



WikiFactFind: Semi-automated fact-checking based on Wikipedia

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Abstract

Fact verification has become an essential task, being used in various areas from checking auto-generated content to fighting disinformation in hybrid wars. However, even though there has been relevant advances in creating automatic fact-checking systems, nowadays manual work is crucial to deliver good quality results. The manual fact verification usually consists of information retrieval, and logical reasoning for making the final verdict. In this work we concentrate on the process of searching for the fact proofs, reveal possible problems while searching, and propose a tool that helps increase the speed of fact checking without sacrificing its quality.

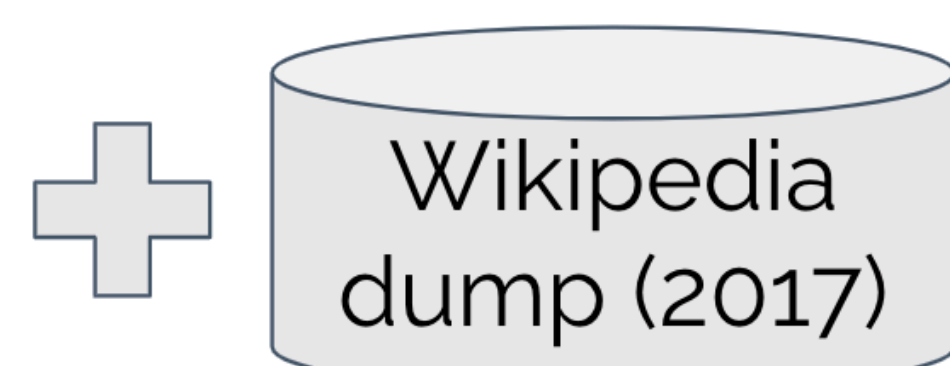
Research questions

- RQ1:** How do manual search strategies impact the fact-checking process?
- RQ2:** Does the claim label influence the results of evidence search?
- RQ3:** What is the relation of Wikipedia article quality and SERP results?

Data preparation

Original FEVER. Data sample

```
{
  "id": 75397,
  "verifiable": "VERIFIABLE",
  "label": "SUPPORTS",
  "claim": "Nikolaj Coster-Waldau worked with the Fox Broadcasting Company.",
  "evidence": [
    [92206, 104971, "Nikolaj_Coster-Waldau", 7],
    [92206, 104971, "Fox_Broadcasting_Company", 0]
  ]
}
```



- Leave only SUPPORTS (S), REFUTES (R) labeled samples
- Actualize article names (approx. 7.4% changed)

Customized FEVER data sample used for search

| Claim | Evidence Articles | Label |
|---|---|----------|
| Nikolaj Coster-Waldau worked with the Fox Broadcasting Company. | Fox_Broadcasting_Company, Nikolaj_Coster-Waldau | SUPPORTS |
| Hermit crabs are arachnids. | Arachnid, Hermit_crab, Decapoda | REFUTES |
| There is a capital called Mogadishu. | Mogadishu | SUPPORTS |

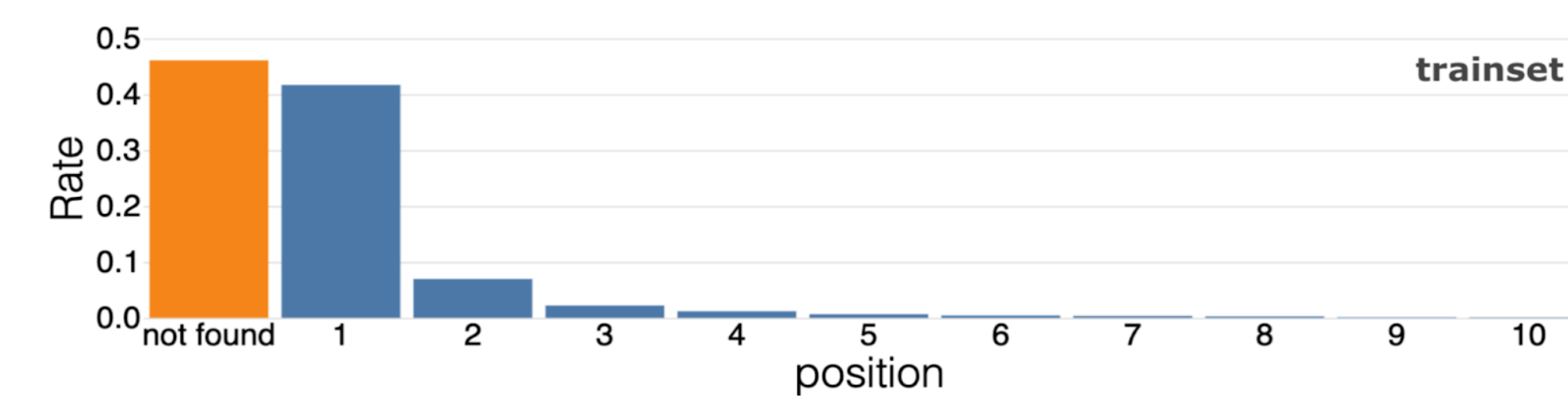
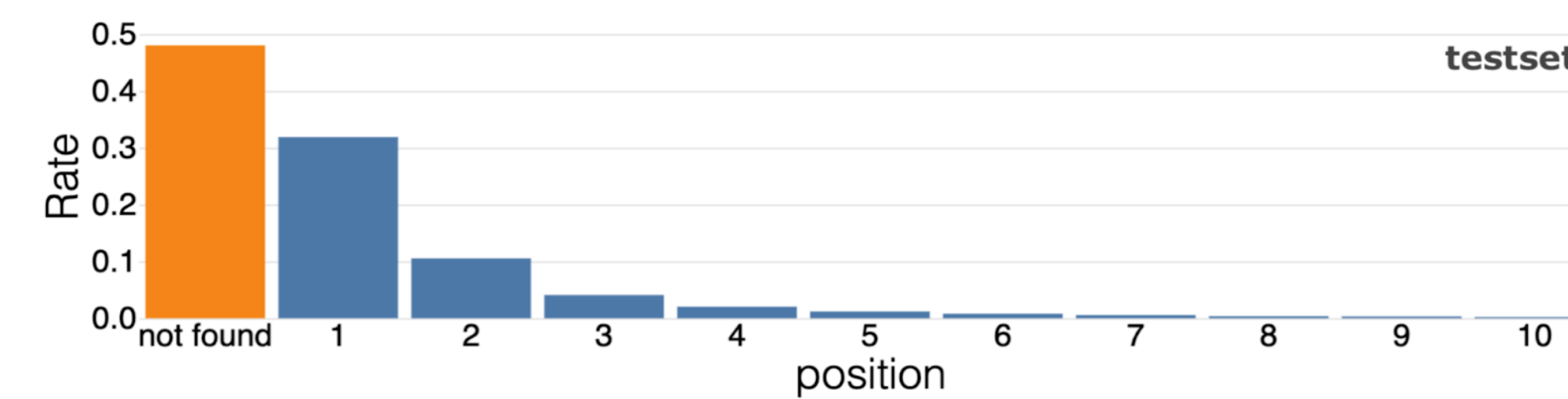
Metrics

- Rate of found items (**RFI**) for top-10 results (equal to Recall@10)
- Rate of correctly placed items on the first position (**RCPI**)
- Distribution of desired evidence on top-10 positions of SERP

Manual evidence search strategies

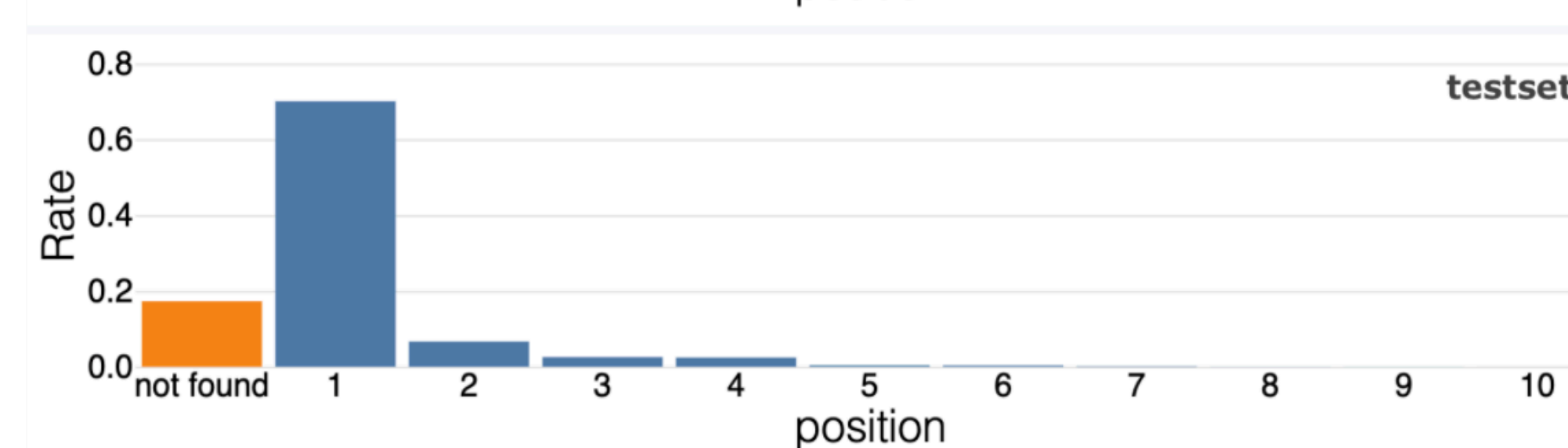
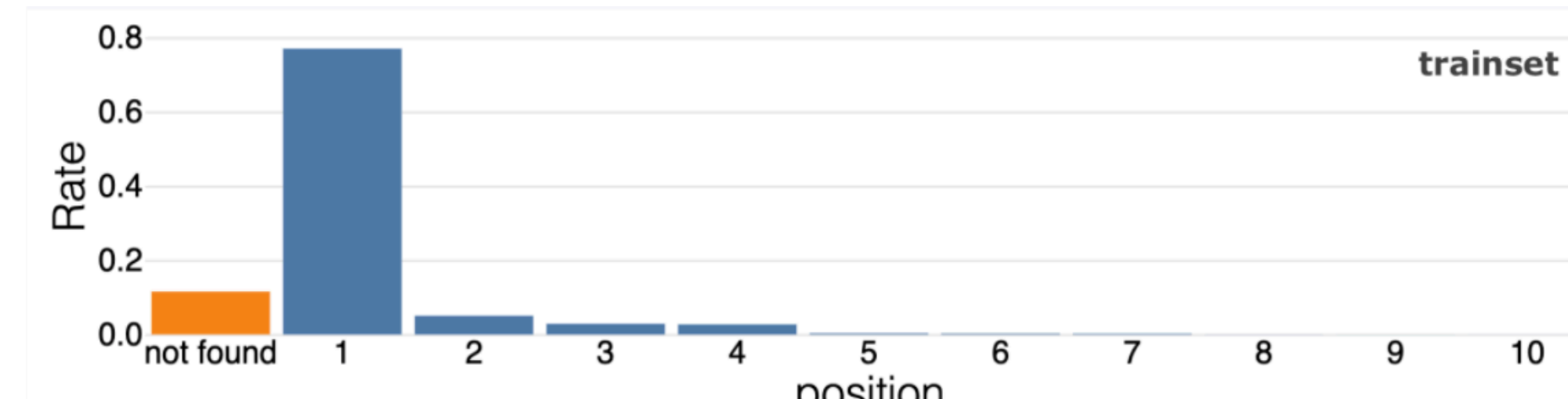
Strategy 1. Using raw Wikipedia search

- Claim is passed to Wikimedia API without any changes
- Does not require additional logical reasoning



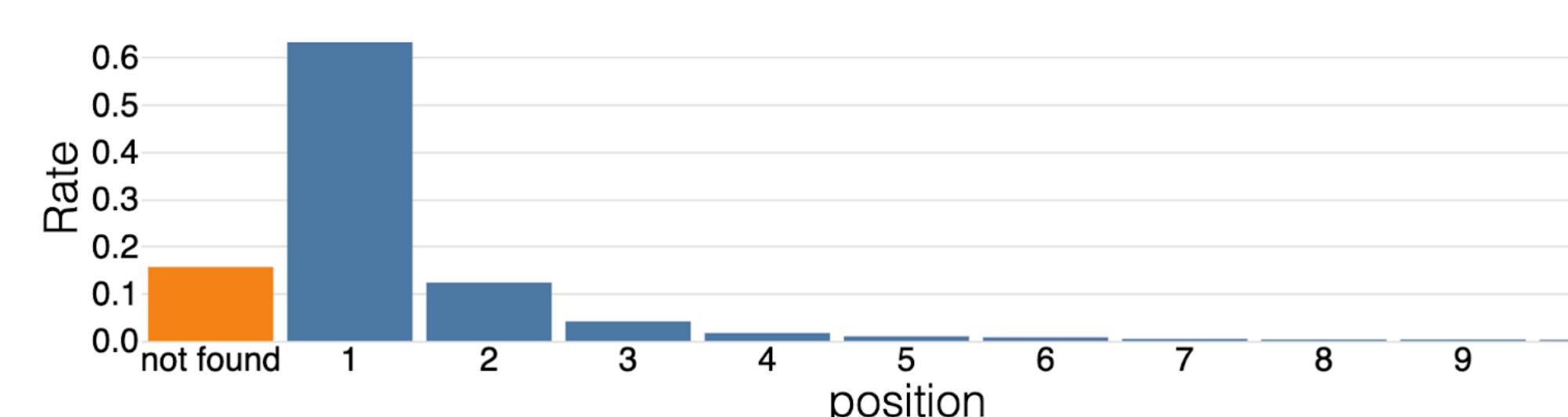
Strategy 2. Enhanced Wikipedia Search

- Parse named entities from the initial claim and pass them independently to the Wikimedia search API*



Strategy 3. Google search engine

- Google search only through the English version of Wikipedia
- Using random search agents and open proxy servers
- Using entire claim without any changes as a query
- Validated on a random 10% sample of the initial dataset

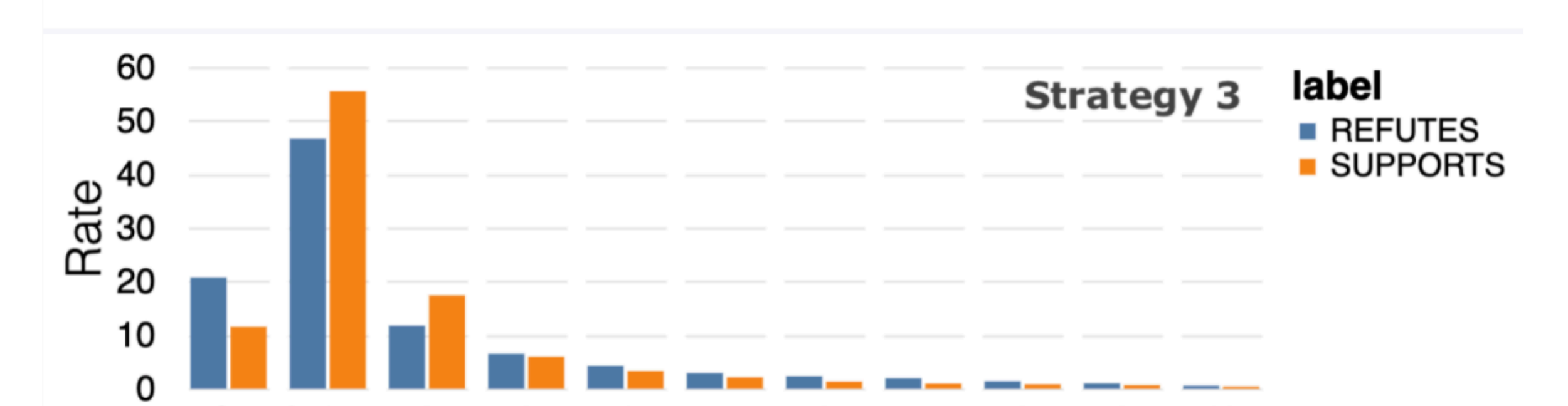
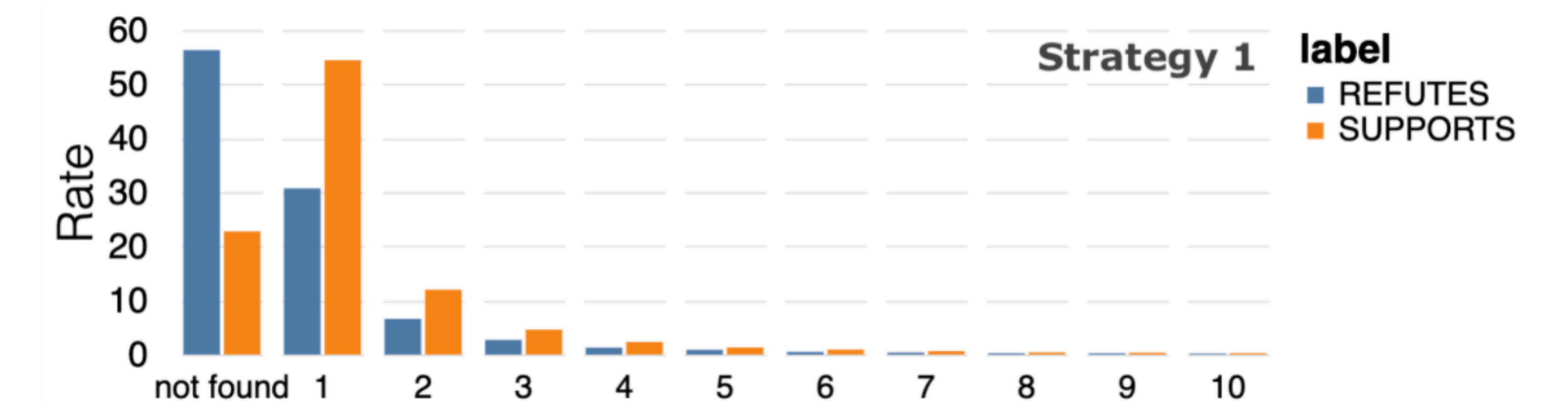


RFI & RCPI comparison

| Strategy | RFI (train/test) | RCPI (train/test) |
|--|------------------|-------------------|
| Strategy 1. Using raw Wikipedia search | 0.681 / 0.539 | 0.705 / 0.773 |
| Strategy 2. Enhanced Wikipedia Search | 0.885 / 0.827 | 0.870 / 0.847 |
| Strategy 3. Google search engine ** | 0.843 | 0.749 |

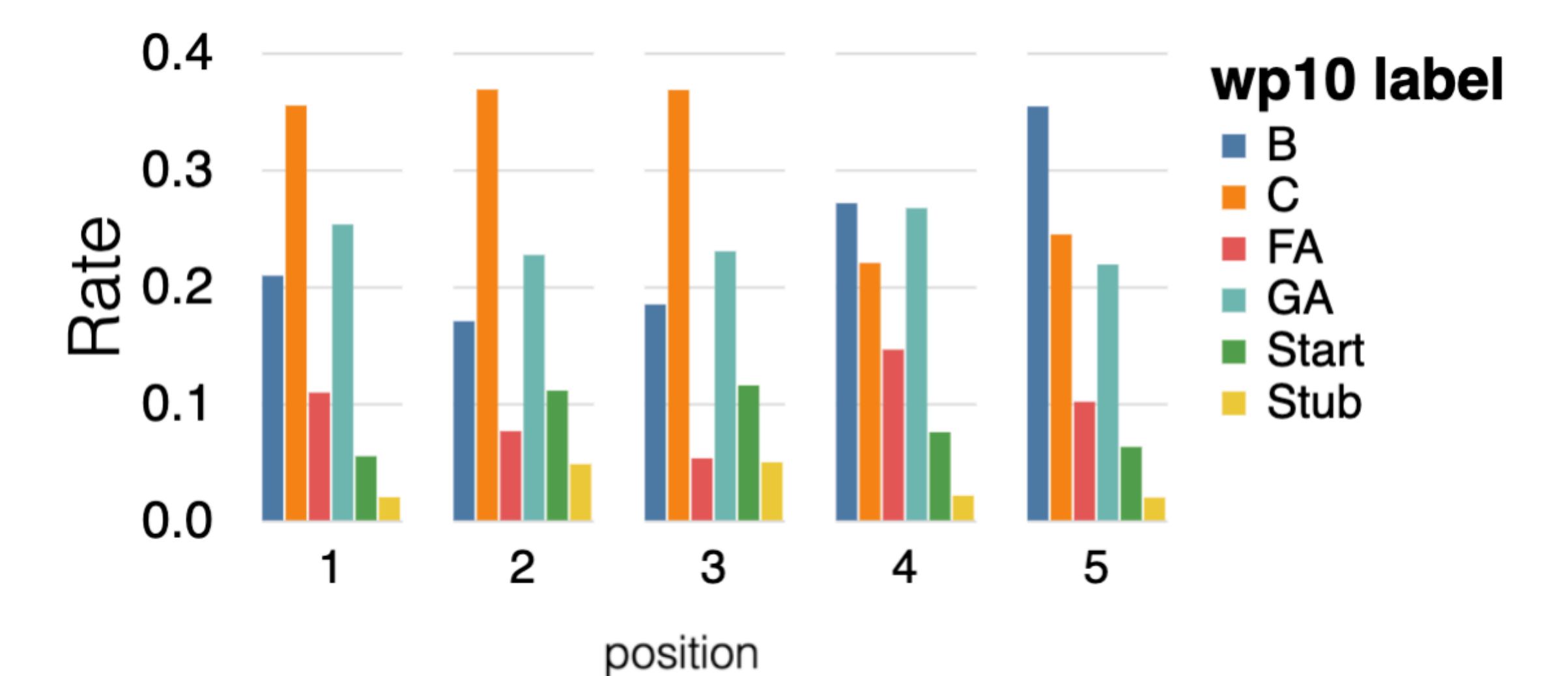
* Use the best performing strategy presented during previous research: WikiCheck: An end-to-end open source Automatic Fact-Checking API based on Wikipedia
 ** Not fully comparable to other strategies due to differences in data

Comparing performance for different labels

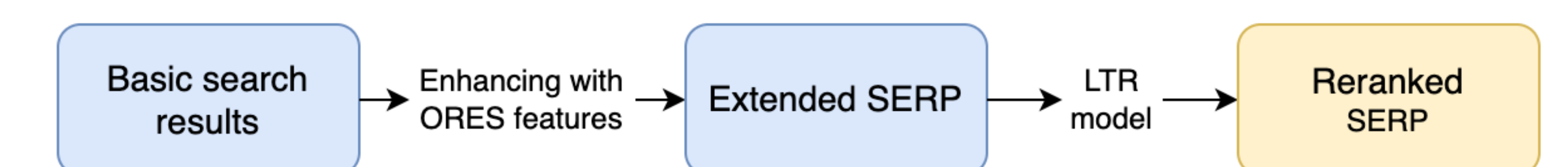


Influence of evidence quality

- Using Objective Revision Evaluation Service (ORES) to evaluate quality of Wikipedia articles with WP10 model
- Calculate the scores for specific page revision that was up-to-date for the time of Wikipedia dump used in FEVER
- Analyzed the WP10 label across SERP position distribution



Efficient facts search tool



Future work

- Enhance the experiments with more datasets and strategies
- Experiment with advanced LTR models for SERP ranking
- Investigate how humans perform in this task when following the tested strategies

Contacts:

