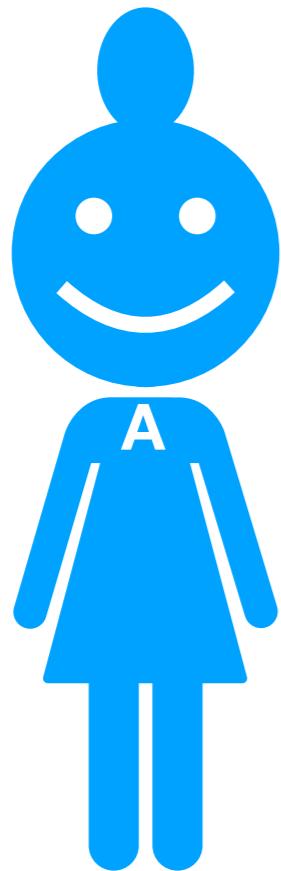


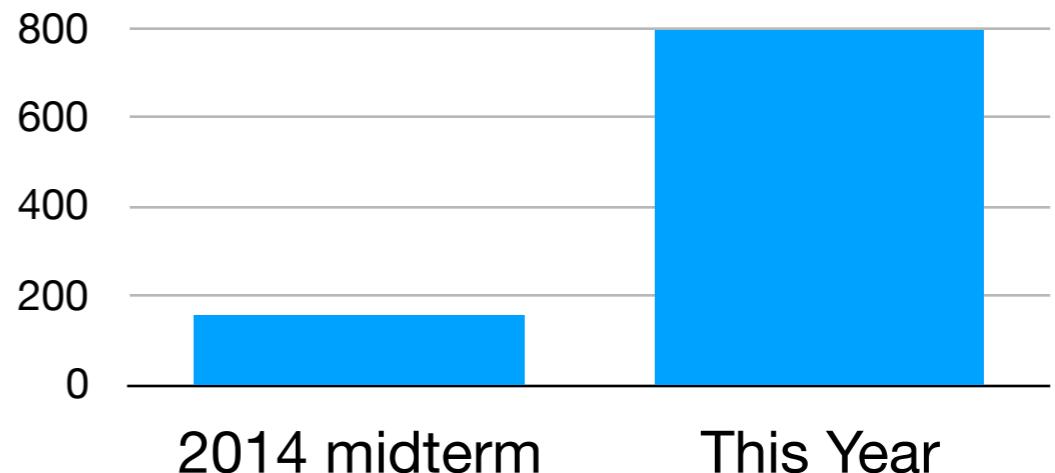
Sampling Talking Points

Ty Yano

I am a responsible citizen!
I want make an informed choice!



A Record 800,000
People Registered to
Vote on National Voter
Registration Day



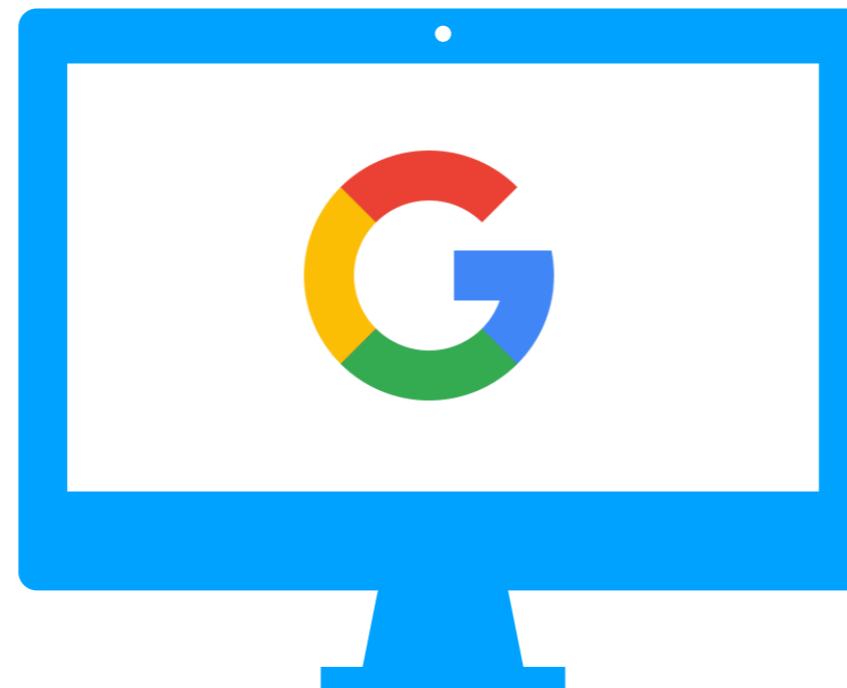
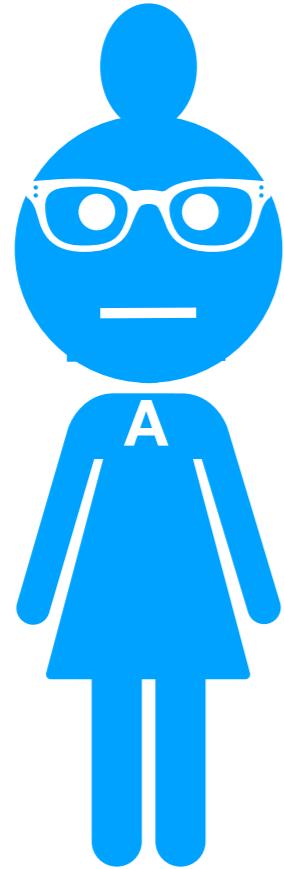
October 1, 2018 Time Magazine

*<http://time.com/5411948/national-voter-registration-drive-record-midterm-elections/>

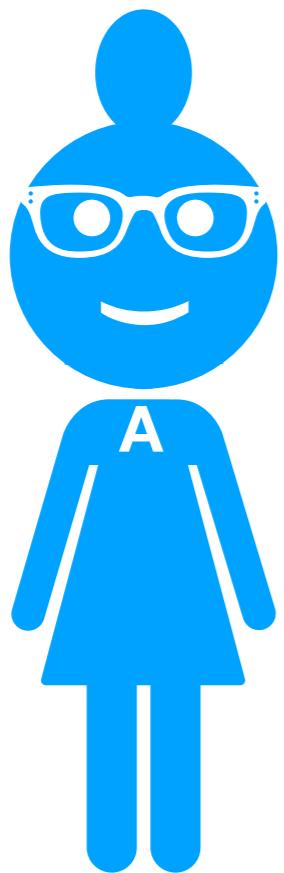
I don't feel good about my **Social Media** ...



Surely, I can't be the only one with such Information Need...



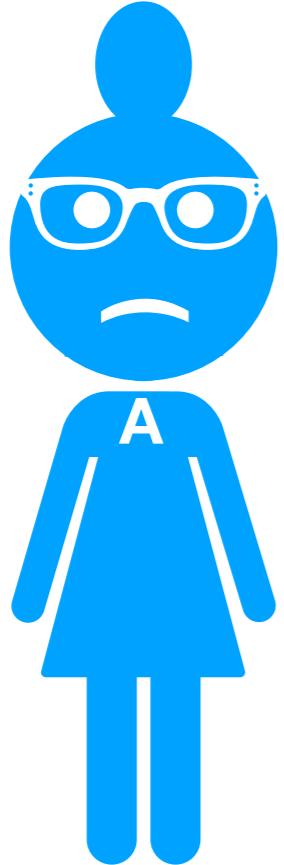
I found a great **content aggregator**
Finally, I can see both side's campaigns



Hum, No tweets?

But I get my news from Twitter...

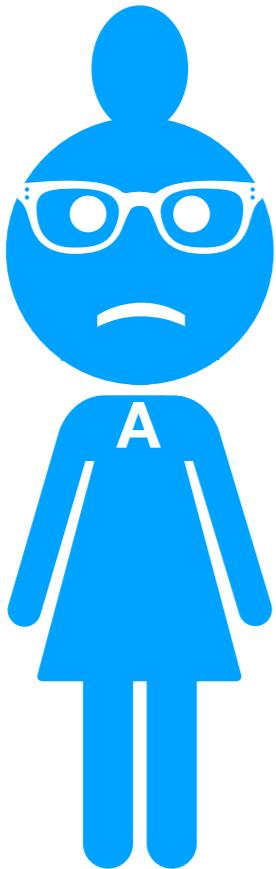
And I think Twitter is very important in this election cycle...



**Information
Need Glass
1/2 full**



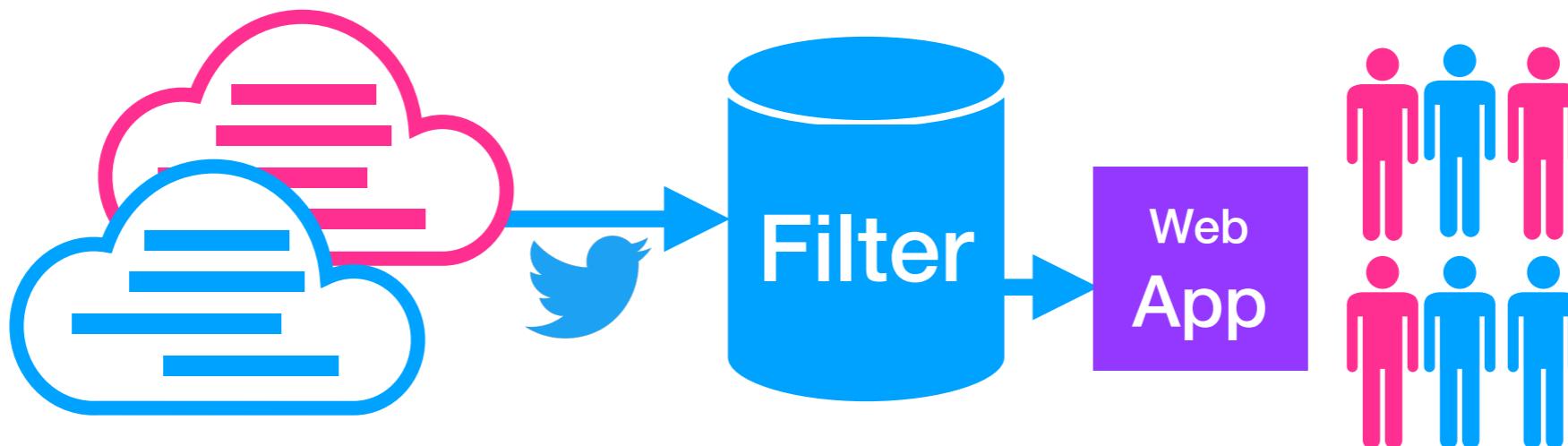
Let's address their information need



- Like many young people, Amy wants to make **informed decision** & **avoid ideological silo**
- Watchdog organizations are already aware of this demand; **campaign ad aggregators** started to popping up.
- **But** they are yet to reach to the most apparent political idea disseminator: **Twitter**

Talking Point Sampler (TPS)

A content aggregation site where user can interface with political campaign **Tweets** from both sides



Find Political Campaign

Select a campaign topic and click "Submit"

Any Issues ▾

Submit

Find Political Campaign

Select a campaign topic and click "Submit"

- Any Issues
- 2nd Amendment and Gun Control
- Reproductive Issue
- Senate, Texas
- Same-Sex Marriage
- Climate Change and Industrial Advancement
- Immigration and Human Rights

Find Political Campaign

Select a campaign topic and click "Submit"

Any Issues

Submit

Query (Keyword):

"2nd Amendment and Gun Control"

Retrieval Summary:

total row: 90 (14 showing)



Liberal



Conservative

<div style="text-align: right; color: blue;">Liberal</div> <div style="border: 1px solid #ccc; padding: 10px;">  <p>Brady Campaign  @Bradybuzz</p> <p>We need young people to turn out to vote this November and we need to make sure that preventing gun violence is a key issue at the ballot box. If we can make that happen, we know we have been successful! -> bit.ly/2q2HuLf</p> <p>10:30 AM - Apr 3, 2018</p> <p>13,450 35 people are talking about this</p> </div>	<div style="text-align: left; color: red;">Conservative</div> <div style="border: 1px solid #ccc; padding: 10px;">  <p>NRA  @NRA</p> <p>CONGRATULATIONS SUPREME COURT NOMINEE BRETT KAVANAUGH</p> <p>#ScotusPick "On behalf of our six million members, the NRA strongly supports Judge Brett Kavanaugh's confirmation to the U.S. Supreme Court. We will be activating our members and tens of millions of supporters throughout the country in support of Judge Kavanaugh." – @ChrisCoxNRA</p> <p>6:24 PM - Jul 9, 2018</p> <p>13,1K 5,199 people are talking about this</p> </div>
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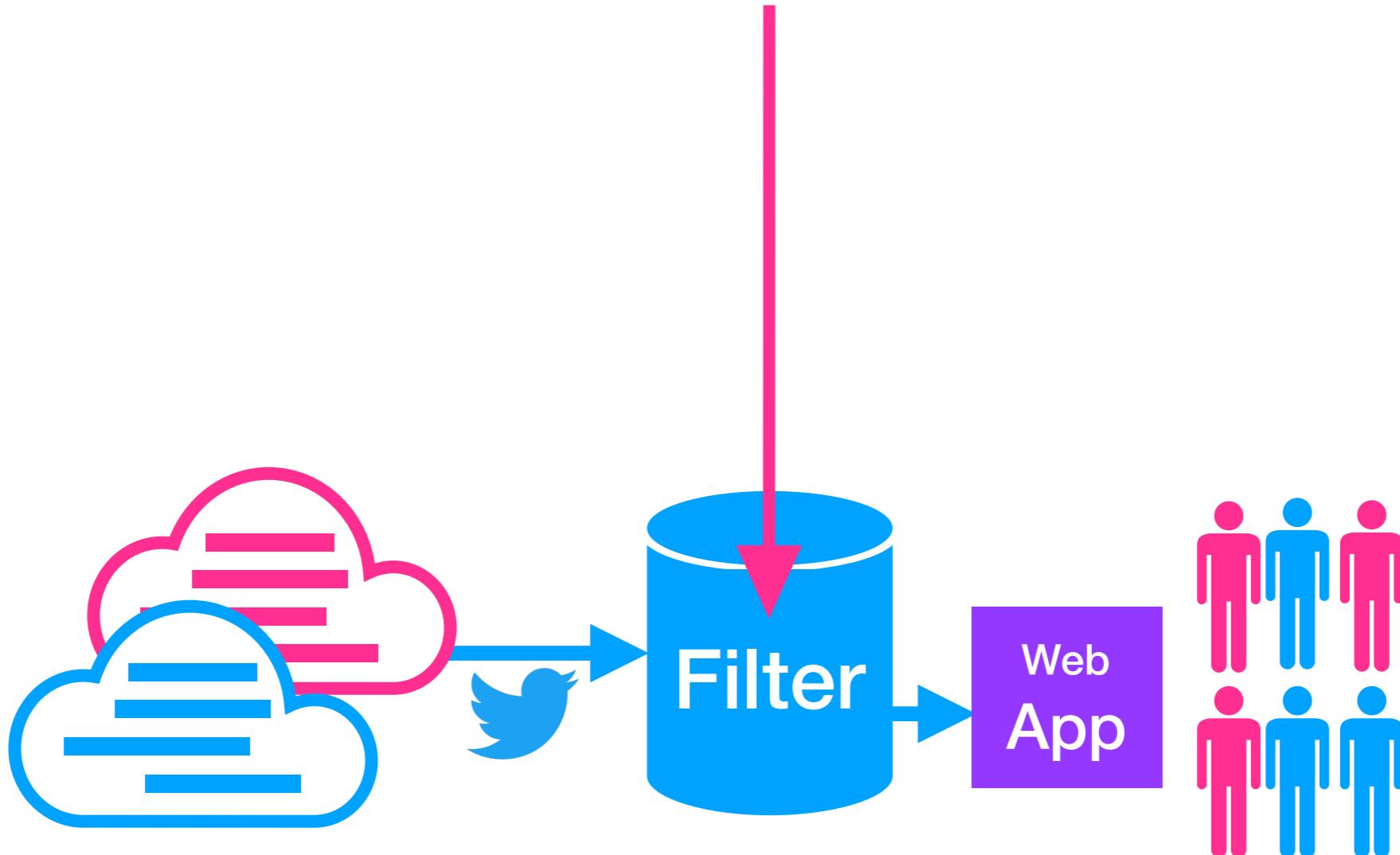
<div style="text-align: right; color: blue;">Liberal</div> <div style="border: 1px solid #ccc; padding: 10px;">  <p>Brady Campaign  @Bradybuzz</p> <p>@BetsyDeVos if we're going to talk about school safety, we NEED to talk about guns. (More than we need to talk about the threat of bears).</p> <p>6:55 AM - Jun 6, 2018 - Washington, DC</p> <p>13,450 316 people are talking about this</p> </div>	<div style="text-align: left; color: red;">Conservative</div> <div style="border: 1px solid #ccc; padding: 10px;"> <p>NRA  @NRA</p> <p>We stand on the precipice of victory – but we have to get concealed carry reciprocity through the Senate. We could have no better champion than @JohnCornyn But we need you to reach out to your U.S. Senators and demand action. - @RepRichHudson #NRAAM #2A #NRA</p> <p>2:42 PM - May 4, 2018</p> <p>735 316 people are talking about this</p> </div>
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<p>Liberal</p> <div style="border: 1px solid #ccc; padding: 10px; background-color: white; margin-bottom: 10px;">  Brady Campaign  @Bradybuzz  <p>We continue to hear from teachers around the country who have made it clear- arming teachers with guns is not the right answer to prevent gun violence. -> on.freep.com/2wGHLcH</p> <p>1:15 PM - May 15, 2018</p>  <p>Poll: Michigan teachers don't want to be ar... The survey was given online to more than 1,000 members of the Michigan Education Association freep.com</p> <p> 33  17 people are talking about this </p> </div> <div style="border: 1px solid #ccc; padding: 10px; background-color: white; margin-bottom: 10px;">  NRA  @NRA  <p>HUGE #WIN FOR GUN OWNERS! "This is a critical issue for law-abiding #gun owners who want to exercise their right to self-defense outside the home. The #2A clearly protects the right to bear arms in public." – @ChrisCoxNRA nraila.org/articles/20180...</p> <p>3:37 PM - Jul 24, 2018</p>  <p>NRA-ILA Federal Appeals Court Confirms ... The NRA applauds a ruling by the 9th Circuit Court of Appeals that confirms the Second nraila.org</p> <p> 7,602  2,930 people are talking about this </p> </div>	<p>Conservative</p>
--	----------------------------

<p>Liberal</p> <div style="border: 1px solid #ccc; padding: 10px; background-color: white; margin-bottom: 10px;">  Brady Campaign  @Bradybuzz  <p>DISARM HATE</p>  <p>Today and every day we remember all of those who were shot and killed at #Pulse nightclub and the many more who were affected by the tragic event. Together we can prevent gun violence and #disarmhate.</p> <p>9:55 AM - Jun 12, 2018</p> <p> 168  91 people are talking about this</p> </div> <div style="border: 1px solid #ccc; padding: 10px; background-color: white; margin-bottom: 10px;">  NRA  @NRA  <p>"Be true to who you are, no matter who's watching. And never, ever stop fighting for the most important thing we have as #Americans... OUR #FREEDOM!" –@ChrisCoxNRA #HSLS2018 #ThursdayThoughts</p> <p>8:02 AM - Jul 26, 2018 · Washington, DC</p> <p> 731  274 people are talking about this </p> </div>	<p>Conservative</p>
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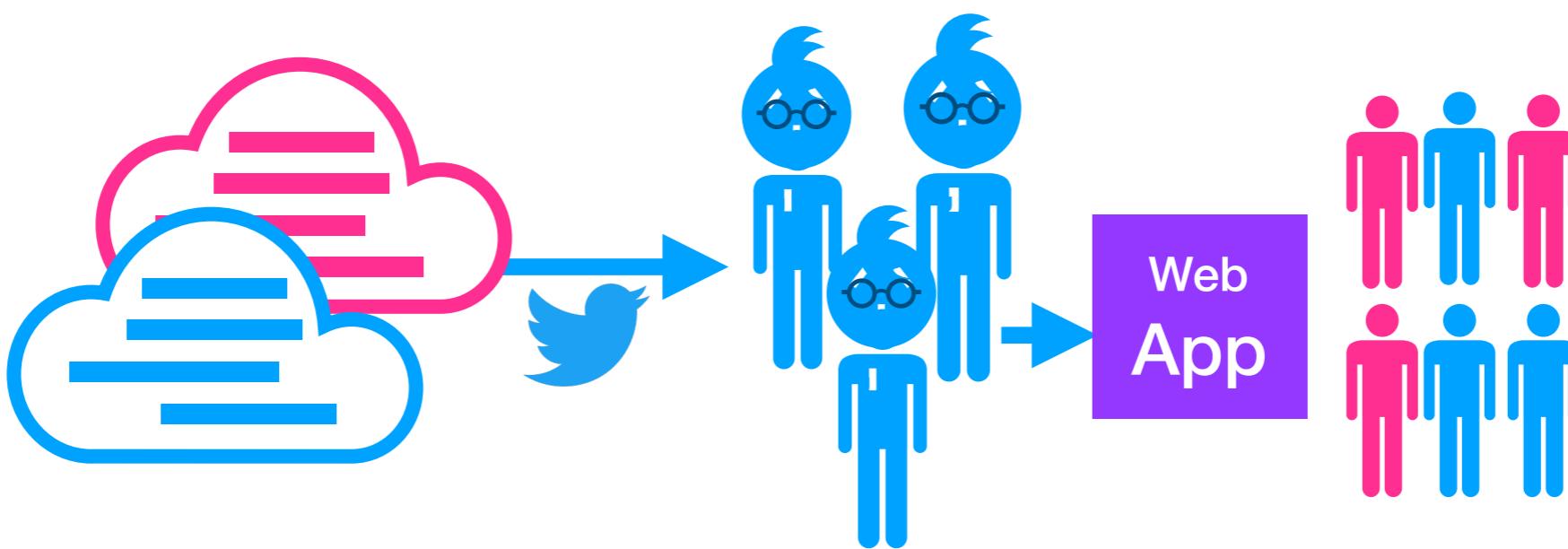
<p>Liberal</p> <div style="border: 1px solid #ccc; padding: 10px; background-color: white; margin-bottom: 10px;">  Brady Campaign  @Bradybuzz  <p>s AND we need</p> <p>...</p> </div>	<p>Conservative</p>
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Lets talk about the filter

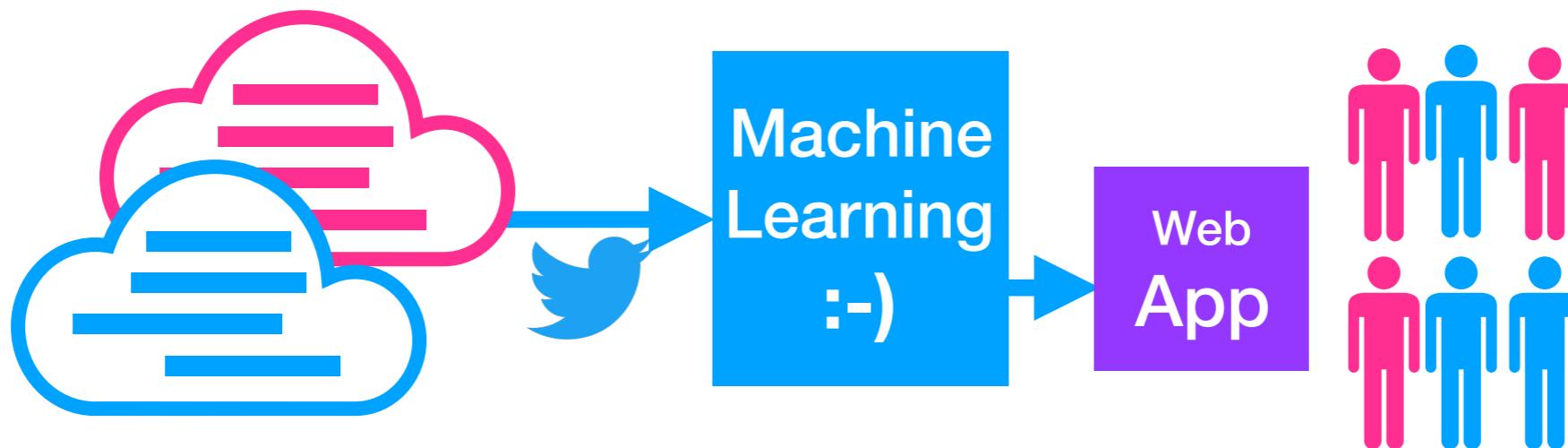


Human power curation do not scale up

Existing political ads filters are often powered by expert or cloud sourced man power; **massively manual effort**;

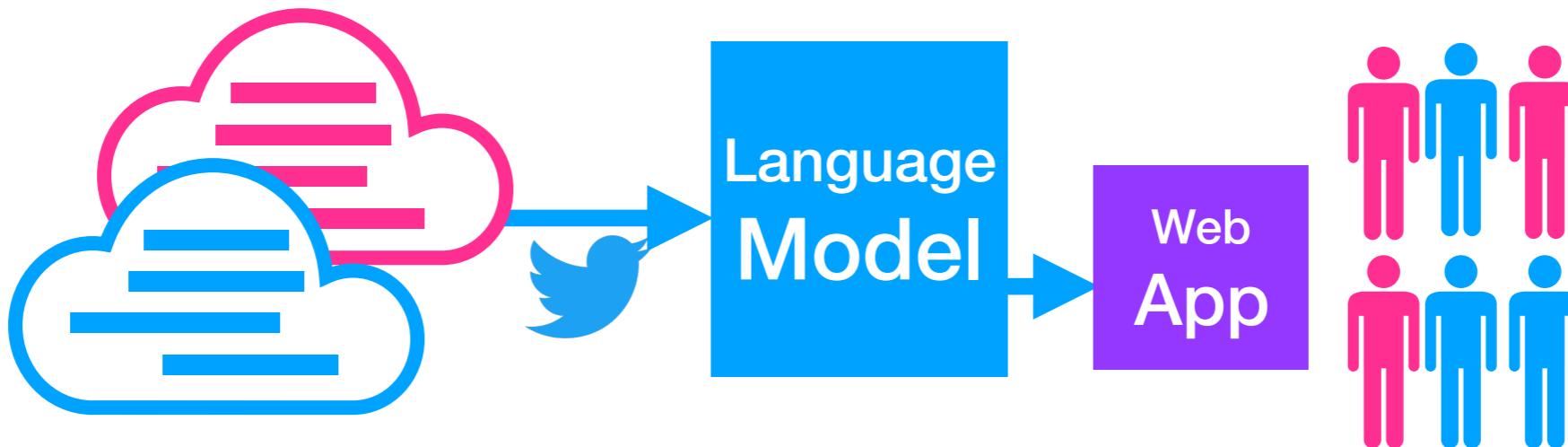


Better solution: automation through Machine learning



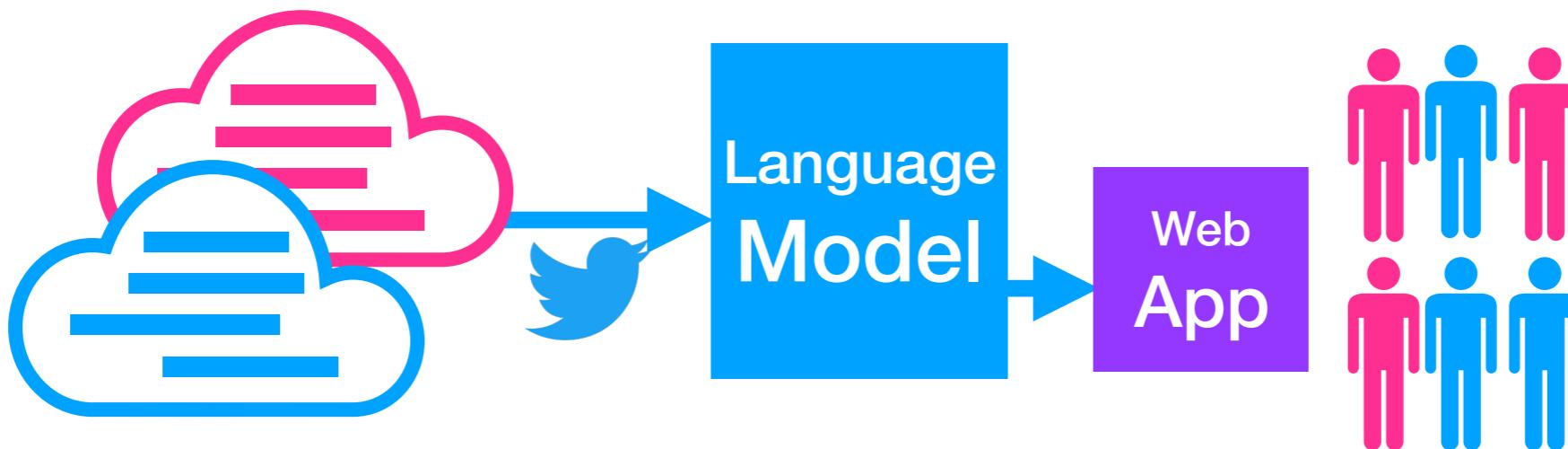
Political Campaign Language Model for Tweet Filtering

A type of ML model which estimate probability of sentence



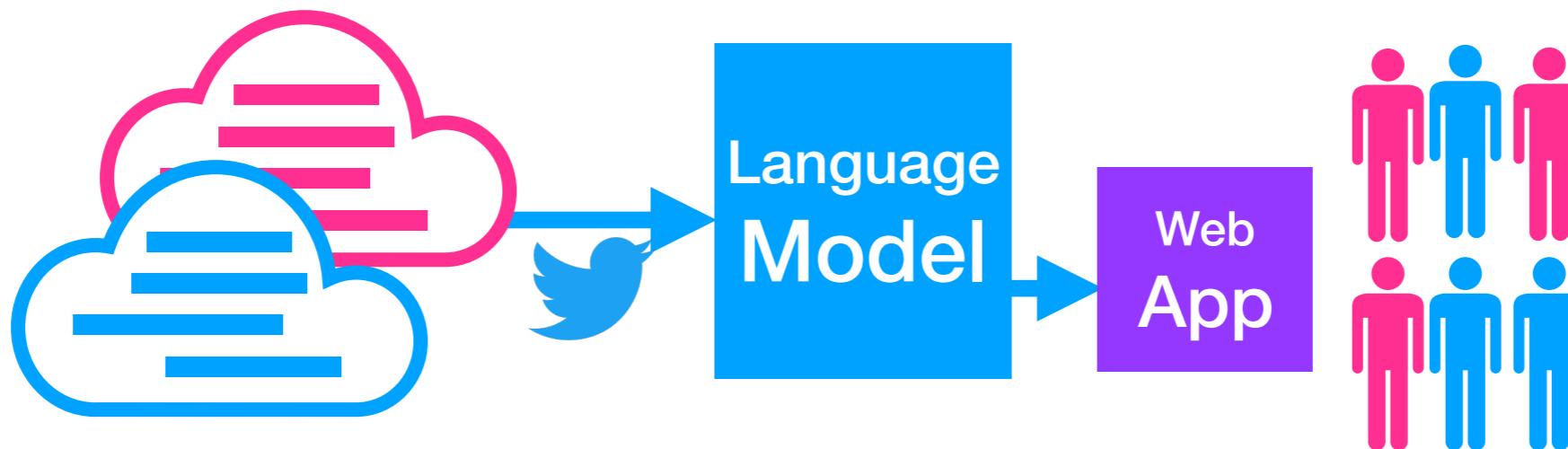
Why Language Model

- It works on **text**; not rely on site specific meta data; can **scale across platform easier**
- It can be **trained without negative example**



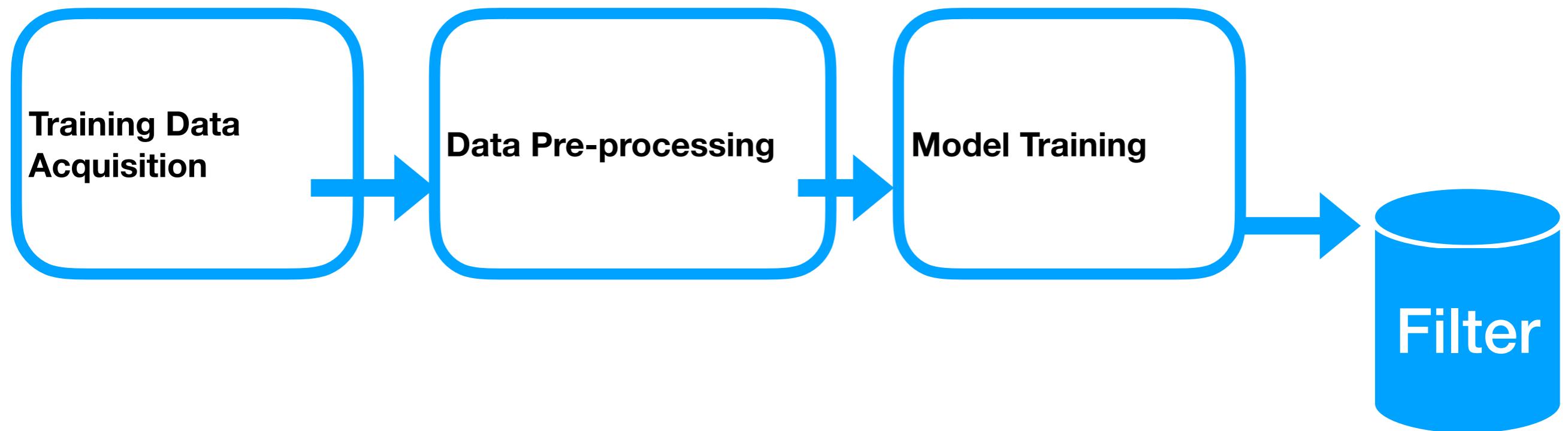
Why Language Model

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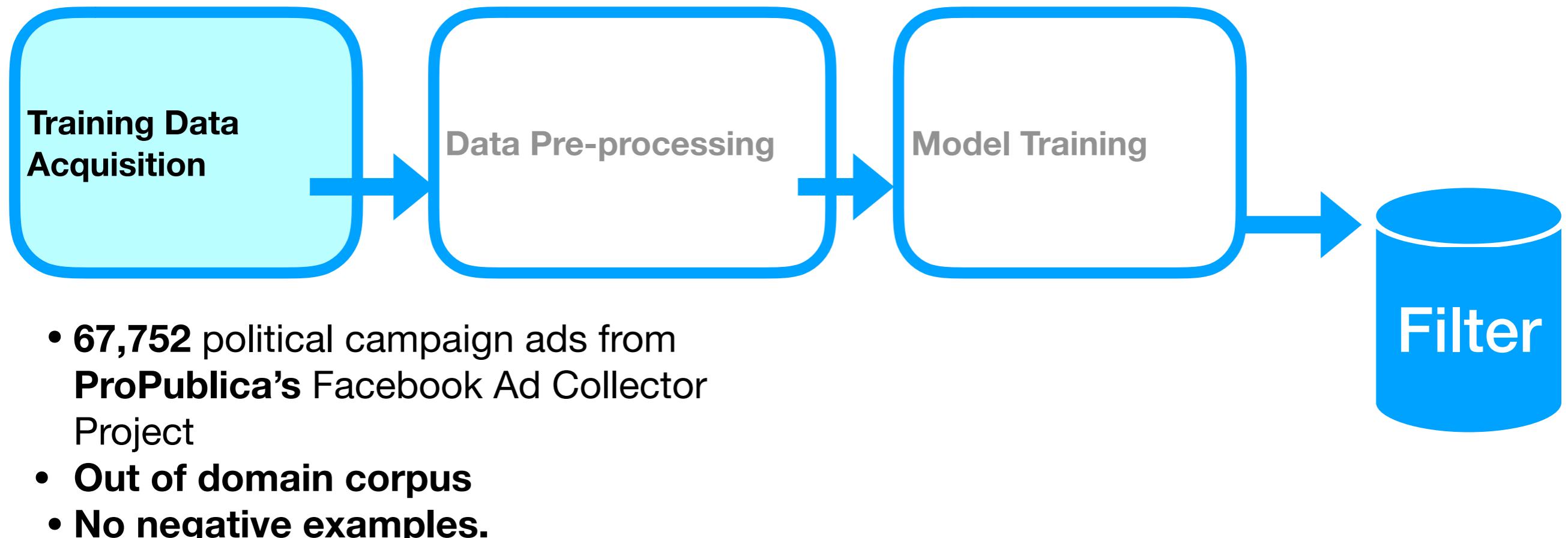


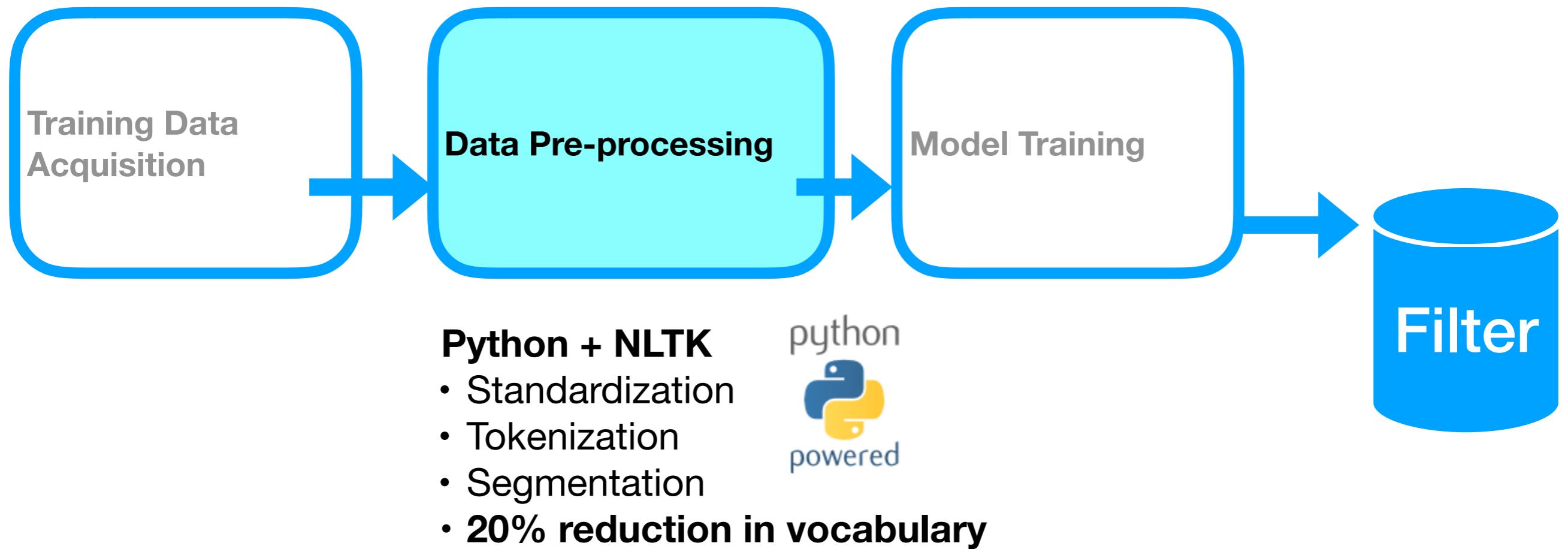
Caveat: It is not intended
for discriminative tasks :(

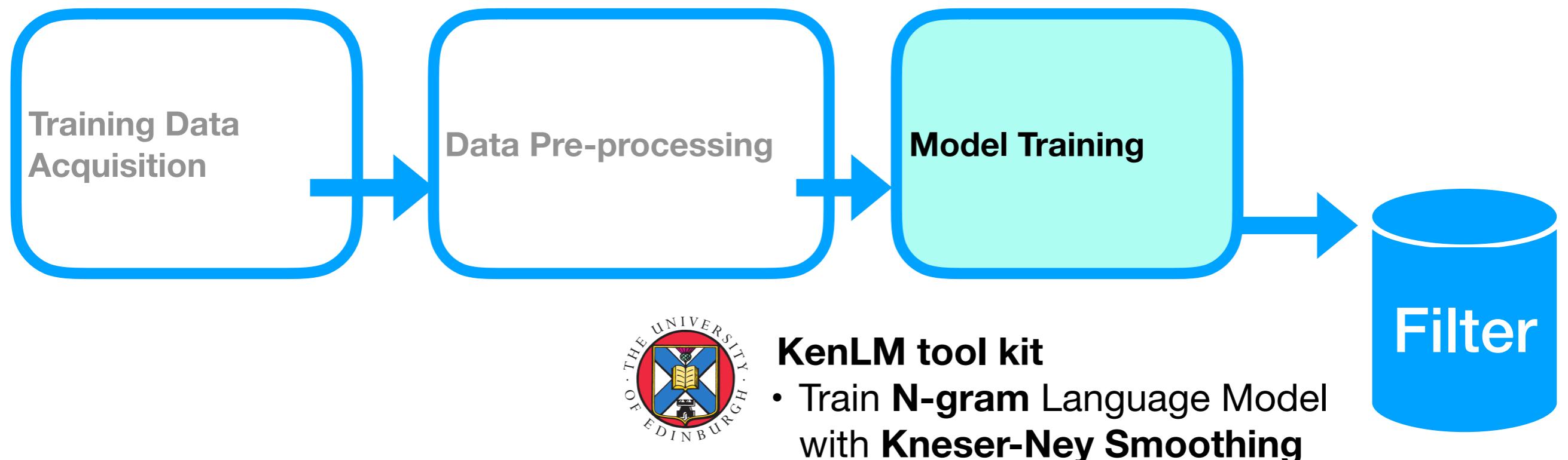
Training pipeline

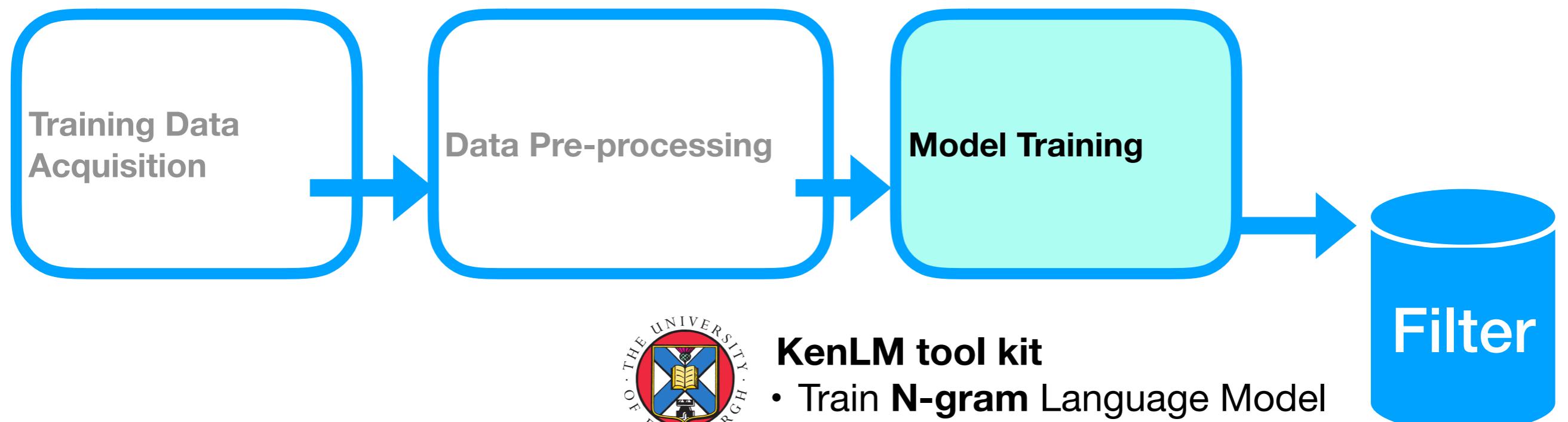


point out: its not tweet
no negative examples
The trick i promised
If time, note on KenNL



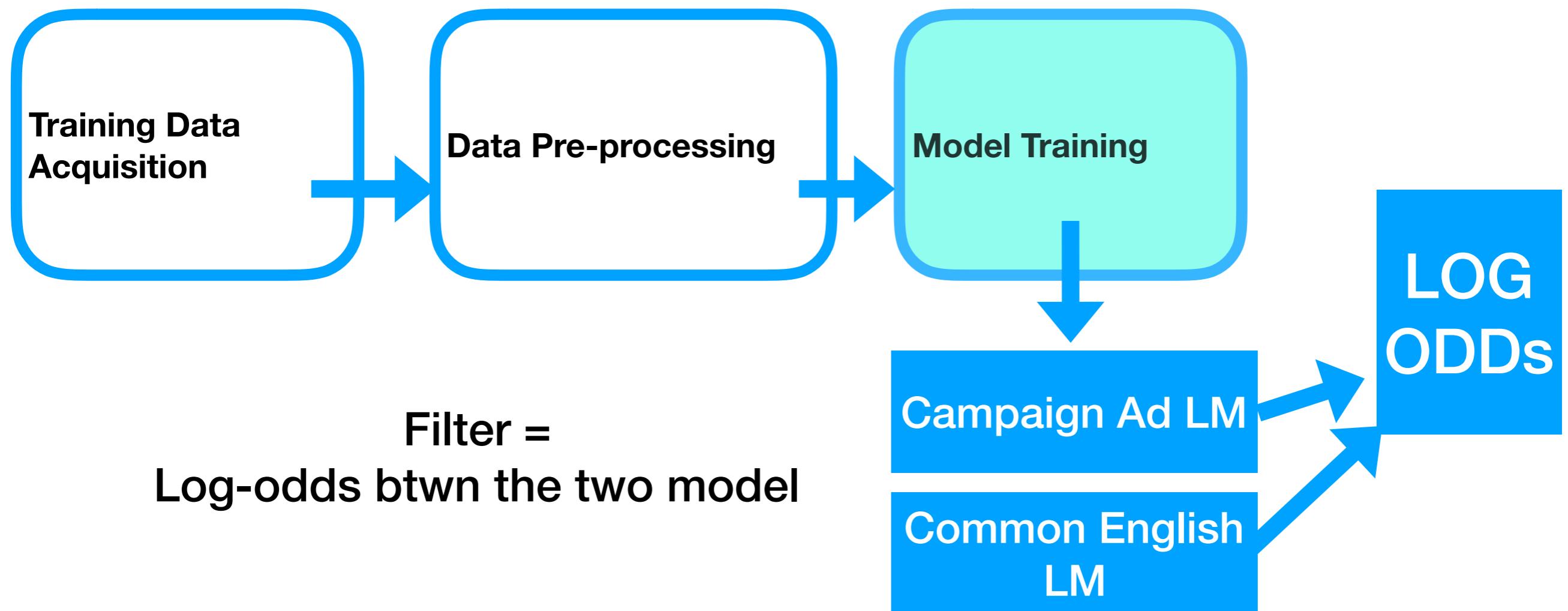




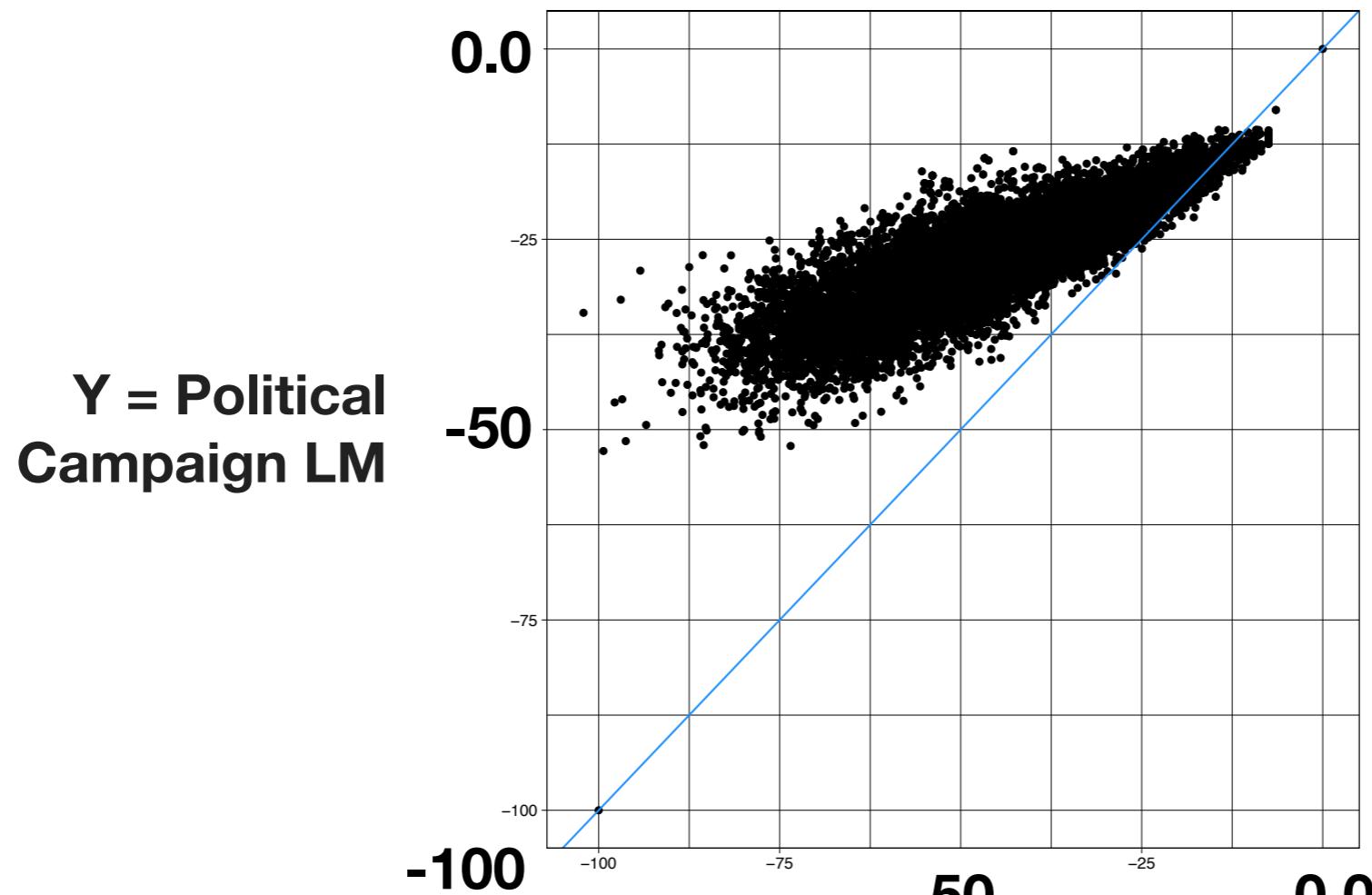


KenLM tool kit

- Train **N-gram Language Model** with **Kneser-Ney Smoothing**
- Train another Language Model using **Brown Corpus of Standard American English**

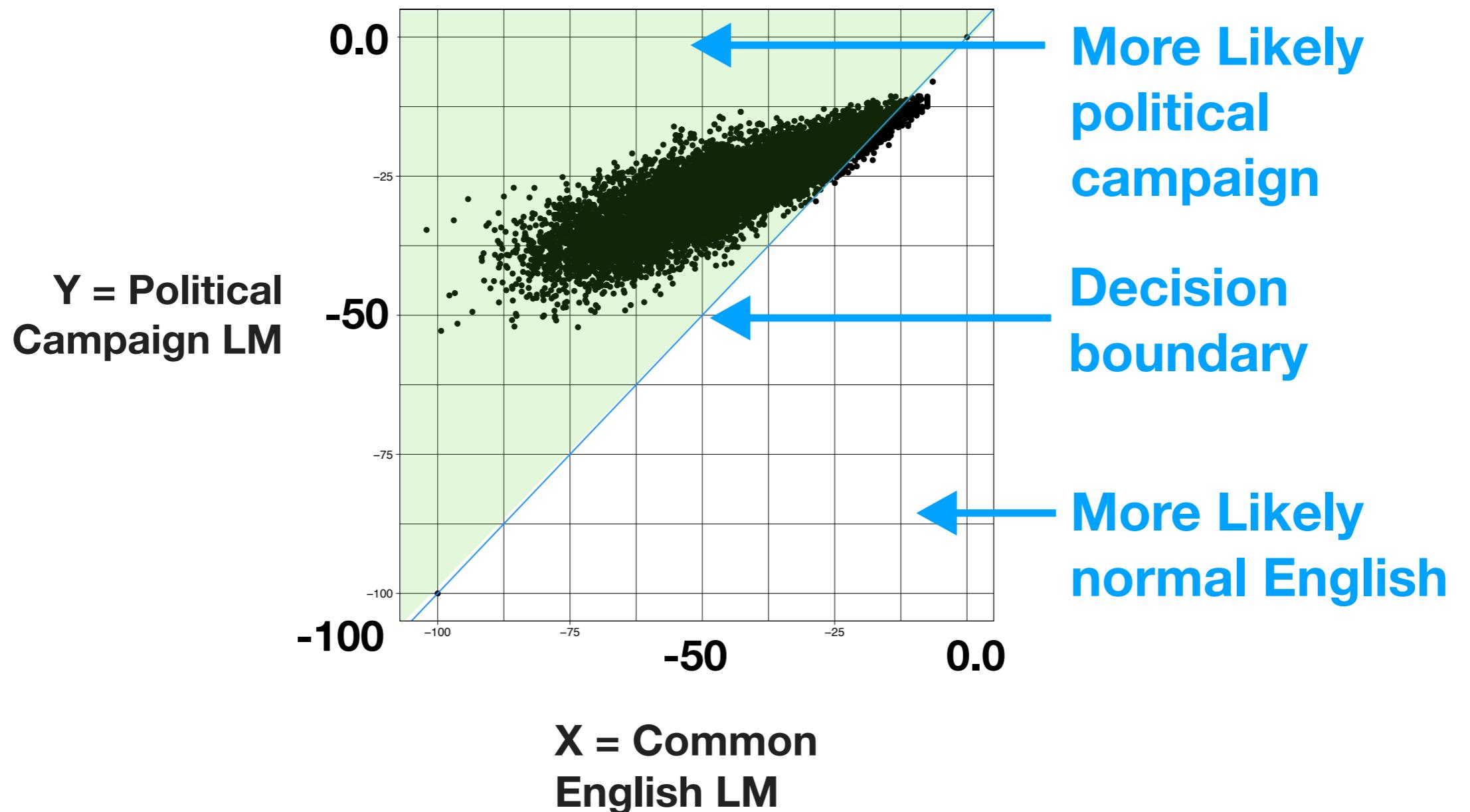


Log-probabilities of sample political ads

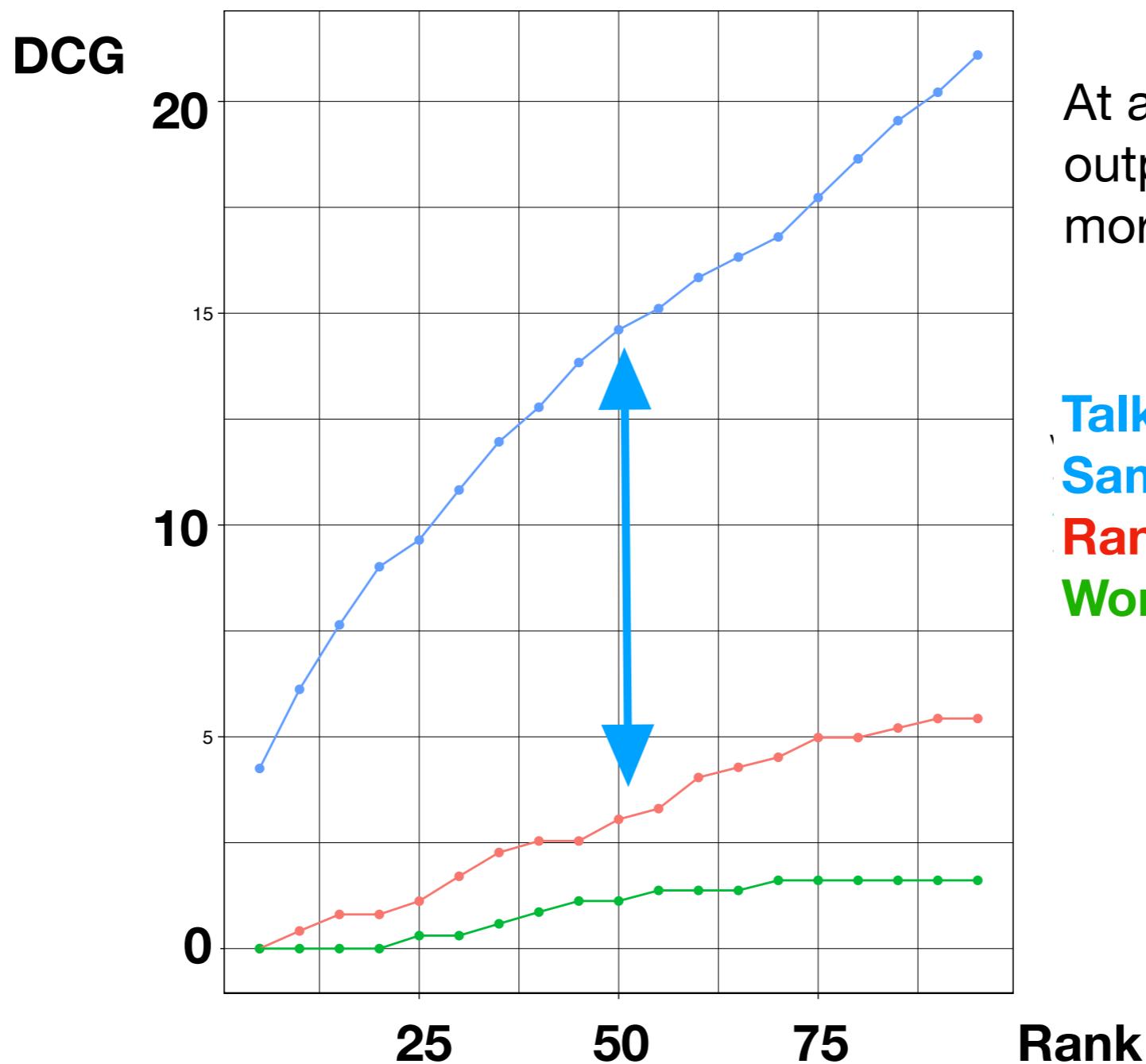


Why take difference between the two models? Here is some intuitions

Contrast between two make a neat decision boundary



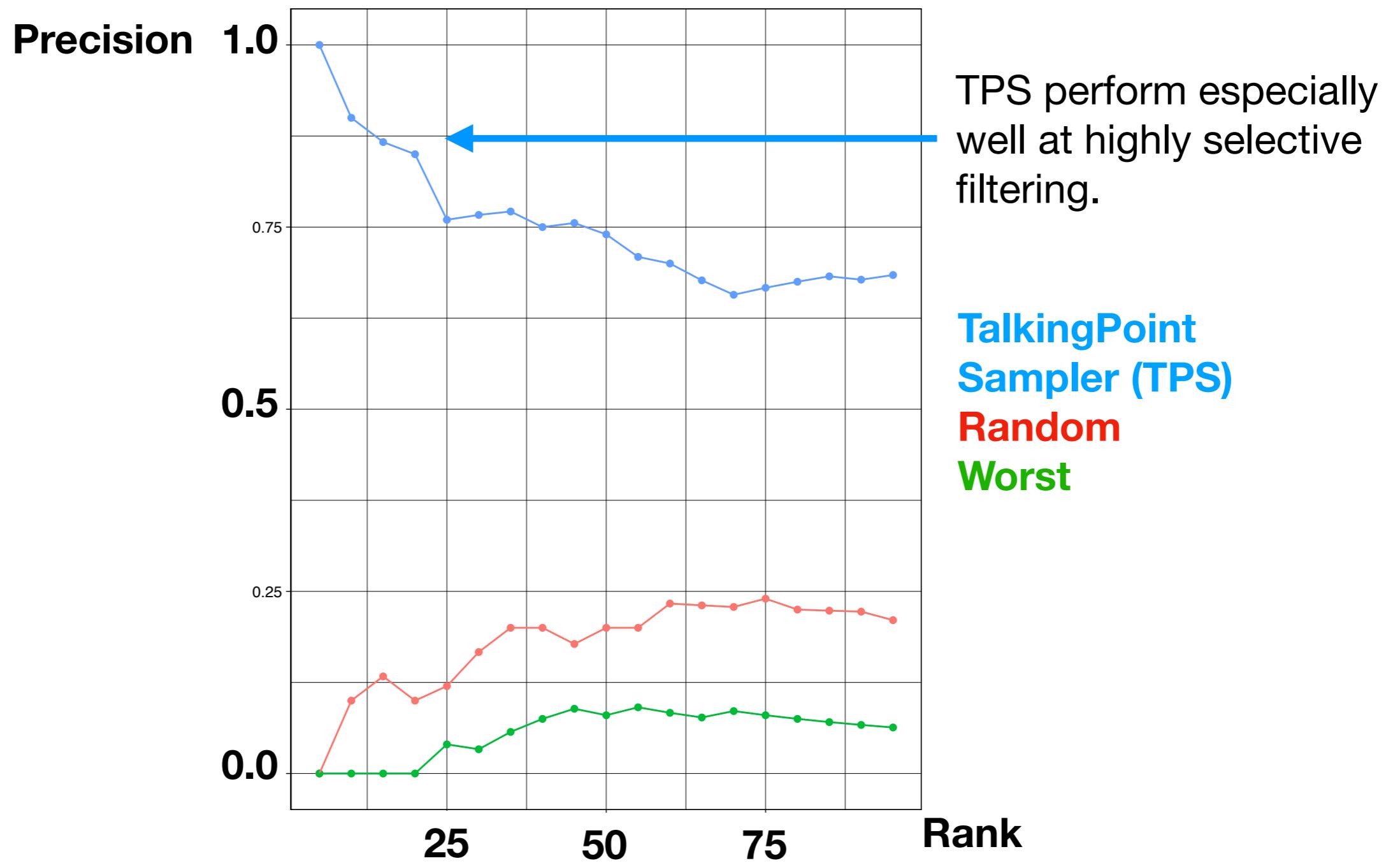
Discounted Cumulative Gain



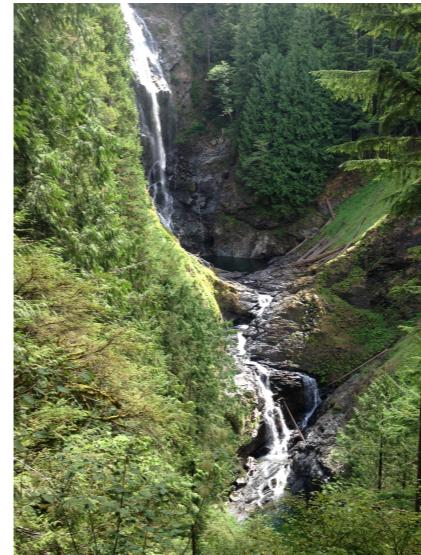
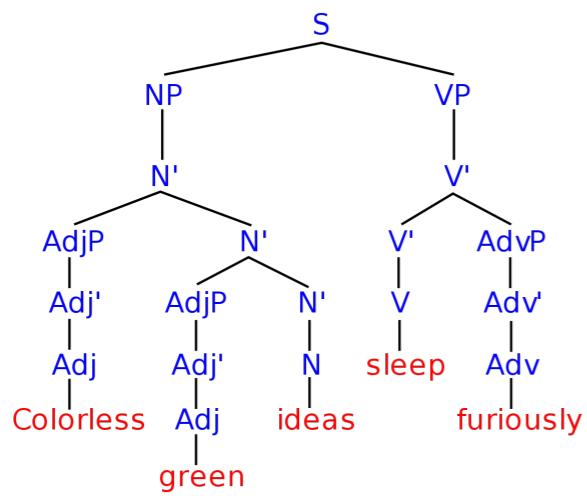
At all position TPS
outperform the baseline
more than 7+ points

TalkingPoint
Sampler (TPS)
Random
Worst

Precisions at rank K



Ty Yano, Ph.D



**Carnegie Mellon University
Computer Science
Ph.D**

End of presentation