

Challenges of Motherhood - Young MUM's urgent questions

Project Report

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ABSTRACT

The birth of a child changes everyday life completely and many unanswered questions in dealing with a newborn might appear. The organization "Österreichischer Kinderschutzpreis - Verein zur Förderung von Kinderschutz und Kindergesundheit in Österreich" wants to find out which questions are in fact really important to a majority of young mothers to be able to provide them professional help.

Therefore, the aim is to find out what the challenges of motherhood are and which questions concern young mothers. Based on Facebook data that is extracted with the help of the platform CrowdTangle, two topic modeling techniques are used: Latent Dirichlet Allocation (LDA) and BERTopic.

While LDA could not extract meaningful topics, the more advanced method BERTopic found clear, interpretable and appropriate topics. When using a reduced, clean dataset of around 6000 Facebook posts BERTopic could extract almost 50 different topics. Based on these results the organization "Österreichischer Kinderschutzpreis" will produce a brochure with answers to the questions of the different topics from experts.

KEYWORDS

Challenges of Motherhood, CrowdTangle, Topic Modeling, Latent Dirichlet Allocation (LDA), BERTopic

MOTIVATION AND PROBLEM STATEMENT

The birth of a child is one of the most significant transitions in a mother's life and it changes everyday life completely. Young mothers have to deal with a lot of new situations and also difficult circumstances must be overcome. They have to face great challenges and many unanswered questions in dealing with their newborn might appear.¹

To be able to professionally support young, inexperienced mums the organization "Österreichischer Kinderschutzpreis - Verein zur Förderung von Kinderschutz und Kindergesundheit in Österreich", an association for the improvement of child protection and child welfare in Austria, wants to find out which questions are in fact really important to the majority of young mothers in the German-speaking area. As a result, the organization wants to provide answers to these questions from experts and offer this useful, professional information in the form of a brochure.

Therefore, on request of the organization "Österreichischer Kinderschutzpreis" and in collaboration with the Institute for Interactive Systems and Data Science from the Graz University of Technology and the Complexity Science Hub Vienna, with Dr. Jana Lasser supervising this project, the following research questions are addressed: What are the challenges of motherhood? Which questions concern young mothers?

¹ Ahlborg, T., & Strandmark, M. (2001). The baby was the focus of attention – first-time parents' experiences of their intimate relationship. *Scandinavian Journal of Caring Sciences*, 15(4), 318-325.

Since Facebook provides a platform where an enormous number of people share information and seek help in today's time, Facebook posts are used as a data basis to find out which questions concern young mothers and to distinguish which of these issues affect the majority of them and are of interest for most mothers.

METHODOLOGY AND PROCESS

The process started with gaining an understanding of the domain by having several meetings with Dr. Martina Fasslabend, initiator and president of the association "Österreichischer Kinderschutzpreis", and Dr. Jana Lasser, supervisor of the project, to develop a precise and accurate description of the problem and the project.

An important part of the work was to explore the platform CrowdTangle and use it to collect the necessary data. CrowdTangle is a public insights tool from Facebook's parent company Meta Platforms Inc that makes it easy to follow, analyze, and report on what's happening with public content on social media. It enables users to easily extract public content from Facebook, Instagram and Reddit. For this project only Facebook data was used, whereby text data was extracted by searching for keywords related to motherhood. Extracting posts directly from specific forums where young mothers are active was not possible, as CrowdTangle does not support data extraction from private Facebook groups.²

The keyword list used to download data via CrowdTangle was generated in brainstorming sessions with the help of domain experts. The first brainstorming session was conducted with Univ. Prof. Dr. Kurt Widhalm, nutritionist and pediatrician, and Dr. Martina Fasslabend, president of the organization "Österreichischer Kinderschutzpreis". The second brainstorming session was conducted with the help of Ingrid Fritz, BSc, who is working as a health and nursing teacher and as a nurse in an obstetrics ward. In total a list of almost 200 German keywords related to babies and parenthood could be generated.

In addition, the following search criteria have been defined in CrowdTangle: The language was set to German. All possible account types were considered and 2019-2021 was chosen as the time frame. Since one can only search for a certain number of keywords at once in CrowdTangle, the keywords had to be split into two parts. Furthermore, only 300.000 posts could be extracted at once, so the data had to be downloaded for each year separately. A more detailed description of CrowdTangle and the keyword list can be found in the corresponding GitHub repository.³

DATA PREPARATION

Data cleaning and preprocessing is an essential and crucial part, especially when working with unstructured social media text data.

Beside metadata, such as the creation date of a post, from which page/account it was posted or how many interactions (likes, comments, etc.) it earned, CrowdTangle always extracts the text message of a post. This message contains the main part of a post and questions if there are any and is therefore used for topic modeling.

Several manual data cleaning steps were necessary to clean the data before the topic modeling could be conducted:

- Since the keywords had to be split into two parts, there were duplicated rows included in the dataset that have to be removed.

² Miles, C. About Us: Learn more about CrowdTangle. <https://help.crowdtangle.com/en/articles/4201940-about-us> (downloaded on 21.08.2022)

³ https://github.com/MagdalenaFritz/Challenges_of_Motherhood-Young_MUMs_urgent_Questions

- Only posts that actually contain questions have been retained, which were identified by searching for posts that contain a question mark.
- All posts with page category “ZOO” have been removed.
- The most active pages with more than 100 posts in the data set were manually screened and all posts from commercial and otherwise inappropriate pages were removed. A list of these pages can be found in the appendix.
- All posts that contained at least one of the following specific words have been removed:

○ Gewinnspiel	○ #handmade
○ GEWINNSPIEL	○ #Handmade
○ GEWINNSPIEL	○ GEWINNEN
○ WERBUNG	○ RABATT
○ ADOPTED	○ Rabatte
○ verlosen	○ Rabatt
○ Verlosung	
- All duplicates from the column “Message” of the dataset have been removed. The post with the earliest creation date was retained.
- Since the dataset included posts that were almost the same and differed by only a few letters, all posts were ordered regarding their length and then the Jaccard similarity was used to calculate the similarity of the posts to their previous posts. All posts with a similarity > 0.95 have been removed.
- Since URLs don't have a meaning and are therefore not helpful for topic modeling, they have been removed from all the posts.
- Even though in CrowdTangle the language German was chosen during data extraction, there were some English posts included in the dataset that have been removed with the help of the pretrained model `lid.176.bin` from the `fasttext` library to identify non-German posts.
- To prepare the text data for topic modeling, the following processing steps were applied to the post texts:
 - tokenization
 - case folding
 - removing stopwords
 - removing all forms of punctuation
 - removing all numbers
 - removing all dashes
 - removing all quotes
 - stemming
- NaN values have been removed from the processed data.
- All Regex expressions and empty tokens have been removed from the posts.
- As a last step it has been checked again if at least one of the defined keywords is included in the preprocessed tokens that have been created. If no keyword was included, the post has been removed.

TOPIC MODELING

To extract the main topics out of the collection of the preprocessed posts two different topic modeling techniques have been used, which cluster the text into distinct topics that can then be interpreted based on the most frequent and important words they contain. The aim of this interpretation is to find a short

description of the members of a topic that is understandable by humans. The topic modeling techniques that have been used are Latent Dirichlet Allocation (LDA) and BERTopic.

Latent Dirichlet Allocation (LDA): Latent Dirichlet Allocation is a generative probabilistic model which can be used to classify text in a document to a particular topic. In particular, it is a three-level hierarchical Bayesian model, where each document is modeled as a finite mixture over an underlying set of topics, more specifically as a multinomial distribution of topics. On the other hand, each topic is modeled as an infinite mixture over an underlying set of word probabilities, or rather as a multinomial distribution of words. LDA therefore builds a topic per document model and a words per topic model, modeled as Dirichlet distributions. An explicit representation of a document is provided by the topic probabilities. Efficient approximate inference techniques based on variational methods and an Expectation Maximization (EM) algorithm can be used for empirical Bayes parameter estimation.⁴ Choosing the right corpus is crucial for LDA, since it assumes that all the chunks of text that are fed into it contain words that are related.⁵

The Python library `gensim` with version 4.1.2 has been used whereby the modul `models.LdaMulticore` estimated the LDA model parameters based on the dictionary and the term-document frequencies that have been created with the modul `corpora.dictionary` at first.⁶ Moreover, the number of topics was chosen as 23 and random seed as 123.

BERTopic: BERTopic is a topic modeling technique based on text embeddings generated by a pre-trained large language model, allowing for easily interpretable topics while keeping important words in the topic descriptions. Pre-trained models are especially helpful as they are supposed to retain more of the context of words within sentences.

BERTopic uses four key components:

- a transformer embedding model
- UMAP dimensionality reduction
- HDBSCAN clustering
- cluster tagging using c-TF-IDF

A transformer embedding model is needed for encoding text to dense vector embeddings. It's important to choose a suitable embedding model as a starting point. After building the embeddings, BERTopic compresses them into lower-dimensional space using the dimensionality reduction technique Uniform Manifold Approximation and Projection (UMAP), which is a combination of PCA and t-SNE. Dimensionality reduction is done since it is unlikely that so many dimensions are really needed to represent the text and that the following clustering step can be done more efficiently.⁷

Next, Hierarchical Density-based Spatial Clustering of Applications with Noise (HDBSCAN) is used to cluster the low-dimensional vectors. HDBSCAN is a hierarchical, density-based method, which brings benefits for easier tuning and visualization of hierarchical data, handling irregular cluster shapes and identifying outliers. Based on the size and the persistence of the clusters over varying lambda values, which measure the stability

⁴ Blei, D. M., Ng, A. Y., & Jordan, M. I. (2003). Latent dirichlet allocation. *Journal of machine Learning research*, 3(Jan), 993-1022.

⁵ Dwivedi, P. (Aug 22, 2018). NLP: Extracting the main topics from your dataset using LDA in minutes. <https://towardsdatascience.com/nlp-extracting-the-main-topics-from-your-dataset-using-lda-in-minutes-21486f5aa925> (downloaded on 21.08.2022)

⁶ NLP APIs. API - gensim. https://tedboy.github.io/nlps/api_gensim.html (downloaded on 28.08.2022)

⁷ UMAP: Uniform Manifold Approximation and Projection for Dimension Reduction. <https://umap-learn.readthedocs.io/en/latest/> (downloaded on 28.08.2022)

of the clusters and are calculated based on the distance between the clusters, the method chooses the final clusters.⁸

As a last step BERTopic uses a modified version of TF-IDF (term frequency–inverse document frequency) called c-TF-IDF to extract the topics for each of the clusters. c-TF-ID identifies the most relevant terms given all of the documents within a cluster.⁹

In practice, the Python library bertopic with version 0.10.0 was used. As a default, BERTopic uses an English model but it supports any language for which an embedding model exists. The default embedding model is “all-MiniLM-L6-v2” when selecting language=“english” and “paraphrase-multilingual-MiniLM-L12-v2” when using multilingual documents or any other language than English, which has shown great performance in other works.¹⁰

For dimensionality reduction the Python library umap-learn with version 0.5.3 was used. The min_dist parameter controls how tightly UMAP is allowed to pack points together, which was assumed to be 0.0 and as a metric the cosine distance was taken. UMAP also provides a n_components parameter option that allows the user to determine the dimensionality of the reduced dimension space the data will be embedded into, which has been determined to be 5. Without specifying these parameters, BERTopic would have chosen the same values for them.¹¹ For clustering the Python library hdbscan with version 0.8.28 was taken.

EVALUATION RESULTS

After data cleaning and data preparation the dataset consisted of 115434 posts in total. The number of posts increased with the years from 33981 posts in 2019 to 43115 posts in 2021 (see figure 2).

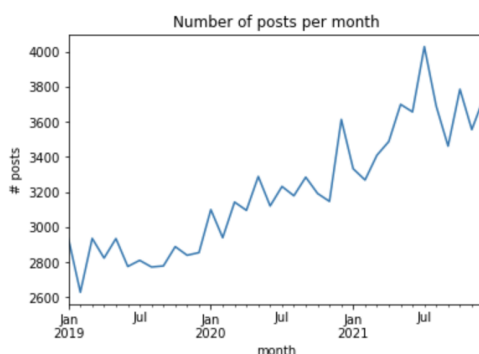


Figure 1: Number of posts per month

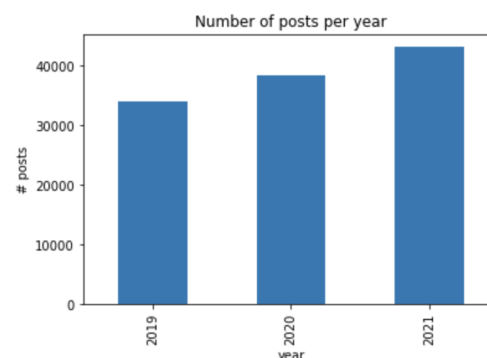


Figure 2: Number of posts per year

Most of the posts, in total 3.47% of them, came from the pages “Eltern.de”, “Mama & Papa = ICH”, “Mein Kind ist mein Leben” and “Echte Mamas”. The page categories that most often occurred are “none”, “BABY_KIDS” and “COMMUNITY”, accounting for 41.74% of all posts.

The average post length is rather long with 969.34 characters.

Since the first try of topic modeling with LDA with the whole dataset didn’t show clear results, a subset of the data has been created with only posts from pages that have a high likelihood of containing questions of young mothers, based on manual inspection of posts from these pages.

⁸ How HDBSCAN works. https://hdbscan.readthedocs.io/en/latest/how_hdbscan_works.html (downloaded on 21.08.2022)

⁹ Briggs, J. Advanced Topic Modeling with BERTopic. <https://www.pinecone.io/learn/bertopic/> (downloaded on 21.08.2022)

¹⁰ BERTopic. <https://maartengr.github.io/BERTopic/api/bertopic.html> (downloaded on 28.08.2022)

¹¹ Additional parameter specification: angular_rp_forest=True, low_memory=False

The relevant pages are:

- Eltern.de
- Echte Mamas
- Mama & Papa = ICH
- Mein Kind ist mein Leben
- Mami mit Herz und Seele
- Von Mama zu Mama
- Von Eltern für Elter
- BabyCenter Deutschland
- MOTHERBOOK

This clean, reduced subset of the data consists of 6011 posts.

RESULTS LDA: LDA was run on the reduced dataset and on the whole dataset. The number of topics was seen as the most important and decisive tuning parameter. Beside this parameter also the random seed was varied and the influence on the results was observed. Unfortunately, despite extensive hyperparameter tuning no meaningful topics could be created with LDA. No matter how the parameters were chosen, multiple different subjects were summarized in one topic while the same subject was split in multiple topics at the same time. Therefore, a more powerful and complex topic modeling technique was used, namely BERTopic.

RESULTS BERTopic: For running BERTopic the language was set to German and the number of topics was not specified and therefore automatic. In the UMAP model the random seed was set to 123 to make everything reproducible, while the other UMAP parameters were chosen as specified above in the chapter “Topic Modeling”. For all other parameters the default values were taken.

For the reduced dataset BERTopic found 49 topics in total, whereas 2800 posts landed in topic -1. Topic -1 refers to all outliers which do not have a topic assigned. Forcing posts in a topic could lead to poor performance. Thus, topic -1 could be ignored.

The number of posts per topic decreases with the number of the topics. While there were 1094 posts assigned to topic 0, there were only 10 posts assigned to topic 47.

For the reduced dataset the resulting topics are very clear and well interpretable. An overview of the different topics gives figure 3, where the number of posts in the specific topic and the first 4 most discriminating and important words for each topic are given.

Topic	Count	Name
-1	2800	-1_babi_mal_schon_hallo
0	1094	0_kind_babi_mama_geburt
1	482	1_schwanger_schwangerschaft_geburt_sex
2	329	2_milch_flasch_muttermilch_pre
3	267	3_schläft_schlafen_nacht_bett
4	65	4_kinderwagen_auto_empfehlen_buggi
5	61	5_schwanger_schwangerschaft_angst_wurd
6	60	6_anonym_posten_bitt_dank
7	57	7_elterngeld_elternzeit_geld_frage
8	44	8_wasser_sonnenschutz_babyschwimmen_babi
9	43	9_video_greta_women_gerwig
10	40	10_windeln_empfehlen_stoffwindeln_größe
11	37	11_schmerzen_kaiserschnitt_wehen_normal
12	35	12_toast_immer_mehr_mama
13	34	13_stillen_mütter_öffentlichkeit_warum
14	25	14_corona_impfung_kreißsaal_situat
15	23	15_flasch_essen_brei_immer
16	22	16_kg_gewicht_zugenommen_kilo
17	22	17_temperatur_fieber_erhöht_senken
18	21	18_angst_geburt_runder_gewalterfahrung
19	21	19_pill_nehmen_genommen_frage
21	20	21_vegan_ernähren_schwangerschaft_datteln
20	20	20_diabet_insulin_zuckertest_schwangerschaftsd...
23	20	23_period_blutung_spiral_blutungen
22	20	22_kaiserschnitt_sternenguck_grund_kaiserschni...
24	19	24_kinderarzt_sorg_zahnenden_heilkraft
25	18	25_antibiotika_antibiotikum_streptokokken_nehmen
26	17	26_babyclub_abgesagt_vorbei_guckt
27	17	27_ultraschal_mädchen_arzt_gestern
28	17	28_passiv_hinzusetzen_hinsetzen_warum
29	17	29_verbrühungen_milch_problem_kinderarzt
30	16	30_pupp_hund_born_babi
31	16	31_geschenk_festmahl_weihnachtsbaum_bekleckert
32	16	32_osteopathen_lieblingsseit_bischen_blockad
35	15	35_team_posten_antworten_mpi
33	15	33_toilett_pamper_trocken_hose
34	15	34_haarausfal_haar_shampoo_nehm
36	14	36_heiß_sommer_sommertag_sorglos
37	14	37_deutschland_ausland_finanziel_absicherung
38	14	38_urlaub_schwanger_fliegen_wandern
39	13	39_zigarette_aufzuhören_rauchen_raucherin
40	13	40_weinen_schreit_allererst_weint
41	13	41_hunger_worauf_gelüst_zwischendurch
42	13	42_koffein_cola_gla_schwangerschaft
43	12	43_kind_prozess_partner_wollen
44	12	44_antidepressiva_psychisch_depressionen_abges...
45	12	45_sport_sportlich_fitnessstudio_übungen
46	11	46_blog_babyleicht_social_media
47	10	47_stoffwindeln_system_empfehlen_benutzt

Figure 3: Topics extracted from the reduced dataset

Many of the topics were expected and not surprising. For the reduced dataset almost all of the found topics are meaningful and appropriate and only a few like topic 6 (“anonym, posten, bitte, danke”) do not fit. Beside general questions about pregnancy and delivery, questions about breastfeeding and breast milk and questions about sleeping seem to concern young mums the most. Looking at the posts showed that young mothers often are asking for experiences from other mothers that help them to deal with the uncertainty of the new situation.

Moreover, the topic about parental leave and parental benefits also seems to be rather important for young mothers, even though general information about this subject should be readily available.

An illustrative depiction of the words that characterize the first 12 topics can be seen in figure 4. Every topic is presented as a barchart of the most important and decisive words that describe the topic. The height of each bar corresponds to the importance of the individual word based on its c-TF-IDF score.

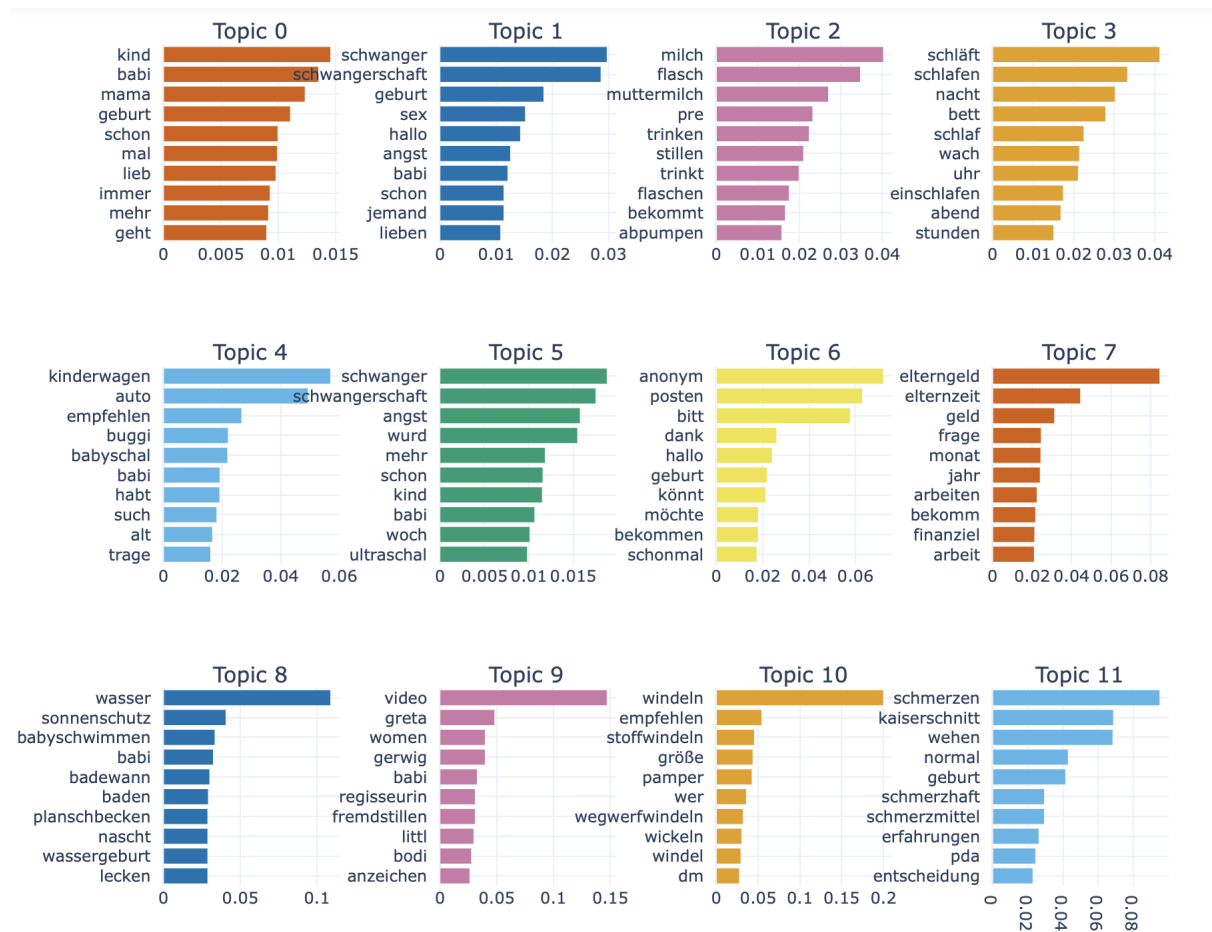


Figure 4: Descriptive words of the first 12 topics

Choosing different random seeds results only in a marginally different outcome. However, it can be observed that the more topics have been found the less topic outliers there are. So, there is a tradeoff between the number of topics and topic outliers.

By changing the default values of all the different parameters in the different components of BERTopic it was tried to improve the model. The main goal was to reduce the topic outliers and therefore the number of posts that cannot be assigned to a topic and that end up in topic -1.

BERTopic is using sentence-transformers to create embeddings for the posts passed it. The language was set to German and so the embedding "paraphrase-multilingual-MiniLM-L12-v2" was used.¹²

Dimensionality reduction is done with the Uniform Manifold Approximation and Production (UMAP) technique. The UMAP algorithm can be fine-tuned using several parameters. The simplest and most effective tuning can be achieved with just the `n_neighbors` parameter.¹³ This parameter is the size of the local neighborhood UMAP will look at when attempting to learn the manifold structure of the data.¹⁴

While choosing `n_components` as 5 and `min_dist` as 0.05 as these are common values in many works, the value of the parameter `n_neighbors` has been varied between 3 and 9 with the goal of reducing the topic outliers. For `n_neighbors` > 8 only less than 5 topics could be found and a lot of topic outliers appeared. The

¹² FAQ. <https://maartengr.github.io/BERTopic/faq.html#why-are-the-results-not-consistent-between-runs> (downloaded on 21.08.2022)

¹³ Briggs, J. Advanced Topic Modeling with BERTopic. <https://www.pinecone.io/learn/bertopic/> (downloaded on 21.08.2022)

¹⁴ Basic UMAP Parameters. <https://umap-learn.readthedocs.io/en/latest/parameters.html> (downloaded on 21.08.2022)

smaller the value for `n_neighbors`, the less topic outliers arose. However, the number of topics increased drastically. To have a good tradeoff between the number of topic outliers and the number of topics, `n_neighbors` has been specified as 4.

Hierarchical Density-based Spatial Clustering of Applications with Noise (HDBSCAN) was then used to cluster the now lower-dimensional vectors. Adding `gen_min_span_tree` adds another step to HDBSCAN that can improve the resultant clusters.¹⁵

The primary parameter to affect the resulting clustering is `min_cluster_size` which is set to the smallest size grouping that should be considered. The parameter `min_samples` provides a measure of how conservative the clustering should be. The larger the value of `min_samples`, the more conservative the clustering and the more points will be declared as noise.¹⁶

While specifying `min_samples` as 10, different values for `min_cluster_size` between 5 and 15 have been tried. One could observe that the higher `min_cluster_size`, the less topics could be found. This resulted in having more topic outliers. A minimal cluster size of 10 has been chosen in the end.

With the help of the `CountVectorizer` and the `ngram_range` parameter one can specify how many tokens each entity contains in a topic representation. In this case also entities with a length of 2 (bigrams) were allowed.¹⁷

All in all, changing the parameters decreased the number of topic outliers. However, the number of resulting topics increased dramatically. Decreasing the number of topics with appropriate functions like `model.reduce_topics()` again is possible, but then the number of topic outliers increased again and it results in having more topic outliers than just using the default parameters.

Therefore, using `BERTopic` with just the default parameters and without parameter fine tuning already works very well for the given problem and the reduced dataset and cannot be improved when putting a penalty on the number of different topics.

The process as described above was also followed with the whole dataset. The language was set to German, the number of topics was not specified and the random seed in the UMAP model was set to 123. For all other parameters the default values were taken. The runtime of several hours to fit the model was much higher than for the reduced dataset and 568 topics have been found.¹⁸

Manual analysis of the topics has shown that the topics that have been found for the restricted dataset were also found in the whole dataset. A lot of topics have been found that do not fit and are not appropriate for our use case. These topics have to be excluded. These unrelated topics are expected, since the full dataset is not as clean and focused on the desired content as the reduced dataset. Even though a lot of data cleaning and data preparation has been done, there are a lot of posts included that do not directly relate to the subject.

¹⁵ Briggs, J. Advanced Topic Modeling with `BERTopic`. <https://www.pinecone.io/learn/bertopic/> (downloaded on 21.08.2022)

¹⁶ Parameter Selection for HDBSCAN*.

https://hdbscan.readthedocs.io/en/latest/parameter_selection.html#selecting-min-cluster-size (downloaded on 21.08.2022)

¹⁷ `sklearn.feature_extraction.text.CountVectorizer`.

https://scikit-learn.org/stable/modules/generated/sklearn.feature_extraction.text.CountVectorizer.html (downloaded on 21.08.2022)

¹⁸ Was run on a 1,4 GHz Quad-Core Intel Core i5 MacBook Pro with 16 GB working memory.

Therefore, using the clean, reduced dataset that is limited to only pages that do for sure include just posts with questions and topics that concern young mothers is more appropriate for the given goal to find out which questions the majority of young mothers concern. Very clear and plausible topics could be extracted from this reduced dataset.

DOMAIN-SPECIFIC LECTURE

To gain theoretical knowledge in this area the lecture “Entwicklungspsychologie I” at the university of Vienna that is held by Dr. Tina Eckstein-Madry is suitable. The lecture units have already been attended in the winter semester 2021, the exam still needs to be done.

CONCLUSION

Given BERTopic's ability to extract clear, interpretable topics, unlike LDA, BERTopic is a much more powerful and advanced method than LDA. From a clean dataset, restricted to Facebook posts that have been posted on Facebook pages where young mothers are active, appropriate topics could be extracted. These topics and the questions in the corresponding posts provide a suitable basis for the organization “Österreichischer Kinderschutzpreis - Verein zur Förderung von Kinderschutz und Kindergesundheit in Österreich” to identify areas of concern and create professional and precise information materials that are valuable for a large number of young mothers.

Appendix

A. Data Preparation

Posts from the following Pages have been removed:

<ul style="list-style-type: none">* Dealtown - Codes / Warehouse Deals / Coupons* Kinderschnäppchen* AMZ Deals - Schnäppchen, Rabatte & Angebote <p>- Sparen!</p> <ul style="list-style-type: none">* Amazon Schnäppchen. Preisfehler, Produktvideos und Kurioses* Schnäppchen & Deals & Rabattcodes <p>Amazing-Deals</p> <ul style="list-style-type: none">* Sparmutti* Promiflash* Run Run Deals Schnäppchen Rabatte DE * Tierengel Bulgarien* Ich liebe Katzen* Schnäppchenjäger - Deals, Rabatte & Schnäppchen* Animal Hope Bulgaria - Varna - Support <p>Page/Deutsch/</p> <ul style="list-style-type: none">* Kinder Lern TV* Ich liebe Hunde* Nähen (OHNE REGELN)* RTL Exclusiv* RTL* Hoffnung für Fellnasen- Alles rund um Tiere* Probenähen und Werbung für Schnitte und neue Stoffe* Online Schnäppchen, Rabatte, Preisfehler und unschlagbare Deals* TAG24 Dresden* TAG24 Chemnitz* TAG24 Erzgebirge* TAG24 Zwickau* TAG24 Vogtland* TAG24 Leipzig* TAG24 Berlin* TAG24 Köln* TAG24 Hamburg* TAG24 München* TAG24 Gera* TAG24 Frankfurt/Main* TAG24* TAG24 Erfurt* TAG24 Jena* TAG24 Stuttgart* TAG24 Paderbor* TAG24 Bielefeld	<ul style="list-style-type: none">* TAG24 Minden* VIP.de* Fifty Shades of Grey Fans - Deutschland* Prominent!* Bewußtes Leipzig* SpassFürKinder* Hilfe für alle Tiere in Not <3 <3* Marktplatz der Tiere ☀* Buchtipp* Wir sind Garten® * PatPat Germany* Babauaba* Coin Master Tausch-Gruppe Deutschland* Die größte Tierschutzgruppe auf Facebook* OK! Magazin* Kokadi* Bücher, Leser und Autoren* Schnäppchenwelt* Buch und Lesen* Lesestoff gesucht?! Werbung für alles rund um <p>Bücher</p> <ul style="list-style-type: none">* Bücher* Neue Stoffe und Schnitte - Werbung* BÜCHER WERBUNG* earnesto* myHummy.de* Büchermarkt* GEGEN Tierquälerei* WhatsApp Gruppen* Haustier sucht Herz* eBooks & Bestseller* TIERE IN NOT <3* Online Deals und Schnäppchen für Alle!* ANIMAL WELFARE NETWORK / TIERSCHUTZ <p>NETZWERK</p> <ul style="list-style-type: none">* Tiervermittlung international aus jedem Land in jeder Sprache* LESELUPE ~~~ BUCHVORSTELLUNG* Die Bücher-Truhe* The Lounge - Books and More* RTL Explosiv* Pfotenfreunde Varna* Der Lese-Klub* Kreatives Nähen >>> Tauschen, Verkaufen und Werben	<ul style="list-style-type: none">* Gala* BUNTE.de* Spiritualität & Bewusstsein - Esoterik, Gesundheit, Heilung* Ernährung und Krebs* Yoga Deutschland* AMZ - Rabatte, Deals und Schnäppchen* Spirituelle Angebote* Ostsee Urlaub (Zimmer frei)* BJ's Book Blog* Werbung für Spirituelles* Werbung für Wellness, spirituelle Bücher etc.* nametests.com Deutsch* RTL Aktuell* omamashop.de* Milkies - Muttermilchschmuck, Gravurschmuck, <p>Erinnerungsschmuck</p> <ul style="list-style-type: none">* Fit mit kids* Spirituelle Webinare und Seminare und Werbung* Freiheit der Gedanken* Freiheitdergedanken* Picarso Fotodesign - Neugeborene Baby <p>Fotografie Cottbus Brandenburg</p> <ul style="list-style-type: none">* Positiv +* Miss Granny Baby & Kindermode* cocoome* BABY born* Pflegende Angehörige* AUF DER SUCHE - Pflege- und Endstellen <3* FOCUS Online Panorama* Energetiker - Netzwerk* Hochwasser in AW - freiwillige Helfer Ahrweiler* Jolie* apost.com Deutsch* Besinnlich kann ja jeder...* die kartenmacherei* Schmusewolke* Hät öper..?* LIMAS Baby Carriers* InTouch* manduca* Seminare - Vorträge - Workshops* Kangatraining in Koblenz mit Katharina* Supermamafitness - Akademie Heike Thierbach
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