UNIVERSITY
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AUSTRALIA

HDR HELPFUL HINTS

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Uses of AI in research – reviewing the literature

SUMMARY

Researchers can utilise a variety of AI tools to review the literature and to learn about the topic of study extensively. As the following table indicates, AI tools can fulfill a range of roles, such as help researchers

- determine which topics, keywords, and authors to search,
- identify and collate relevant publications,
- understand challenging publications, theories, and concepts,
- extract patterns and themes from this information.

					
Determine which topics, keywords, & authors to search	Collate all the publications you plan to read	Extend your search for publications you might have overlooked	Confine your search to publications that are especially vital	Understand challenging publications, theories, and concepts	Extract patterns and themes from this information

Note this document is designed to help research understand the literature and write a narrative review. This document is not sufficient to help researchers conduct systematic reviews. To conduct systematic reviews, other tools, such as Iris, may be helpful.

1 DETERMINE WHICH TOPICS, KEYWORDS, & AUTHORS TO SEARCH

					
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The first phase of a research project is to formulate the research questions. Typical research questions may be

- does meditation diminish the incidence of diabetes in older people?
- can the impact of humility on wellbeing be ascribed to confidence?
- how does not the climate affect the impact of car pollution on the quality of water?
- what is the lived experience of HDR candidates who experience disabilities?

After researchers have clarified the research question or questions they want to explore, they need to read all the publications that inform this pursuit. To achieve this goal, they first need to

- clarify which topics they need to review in detail,
- identify the keywords they need to enter into databases to learn about these topics,
- determine which authors write about these topics as well as the most productive research centres on this topic.

The following table illustrates some prompts you can enter into AI tools, such as Chat GPT, to answer these questions.

PRACTICE	EXAMPLES
Prompt the tool to identify the main topics, theories, and advances to consider that are relevant to your research question.	• I am studying whether age affects the relationship between meditation and diabetes. When reviewing the literature what are the main topics I should consider? • What are the key theories, frameworks, concepts, and arguments that are relevant to this topic? • And what are the most recent advances in this field of research?
Ask the tool to suggest some keywords you should enter into databases while reviewing the literature.	• You suggested I should learn about the effects of meditation on physiology and the effects of stress on diabetes. • To learn about these topics, what keywords should I enter into databases, such as Google Scholar? • What bibliographic databases are most relevant to this research question?
You can also prompt the tool to identify relevant academics, research centres, and journals.	• Which academics or writers are studying and publishing on this topic? • Which research institutes or research centres around the globe are most renowned for their advances on this topic.

2 DETERMINE WHICH TOPICS, KEYWORDS, & AUTHORS TO SEARCH

					
Determine which topics, keywords, & authors to search	2 Collate all the publications you plan to read	Extend your search for publications you might have overlooked	Confine your search to publications that are especially vital	Understand challenging publications, theories, and concepts	Extract patterns and themes from this information

After identifying the relevant topics to pursue, you then need to collate the publications to read. You can obviously use standard bibliographic databases, such as Google Scholar. However, to complement these databases, you could also use a range of AI tools. These AI tools may

- convey more information about the quality of each publication,
- enable you to enter questions, such as "which studies examine whether meditation prevents diabetes", rather than merely keywords,
- store these publications more systematically,
- extract key information from these publications more efficiently.

Here are some examples of some useful AI tools that fulfill these goals.

Elicit
Functions • Elicit helps researchers locate relevant publications—from another AI tool called Semantic Scholar, extract key information from these publications, and then derive themes from this information. • Users can ask questions to locate these publications, such as "What are the effects of … on…"or "Can you identify all datasets that have been used to study the effects of … on…".

- To improve the validity of this information, Elicit estimates the trustworthiness of each study—guided by, for example, the source of funding, the sample size, and the experimental design.
- A free version is available but paid versions are more comprehensive.

Research Rabbit

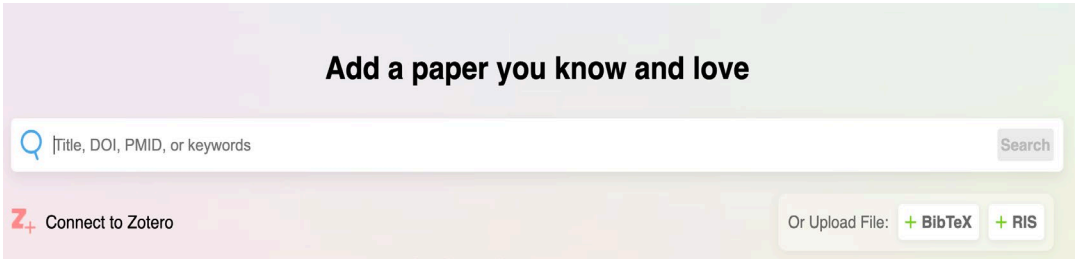
Overview

- Research Rabbit uses AI to uncover publications that are most associated with your favourite papers or keywords.

How to access Research Rabbit

- Visit this webpage and sign in. You simply need to enter your email and then create a password.
- The tool might then seek additional information, such as your name, institution, and topic of interest as well.
- Research Rabbit have pledged to maintain a free version of this tool indefinitely.

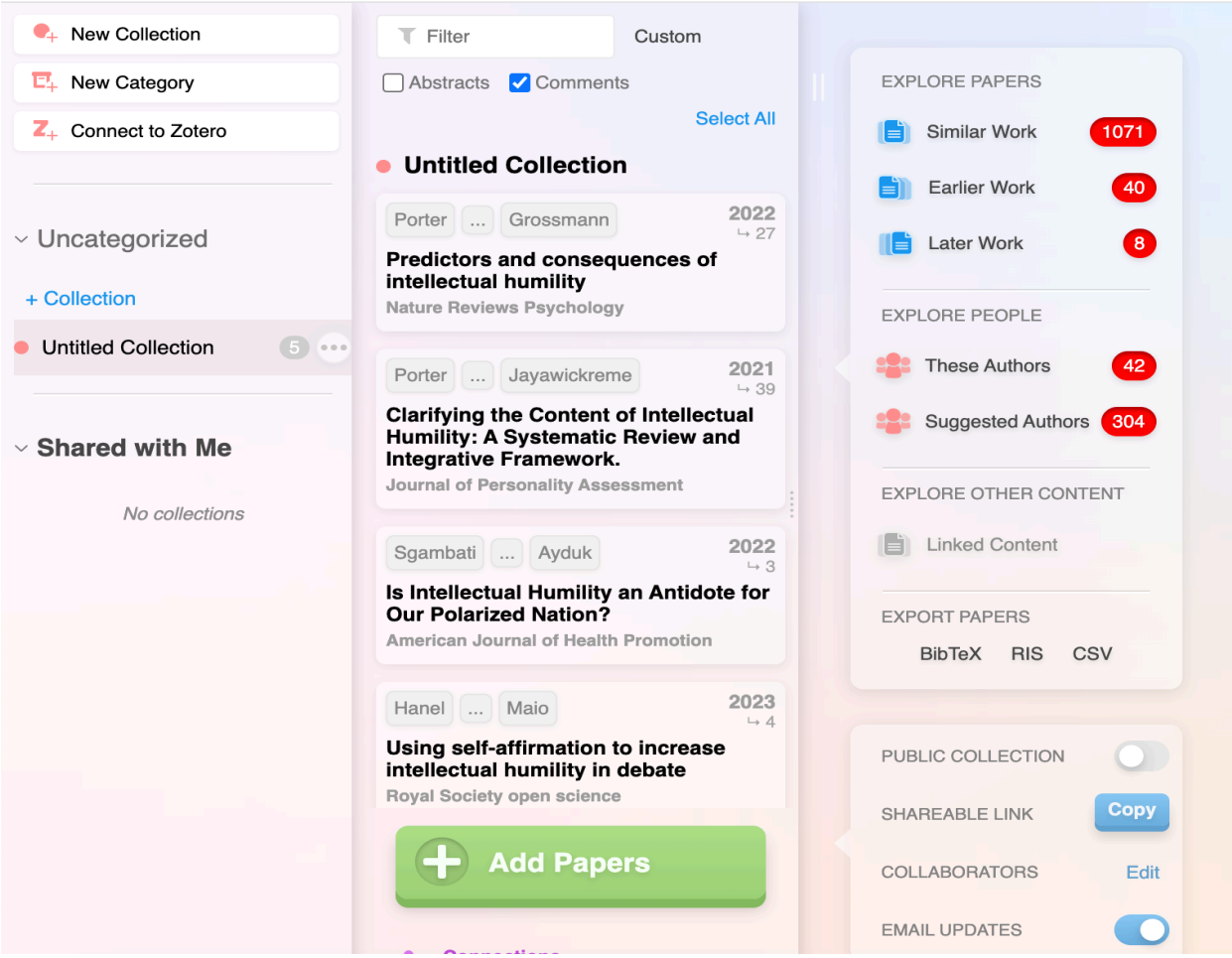
Specify the most relevant publications



- You will then be prompted to search or add a paper you like.
- You could enter a specific title and doi or instead enter some relevant keywords.
- For example, if interested in how humility promotes wellbeing, you could simply enter "humility wellbeing".
- The tool may then prompt you to choose a database—either Biomedical & Life Sciences or All Subject Areas—and then extract all relevant publications from this database.

Choose a subset of the suggested publications

- The tool will usually generate a long list of publications, ordered according to relevance.
- From this list of publications, you can select "Add to collection" any examples that are relevant to your work.
- You can gradually build several distinct collections, each corresponding to a separate topic. generating something like the following screen.
- The tool can be also integrated with Zotero, to enable you to readily insert these publications into your reference list.



Semantic Scholar
Functions • Like Google Scholar, but also highlights the key features of each publication that may be relevant to specific keywords. • Also, unlike Google Scholar, excludes publications that behind a paywall. • So, useful if you want to read the publications immediately.

Smartsearch.org
Functions • Searches multiple databases at once, including Google Scholar, Pub Med, Scopuus, Web of Science, and Lens. • Also identifies all the databases that could be relevant to your topic. • Users do need to pay a modest fee.

3 EXTEND YOUR SEARCH FOR PUBLICATIONS YOU MIGHT HAVE OVERLOOKED

					
Determine which topics, keywords, & authors to search	Collate all the publications you plan to read	3 Extend your search for publications you might have overlooked	Confine your search to publications that are especially vital	Understand challenging publications, theories, and concepts	Extract patterns and themes from this information

The previous phase uncovered clusters of publications you may read later. Despite their best attempts, researchers can never locate all publications that could be relevant. Nevertheless, some of these overlooked publications could be especially useful. Therefore, you can use the following set of tools to identify overlooked publications that may be vital.

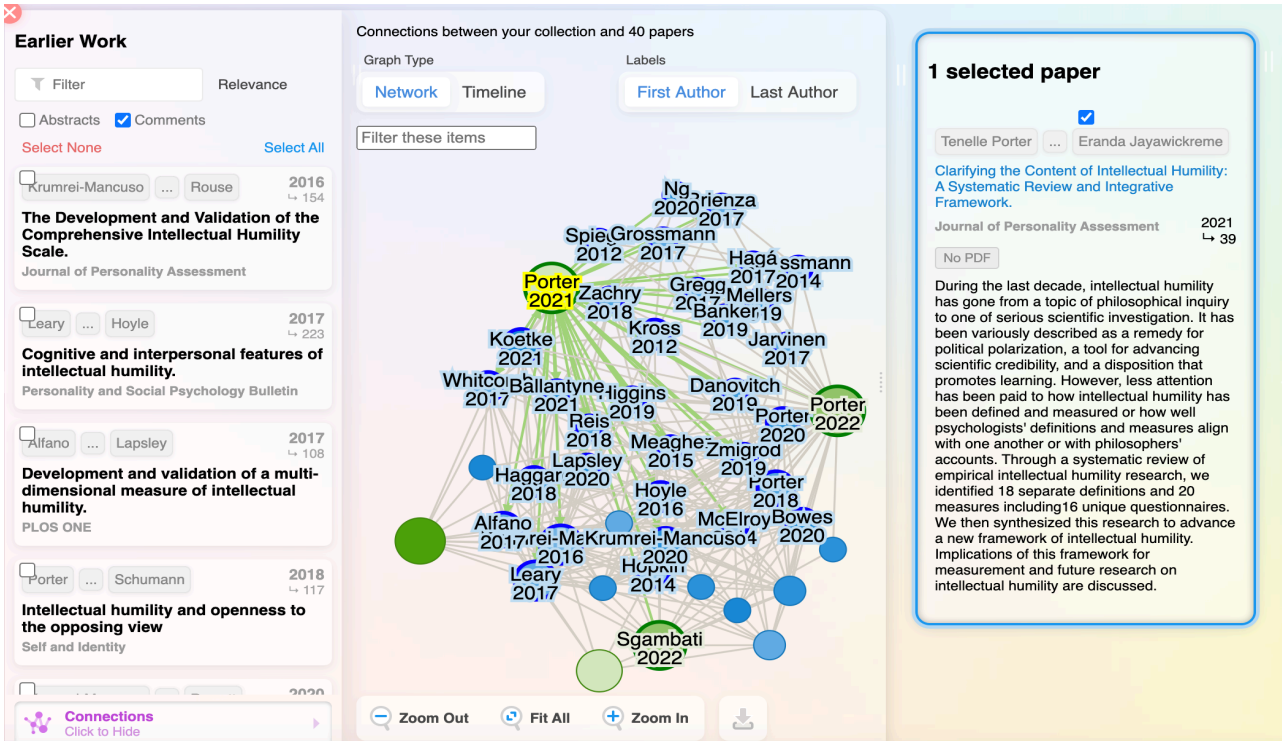
Consensus
Functions • Uses GPT 4 to summarise papers on a topic. You can simply enter the topic—or write something like "What are some authoritative studies that support the argument that …"? • The answer will include references. • You can also identify all the publications these works have cited.
Fees • For unlimited summarises, you need to pay a small fee.

Connected Papers
Functions • After you enter a publication, the tool generates a graph that shows similar works—to identify publications you may have overlooked. • You can also identify all the publications these works have cited.

Goatstack
Functions • At regular intervals, sends you emails that list the publications you should read. • To set up these alerts, first specify the topics you want to learn and topics you want to exclude. • Next, specify how often you want to receive these lists, such as weekly or fortnightly. • The tool will then send emails that display the latest publications on this topic.

Scholarly Assistant
Functions • Can identify and summarise more recent research on a topic than many other tools—and thus may identify advances you could have otherwise overlooked. • Can also suggest improvements to a publication.

If you use Research Rabbit, as discussed in the previous section, you can also seek information that helps you uncover some overlooked publications. Specifically, if you choose the options in the right panel under "Explore options" or "Explore people", you can generate graphs about various publications or authors, as the following example reveals



These graphs reveal which publications cite one another. To use this graph effectively

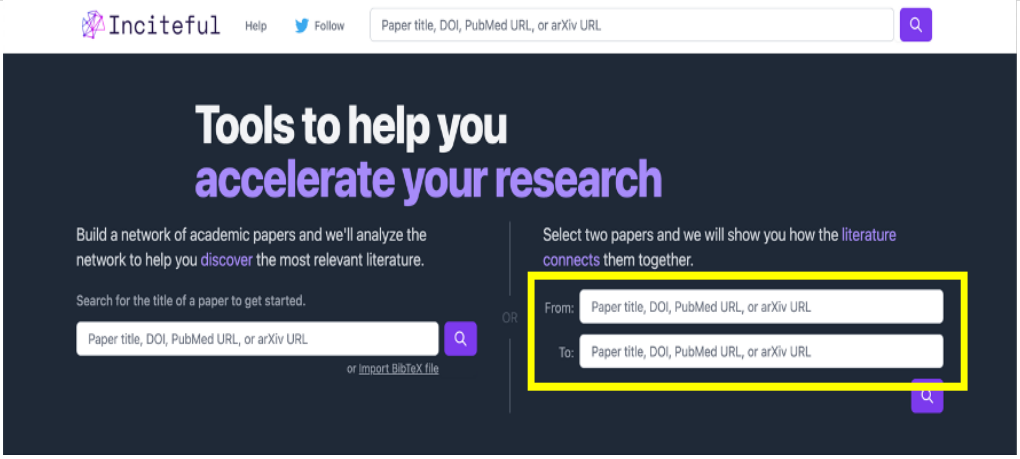
- perhaps first select papers that are not as connected to other publications; these papers do not overlap extensively with the other publications and thus are more likely to generate insights that you have overlooked before,
- if you press the "Timeline" option above the graph, the figure will show how the papers evolved over time.

4 CONFINE YOUR SEARCH TO PUBLICATIONS THAT ARE VITAL

					
Determine which topics, keywords, & authors to search	Collate all the publications you plan to read	Extend your search for publications you might have overlooked	4 Confine your search to publications that are especially vital	Understand challenging publications, theories, and concepts	Extract patterns and themes from this information

The previous phases may generate an extensive array of publications you should read. However, you may not be able to read all these publications in detail—at least not before you complete your research proposal review. So instead, you want to identify which publications are vital. Some AI tools can help you achieve this goal.

Inciteful
Functions • Suppose you are interested in two distinct topics, such as "humility" and "mental health". • Inciteful can help you identify which publications you should read to understand the association between these topics.
Access the tool • Visit this webpage to generate the following screen. • At the time of writing, this tool was free to use.



Enter your first publication

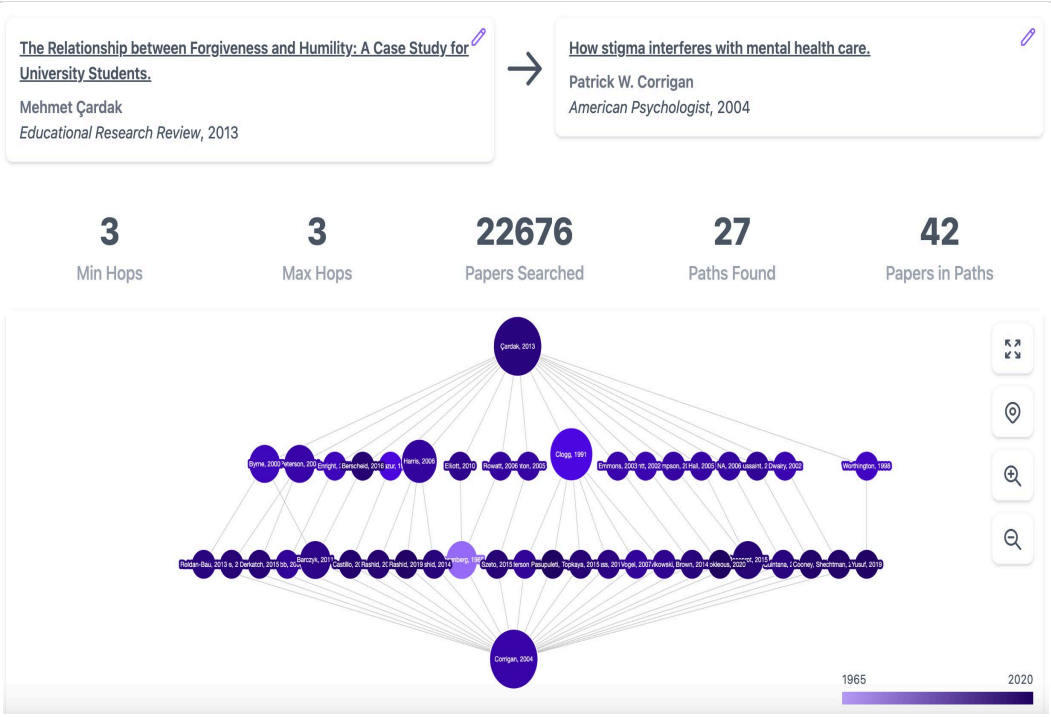
- On the right side, you will see a box titled “From”.
- In this box, you can enter the title of a specific publication you like.
- Alternatively you can enter keywords, such as “humility university”, and the tool will identify some relevant publications. You can then choose one of these publications.

Enter your second publication

In the next box, labelled “To”, enter your second publication or keywords, such as “mental health”.

Press the search icon underneath

Once you press the search icon or magnifying glass, a screen that resembles the following should appear.



Interpret this output

- In this graph, each circle represents one publication.
- As the graph reveals, at least 18 studies have cited your first publication—as the second row of 18 circles reveals.
- And about 22 publications both cite these 18 studies and are cited by your second publication.

- Accordingly, if you read or skimmed many of these publications, you would understand the literature that integrates your two chosen publications.
- In this example, you would greatly understand how humility is associated with mental health, for example.
- This tool thus helps you write a narrative that connects your interests.

Identify the publications

- To identify the title of these publications, simply click some of the circles.
- You could search these publications in the online library catalogue.
- Alternatively, if these publications are available to the public, you might be able to access these papers from the platform.

5 UNDERSTAND CHALLENGING PUBLICATIONS, THEORIES, AND CONCEPTS

					
Determine which topics, keywords, & authors to search	Collate all the publications you plan to read	Extend your search for publications you might have overlooked	Confine your search to publications that are especially vital	5 Understand challenging publications, theories, and concepts	Extract patterns and themes from this information

Generative AI tools cannot only help you identify suitable publications but can also help you understand these publications. For example, these tools may summarise multiple publications about a topic or translate complicated descriptions into simple explanations. Elicit, often used to locate suitable publications, can also summarise these works. Here are some other examples.

BookAI
Functions • An AI tool you can use to learn from books more efficiently. • You can ask questions like "What are the 10 ideas from this book I could implement today" or "Explain the 10 main points from this book".

heuristi.ca
Functions • Free tool that helps you learn about a topic by integrating Chat GPT with mind maps and other visual tools.

Paper interpreter
Functions

- Presents simple summaries of challenging papers that are open access.
- You simply need to enter the URL of this paper.

SciSpace

Functions

- Helps convert long, challenging publications into simpler documents.
- The library comprises 200 million research papers across various domains and disciplines.
- You can use the AI Copilot Assistant to ask questions about papers and clarify the concepts.
- Although free, a premium version enables you to use the AI Assistant without limits and to export references to Zotero or other reference management tools

NoBinge

Functions

- Sometimes, rather than interpret publications, you may want to simplify the materials that appear on YouTube—such as a video that explains a theory or method
- NoBinge can summarise the content of YouTube videos.
- Simply paste the video URL into the prompt box. You can also indicate whether you want the summary to be short, balanced, or extensive.
- You can also insert specific prompts or questions about these videos—and the tool will answer these questions.

Many generic AI tools, such as Chat GPT, can also help you understand complicated publications, theories, and arguments. Can you simply enter a prompt like:

- I am going to upload a publication: Can you explain this publication in about 3 to 5 paragraphs using simpler language?
- Can you describe this theory in simple language?

6 EXTRACT PATTERNS AND THEMES FROM THIS INFORMATION

					
Determine which topics, keywords, & authors to search	Collate all the publications you plan to read	Extend your search for publications you might have overlooked	Confine your search to publications that are especially vital	Understand challenging publications, theories, and concepts	6 Extract patterns and themes from this information

After you have collated many publications to read as well as read or summarised these publications, you need to write a review. To achieve this goal, you need to convert this knowledge into a narrative. That is, you need to derive the themes, patterns, or arguments from the past literature. Generative AI could help you achieve this goal.

Documind.chat

Functions

- Helps you extract information—or even write articles—from multiple pdfs or publications.

Procedure

- First, you upload your pdfs, such as all the publications you have downloaded from the library or web. You can then arrange these publications into folders, such as "articles on diabetes" and "articles on mental health".
- Second, you can ask questions about these publications, such as "which approach to manage diabetes is most effective". The tool will generate answers that refers to specific pdfs or publications.
- Third, you can ask the tool to generate summaries, articles, or plans from these publications. To illustrate, you could write "Can you generate a plan that summarises these articles".
- You can click the relevant buttons to derive these answers from only a subset of these publications, such as one folder.

Petal
Functions • To use this tool, first collect pdfs of all publications you plan to read. You could use other tools, such as Elicit, to achieve this task. • Second, access the website and open an account. The free version is limited and does not enable you to analyse multiple papers simultaneously. So, you will may need to pay a limited fee. • Third, choose the "Document Analysis Platform" option. • Fourth, upload your pdfs into petal. Several options are available. • Fifth, enter prompts to learn about these documents. To achieve this goal, choose "Multi-doc Chat" and watch the tutorial. Here is a typical prompt: Act in the role of an experienced academic researcher, with expertise in the field of... Can you first identify the key themes in this literature… • Sixth, ask more specific questions about the literature—such as "Can you collect evidence that tests the theory that…"