The Difference between Knowledge and Understanding

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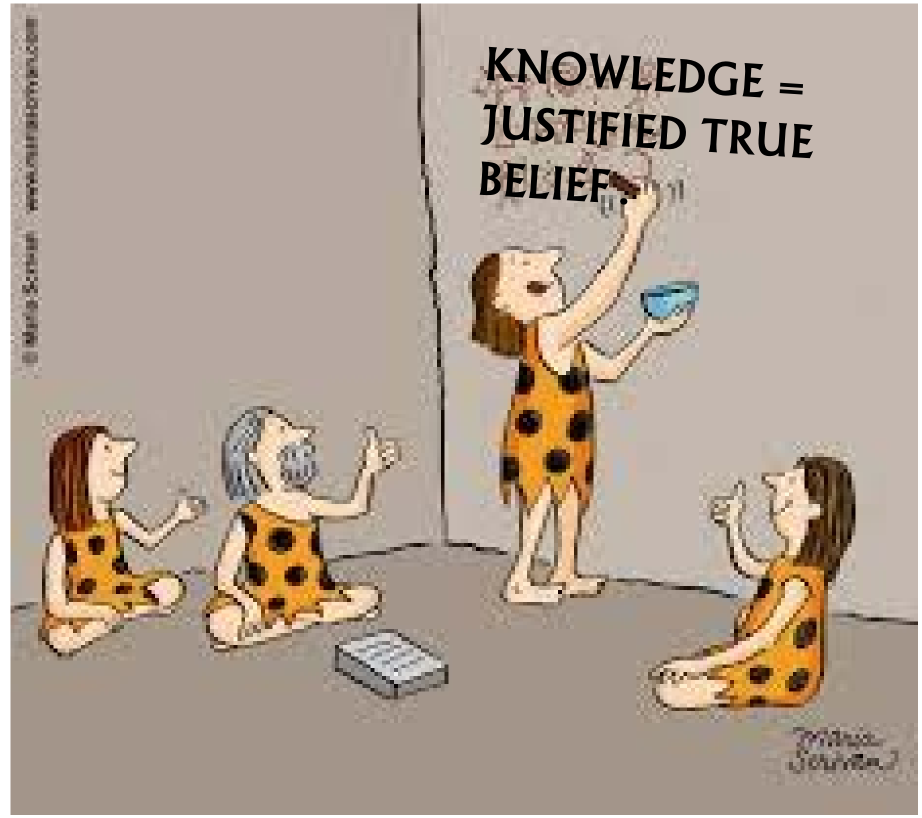
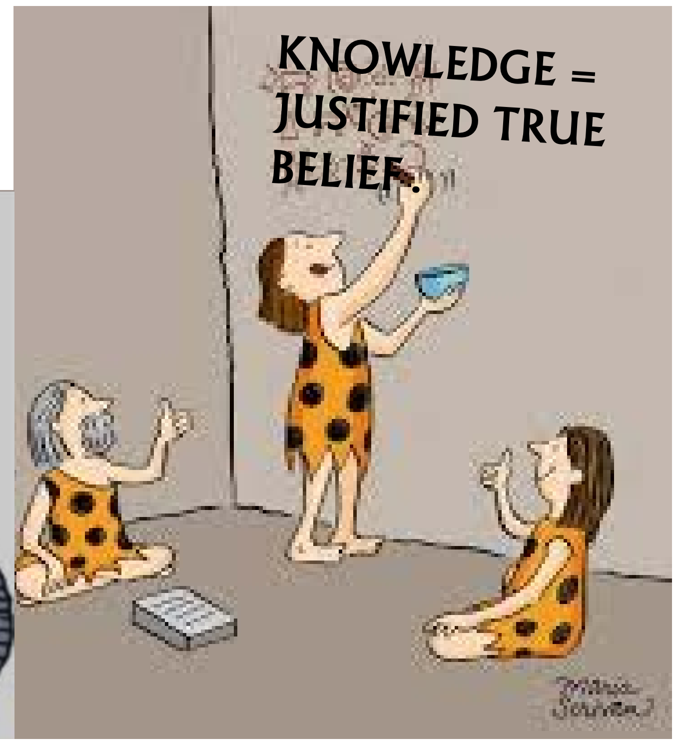

KNOWLEDGE =
JUSTIFIED TRUE
BELIEF!


KNOWLEDGE = JUSTIFIED TRUE BELIEF.

Jones

Smith

Brown

1962

Gettier case

Smith believes from experience

q … Jones owns a Ford.

and also believes $\Downarrow$

p … Someone in the office owns a Ford.

Gettier case

q … Jones owns a Ford

$\Downarrow$

p … Someone in the office owns a Ford.

$\downarrow$

justified belief *in* **p**

Gettier case

q = Jones owns a Ford. ***false***

$$\Downarrow$$

p = Someone in the office owns a Ford.

Gettier case

q = Jones owns a Ford. ***false***

$$\Downarrow$$

p = Someone in the office owns a Ford. ***true***

Gettier case

q = Jones owns a Ford. ***false***

$$\Downarrow$$

p = Someone in the office owns a Ford. ***true***

r = Brown owns a Ford. ***true***

Gettier case

q = Jones owns a Ford. ***false***

$\Downarrow$

p = Someone in the office owns a Ford. ***true***

r = Brown owns a Ford. ***true***

… oops

Gettier case

q = Jones owns a Ford. ***false***

$\Downarrow$

p = Someone in the office owns a Ford. ***true***

r = Brown owns a Ford. ***true***

… justified, true belief in p

but not knowledge


nationals.co
ONALS DREAM FOUNDATION
335


IMPROVE ON THE
HAMSTER WHEEL
CONSIDER A MORE
COMPLETE TRAINING
REGIMEN FOR YOUR PET


Hamster
wheel
for sale!


IMPROVE ON THE
HAMSTER WHEEL
CONSIDER A MORE
COMPLETE TRAINING
REGIMEN FOR YOUR PET

Plan

1. Added value of knowledge over true belief follows from the tracking conditions.
2. Tracking improves relevance matching, hence Gettierization avoidance (w/o ad hoc additions).
3. Don’t need to presuppose value of knowledge to see value of gettierization avoidance.
4. Understanding $\approx$ relevance matching.
5. Understanding is simulation.

The True Belief Game – Approx.

You → *World* ↓	b(p)	- b(p)
p	(0,10)	(0,-20)
- p	(0,-7)	(0,5)

Payoff assumptions: p true → (believe > not believe),
p false → (not believe > believe)

“Mere” good and bad states

Good belief states:

p true	S believes p	true belief
p false	S does not believe p	good lack of belief

Bad belief states:

p true	S does not believe p	bad lack of belief
p false	S believes p	false belief

“Mere” good and bad states

Good belief states:

p true	**S believes p**	**true belief**
p false	**S does not believe p**	**good lack of belief**

Bad belief states:

p true	**S does not believe p**	**bad lack of belief**
p false	**S believes p**	**false belief**

Belief state vs. Strategy

Belief state: p true, S doesn't believe p

Strategy: In response to p, don't believe p

In response to –p, don't believe p

(disposition, regularity)

The True Belief Game – Approx.

You → *World* ↓	b(p)	- b(p)
p	(0,10)	(0,-20)
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Belief state vs. Strategy

Belief state: p true, S doesn't believe p

Strategy: In response to p, don't believe p

In response to –p, don't believe p

disposition, rule for responding to all possible plays of opponent.

Belief state vs. Strategy

Belief state: p true, S doesn't believe p

p, -b(p)

Strategy: disposition, regularity for responding to all possible plays of opponent.

e.g. ***Tracking*** is a strategy:

1) **P(-b(p)/-p) > s**

2) **P(b(p)/p) > t**

Knowledge = Tracking

Tracking is a strategy:

1) **P(-b(p)/-p) > s**
2) **P(b(p)/p) > t**

Variation
(Sensitivity)

Adherence

The True Belief Game – Approx.

You → *World* ↓	b(p)	- b(p)
p	(0,10)	(0,-20)
- p	(0,-7)	(0,5)

Payoff assumptions: p true → (believe > not believe),

p false → (not believe > believe)

The subject who is a tracker of p has an

Evolutionarily Stable Strategy (ESS)

Tracker is evolutionarily stable

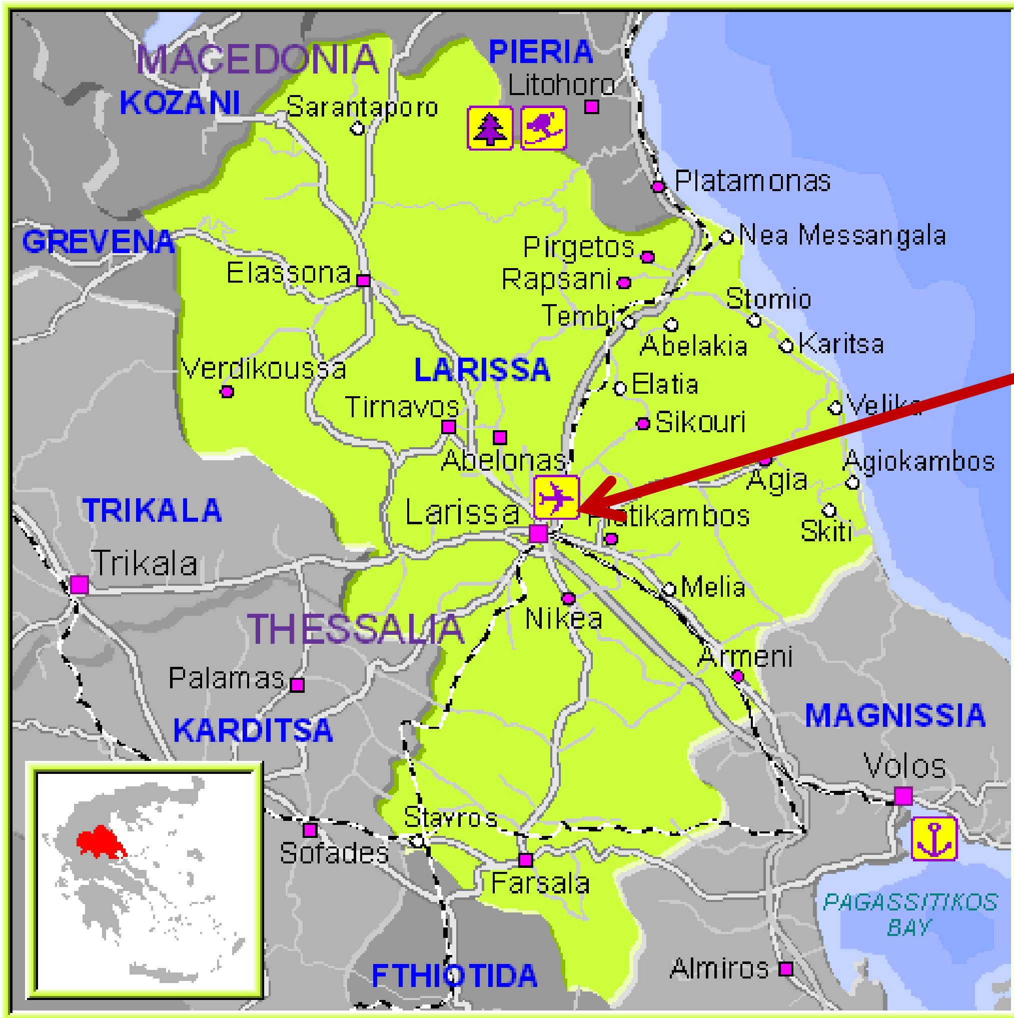
→ Tracking type (R) **strictly dominates** any type following *any* other conditions beyond true belief (-R), in the struggle for survival and utiles.

→ Once this strategy is achieved by some level of majority of the population, no small population with an alternative strategy can "invade" and drive it out.

→ These properties hold independently of the dynamics of interaction.

*If we think intuitively that knowledge can be of evolutionary or utilitarian value, then this is a unique **explanatory** advantage of the tracking theory.*

This shows (tracking) knowledge is more valuable than mere true belief, without ad hoc tinkering.


MACEDONIA
KOZANI
PIERIA
Litohoro
Sarantaporo
Platamonas
GREVENA
Nea Messangala
Pirgetos
Elassona
Rapsani
Stomio
Tembi
Abelakia
Karitsa
Verdikoussa
LARISSA
Elatia
Tirnavos
Sikouri
Abelonas
Agiokambos
Agia
TRIKALA
Larissa
Skiti
Trikala
Melia
Nikea
THESSALIA
Armeni
Palamas
KARDITSA
MAGNISSIA
Volos
Stavros
Sofades
Farsala
PAGASSITIKOS
BAY
Almiros
FTHIOTIDA

Larissa

p = Route A will get me to Larissa by 12.

Suppose:

p is true

S, S' believe p

S uses a paper map. S' uses real-time GPS.

p = Route A will get me to Larissa by 12.

p is true

S, S’ believe p

S’ has a strong disposition to believe p when it’s true and not believe p when it’s false.

S uses a paper map.

S’ uses real-time GPS.

S has a true belief.

S’ has a true belief and is **tracking**.

p = Route A will get me to Larissa by 12.

p is true

S, S' believe p

S' has a strong disposition to believe p when it's true and not believe p when it's false.

S uses a paper map.

S' uses real-time GPS.

S has a true belief.

S' has a true belief and a **contingency detector**.

“The Value of Knowledge and the Pursuit of Survival,” *Metaphilosophy* (2010)

The Gettier Problem

Gettier cases and relevance

p = Someone in the office owns a Ford.   *true*

q = Jones owns a Ford.   *false*

r = Brown owns a Ford.   *true*

Gettier cases and relevance

p = Someone in the office owns a Ford. *true*

q = Jones owns a Ford. *false*

r = Brown owns a Ford. *true*

$$P(\mathbf{b(p)}/{-q}.\mathbf{r}) = P(\mathbf{b(p)}/{-q}.\mathbf{-r})$$

but

$$P(\mathbf{p}/{-q}.\mathbf{r}) \neq P(\mathbf{p}/{-q}.\mathbf{-r})$$

q is (positively) relevant to your believing p.

$$P(b(p)/q) \gg P(b(p)/-q)$$

Or: $$P(b(p)/q)/P(b(p)/-q) \gg 1$$

q is (positively) relevant to p

$$P(p/q) \gg P(p/{-q})$$

Or: $$P(p/q)/P(p/{-q}) \gg 1$$

Relevance matching on q for p:

$$P(b(p)/q)/P(b(p)/-q) \;=\; P(p/q)/P(p/-q)$$

The difference q's truth value makes to your *belief* in p is the same as the difference q's truth value makes to p's truth value.

Relevance mismatch on q for p

$$P(b(p)/q)/P(b(p)/-q) \;\neq\; P(p/q)/P(p/-q)$$

q's truth value makes more of a difference, or less of a difference, to your *belief* in p than it does to p's truth value.

Gettier case

p = Someone in the office owns a Ford. *true*

q = Jones owns a Ford. *false*

r = Brown owns a Ford. *true*

$$P(b(p)/q) \gg P(b(p)/-q)$$

but

$$P(p/q) > P(p/-q)$$

Relevance matching on q for p:

$$P(b(p)/q)/P(b(p)/-q) = P(p/q)/P(p/-q)$$

Relevance mismatch on q for p

$$P(b(p)/q)/P(b(p)/-q) \neq P(p/q)/P(p/-q)$$

Gettierization → relevance mismatch for p on some q for which $P(b(p)/q) >> P(b(p)/-q)$

or …

Relevance matching on q for p:

$$P(b(p)/q)/P(b(p)/-q) = P(p/q)/P(p/-q)$$

Relevance mismatch on q for p

$$P(b(p)/q)/P(b(p)/-q) \neq P(p/q)/P(p/-q)$$

Gettierization → relevance mismatch for p on some r for which $P(p/r) >> P(p/-r)$

Gettierized belief in p

Depends on:

1) basing belief in p on q (the helper) when q is false
2) having a relevance mismatch on q for 1) to exploit
3) p is true

Relation of *Relevance Matching* for p and *Tracking* p

$$\mathbf{P(b(p)/q)} = \frac{P(b(p)/p)P(q/b(p).p)\mathbf{P(p/q)}}{P(q/p)} + \frac{P(b(p)/-p)P(q/b(p).-p)P(-p/q)}{P(q/-p)}$$

$$\mathbf{P(b(p)/-q)} = \frac{P(b(p)/p)P(-q/b(p).p)\mathbf{P(p/-q)}}{P(-q/p)} + \frac{P(b(p)/-p)P(-q/b(p).-p)P(-p/-q)}{P(-q/-p)}$$

Relevance Matching

$$\frac{P(b(p)/q)}{P(b(p)/-q)} = \frac{P(p/q)}{P(p/-q)}$$

Relation of *Relevance Matching* for p and *Tracking* p

$$P(b(p)/q) = \frac{P(b(p)/p)\,P(q/b(p).p)\,P(p/q)}{P(q/p)} + \frac{P(b(p)/-p)\,P(q/b(p).-p)\,P(-p/q)}{P(q/-p)}$$

$$P(b(p)/-q) = \frac{P(b(p)/p)\,P(-q/b(p).p)\,P(p/-q)}{P(-q/p)} + \frac{P(b(p)/-p)\,P(-q/b(p).-p)\,P(-p/-q)}{P(-q/-p)}$$

Perfect Sensitivity to p

$$P(b(p)/q) = \frac{P(b(p)/p)P(q/b(p).p)P(p/q)}{P(q/p)}$$

$$P(b(p)/-q) = \frac{P(b(p)/p)P(-q/b(p).p)P(p/-q)}{P(-q/p)}$$

Relation of ***Tracking* p** to ***Relevance Matching*** for p on q

$$\mathbf{P(b(p)/q)} = \alpha\ \mathbf{P(p/q)}$$

$$\mathbf{P(b(p)/-q)} = \alpha\ \mathbf{P(p/-q)}$$

Relation of ***Tracking*** **p** to ***Relevance Matching*** for p

$$\frac{P(b(p)/q)}{P(b(p)/-q)} = \frac{P(p/q)}{P(p/-q)}$$

Relation of ***Tracking* p** to ***Relevance Matching*** for p

$$\frac{P(b(p)/q)}{P(b(p)/-q)} = \frac{P(p/q)}{P(p/-q)}$$

1. Perfect tracking of p $\Rightarrow$ Perfect relevance matching for p on q

Relation of ***Tracking*** **p** to
Relevance Matching for p

$$\frac{P(b(p)/q)}{P(b(p)/-q)} = \frac{P(p/q)}{P(p/-q)}$$

1. Perfect tracking of p $\Rightarrow$
Perfect relevance matching for p on q, ***for all*** **q**

I.e., perfect tracking $\Rightarrow$ No possibility of gettierization
(on any q)

Relation of ***Tracking*** **p** to ***Relevance Matching*** for p

$$\frac{P(b(p)/q)}{P(b(p)/-q)} = \frac{P(p/q)}{P(p/-q)}$$

1. Perfect tracking of p $\Rightarrow$
   Perfect relevance matching for p on q, ***for all*** **q**

2. Increased tracking $\Rightarrow$
   Increased relevance matching for p on every q

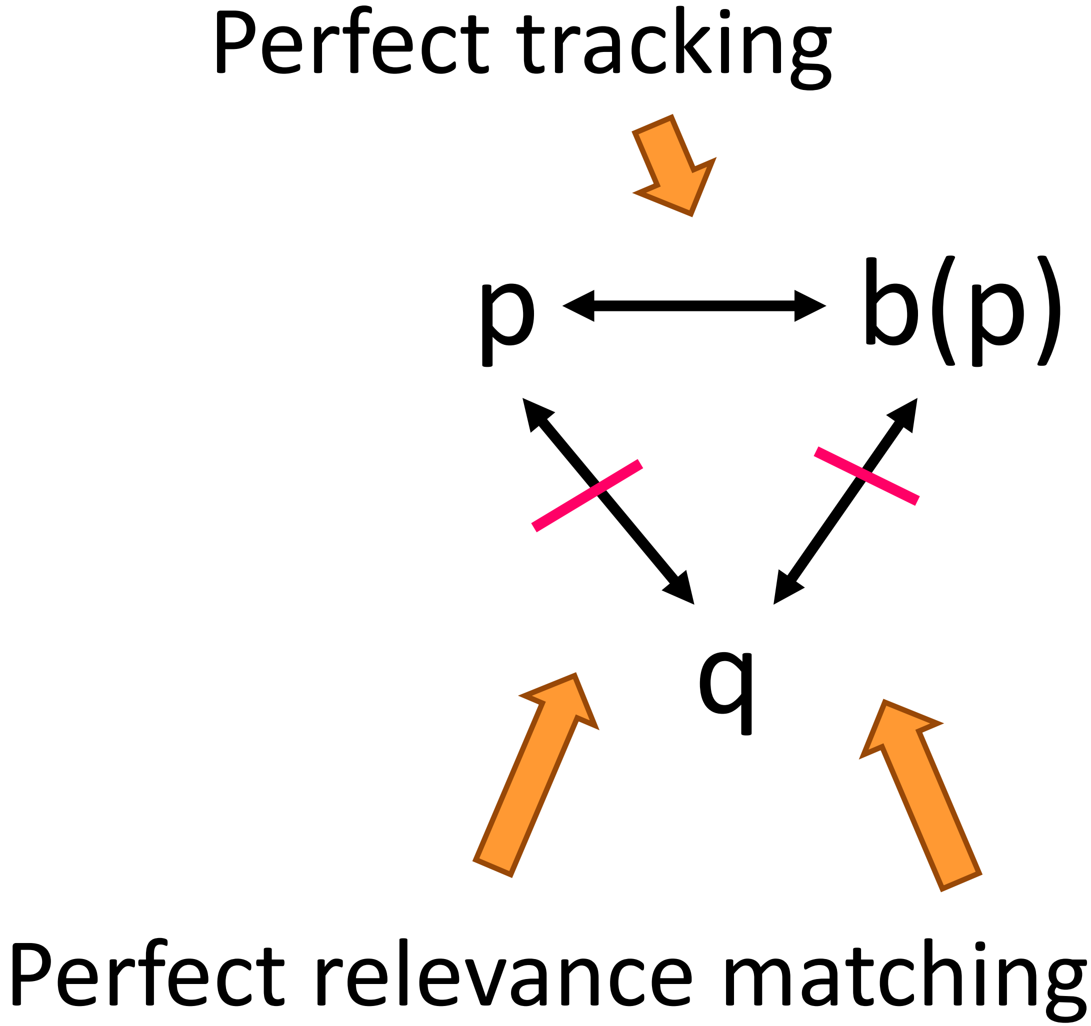
Relation of ***Tracking* p** to ***Relevance Matching*** for p

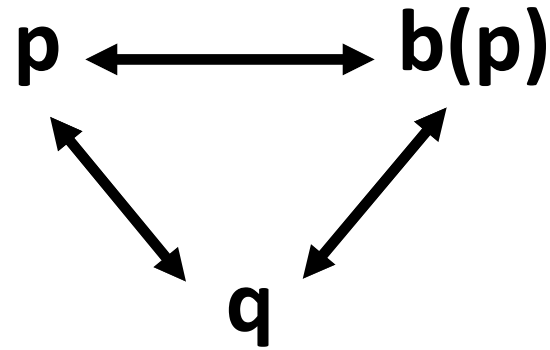
$$\frac{P(b(p)/q)}{P(b(p)/-q)} = \frac{P(p/q)}{P(p/-q)}$$

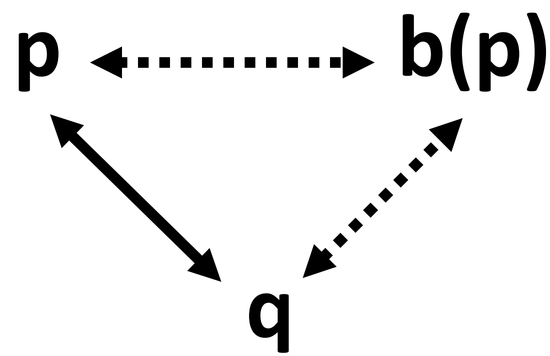
1. Perfect tracking of p $\Leftrightarrow$
   Perfect relevance matching for p on all q

2. Increased tracking of p $\Rightarrow$
   Increased relevance matching for p on all q

3. Increased relevance matching for p on a given q $\cancel{\Rightarrow}$
   Increased tracking of p

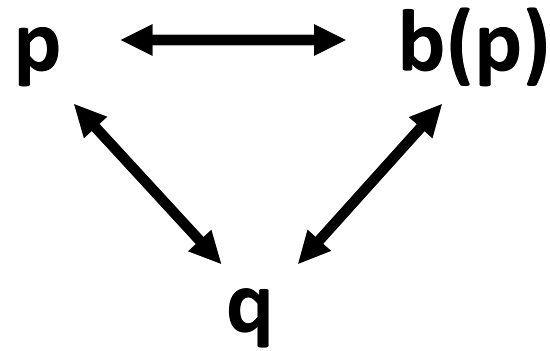

Perfect tracking
p
b(p)
q
Perfect relevance matching

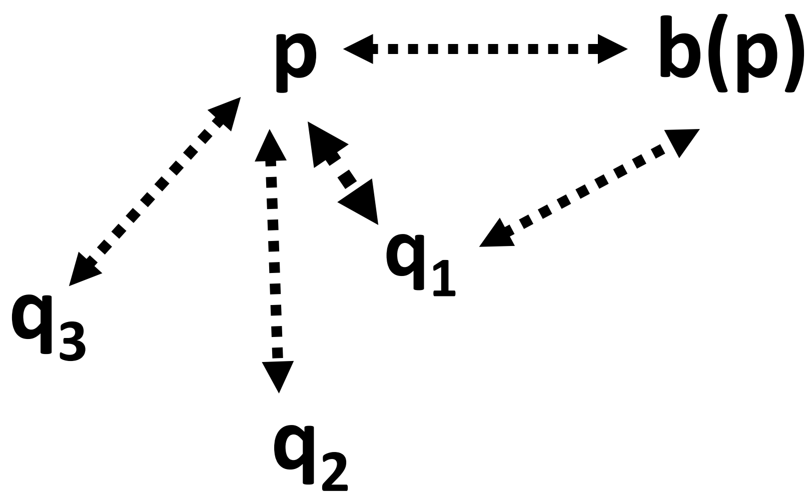

p
b(p)
q

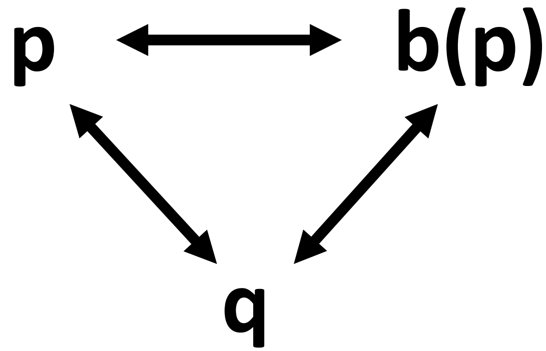

p
b(p)
q

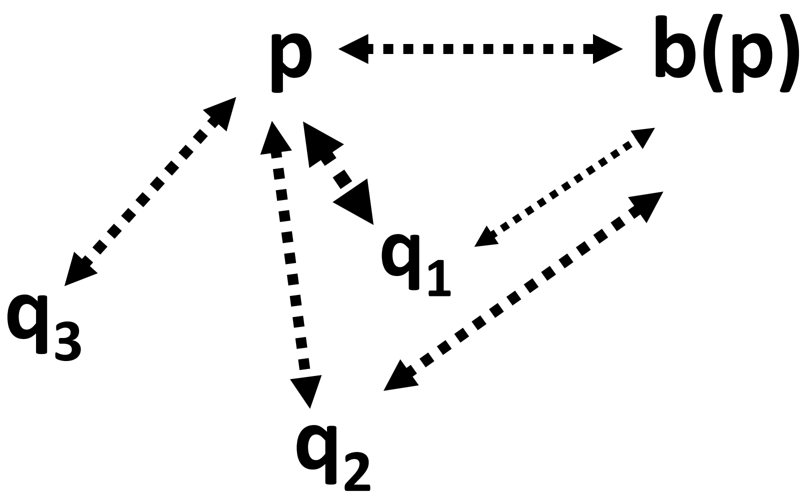
$$\begin{tikzcd} p \arrow[rr, leftrightarrow] \arrow[dr, leftrightarrow] & & b(p) \arrow[dl, leftrightarrow] \\ & q & \end{tikzcd}$$

$$\begin{tikzcd} p \arrow[rr, leftrightarrow, dotted] \arrow[dr, leftrightarrow, dotted] & & b(p) \arrow[dl, leftrightarrow, dotted] \\ & q & \end{tikzcd}$$


p
b(p)
q


p
b(p)
q1
q3
q2


p
b(p)
q


p
b(p)
q1
q2
q3

Gettier cases, relevance matching, and understanding

p = Someone in the office owns a Ford.
q = Jones owns a Ford.
r = Brown owns a Ford.

Have: $P(p/q) = 1$, $P(b(p)/q) = 1$

But: $P(p/-q) \neq P(b(p)/-q)$

Other ways than q of making p true are more relevant to p than S's belief dispositions reflect.

S doesn't understand why p is true.

Definition – first pass

If S believes p and p is true, then

S's ***understanding*** of why p is true ***improves*** iff
there is an increase in relevance matching for p on some q and no outweighing decrease in relevance matching for other q.

Recall

Increasing your tracking of p will increase your relevance matching for p on every q.

→ **Tracking brings relevance matching, G-avoidance, and understanding.**

Increasing your relevance matching *on a given* q doesn't necessarily increase your tracking of p.

Knowledge and Understanding

Increasing your tracking of p will increase your relevance matching for p on every q.

→ **Knowledge brings relevance matching, G-avoidance, and understanding.**

Increasing your relevance matching *on a given* q doesn't necessarily increase your tracking of p.

But improved *understanding* of p always improves level of tracking (knowledge) of p.

Understanding and Explanation

Fact: Relevance matching your belief in p to the web of q's relevant to p does not require you to be able to *cite* the factors probabilistically relevant to p.

Opinions:

1. If we add a citation requirement, then we get a definition of ability to give an *explanation*. (= Salmon statistical relevance view)

2. Not all *understanding* brings ability to give *explanations*.

Prediction of human behavior

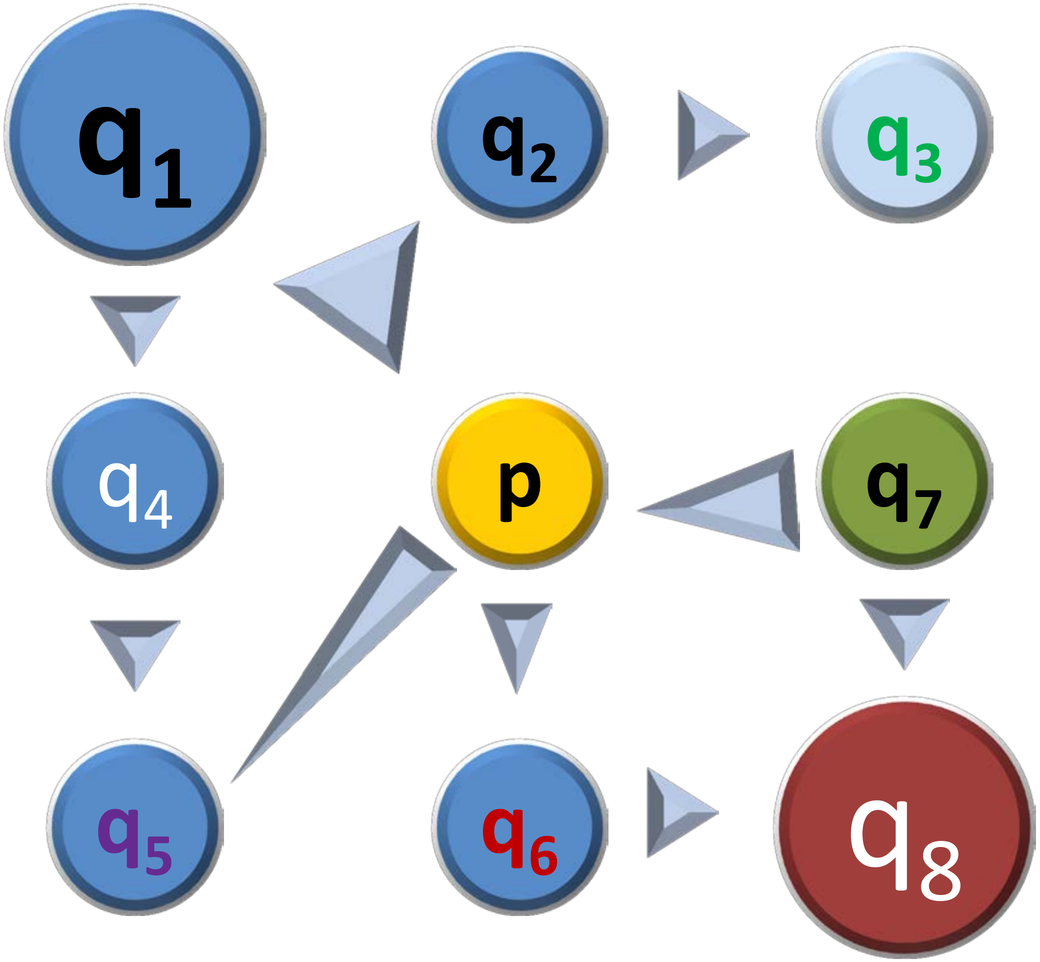
S: I know what she’ll do.

A: How do you know?

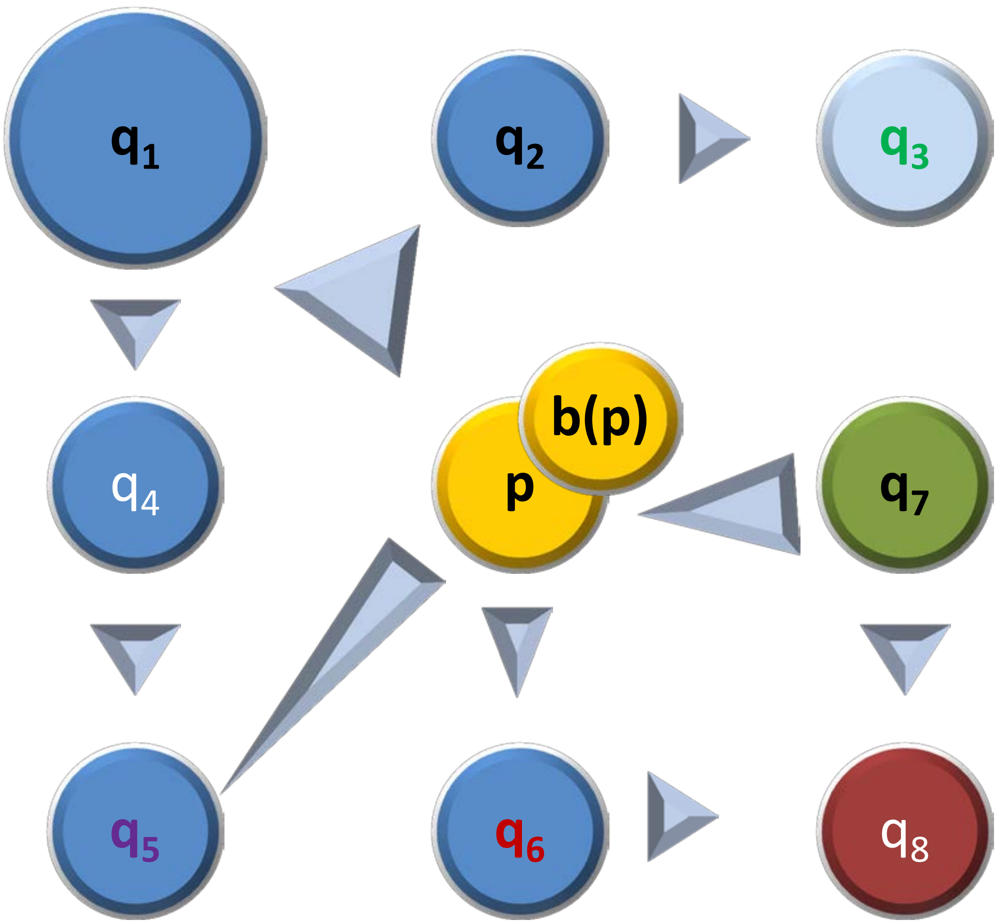
S: I understand her.

We do this without being able to list all the factors.
(Challenge for the higher-order view of understanding other minds.)

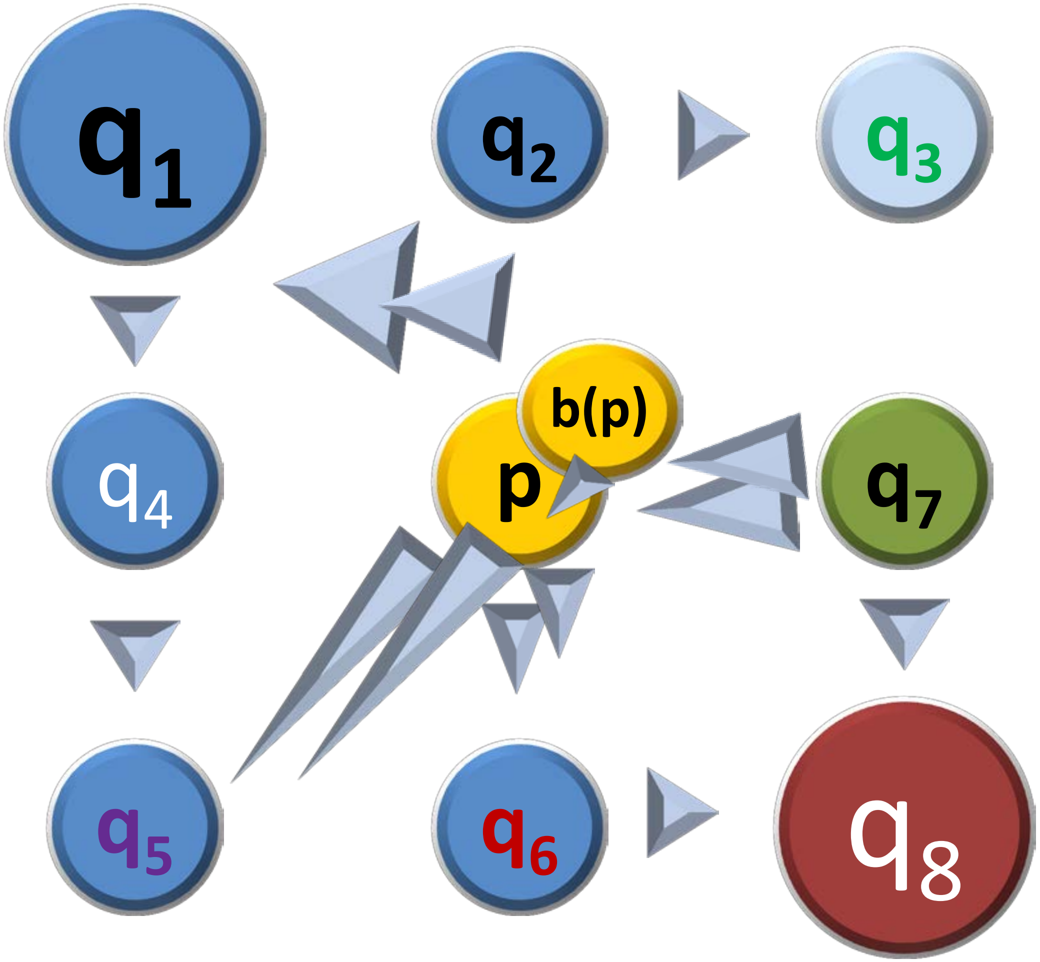
p's web of relevance



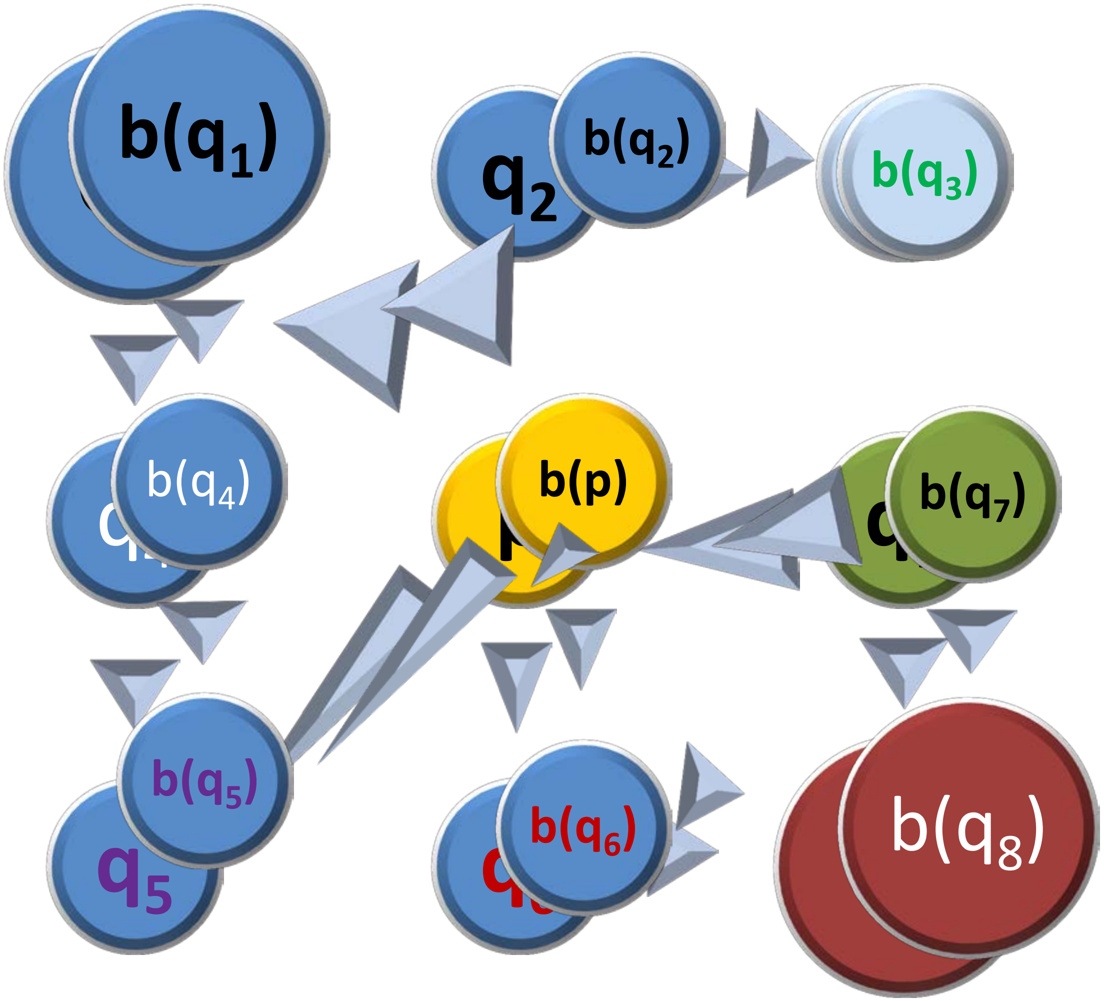
Mere true belief in p



Relevance Matching, Understanding?



Hyperbolic intellectualism



Understanding

Understanding *why you should believe* p

Understanding *why* p is true

Understanding

p = Jefferson is dead

Understanding *why you should believe* p

q_1 = lack of pulse

Understanding *why* p

q_2 = gunshot wound

q_3 = political disputes

indicators of p   vs.   what makes p true

Awkward

You track p via a great indicator

$\Rightarrow$ You relevance match on all q.

$\Rightarrow$ You understand why Jefferson is dead.

Awkward

Your believing p (hurricane tomorrow)

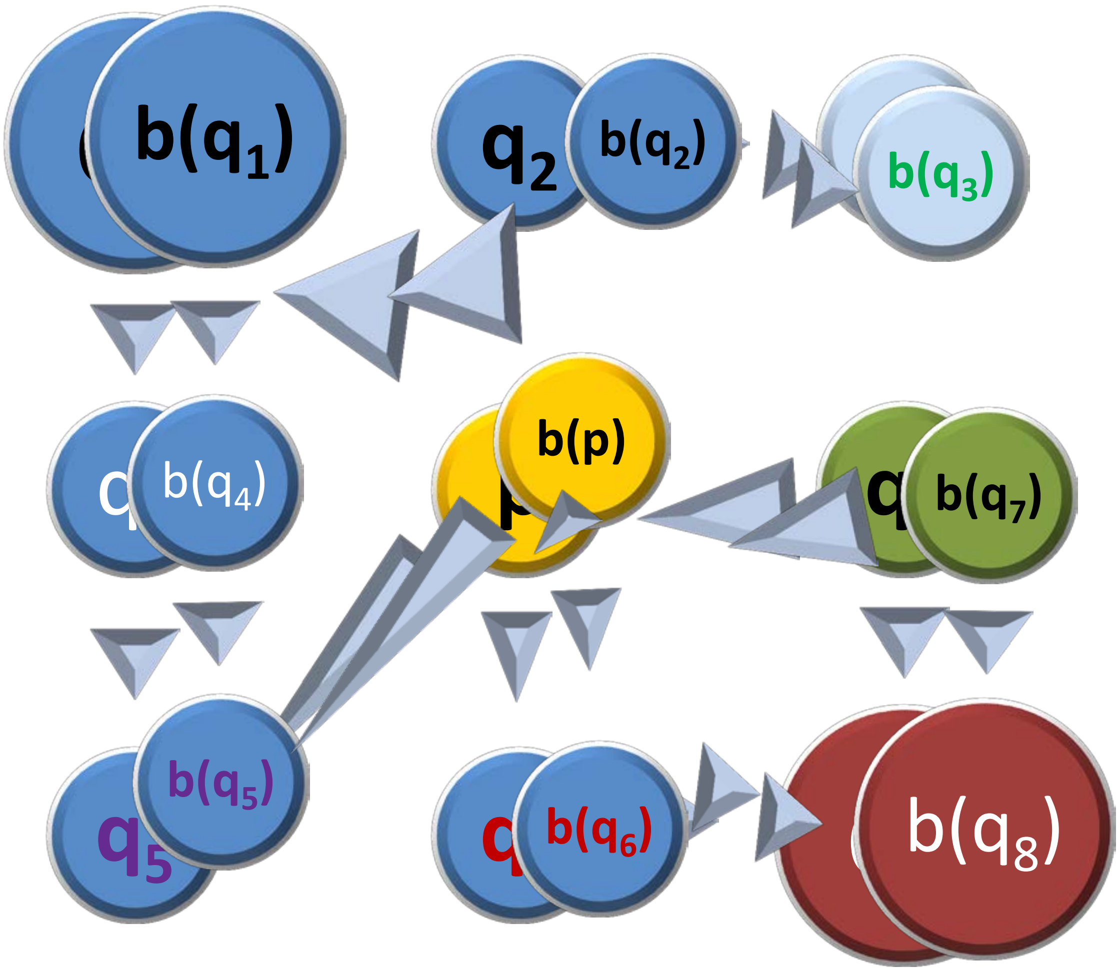
co-varies with output of a great computer simulation programmed by someone else.

$\Rightarrow$ You track p.

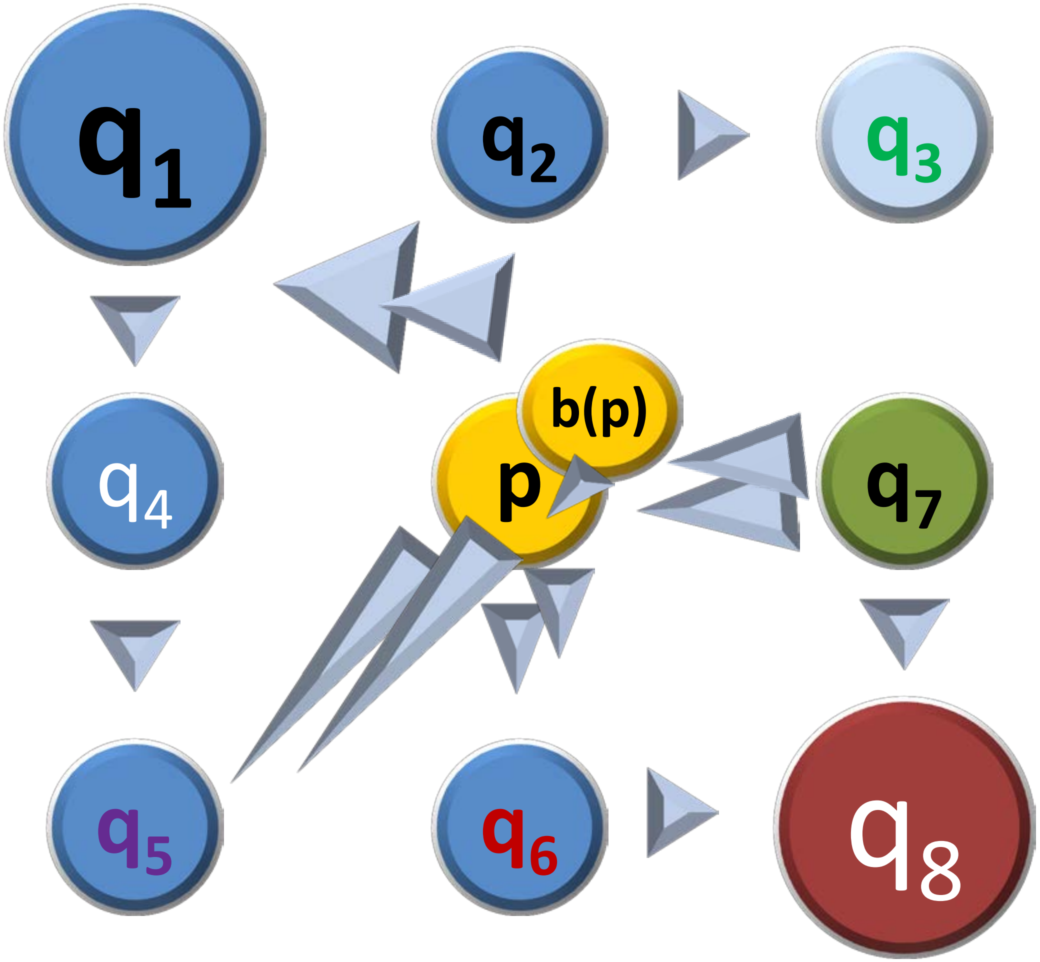
$\Rightarrow$ You relevance match on all q.

$\Rightarrow$ You understand why p is true.

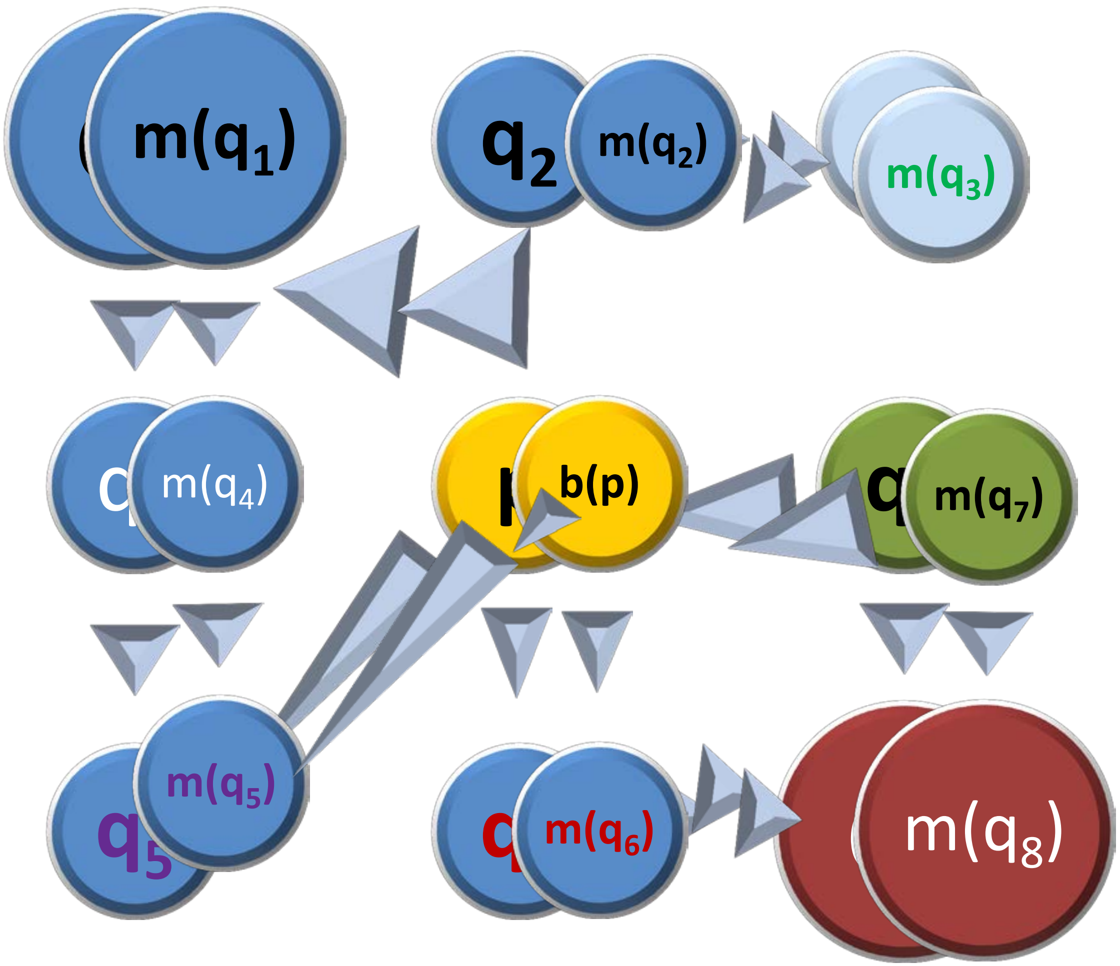
Hyperbolic Intellectualism



Understanding?



Owning the relevance matching



Prediction of human behavior

S: I know what she’ll do.

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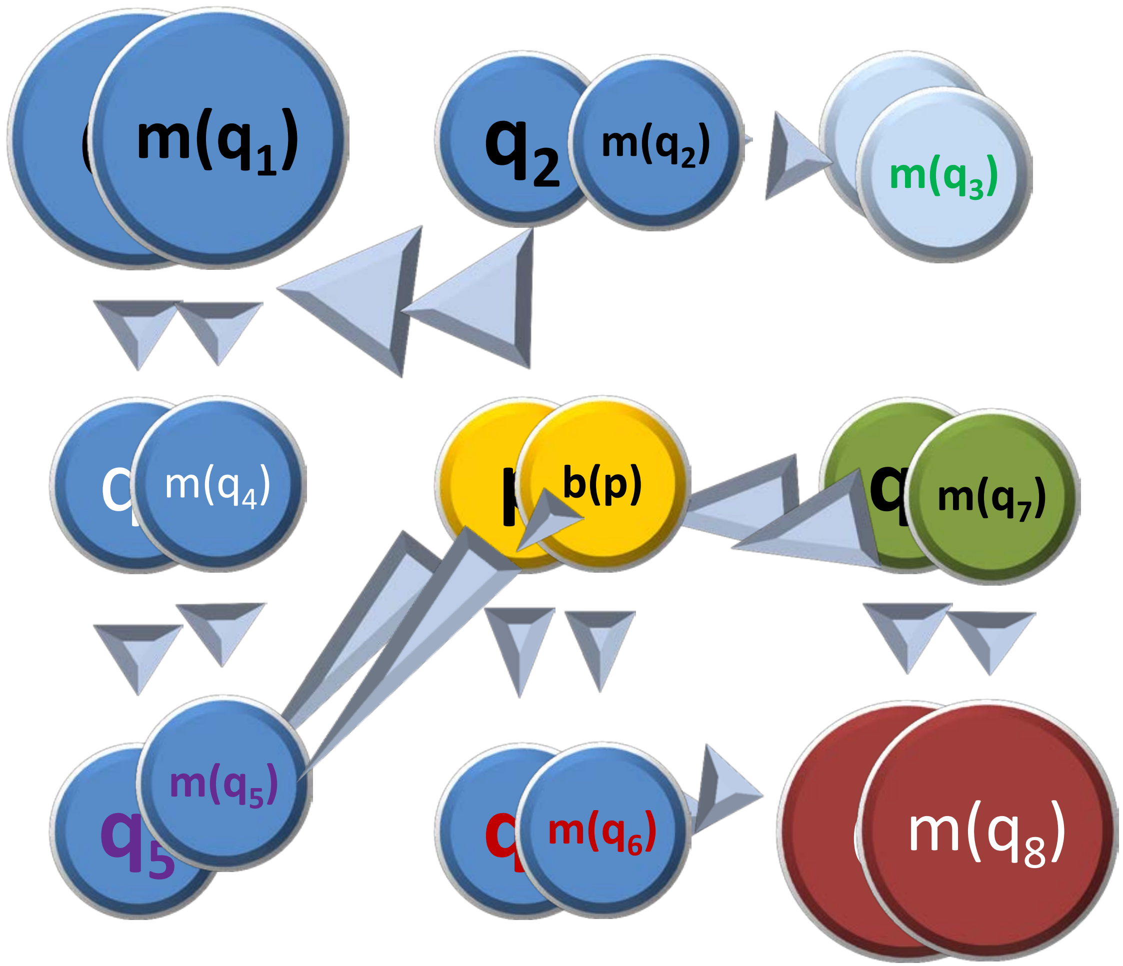
We do this without being able to list all the factors. (Challenge for the higher-order view of understanding other minds.)

Understanding as simulation



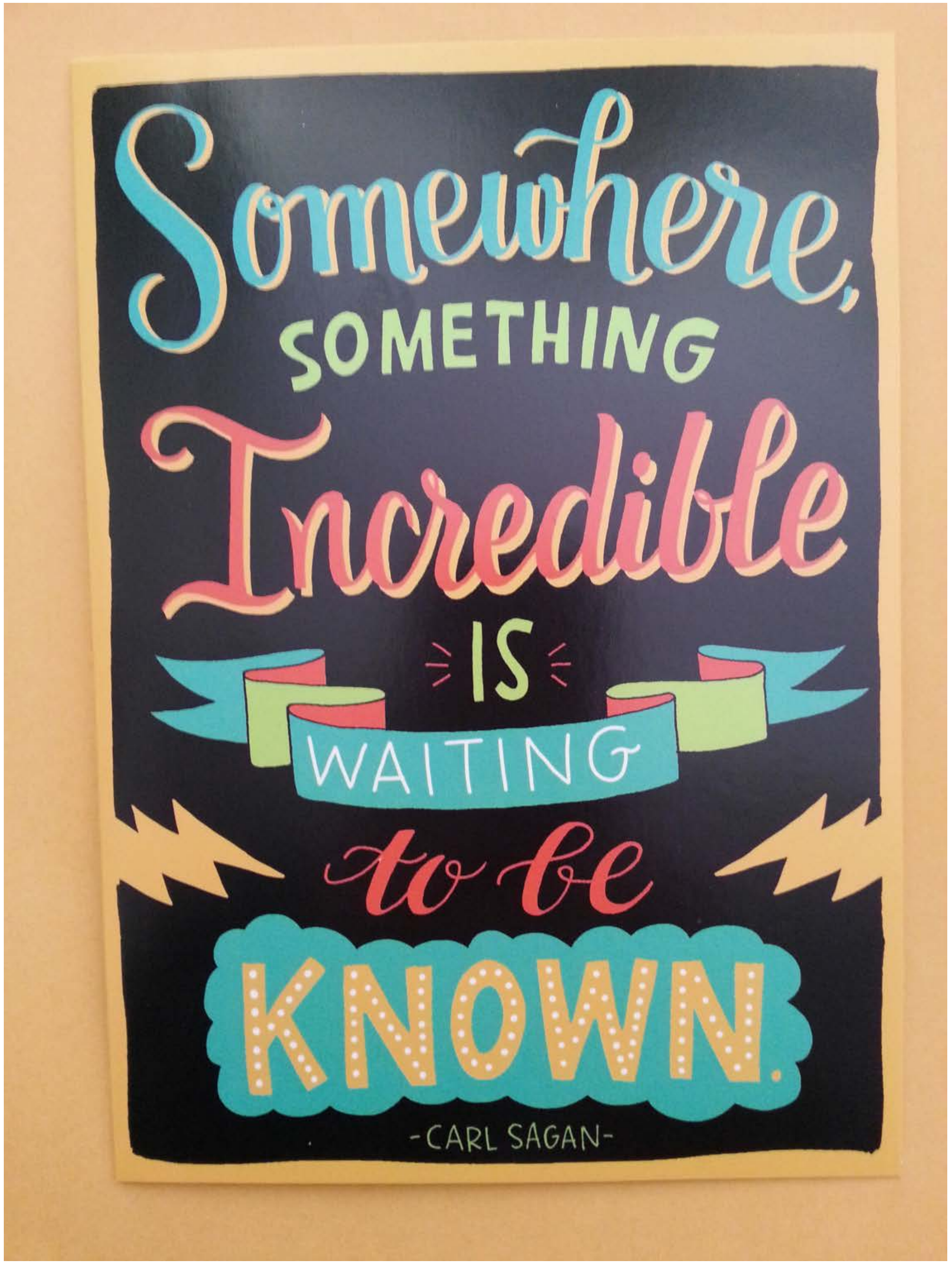
Summary

1. Knowledge (tracking) is more valuable than mere true belief; it is an ESS.

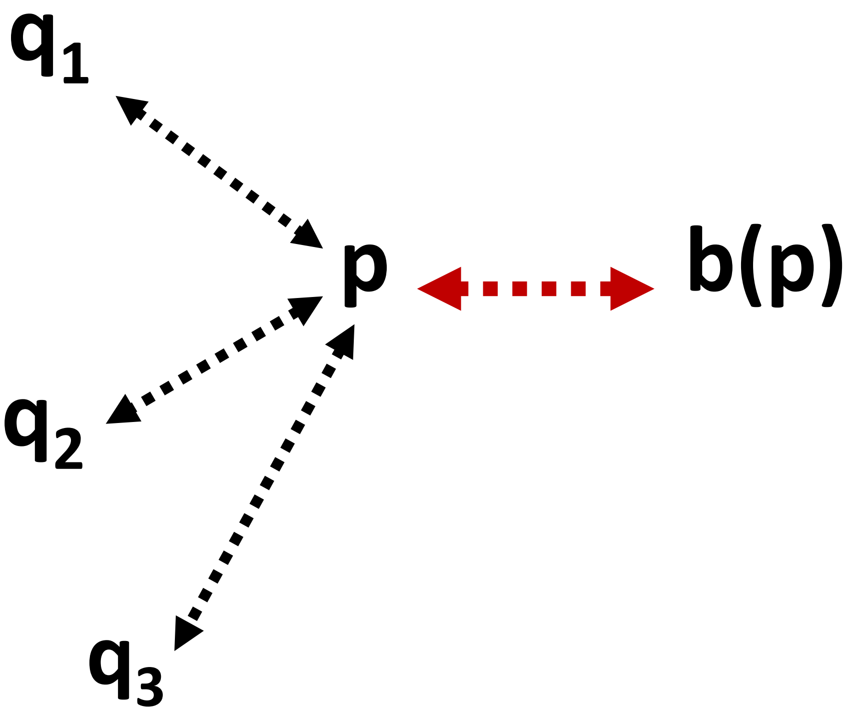
2. What explains that value (tracking) also directly opposes gettierization.

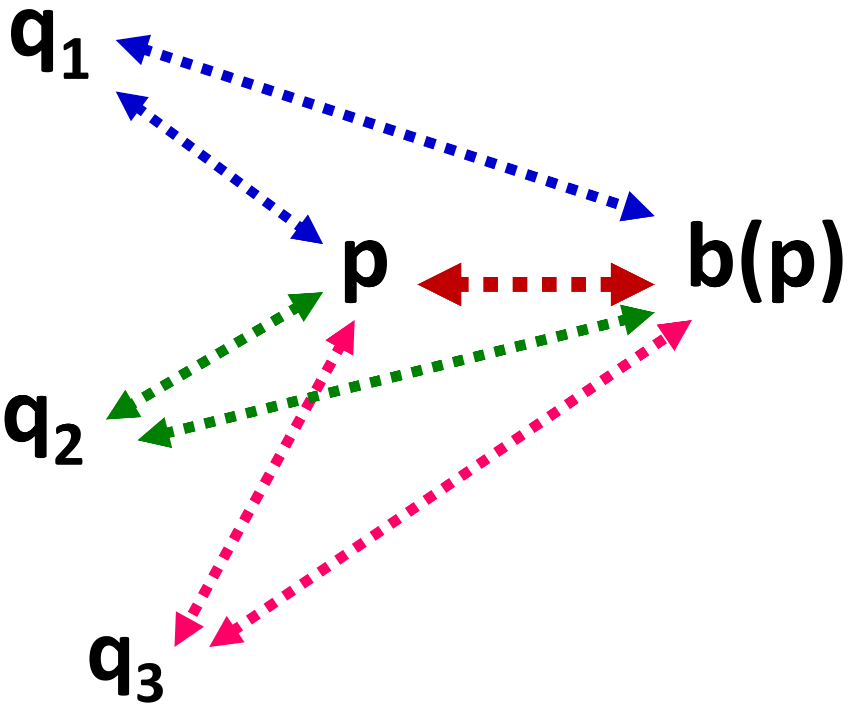
3. Gettierization avoidance for p has a value – contributing to understanding p – even if we don’t assume knowledge of p has value.

4. Understanding ~ relevance matching ~ simulation


Somewhere,
SOMETHING
Incredible
IS
WAITING
to be
KNOWN.
-CARL SAGAN-

$p \longleftrightarrow b(p)$


q_1
p
b(p)
q_2
q_3



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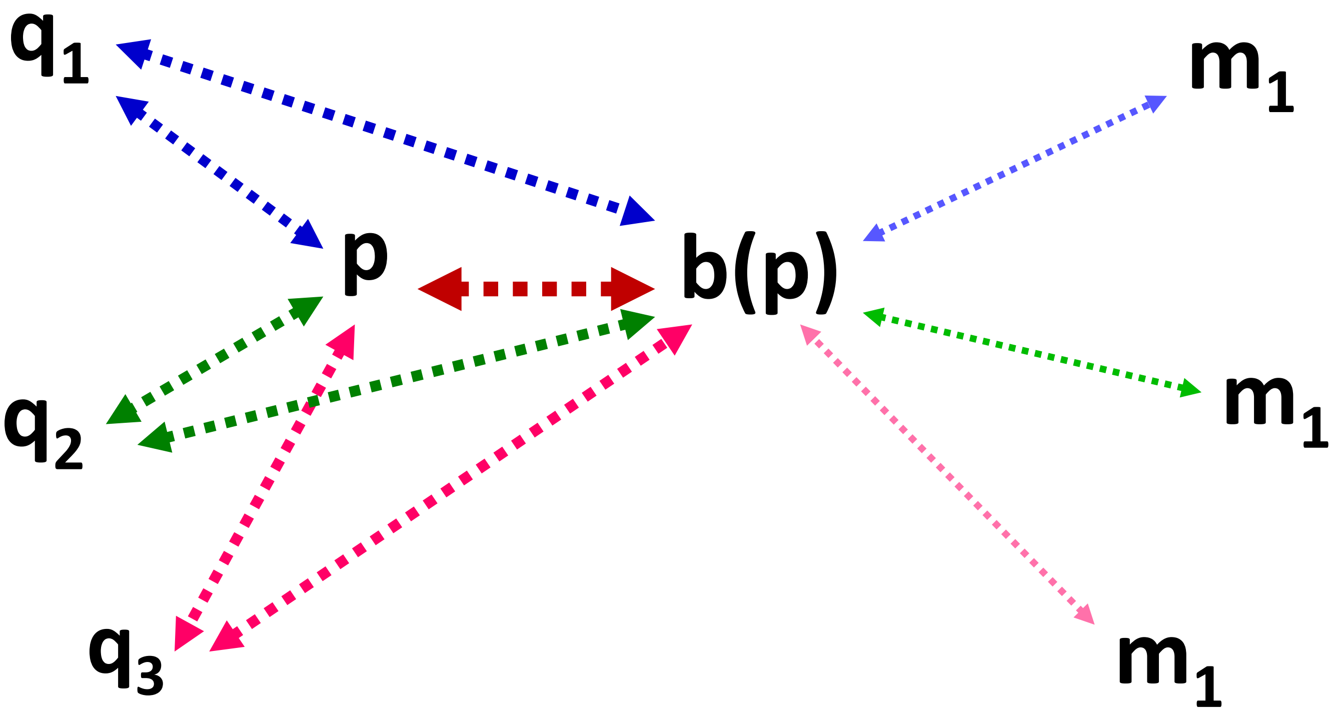
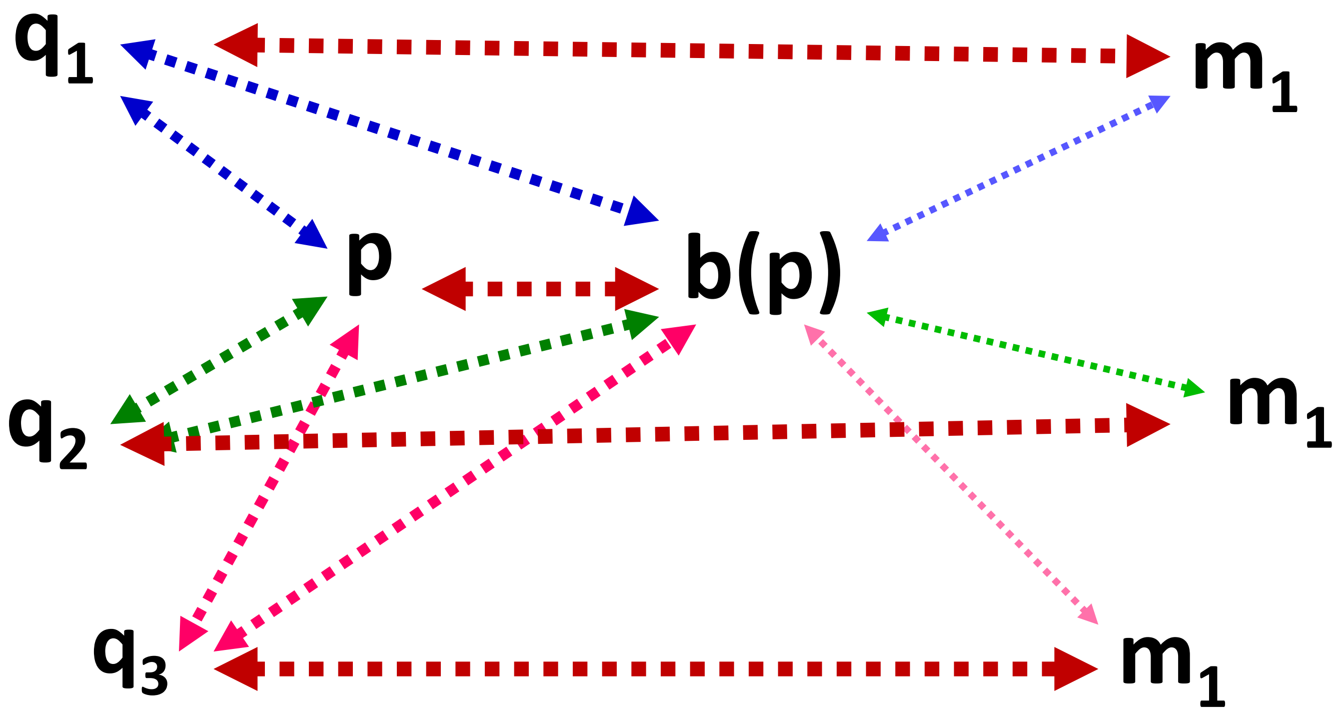
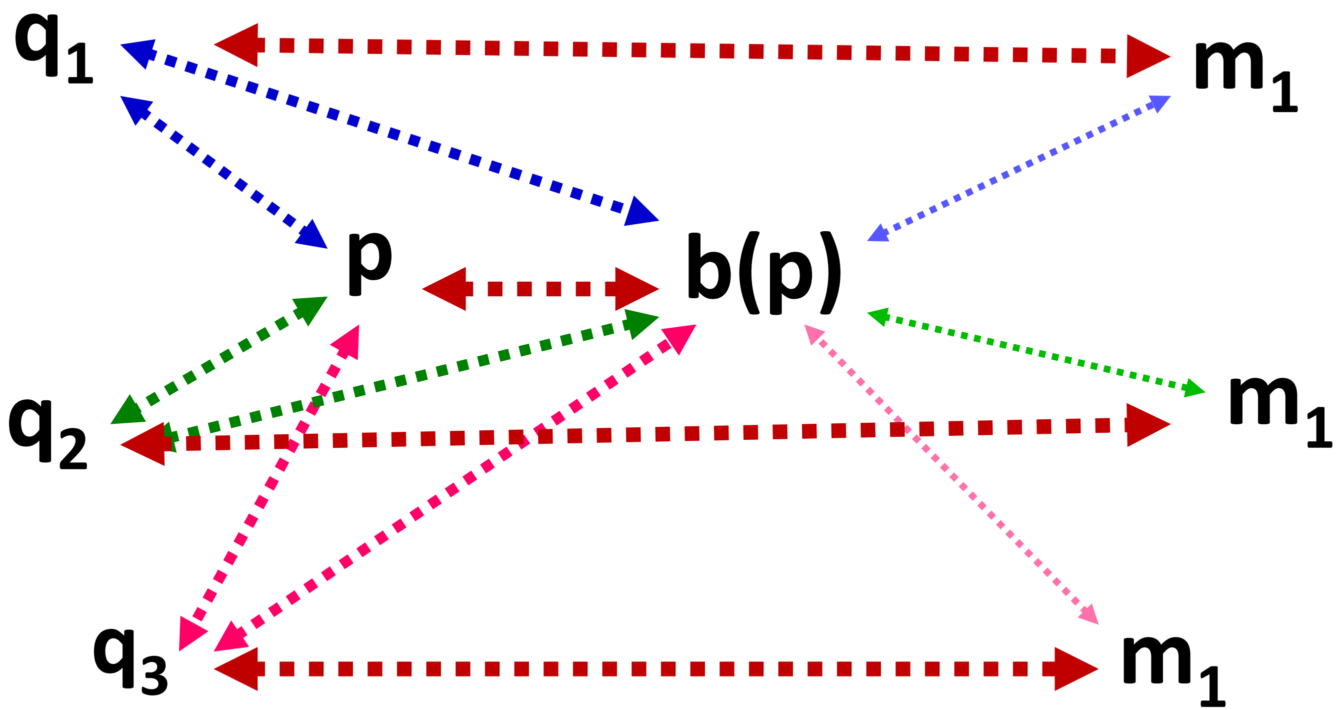


q1
m1
p
b(p)
q2
m1
q3
m1



q_1
m_1
p
$b(p)$
q_2
m_1
q_3
m_1



q_1
m_1
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q_2
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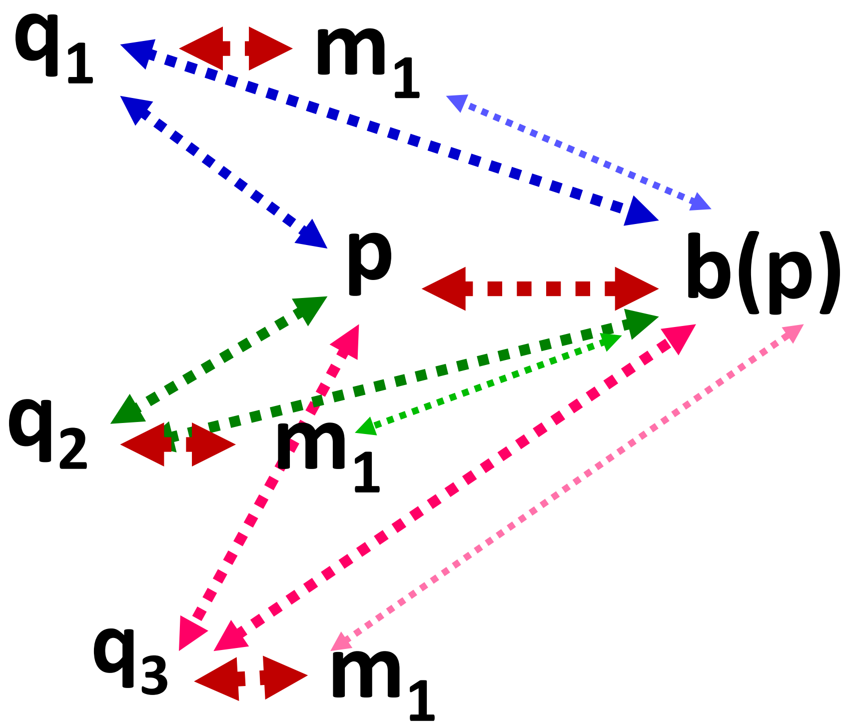

q_1
m_1
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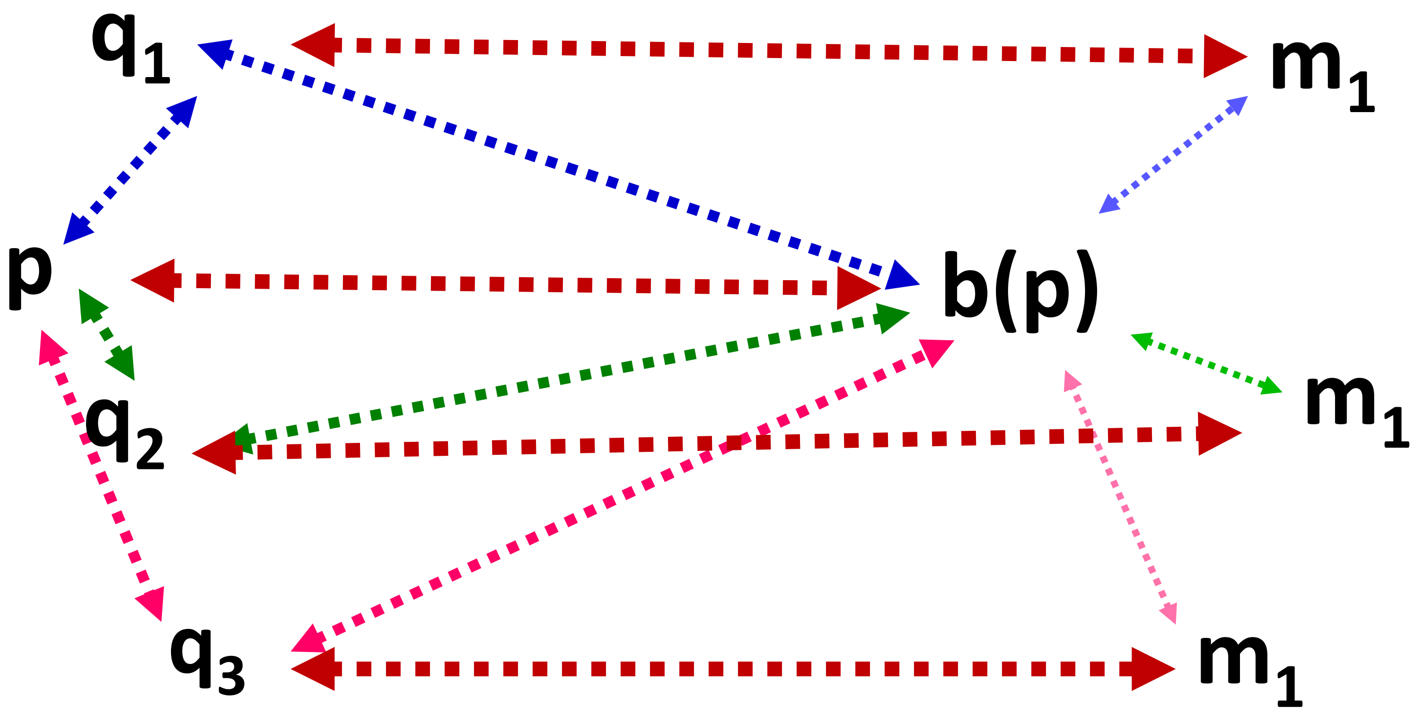
b(p)
q_2
m_1
q_3
m_1



q_1
m_1
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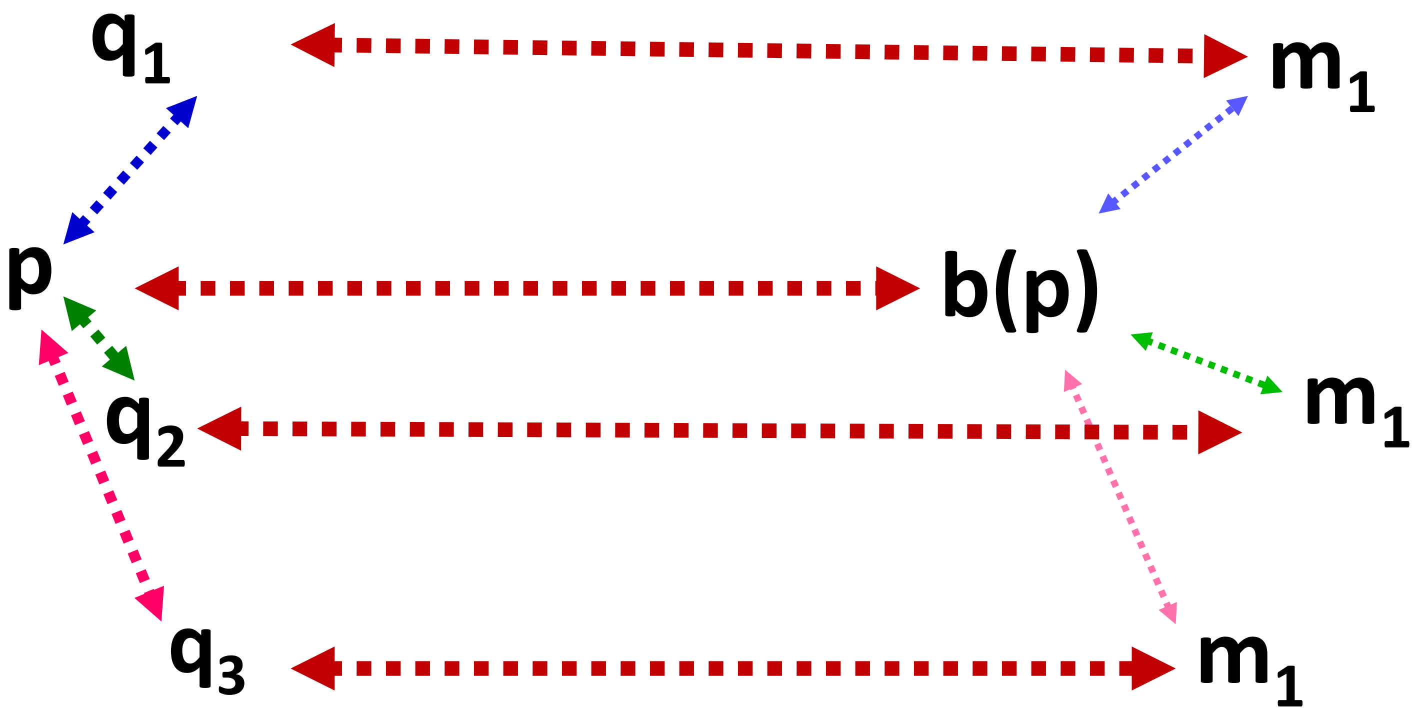
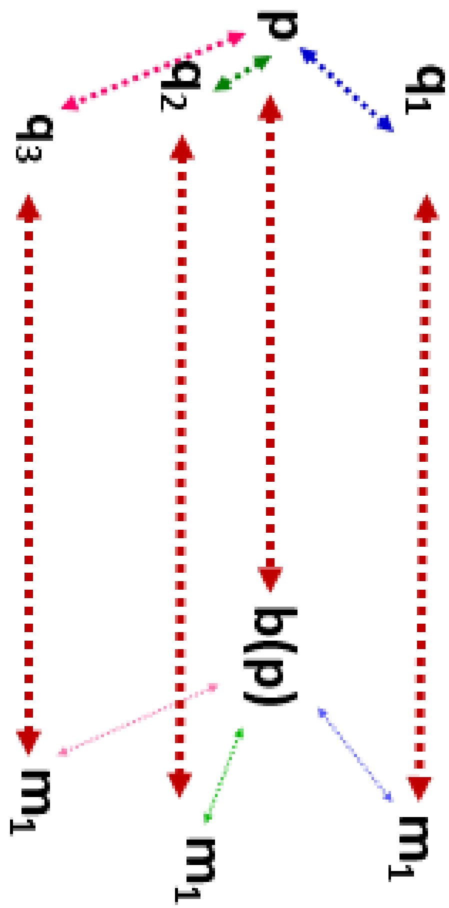
q_3
m_1



q_1
m_1
p
$b(p)$
m_1
q_2
q_3
m_1


p
q1
q2
q3
b(p)
m1
m1
m1