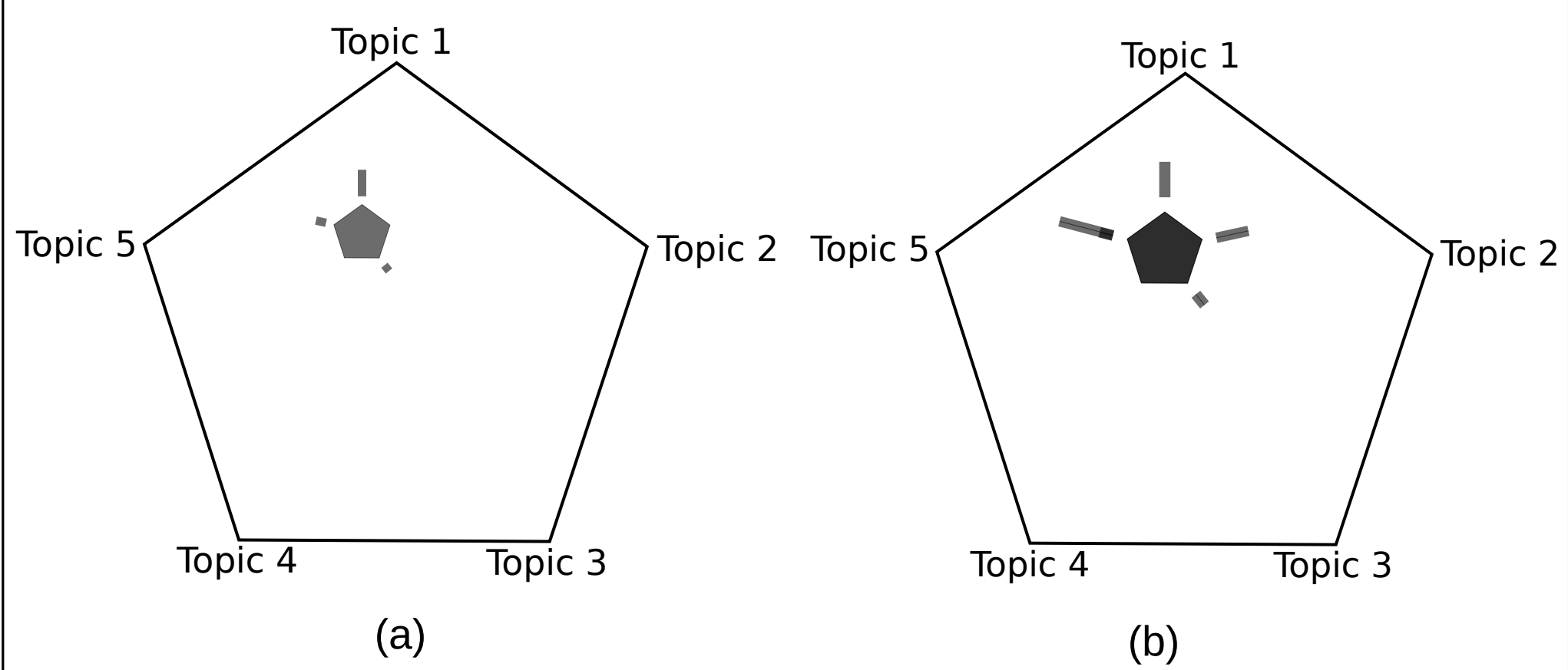


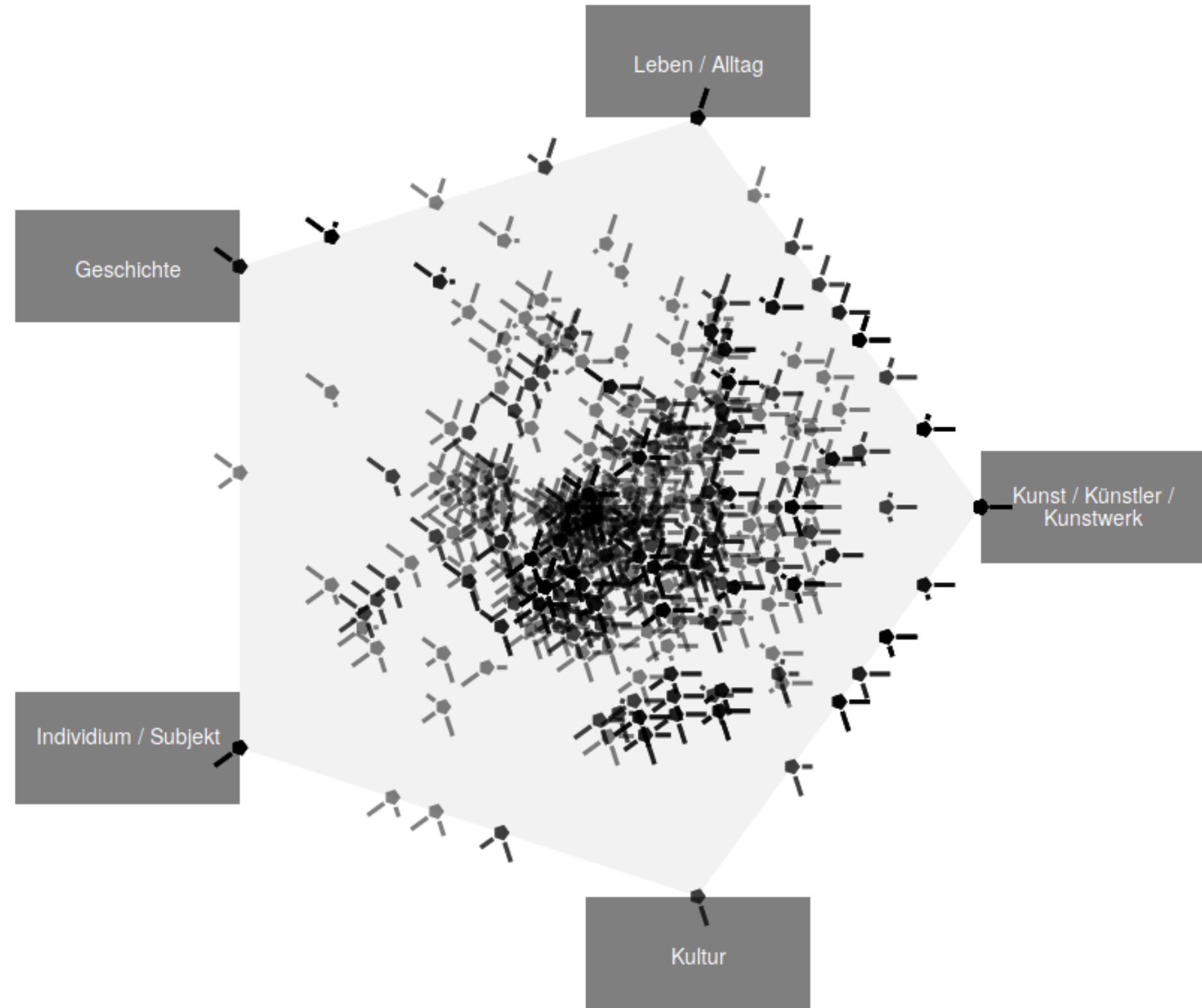
Improving Barycentric Embeddings of Topic Spaces

Dora Kiesel, Patrick Riehm, Fan Fan, Yamen Ajjour, Henning Wachsmuth, Benno Stein, Bernd Froehlich

Background

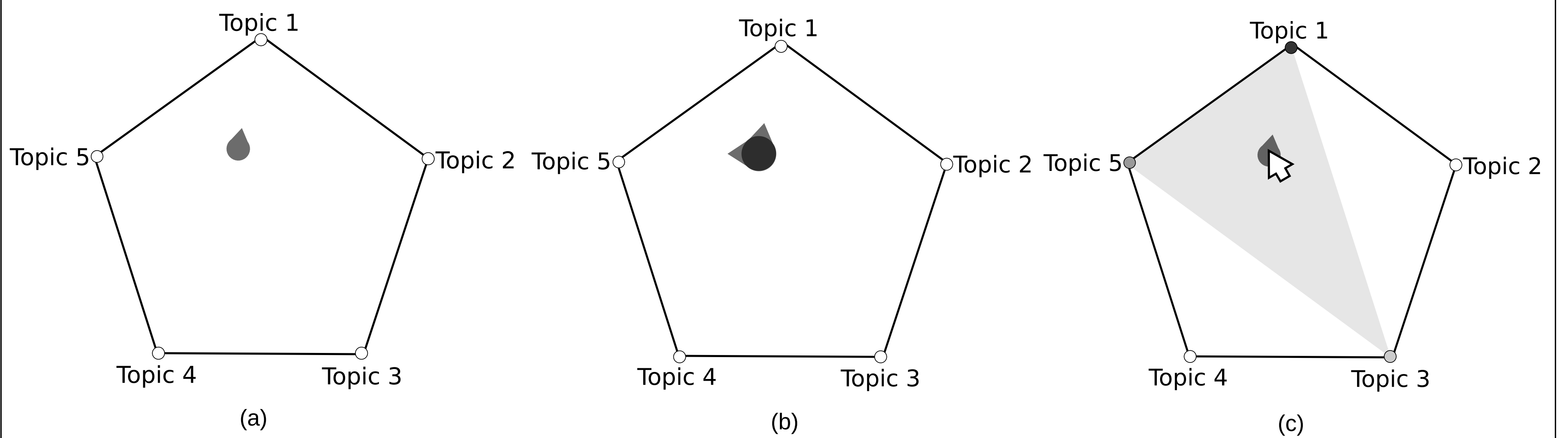


Glyphs design: (a) Using spikes as topic hints as in [1] for a single document. (b) Overplotting of spikes of two documents.



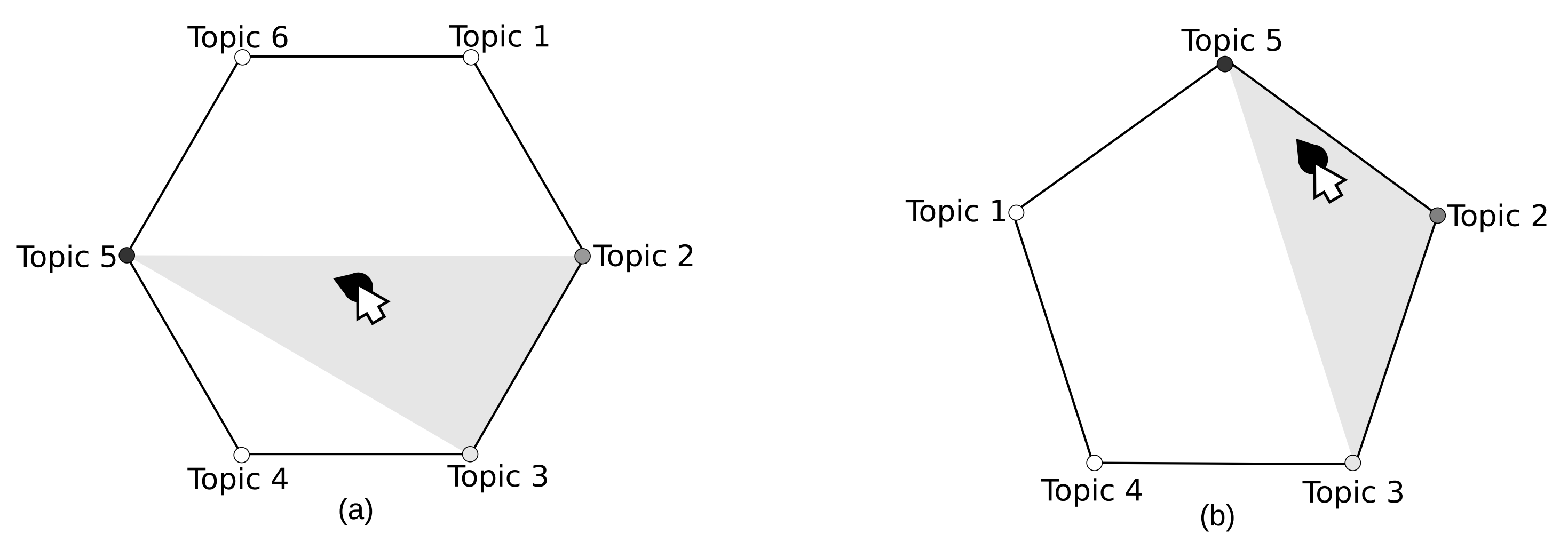
The regular barycentric embedding as in [1]: The glyphs show one spike for each related topic which causes a lot of visual clutter and overplotting in the center of the visualization.

Reducing Position Ambiguity: Reduced Glyph Design



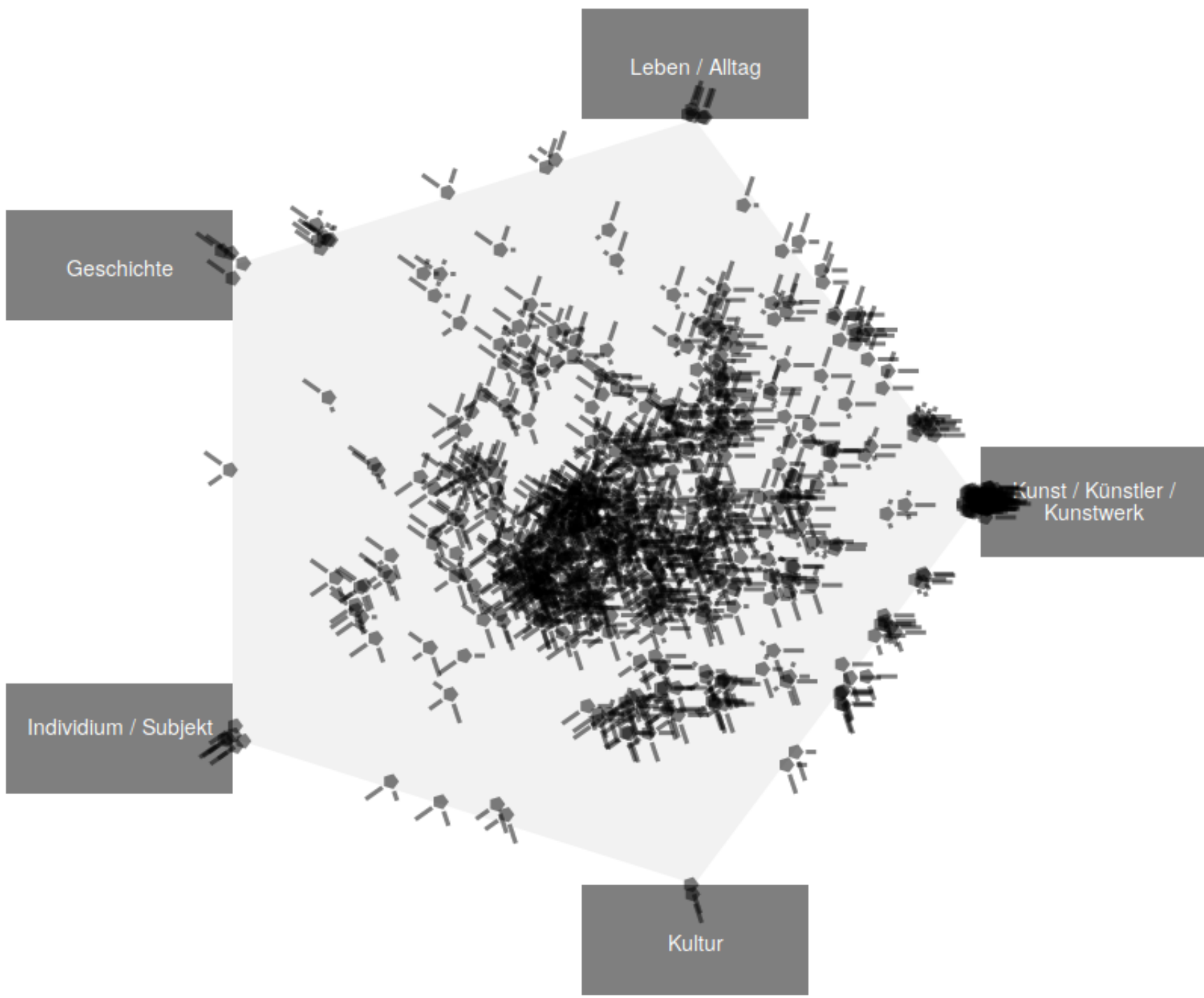
The reduced glyph design encodes only the most prominent topic: (a) Single document. (b) Aggregation of two documents. (c) Hovering reveals a polygon connecting all relevant topics.

Reducing Position Ambiguity: Layout Guidelines



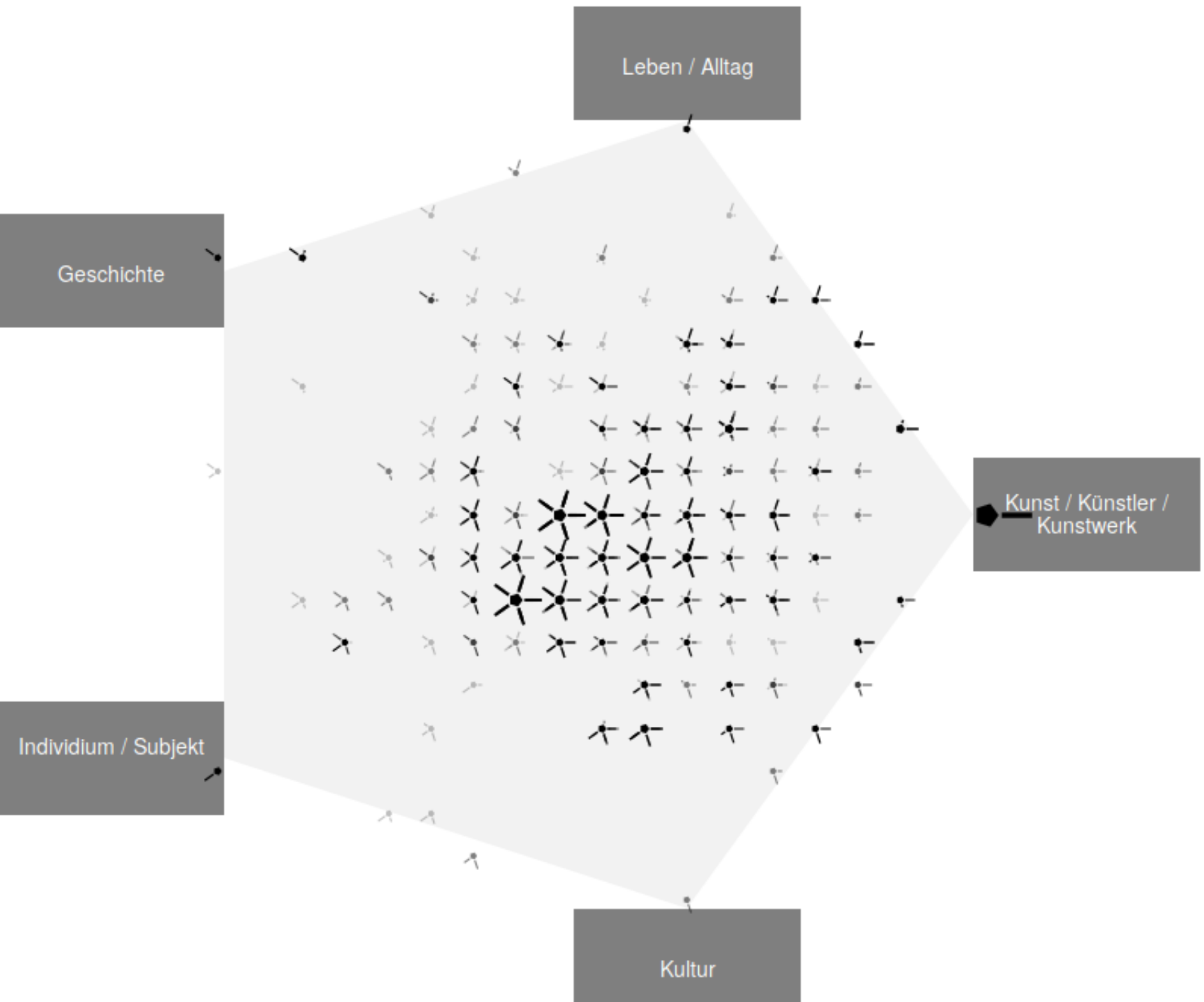
Two topic space layouts showing the same document: (a) Non-Optimized: the two most prominent topics are placed directly opposing each other. Therefore, the document is placed almost in the center. (b) Optimized: Using odd numbers of topics avoids a layout of directly opposed placement of topics. Additionally, placing related topics adjacent to each other pulls the document off the center of the visualization.

Reducing Overplotting: Jittering



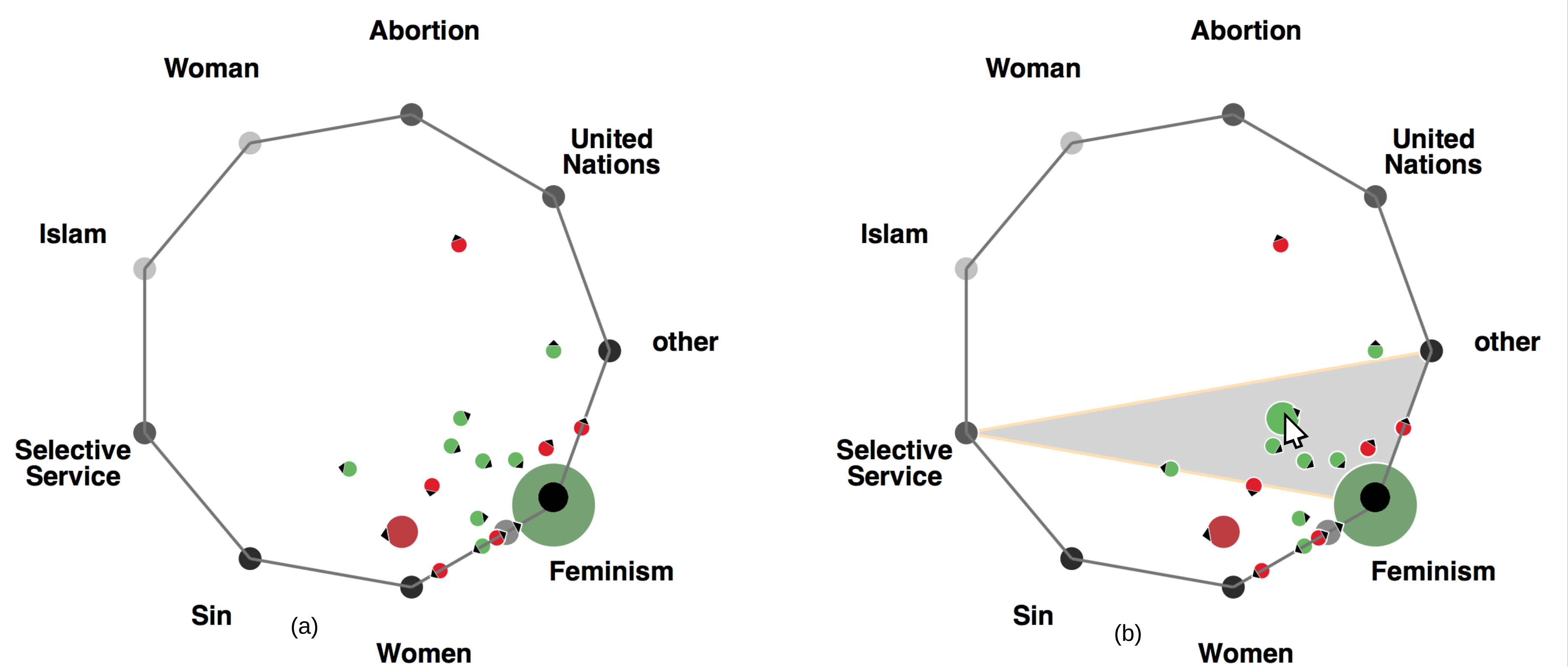
Introducing jitter provides an impression of the actual number of documents.

Reducing Visual Clutter: Grid



Using a grid and aggregating glyphs leads to a tidier display without overlaps.

Use Case : Argument Search Interface



Interactive visualization of an argument search engine [2] (<https://args.me>): (a) Visualisation of the results of the query "feminism", showing the eight most prominent topics of the results plus the "other" topic - a summarization of all other. The color displays the stance as pro ●, contra ●, and neither ●. The glyphs' sizes indicate the number of arguments being represented. (b) Hovering over an argument displays a magnified version of the glyph as well as a polygon for emphasizing all topics that influenced its position.

References:

- [1] P. Riehm, D. Kiesel, M. Kohlhaas, and B. Froehlich. Visualizing a thinker's life. IEEE Transactions on Visualization and Computer Graphics, 2018. doi: 10.1109/TVCG.2018.2824822
- [2] H. Wachsmuth, M. Potthast, K. Al-Khatib, Y. Ajjour, J. Puschmann, J. Qu, J. Dorsch, V. Morari, J. Bevendorff, and B. Stein. Building an Argument Search Engine for the Web. In Proceedings of the Fourth Workshop on Argument Mining (ArgMining 17), 2017. doi: 10.18653/v1/W17-5106

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