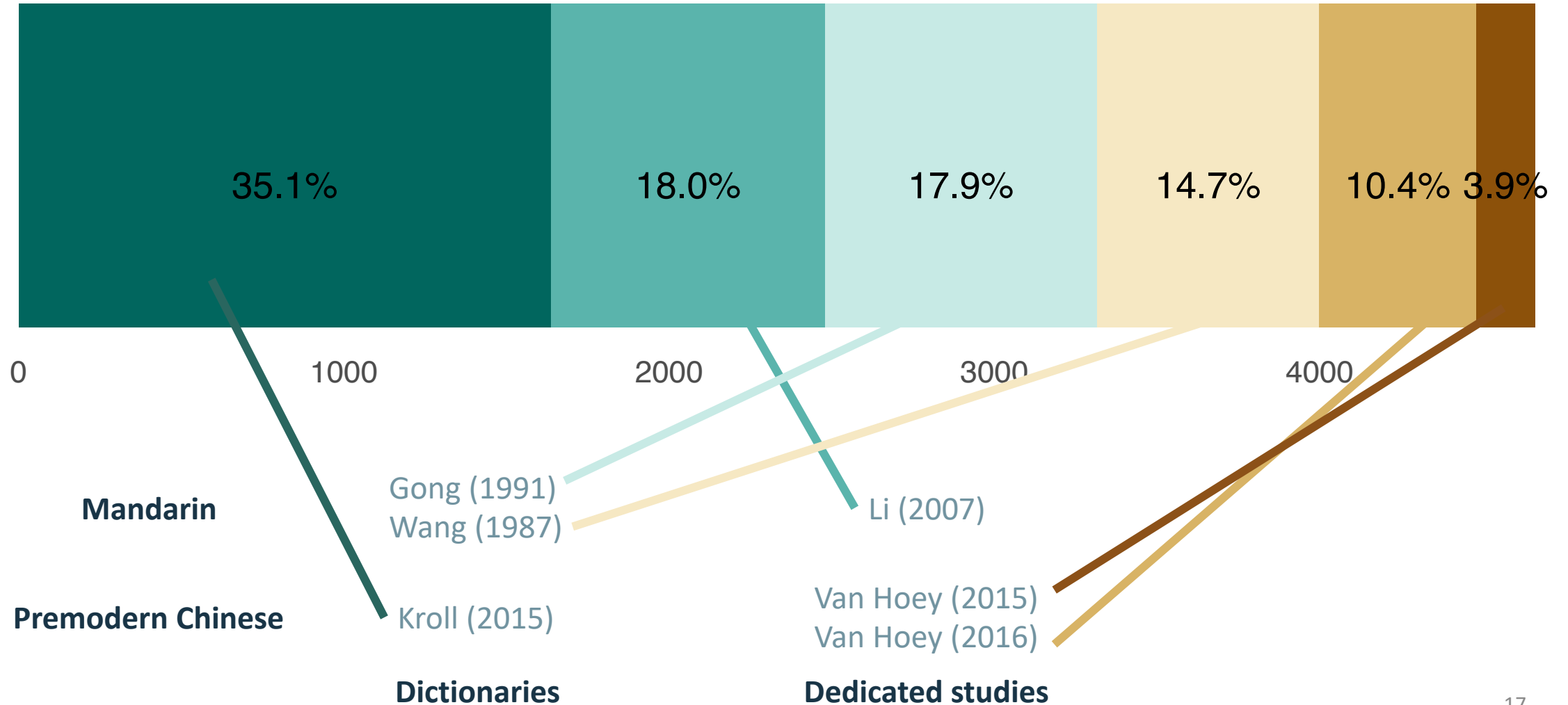
Previous 1 2 3 4 5 ... 467 Next

4662 entries; 3452 distinct onomatopoeia and ideophones

# Variables coded in CHIDEOD



# Sources for CHIDEOD



## Formal variables

## Semantic variables

## Other variables

phonology

pinyin tone,  
pinyin num,  
pinyin none

Middle Chinese (MC)  
Old Chinese (OC)

word  
level

Kroll dictionary  
Handian (zdic)  
Hanyu Da Cidian

variants

note

sensory modality

datasource

traditional  
simplified

T1-T4

S1-S4  
S1-S4.charfreq  
S1-S4.famfreq

morphology

character  
level

S1-S4.sem  
S1-S4.semfreq  
S1-S4.semfam

radical support

below-  
character  
level

S1-S4.phon  
S1-S4.phonfreq  
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orthography

# variables in CHIDEOD

Abbreviations:

*S* = simplified,

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*phon* = phonetic radical,

*freq* = (token) frequency,

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phonology

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pinyinnum,  
pinyinnone

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Old Chinese (OC)

traditional  
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morphology

radical support

word  
level

character  
level

below-  
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## Semantic variables

Kroll dictionary  
Handian (zdic)  
Hanyu Da Cidian

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**word  
level**

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level**

**below-  
character  
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# Formal variables

Traditional  
character

關關

Simplified  
character

关关

onomatopoeia

'cry of an osprey'

# Formal variables

## word level

Phonology

guān~guān

guan1~guan1

guan~guan

Middle Chinese

kwaen~kwaen

Old Chinese

\*[k]ʰro[n]~[k]ʰro[n]

(Baxter & Sagart 2014; 2015)

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## character level

T1 T2 T3 T4

關 關 NA NA

S1 S2 S3 S4

关 关 NA NA

Character frequency per million

976,716

Family frequency

90

Traditional character

關關

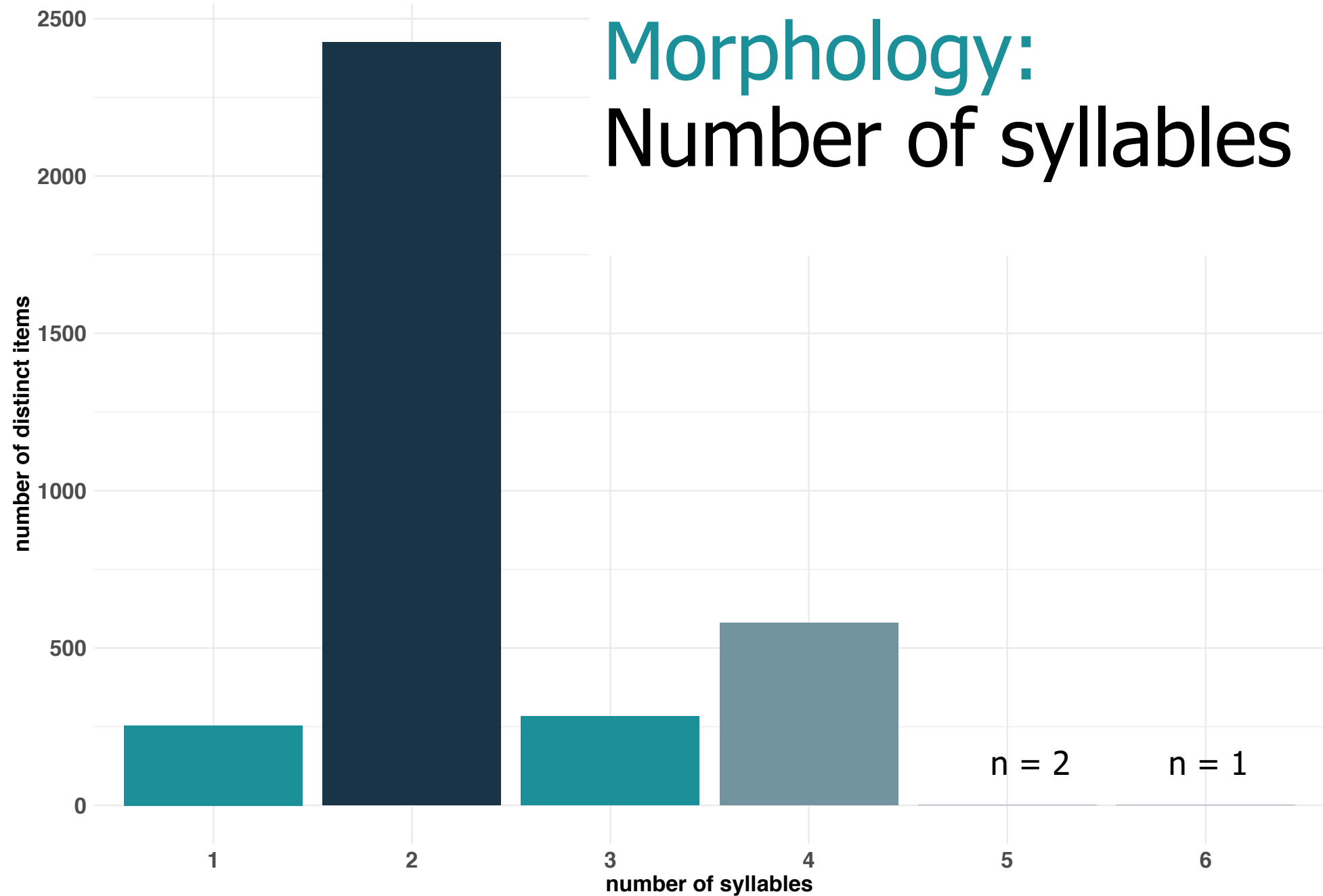
Simplified character

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# Morphology: Number of syllables





## Based on identifying a

- **BASE**
- **REDUPLICANT**
- **extra elements**

(cf. Sun 1999)

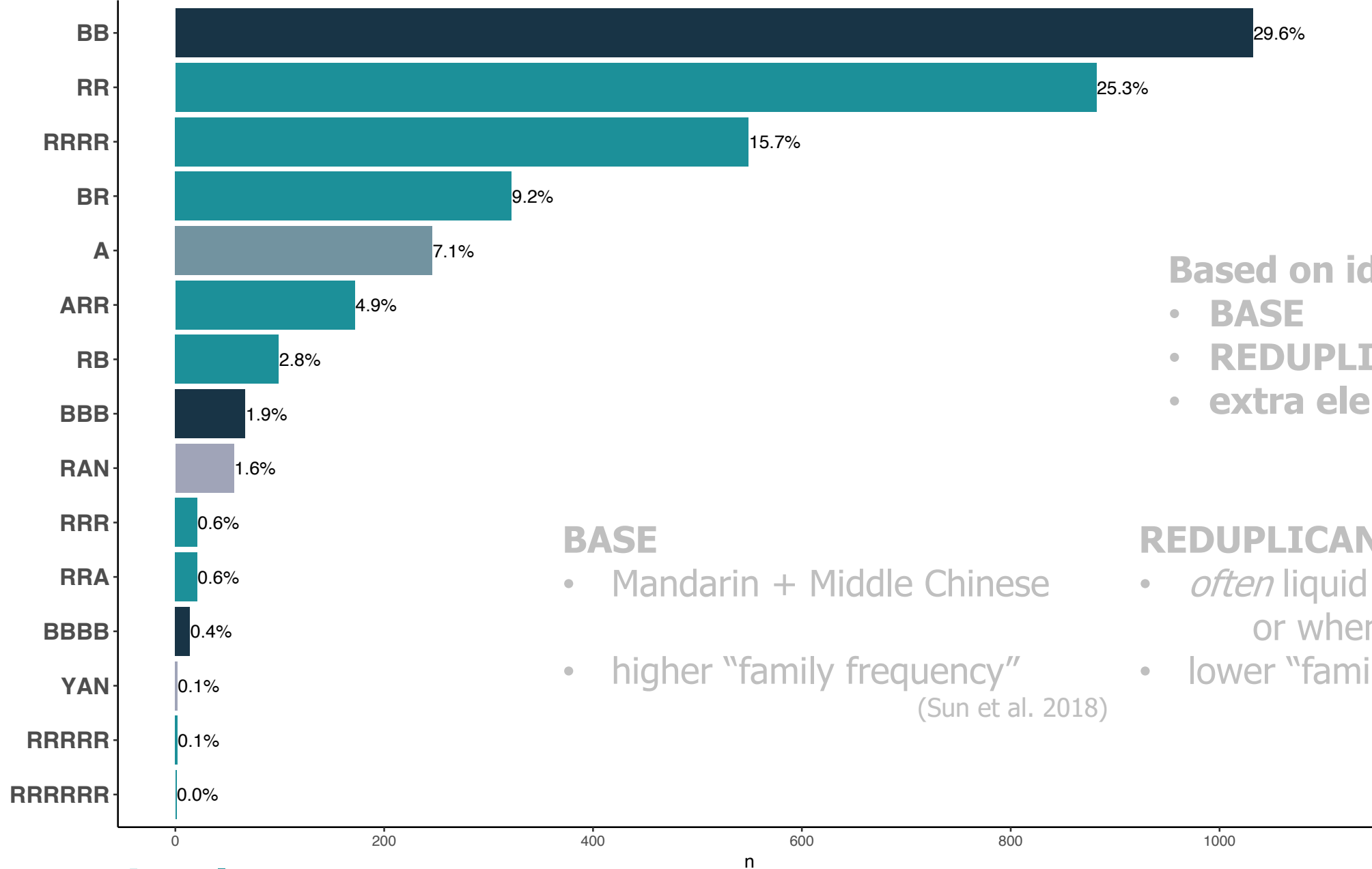
## **BASE**

- Mandarin + Middle Chinese
- higher “family frequency”  
(Sun et al. 2018)

## **REDUPLICANT**

- *often* liquid (or MC reflex)  
or when base unclear
- lower “family frequency”

# Morphological categories and their frequencies



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## BASE

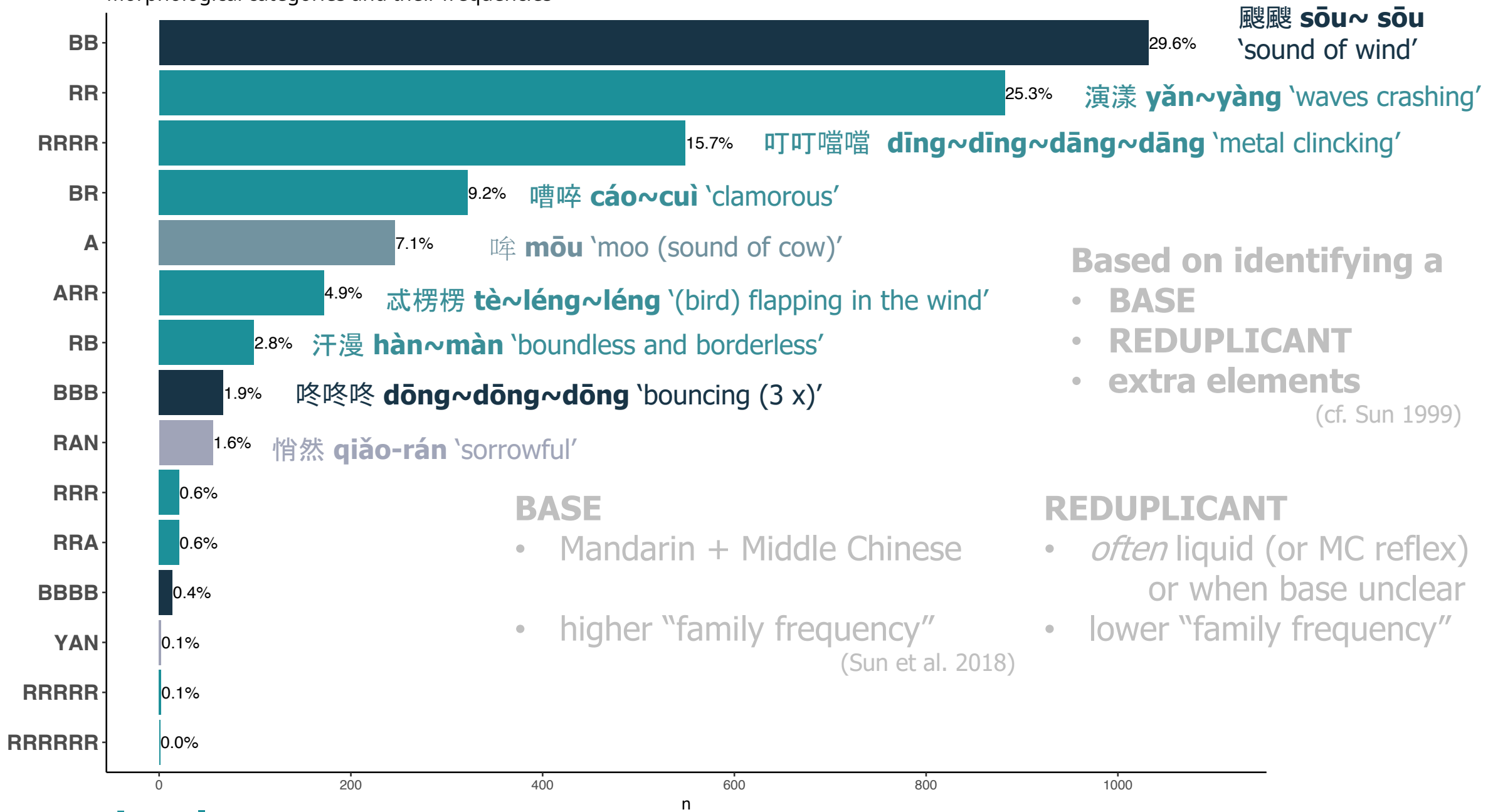
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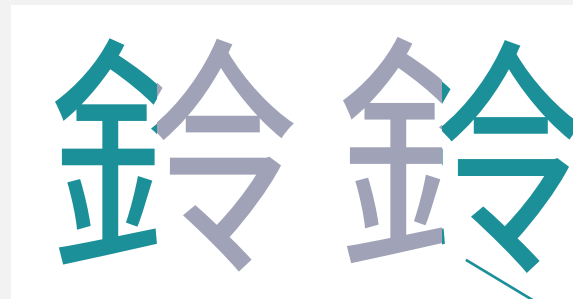
# Formal variables: below-character level

About 72 % of Chinese characters are composed of a semantic radical and a phonetic part, based Chinese Lexical Database (Sun et al. 2018)

250 semantic radicals in the CLD

e.g.

- 口 MOUTH 286 characters
- 扌 HAND 255
- 艹 GRASS 244
- 木 WOOD 255
- 亻 PERSON 222



líng~líng  
'onomatopoeia:  
sound of small clapper bells  
on carriages'

1079 phonetic radicals in the CLD

e.g.

- 非 *fei* 19 characters
- 客 *ke* 19
- 隹 *zhui* 18
- 包 *bao* 18
- 且 *ju* 18

In 鈴鈴 the semantic radical 金 (钅) indicates METAL

In 鈴鈴 the phonetic radical is 令 *ling*

The ideophone is motivated by orthography

The ideophone is motivated by phonology (BB type)

# Phonological support: Sound correspondences the orthographic forms (of ideophones)

## Full reduplication (BB+)

## Partial reduplication

- BR
- RB
- RR
- RRA
- ARR
- RR+

## Single A

## Compositional RAN/YAN

懊惱  
ào~nǎo  
'vexed'

奧 *ao*

惱 *nao*

**42.9% of CHIDEOD (1483 items) have this kind of phonological support.**

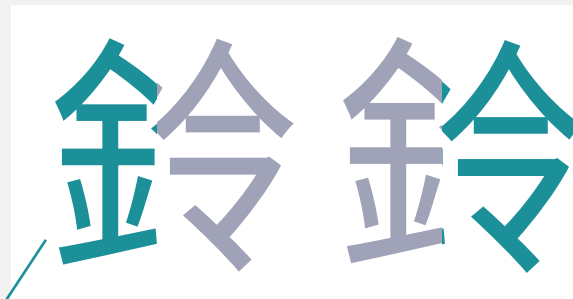
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# Formal below: semantic radical support

## Radical support:

reduplication in the orthographic form  
(of ideophones)

## Different ontological domains

- speaking
- nature
- human
- ...

Whether this differs significantly from prosaic words is still undetermined.

Most interesting in **partially reduplicated** forms.

radical support		morphological pattern frequencies				
radical	meaning	A	BR	RB	RR	RRRR
口	<b>MOUTH</b>	129	8		196	266
氵	<b>WATER</b>		50	7	51	7
山	<b>MOUNTAIN</b>		21		21	
艹	<b>GRASS</b>		11		21	
足	FOOT				18	
王	JADE				15	5
卜	HEART1		8	6	14	
糸	SILK				12	
扌	HAND		5		10	
心	HEART2				9	
金	METAL				9	6
女	WOMAN		5		8	
辵	WALK				8	
NA		98	154	45	374	254

# What is more important in partial?

**Subset:** `datasource = Kroll + binomes (two characters) [morphology = RR|RB|BR]`

With these two parameters

- **Phonological form** — Morphophonological motivation / markedness
- **Written form** — Ortographic motivation / markedness

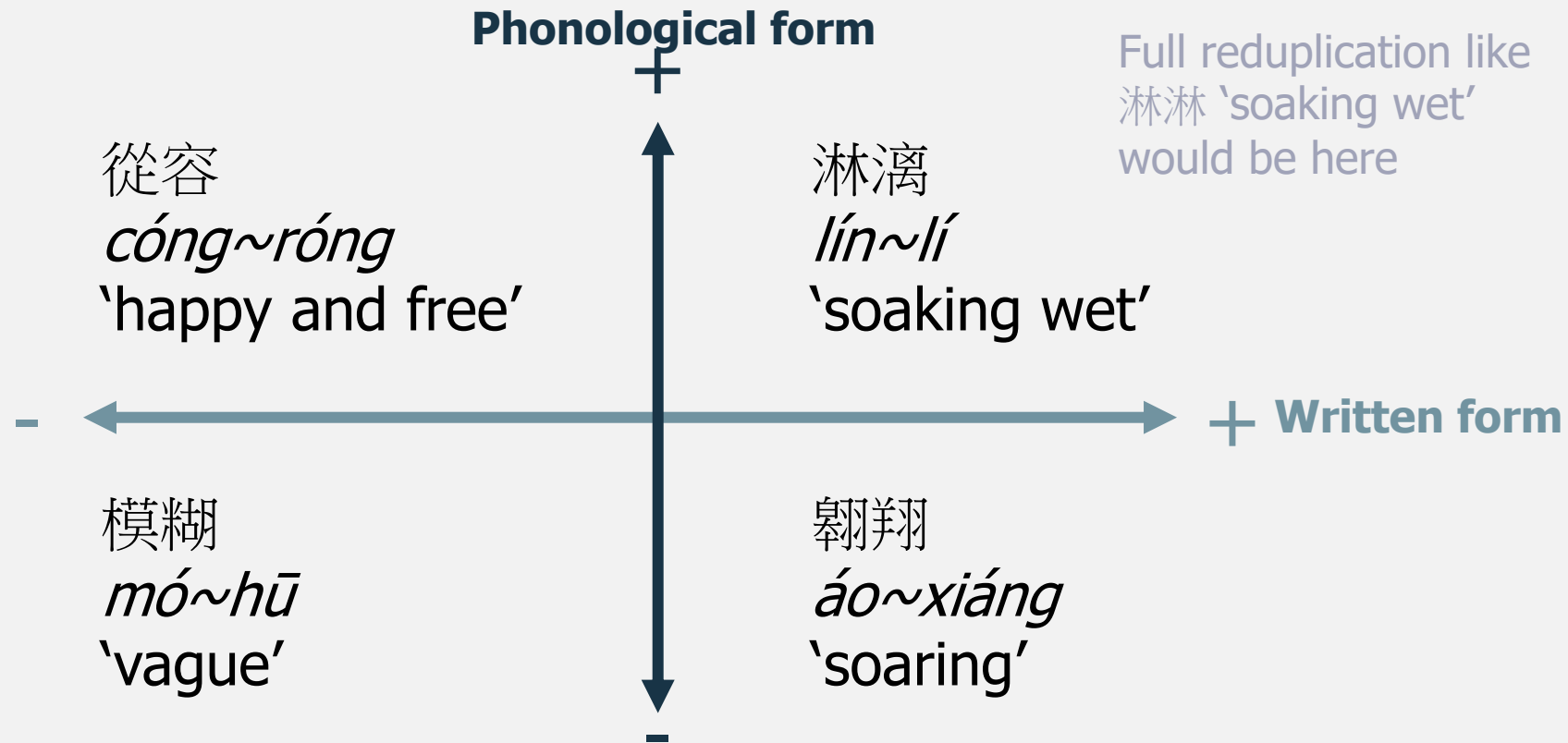


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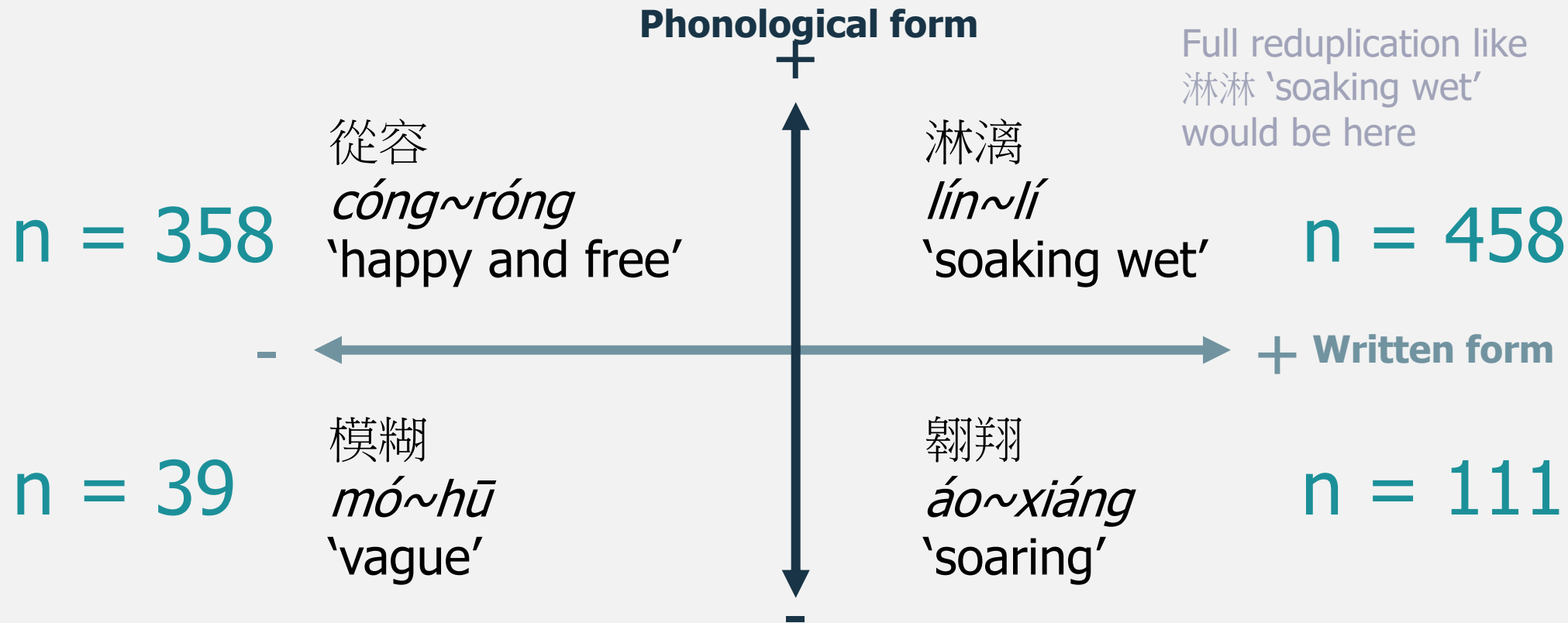


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- **Phonological form** — Morphophonological motivation / markedness
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$\chi^2 = 15.99$   
 $p = 6.369e-05$

## Formal variables

phonology { pinyintone,  
pinyinnum,  
pinyinnone  
Middle Chinese (MC)  
Old Chinese (OC)

traditional  
simplified

T1-T4

S1-S4  
S1-S4.charfreq  
S1-S4.famfreq

S1-S4.sem  
S1-S4.semfreq  
S1-S4.semfam

S1-S4.phon  
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morphology

radical support

## Semantic variables

Kroll dictionary  
Handian (zdic)  
Hanyu Da Cidian

sensory modality

## Other variables

variants

note

datasource

word  
level

character  
level

below-  
character  
level

# variables in CHIDEOD

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# Semantic variables:

## 3 dictionaries define most ideophones

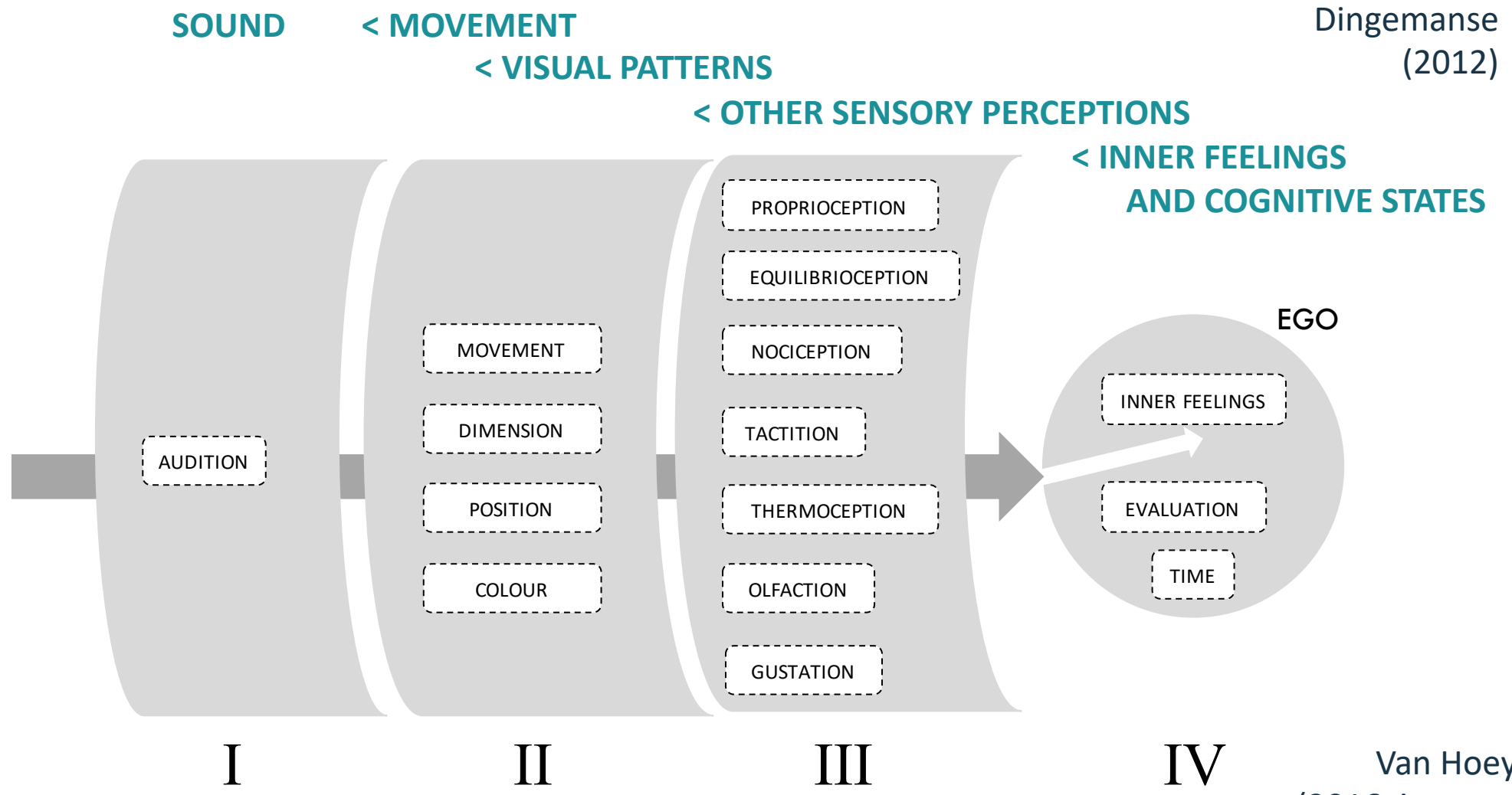
comprehensive dictionary	Classical Chinese	Mandarin dictionary	n
Hanyu Da Cidian	Kroll	zdic (Handian)	
✓	✓	✓	971
✓	×	✓	710
✓	✓	×	423
✓	×	×	464
×	✓	×	178
×	×	✓	46
×	✓	✓	15
×	×	×	<b>987</b>

**2807**

This is why in-depth studies are important.

- BBB BBBB RRR RRRR types
- obscure forms

# Semantic variables: Sensory domains in-depth studies



Dingemans  
(2012)

Van Hoey  
(2016, in prep.)

## Formal variables

## Semantic variables

## Other variables

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pinyin tone,  
pinyin num,  
pinyin none

Middle Chinese (MC)  
Old Chinese (OC)

word  
level

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Handian (zdic)  
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sensory modality

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radical support

below-  
character  
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orthography

# variables in CHIDEOD

Abbreviations:

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# Other variables: variant written forms

*xiāng~yáng*

'wandering and wavering'

form                      radical support

- 僂佯                      PERSON 亻
- 徬徉                      WALKING 彳
- 相羊                      NA

Future exploration: differences in the conceptualization between these different orthographic forms with different radical support.

cf.

*máng~máng*

'stretching farther than they eye can see'

- 芒芒                      (GRASS 艹)
- 茫茫                      (GRASS 艹 + WATER 氵)

Over time the grass+water variant became more popular +  
took over the non-water variant when used in relation to bodies of water (Van Hoey 2019)

# A short application of CHIDEOD

Vowel alternation in partially reduplicated syllables



# Vowel alternation (ding~dang)

## Group 1:

- SOUND ideophones in Kroll's (2015) dictionary of Classical and Medieval Chinese
- Partial reduplication types

## Group 2:

- SOUND ideophones in 3 onomatopoeia data sources of Mandarin Chinese (Wang 1987, Gong 1991; Li 2007)
- Partial reduplication types

# Vowel alternation (ding~dang)

## Group 1:

- SOUND ideophones in Kroll's (2015) dictionary of Classical and Medieval Chinese

```
[datasource == Kroll]  
[sensory modality == SOUND]
```

- Partial reduplication types

```
[morphology == BR, RB, RR, RR+]
```

## Group 2:

- SOUND ideophones in 3 onomatopoeia data sources of Mandarin Chinese (Wang 1987, Gong 1991; Li 2007)

```
[datasource == Wang|Gong|Li]  
[sensory modality == SOUND]
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- Partial reduplication types

```
[morphology == BR, RB, RR, RR+]
```

n = 167

23/167 with vowel alternation (13.77%)

## Group 2:

- SOUND ideophones in 3 onomatopoeia data sources of Mandarin Chinese (Wang 1987, Gong 1991; Li 2007)

```
[datasource == Wang|Gong|Li]  
[sensory modality == SOUND]
```

- Partial reduplication types

```
[morphology == BR, RB, RR, RR+]
```

n = 1421

983/ 1421 with vowel alternation (69.2%%)

# Vowel alternation (ding~dang)

## Group 1:

- SOUND ideophones in Kroll's (2015) dictionary of Classical and Medieval Chinese

```
[datasource == Kroll]  
[sensory modality == SOUND]
```

- Partial reduplication types

```
[morphology == BR, RB, RR, RR+]
```

n = 167

23/167 with vowel alternation (13.77%)

## Group 2:

- SOUND ideophones in 3 onomatopoeia data sources of Mandarin Chinese (Wang 1987, Gong 1991; Li 2007)

```
[datasource == Wang|Gong|Li]  
[sensory modality == SOUND]
```

- Partial reduplication types

```
[morphology == BR, RB, RR, RR+]
```

n = 1421

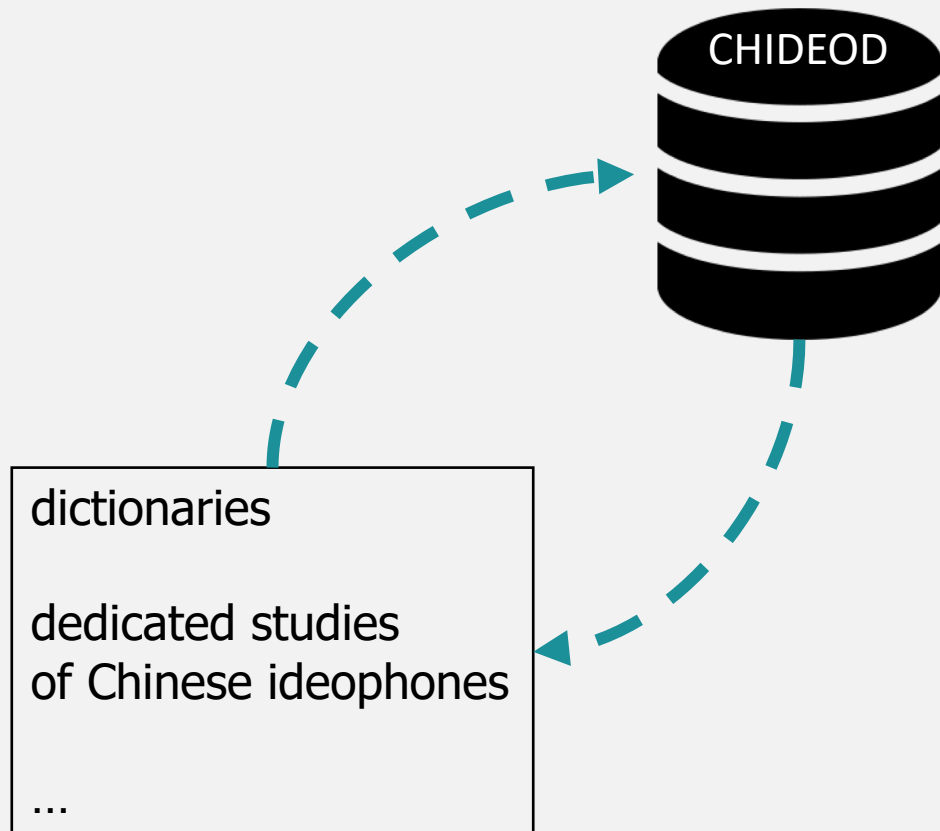
983/ 1421 with vowel alternation (69.2%%)

$\chi^2 = 195.1928,$   
 $p < 0.001,$   
 $\phi = 0.35$

**Either this is a recent development (not very likely)  
or it has been underdocumented (more likely).**

# Summary

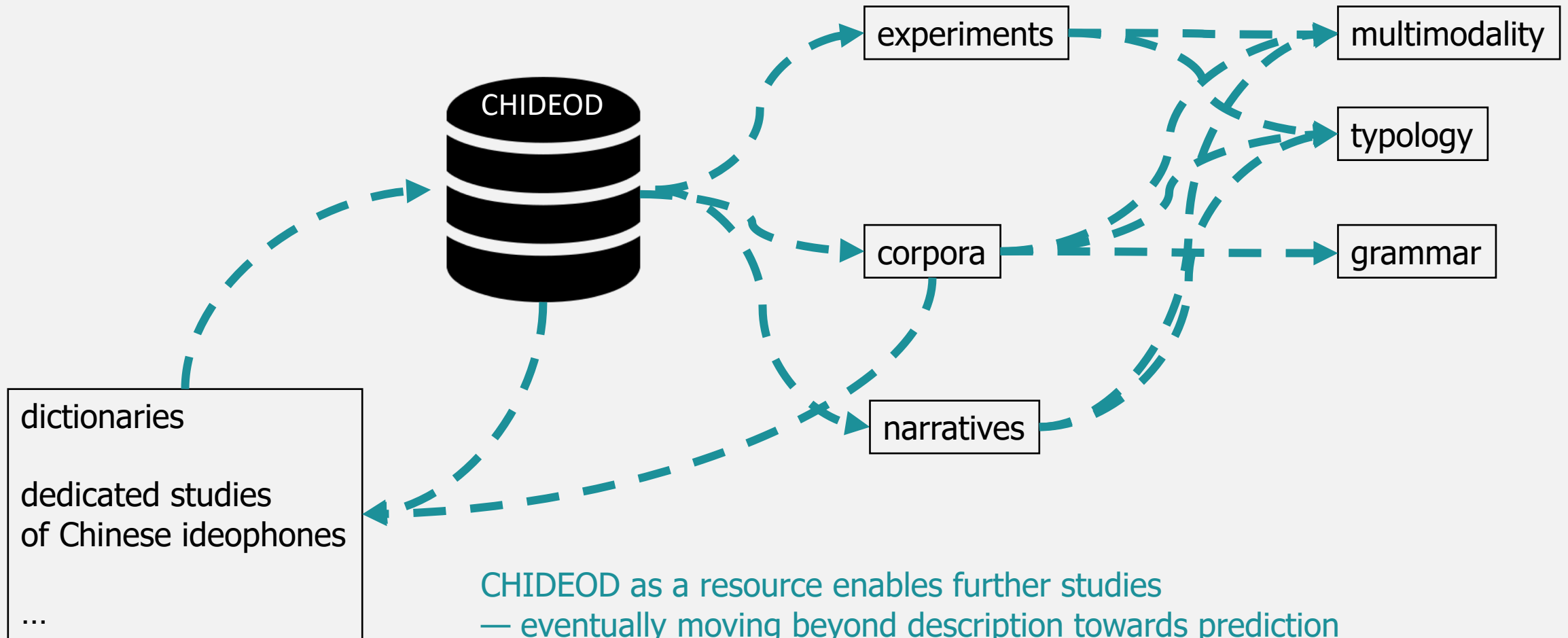
# CHIDEOD: future applications



In future versions of the database:

- ❖ more sources
- ❖ other variables:
  - ❖ other Sinitic languages such as Cantonese, Taiwanese
  - ❖ token frequencies based on corpora
- ❖ ...

# CHIDEOD: future applications



# References

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# Demonstration

- <https://simazhi.shinyapps.io/Chineseideophone/>
- <https://osf.io/kpwgf/>

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