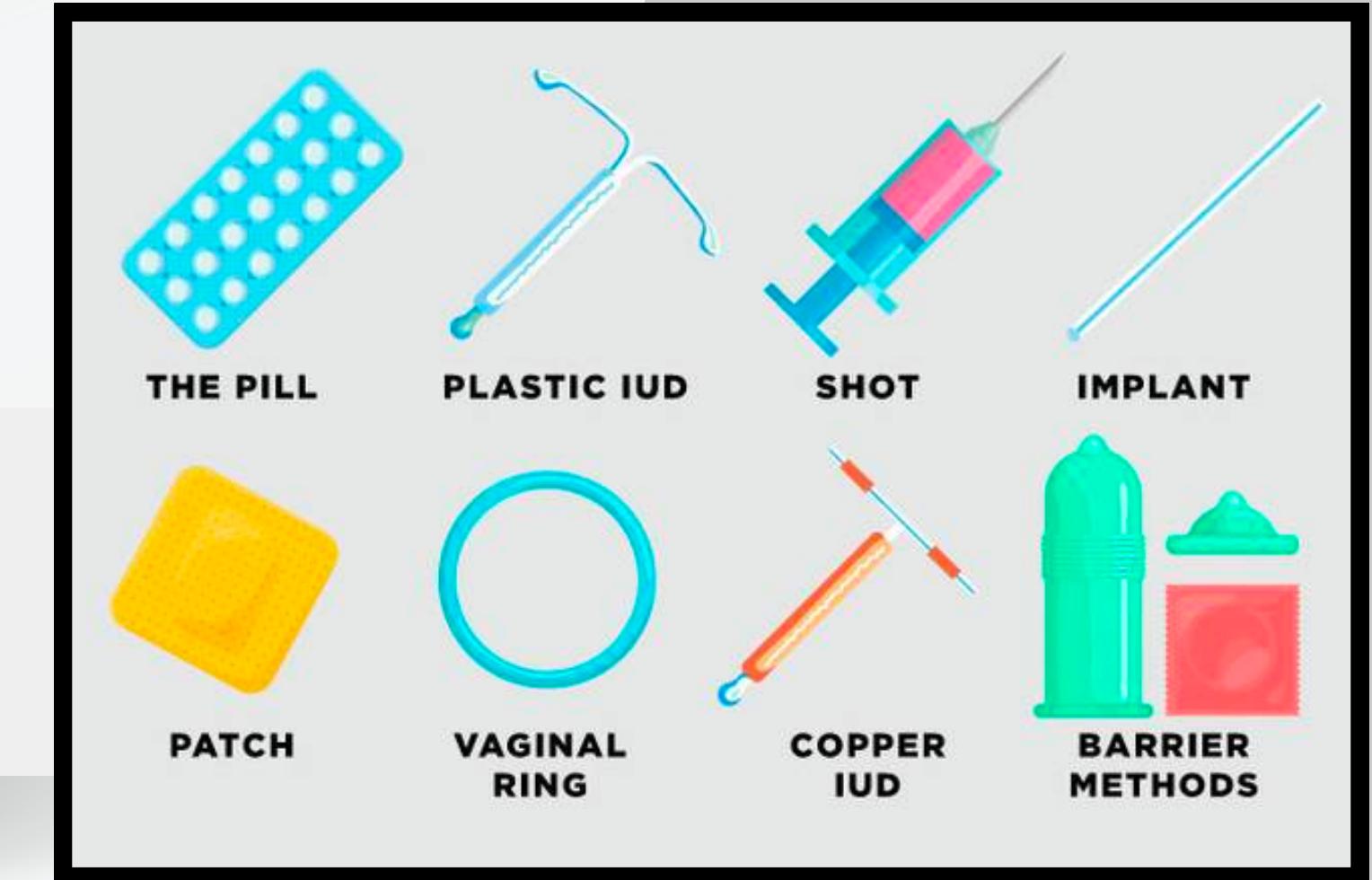


PREDICTING SENTIMENT TOWARD BIRTH CONTROL METHODS

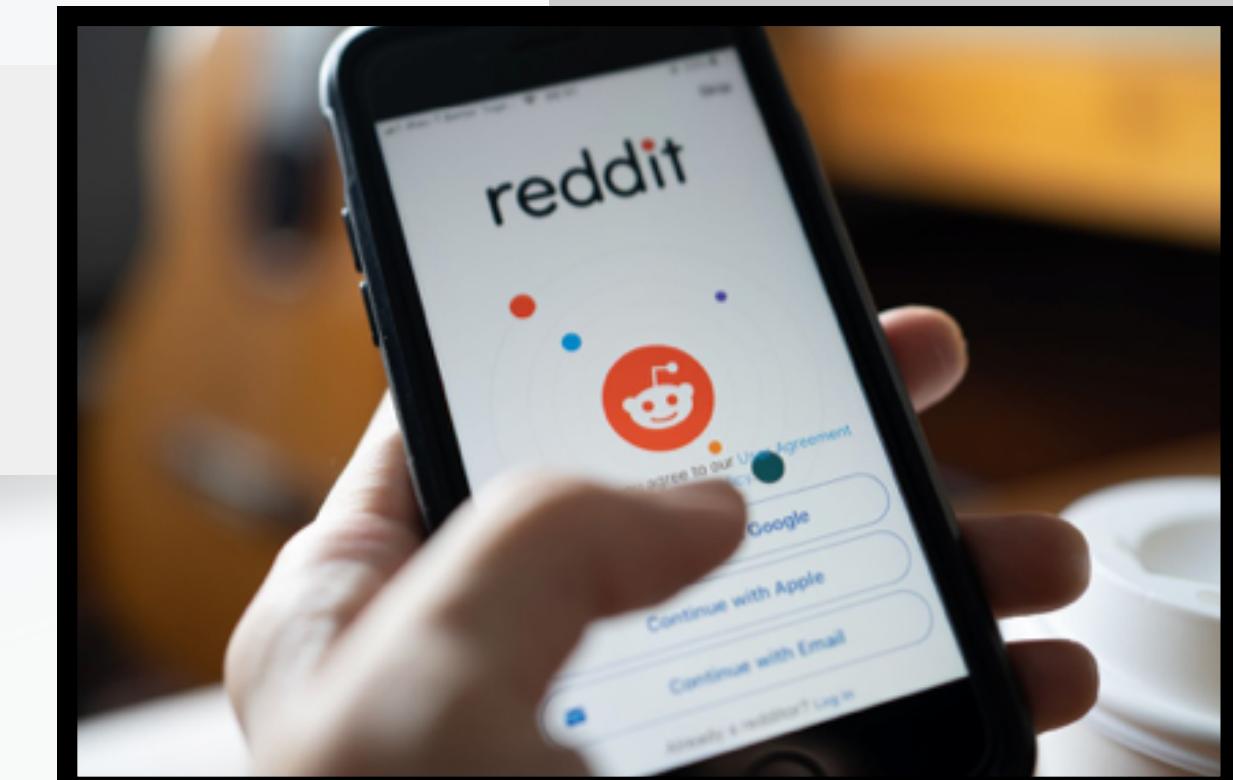
Aaron Galbraith • 2023

BACKGROUND

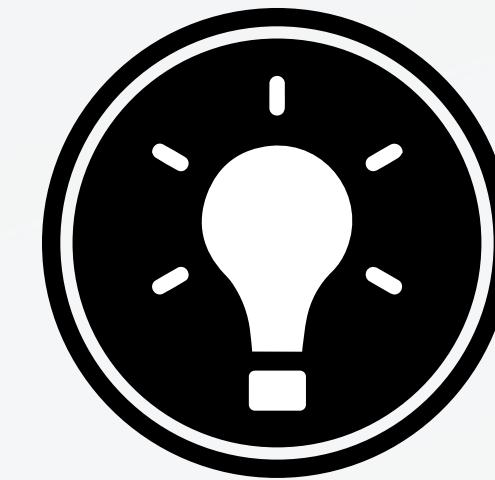
There are many birth control methods to choose from



Conversations about birth control are happening online



PROJECT GOAL



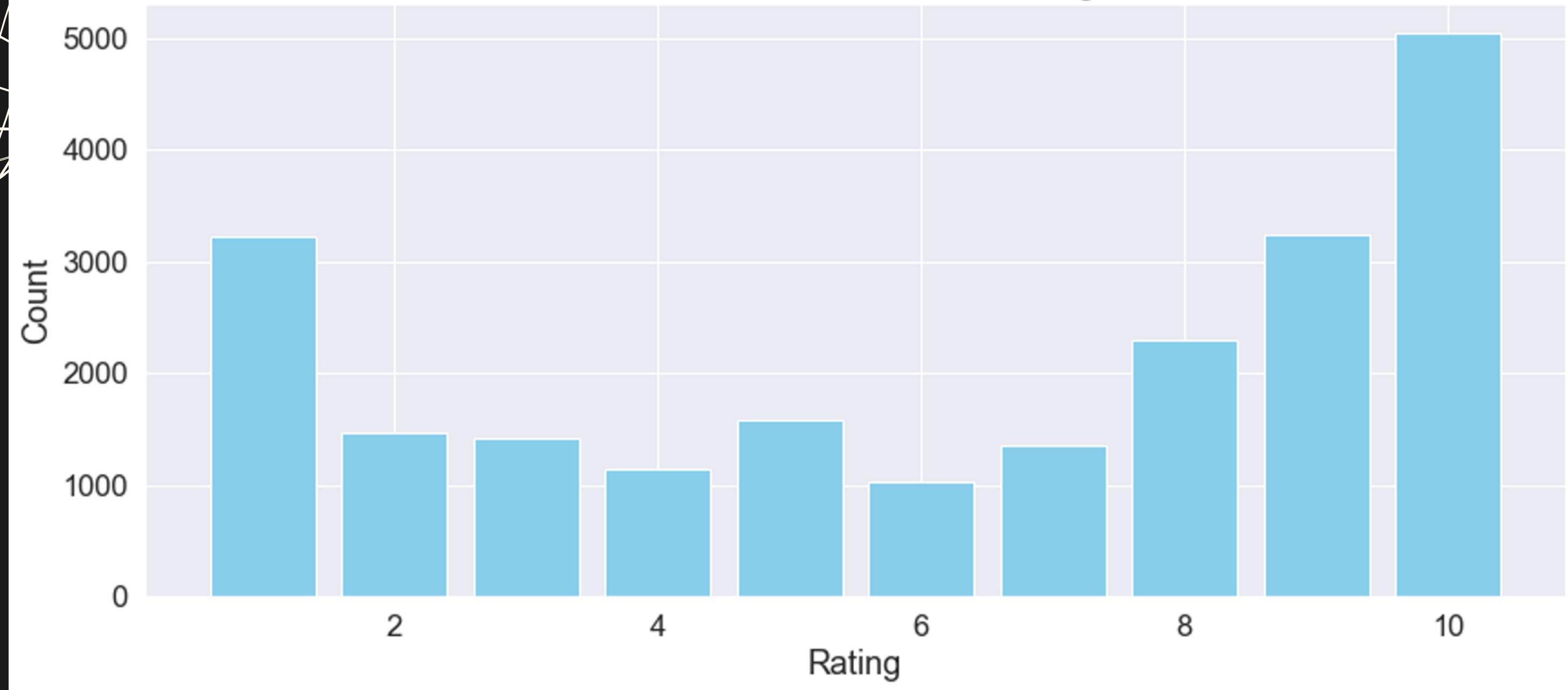
To help Pfizer understand public sentiment toward various birth control methods in order to develop and market their products accordingly

THE DATA

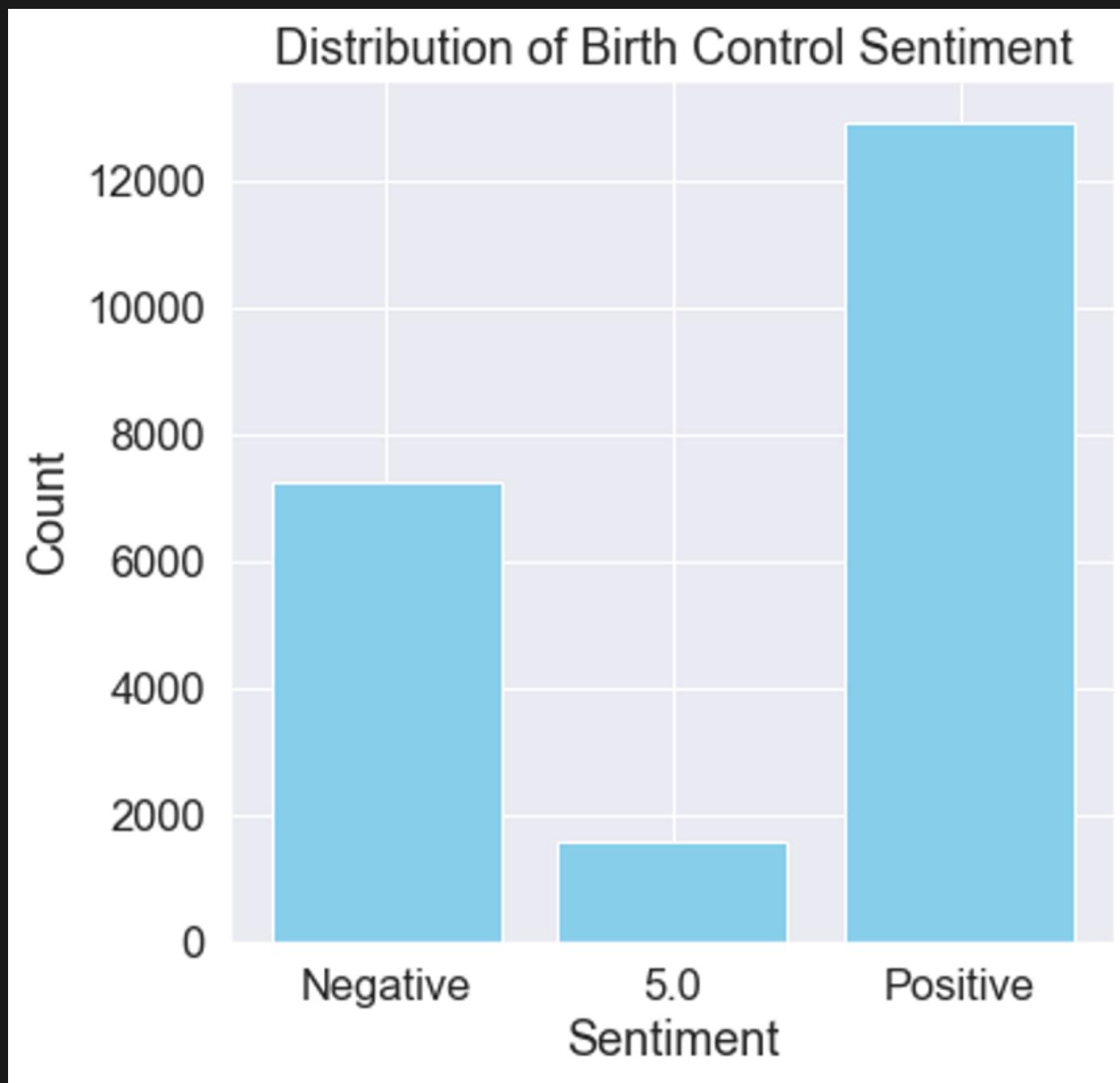
acquired from drugs.com by researchers at UC Irvine

- OVER 20,000 REVIEWS FROM 2008-2017
- 1-10 RATING
- 7 DIFFERENT BIRTH CONTROL METHODS

Distribution of Birth Control Ratings

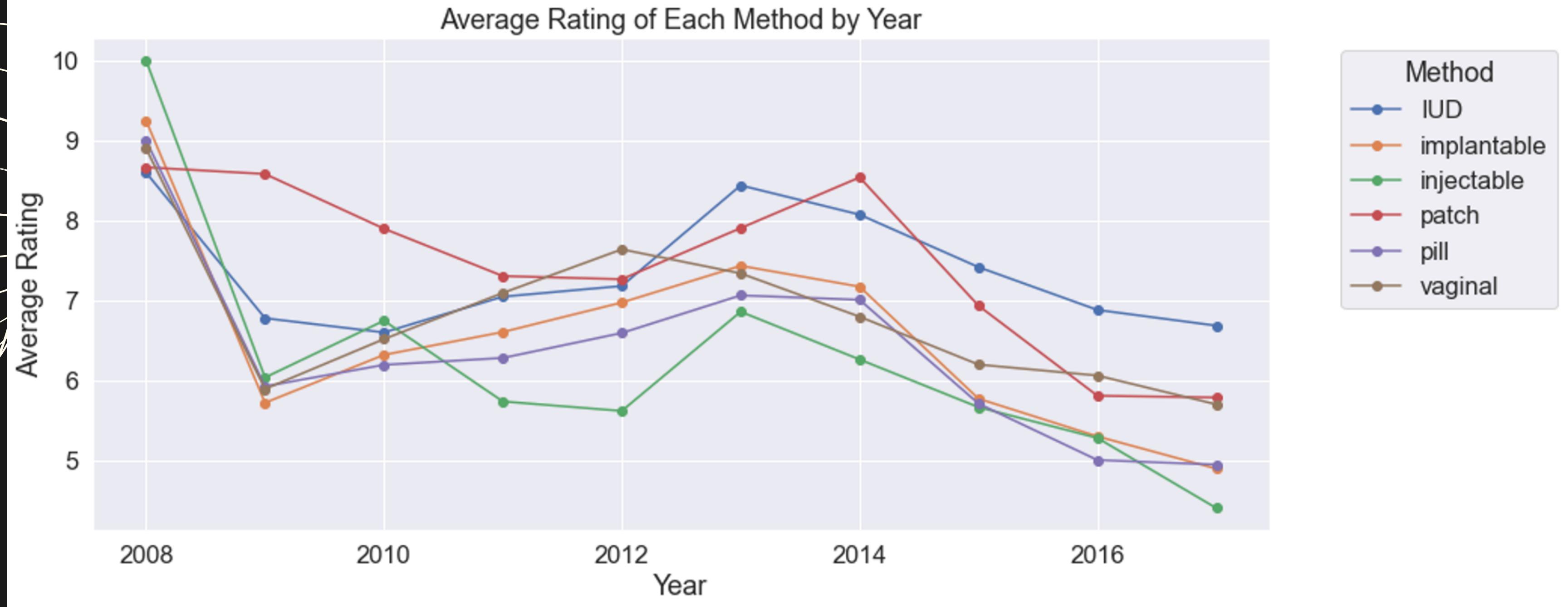


Sentiment is more prevalent at extreme ratings

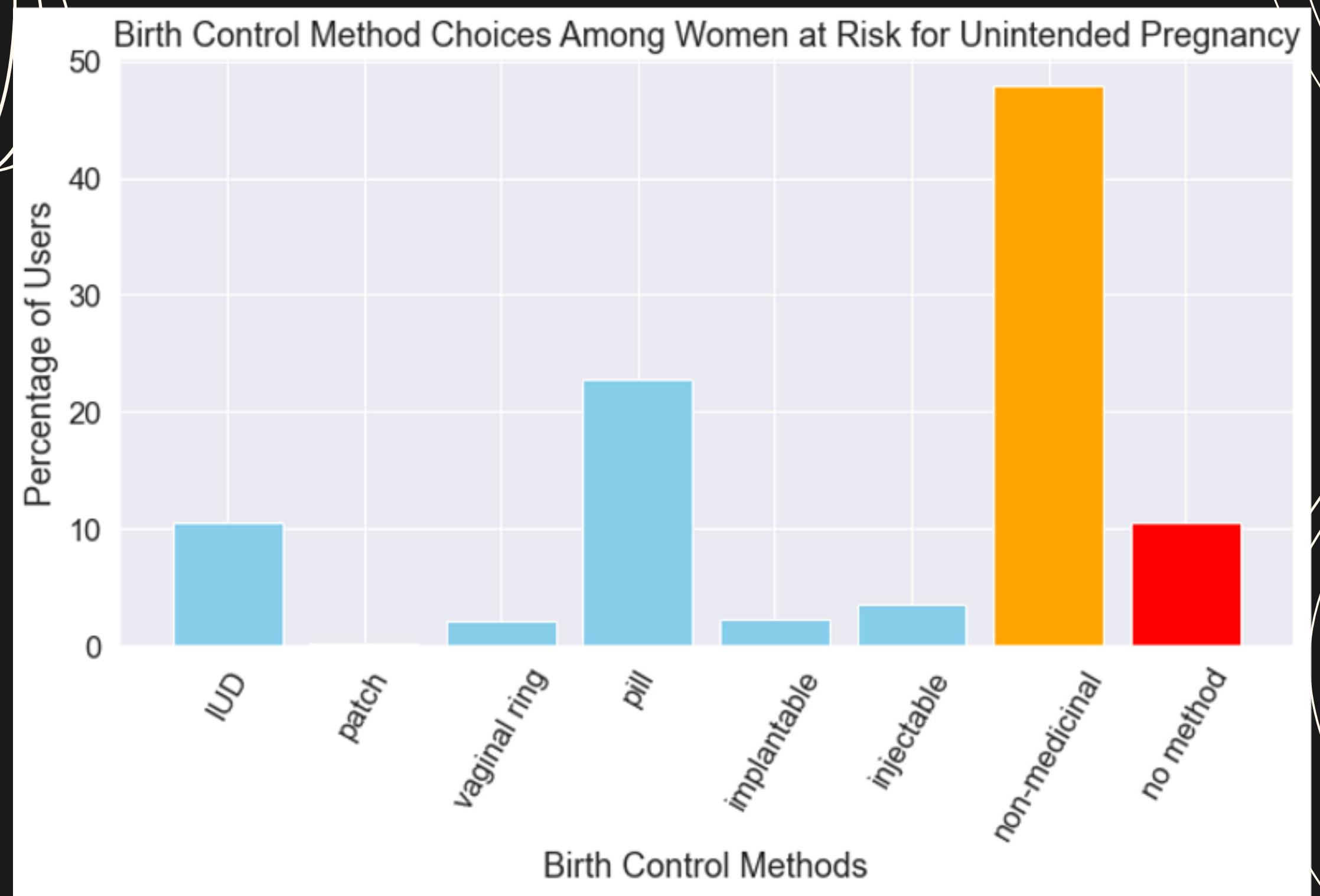


10 ratings merged to two sentiments
5.0 ratings are ignored

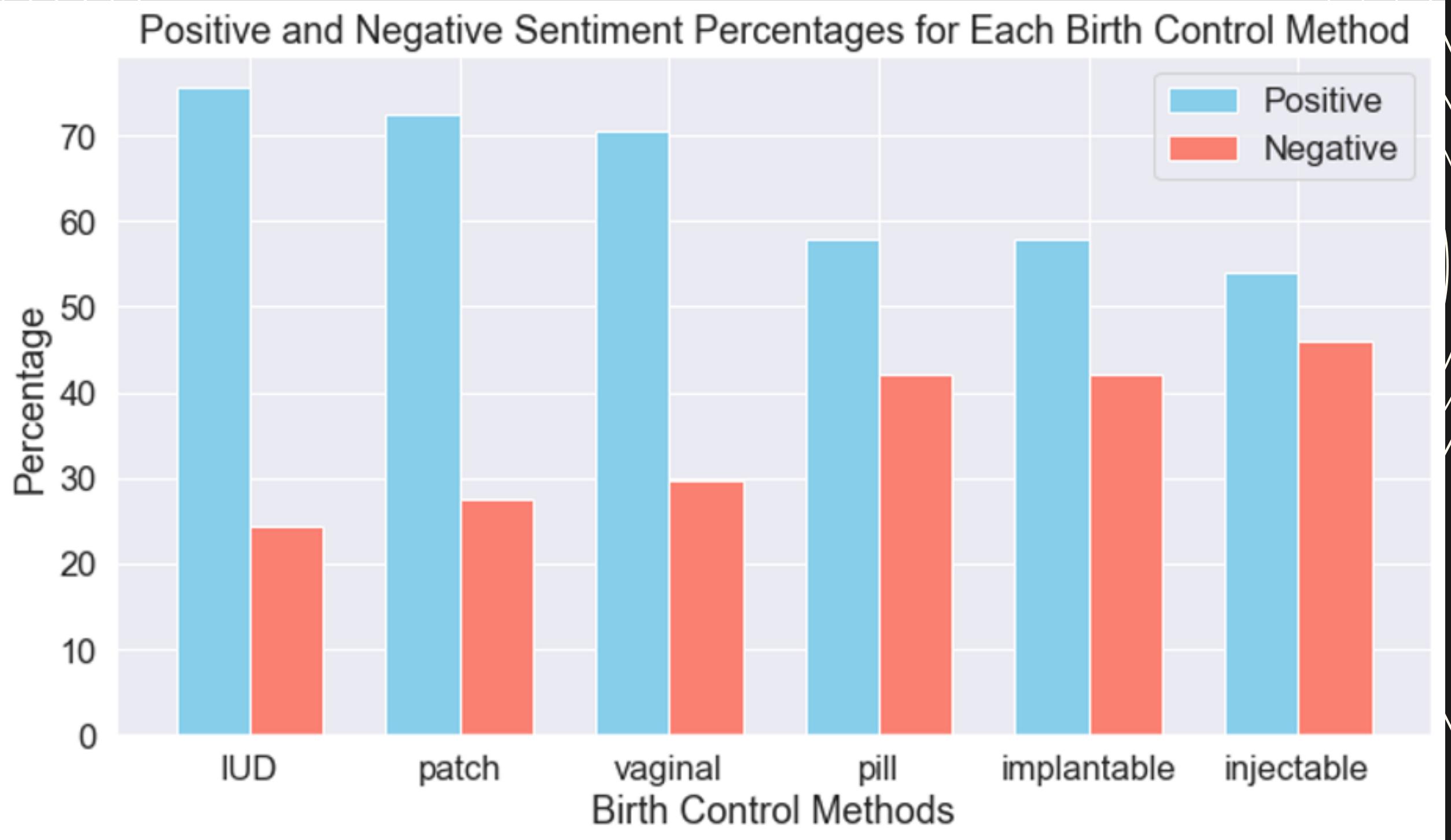
Average Rating of Each Method by Year



Sentiments change over time



The patch is less commonly used than the pill



The patch has much better favorable /
unfavorable than the pill

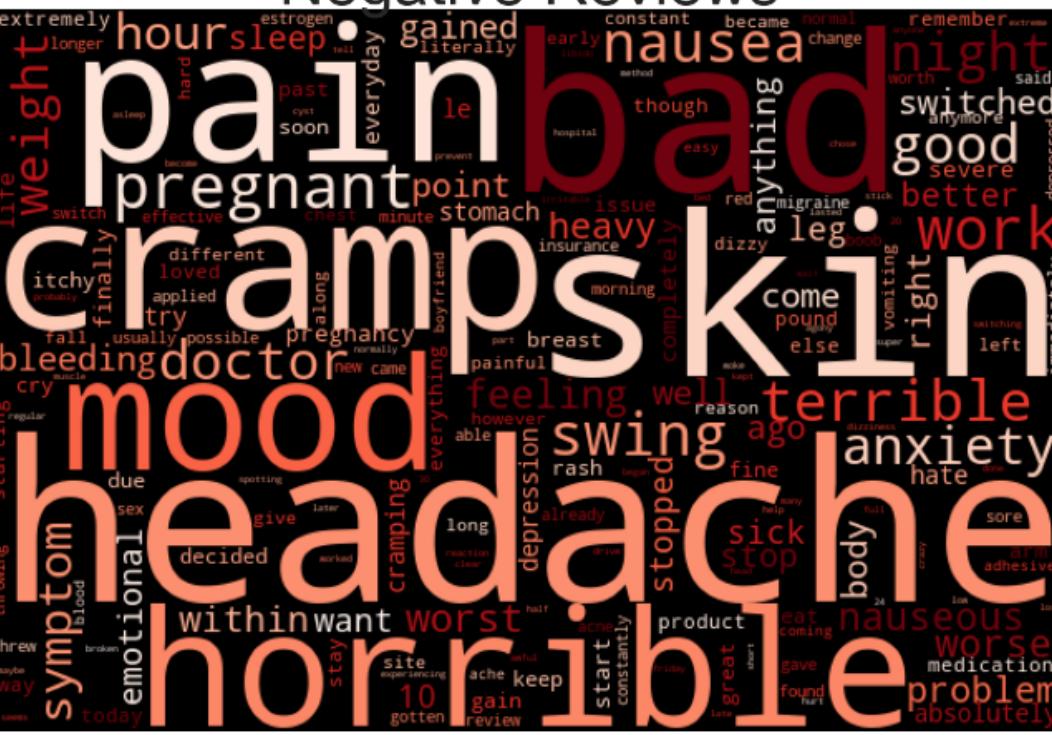
WORD CLOUDS FOR PATCH REVIEWS



Positive Reviews



Negative Reviews

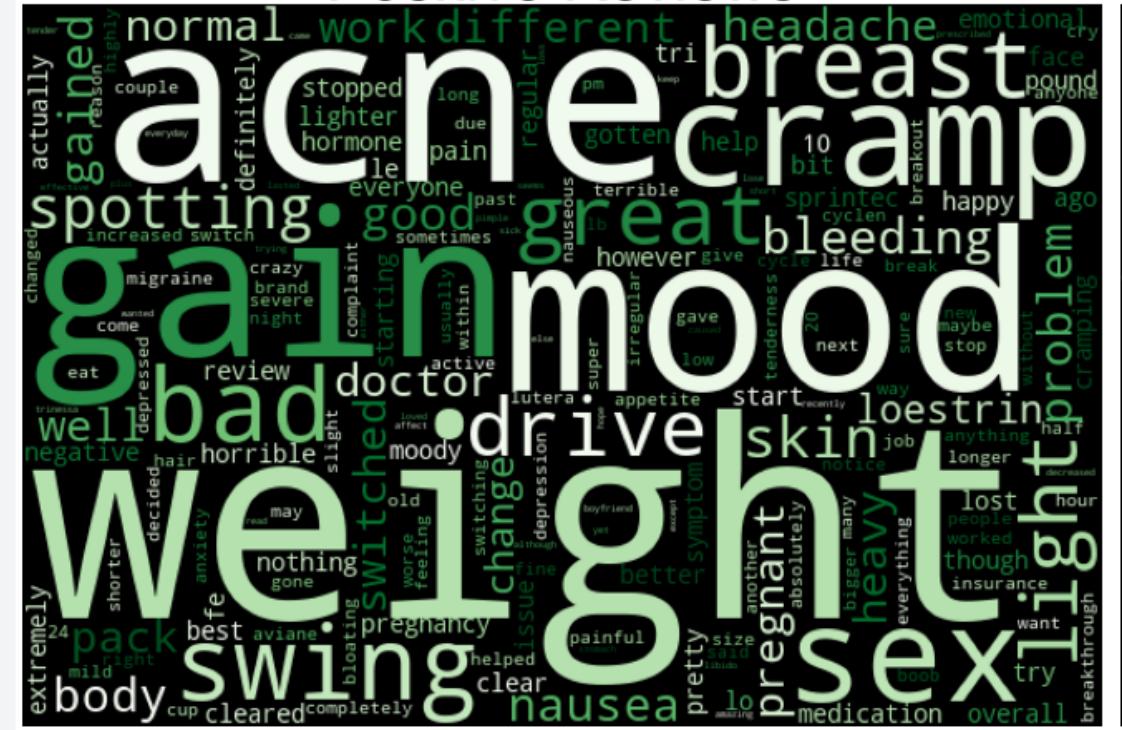


[...] I am back to the weight I was before I started birth control ... but my breasts are still birth control sized [...]

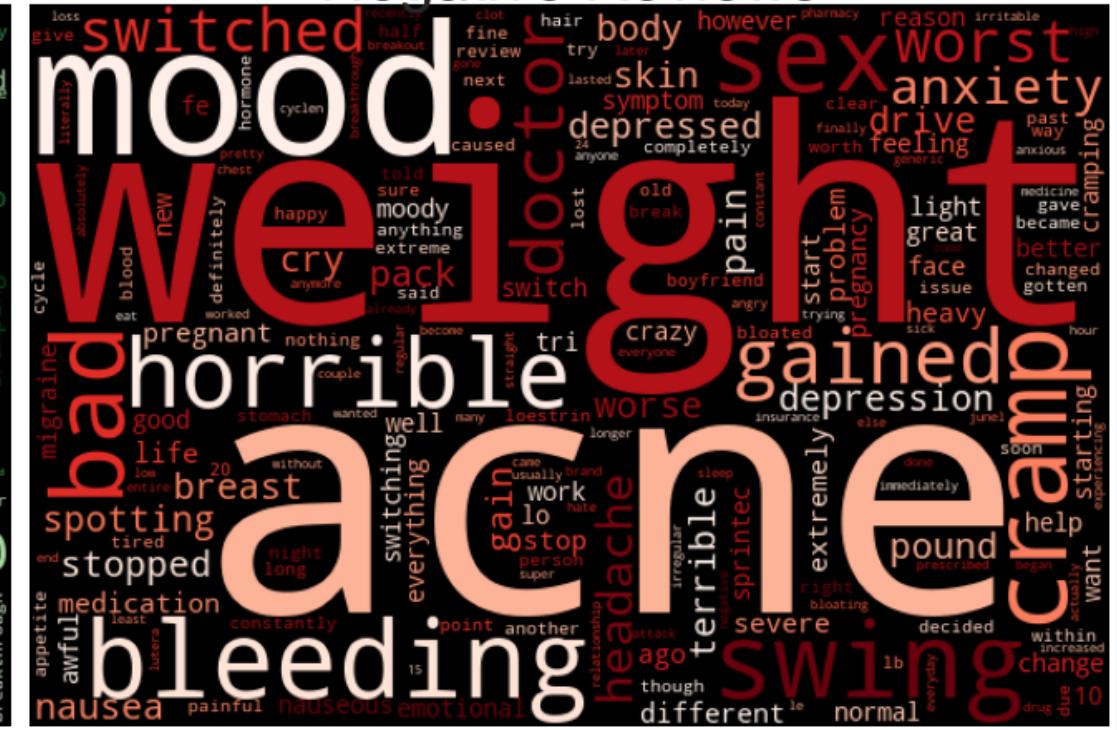
WORD CLOUDS FOR PILL REVIEWS

[...] I went from that to bleeding three weeks out of the month and it would never stop. [...]

Positive Reviews



Negative Reviews



METHODS

- FEATURE CREATION, E.G. READABILITY SCORES
- CHATGPT3 HELPED WITH BRAND CATEGORIZATION
- METRICS: F1-MACRO FOR METHOD PREDICTION & ROC-AUC FOR SENTIMENT PREDICTION
- ML CLASSIFIERS: DECISION TREE, RANDOM FOREST, LOGISTIC REGRESSION*

MODEL RESULTS: METHOD PREDICTION

model	F1-macro	accuracy
Dummy Classifier (BASELINE)	0.14	28.2%
Random Forest	0.59	83.3%
... with hyperparameter tuning	0.59	83.3%
Logistic Regression	0.87	92.1%
... with hyperparameter tuning	0.90	94.2%

MODEL RESULTS: SENTIMENT PREDICTION

model	ROC-AUC	recall	accuracy
Dummy Classifier (BASELINE)	0.48	37.9%	54.0%
Random Forest	0.92	61.3%	82.4%
... with hyperparameter tuning	0.93	63.0%	83.1%
Logistic Regression	0.93	96.0%	77.2%
... with hyperparameter tuning	0.95	91.3%	86.3%

RECOMMENDATIONS

- ABANDON INJECTABLE
- PATCH AS PILL ALTERNATIVE
- PROMOTE FAVORABLE WEIGHT AND BODY IMAGE EFFECT OF PATCH
- APPLY METHOD AND SENTIMENT PREDICTION MODELS TO ONLINE SPACES

FURTHER INQUIRY

- INCORPORATE UPVOTES
- RECOMMENDATION ALGORITHM
- SCRAPE TEXT FROM REDDIT, QUORA, AND ANALYZE MODEL EFFECTIVENESS ON DATA



THANK YOU

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