



Exploring morphological connexions within the mental lexicon: evidence from speakers from diverse educational backgrounds

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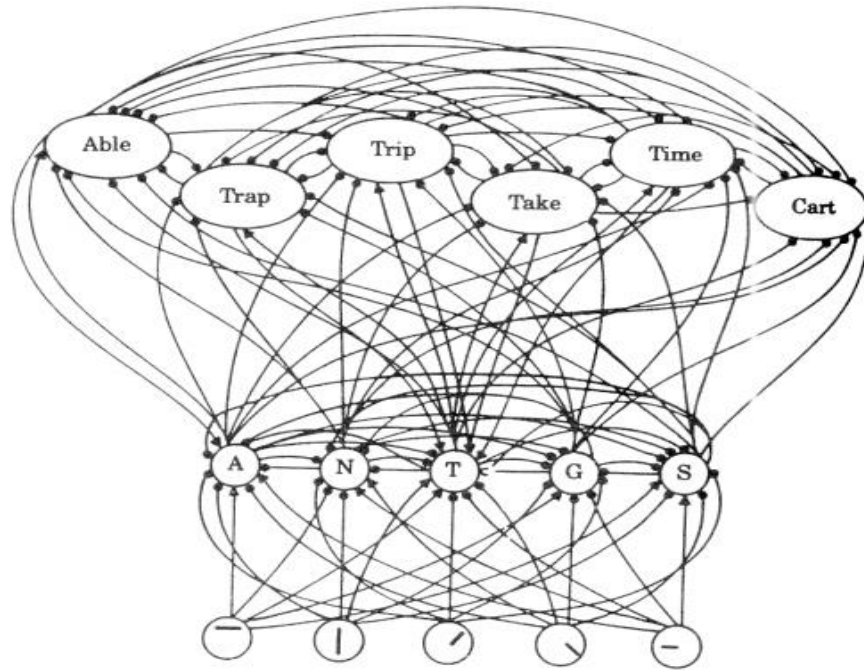
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- The relations between lexical representations (orth., sem., morph.) within the mental lexicon are studied thanks to the ‘neural metaphor’ or ‘brain metaphor’, i.e., symbolic connexionism (e.g., Hebb, 1949; McClelland & Rumelhart, 1981, different from distributed connexionism Rum & McClell 86)
- Discussion on the *ratio* between storage and computation (e.g., Baayen, 2007; 2014)
- We consider that there IS a mental lexicon containing word representations (LTM)
- Cognitive experimental approach relative to written word comprehension

The study of morphologically complex words

- These have been extensively studied during the last 30 years, in a large variety of languages and settings.
- From a linguistic point of view: the lexeme vs morpheme problem (e.g. Corbin 1987/1991; Aronoff 1994, 2007; Booij 2002, 2015; Blevins 2006; Marantz 2013)
- From a psycholinguistic point of view: cognitive processes underlying complex words identification, representation & processing
- e.g., storage vs computation, connectivity (association processes)
- Data from psycholinguistic protocols
- Various methodologies, very often: masked priming associated with the LDT
- Various types of groups, still, the most influential results come from university students

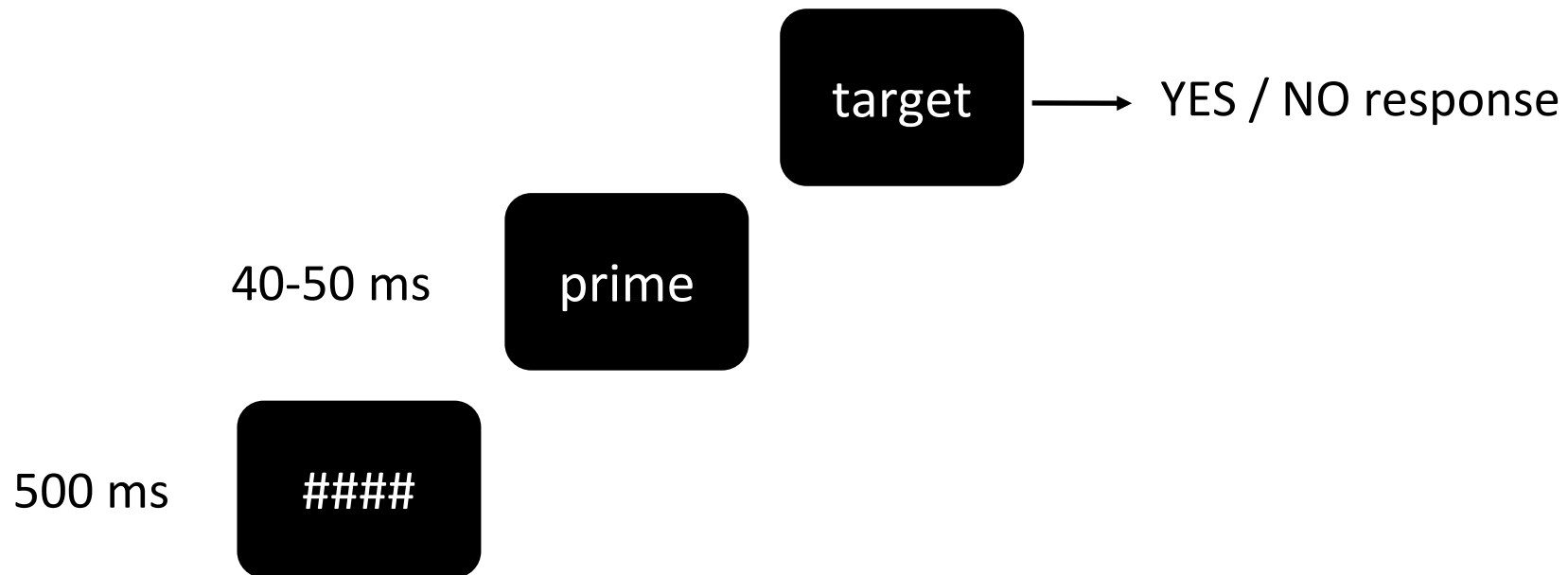
We wish to explore the variable *speaker*, i.e., the kind of speaker usually ‘chosen’ to participate in psycholinguistic protocols

- Growing consciousness for the **need to take as participants not only university students, but also less educated publics.**
- We will review three sets of data, with three different populations.

Methodology : the masked priming paradigm (Forster & Davis, 1984; Forster & Forster, 2003)

Behavioural measure: Reaction times (RTs to LD) reflect the access speed to mental representations

- automatic processing, the speaker/reader cannot use any strategies, because she does not consciously perceive the prime (SOA = 48ms) and cannot process it (consciously)
- Priming effects result from a transfer of activation from the prime to the target
- Protocol studying the nature, + or -, and the strength of the links (if any) connecting mental representations
- The sum of these two forces leads to the observed effect (e.g. Voga & Giraudo, 2017)
- L1 to L1, from L1 to L2, from L2 to L1...



#####

πλουραλιστής

pluraliste

Computation (mandatory-decomposition-into-morphemes*) *vs* **storage** (word-listing)

Are there any ‘intermediate’ options ? Yes, if we accept that

Paradigmatic structure affects processing

“We have seen that probabilistic information about individual inflectional variants is available in lexical memory. It is well-known that inflectional variants are organized in paradigms (see, e.g., Matthews, 1974). From the syntagmatic perspective of standard decompositional approaches, paradigms are enigmatic oddities with little more status than educationally useful ways of displaying inflectional variants. After all, to the extent that an inflectional variant is decomposable, its structure can be accounted for by a syntagmatic rule. However, paradigmatic structure and its complexity is emerging from recent experimental studies as a genuine independent factor in lexical processing” Baayen, 2007: 84

→ Many experimental facts demonstrate that paradigm-induced (or paradigm-like-induced) effects are everywhere in the lexicon (derivation, inflection, mono- and bilingual lexicon)

*In the case of psycholinguistic models, ex. Rastle & Davis 2008; for French: Meunier & Longtin, 2007

Overview of Paradigm-related effects

Evidence from: [LDT, masked priming with a 48ms SOA]

- **The distributional characteristics of suffixes**, e.g., suffix productivity: Giraudo & Dal Maso (2016), with L1 speakers on three Italian suffixes, *-tore*, *-ico* and *-etto* with different perceptual characteristics;
- **morphological families**, e.g., large MFS induces stronger morphological effects De Jong, Schreuder & Baayen 2000; Mulder, Dijkstra, Schreuder, & Baayen 2014; Gr-Fr. stimuli: Voga, 2015; Voga, Gardani & Giraudo 2020.
- **Morphological series**, e.g., Dal Maso & Giraudo (2019) found in Italian that paradigmatic effects are inherently graded as they depend on series internal consistency and interact with family effects during word access, Giraudo & Hathout (2012)
- **Lexicality of primes and targets** e.g., Giraudo & Voga (2016) showed in French that words and segmentable pseudowords exhibit different morphological priming effects (words > nonexisting words)
- **Lexicality of prefixed words' base** inhibits processing, whereas non-word base (segment) enhances priming (Voga, 2020, bilingual setting)
- **Typological factors** [+ diff. in oral frequency], e.g., Greek aorist αγάπησα-αγαπάω > αγάπησα-αγαπώ, (Anastassiadis-Syméonidis & Voga, 2012; Voga, Giraudo & Anastassiadis-Syméonidis, 2012)
- **Relative frequencies** between prime and target, e.g., Voga & Giraudo (2017; 2009) found different morph priming effects when prime and target frequencies are inverted
- And other effects related to manipulation of complex words **lexical & base** frequency (e.g., Giraudo & Grainger, 2001; Giraudo & Orihuela, 2015; Giraudo, Dal Maso & Piccinin, 2016)

Paradigm-induced effects

These factors relate to the general organization of the mental lexicon and extend beyond the 'lexical item' taken as a stimuli in a given experiment

- **Words are inter-connected** : with other words of their family/series, as well as with novel-words, non-words, possible-words, words from the *other* language...
- Does this lexico-semantic architecture is the same for all speakers ?
- Contrary to the popular opinion relative to generative linguistics "idealized speaker", **all speakers are not equivalent with respect to language use**, and possibly to language representation
- In the case of masked priming protocols tapping into morphological processes, **the variable "speaker" is not often considered**, i.e., it is a special profile of speaker which is taken into account
- Participants tend to be highly educated students of which the majority is female, very often attending philological curricula
- However, it is widely admitted that "**differences in individual language users may lead to remarkably different use of the possibilities offered by the grammar of 'the language'**" (Baayen 2014: 100): e.g., sex differences (Kimura 1999, for a comparison between the verbal skills of men and women)
- ➔ differences related to speakers' experience with language, ex. "vocabulary size", Mainz, Shao, Brysbaert & Meyer (2017) or exposure to print.
- ➔ Differences related to exposure to heritage language and its use.

Paradigm-induced effects: open questions

- **Does the lexico-semantic architecture is the same for all speakers ? (structure & processing)**
 - In order to answer this question, we must compare data in which the only variable changing is the variable 'speaker'
 - comparable settings, i.e., same protocol, same type of stimuli (as much as possible), same conditions, etc.
- **Raising questions about the way we study morphological effects :**
 - What are the consequences for our understanding of how morphological relations are coded and processed with the mental lexicon?
 - Is morphology the main factor of organization for the mental lexicon *for everybody*?
 - If not, what are the alternatives?
 - Lack of morphological awareness: what is the impact for language learning and reading?
 - Are there any didactic solutions to provide to teachers working with fragile publics?

Testing participants from diverse educational backgrounds

“differences in individual language users may lead to remarkably different use of the possibilities offered by the grammar of ‘the language’” (Baayen 2014)

➔ Our objective: Diversify the ‘idealised speaker’ : Testing participants who differ substantially in the formal schooling received, in their exposure to print, in L1 (formal vs heritage), etc.

Reference	Protocol, Sub & error rate	Stimuli
Voga & Anastassiadis-Syméonidis (2018) <i>Lexique</i> 23, 160-184 (exp. 1a)	Cross-language masked priming L1 to L2 Greek to French 29 Univ. students M age: 19-32 M error rate: 2,7%	3 types of prime-target pairs (primes in L1 – targets in L2) : - Zero-base cognates -iste πλουραλιστής /pluralistís/ - <i>pluraliste</i> - Non-cognates Greek base -iste ατομικιστής /atomikistís/ - <i>individualiste</i> - Cognates Greek base -ique μοναρχικός /monarhikós/ - <i>monarchique</i>
Voga & Anastassiadis-Syméonidis (2017) <i>IsMo</i> Lille, oral comm. (exp. 1b)	L1-L1 masked priming L1 to L1 Greek 27 technical school students M age: 18-23 < 22% error rate in the LD	Same as above, but all words in Greek (L1 primes, L1 targets) Consequently: the translation condition was an identity one

Table 1. Experiments 1a (Univ. students) and 1b (technical school students). Priming effects and error rates for the three types of stimuli (0-base cognates *-iste*, cognates Greek base *-iste*, cognates Greek base *-ique*) for the two experiments. The priming effects are estimated on the basis of the unrelated condition.

Words	Priming effect (exp. 1a, targets in fr.)		Err. (exp. 1a)	Priming effect (exp. 1b, targets in Gr.)		Err. (exp. 1b)
	Un - T	Un - M		Un - Id	Un - M	
0-base cognates <i>-iste</i> πλουραλιστής ‘pluralist’	20	85*	1.1	45	50	9.1
Non-cognates Greek base <i>-iste</i> ατομικιστής ‘individualist’	-52	5	4.25	-45	-2	4.7
Cognates Greek base <i>-ique</i> μοναρχικός ‘monarchic’	83*	49*	0.86	52*	17	0.96

Exp. 1a. Main factors: Prime type=sign $F(2, 56)=4.96, p<.05$, Type of target [$F(2, 56)= 56.22, p<.0001$].

Interaction shows trend towards significance $F(4, 112) = 2.22$.

Exp. 1b. A=ns. Type of target=sign $F(2, 52)=14,77, p<.001$. AxC=ns. Only one significant planned comparison (*): $F(1, 26) = 4.28, p<.05$. Errors are given for the three exp. conditions altogether

Outcome of previous results

Exp. 1a & 1b both used the masked priming technique with a 48ms SOA, a prime duration that generally leads to morphological (and identity*) priming effects

- The stimuli tested in these experiments were selected to activate the morphological connexion between *-isme* and *-iste*, two related morphemes that exist in Gr & Fr, and to compare it with the *-isme/-ique* connexion
- 3 priming conditions: translation (identity for monolinguals); morphological ; unrelated
- **University student group (exp. 1a)** : robust morph. priming in the L1 to L2 direction, even for 0-base cognates, for which no translation-identity priming is found [$\pi\lambda\omicron\upsilon\rho\alpha\lambda-$ /plural-/ or $\rho\epsilon\alpha\lambda-$ /real-/ do not constitute entry units for the L1 lexicon of our subjects, and as such they cannot contact the corresponding lexical entry (Corbin, 1987: 457-459, 'ils ne sont les produits d'aucune Règle de Construction de Mot')].
- **Technical school group (exp. 1b): no morph priming at all despite that both primes and targets were in their L1**

Why ? → Maybe small vocabulary size (for which we did not control)

- Hypothesis of qualitative differences within the processing system, depending on the type of speaker, e.g., Clahsen, Felser, Neubauer, Sato & Silva (2010) claim the inability of L2 learners to rely on the computational component and their inclination to list forms in the lexicon rather than creating them with stems and affixes (as native speakers do).
- Necessary to test different populations...

*As long as there is a lexical entry

Exp. 2 Second chance school participants

We ran the same experiment with 2nd chance school students, in Montpellier

- Practically the same experiment (exp. 1b): same-language (French L1) priming, LDT, 48ms SOA, 3 conditions: identity-morph-unrelated
- Differences: suppression of condition b (non-cognates Greek base), given that most of these words do not exist in French
- The morphological prime for condition c was the base, ex. *monarchie* for the target *monarchique*
- Most of our participants in this experiment had **French as their ‘school language’**
- though in most cases, **French was not the ‘home language’** (cf. participants profile, Table 2)
- Most participants had a *terminale* class level (i.e., the high school degree/ A level year), with some of them declaring a *seconde* level, before integrating the school (i.e., 11/10th grade)
- Two groups were created, based on a double assessment of participants linguistic competence: **her/his score in a French vocabulary test and the proportion of errors in the lexical decision protocol**
- Some items were excluded from the analysis because of high error rates (*altermondialiste, amoraliste, chauviniste, spasmodique*)
- Only the results of the group that performed better will be reported here (<22% error rate in the LD task)

Table 2. Participants profile – 2nd chance school

1. Profil des participants : ISMO-GB											
a. Ecole de la 2ème Chance (Montpellier-Port Marianne)											
Sujet	Sexe	Age	Profil avant E2C			L1	L-Maison	L-Ecole (Pays)	L2	Séjour Longue Durée (plus d'un mois) à l'Etranger (Pays) - (Période de séjour en France pour les étrangers)	Score Vocadu laire
			Scolarité (Pays)	Formation Professionnelle(Pays)	Diplômes (Pays)						
1	H	21	2nde (France)	SFP	Brevet (France)	FRA/SPA/ARA	FRA/SPA/ARA	FR (France)	ENG/CPF	1-2ans (Réunion)	15/18
2	F	24	Terminale (Algérie/Kabyle)	BT-Tourisme (Algérie)	BT	KAB	KAB/FRA(-)	ARA+1hjFRA (Algérie)	FRA	X - (5mois en France)	09/18
4	F	23	1ère (Italie)	SFP	SD	ARA/BER /ITA	ITA/BER/FRA (-)	ITA (Italie)	FRAB2/ENG/ SPA	3/6 mois (Italie+Maroc) - (4ans en France)	11/18
5	H	17	2nde (France)	SFP	SD	FRA	FRA	FRA (France)	ENG	X	17/18
9	F	19	Terminale (France)	POSC (France)	Brevet (France)	FRA	FRA	FRA (France)	ENG/DEUB2	2 mois (Allemagne)	18/18
10	F	16	3ème (France)	MFR (France)	SD	ARA Algérie/CPF Réunion	ARA Algérie/CPF/ FRA(-)	FRA (France+Réu nion-1m)	ENG/SPA/ ROM	1m(Algeterre)+1m(Espagne)+ 1m(Réunion)	09/18
15	H	23	UNIV-1ère année (France)	Formation Aide soignant/Informatique /Histoire (France)	BAC/Brevet/BAFA	FRA	FRA/NLD	FRA (France)	X	1-2mois (Belgique)	14/18
16	H	22	2nde (France)	SFP	SD	FRA	FRA	FRA (France)	ENG	X	17/18
17	H	20	3ème+1ans Alternance (France)	Apprentissage Mécanique (France)	SD	FRA	FRA	FRA (France)	X	X	14/18
21	F	21	Terminale (France)	SFP	BAC (Maroc)	ARA	ARA	ARA2- 3h/s+FRA (Maroc)	FRA/BER	X - (2ans en France)	11/18
22	H	17	3ème (France)	SFP	SD	FRA	FRA	FRA (France)	ENG/SPA	X	15/18
23	F	19	1ère (France)	SFP	Brevet (France)	FRA	FRA/ITA	FRA (France)	ENG/SPA	X	16/18

Table 2. Participants profile – 2nd chance school

35	H	18	Terminale (France)	SFP	SD	ARA	A+FRA (mélange)	FRA (France)	SPA	X	15/18
37	F	20	Terminale (Espagne)	CAP Infirmier (Espagne)	CAP (Espagne)	CAT	BER /CAT	CAT (Espagne)	FRA/ENG/SPA	1m (Maroc) +1m (Espagne)	06/18
38	H	19	3ème-(France)	SFP	SD	FRA	FRA	FRA (France)	X	X	13/18
40	F	17	2nde (France)	SFP	CFG (France)	FRA	FRA	FRA (France)	ENG/SPA	X	12/18
41	F	20	Terminale (Martinique)	SFP	Brevet (Martinique)	FRA-CPF	FRA/CPF	RA (Martinique)	ENG/ZHO/EUS	X	12/18
42	H	19	2nde (France)	SFP	Brevet (France)	FRA	FRA	FRA (France)	X	X	17/18
43	F	21	UNV (Pérou)	SFP	BAC (Pérou)	SPA	SPA	SPA (Pérou)	FRAB1	X - (2ans en France)	05/18
44	F	23	UNV (Espagne)	Professeur des écoles/Enseignant	LicenceUNIV (Espagne)	SPA	SPA	SPA (Espagne)	FRA/ENG	1an Erasmus (France) + 1m (Espagne) - (2ans en France)	15/18
45	H	19	1ère (France)	SFP	SD	FRA/ENG/ARA	FRA	FRA (Maroc)	SPA	1m (Angeterre) + 1m (Maroc)	14/18
46	F	18	Terminale (France)	SFP	SD	FRA	FRA	FRA (France)	X	X	16/18
47	H	21	Terminale (Espagne)	SFP	BAC (Espagne)	SPA	SPA	SPA (Espagne)	FRA/ENG	1-2m (Espagne) -(2ans en France)	11/18
48	H	17	2nde (France)	SFP	Brevet-CFG (France)	FRA/ITA	ITA	FRA (France)	ENG/SPA	1m (Italie) +3m (Serbie)	12/18
49	H	21	2nde (France)	SFP	SD	FRA/ARA	FRA+ARA	FRA (France)	X	1-2m (Maroc) + 1m (Pays-Bas)	16/18
50	F	23	2nde (Italie)	SFP	SD	ITA	ITA	Ita (Italie)	FRA/ENG	1-2m (Italie) - (2ans en France)	12/18

Table 3 (Exp. 2, L1 to L1 priming, 2nd chance school students). RTs (ms) and error rates for the three experimental conditions (identity, morphological, unrelated) for the 2 types of stimuli (*-iste* targets; *-ique* targets). The priming effect is estimated on the basis of the unrelated condition.

Words	Identity (I)		Morphological (M)		Unrel. (Un)		Priming effect	
	RT	Err.	RT	Err.	RT	Err.	Un - I	Un - M
<i>-iste</i> <i>Pluraliste</i> 10.1 lt., 1,7 occ./m	1060 <i>pluraliste</i>	14.7	1060 <i>pluralisme</i> 10 lt	13.1	1056 <i>débordement</i>	14.4	0	4
-	-	-	-	-	-	-	-	-
<i>-ique</i> <i>monarchique</i> 10.4 lt., 5,7 occ./m	933 <i>monarchique</i>	6.9	1023 <i>monarchie</i> 9 lt	9.7	1059 <i>négociable</i>	6.6	66*	36*

Exp. 2 Results from 2nd chance school participants [and comparison]

48ms SOA, prime duration giving rise to morphological (and identity) priming effects

Within-comparison (2nd chance school Fr. – technical school Gr.)

- These participants exhibit a **similar (but not identical) priming pattern**
- 2nd chance group Fr. → They show robust priming for the identity and morphological *-ique* conditions (base/*-ique* derivation)
- 2nd chance group Fr. → **Priming for identity and morphological *-ique* conditions is concomitant**, which is what we find in the literature (as long as there is a lexical entry to activate...)
- **Technical school group showed no morph priming**, only identity priming in the *-ique* condition (but the morph condition was not primed by the base...)

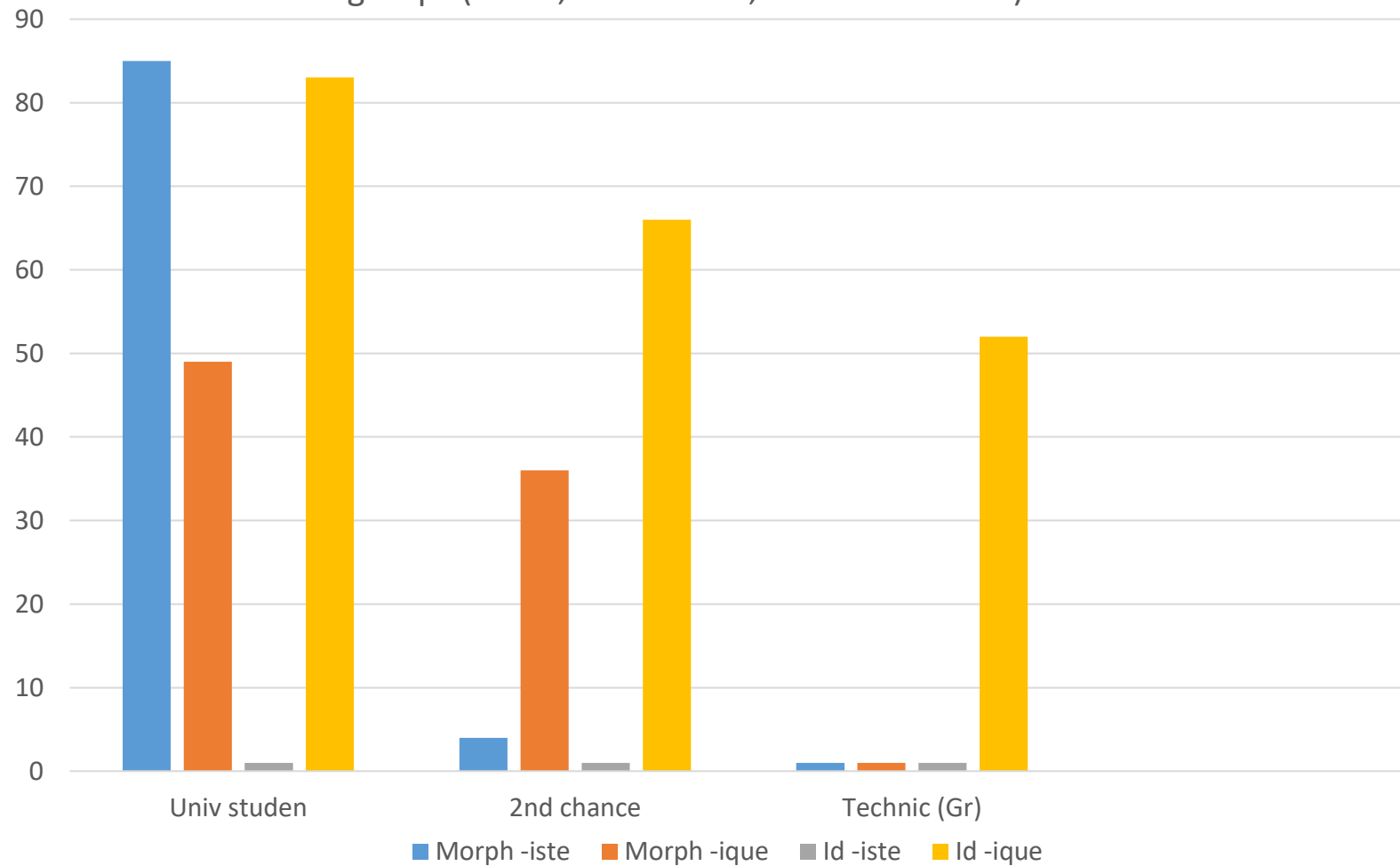
- **Comparison with the Univ. Student group** => 2nd chance and techn. school gr. behaved differently
 - For the *-isme/-iste* condition, ex. *pluralisme – pluraliste* : **only univ. students showed priming effects**
 - 2nd chance and technical group show no priming for the *-iste/-isme* condition (i.e., identity or morph)
 - For the *-ique* condition, (*-isme/-ique* or *base/-ique*): **positive id. & morph. effects for univ. students and 2nd chance school students**
 - but not for the (Greek) technical school students, who showed only an identity effect

Table 4. Experiments 1a, 1b and 2. Priming effects and error rates for the three types of word stimuli (*-iste*, Greek base *-iste*, *-ique*) for the three experiments. The priming effects are estimated on the basis of the unrelated condition.

Words	Priming effects Exp. 1a, primes in Gr., targets in Fr., L1 to L2 University students		Priming effects Exp. 1b, primes & targets in Gr., L1 to L1 Technical school		Priming effects Exp. 2, primes & targets in Fr. 2 nd chance school (Fr.)	
	Un - T	Un - M	Un - T	Un - M	Un-I	Un - M
<i>-iste</i> πλουραλιστής ‘pluralist’ - pluraliste	20	85*	45	50	0	4
<i>-iste</i> Greek base ατομικιστής ‘individualist’ - individualiste	-52	5	-45	-2	-	-
<i>-ique</i> μοναρχικός ‘monarchic’ - monarchique	83*	49*	52*	17	66*	36*

Graph 1. 'Hierarchy' of effects (following speakers profile and suffix)

Morphological (-iste and -ique) and identity significant priming effects for the 3 groups (Univ. ; 2nd chance ; technical school)



Conclusion

- Words are interconnected, but these connexions vary following speaker's experience with language
- Pieces of words (morphemes, segments) are also interconnected : the *-iste/-isme* connexion leads to significant morph effects (even when there is no lexical entry... cf. Exp. 1a)
- However, when it comes to speakers with less experience with written word, the (existing) lexical entry (in French, ex. *plural-* in *pluraliste - pluralisme*) is not sufficient to trigger morph. effect
- Whereas the *-ique* condition (primed by the base) does (2nd chance students)
- **Morphological effects are modulated following speakers' diversity**
- Morphology still is a determining factor for the organization of the mental lexicon
- Morphological effects cannot be reduced to formal decomposition effects (e.g., Rastle & Davis, 2008, Meunier & Longtin, 2007), otherwise we should observe no differences between types of suffixes
- Morph processing reflects the influence of several variables (Freq., productivity, etc., cf. refs in slide 8)
- This influence translates in terms of strength of connection (when there is one) between mental representations
- Morphological awareness training needs to be encouraged during language acquisition, remediation and throughout speaker's life

Thank you !

References (p.1)

Anastassiadis-Symeonidis, A. & Voga, M. 2012. Traitement des verbes du 2ème group du grec moderne : une approche expérimentale. *Studies in Greek Linguistics* 32, 24-37. [Επεξεργασία ρημάτων β' συζυγίας της νέας ελληνικής: μια πειραματική προσέγγιση. *Μελέτες*, 32, 24-37].

http://ins.web.auth.gr/index.php?option=com_content&view=article&id=521&Itemid=181&lang=en

Anastassiadis-Symeonidis, A. (2021). Pour un Dictionnaire de Familles d'unités (sous)lexicales. *Proceedings of EURALEX XIX 2021*, Vol. 2, 553-556. [Pages-from-EURALEX2021_ProceedingsBook-Vol2-p553-566.pdf \(euralex2020.gr\)](#)

Aronoff, M. 1994. *Morphology by itself*. Cambridge: MIT Press.

Baayen, R.H. 2007. Storage And Computation In The Mental Lexicon. In G. Jarema & G. Libben (eds.), *The mental lexicon: Core perspectives*. Amsterdam|London: Brill, 81-104

Baayen, R.H. 2014. Experimental and psycholinguistic approaches. In Rachel Lieber & Pavol Štekauer (eds.), *The Oxford handbook of derivational morphology*, 95–117. Oxford: Oxford University Press.

Blevins, J. P. 2006. Word-based morphology. *Journal of Linguistics* 42: 531–573.

Booij, G. 2002. *The morphology of Dutch*. Oxford: Oxford University Press.

Booij, G. 2015. Construction Morphology. In A. Hippisley & G. Stump (eds.), *The Cambridge handbook of morphology*. Cambridge: Cambridge University Press. 424–448.

Corbin, D. 1987/1991. *Morphologie dérivationnelle et structuration du lexique*, vol. 2. Tübingen/Villeneuve d'Ascq: Max Niemeyer Verlag / Presses Universitaires de Lille.

Dal Maso, S., & Giraud, H. 2019. On the interplay of family and series effects in visual word recognition. In F. Namer and N. Hathout (Eds.) *Paradigms in word formations, Special issue of Morphology*, 29(2), 293-315.

de Jong, N., Schreuder R., et Baayen, R. H. 2000. The morphological size effect and morphology. *Language and Cognitive Processes* 15. 329-365

References (p.2)

- Giraud, H. et Dal Maso, S. 2016a. Suffix perceptual salience in morphological masked priming. *Lingue e Linguaggio*, XV.1, 83-104.
- Giraud, H., Dal Maso, S. & Piccinin, S. 2016. The role of stem frequency in morphological processing. *On-line Proceedings of the 10th Mediterranean Morphology Meeting (MMM10), Quo vadis morphology? Grammar, cognition and computation*, 64-72. [MMM10 proceedings BOOK.pdf \(huji.ac.il\)](#)
- Giraud, H., & Grainger, J. 2001. Priming complex words: Evidence for supralexicalexical representation of morphology. *Psychonomic Bulletin and Review*, 8 (1), 127-131.
- Giraud, H. & Hathout, N. 2012. Series size effects in visual word recognition, Workshop *Exo-lexical variables in monolingual and bilingual morphological processing*, IMM12, February 9-12, Vienna, Austria.
<http://www.networds-esf.eu/index.php?page=publications>
- Giraud, H., & Orihuela, K. 2015. Visual word recognition of morphologically complex words: Effects of prime word and root frequency. In V. Pirrelli, C. Marzi, M. Ferro (eds.): *Word Structure and Word Usage. Proceedings of the NetWordsS Final Conference*, 128-131. <http://ceur-ws.org/Vol-1347/>
- Giraud, H. & Voga, M. 2016. Words matter more than morphemes: An investigation of masked priming effects with complex words and nonwords. *Italian Journal of Linguistics*, 28.1: 49-78.
- Hebb, D.O. 1949. *The Organization of Behavior*. Wiley: New York.
- Kimura, D. 1999. *Sex and cognition*. The MIT Press.
- Mainz, N., Shao, Z., Brysbaert, M. et Meyer, A. 2017. Vocabulary Knowledge Predicts Lexical Processing: Evidence from a Group of Participants with Diverse Educational Backgrounds. *Frontiers in Psychology*, 8: 1164.
- McClelland, James L. & David E. Rumelhart 1981. An interactive activation model of context effects in letter perception: Part 1. An account of basic findings. *Psychological Review* 88: 375–407.

References (p.3)

- Marantz, A. 2013. No escape from morphemes in morphological processing. *Language & Cognitive Processes* 28(7): 905–916.
- Meunier, F. & Longtin, C. 2007. Morphological decomposition and semantic integration in word processing. *Journal of Memory and Language* 56: 457–471.
- Mulder, K., T. Dijkstra, R. Schreuder & H. Baayen. 2014. Effects of primary and secondary morphological family size in monolingual and bilingual word processing. *Journal of Memory and Language* 72. 59-84.
- Rastle, K. & Davis, M. 2008. Morphological decomposition based on the analysis of orthography. *Language and Cognitive Processes* 23: 942–971.
- Rumelhart, D. E., et McClelland, J. L. (Eds.). On learning the past tenses of English verbs. In: *Parallel distributed Processing, Explorations in the Microstructures of Cognition (Vol. 2): Psychological and Biological Models*, MIT Press, 1986.
- Voga, M. (2015). Towards a supra-lexical representation of morphology in the bilingual lexicon: evidence from Greek-French cognates. *Studies in Greek Linguistics*, 35, 106-130. [Προς μια υπερ-λεξική αναπαράσταση της μορφολογίας στο δίγλωσσο νοητικό λεξικό: δεδομένα από ελληνο-γαλλικά διαγλωσσικά ομότυπα. *Μελέτες*, 35, 106-130].
http://ins.web.auth.gr/images/MEG_PLIRI/MEG_35_106_130.pdf
- Voga, M. (2020). Lexical co-activation with prefixed cognates and non-cognates: evidence from cross-script masked priming. In M. Schlechtweg (ed.), *The learnability of complex constructions from a cross-linguistic perspective*. Trends in Linguistics. Studies and Monographs [TiLSM], 345. Berlin: Mouton De Gruyter, 7-38.
- Voga, M., Anastassiadis-Symeonidis, A. 2018. Connecting lexica in bilingual cross-script morphological processing: base and series effects in language co-activation. *Lexique*, 23. 160-184.

References (p.4)

- Voga, M., Gardani, F. et Giraud, H. 2020. Multilingualism and the Mental Lexicon. Insights from language processing, diachrony, and language contact. In V. Pirelli, I. Plag et W. Dressler (eds.), *Word knowledge and word usage: A Cross-Disciplinary Guide to the Mental Lexicon*. Series: Trends in Linguistics. Studies and Monographs [TiLSM], 337. Berlin: Mouton De Gruyter, 506-552. <https://doi.org/10.1515/9783110440577>
- Voga, M., Giraud, H. & Anastassiadis-Symeonidis, A. 2012. Differential processing effects within 2nd group Modern Greek verbs. *Lingue e Linguaggio*, 2, 215-234.
- Voga, M. et Giraud, H. 2017. Word and beyond-word issues in morphological processing. *Word Structure*, 10 (2): 235-254.
- Voga, M. et Giraud, H. 2009. Pseudo-family size influences processing of French inflections: Evidence in favor of a supralexicale account. In F. Montermini, G. Boyé et N. Hathout (eds.) *Selected Proceedings of the 6th Décembrettes: Morphology in Bordeaux*, 148-155. Somerville, MA: Cascadilla Proceedings Project.