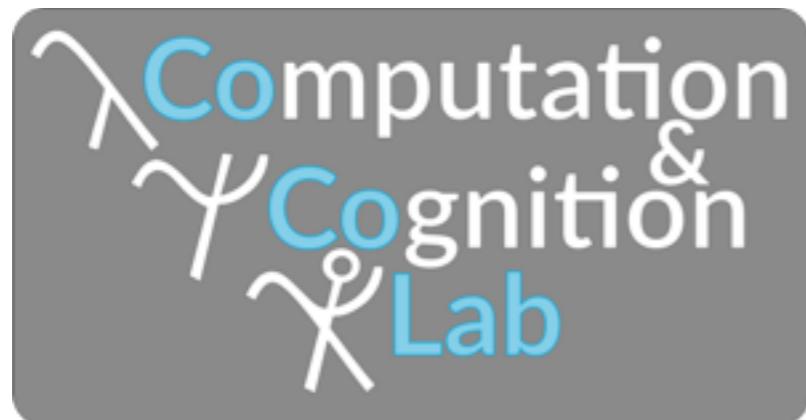


Black Lives Matter: the role of prior beliefs and the QUD in (preventing) exhaustivity inferences

Judith Degen
28-29.3.2017

Formal Pragmatics and Social Meaning Workshop





Black Lives Matter
HOLD Police ACCOUNTABLE
END RACISM



TEXAS Consumer @TexasConsumer · Feb 19

#BlackLivesMatter 🕊 is extremely racist! #AllLivesMatter

BLACK LIVES MATTER

OTHER HUMAN LIVES MATTER

WHALE LIVES MATTER

ALL OCEAN LIFE MATTERS

**ALL MAMMALS, BIRDS, REPTILES,
INSECTS, BACTERIAL LIVES MATTER**

TREES, FLOWERS, FOOD CROP LIVES MATTER

ALL LIVES MATTER!

#AllLivesMatter

Plan

“All lives matter” as failure of pragmatic inference

1. Quantity inferences in RSA
2. Three important factors:
 1. alternatives
 2. QUD
 3. prior beliefs

What does RSA stand for?

Quantity inferences

Types of Quantity inferences

Scalar

Bob did some of the readings.

→ Bob did some, but not all, of the readings.

Types of Quantity inferences

Scalar

*Bob did **some/all** of the readings.*

→ Bob did **some**, but not **all**, of the readings.

When it is said that Bob did some of the readings, some could mean all because if he did all of the readings then he did some of the readings
Standard interpretation is that rather than assuming he did all of the readings (which includes some), he did some of the readings but not all

Types of Quantity inferences

Scalar

*Bob did **some/all** of the readings.*

→ Bob did **some**, but not **all**, of the readings.

Jane is a good writer.

→ Jane is not a brilliant writer.

Types of Quantity inferences

Scalar

*Bob did **some/all** of the readings.*

→ Bob did **some**, but not **all**, of the readings.

*Jane is a **good/brilliant** writer.*

→ Jane is not a **brilliant** writer.

Types of Quantity inferences

Scalar

*Bob did **some/all** of the readings.*

→ Bob did **some**, but not **all**, of the readings.

*Jane is a **good/brilliant** writer.*

→ Jane is not a **brilliant** writer.

The utterance alternatives matter to interpretation

Types of Quantity inferences

Exhaustivity

I had a salad for dinner.

→ I had a salad for dinner and nothing else.

Types of Quantity inferences

Exhaustivity

I had a salad for dinner.

→ I had a salad for dinner and nothing else.

Black lives matter.

→ Black lives matter and no other ones do.

Types of Quantity inferences

Exhaustivity

I had a salad for dinner.

→ I had a salad for dinner and nothing else.

Black lives matter.

→ Black lives matter and no other ones do.

Why (not)? What are potential alternatives?

Types of Quantity inferences

Exhaustivity

I had a salad for dinner.

→ I had a salad for dinner and nothing else.

Black lives matter.

→ Black lives matter and no other ones do.

Why (not)? What are potential alternatives?

Black lives don't matter.

All lives matter.

Types of Quantity inferences

Exhaustivity

I had a salad for dinner.

→ I had a salad for dinner and nothing else.

Black lives matter.

→ Black lives matter and no other ones do.

Why (not)? What are potential alternatives?

Black lives don't matter.

All lives matter.

Types of Quantity inferences

Exhaustivity

I had a salad for dinner.

→ I had a salad for dinner and nothing else.

Black lives matter.

→ Black lives matter and no other ones do.

Why (not)? What are potential alternatives?

Response to interpretation

Black lives don't matter. → *Black lives matter, too.*

All lives matter. → *Only black lives matter.*

What modulates exhaustivity?

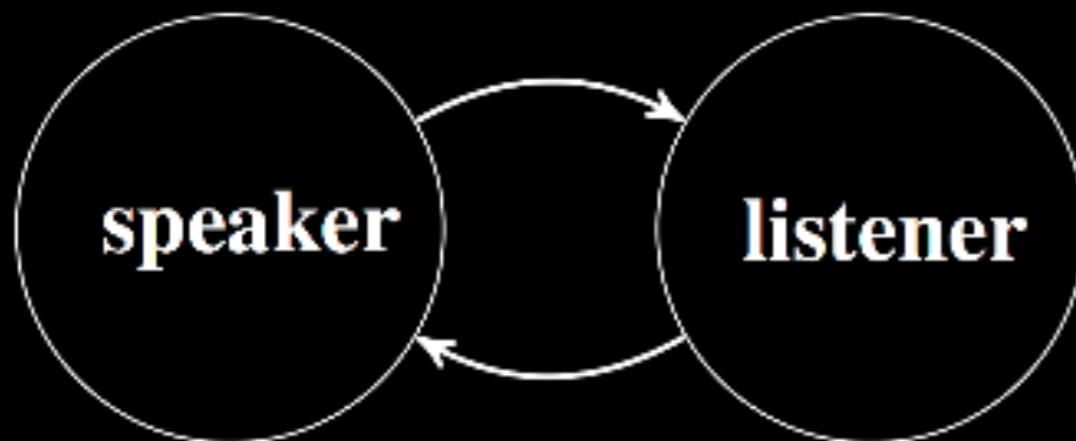
- syntax (e.g., English *it*-clefts, French *c'est* clefts, fronting, Hungarian pre-verbal focus, German *es*-cleft exclusives)
- pragmatics (e.g., QUD, alternatives)

Question under discussion

Beaver & Clark 2008; Szabolcsi (1981); Destruel et al. 2015; Onea & Beaver 2011; Beaver & Clark 2008; Velleman et al 2012; Onea & Beaver 2011; Drenhaus et al 2011; Byram Washburn et al 2013; van Rooij & Schulz 2004; Spector 2016

Quantity inferences in the Rational Speech Act framework

Probabilistic pragmatics



Plural predication

Scontras & Goodman 2016

Vague quantifiers

Schöller & Franke 2016

In the works:

I-implicatures Poppels & Levy

overinformativeness Degen & Goodman

generics Tessler & Goodman

modals Herbstritt & Franke

Reference

Frank & Goodman 2012; Degen & Franke 2012; Qing & Franke 2015; Franke & Degen, 2016; Graf et al. 2016

Cost-based Quantity implicatures

Degen et al. 2013; Rohde et al. 2012

Scalar implicatures

Franke 2009; 2011; Russell 2012; Goodman & Stuhlmüller 2013; Degen et al. 2015

Embedded implicatures

Potts et al. 2016; Bergen et al. 2016

M-implicatures

Bergen et al., 2012

Figurative meaning

Kao et al., 2013; 2014; 2015

Gradable adjectives

Lassiter & Goodman, 2013; 2015; Qing & Franke, 2014

RSA for scalar implicature

$$M = \{m_{\neg \exists}, m_{\exists \neg \forall}, m_{\forall}\}$$

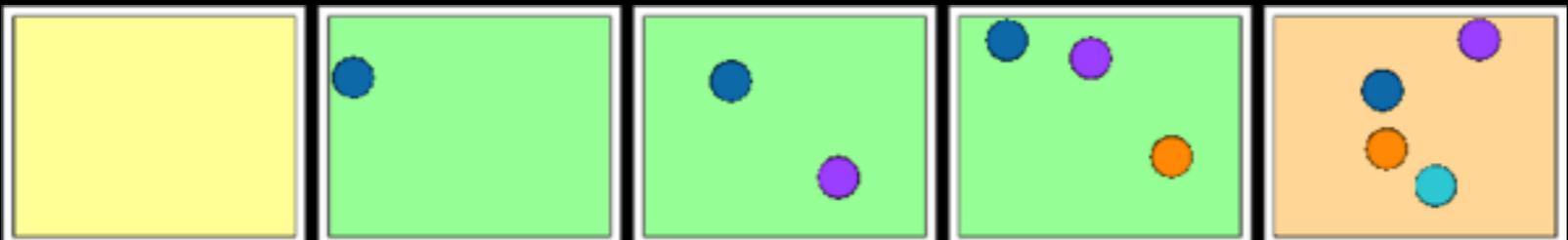
$$U = \{u_{\text{none}}, u_{\text{some}}, u_{\text{all}}\}$$

$$[[u_{\text{none}}]] = \{m_{\neg \exists}\}$$

$$[[u_{\text{some}}]] = \{m_{\exists \neg \forall}, m_{\forall}\}$$

$$[[u_{\text{all}}]] = \{m_{\forall}\}$$

$$\mathcal{L}(u, m) = \begin{cases} 0 & \text{if } m \notin [[u]] \\ 1 & \text{if } m \in [[u]] \end{cases}$$

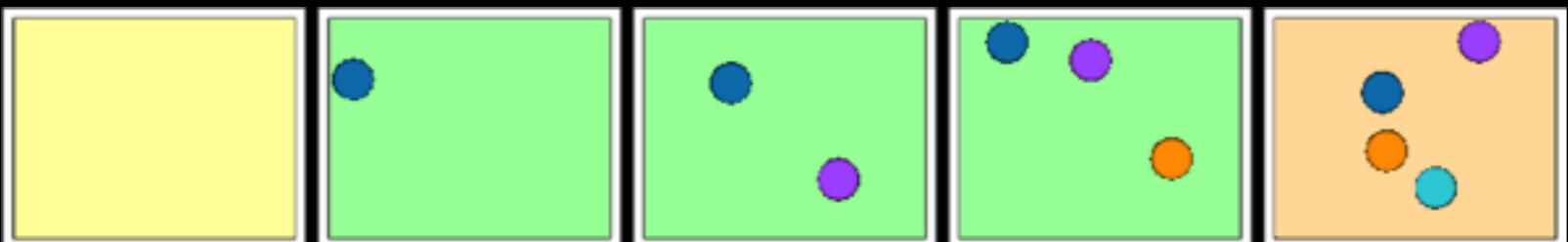


Ann found some of her marbles

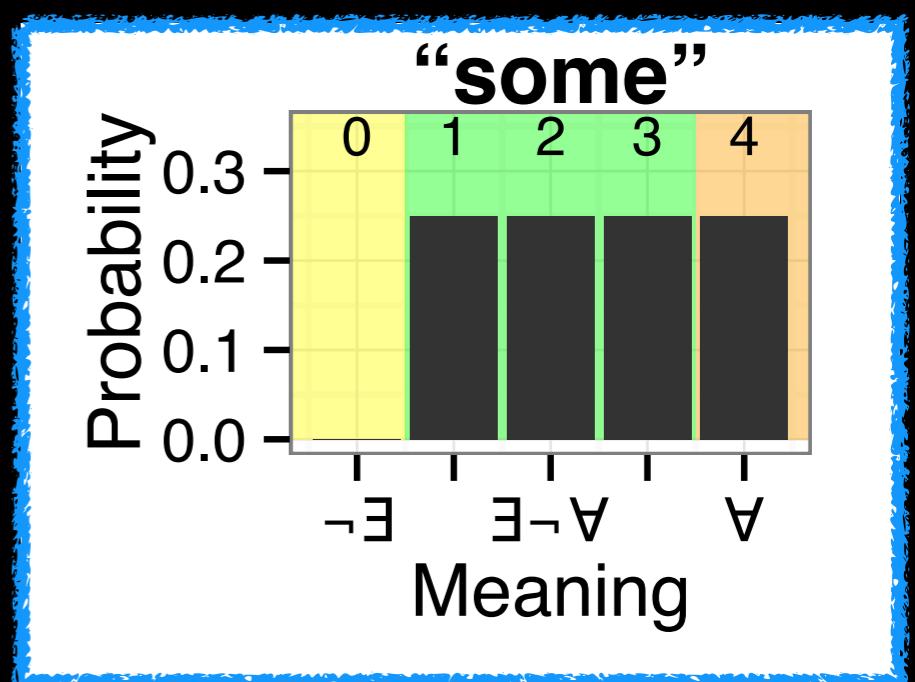
RSA for scalar implicature

Literal listener

$$P_{L_0}(m|u) \propto \mathcal{L}(u, m) \cdot P(m)$$



$$\begin{aligned}M &= \{m_{\neg\exists}, m_{\exists\neg\forall}, m_\forall\} \\U &= \{u_{\text{none}}, u_{\text{some}}, u_{\text{all}}\} \\[[u_{\text{none}}]] &= \{m_{\neg\exists}\} \\[[u_{\text{some}}]] &= \{m_{\exists\neg\forall}, m_\forall\} \\[[u_{\text{all}}]] &= \{m_\forall\}\end{aligned}$$



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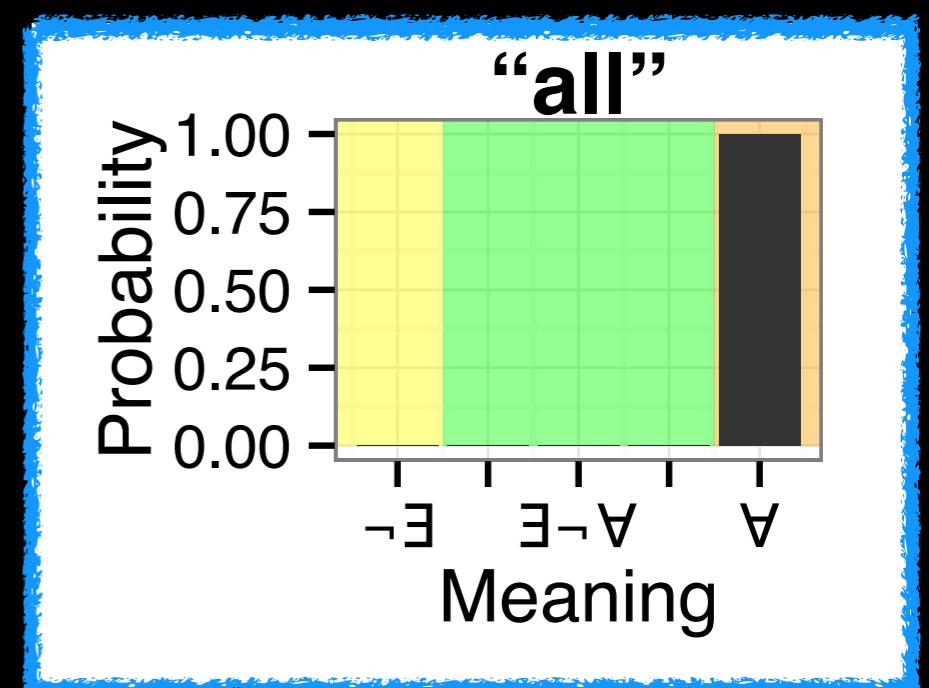
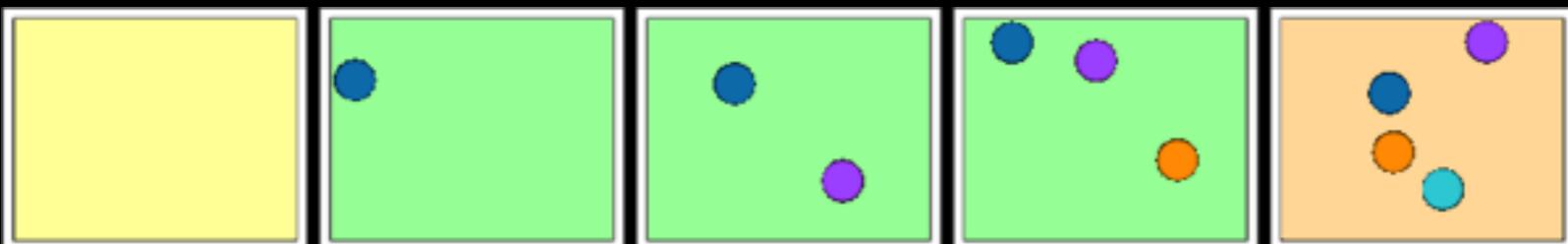
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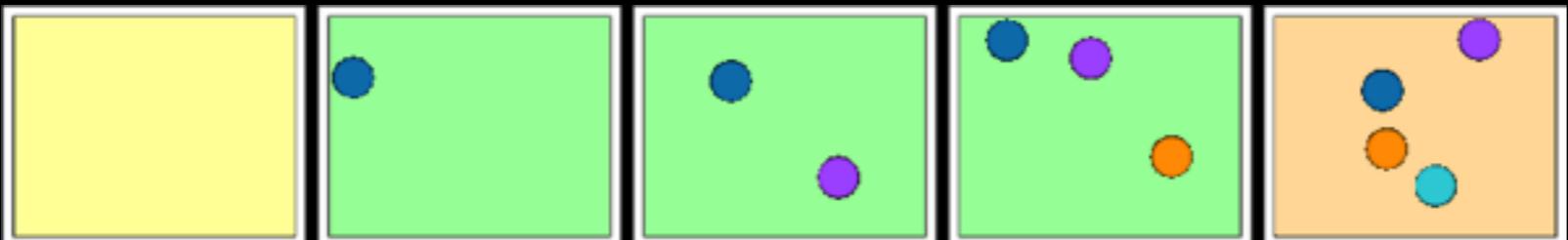
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$$P_{S_1}(u|m) \propto e^{\lambda \cdot (\ln P_{L_0}(m|u))}$$



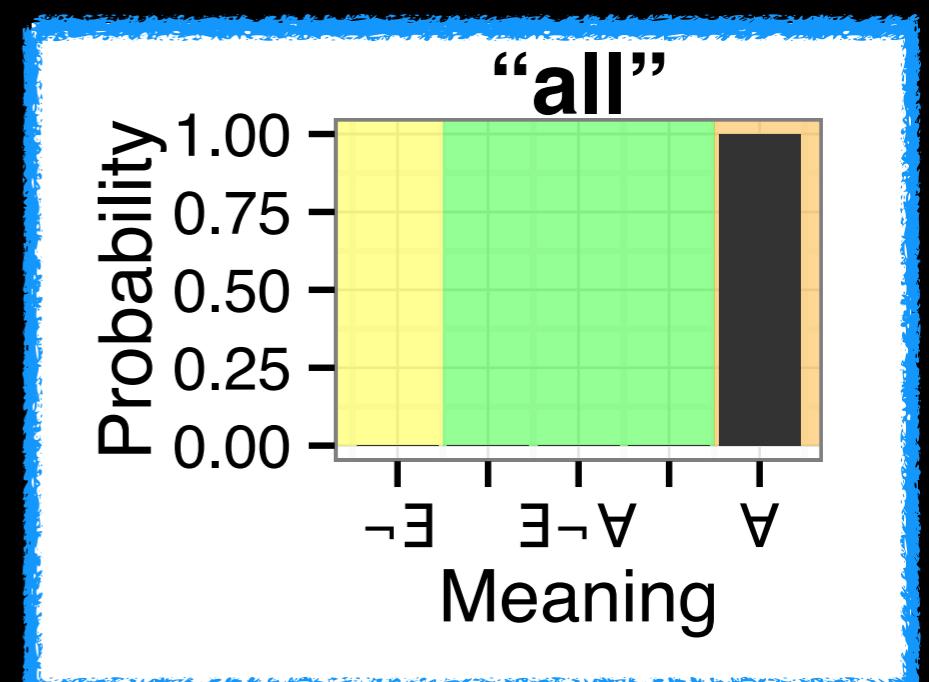
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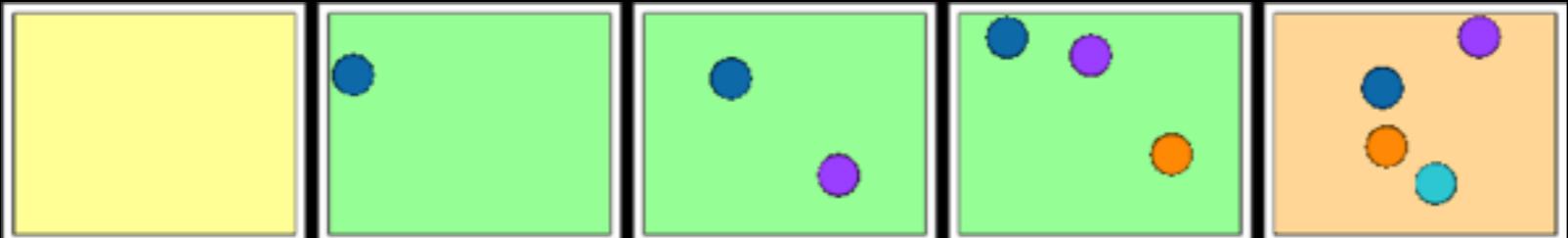
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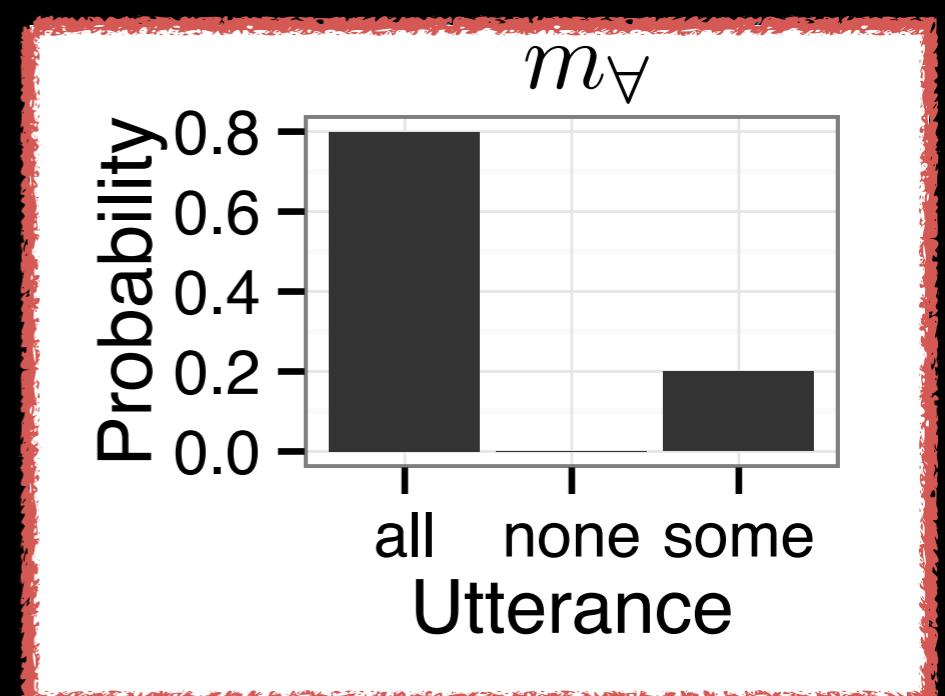
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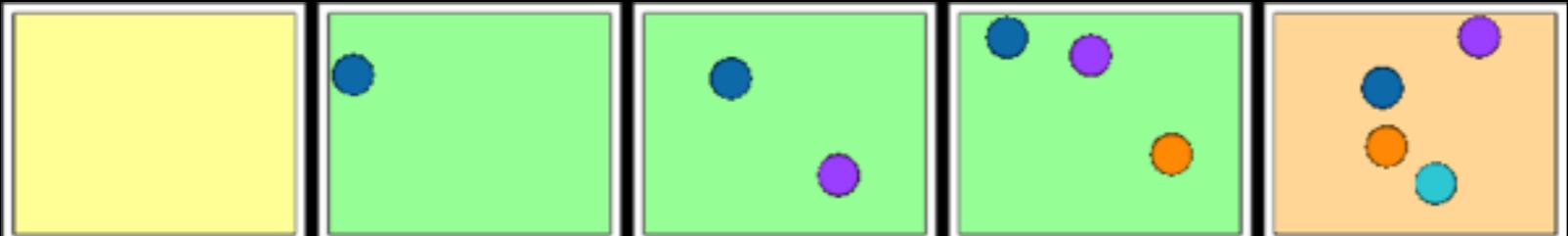
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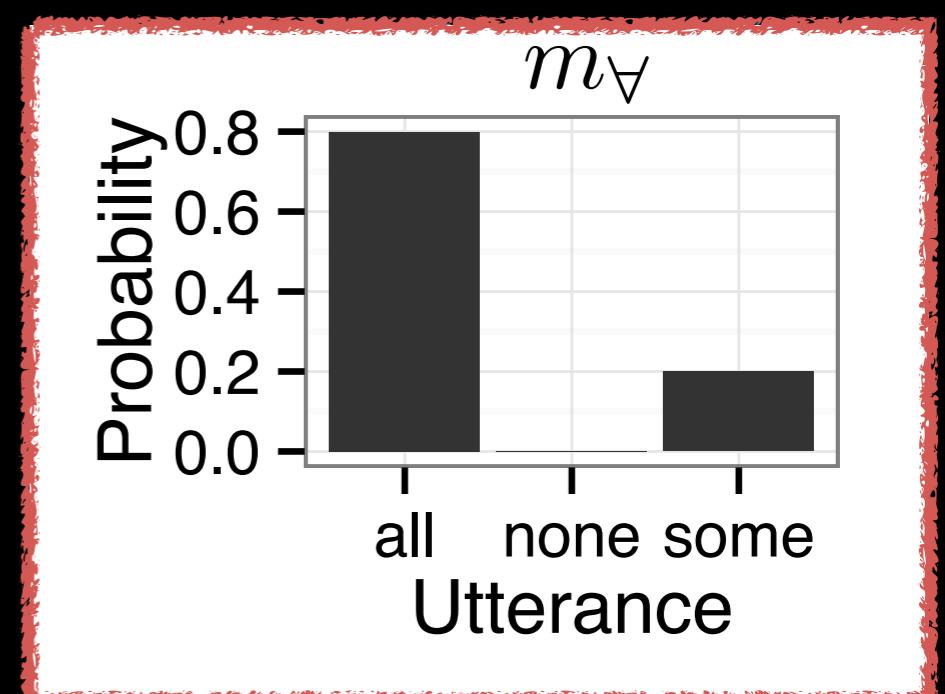
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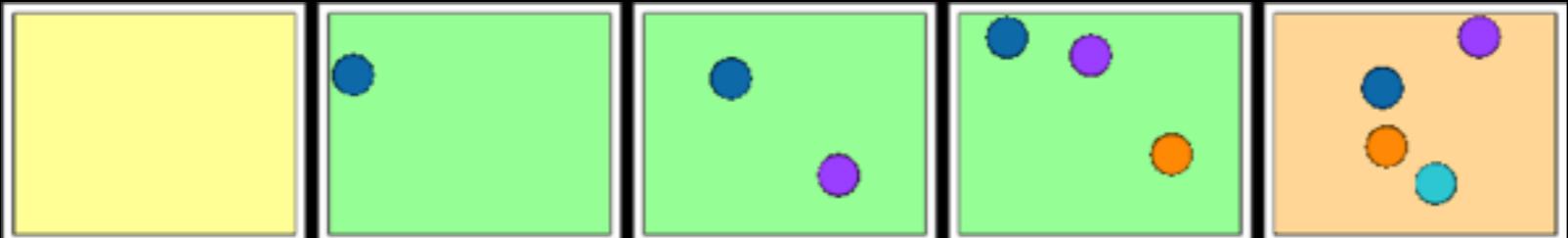
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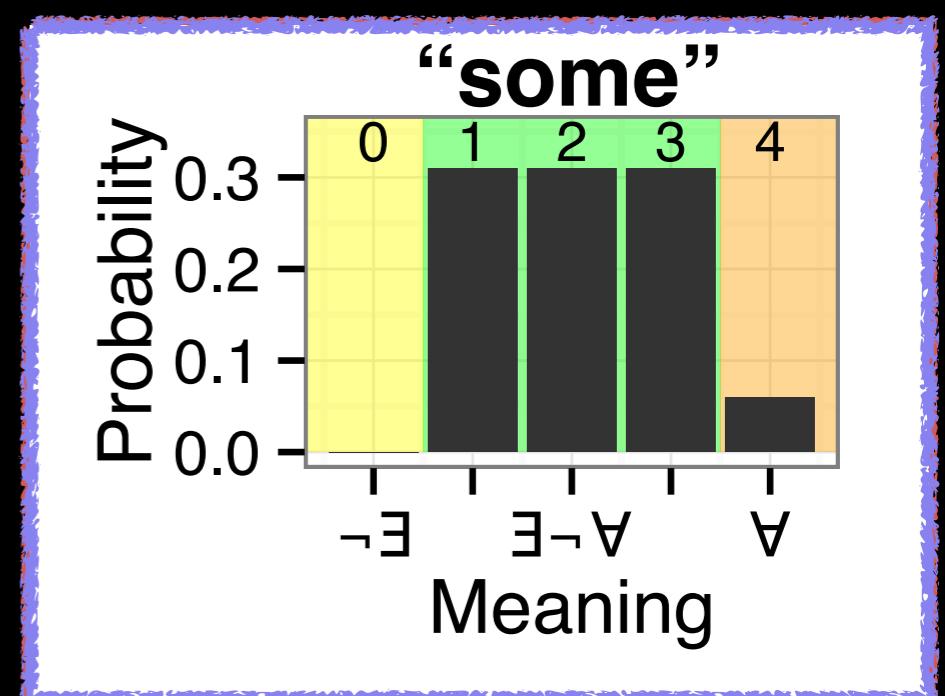
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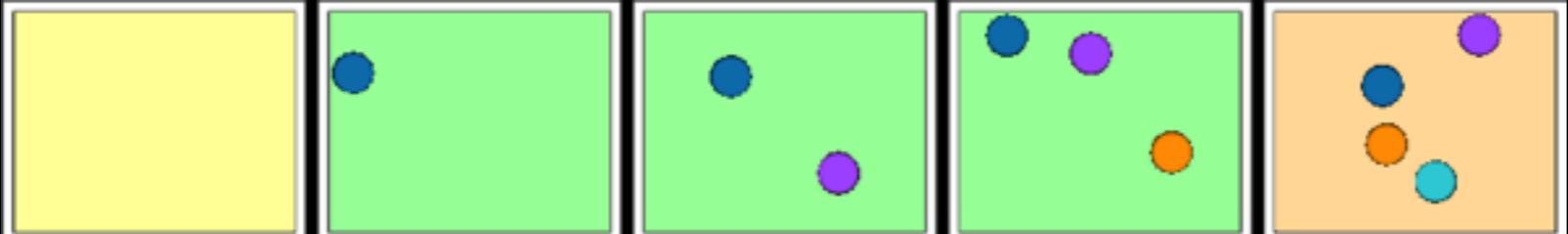
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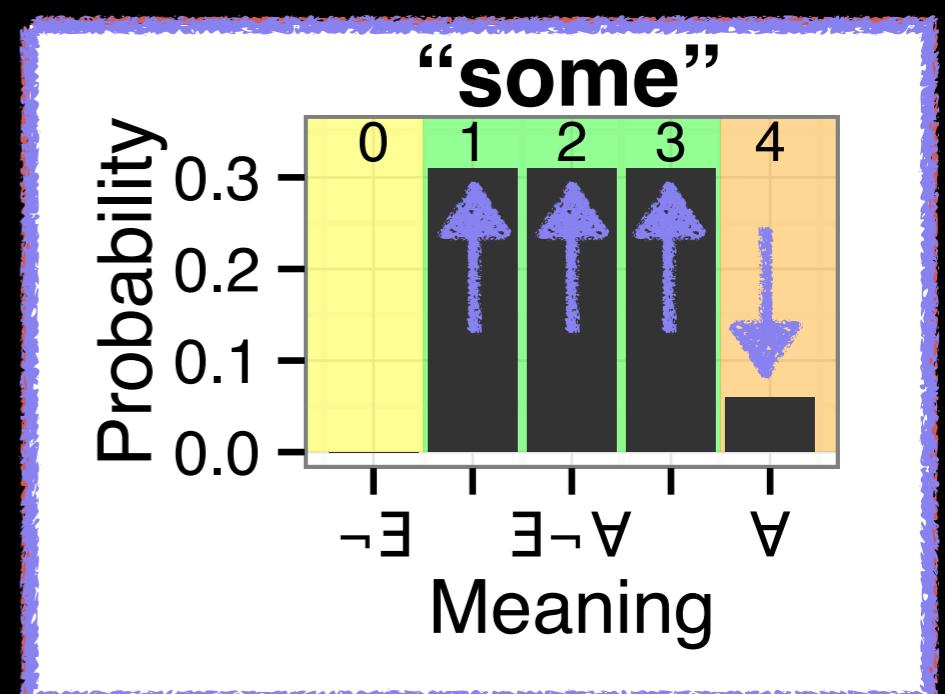
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RSA for “Black lives matter”

$$M = \begin{array}{|c|c|} \hline & b \wedge w & b \wedge \neg w \\ \hline \neg b \wedge w & & \\ \hline \neg b \wedge \neg w & & \\ \hline \end{array}$$

$U = \{\text{Black lives matter},$
 $\text{All lives matter},$
 $\text{White lives matter},$
 $\text{No lives matter}\}$

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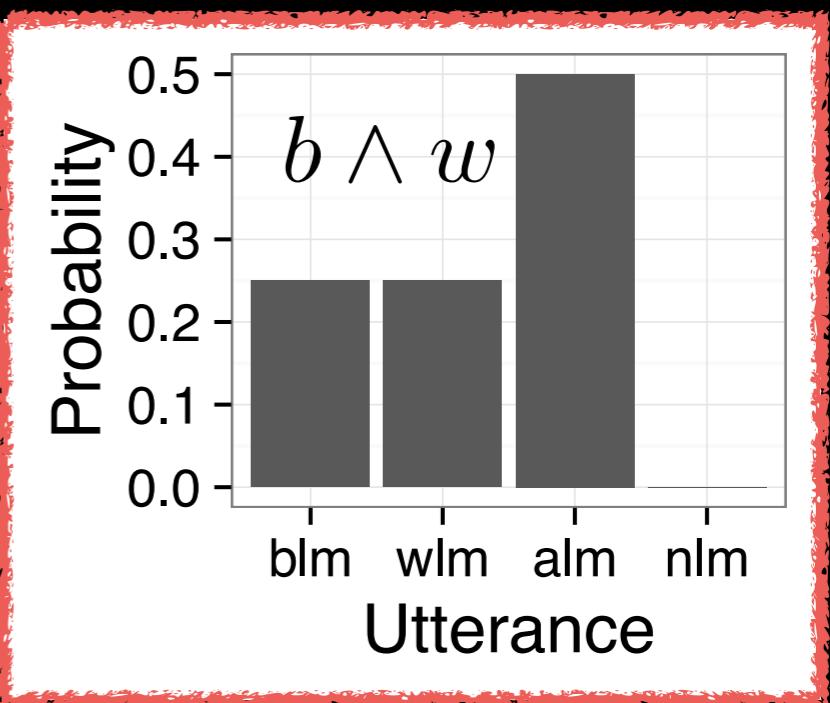
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Pragmatic speaker

$$P_{S_1}(u|m) \propto e^{\lambda \cdot (\ln P_{L_0}(m|u))}$$



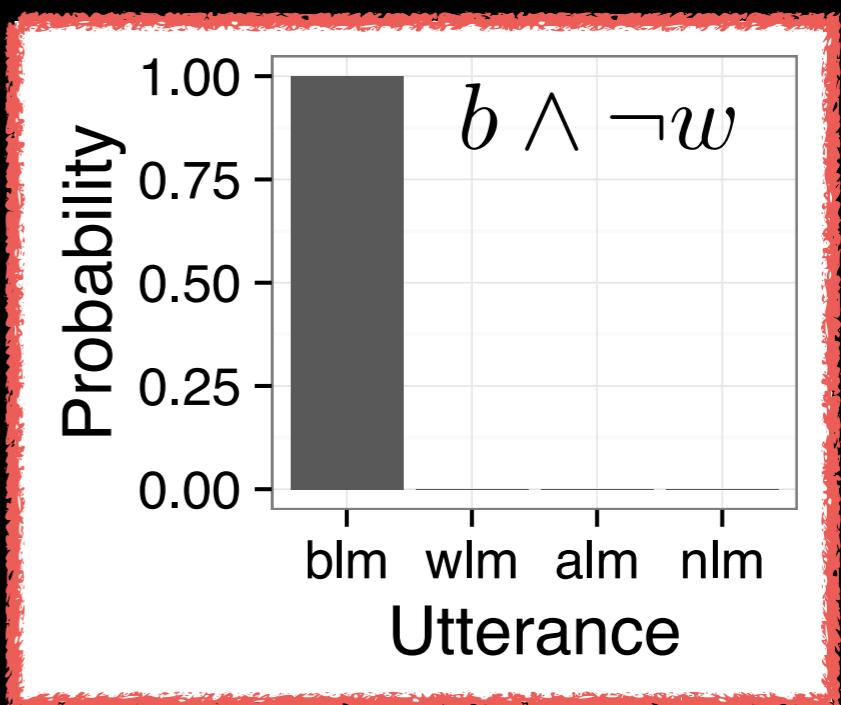
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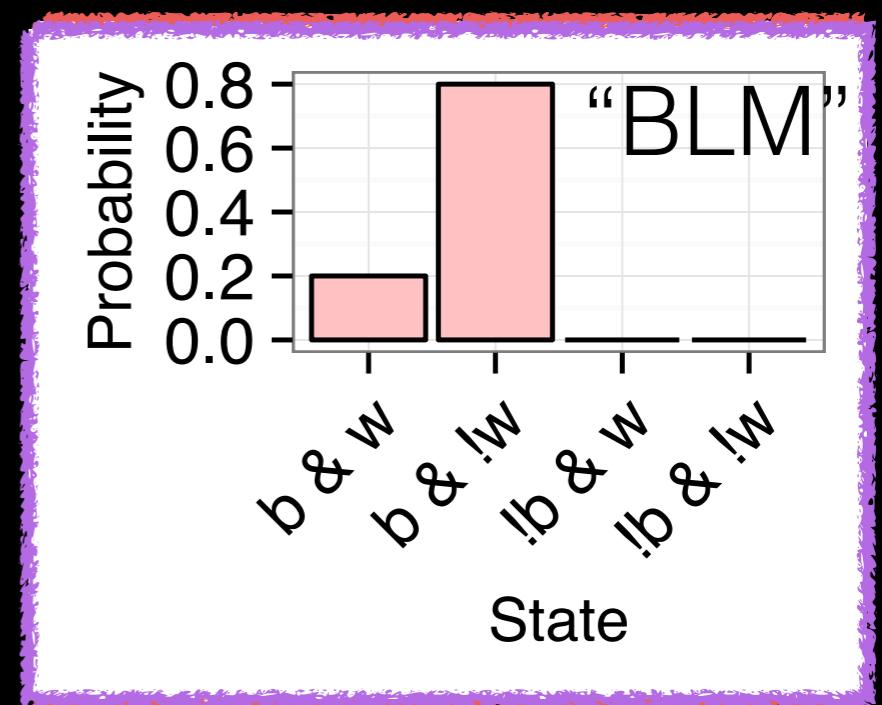
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Pragmatic listener

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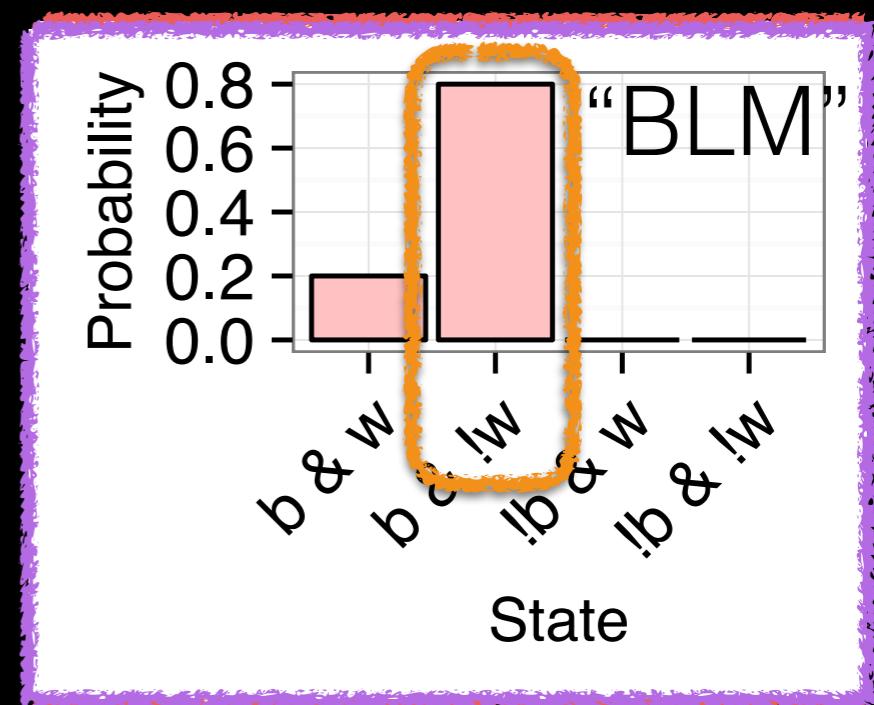
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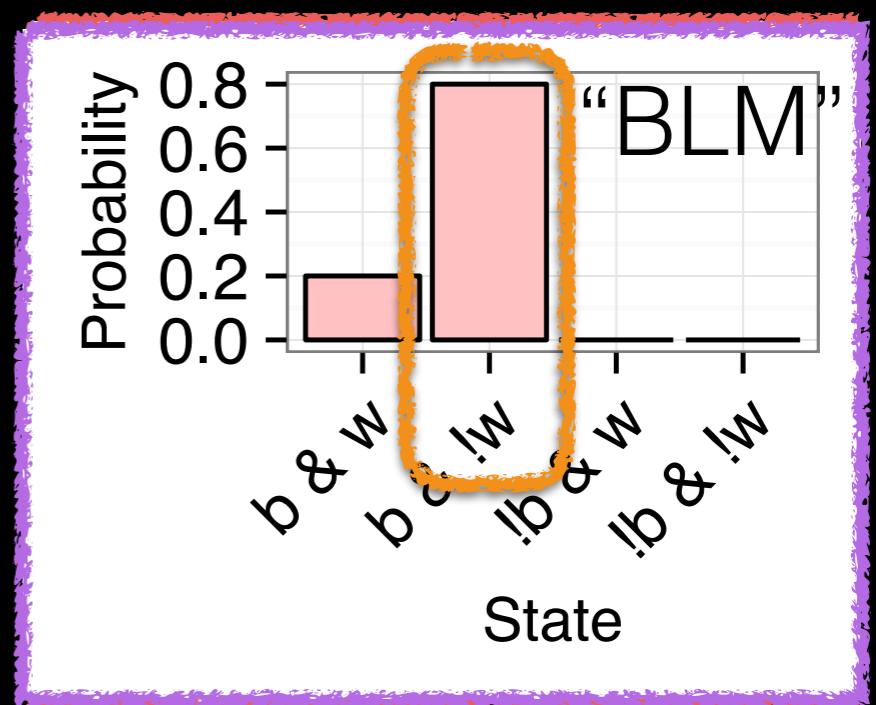
“But all lives matter!”

Pragmatic speaker

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Pragmatic listener

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Alternatives

Alternatives

Full set

Black lives matter

White lives matter

All lives matter

No lives matter

Alternatives

Full set

Black lives matter

White lives matter

All lives matter

No lives matter

Restricted set

Black lives matter

Black lives don't matter

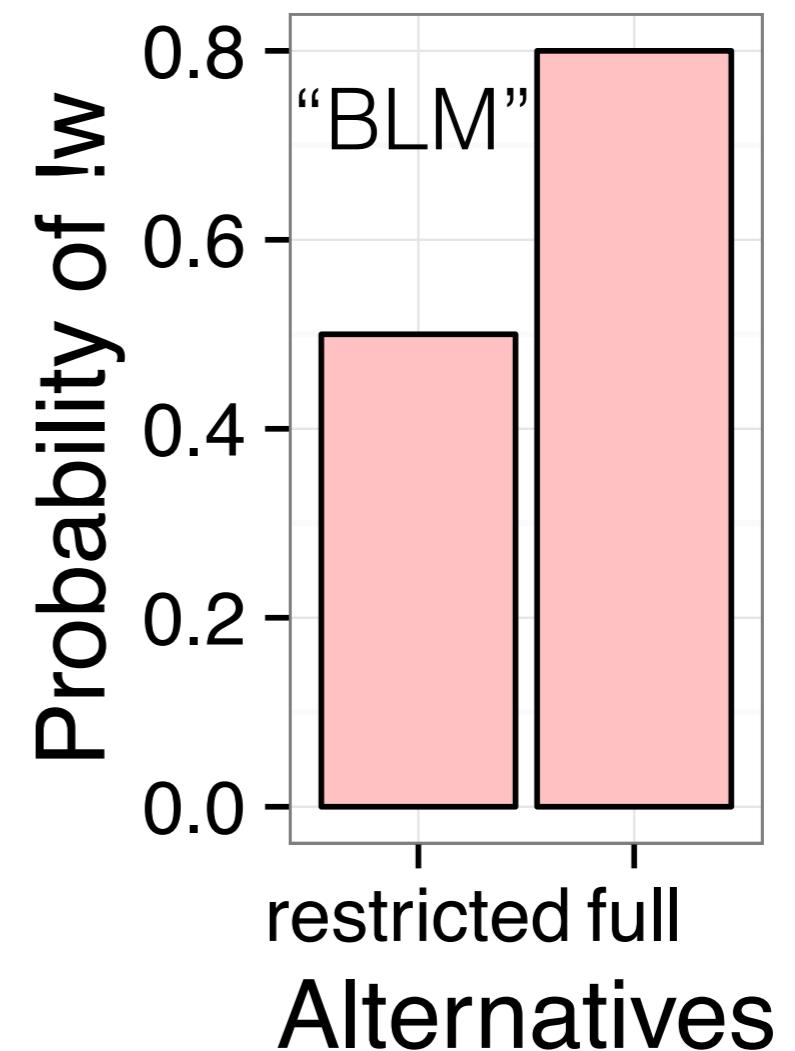
Alternatives

Full set

Black lives matter
White lives matter
All lives matter
No lives matter

Restricted set

Black lives matter
Black lives don't matter



Restricted set of alternatives: weaker exhaustivity inference

Where do the alternatives come from?

Some unsatisfying things:

- ad hoc restriction of set
- “Black lives don’t matter” is syntactically more complex than “Black lives matter” [Katzir 2007; Fox & Katzir 2011](#)

QUD

QUD

Do black lives matter?

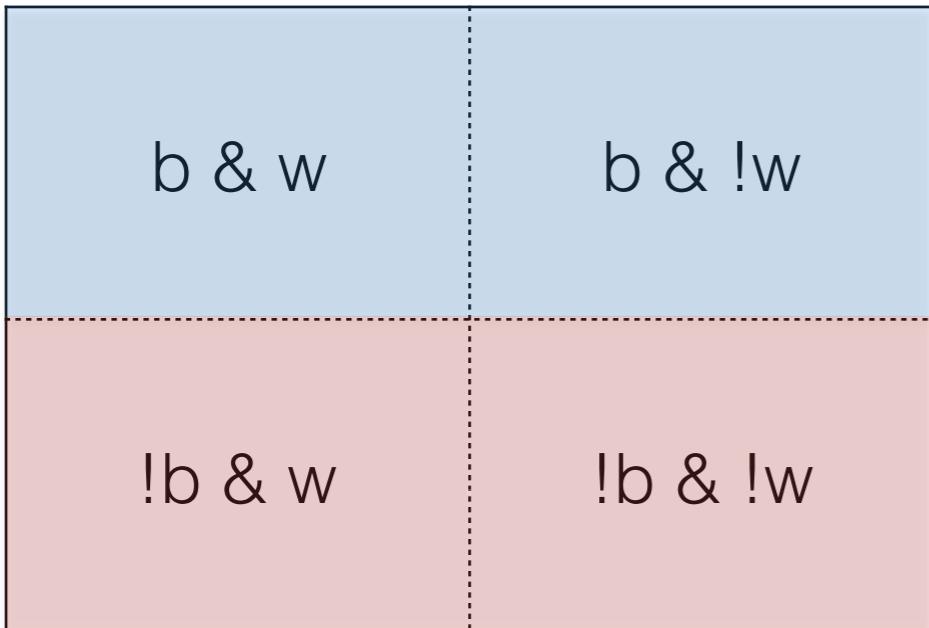
b & w	b & !w
<hr/>	
!b & w	!b & !w

Which lives matter?

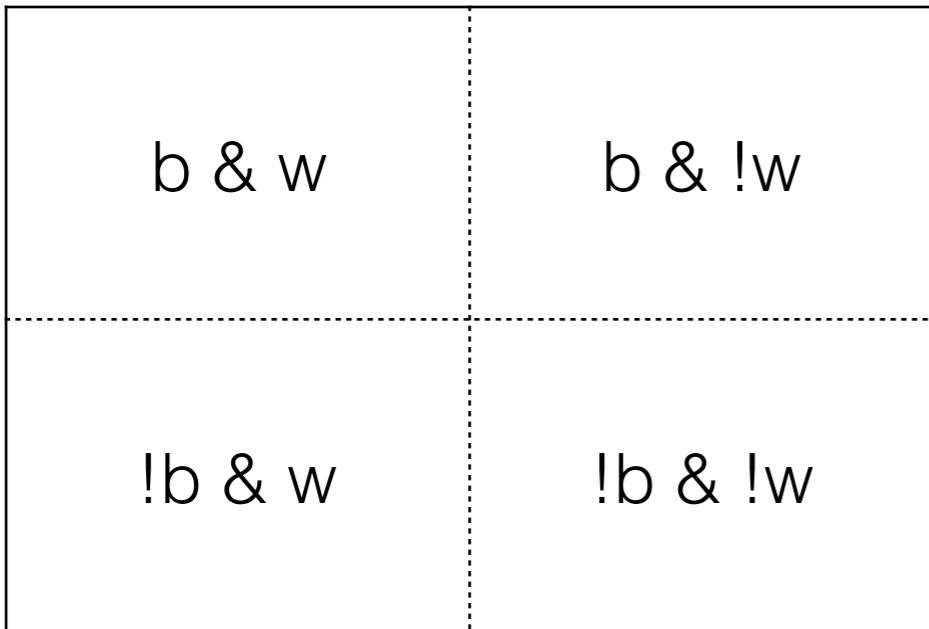
b & w	b & !w
<hr/>	
!b & w	!b & !w

QUD

Do black lives matter?

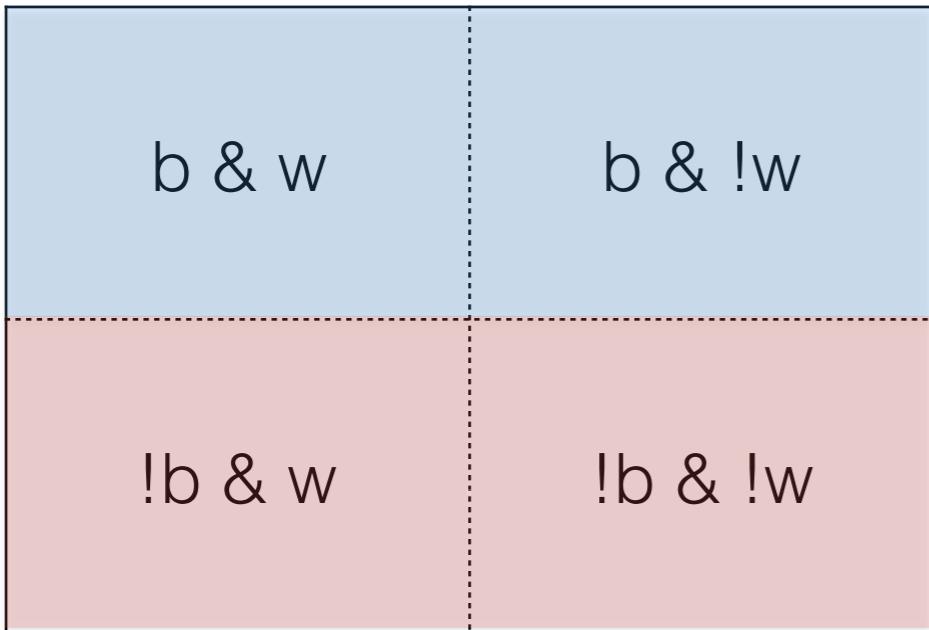


Which lives matter?

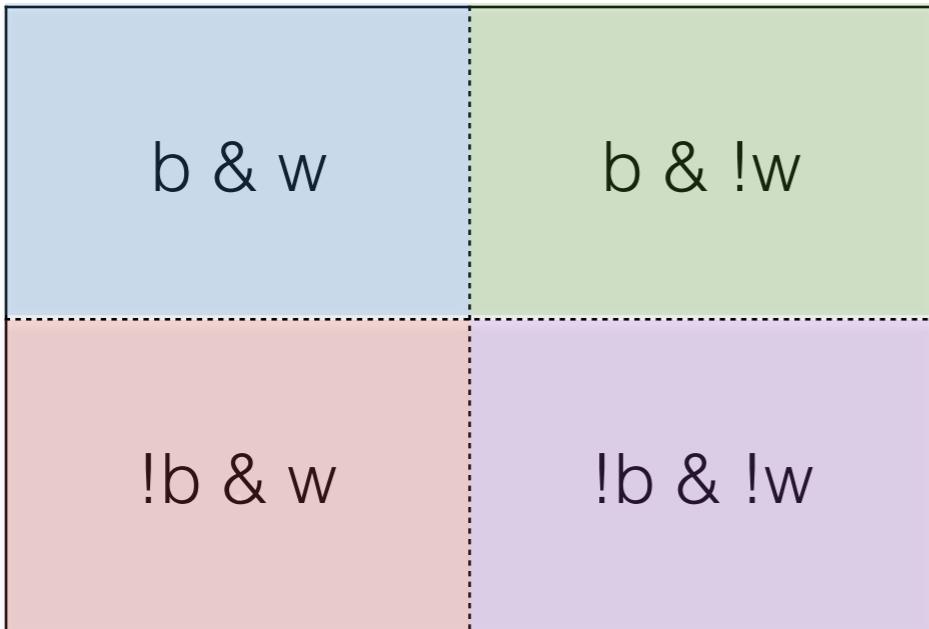


QUD

Do black lives matter?



Which lives matter?



QUD

Do black lives matter?

b & w	b & !w
!b & w	!b & !w

Full set of alternatives

*Black lives matter
White lives matter
All lives matter
No lives matter*

Which lives matter?

b & w	b & !w
!b & w	!b & !w

QUD

Do black lives matter?

b & w	b & !w
!b & w	!b & !w

Full set of alternatives

Black lives matter
White lives matter
All lives matter
No lives matter

Which lives matter?

b & w	b & !w
!b & w	!b & !w

$$q : M \rightarrow A$$

Projection function reduces the meaning space from 4 t(4 colors) to 2 (2 colors)

$$P_{L_1}(m|u, q) \propto P_{S_1}(u|m, q) \cdot P(m) \cdot P(q)$$

QUD

Do black lives matter?

b & w	b & !w
!b & w	!b & !w

Full set of alternatives

Black lives matter
White lives matter
All lives matter
No lives matter

Which lives matter?

b & w	b & !w
!b & w	!b & !w

$q : M \rightarrow A$

$$P_{S_1}(u|m, q) \propto e^{\lambda \cdot (\ln P_{L_0}(q(m)|u))}$$

$$P_{L_1}(m|u, q) \propto P_{S_1}(u|m, q) \cdot P(m) \cdot P(q)$$

QUD

Do black lives matter?

b & w	b & !w
!b & w	!b & !w

Full set of alternatives

Black lives matter
White lives matter
All lives matter
No lives matter

Which lives matter?

b & w	b & !w
!b & w	!b & !w

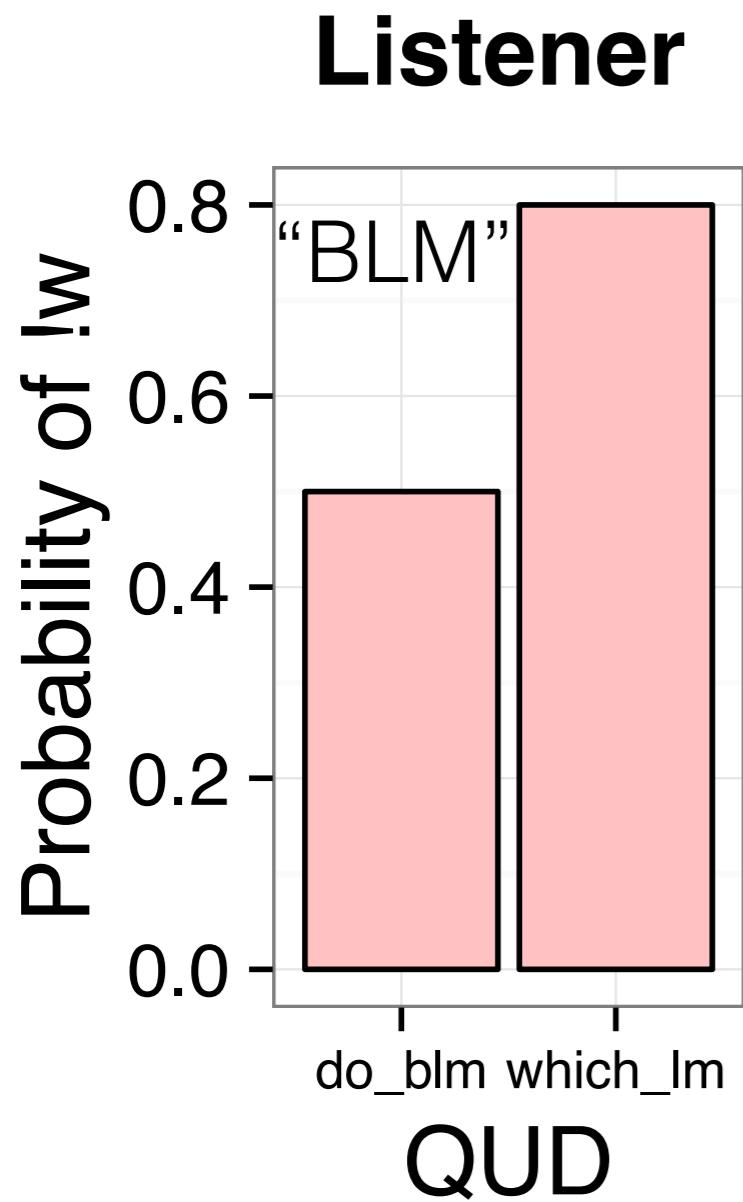
$$q : M \rightarrow A$$

$$P_{L_0}(q(m)|u) \propto \sum_{m'} \delta_{q(m')=q(m)} P_{L_0}(m'|u)$$

$$P_{S_1}(u|m, q) \propto e^{\lambda \cdot (\ln P_{L_0}(q(m)|u))}$$

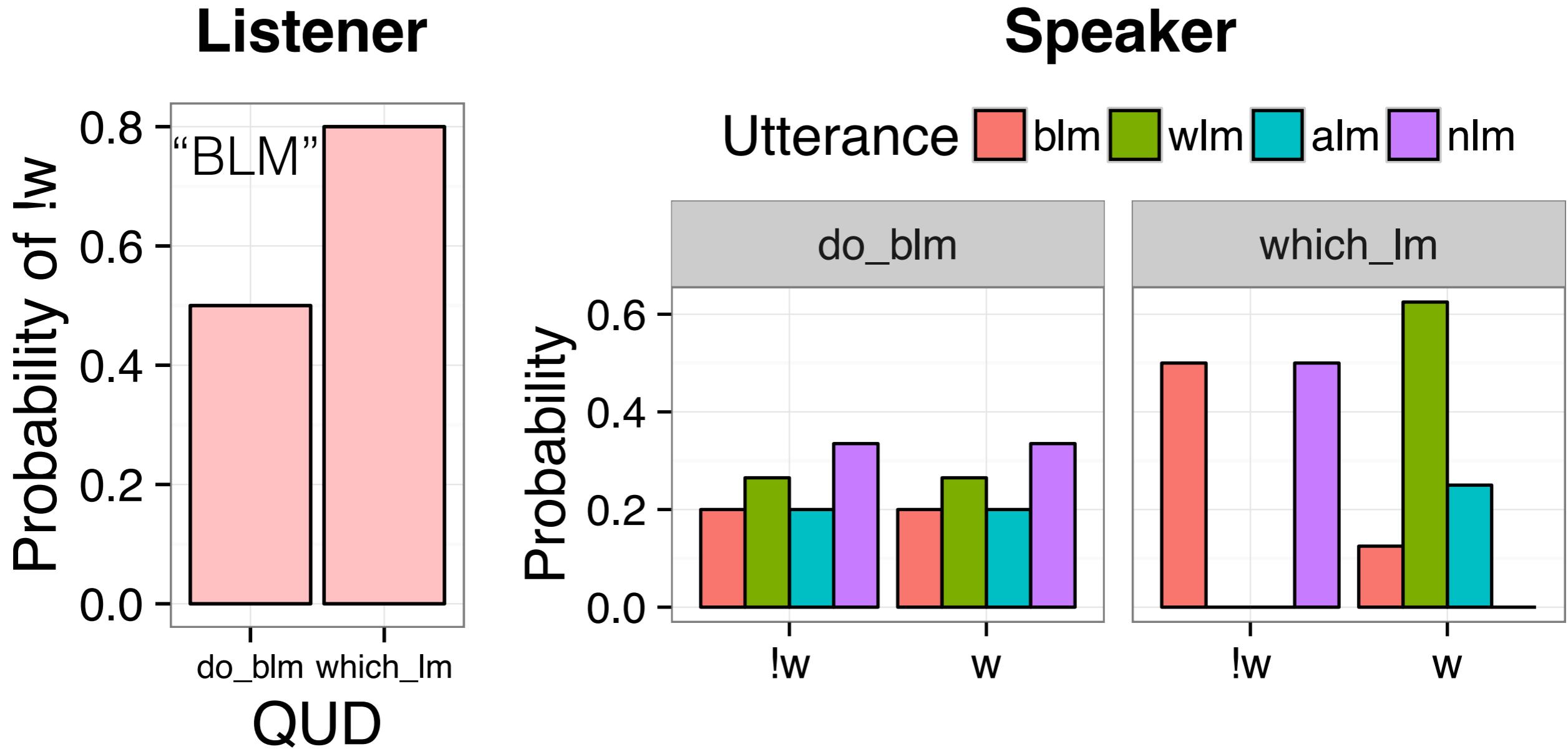
$$P_{L_1}(m|u, q) \propto P_{S_1}(u|m, q) \cdot P(m) \cdot P(q)$$

Results



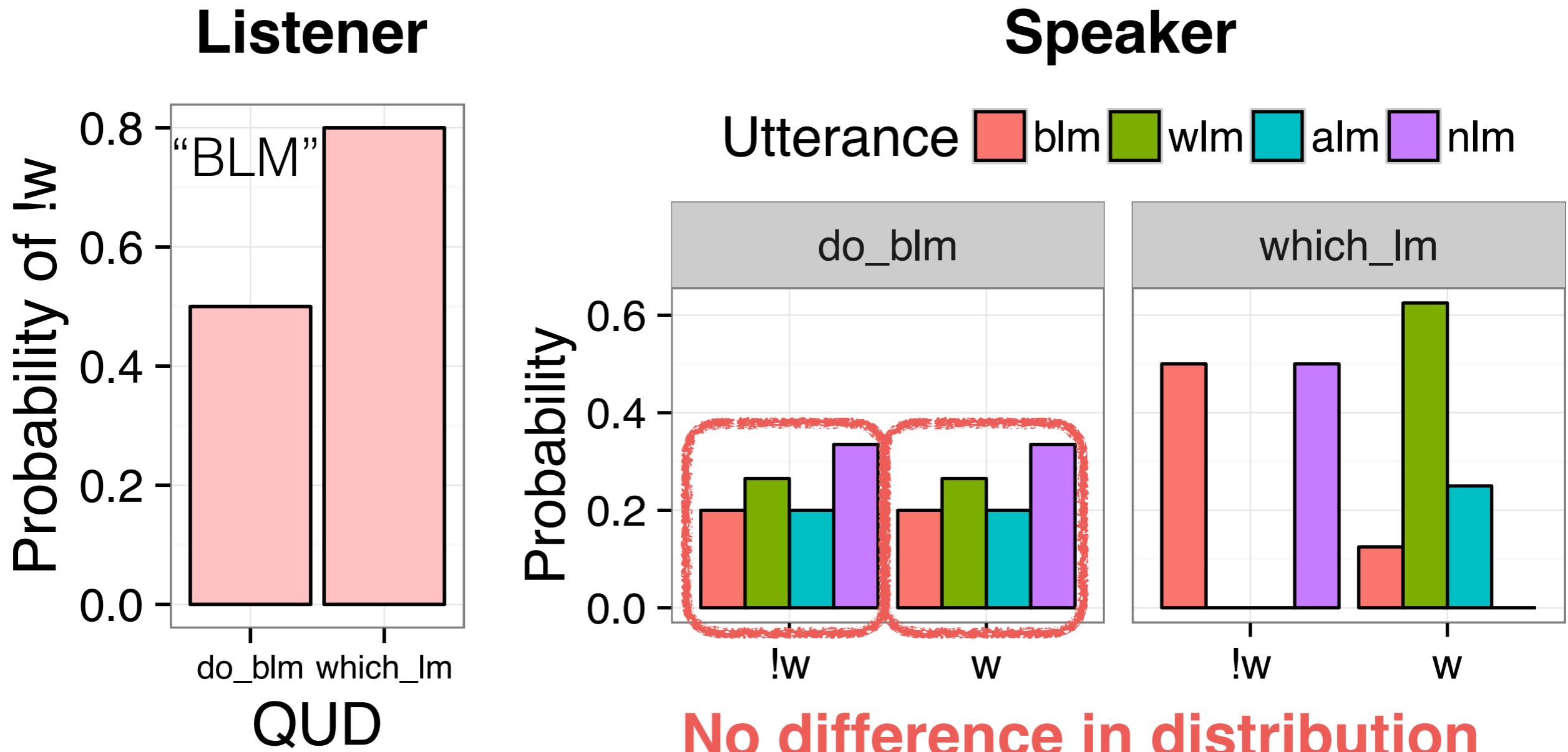
“Do black lives matter” QUD: weaker exhaustivity inference

Results



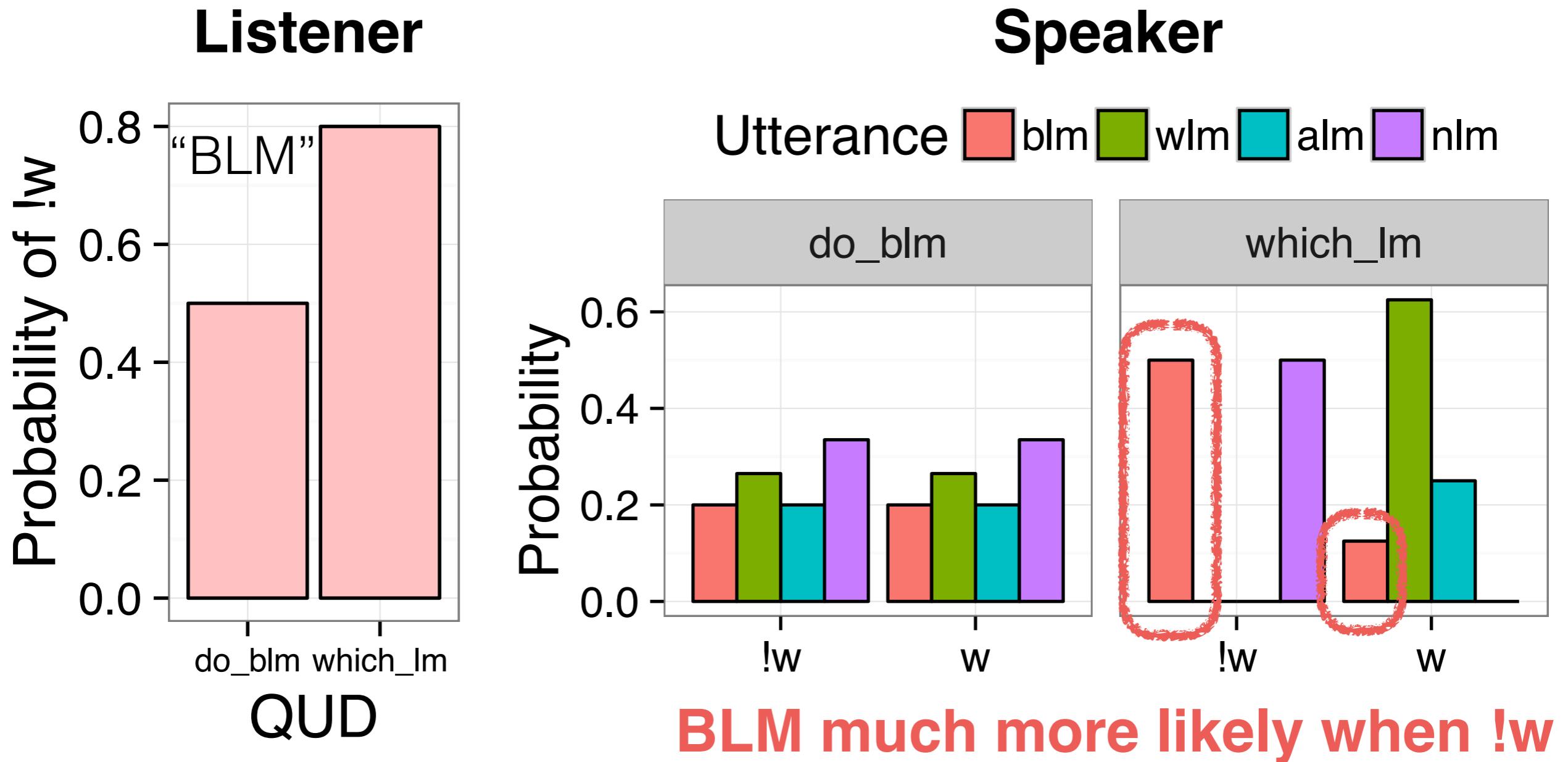
“Do black lives matter” QUD: weaker exhaustivity inference

Results



“Do black lives matter” QUD: weaker exhaustivity inference

Results



"Do black lives matter" QUD: weaker exhaustivity inference

Where do the QUDs come from?

- How do we know what the QUD is?
- Who is more likely to assume which QUD?

Prior beliefs

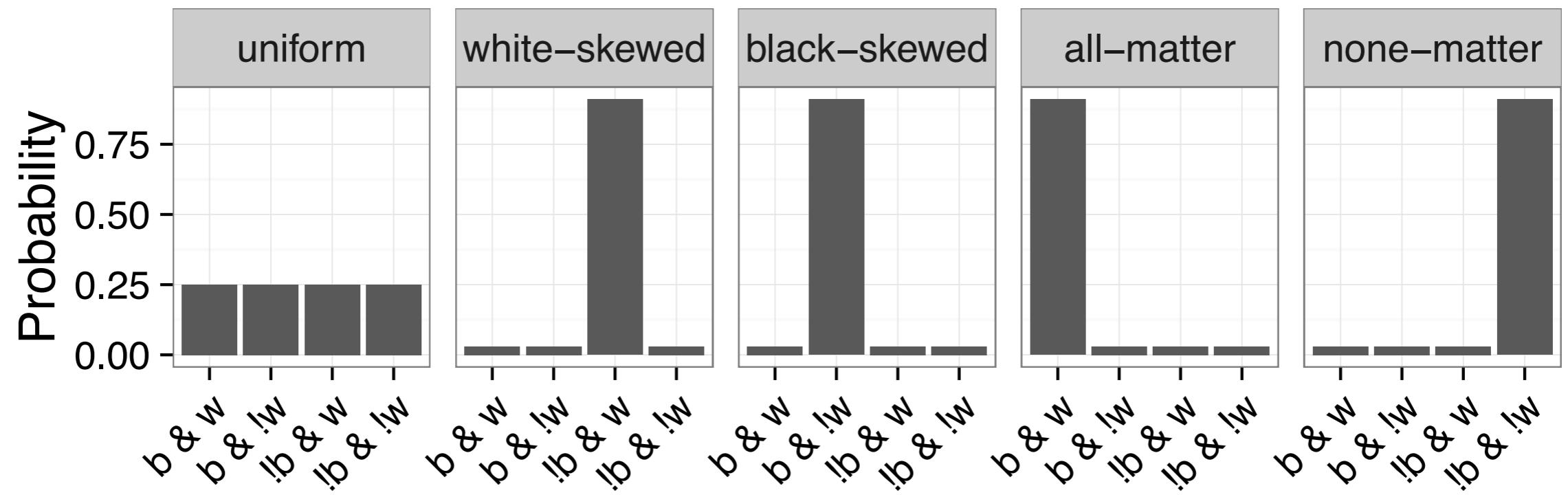


Dave Pas @dacarada2 · Feb 19

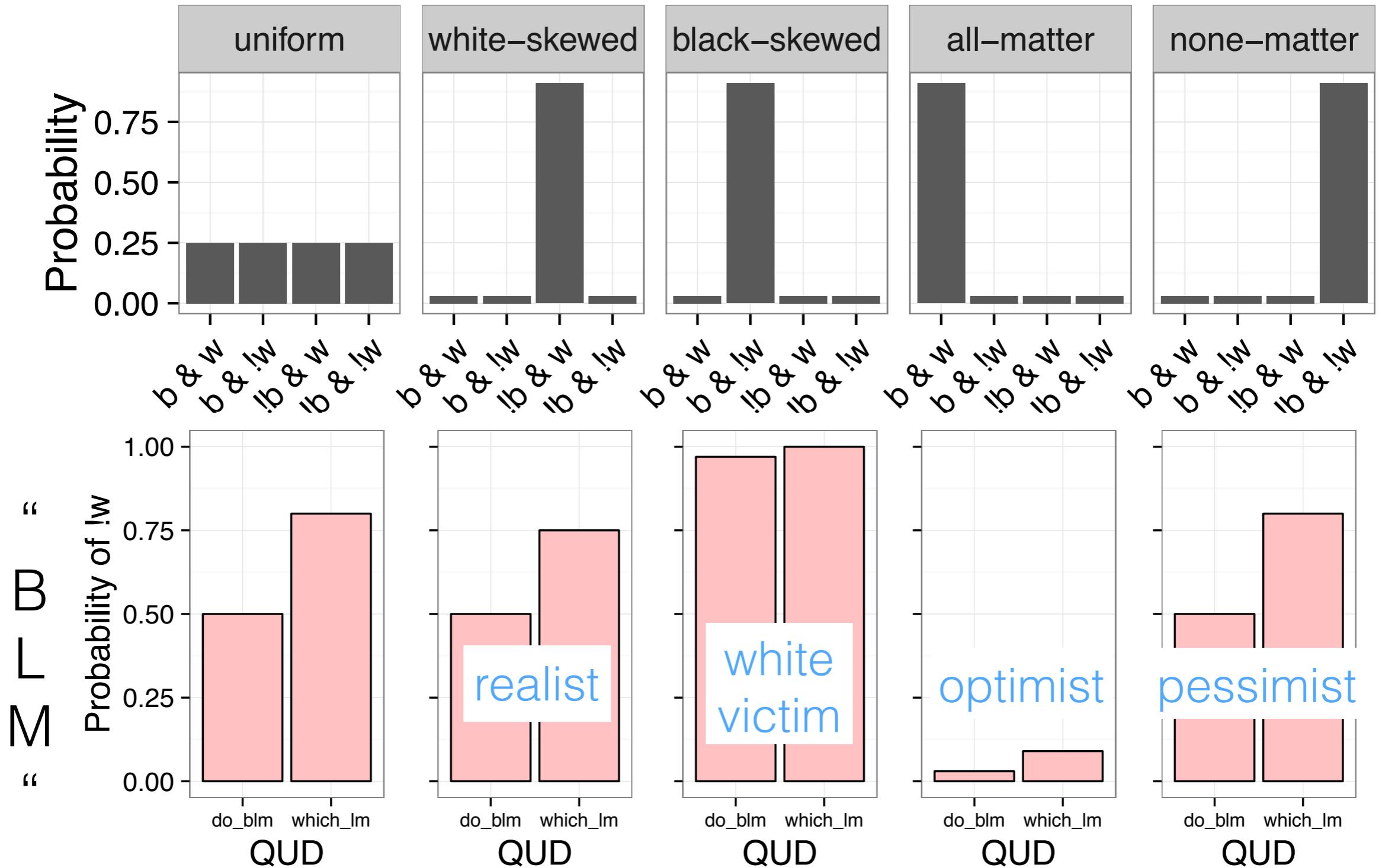
For the group black lives matter to exist there must be a black lives don't matter group. Where is it? #AllLivesMatter #FakeNewsMedia



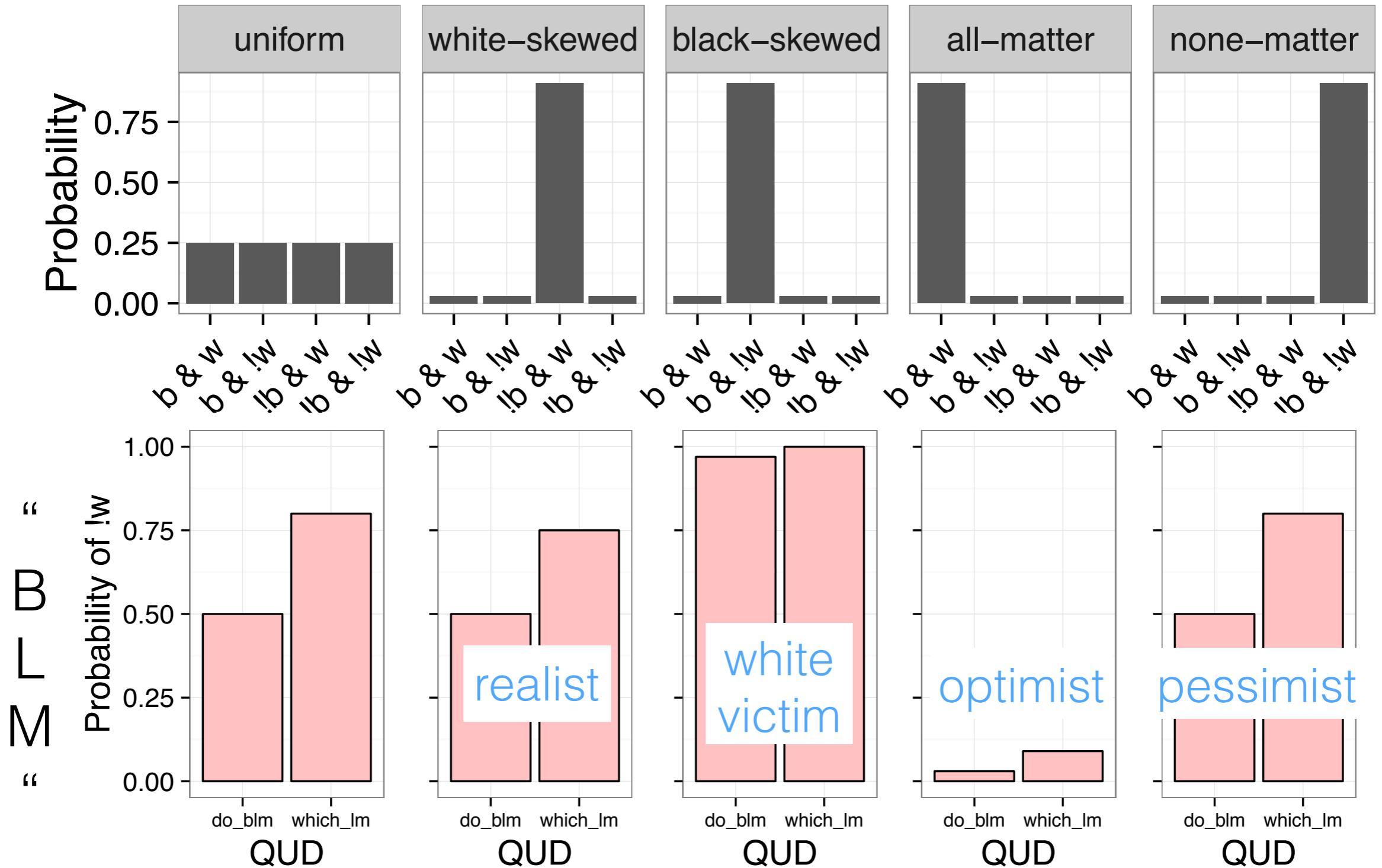
Different possible priors



Different possible priors



Different possible priors



Modulation by prior, but main effect of QUD on exh. inference

QUD inference

$$P_{L_1}(m|u,q) \propto P_{S_1}(u|m,q) \cdot P(m) \cdot P(q)$$

QUD inference

$$P_{L_1}(m, q|u) \propto P_{S_1}(u|m, q)P(m)P(q)$$

QUD inference

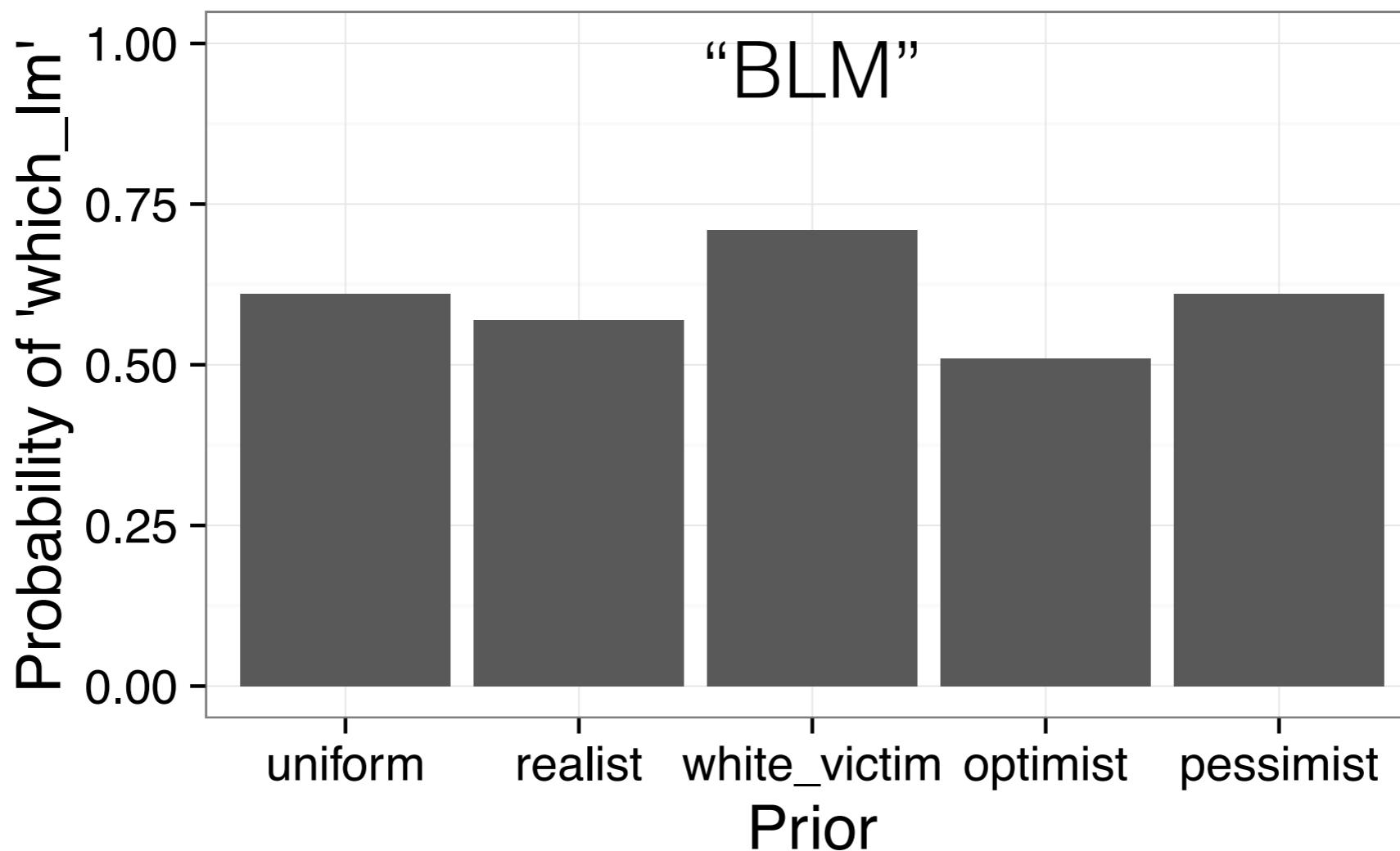
$$P_{L_1}(m, q|u) \propto P_{S_1}(u|m, q)P(m)P(q)$$

$$P_{L_1}(q|u) \propto P(q) \sum_m P(m)P_{S_1}(u|m, q)$$

QUD inference

$$P_{L_1}(m, q|u) \propto P_{S_1}(u|m, q)P(m)P(q)$$

$$P_{L_1}(q|u) \propto P(q) \sum_m P(m)P_{S_1}(u|m, q)$$



Discussion

challenges, directions,
connections

Challenge 1

“People know exactly what BLM means”

- potential modeling solution: the ‘socially aware racist’ who would like to say ‘black lives don’t matter’, but the cost on that utterance is too high
- is “all lives matter” the next best thing they can say?

cf Michael Franke’s work on non-cooperative games

Seen on a San Francisco
bathroom wall

Black lives matter

Seen on a San Francisco
bathroom wall

~~Black~~ lives matter

All

Seen on a San Francisco
bathroom wall

~~Black~~ lives matter

All

You're changing the question
under discussion, asshole

Seen on a San Francisco
bathroom wall

~~Black~~ lives matter

All

You're changing the question
under discussion, asshole

Body Count “No Lives Matter”
Ice-T in intro monologue: “You’re diluting the issue.”

Challenge 2

“You’re considering the wrong QUDs”

Imperative

Q



U



D



?



Connection: #AllLivesMatter vs #NotAllMen



Catherine Amayi @catherine_amayi · Feb 19

#notallmen has a striking resemblance to #AllLivesMatter as a counter to
#blacklivesmatter 🌱

3

17

1

"6.5% of men are rapists, .0035% of Refugees are
terrorists, but #NotAllMen am I right? @realDonaldTrump"

Responses

Black lives matter.

All lives matter.

Not all black lives.

Men are pigs.

All people are pigs.

Not all men.

Robins lay eggs.

All birds lay eggs.

Not all robins.

Issues: focus, valence of predicate, ...

Conclusion

Misunderstandings (whether willful or not) are ubiquitous.

Misinterpretation of “Black lives matter” can be explained as interpretation against alternate QUD, in turn a result of varying prior beliefs.

Computational models that take into account complex interaction between contextual factors can potentially help identify points of intervention (cf dogwhistle politics Henderson & McCready 2016).

Much work to be done...

Thanks

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Robert Hawkins
Mika Braginsky
Dan Lassiter
Leon Bergen