Training an NLP on Habitual Be

A First Step Towards an AAVE-literate Language Learning Model

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- 15+ years digital marketing/comms in nonprofit sector
- Studied photography, writing, and history
- Skilled in archival research, storytelling, and narrative construction
- Live Storyteller

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Source: **Tense and Aspectual *be* in Child African American English**. Janice E. Jackson & Lisa Green
https://doi.org/10.1007/1-4020-3232-3_13

Dialogue

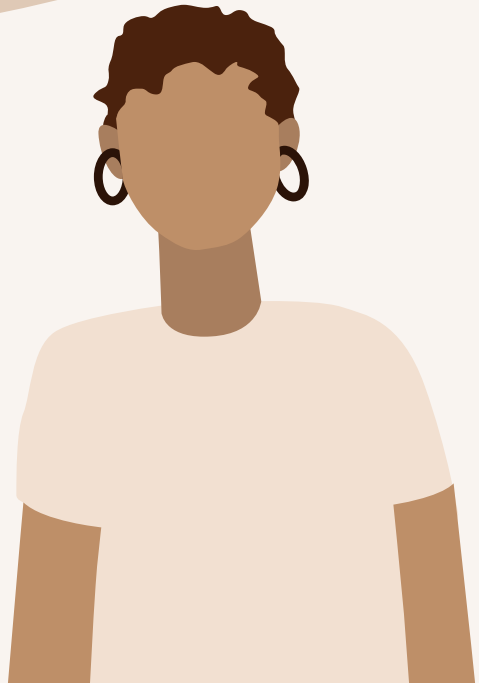
Cookie Monster is sick and not eating cookies today. Elmo is eating cookies. Ernie only eats cookies on his birthday when his mom lets him. Cat has never had a cookie. Cats can't eat cookies.

Task Questions

1. Who be eating cookies?
2. Who is eating cookies?
3. Who eats cookies?
4. Who don't be eating cookies?
5. Who doesn't eat cookies?
6. Who isn't eating cookies?

Correct Responses

1. Cookie Monster
2. Elmo
3. Cookie Monster, Ernie, Elmo
4. Cat, Ernie, Elmo
5. Cat, Ernie
6. Cookie Monster, Ernie, Cat



We can predict habitual be with 90% accuracy

Agenda

01 Objectives + Methodology

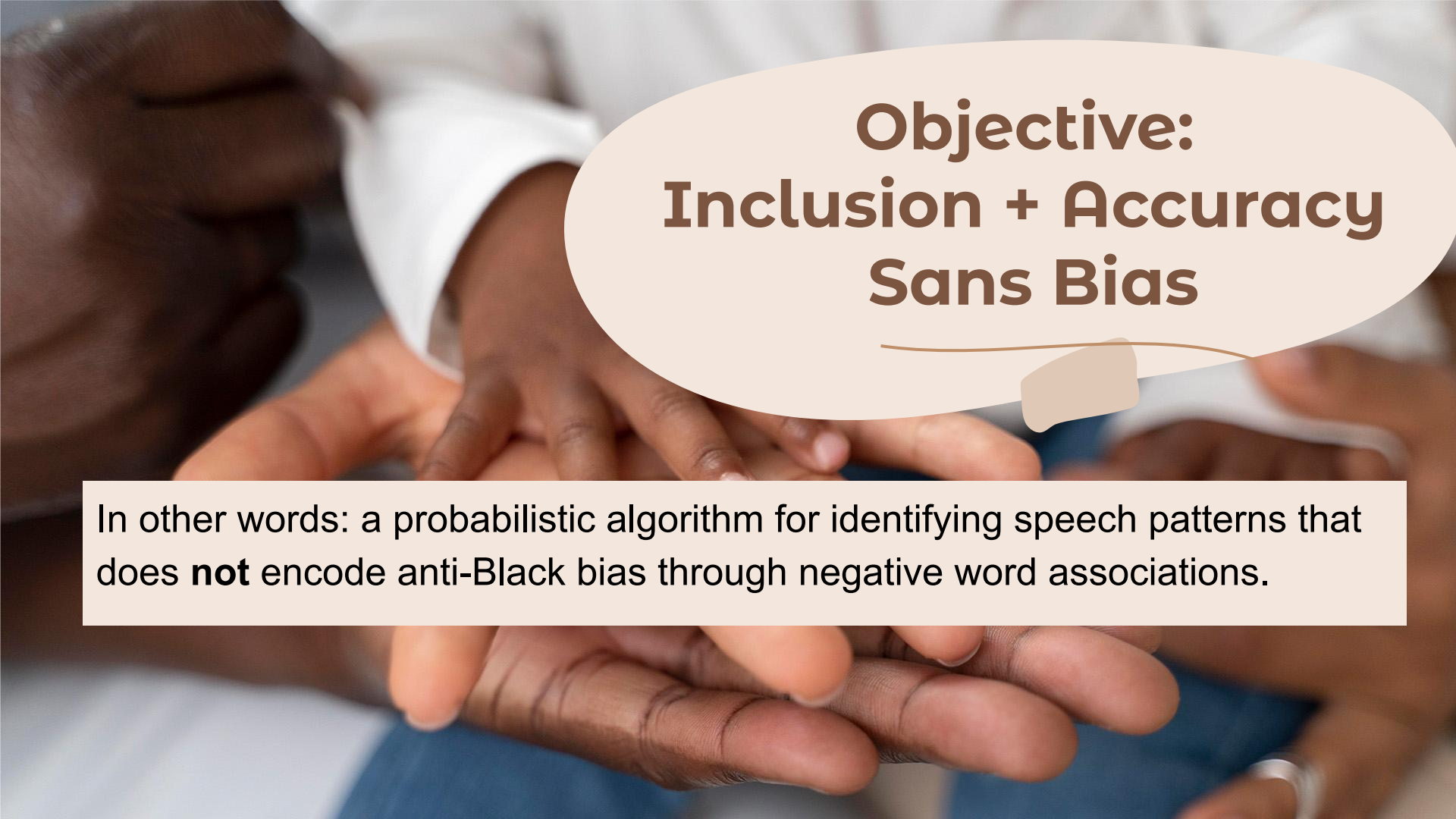
02 Data Overview

03 Final Model

04 Conclusion + Next Steps

01

Objectives + Methodology



Objective: Inclusion + Accuracy Sans Bias

In other words: a probabilistic algorithm for identifying speech patterns that does **not** encode anti-Black bias through negative word associations.

"If we filter out the discourse of marginalized populations, we fail to provide training data that reclaims slurs and otherwise describes marginalized identities in a positive light."

— On the Dangers of Stochastic Parrots: Can Language Models Be Too Big?

Source: On the Dangers of Stochastic Parrots: Can Language Models Be Too Big?
Emily M. Bender, Timnit Gebru, Angelina McMillan-Major, Shmargaret Shmitchell
https://dl.acm.org/doi/pdf/10.1145/3442188.3445922

Methodology

- Hand curated dataset
- Including ‘stop words’
- No filtering of obscenities or slurs
- Data documentation
- Ongoing corpus edits/expansion to ensure balance and mitigate bias

02

Data Overview

Data Overview

2K Corpus

Manually Compiled + Tagged

Native AAVE speakers

In all habitual be records + most present be records

Data Limitations + Room for Improvement

Team of One

Collaboration with stakeholders is a must

No Sentiment Analysis (Yet!)

Imbalanced sentiment could contribute to bias

Speaker Diversity

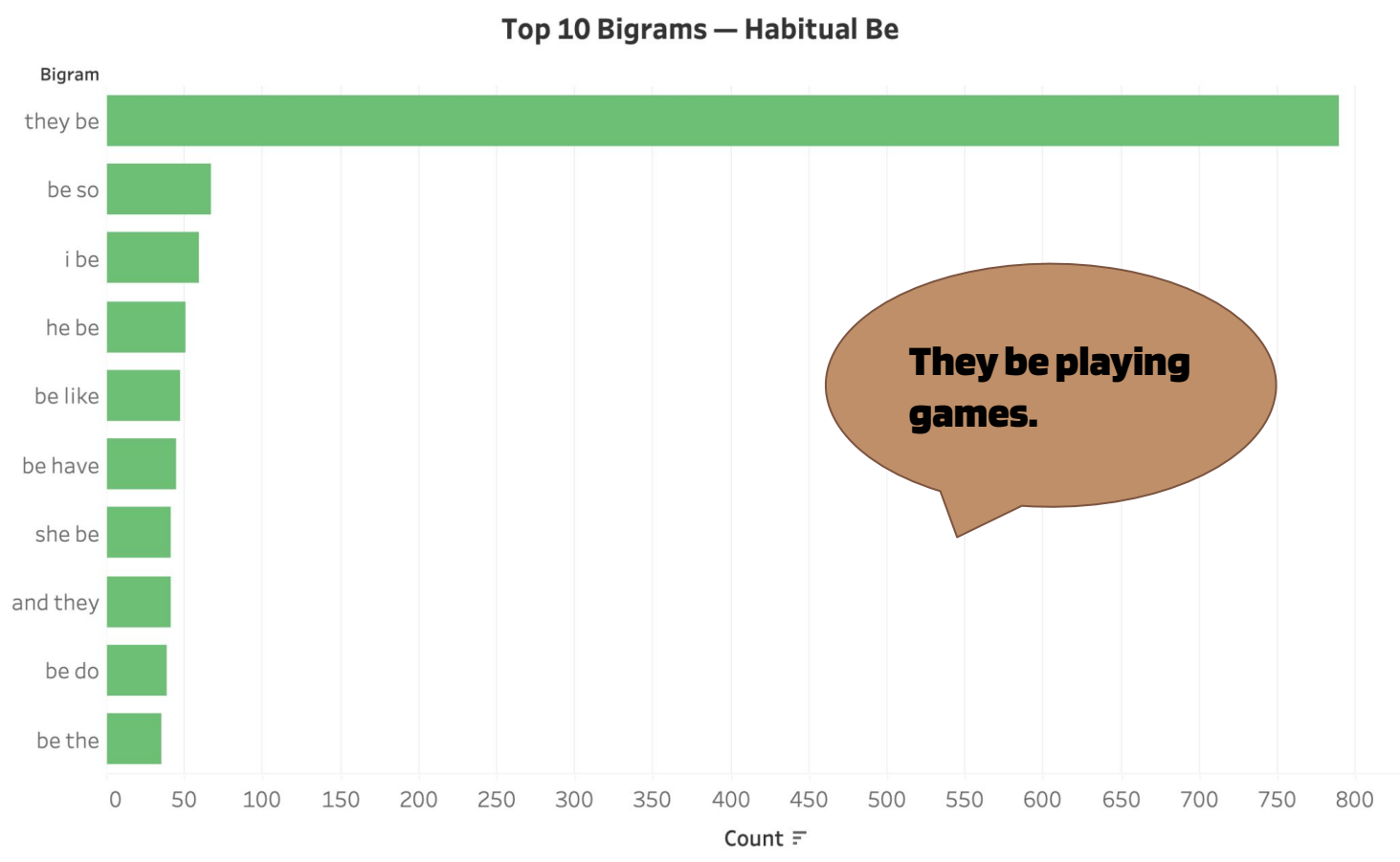
Curate and confirm balanced representation across age, class, gender, sexual orientation, location, and other demographics

Habitual Be Sentences Contain More Curse words

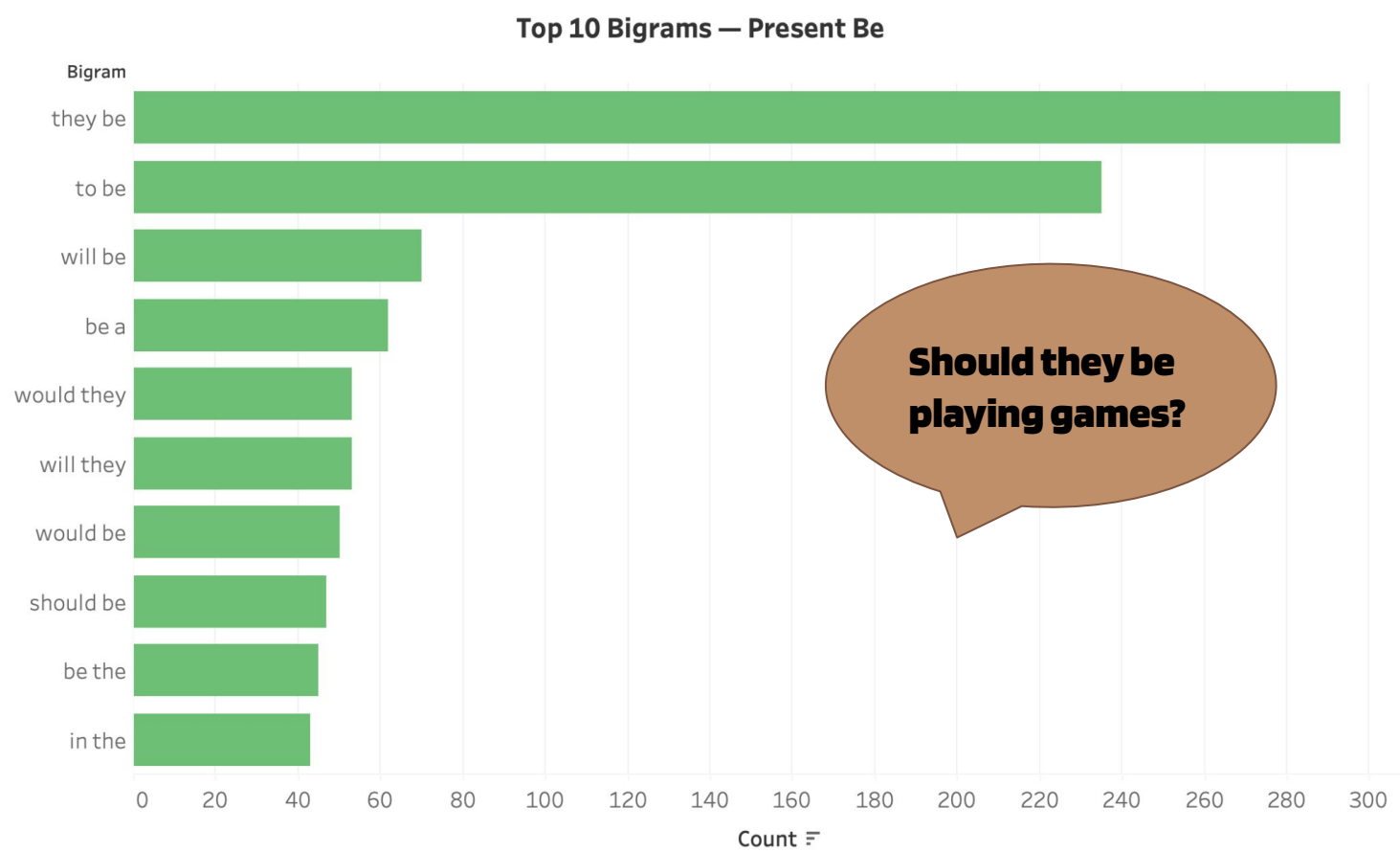
Habitual Be Word Cloud

Present Be Word Cloud

Bigrams are Key



Bigrams are Key



03

Final Model

Multinomial Naive Bayes

	Training	Test
Accuracy	93%	90%
Recall	95%	91%
Precision	91%	89%
F1	0.93	0.90

04

Conclusion + Next Steps

Next Steps

Edit + Expand Corpus

In collaboration with other AAVE speakers + linguists

Model Iterations

support vector machines + neural networks

Train models

Incorporate more aspects of AAVE

Thank you!

Any questions? Drop them in the Q & A!

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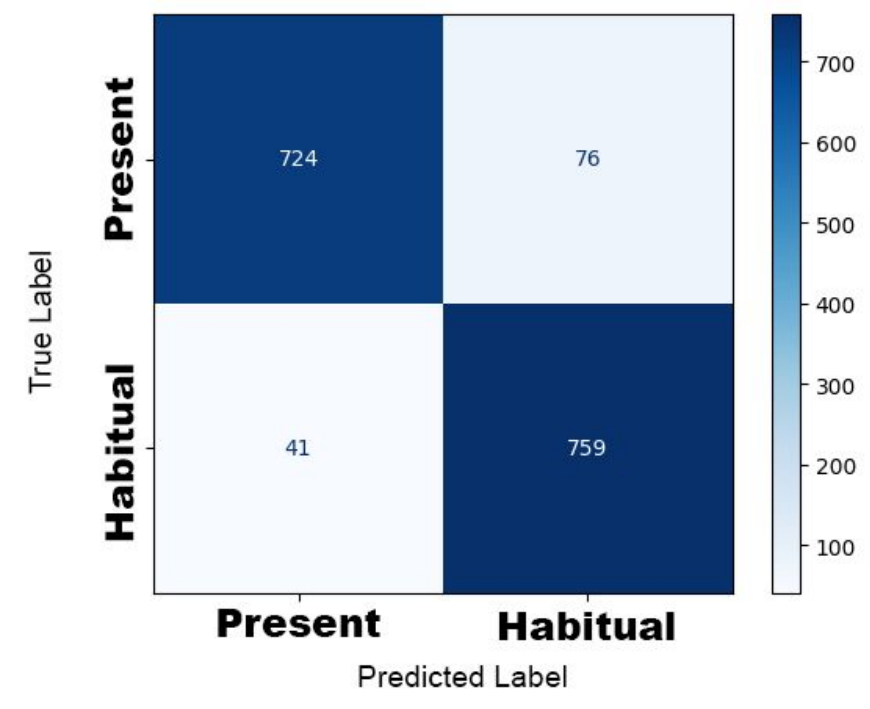
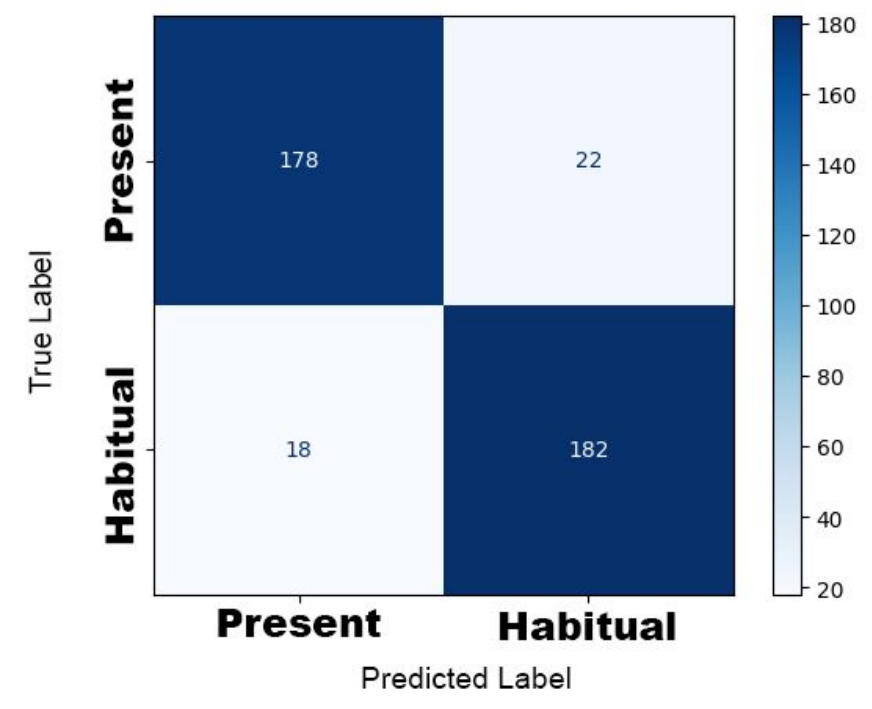
Appendix

Confusion Matrices

Train



Test



Sources & Further Reading

- Emily M. Bender, Timnit Gebru, Angelina McMillan-Major, and Shmargaret Shmitchell. 2021. ***On the Dangers of Stochastic Parrots: Can Language Models Be Too Big?*** 🦜 In Proceedings of the 2021 ACM Conference on Fairness, Accountability, and Transparency (FAccT '21). Association for Computing Machinery, New York, NY, USA, 610–623. https://doi.org/10.1145/3442188.3445922

- Emily M. Bender and Batya Friedman. 2018. ***Data Statements for Natural Language Processing: Toward Mitigating System Bias and Enabling Better Science.*** Transactions of the Association for Computational Linguistics, 6:587–604.https://aclanthology.org/Q18-1041

- Timnit Gebru, Jamie Morgenstern, Briana Vecchione, Jennifer Wortman Vaughan, Hanna Wallach, Hal Daumé III, Kate Crawford. 2018. ***Datasheets for Datasets*** https://arxiv.org/abs/1803.09010

- Samuel Gehman, Suchin Gururangan, Maarten Sap, Yejin Choi, and Noah A. Smith. 2020. ***RealToxicityPrompts: Evaluating Neural Toxic Degeneration in Language Models***. In Findings of the Association for Computational Linguistics: EMNLP 2020, pages 3356–3369, Online. Association for Computational Linguistics.

- Janice E. Jackson, Lisa Green. 2005. ***Tense and Aspectual be in Child African American English.*** In: Verkuyl, H.J., de Swart, H., van Hout, A. (eds) Perspectives on Aspect. Studies in Theoretical Psycholinguistics, vol 32. Springer, Dordrecht. https://doi.org/10.1007/1-4020-3232-3_13

- Margaret Mitchell, Simone Wu, Andrew Zaldivar, Parker Barnes, Lucy Vasserman, Ben Hutchinson, Elena Spitzer, Inioluwa Deborah Raji, and Timnit Gebru. 2019. ***Model Cards for Model Reporting.*** In Proceedings of the Conference on Fairness, Accountability, and Transparency (FAT* '19). Association for Computing Machinery, New York, NY, USA, 220–229. https://doi.org/10.1145/3287560.3287596