

GenAI MODELS AS KEYWORD

RANKERS: A LEARNER-CENTRED CASE

STUDY FOR L2 SPANISH

Jasper Degraeuwe – 11 December 2025 – AILLTE Symposium

The Multifaceted Role of Generative AI in Transforming Language Learning and Teacher Education

ABOUT ME

- Ghent University (Belgium)
- PhD on **Intelligent Computer-Assisted Language Learning (ICALL)**
 $\text{ICALL} \approx \text{CALL} + \text{AI and NLP}$
- Postdoctoral researcher on **educational technologies and AI for language learning**

SNEAK PEEK

SNEAK PEEK

- Language learning resources
- Thematically organised vocabulary lists

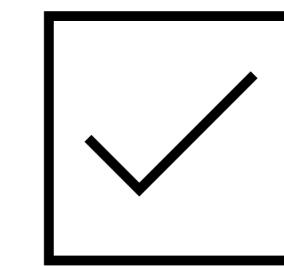
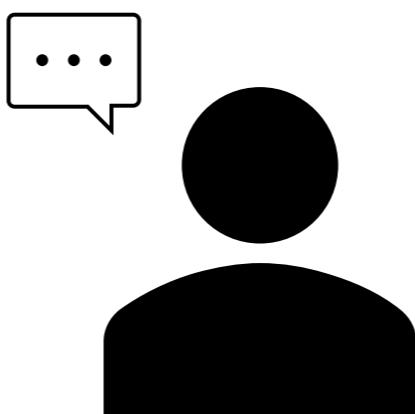
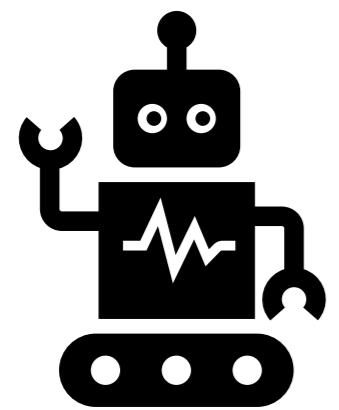
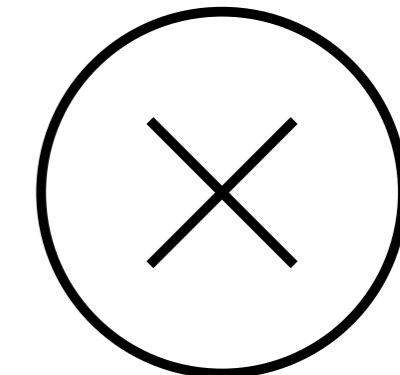
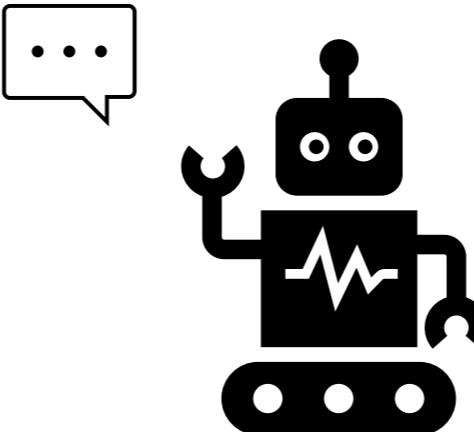
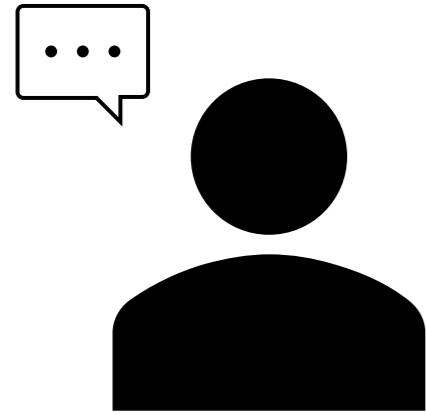
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	Type	Rank	Freq_Tar	Freq_Ref	Range_Tar	Range_Ref	Keyness (Likelihood)	Keyness (Effect)	
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2	of	2	1677	1946	17	38	377.452	0.089	
3	christian	3	89	2	13	2	190.266	0.005	
4	doctrine	4	75	0	6	0	175.264	0.004	
5	religion	5	79	1	8	1	174.611	0.005	
6	church	6	77	2	13	2	162.775	0.004	
7	divine	7	57	1	9	1	123.821	0.003	
8	social	8	62	4	10	3	117.666	0.004	
9	sacred	9	59	3	8	3	116.065	0.003	
10	theology	10	49	0	7	0	114.480	0.003	
11	scripture	11	47	0	5	0	109.806	0.003	
12	science	12	57	4	3	3	106.629	0.003	
13	theological	13	44	0	9	0	102.794	0.003	
14	faith	13	44	0	12	0	102.794	0.003	
15	justification	15	41	0	2	0	95.783	0.002	

SNEAK PEEK

- Language learning resources
- Thematically organised vocabulary lists
- Three-way comparison
 - Human ranking (“gold standard”)
 - Ranking based on statistical “keyness” method
 - GenAI-based ranking

TARGET SETTING

Second language acquisition (SLA)



RESEARCH QUESTION

RESEARCH QUESTION

Are GenAI models able to rank vocabulary items according to their keyness (i.e. typicality) for a given semantic domain?



REAL-LIFE UTILITY

TARGET USERS

- Educational setting
 - Language learners
 - Language teachers
 - Especially in language for specific purposes setting
- Professional setting
 - Language professionals (e.g., interpreters)

SCENARIO A: BACKGROUND

- Teacher
- Preparation of vocabulary class
- Topic: music

SCENARIO A: GATHER TEXTS

Elton John gives diners preview of Britney Spears' first music since 2016

Share  Save 

24 August 2022

Mark Savage
BBC Music Correspondent



Britney Spears and Sir Elton John, pictured here in 2013, reportedly recorded their duet last month

Sir Elton John has given French diners a preview of Britney Spears' first new music since the conservatorship running her life was lifted last year.

Sir Elton has recorded a duet with Spears, called Hold Me Closer, which will be released on Friday.

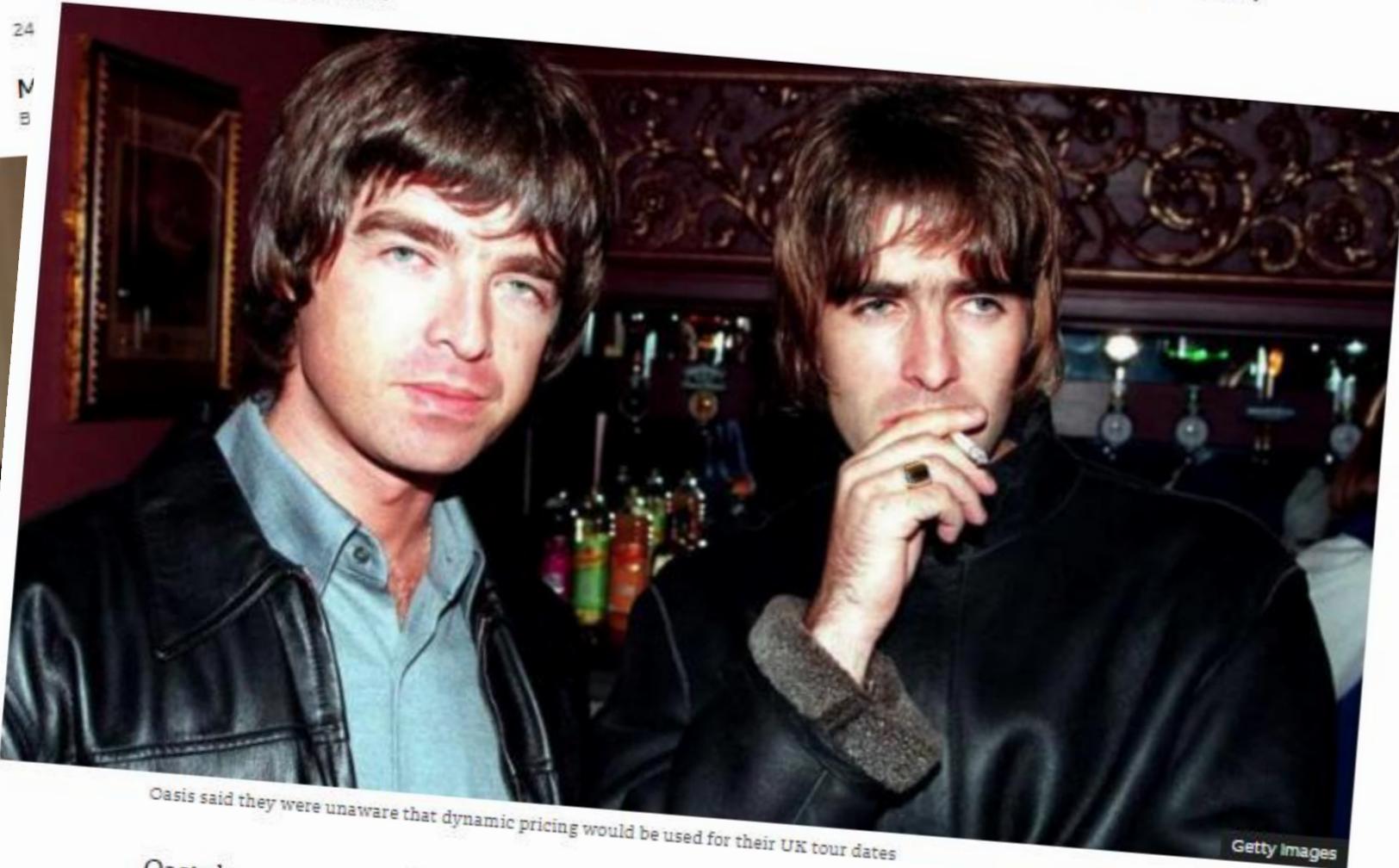
However, he couldn't resist sharing the track with the patrons of a restaurant in Cannes on Tuesday night.

Oasis ditch dynamic ticket pricing for US gigs

1 day ago

Mark Savage
Music Correspondent

Share Save



Getty Images

Oasis said they were unaware that dynamic pricing would be used for their UK tour dates

Oasis have announced they will ditch dynamic pricing for the American leg of their reunion tour, after it caused "an unacceptable experience" for UK fans.

The system raises the price of concert tickets at times of high demand. When Oasis' UK dates went on sale, some fans were charged more than £350 for tickets with an initial face value of £150.

The band faced significant backlash, and the UK's competition regulator launched an investigation into whether Ticketmaster breached consumer protection law.

In a statement announcing dates in the US, Canada and Mexico, the group's managers said they wanted to "avoid a repeat of the issues" faced by fans in the UK and Ireland. However, ... Cannes on Tuesday night.

E
B

Oasis ditch US gigs

1 day ago

Mark Savage
Music Correspondent

24

M
B



Oasis said they were unaware that dynamic

Oasis have announced they will go on a reunion tour, after it caused "an outcry".

The system raises the price of certain UK dates went on sale, some fans paid an initial face value of £150.

The band faced significant backlash and investigation into whether Tickets

In a statement announcing dates, they wanted to "avoid a repeat of what happened in

Cannes on Tuesday night."

Why Katy Perry's comeback has gone so wrong

20 September 2024

Share Save

Nick Levine



Getty Images

(Credit: Getty Images)

She was one of the world's biggest pop stars – but her new album has been plagued by controversy and failed singles. Here's why she's stumbled – and what it says about music today.

The comeback has a special place in pop culture. From [Judy Garland's](#) career-reviving 1961 concert at Carnegie Hall to Cher's reinvention as a chart-topping dance diva with 1998's *Believe*, it's a story that never loses its emotional piquancy. There's something moving and even comforting about seeing a great star return to the top, particularly because it doesn't happen every time. For this reason, the narrative's sad flipside – the failed comeback – is every bit as fascinating. It reminds us that to miss the target is fundamentally human and that nothing in life is guaranteed.

— [Nick Levine in the UK and Ireland](#).

Entertainment
Business

Oasis ditch US gigs

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More



Oasis said they were unaware that dynamic

Oasis have announced they will go on a reunion tour, after it caused "an outcry".

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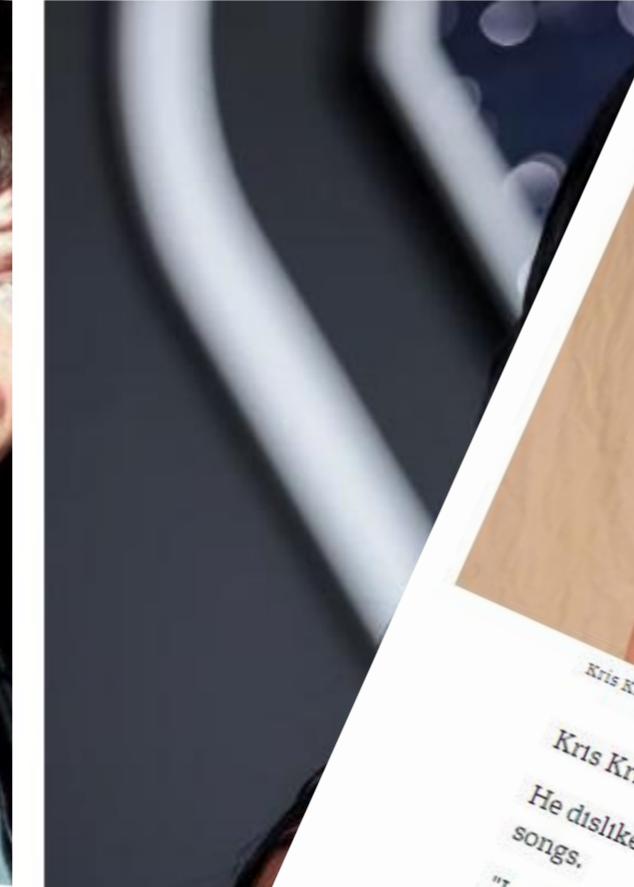
The band faced significant backlash and investigation into whether Tickets

In a statement announcing dates, they wanted to "avoid a repeat of what happened in Cannes on Tuesday night."

Why Katy Perry's critics are wrong

20 September 2024

Nick Levine



Kris Kristofferson: Five (or maybe 10) of his best songs

1 day ago

Mark Savage
Music correspondent, BBC News

Share Save



Getty Images

Kris Kristofferson was one of the "outlaw country" stars of the early 1970s. He disliked being called a poet and preferred it when other people performed his songs.

"I sing like a bullfrog," he once told record producer Fred Foster. "Yeah," Foster replied, "but a bullfrog who communicates."

Kristofferson's plainspoken vocals may have lacked range but they carried something more important - conviction. The comeback has a special place in music history. In 1961 concert at Carnegie Hall to Cher's 1998's Believe, it's a story that never loses its moving and even comforting about seeing a great artist because it doesn't happen every time. For this reason, the failed comeback - is every bit as fascinating. It reminds us that to fundamentally human and that nothing in life is guaranteed.

... tours in the UK and Ireland.

Oasis ditch US gigs

1 day ago

Mark Savage
Music Correspondent

Entertainment



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The system raises the price of certain UK dates went on sale, some far above the initial face value of £150.

The band faced significant backlash and investigation into whether Tickets

In a statement announcing dates, the band said they wanted to "avoid a repeat of what happened in Cannes on Tuesday night". However, the band has now

Why Katy Perry's 'Kris' is wrong

20 September 2024

Nick Levine



She was criticised by controversial artist Kris Kristofferson for her song.

The comeback has a special place in the hearts of many. The 1961 concert at Carnegie Hall is one of the most moving and even comforting albums ever made because it doesn't happen every day. A failed comeback – is every bit as fundamentally human and that

Kris Kristofferson's 'Kris' goes wrong

Village brass band for children wins national award

2 days ago

Clara Bullock & Will Glennon
BBC News, Wiltshire

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Joshua, 11, plays the euphonium in Brass Roots

A village brass band for children has won a national award.

Bratton Community Brass Band, near Westbury, Wiltshire, has been running for more than 100 years, and it launched a children's section, Brass Roots, in 2023.

The new group has now won a Classic FM award for Best Music Learning Initiative.

Lydia Grace-Hills, musical director, said: "Brass banding is the best type of mindfulness you can get. There is nothing better than making music together."

Oasis ditch US gigs

1 day ago

Mark Savage
Music Correspondent

24

M B



Oasis said they were unaware that dynamic

Oasis have announced they will go on a reunion tour, after it caused "an outcry".

The system raises the price of certain UK dates went on sale, some fans paid an initial face value of £150.

The band faced significant backlash over the investigation into whether Tickets On Sale was a success.

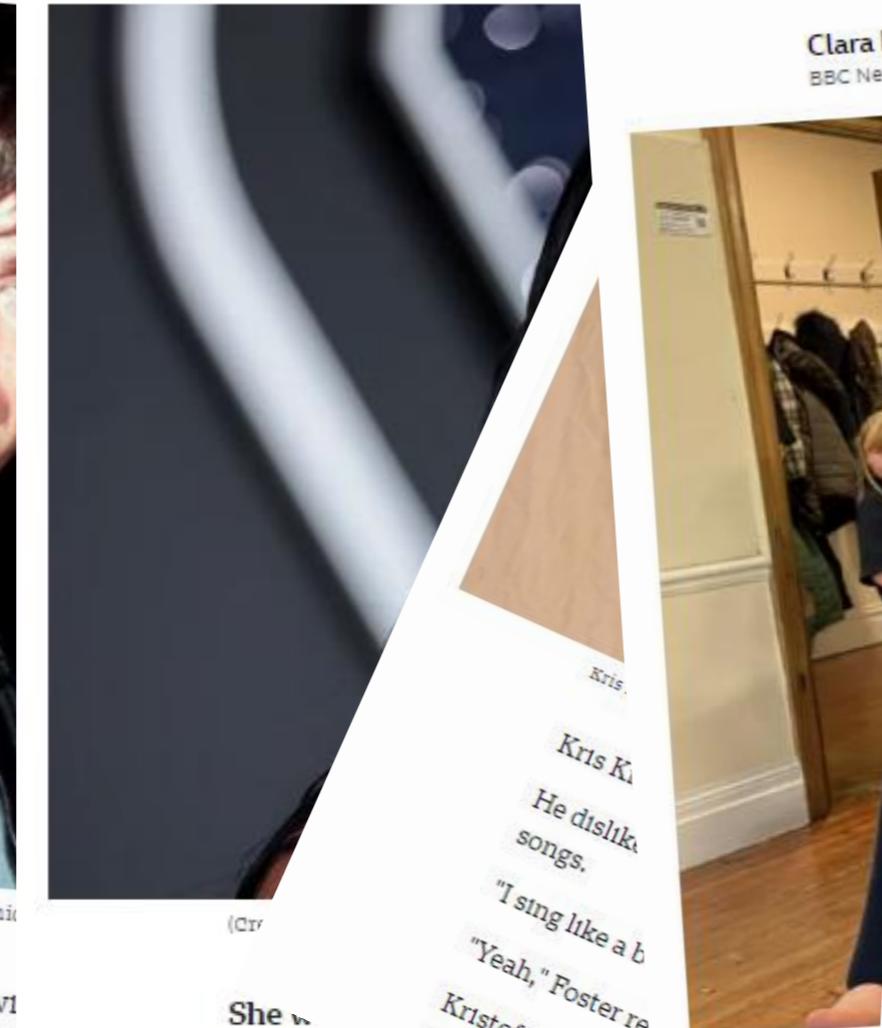
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Cannes on Tuesday night.

Why Katy Perry's critics are wrong

20 September 2024

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Kris Kristofferson
He dislikes songs.
"I sing like a b
"Yeah," Foster re
Kristofferson's pla
more important - col

The comeback has a special place in the history of rock. In 1961, he performed at Carnegie Hall in New York City. In 1998's *Believe*, it's a story that's both moving and even comforting at times because it doesn't happen every day. A failed comeback – is every bit as fundamentally human and that's why it's so important to us in the UK and Ireland.

Village nation

2 days ago

Clara Bullock
BBC News, W



Johnny Cash and his wife June pose with their eighteen month-old son John in Glasgow in 1971

There are many places of pilgrimage for fans of legendary musician Johnny Cash, among them Arkansas, where he was born, Nashville, Tennessee, the home of country music - and Fife.

In truth, the east coast of Scotland is not yet a hotspot for fans of the Man in Black but some people think it should be.

A small festival in Aberdour is now paying tribute to Cash's legacy and his Scottish links.

Cash himself claimed his ancestors were from the Kingdom of Fife and was proud of his Scottish roots, even if they had crossed the Atlantic way back in the 17th Century.

The all-American musician began his career in the 1950s, recording alongside Elvis Presley at the famous Sun Studios in Memphis.

The Scottish roots of Johnny Cash

6 March 2020

Steven Brocklehurst
BBC Scotland News

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Getty Images

SCENARIO A: READ AND ANALYSE TEXTS

Sir Elton John has given French diners a preview of Britney Spears' first new music since the conservatorship running her life was lifted last year.

Sir Elton has recorded a duet with Spears, called Hold Me Closer, which will be released on Friday.

However, he couldn't resist sharing the track with the patrons of a restaurant in Cannes on Tuesday night.

After approaching the restaurant's DJ, he sang along with the track, streaming the reaction on his Instagram page.

Wearing a colourful shirt and matching shorts, Sir Elton, who had hip surgery last year, remained seated for the performance.

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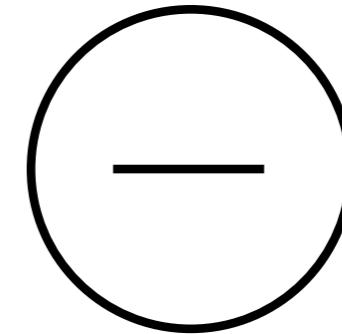
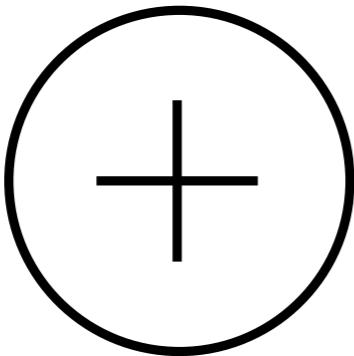
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SCENARIO A: PROS AND CONS



Teacher expertise

Authentic input data (articles)

→ **Very qualitative**

Very time-consuming

SCENARIO B: GenAI ASSISTANCE

1. Prompt: “please give me a list of the n most typical words of the domain of music”
2. Introduce prompt into GenAI model

SCENARIO B: PROS AND CONS

- Advantages: very quick
- Disadvantages: no evidence if output corresponds to established knowledge / human intuition

RESEARCH TIME!

METHODOLOGY

DATA COLLECTION (1)

- Target language = L2 Spanish
- Four specific topics: economics, health, law, and migration
- Data source: Spanish Corpus Annotation Project (scap.ugent.be)
 - Specialised newspaper-article corpora
 - Large general reference corpus

DATA COLLECTION (2)

- Create list of 200 vocabulary items for each topic (random stratified sampling)
 - 50 frequent + key items: high SC frequency and higher (normalised) frequency than in RC
 - 50 frequent + “non-key” items: high SC frequency and lower frequency than in RC
 - 50 infrequent + key items: low SC frequency and higher frequency than in RC
 - 50 infrequent + “non-key” items: low SC frequency and lower frequency than in RC

DATA COLLECTION (3)

economics

```
1 aspecto · (GROUP: · freq_not_key)
2 zanja · (GROUP: · not_freq_not_key)
3 tiempo · (GROUP: · freq_not_key)
4 contacto · (GROUP: · freq_not_key)
5 vigencia · (GROUP: · not_freq_key)
6 mango · (GROUP: · not_freq_not_key)
7 recesión · (GROUP: · not_freq_key)
8 dormitorio · (GROUP: · not_freq_not_key)
9 impostor · (GROUP: · not_freq_not_key)
10 catarata · (GROUP: · not_freq_not_key)
11 carrete · (GROUP: · not_freq_not_key)
12 error · (GROUP: · freq_not_key)
13 disposición · (GROUP: · freq_key)
14 vista · (GROUP: · freq_not_key)
15 vez · (GROUP: · freq_not_key)
16 voz · (GROUP: · freq_not_key)
17 arañazo · (GROUP: · not_freq_not_key)
18 acreedor · (GROUP: · freq_key)
19 tema · (GROUP: · freq_not_key)
20 cometa · (GROUP: · not_freq_not_key)
21 canje · (GROUP: · not_freq_key)
22 hígado · (GROUP: · not_freq_not_key)
23 papel · (GROUP: · freq_not_key)
24 debate · (GROUP: · freq_key)
25 jefe · (GROUP: · freq_not_key)
```

law

```
1 bien · (GROUP: · freq_key)
2 párrafo · (GROUP: · not_freq_key)
3 consenso · (GROUP: · not_freq_key)
4 cutis · (GROUP: · not_freq_not_key)
5 yate · (GROUP: · not_freq_key)
6 sillón · (GROUP: · not_freq_not_key)
7 granate · (GROUP: · not_freq_not_key)
8 grito · (GROUP: · freq_not_key)
9 lado · (GROUP: · freq_not_key)
10 petaca · (GROUP: · not_freq_not_key)
11 clave · (GROUP: · freq_key)
12 foto · (GROUP: · freq_not_key)
13 orden · (GROUP: · freq_key)
14 intento · (GROUP: · freq_key)
15 pantalla · (GROUP: · freq_not_key)
16 móvil · (GROUP: · freq_not_key)
17 cuota · (GROUP: · freq_key)
18 mercado · (GROUP: · freq_key)
19 indemnización · (GROUP: · freq_key)
20 cohecho · (GROUP: · freq_key)
21 sesión · (GROUP: · freq_key)
22 infante · (GROUP: · freq_key)
23 hada · (GROUP: · not_freq_not_key)
24 deducción · (GROUP: · not_freq_key)
25 alianza · (GROUP: · not_freq_key)
```

SNEAK PEEK

- Language learning resources
- Thematically organised vocabulary lists
- **Three-way comparison**
 - Human ranking (“gold standard”)
 - Ranking based on statistical “keyness” method
 - GenAI-based ranking

RANKING 1 – HUMAN RANKING

- Best-worst scaling experiment
- Participants: six L2 Spanish learners (L1 = Dutch)

RANKING 1 – HUMAN RANKING

Read these instructions carefully once. They will remain available with each question of the task, but you do not need to go through them each time.

As part of one of your Spanish courses, you are taking several vocabulary classes, each about a specific topic. Each topic starts from a central vocabulary list containing the most relevant/typical vocabulary items for the specific domain. This vocabulary is then incorporated into all kinds of different exercises, from reading texts to fill-in-the-blanks exercises.

This experiment revolves around the domain “[NAME_DOMAIN]”. To improve the quality of the central vocabulary lists for this domain, we collect input from the end users of the vocabulary lists and learning materials, including you as a student of Spanish as a foreign language. The task we have developed for this purpose goes as follows: you will be shown series of four words. Each time, indicate the word that you think is *most relevant/typical* (“best”) to include in the central vocabulary list, and the word that is *least relevant/typical* (“worst”). If a word has less relevant meanings in addition to a relevant meaning for the domain, you do not have to take the irrelevant meanings into account.

Finally, it is important to mention that you have to make a choice either way. If, of the four words, there is none that you would include in the list, tick the “least bad” option as “best”. You are also allowed to consult external resources if you wish, but normally the added translations should suffice to complete the experiment smoothly. It is by no means compulsory to complete the experiment in a single sitting: you may interrupt the experiment as many times as you wish.

RANKING 1 – HUMAN RANKING

best worst



la patrullera (patrouilleboot)



el bollo (broodje, kadetje)



la carta (brief, kaart)



la vainilla (vanille)

RANKING 1 – HUMAN RANKING

- Best-worst scaling experiment
 - Participants: six L2 Spanish learners (L1 = Dutch)
 - Each of the 200 items was compared to three other words in eight unique 4-tuples
 - Each tuple was annotated by three different L2 learners
- $8 \times 3 = 24$ “typicality comparisons” / vocabulary item

RANKING 1 – HUMAN RANKING

Item	#best	#worst	Score
<i>empreendedor</i> (entrepreneur')	19	0	$(19 - 0) / 24 = 0.79$
<i>prohibición</i> (prohibition, ban')	5	0	$(5 - 0) / 24 = 0.21$
<i>equivocación</i> (mistake')	4	3	$(4 - 3) / 24 = 0.04$
<i>género</i> (gender, kind')	2	11	$(2 - 11) / 24 = -0.38$
<i>pantano</i> (swamp, reservoir')	0	19	$(0 - 19) / 24 = -0.79$

OVERVIEW RANKINGS

Word	Human ranking	Baseline ranking (DKL)	GenAI-based ranking
<i>entrepreneur</i>	14.5 (0.79)		
<i>prohibition, ban</i>	68 (0.21)		
<i>mistake</i>	91.5 (0.04)		
<i>gender, kind</i>	147.5 (-0.38)		
<i>swamp, reservoir</i>	189 (-0.79)		

RANKING 2 – STATISTICAL MEASURE (DKL)

- Kullback-Leibler divergence (DKL)
- Statistical measure from information theory that can be used to compare frequencies from two corpora (Gries, 2021)
- Serves as “baseline” ranking

RANKING 2 – STATISTICAL MEASURE (DKL)

- a = lemma frequency of target item in SC
- b = lemma frequency of target item in RC
- $c = a + b$
- d = corpus size SC
- e = corpus size RC
- $f = d + e$

$$D_{KL} = \left(\frac{a}{c} \times \log_2 \frac{a/c}{d/f} \right) + \left(\frac{b}{c} \times \log_2 \frac{b/c}{e/f} \right)$$

OVERVIEW RANKINGS

Word	Human ranking	Baseline ranking (DKL)	GenAI-based ranking
<i>entrepreneur</i>	14.5 (0.79)	19 (2.58)	
<i>prohibition, ban</i>	68 (0.21)	66 (0.60)	
<i>mistake</i>	91.5 (0.04)	175 (-0.09)	
<i>gender, kind</i>	147.5 (-0.38)	88 (0.05)	
<i>swamp, reservoir</i>	189 (-0.79)	168 (-0.08)	

RANKING 3 – GenAI-BASED RANKING

- Three “lightweight” open-source models tested:
Gemma-3-4b (Google), Llama-3.1-8B (Meta), and
Minstral-8B (Mistral)
- Exact same task as given to humans: best-worst
scaling

RANKING 3 – GenAI-BASED RANKING

```
system_prompt = (f"You are an expert in designing courses of Spanish as a foreign language for native speakers of Dutch. "
                 f"You are currently preparing a vocabulary class for a group of advanced learners on {domain} as the "
                 f"specific topic. More specifically, you want to create a vocabulary list in which words are ranked "
                 f"based on how typical they are of the domain of {domain}.")  
  
user_prompt = (f"Here is a set of four Spanish words and their translations to Dutch:\n\n{item}\n\nGive the 'word_ID' of "
                  f"the **most typical** word of the domain of {domain} and the 'word_ID' of the word that is **least "
                  f"typical** of the domain of {domain}. In case a word has multiple meanings, base your judgement on the "
                  f"meaning that has the strongest relation with the domain of {domain} and disregard all other meanings. "
                  f"Respond two word IDs, separated by means of a semicolon: first the 'word_ID' of the word that is **most "
                  f"typical** of the domain of {domain} and then the 'word_ID' of the word that is **least typical** of the "
                  f"domain of {domain}. Do not include any introduction, summary, or explanation.")
```

RANKING 3 – GenAI-BASED RANKING

Item	#best	#worst	Score
<i>empreendedor</i>	6	0	$(6 - 0) / 8 = 0.75$
<i>prohibición</i>	0	0	$(0 - 0) / 8 = 0$
<i>equivocación</i>	3	1	$(3 - 1) / 8 = 0.25$
<i>género</i>	0	2	$(0 - 2) / 8 = -0.25$
<i>pantano</i>	0	4	$(0 - 4) / 8 = -0.5$

OVERVIEW RANKINGS

Word	Human ranking	Baseline ranking (DKL)	GenAI-based ranking
<i>entrepreneur</i>	14.5 (0.79)	19 (2.58)	12 (0.75)
<i>prohibition, ban</i>	68 (0.21)	66 (0.60)	99.5 (0)
<i>mistake</i>	91.5 (0.04)	175 (-0.09)	62.5 (0.25)
<i>gender, kind</i>	147.5 (-0.38)	88 (0.05)	135 (-0.25)
<i>swamp, reservoir</i>	189 (-0.79)	168 (-0.08)	172 (-0.05)

ANALYSIS: CORRELATION BETWEEN RANKINGS

RESULTS: CORRELATION WITH HUMAN RANKING

	ECON	HEALTH	LAW	MIGR	OVERALL
	Spearman's ρ				
D_{KL}	0.76	0.25	0.72	0.52	0.56
Gemma	0.76	0.67	0.72	0.6	0.69
Llama	0.82	0.66	0.74	0.55	0.69
Mistral	0.8	0.7	0.83	0.6	0.73
	Kendall's weighted τ				
D_{KL}	0.59	0.19	0.53	0.4	0.42
Gemma	0.77	0.75	0.76	0.62	0.72
Llama	0.74	0.71	0.72	0.57	0.69
Mistral	0.74	0.76	0.81	0.6	0.73

RESULTS: SUMMARY

- DKL baseline scores are consistently outperformed by GenAI models
- Moderate to high correlation (0.6 – 0.83 for Spearman's ρ)
- Small open-source models!
- Mistral performs best

RESULTS: INTERPRETATION

- Statistical keyness metrics based on word frequencies are a legitimate method to create rudimentary domain-specific word lists for L2 learning purposes
- GenAI models take this a considerable step further and provide keyword rankings that resemble human intuitions relatively well

CONCLUSION

CONTRIBUTIONS

- Publicly available “gold-standard” data: human ranking of 200-item vocabulary lists (totalling 4,800 annotations)
- First-of-its-kind empirical evidence into:
 - Correlation between human ranking and statistical keyness measure (DKL)
 - Correlation between human ranking and GenAI-based ranking
- Prompting: asking to **compare items** seems to work well

LIMITATIONS (DATASET)

- Limited numbers of topics
- Limited number of target items per topic

LIMITATIONS (MODELS)

- Results not fully replicable → more research needed to corroborate findings
- Environmental cost GenAI > environmental cost statistical keyness measures (although impact of small models should be reasonable)
- Average correlation of 0.73 → still room for improvement

REFERENCES

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