A New German Reddit Corpus

A Report on Work in Progress

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What's Reddit?

- Social news aggregation, discussion and micro-blogging platform
- Founded in 2005
- One of the most popular websites in the US (Alexa rank: 6[1], SimilarWeb rank: 10[2]
- Increasingly popular in Germany (Alexa rank: 9[3], SimilarWeb rank: 31[4]

[1] https://www.alexa.com/topsites/countries/US, 9.10.2019
[2] https://www.similarweb.com/top-websites/united-states, 9.10.2019
[3] https://www.alexa.com/topsites/countries/DE, 9.10.2019
[4] https://www.similarweb.com/top-websites/germany, 9.10.2019

What's Reddit?

- Self-proclaimed "front page of the internet":
  - Users submit content (e.g. links, images, text)
  - Submissions are voted up or down
  - Submissions with the most upvotes make it to the front page
- Submissions can be commented on, comments can also be voted up or down
- Nested conversation threading
- Since 2008, users ("redditors") can create "subreddits" (categories or communities) with their own rules

Who uses Reddit?

- While more women than men use social media in general (at least in the US[5], Reddit is more popular among men than among women[6]
- Users are mostly young[7], with a high share of people interested in technology

[5] https://www.statista.com/statistics/471345/us-adults-who-use-social-networks-gender/

[6] https://www.statista.com/statistics/261765/share-of-us-internet-users-who-use-reddit-by-gender/

[7] https://www.statista.com/statistics/261766/share-of-us-internet-users-who-use-reddit-by-age-group/

The German Reddit Sphere

- Subreddits can be very heterogenous
- Parts of Reddit can be very weird to outsiders, the same goes for large parts of the German Reddit sphere
- Special emoticons: :) $\rightarrow$ Ü, :o $\rightarrow$ Ö, :< $\rightarrow$ Ä
- Quite common: word-for-word translations of English words and phrases:
  - *pfostieren*
  - *ausgelöst*
  - *Maimai*
  - *Fixierte das für dich.*
  - *schuldiges Vergnügen*
  - *Lases*, *Unterlases*
  - *kantig*, *Kantenfürst*

Building a Reddit Corpus

- In an ongoing effort, Jason Baumgartner collects every Reddit submission and comment, publicly accessible via `https://files.pushshift.io/reddit/`[8] (some caveats apply, see Gaffney and Matias, 2018)
- 2015: first attempt at extracting German comments (Barbaresi, 2015), resulting corpus still relatively small (97505 comments, 566362 tokens)
- Since then, activity on Reddit has increased greatly
- We adapt Barbaresi's approach of using a two-tiered filter to detect German comments in the vast dataset:
  1. spell checking
  2. language identification

[8] see also `https://www.reddit.com/r/pushshift/comments/bcxguf/new_to_pushshift_read_this_faq/`

Raw data (1)


```
'archived': False,
'author': 'Mythic_Emperor',
'author_created_utc': 1521765799,
'author_flair_background_color': None,
'author_flair_css_class': None,
'author_flair_richtext': [],
'author_flair_template_id': None,
'author_flair_text': None,
'author_flair_text_color': None,
'author_flair_type': 'text',
'author_fullname': 't2_12w6sr28',
'author_patreon_flair': False,
'body': 'Es geht mir Gut. Und dir?',
'can_gild': True,
'can_mod_post': False,
'collapsed': False,
'collapsed_reason': None,
'controversiality': 0,
'created_utc': 1541030413,
```

Raw data (2)


```
'distinguished': None,
'edited': False,
'gilded': 0,
'gildings': {'gid_1': 0, 'gid_2': 0, 'gid_3': 0},
'id': 'e8tkilo',
'is_submitter': False,
'link_id': 't3_9t23an',
'no_follow': True,
'parent_id': 't1_e8tfeac',
'permalink': '/r/HistoryMemes/comments/9t23an/are_you_just_gonna_scroll
'removal_reason': None,
'retrieved_on': 1544848339,
'score': 2,
'send_replies': True,
'stickied': False,
'subreddit': 'HistoryMemes',
'subreddit_id': 't5_2v2cd',
'subreddit_name_prefixed': 'r/HistoryMemes',
'subreddit_type': 'public'
```

Detecting German posts – the strategy

Barbaresi (2015)

1. Sanitizing
   - Ignore newlines and URLs
   - Don't consider very short posts or posts which were deleted
2. Spell checking
   - Check every token (`re.findall(\w+)`) against both a German and an English dictionary
   - If not in respective dictionary: count an error
   - Classify as potentially German if English error rate higher than 30% and German error rate less than 70%
3. Language identification
   - Run langid (Lui and Baldwin, 2014) on potentially German posts

Evaluation of the Two-tiered Filter

- Random sample of 1618 comments from 2016
- Looking at the first 565 comments (20020 lines), we see many of them (148, or 26%) are not actually in German (1423 lines $\rightarrow$ 7%)
- Longer comments are apparently recognized quite reliably as German, while shorter ones are often misclassified
- Also problematic: comments which only contain links to subreddits, lots of markup or proper names

Possible Corpus Cleanup

- Top 10 subreddits, 2016-2018 (out of 33144, containing 6784837 "German" comments):

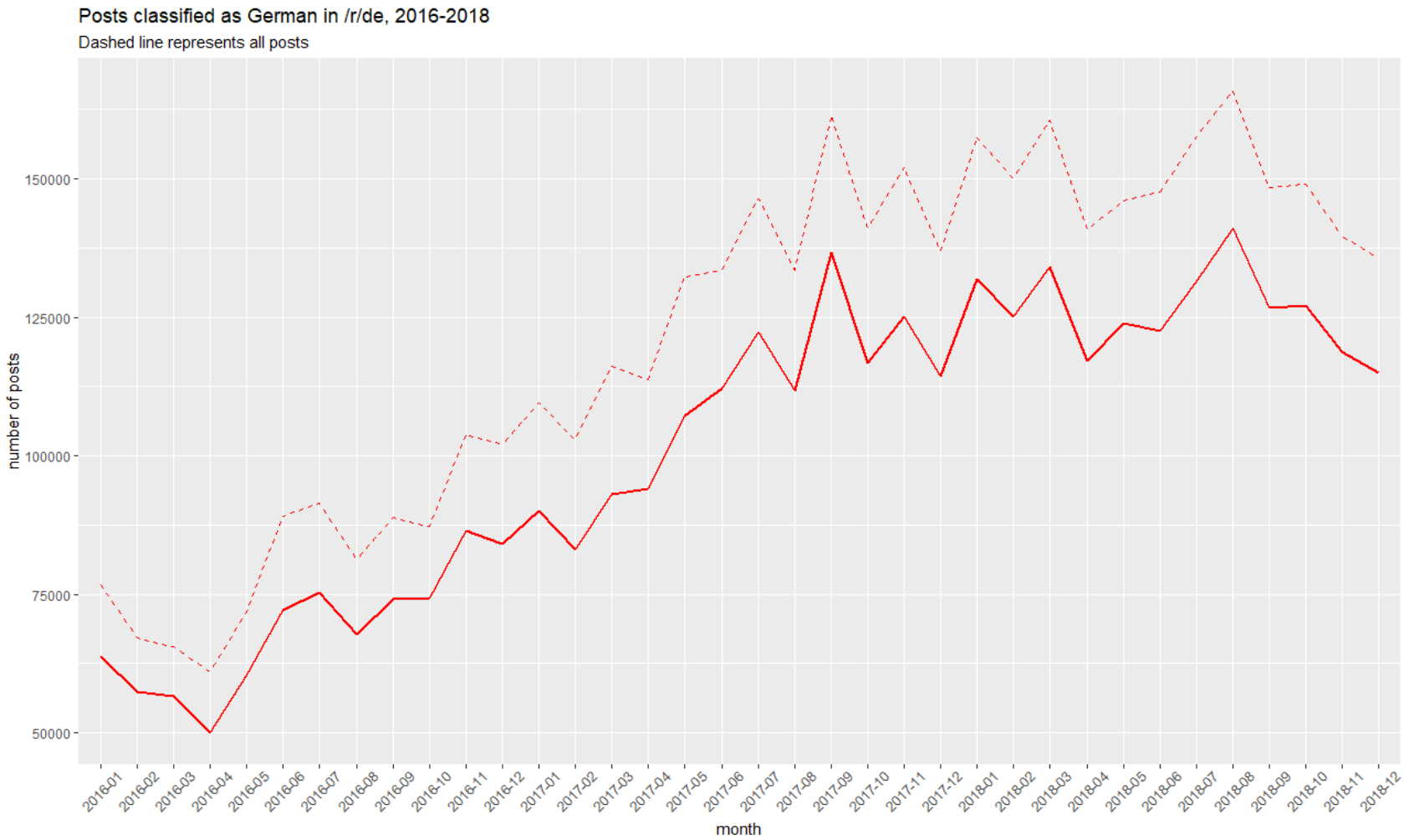
Subreddit	"German"	Total	Fraction
de	3644481	4364440	0.835
Austria	389041	483125	0.805
rocketbeans	142787	164699	0.867
AskReddit	125411	183147454	0.000685
edefreiheit	121370	147150	0.825
de_IAmA	58172	65768	0.885
Finanzen	48033	55009	0.873
Fireteams	38042	2125695	0.0179
soccer	33727	22918204	0.00147
rbtvcirclejerk	32493	38945	0.834

- Comments in subreddits with low fractions of "German" comments are probably not German after all

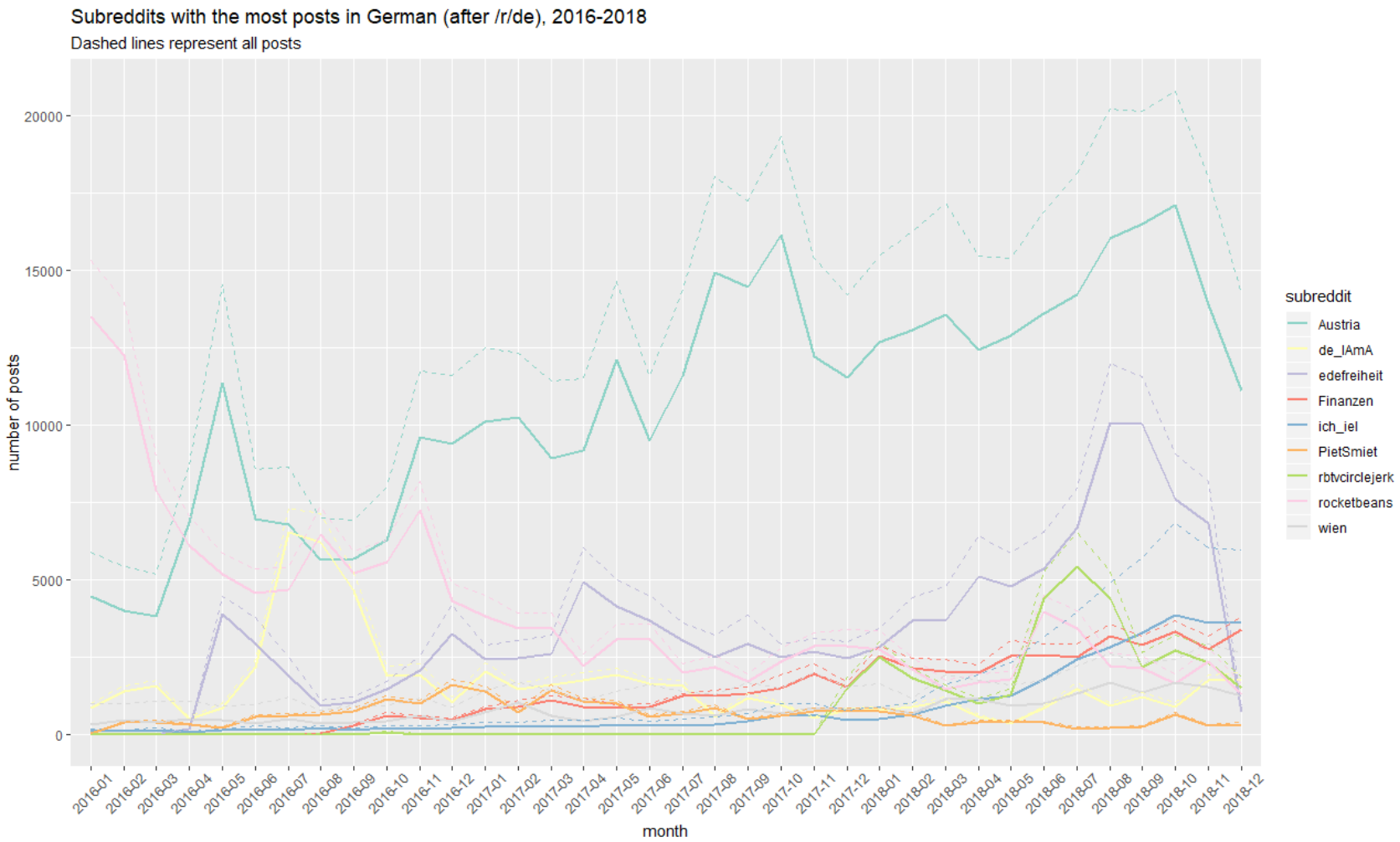
Possible Corpus Cleanup

- By filtering out subreddits with less than 10% and/or less than ten "German" comments, we can remove 27% of all comments classified as German
- Remaining comments: 4926924
- However, for those subreddits which are predominantly German, shouldn't we include *all* comments in our corpus?

Top 10 Subreddits



Top 10 Subreddits



Pre-processing and Tokenization

- Reddit comments can contain Markdown markup[9], so they have to be pre-processed to avoid curious tokenization results:
  - *∼∼der gute∼∼ Ketchup gehört in den ∼∼Reis oder aufs Brot∼∼ Müll.*
  - *Ich würde dir die [∼∼Sokratische Methode∼∼](https://de.wikipedia.org/wiki/Sokratische_Methode) [Mäeutik](https://de.wikipedia.org/wiki/M%C3%A4eutik) empfehlen.*
- Short form links to subreddits and user pages have to be tokenized properly (*r/oldschoolcool*, */r/de*, */r/de/about/traffic*, *l/de*, */u/username*, */u/username*, ...)
- In the absence of punctuation, line breaks (and sometimes, emoticons) can mark sentence boundaries

[9] see `https://www.reddit.com/wiki/markdown`

Example: Emoticons as Sentence Boundaries

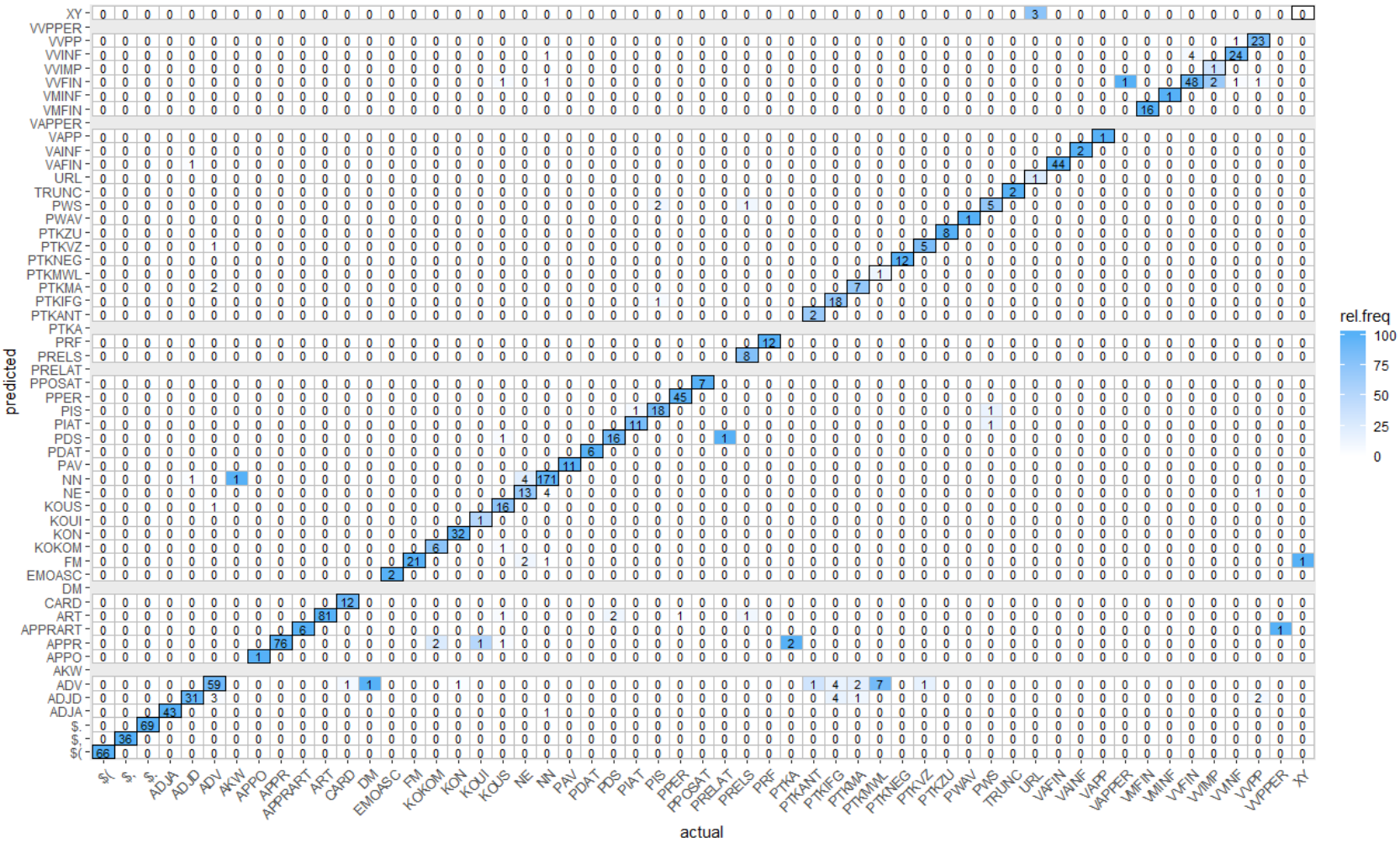
Token	TreeTagger	Lemma	SoMeWeTa	Corrected POS
<s>				
So	ADV	so	ADV	DM
bin	VAFIN	sein	VAFIN	VAFIN
endlich	ADV	endlich	ADJD	ADV
zu	APPR	zu	APPR	APPR
was	PIS	was	PIS	PIS
gekommen	ADJD	kommen	VVPP	VVPP
:D	ADJD	:D	EMOASC	EMOASC
Habe	VAFIN	haben	VAFIN	VAFIN
jetzt	ADV	jetzt	ADV	ADV
...				

Tokenization and POS Tagging

- Random sample tokenized with SoMaJo[10] and tagged with SoMeWeTa[11] (trained on EmpiriST corpus; tagset: STTS_IBK[12])
- Corrected POS tags in a small number of comments (1186 tokens – so far) to evaluate performance
- Accuracy: 92.6%

[10] Proisl and Uhrig (2016)
[11] Proisl (2018)
[12] Beißwenger et al. (2015)

Confusion Matrix



Outlook

- More corpus cleaning necessary
- Tokenization rules have to be updated
- POS-tagging, lemmatization etc. further down the pipeline
- Tagset: more discussion needed

Bonus Content: Some Notes on STTS-IBK

- Some very fine-grained categories like DM (e.g. "epistemisches *weil*"), PTKIFG, PTKMWL which are difficult to annotate manually, but no differentiation between some more obvious ones, e.g. *sein* as an auxiliary or as a full verb, definite and indefinite articles, ...
- Tags for some contracted forms but not all (STTS-IBK guidelines state to just annotate POS for the first word in these cases)
- Catch-all category $(\rightarrow$ no differentiation between opening and closing brackets or quotation marks, dashes, slashes etc. (asterisks to mark "Aktionswörter" also fall into this category)
- What to do with acronyms like *scnr* (*sorry, could not resist*) or *imho* (*in my humble opinion*)? Do we need new tags?
- TRUNC nur für Kompositionserst-, nicht aber für -zweitglieder

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Devin Gaffney and J. Nathan Matias. Caveat emptor, computational social science: Large-scale missing data in a widely-published reddit corpus. *PLOS ONE*, 13(7): 1–13, 07 2018.

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