

Une approche automatique pour identifier les mots-clés pour les revues systématiques



An automated approach to identifying search terms for systematic reviews

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Morgan W. Tingley, and Chris S. Elphick

*University of Connecticut*





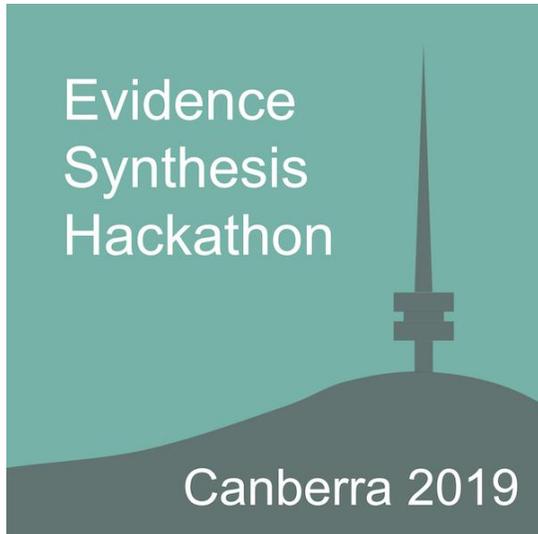
Andrew Stillman



Morgan Tingley

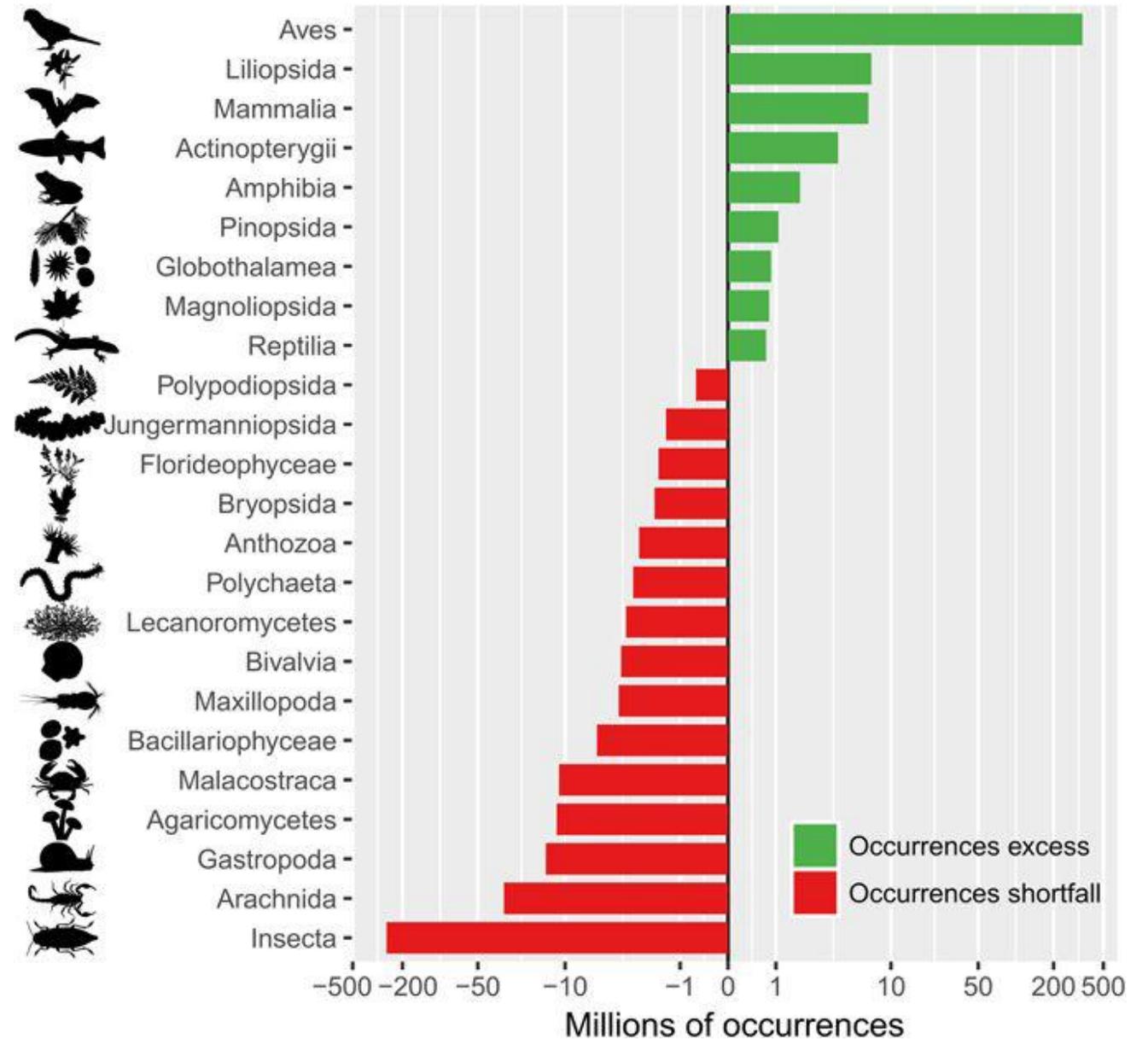


Chris Elphick



Nous étudions les oiseaux plus que les autres taxons relatif à leur diversité.

Birds are the most overstudied taxa.



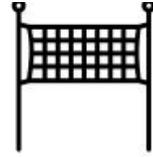
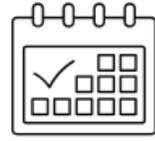
Troutet et al. (2017)

Beaucoup d'études sur les oiseaux c'est bon, mais c'est très difficile pour faire les synthèses.

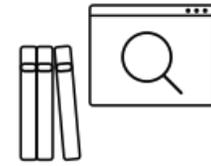
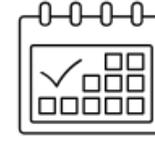


- On a besoin de retrouver tous les études qui sont pertinentes.
- Si on revue les études qu'on connaissait, nos synthèses sont sujet à partialité.
- Need to retrieve all relevant studies for synthesis.
- Reviewing familiar studies leads to biased conclusions.

Pour une vrai  
synthèse, on a  
besoin de prendre  
une approche  
expérimentale à  
revue la  
littérature.

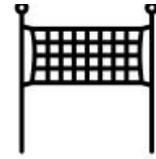
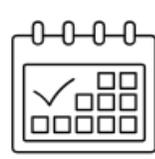


On recherche  
des données

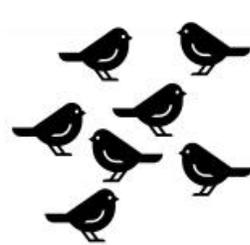
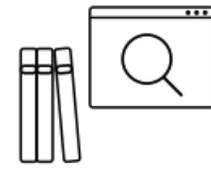
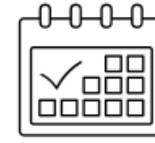


We need to take  
an experimental  
design approach  
to reviewing the  
literature.

Pour une vrai  
synthèse, on a  
besoin de prendre  
une approche  
expérimentale à  
revue la  
littérature.



On recherche  
des données



On trie les données



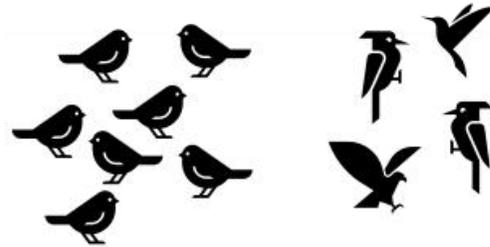
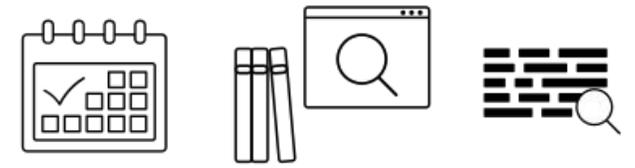
We need to take  
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literature.

Pour une vrai  
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besoin de prends  
une approche  
expérimentale à  
revuer la  
littérature.

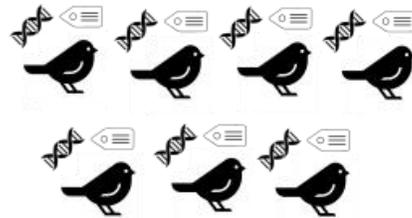
We need to take  
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to reviewing the  
literature.



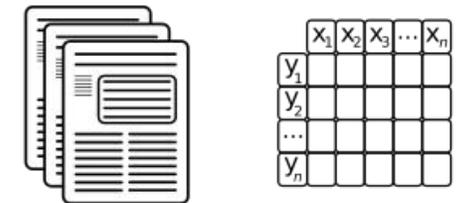
On recherche  
des données



On trie les données



On recueille des  
métadonnées ou  
des autres variables

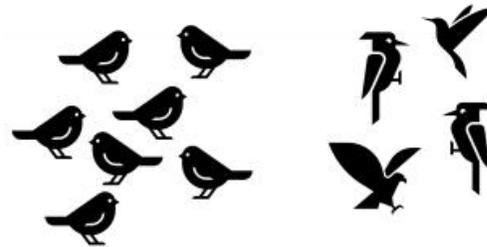
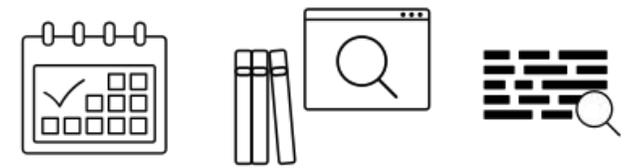


Pour une vrai  
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besoin de prendre  
une approche  
expérimentale à  
revue la  
littérature.

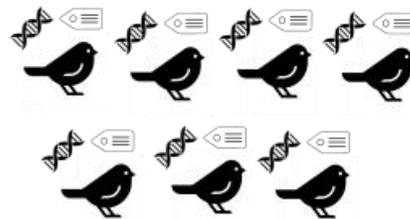
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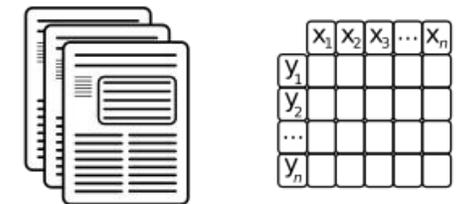
On recherche  
des données



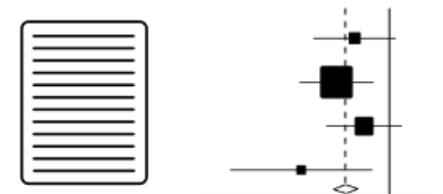
On trie les données



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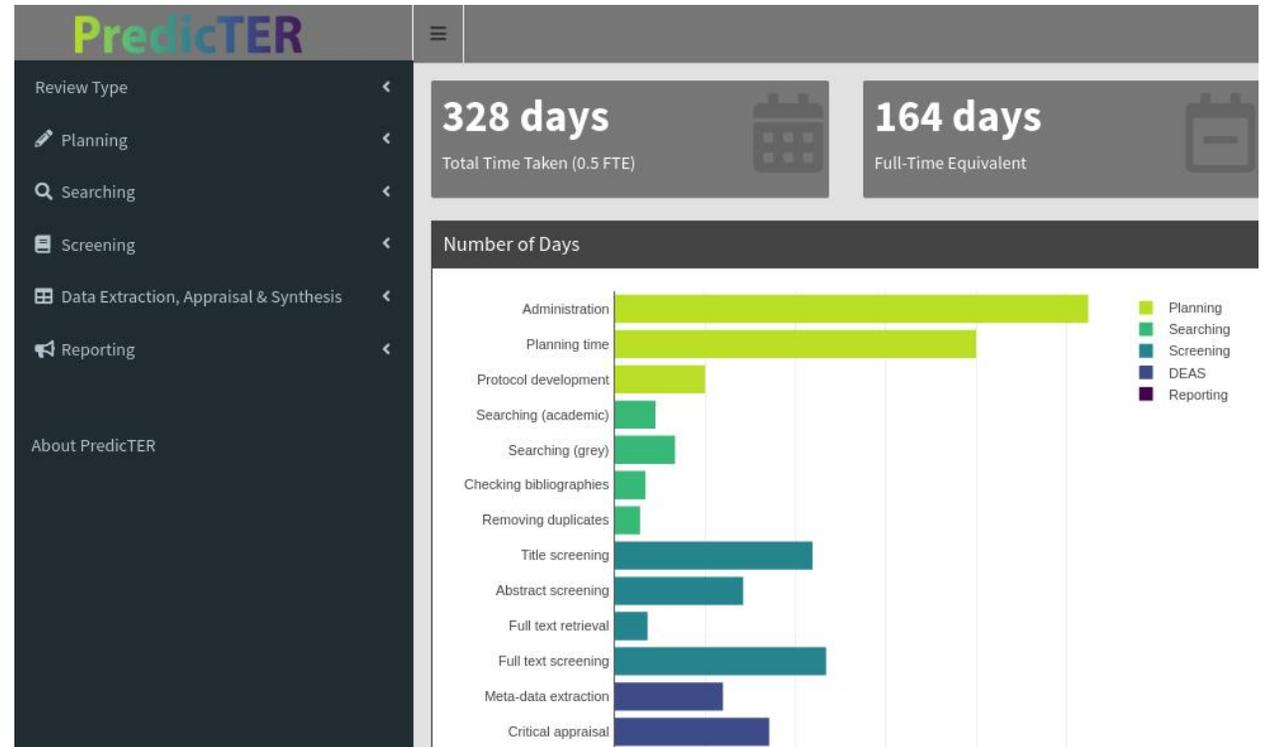
On analyse  
les données



Les revues systématiques prends une approche expérimentale à revuer la littérature, mais ils sont difficiles.

Systematic review takes an experimental approach to synthesis, but adoption is hampered by resources.

- La moyenne temps pour faire une revue systématique en écologie c'est 328 jours.



La recherche est la foundation pour tous les autres étapes d'une revue systématique.

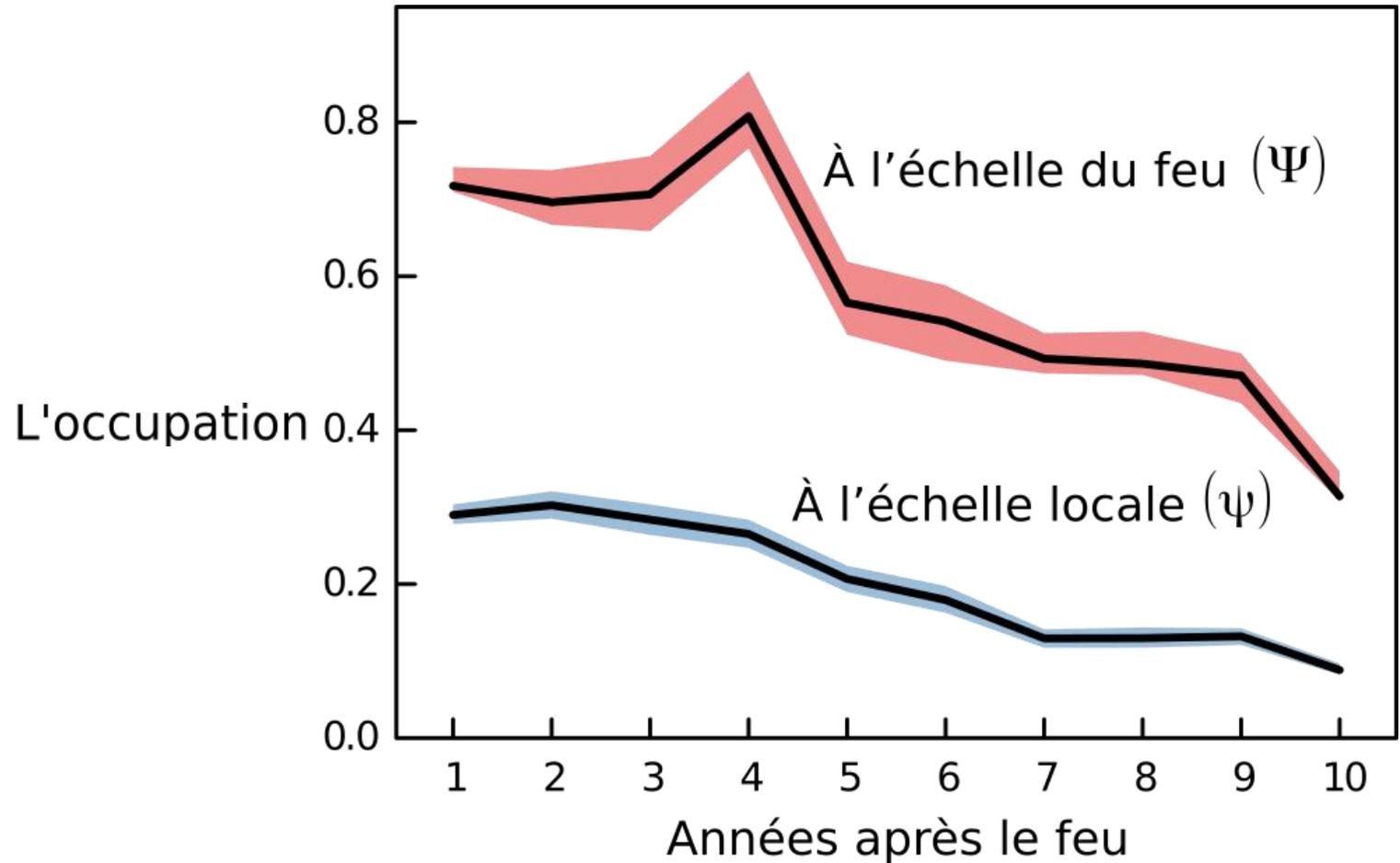
Avec R, on peut la faire plus bien.

R can help improve search strategies, which are the basis for all future steps.



Quels sont les processus écologiques à la base de l'occupation des forêts brûlées par le pic à dos noir?

What are the processes leading to declines in Black-backed Woodpecker occupancy with time since fire?



On fait une petite recherche bibliographique.

Researchers conduct a naive search.

Enter query string

```
TITLE-ABS-KEY(((woodpecker* OR sapsucker* OR Veniliorn* OR Picoid* OR  
Dendropic* OR Melanerp* OR Sphyraptic*)  
AND  
(fire* OR burn* OR wildfire*)  
AND  
( (occup* OR occur* OR presen* OR coloniz* OR colonis* OR abundan* OR  
"population size" OR "habitat suitability" OR "habitat selection" OR persist*) OR  
(nest* OR reproduct* OR breed* OR fledg*) NEAR/3 (succe* OR fail* OR surviv*))  
OR  
(surviv* OR mortalit* OR death*) OR  
("food availab*" OR forag* OR provision*) OR  
(emigrat* OR immigrat* OR dispers*)))
```

Outline query

Add Author name / Affiliation

Clear form

Search Q

On télécharge les résultats du recherche. litsearchr import et déduplique les résultats.

litsearchr imports and deduplicates the naive search results.

```
7
8 BBWO_import <-
9   import_results(
10     directory = "./naive_results/",
11     filename = NULL,
12     save_dataset = FALSE,
13     verbose = TRUE
14   )
15
16 table(BBWO_import$database)
17
18
19 BBWO_data <-
20   remove_duplicates(df = BBWO_import, field = "title", method = "quick")
21
```

litsearchr identifiat toutes les mots clés potentielles et fait une matrice des mots clés.

litsearchr builds a co-occurrence network of potential terms.

Age structure of Black-backed Woodpecker populations in burned forests

Siegel, Rodney B.; Tingley, Morgan W.; Wilkerson, Robert L.; Howell, Christine A.; Johnson, Matthew; Pyle, Peter

Population age structure is important for understanding population dynamics, but can be difficult to resolve in landbirds due to the limited number of age classes discernible by examining plumage. In forests of western North America, Black-backed Woodpeckers (*Picoides articus*) typically colonize burned areas shortly after fire, but densities decline within 6-10 yr. This pattern is often assumed to result from adult Black-backed Woodpeckers abandoning territories when food resources wane, yet long-distance breeding dispersal is relatively rare in birds, whereas long-distance natal dispersal is more common. To determine whether colonization of newly burned areas is driven primarily by breeding dispersal of adults or natal dispersal by young birds, we captured 57 adult Black-backed Woodpeckers in 6 burned areas in California between 1 and 8 yr after fire. We used patterns of multiple feather generations retained among primary coverts, secondaries, and secondary coverts to assign birds to 1 of 5 age classes (second-, third-, and fourth-calendar-year; after-third-calendar-year; and after-fourth-calendar-year). Population age structure varied dramatically across burned areas, with a preponderance of second-calendar-year birds in the 1 yr and 2 yr postfire areas, and a preponderance of birds at least 3 yr old in the older postfire areas. Poisson generalized linear mixed models (GLMMs) revealed that the effect of years since fire on woodpecker age was highly significant ( $z = 3.575$ ,  $P < 0.001$ ). Our results indicate that natal dispersal is the primary means by which Black-backed Woodpeckers colonize recently burned areas in western forests, and that breeding dispersal is uncommon. The decline of Black-backed Woodpecker populations 6-10 yr after fire likely reflects the lifespan of individual birds that colonized the burned area, or of offspring that they produced in the early postfire years. Our discrimination of Black-backed Woodpeckers into 5 age classes confirms previous suppositions about plumage-based age determination in woodpeckers, and is likely applicable to other woodpecker species.

litsearchr suggère des mots-clés pour la recherche et on décide qui sont des mots-clés biens.

litsearchr suggests keywords which researchers select from.

```
      group      term
10      no      bachman's sparrows
11 process      bark beetle
12 process      bark beetles
13 process      basal area
14 process      beetle outbreaks
15      no      biodiversity conservation
16      no      biological diversity
17 response      bird abundance
18      bird      bird assemblages
19      bird      bird communities
20      bird      bird community
>
```

litsearchr traduit la recherche et écrit la recherche.

litsearchr translates and writes Boolean searches.

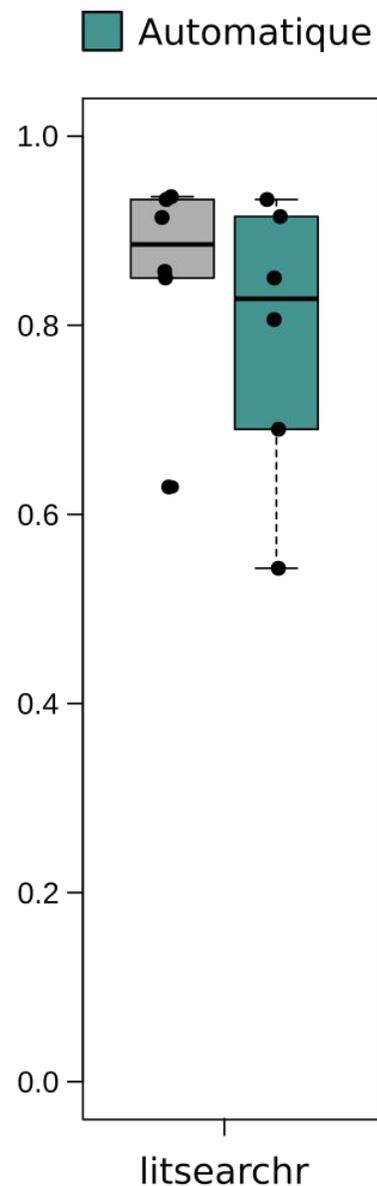
```
((("home* rang* size*" OR "breed* season*" OR "forag* behavior*" OR "forag* habitat*" OR "habitat* select*" OR "habitat* suitabl*" OR "habitat* use" OR "nest-sit* select*" OR "nest* habitat*" OR "reproduct* success*" OR "speci* habitat*" OR "bark* beetl*" OR "basal* area*" OR "canopi* cover*" OR "dead* tree*" OR "fire* habitat*" OR "ground* cover*" OR "mountain* pine* beetl*" OR "nest* site*" OR "nest* site*" OR "nest* success*" OR "nest* surviv*" OR "site* select*" OR "woodpeck* nest*" OR "woodpeck* nest*") AND (wildfir* OR "burn* forest*" OR "fire* regim*" OR "fire* sever*" OR "fire* suppress*" OR "forest* fire*" OR "natur* disturb*" OR "prescrib* burn*" OR "prescrib* fire*" OR "salvag* logging" OR "burn* area*" OR "burn* area*" OR "burn* forest*" OR "burn* site*" OR "fire* habitat*" OR "fire* regim*" OR "fire* salvag*" OR "fire* salvag* logging" OR "fire* specialist*" OR "postfir* salvag*" OR "postfir* salvag* logging" OR "prescrib* burn*" OR "sever* fire*") AND (woodpeck* OR sapsuck* OR Veniliorni* OR Picoid* OR Dendropicoid* OR Melanerp* OR Sphyrapticus* OR "bird* communiti*" OR "caviti* nest*" OR "bird* abund*" OR "bird* communiti*" OR "bird* popul*" OR "bird* speci*" OR "caviti* nester*" OR "colapt* auratus*" OR "las aves" OR "melanerp* lewi*" OR "northern* flicker*" OR "picoid* arcticus*" OR "picoid* boreali*" OR "picoid* villosus*") AND (occup* OR "speci* abund*" OR "speci* composit*" OR "speci* rich*" OR "bird* abund*" OR "bird* communiti*" OR "bird* popul*" OR "woodpeck* popul*"))
```

```
((("taille du domaine vital" OR "saison des amours" OR "comportement de butinage" OR "habitat d'alimentation" OR "sélection de l'habitat" OR "convenance de l'habitat" OR "utilisation de l'habitat" OR "habitat de nidification" OR "succès de reproduction" OR "habitat des espèces" OR "les scolytes zone basale" OR "couverture de la canopée" OR "arbres morts" OR "habitat du feu" OR "couverture de sol" OR "dendroctone du pin ponderosa" OR "site de nidification" OR "sites de nidification" OR "succès du nid" OR "survie du nid" OR "sélection du site" OR "nid de pics" OR "nids de pic") AND (incendies OR "forêt brûlée" OR "régime des feux" OR "gravité du feu" OR "feu de forêt" OR "perturbation naturelle" OR "brûlage dirigé" OR "feu dirigé" OR "exploitation forestière de récupération" OR "zone brûlée" OR "zones brûlées" OR "forêts incendiées" OR "sites brûlés" OR "habitat du feu" OR "les régimes de feu" OR "sauvetage au feu" OR "exploitation forestière de secours" OR "sauvetage après incendie" OR "brûlure dirigée" OR "feu de gravité") AND (Pivert OR sapsucker OR Veniliornis OR "Les picoides" OR Dendropicoides OR Mélanerpes OR Sphyrapticus OR "communauté d'oiseaux" OR "nidification de cavité" OR "abondance des oiseaux" OR "communautés d'oiseaux" OR "populations d'oiseaux" OR "espèces d'oiseaux" OR "nicheurs de cavité" OR "pic cockadé" OR "pics cockad" OR "colaptés auratus" OR "pic chevelu" OR "pic à tête pics à tête blanche" OR "las aves" OR "le pic de Lewis" OR "les pics de Lewis" OR "mélanerpes lewis" OR "scintillement nordique" OR "picoides arcticus" OR "picoides borealis" OR "picoides villosus" OR "pic orteil" OR "nid de pics" OR "nids de pics" OR "population de pics" OR "espèces de pics") AND (occupation OR "abondance des espèces" OR "composition des espèces" OR "la richesse des espèces" OR "abondance des oiseaux" OR "communautés d'oiseaux" OR "populations d'oiseaux" OR "population de pics"))
```

Est-ce que litsearchr fonctionne aussi bien que les chercheurs qui écrire les recherches?

Testing the performance of litsearchr against conventional searches

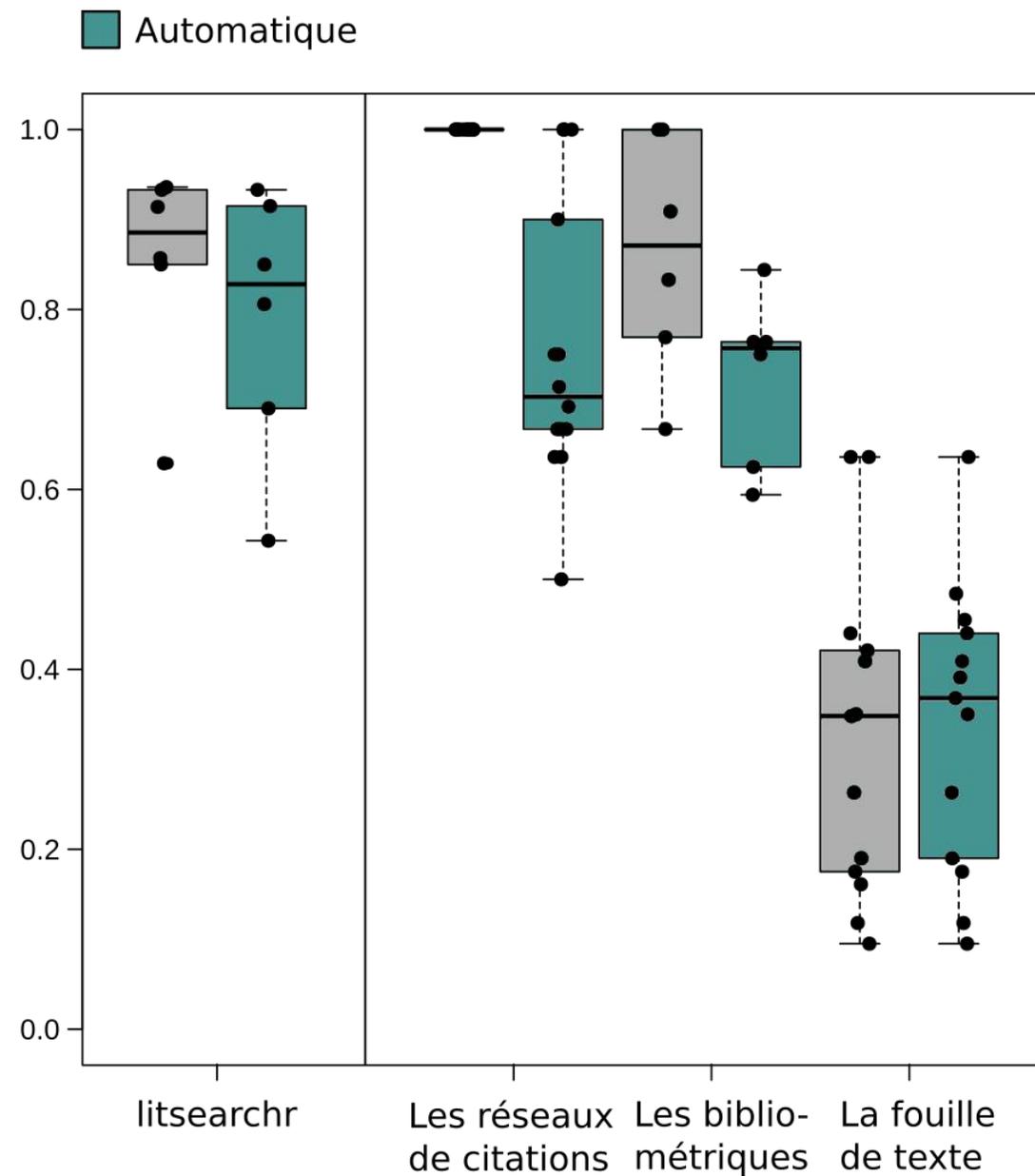
La sensitivite



# Et les autres approches automatiques?

## Comparison to other partially automated methods

La sensitivite



Pour plus d'information sur la méthode:

**Methods in Ecology and Evolution**



RESEARCH ARTICLE |  Full Access

## An automated approach to identifying search terms for systematic reviews using keyword co-occurrence networks

Eliza M. Grames , Andrew N. Stillman, Morgan W. Tingley, Chris S. Elphick

First published: 20 July 2019 | <https://doi-org.ezproxy.lib.uconn.edu/10.1111/2041-210X.13268>

 @ElizaGrames

# Des conclusions et des directions futures

- On a besoin des revues systématiques en ornithologie parce-qu'on a beaucoup d'etudes.
- Pour faire les revues systématiques plus vite, on a besoin d'automation pour identifier les etudes.
- litsearchr peut identifier les mots-clés et peut écrire les recherches pour les revues systématiques.
- Il y a beaucoup d'autre packages en R pour faire les revues systématiques; ils sont dans le metaverse

<https://elizagrames.github.io/litsearchr>



 @ElizaGrames