

What Kind Of Sociologist Is Your LLM?

Task B: LLMs Display Promising But Limited Capabilities When Explaining News Through SOCIAL Theory.

Research Process

Our Dataset

- **Source:** Selection of articles in the French Newspaper "Le Monde"
- **Original dataset:** Highly unbalanced regarding the articles' supercategories, these being skewed towards "politics and international relations" and "arts and culture".
- **Constructed dataset:** We added a supplementary dataset, eventually enabling us to construct a dataset with a more balanced distribution of supercategories (1308 rows).

Methodology: Chain-of-Thought

Instead of jumping directly to the final answer, CoT involves a sequence of logical steps that connect the initial information to the solution. We pursued this approach by adding iteration steps to our prompt that recognizes various dimensions and providing the model with input-output examples.

Extract of Prompt

The objective of this task is to deliver a theoretically grounded sociological analysis of a current event by systematically applying the theoretical framework of a single theorists. Be very specific. To ensure conceptual clarity and theoretical rigor while remaining accessible, the analysis should follow a structured chain of thought approach...



OUR PROMPT

STEP 1.

Preparation of the dataset: The original dataset was too unbalanced in terms of categories (politics, business, etc.). In order to balance it, we first annotated the newspaper by adding supercategories: categories which represent the main journalistic categories of the news article.

STEP 2.

Prompting: Meta-Data We generate relevant information about the article that the LLM uses for its chain-of-thought approach: the main protagonists of the article, the summarization of the event in 2 keywords and the epistemological discipline that best matches the mentioned event.

STEP 3.

Prompting: Analysis Based on the previous step, we then let the LLM assess 3 possibilities for the following dimensions:

- Sociologist,
- Concept,
- Connection

In the final internal iteration the LLM selects the sociologist that best matches the event, plus the reasoning, the aspect of the text that influenced its decision, the name of the concept, the concept in keywords and the contribution of the concept to sociology

STEP 4.

Data cleaning : Having added the LLMs' suggestions into one additional column in the dataset, we split the contents into several distinct columns. Due to different column structures, a thorough manual cleaning step was necessary.

STEP 5.

Final results

Our prompt produced various dimensions which built the basis of our analysis:

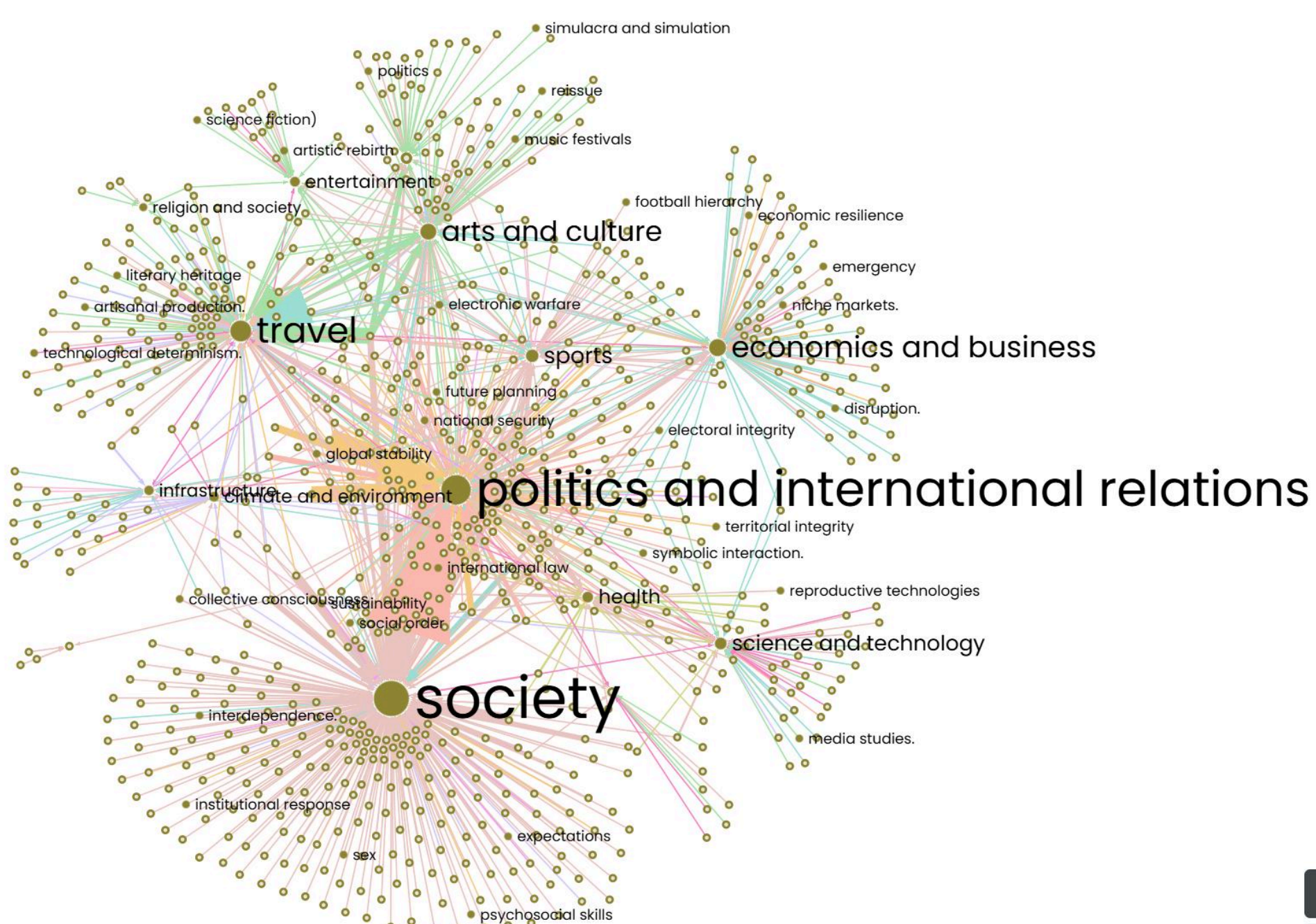
Analysis 1: Comparison of main authors and concepts.

Analysis 2: Co-Occurrence Network by categories

Analysis 3: Co-Citation Network by authors

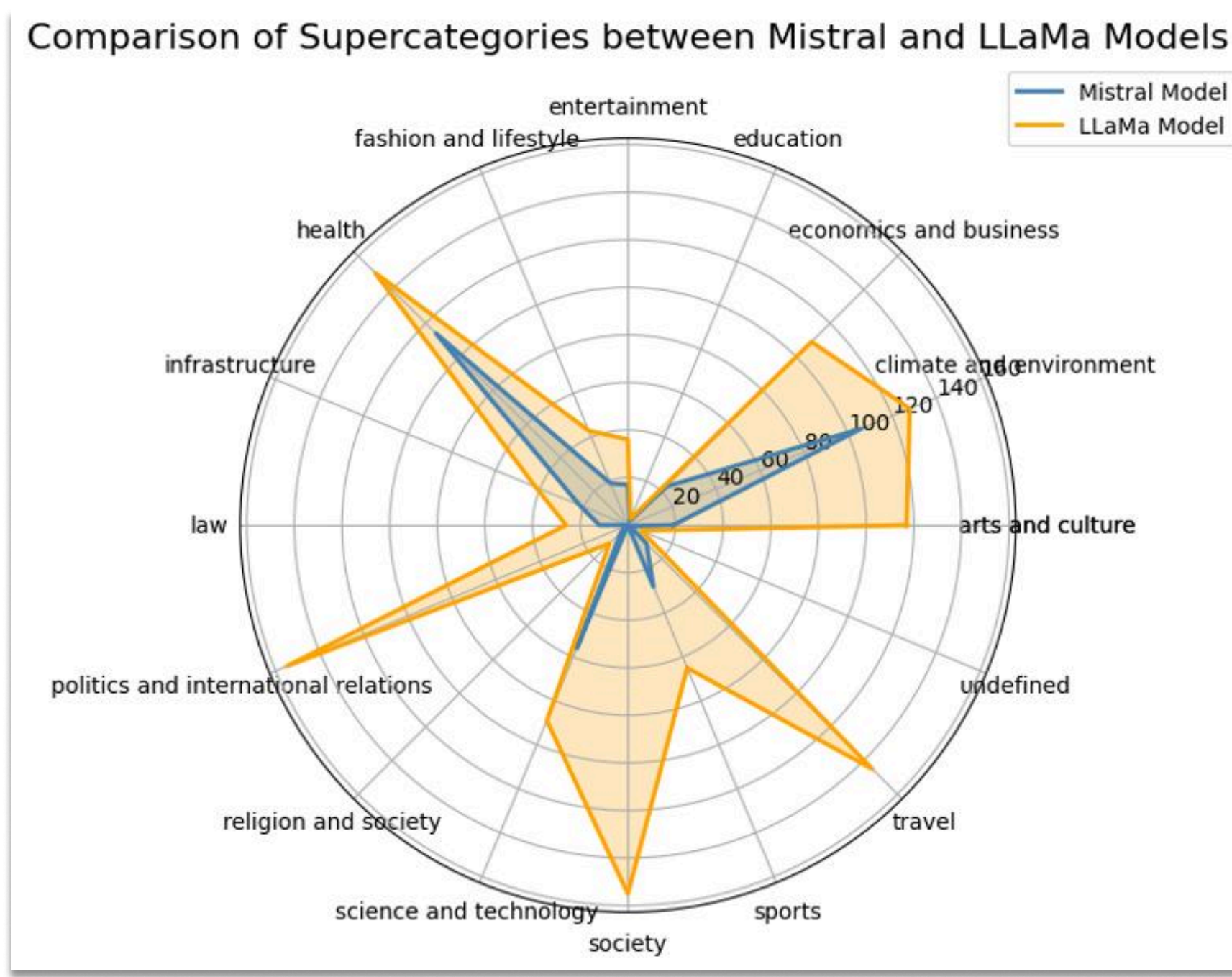
Analysis 4 : Comparison of super categories

CONSISTENCIES WITHIN MODEL

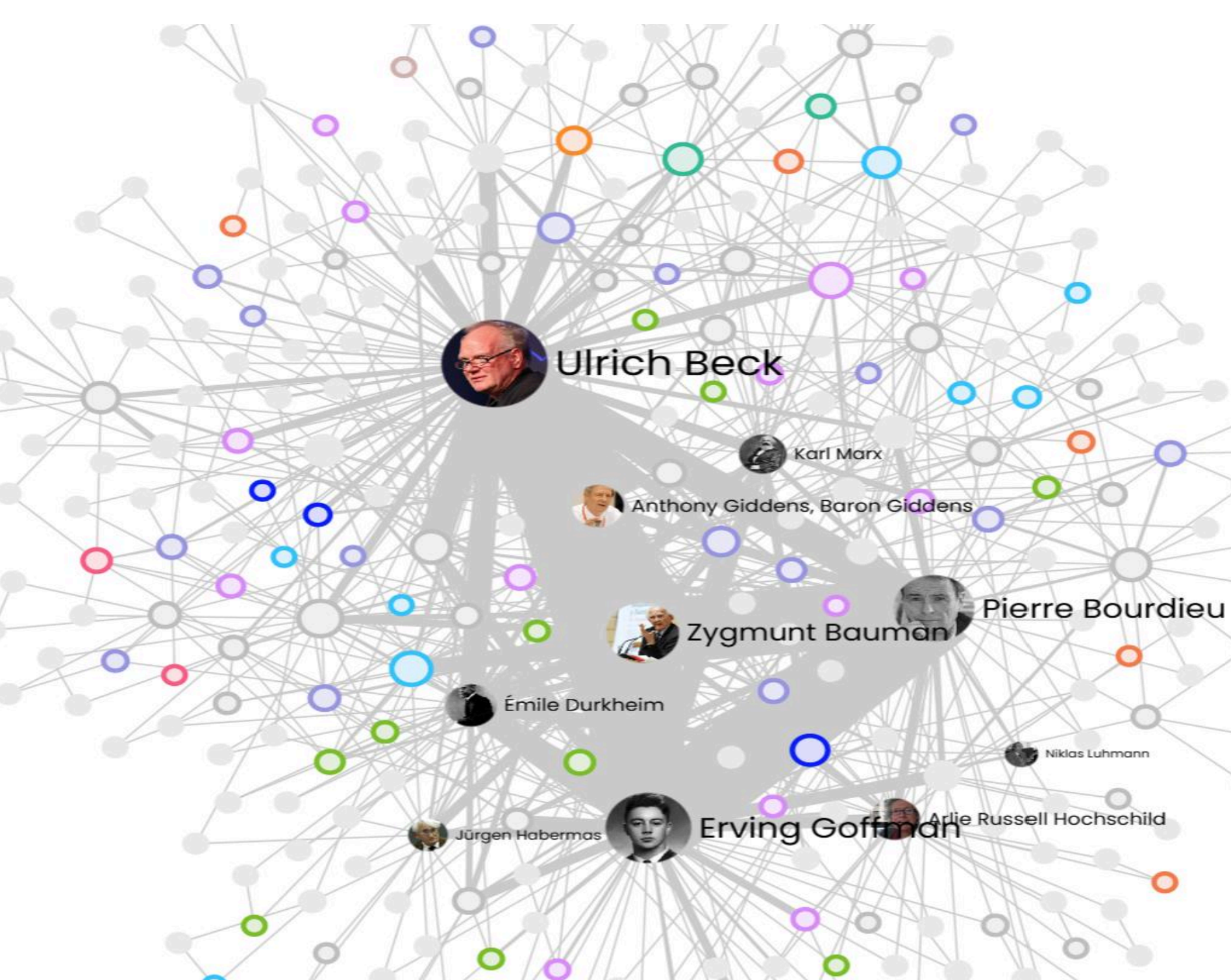


Consistency between domain of knowledge and keyword selection on Llama: the density chart shows that Llama labels keywords in the appropriate theoretical domains consistently.

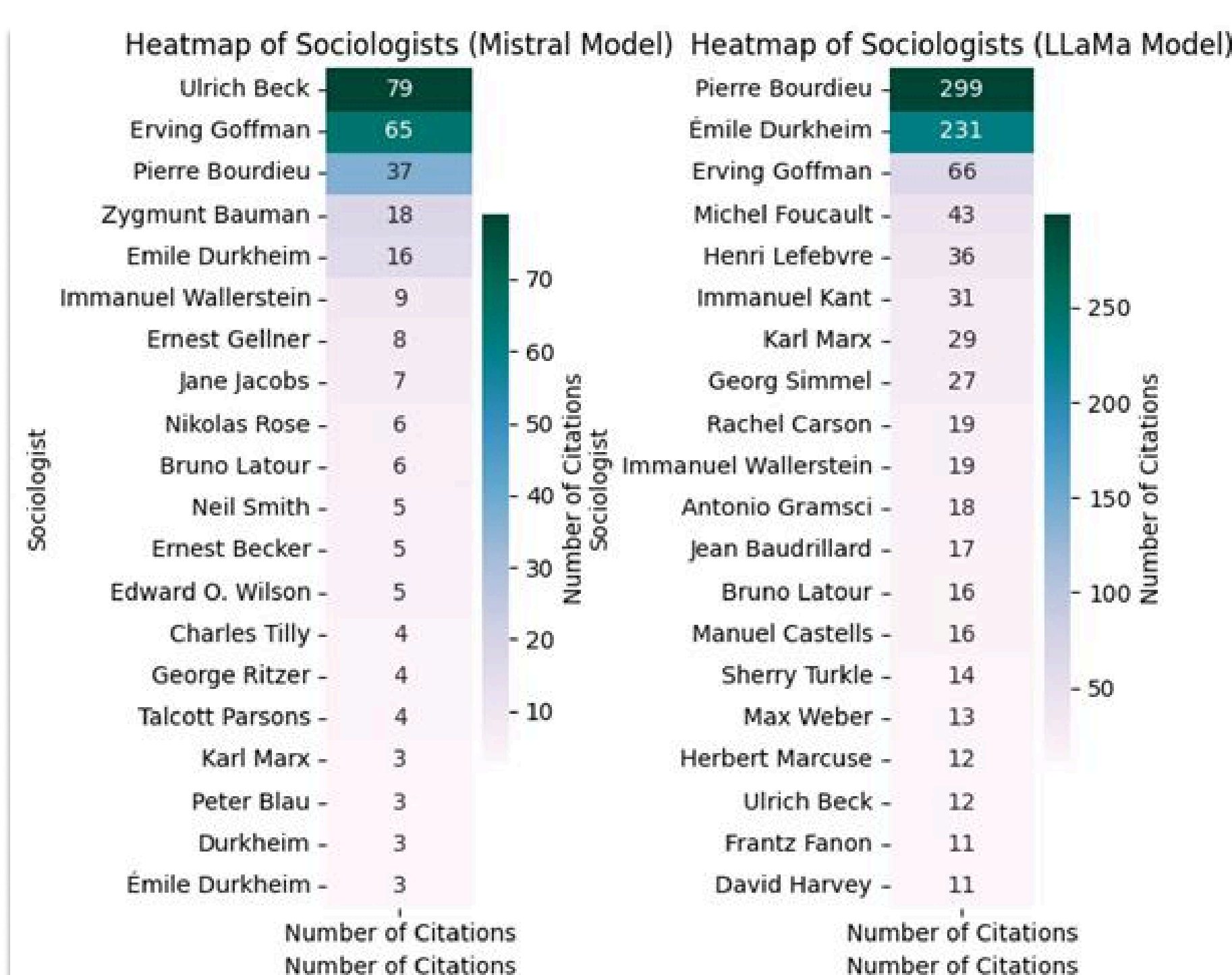
INCONSISTENCIES ACROSS MODELS



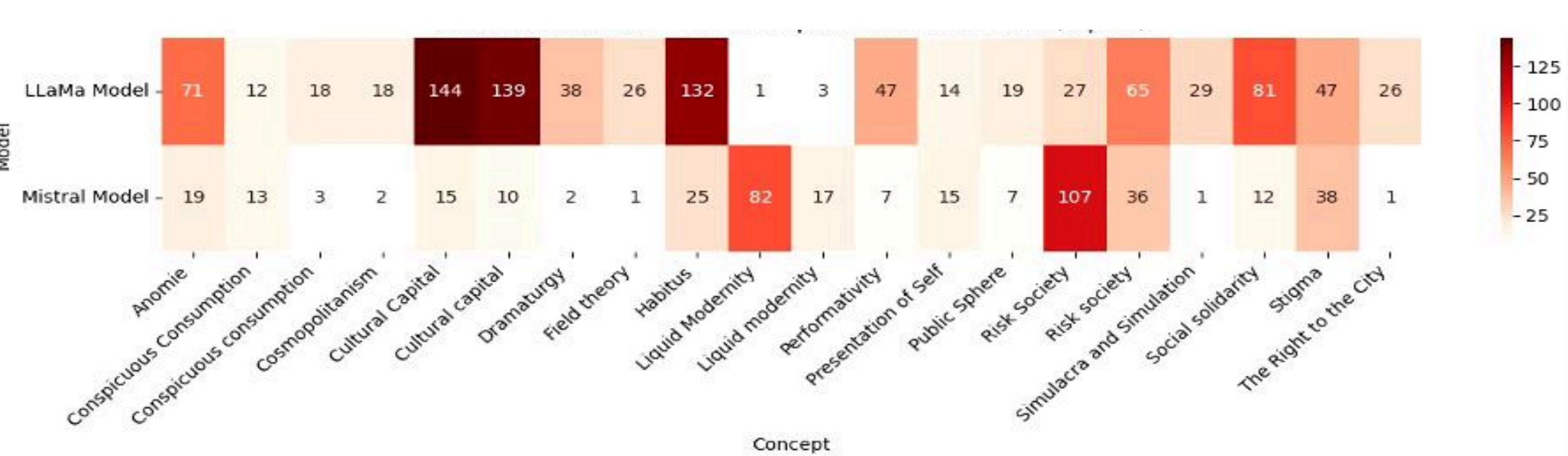
Inconsistency in Article Categorization Between Models: From the start, noticeable discrepancies in how news articles are sorted into contextual categories, underscoring a mismatch between them.



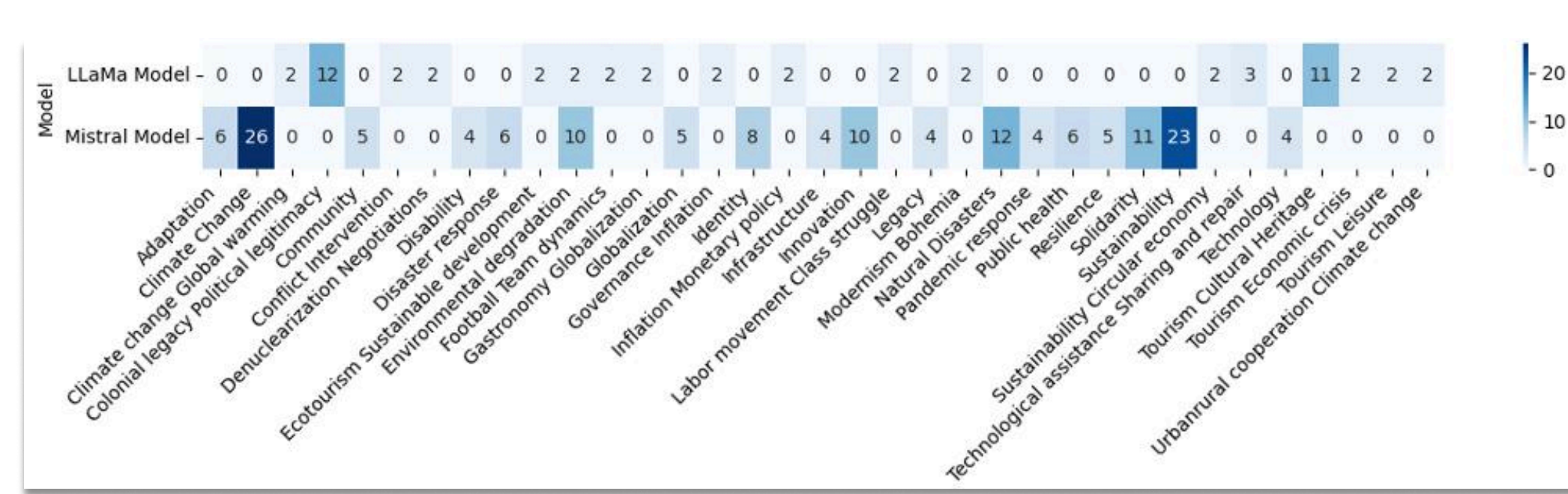
Consistency between domain of knowledge and keyword selection on Llama: the density chart shows that Llama labels keywords in the appropriate theoretical domains consistently.



Inconsistency: The models show little overlap in choosing key authors and theories to explain news phenomena, underscoring a mismatch between them.



The heat map, based on association scores with different sociological concepts, shows: LLaMa shows a strong association with "Cultural Capital", "Habitus" and "Risk Society". Both models have weak associations with concepts such as "Stigmatization" and "Right to the City".



Inconsistency in Keywords Selection Between Models: Keywords help us understand a model's choice of concepts and theories. The choice of markedly different keywords by models, mirroring differences in contextual categorization, reflects how they interpret concepts and theories.

MAIN TAKE-AWAYS

- **General assessment:** Overall, using large language models (LLMs) to interpret news with theory is interesting but comes with many limitations.
- **Consistency within models:** Individual models are consistent in linking keyword selections with seemingly coherent concepts and social theorists.
- **Inconsistency across models:** The models do not consistently select the same categories and keywords for labelling news articles.
- **Future research:** Future studies should focus on refining prompts 1) to achieve more consistency between models keyword identification and downstream theoretical explanations, and 2) address data processing challenges, possibly through multi-step approaches 3) explore biases in the selection of theories and authors.

LIMITATIONS

- **Prompt:** CoT showed promising capabilities in identifying various dimensions in one prompt; however, our prompt was long and technical - so it didn't work on two proposed LLMs - Qwen & Gemma, limiting our analysis to two models, Mistral and LLaMa.
- **Technical issues & time constraints:** Rigorously assessing capability of LLMs would require manual validation of suggested sociologists and concepts, beyond our resources and time frame.
- **Structure of output:** Despite inclusion of delimiters in the prompt to give us structured outputs, the final output varied between articles, which led to a tedious data cleaning step.

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