

# Computational Psychiatry

## Introducing a Contemporary Strategy to Efficiently Diagnose and Treat Mental Disorders and Illnesses

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### Introduction

The merging of cutting-edge technologies and the growing need for a deeper knowledge of mental diseases have recently fueled a dramatic shift in the discipline of psychiatry. Computational psychiatry combines methods from computer science, psychology, and neuroscience to build complex models that shed light on the causes of psychiatric disorders. By helping scientists to interpret complex brain mechanisms, predict treatment responses, and tailor interventions on an individualized basis, computational psychiatry heralds a new era of personalized mental healthcare.

### Objectives

This research poster aims to summarize and analyze the potential of computational psychiatry through our 100 most-cited sources.

### Methods

#### Search Strategy

Electronic searches made on the Web of Science yielded a number of results tracing back from 1976 to 2023. To obtain a list of viable articles, the keyword “computational psychiatry” was implemented. No restrictions were applied in the sections countries/regions, languages, or article type. From such traits, a total of 5,407 articles corresponded with the specific traits that were asked for. These article options were further sorted from by number of “citations: highest first.”

#### Data Extraction

The eligible top 100 cited articles exported from the Web of Science were filtered in Bibliometrix to include articles, proceeding papers, and reviews. We further filtered articles to be in the English language and set the publication date to range from 2013 to 2023. Information regarding article title, year of publication, journal, and total number of citations was recorded for each source. The most relevant authors and affiliations were subsequently extracted from the entire dataset.

Relevant topics were recorded from the Web of Science through the filter, “Citation Topics.” Relevant affiliations only of the senior authors were collected, and only the first topic listed was recorded if multiple existed. Each of the top 20 most cited articles were reviewed to record the study type. All quantitative data was inputted into Excel to be organized and generated into graphs and figures.

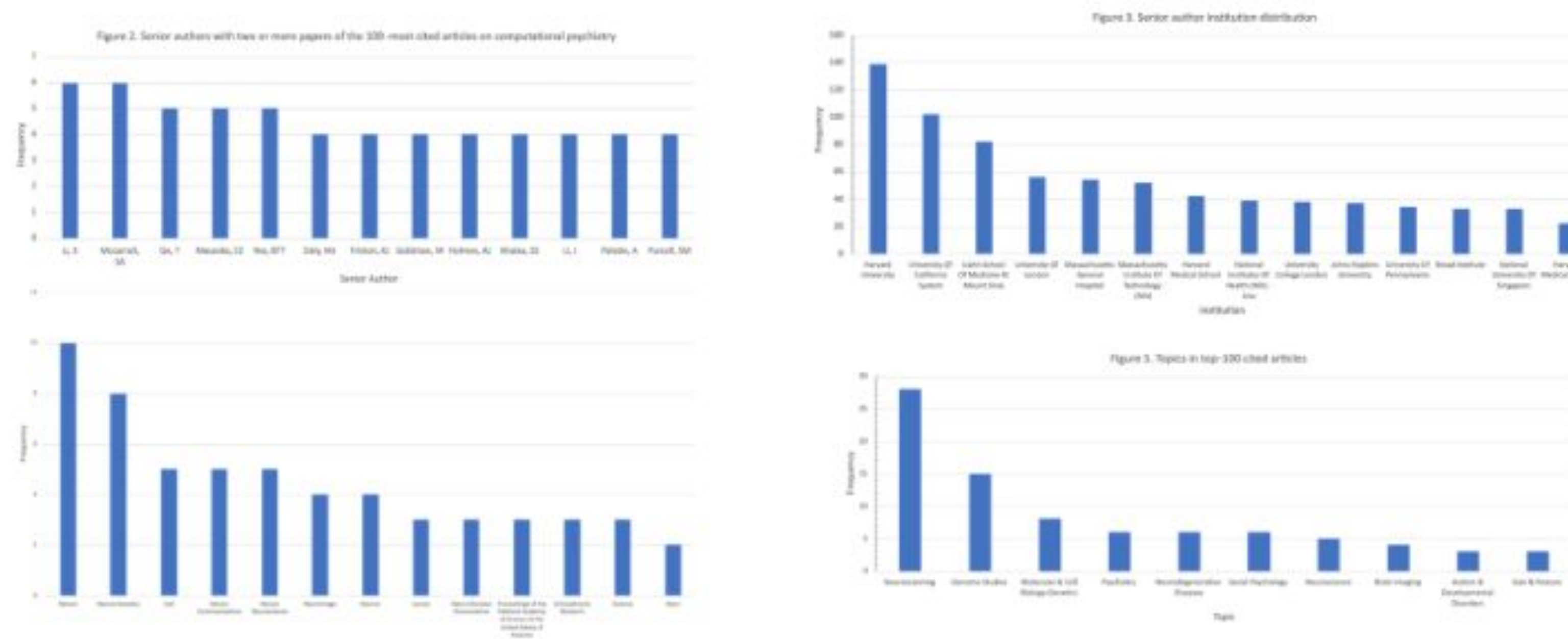
### Results

#### Top 100 Most-cited Articles:

From the Web of Sciences, the studies related to the topic “computational psychiatry” was 5,405. The top 100 most-cited studies were filtered out and categorized into 77 articles, 22 reviews, and 1 proceeding paper. Citation count ranged from 3 to 4862. The most-cited study was “Second-Generation Plink: Rising to the Challenge Of Larger and Richer Datasets” (cited 4,862 times). The top 100 most-cited studies were published between 2013 and 2023.

#### Senior Authors

Figure 2 shows 13 senior authors who published 2 or more studies in the the top 100 most-cited studies but more than 13 authors were found to have published 2 or more sources. Xin Li as well as Steven Mccarroll were the most published senior authors, both with a total of 6 sources. Additionally, as can be seen in Figure 2, 8 leading authors, constituting 62% of the most relevant authors displayed, published 4 sources.



### Conclusions

In conclusion, this bibliometric analysis provides valuable insights into computational psychiatry's current research landscape and its evolving trends. By examining a comprehensive collection of scholarly articles, we identified a total of over 100 cited publications. Notably, we observed a significant increase in the number of publications focusing on machine learning applications in psychiatry, especially regarding neuroscanning. However, our research also highlights the cruciality of devoting more time towards the areas of autism, developmental disorders, gait, and posture within the domain of computational psychiatry as the prevalence of these issues rise. In doing so, a deeper understanding of the underlying mechanisms and potential interventions or treatments can be developed to promote better outcomes and meaningful advancements towards these topics. Ultimately, these findings underscore the relevance and potential of computational approaches in advancing our understanding and treatment of mental health disorders.

### References

1. Web of Science
2. R-Studio Application
3. BiblioShiny

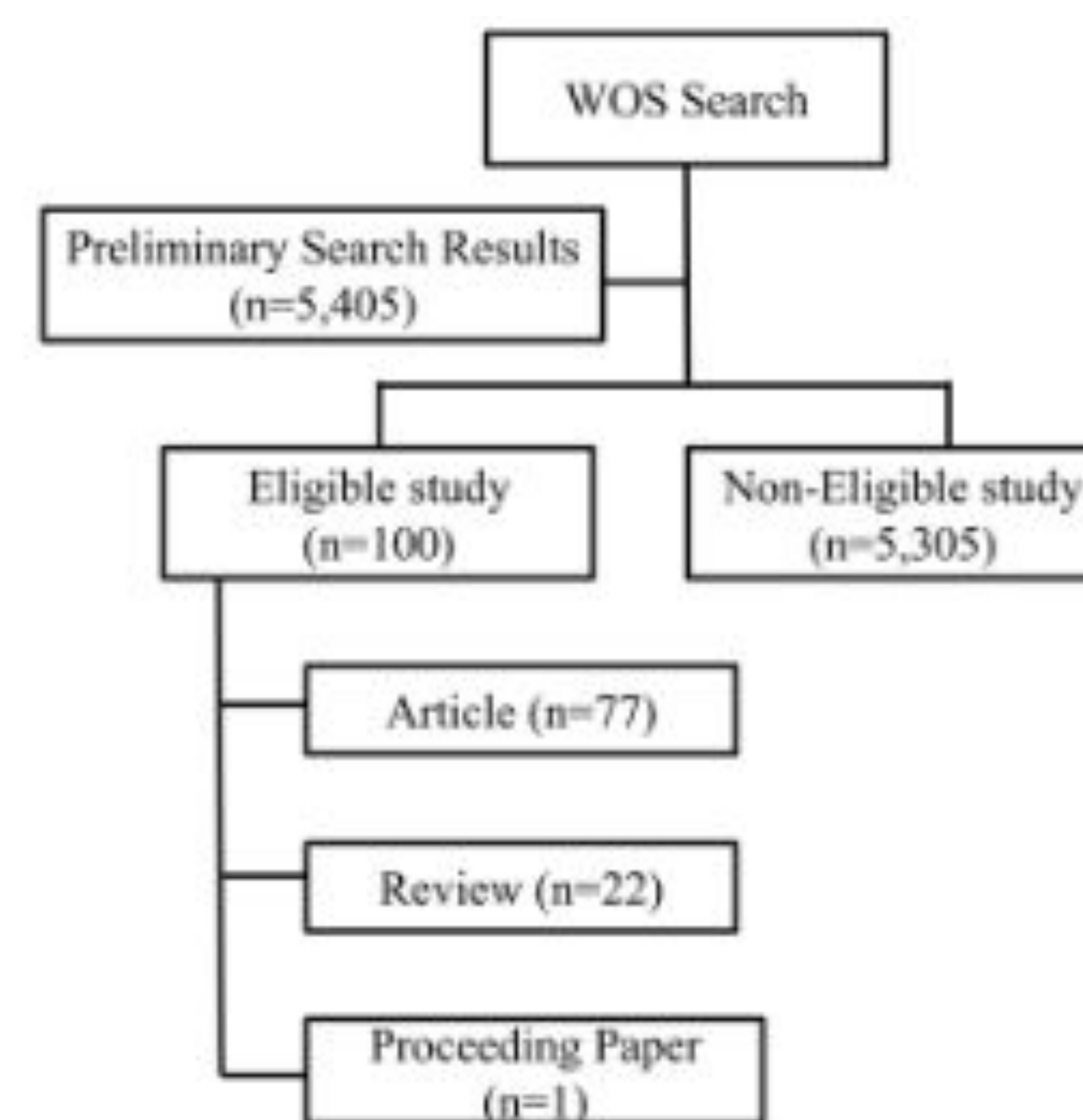


Figure 1. Flow diagram of the literature search process outlining the number of studies that were identified, included, and excluded at each stage.