Are hopeful narratives more convincing? An experiment

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Intuition


THE MYSTERIOUS CASE OF THE COVID-19 LAB-LEAK THEORY
Did the virus spring from nature or from human error?
By Carolyn Kormann
October 12, 2021

Research question & contributions

First experimental investigation on how exposure to (conflicting but equally plausible) narratives affect individuals' beliefs and behavior.

We are exposed to many, possibly conflicting, narratives: why are some narratives more *popular* than others? How one would react when (mutual) refutation is made explicit?

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First experimental investigation on how exposure to (conflicting but equally plausible) narratives affect individuals' beliefs and behavior.

We are exposed to many, possibly conflicting, narratives: why are some narratives more *popular* than others? How one would react when (mutual) refutation is made explicit?

- **Simple, clean and aseptic experimental design**: while it can be *easily* modified to include real-world related conjectures, our aim is to rule out any possible confounds due to subjects' personal experiences and convictions;
- **No context specific** policy implications: our results can be useful in several fields, for example in the understanding of demagoguery;
- Contribution to the **growing (experimental) literature on narratives, "mental models" and "learning about a game"** (Oechssler and Schipper 2003).

Related literature

- Theoretical definition/analysis of narratives:
  - narratives as simple explanations of events to reach an enduring understanding of reality (Shiller (2007, 2017), Juille and Jullien (2016), Eliaz and Spiegler (2020));
  - narratives as arguments endorsing moral or prosocial behavior (Bénabou, Falk, and Tirole (2018, 2020)).

- Lab experiments model narratives with social or moral attributes (Antinyan et al. (2021), Balafoutas et al. (2021), Harrs et al. (2021), Hillenbrand and Verrina (2022)).

- Lab experiments on incomplete/misspecified mental models of a data-generating process (Enke (2020), Esponda et al. (2021), Charles and Kendall (2022), Graeber (2022), Kendall and Oprea (2022)).

Example

Example

@ wins against %.

Example

@ wins against **%**.

You are told that behind this evidence there's a simple rule:

- Either **@** wins against **%**
- or **Blue** wins against **Red**

Experimental design

Experimental design

- 3 symbols and 3 colors: @, % and #, Yellow, Blue, Red

- 2 mutually exclusive possible rules: Symbol rule (@>%>#) or Color rule (Yellow > Blue > Red) in determining the winner of the zero-sum game:
  - Subjects know that 50% of the participants are randomly assigned to the Symbol rule and 50% of them are assigned to the Color rule (see).
- Subjects know they will choose the Symbol while the color will be randomly drawn afterwards.
- Costs associated to actions are shown to subjects (@ most costly, # cheapest) (see)

- TREATMENTS: Some outcomes, that are true independently of the actual rule, are shown in the **instructions.** Instructions differ in the way of presenting ambiguous evidence:
  - Baseline (random order): BSL
  - Symbol order: SYM
  - Color order: COL

Baseline treatment

Baseline

%	wins against	#	how much?	14-4-6=4
@	wins against	#	how much?	14-6-4=4
@	wins against	%	how much?	14-6-6=2
@	wins against	%	how much?	14-6-6=2
@	wins against	#	how much?	14-6-6=2
%	wins against	#	how much?	14-4-4=6
@	wins against	%	how much?	14-6-4=4
@	wins against	#	how much?	14-6-6=2
%	wins against	#	how much?	14-4-6=4

Symbol treatment

Symbol Order

@	wins against	%	how much?	14-6-4=4
@	wins against	%	how much?	14-6-6=2
@	wins against	%	how much?	14-6-6=2
@	wins against	#	how much?	14-6-6=2
@	wins against	#	how much?	14-6-6=2
@	wins against	#	how much?	14-6-4=4
%	wins against	#	how much?	14-4-6=4
%	wins against	#	how much?	14-4-4=6
%	wins against	#	how much?	14-4-6=4

Color treatment

Color Order

%	wins against	#	how much?	14-4-6=4
@	wins against	%	how much?	14-6-6=2
@	wins against	#	how much?	14-6-6=2
@	wins against	#	how much?	14-6-6=2
%	wins against	#	how much?	14-4-6=4
@	wins against	%	how much?	14-6-6=2
@	wins against	%	how much?	14-6-4=4
@	wins against	#	how much?	14-6-4=4
%	wins against	#	how much?	14-4-4=6

Experimental design

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- Every 9 rounds:
  - we elicit **beliefs** about which rule the subject thinks having been assigned to, through a binary lottery procedure (McKelvey and Page, 1990; Schlag and van derWeele, 2013; Hossain and Okui, 2013; Harrison et al., 2014);

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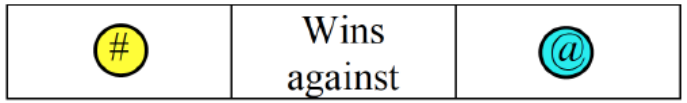
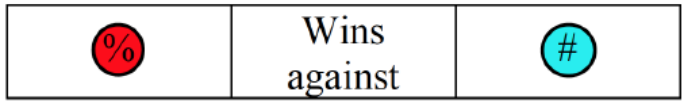
  - we provide each subject with an **outcome of a further match** perfectly informative about the actual implemented rule.

Example of further match: Color rule

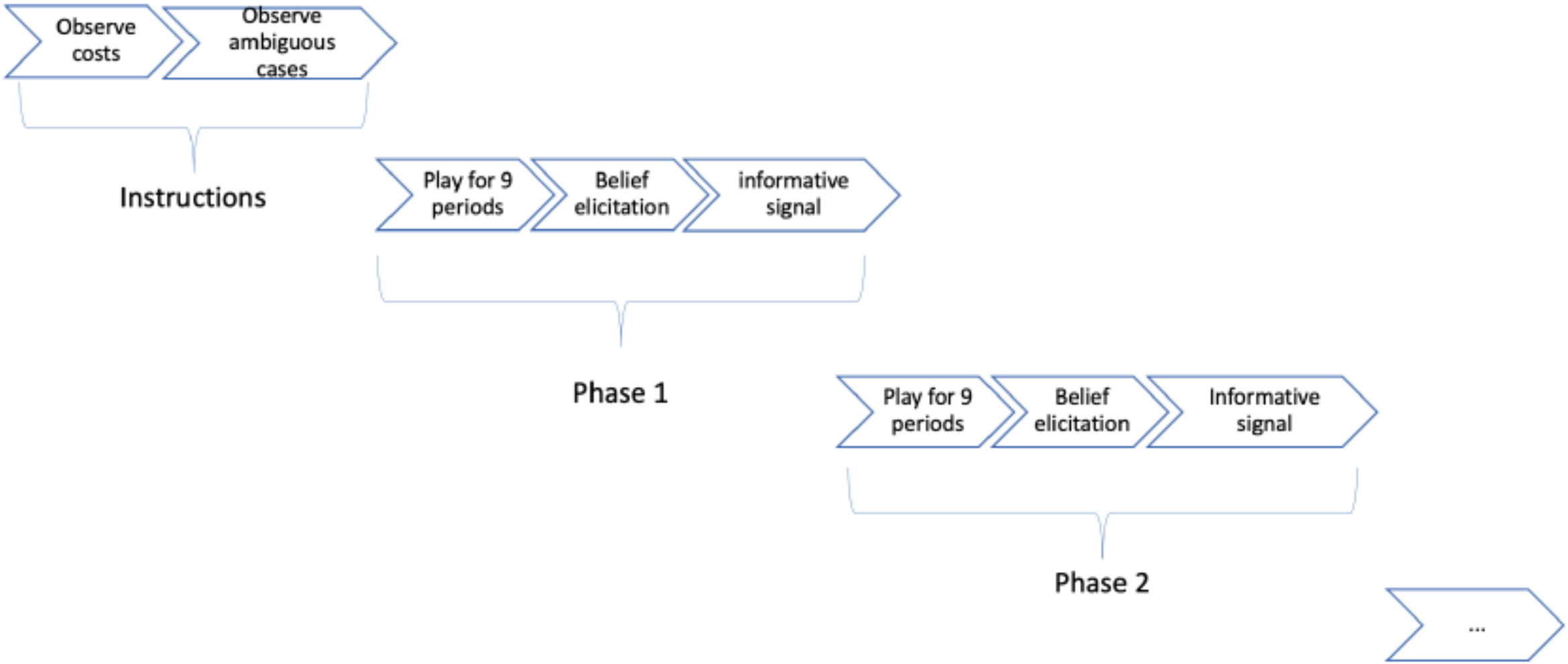


Example of further match: Symbol rule



The further match shown to each subject **unambiguously confutes one of the two rules deducible from the instructions** (@>%># or Yellow>Blue>Red) **and confirms the other.**

Experimental design: timeline



Experimental procedures

- Pre-registration in OSF.
- Experimental data from 244 subjects recruited via Orsee.
- The experiment was conducted in Venice (VERALab) from December 2021 to February 2022, with zTree.
  - Post-experimental questionnaire: risk attitudes (Dohmen et al. 2011), ambiguity aversion (Cavatorta and Schröder 2021), optimism (Kemper et al. 2015), Cognitive Reflection Test (Frederick 2005, Sirota and Juanchich 2018), socio-demographic questions (age, previous participation to economic experiments, sex).
- Payment of 1 (random) round of the game among 36 + payment of 1 (random) beliefs elicitation round among 4 + show-up fee.

Results

Results

Variables of interest

- **Beliefs**→ 50/50 in round 9, 100 in the following rounds.
- **Choices**
  - consistent with the symbol being the rule governing the game → choose @ (the dominant symbol);
  - consistent with the color being the rule governing the game → choose # (the cheapest symbol);
  - "random" → two combinations of strategies, namely, playing % against @ and % against % are not reconcilable with any of the two hierarchies.

Results → Beliefs in round 9

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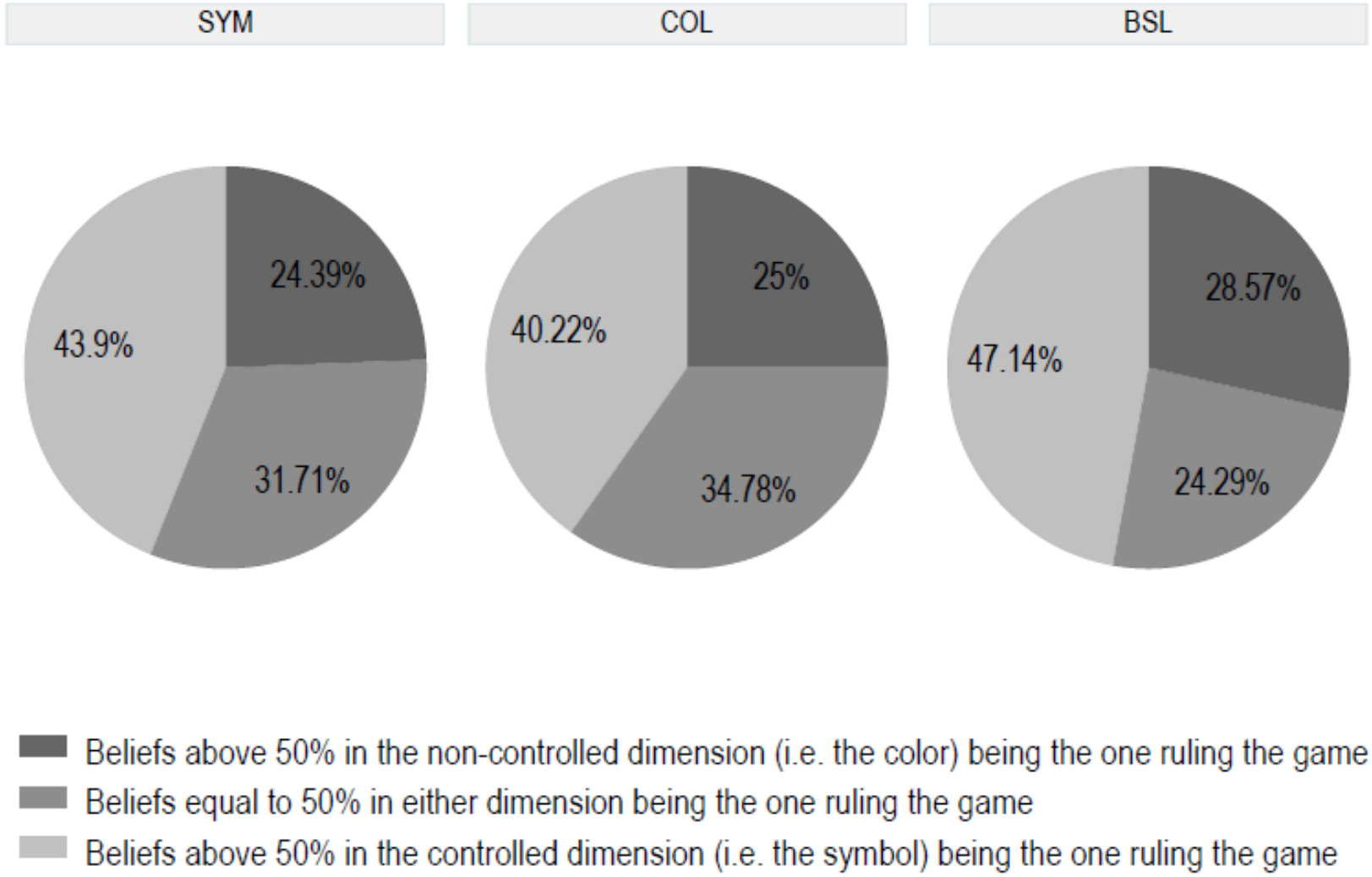
Result 1

Subjects' beliefs are unbalanced towards the symbol rule



The effect of the information on beliefs and behavior → from round 9 to 36

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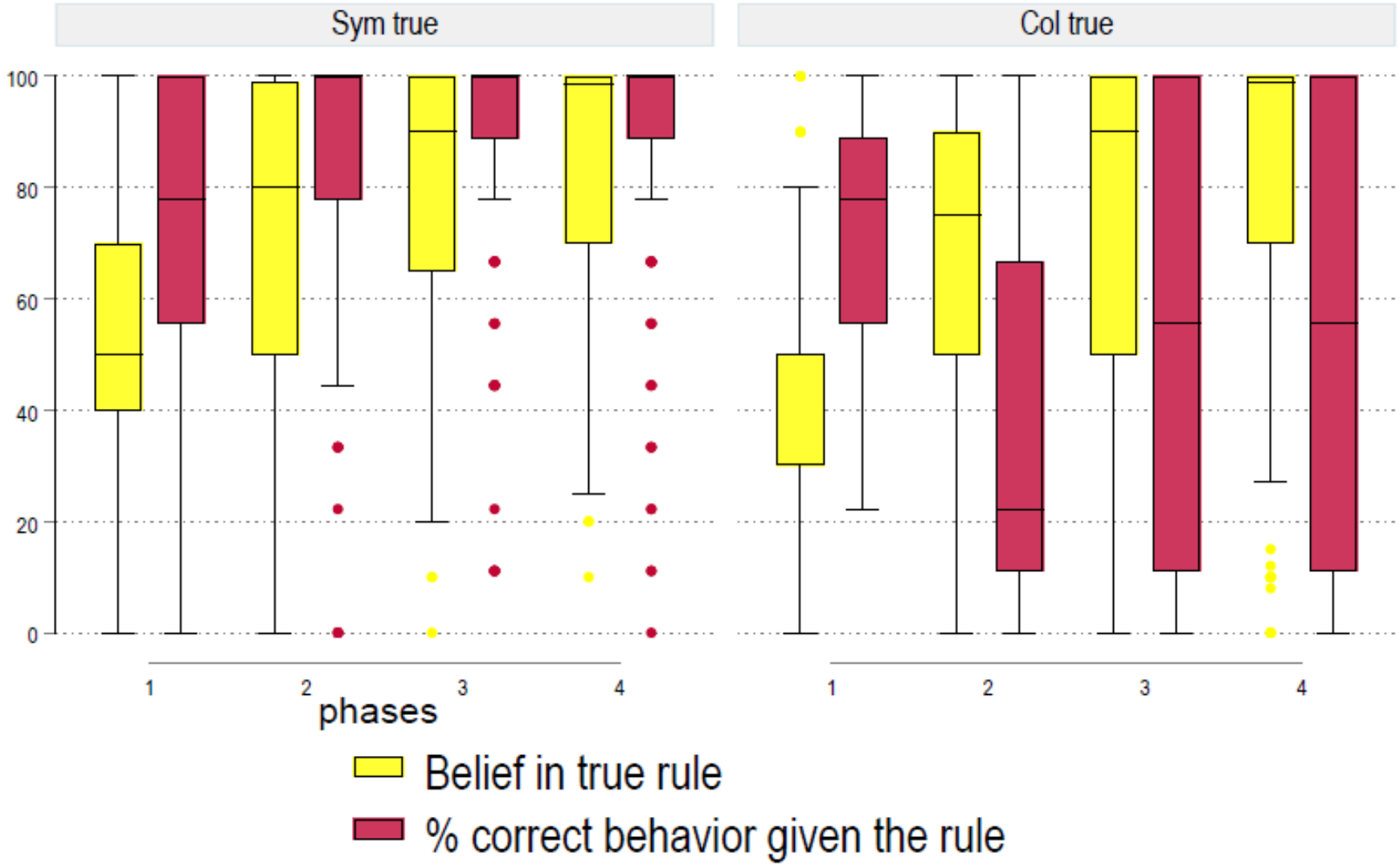
- The further match shown to subjects at the end of round 9th (and 18th, 27th, 36th) allow individuals to perfectly identify the actual rule they were assigned to.

- Both beliefs and behavior should be adjusted accordingly:
  - Symbol rule: choose the dominant symbol;
  - Color rule: choose the cheapest symbol to minimize unnecessary costs;

Result 2

- Beliefs are updated “fast” between phases 1 and 2, with no significant diff. between rules.
- Behavior takes more time to become consistent when the non-controlled dimension (the Color) is the one determining the winner of the game



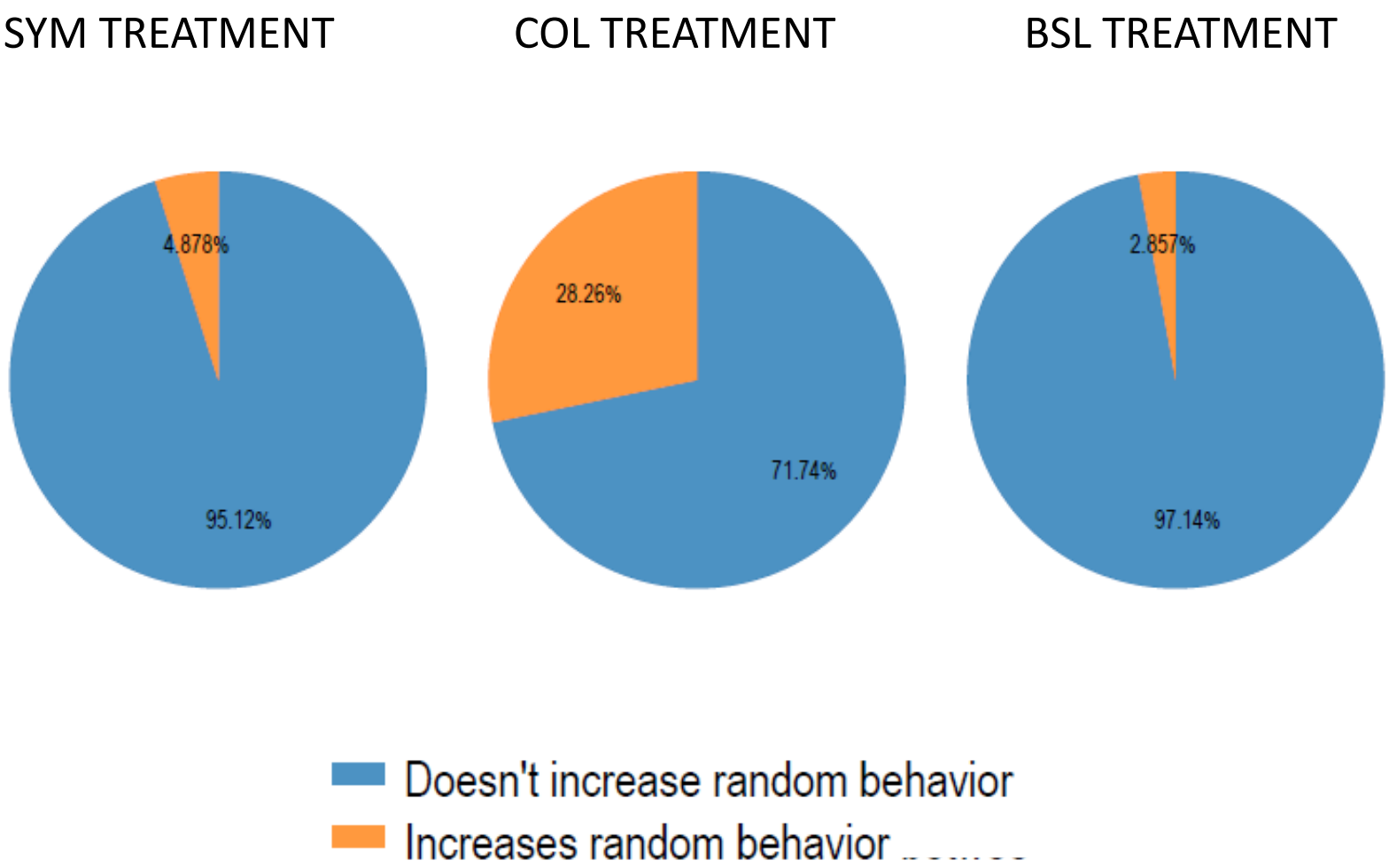
Displacement

There are two combinations of strategies, namely, playing % against @ and % against %, that are not reconcilable with any of the two hierarchies so that we define as "random" behavior.

Displacement by treatment if **Symbol rule**

Result 3a

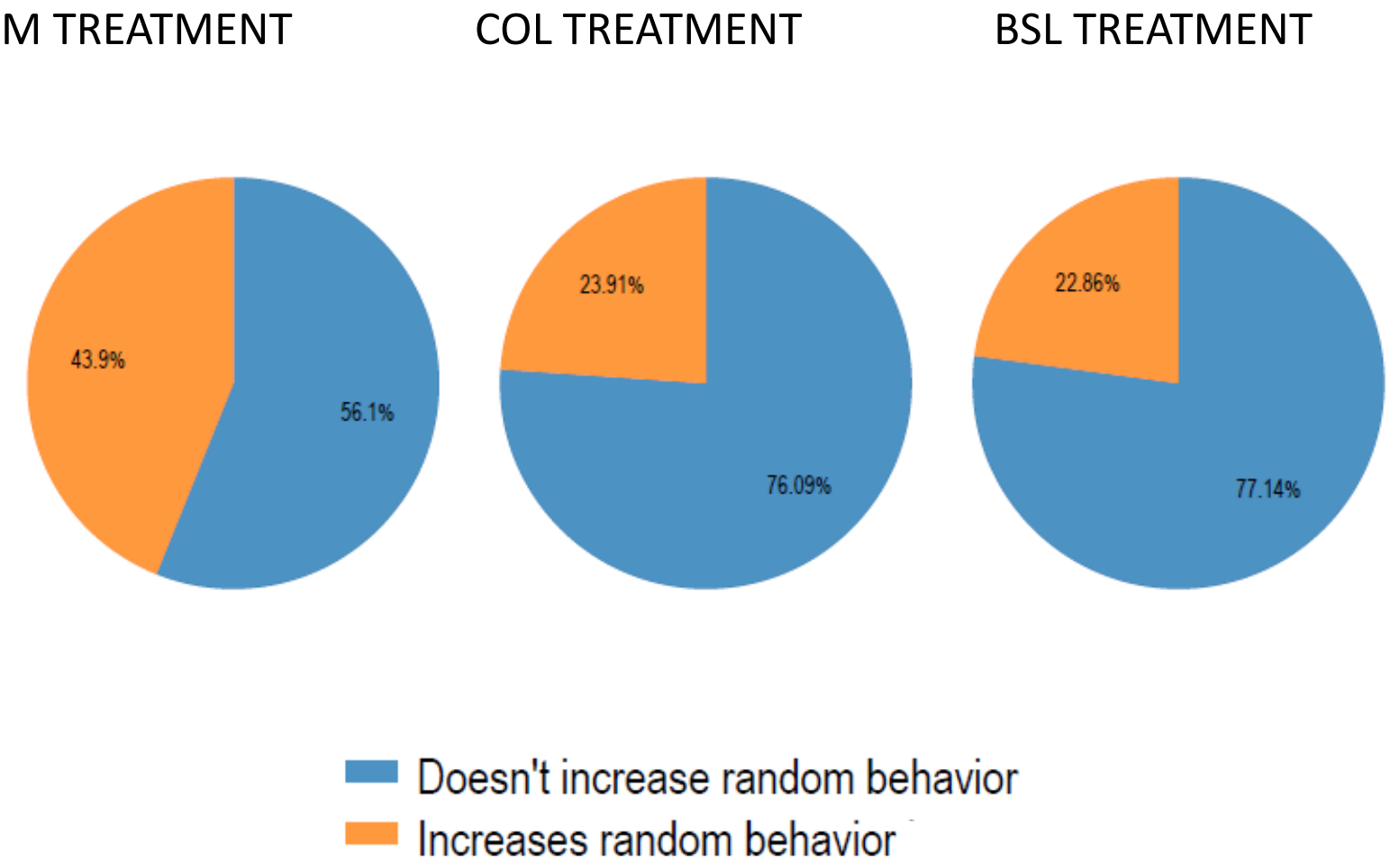
When only considering those subjects assigned to the Symbol rule, **displacement is higher for the subjects assigned to the COL treatment**



Displacement by treatment if **Color rule**

Result 3b

When only considering those subjects assigned to the Color rule, **displacement is higher for the subjects assigned to the SYM treatment**



Conclusion

- When in doubt about the roots of an uncertain phenomenon, people prefer to interpret reality in a way that gives them control over the situation, independently on the narratives they have been exposed to, even if this is detrimental for their earnings;

- Individuals' biased behavior is persistent, even after receiving full information on "*what causes what [...] and what should be done.[...]*";
  - Providing non-ambiguous information that contradicts the content of the narrative increases the fraction of random and unexplainable choices.

Thank you

What rule will be used to determine the outcome of the comparison between the two balls? There are two possible rules that determine the result of the comparison between the two balls:

- The "symbol rule", according to which the winner between the two balls is determined exclusively on the basis of a specific hierarchy between the symbols , % and #.
- The "color rule" according to which the winner between the two balls is determined exclusively on the basis of a specific hierarchy between the colors Yellow, Blue and Red.

At the beginning of the experiment, the computer will randomly assign half of the participants to the symbol rule and the remaining half of the participants to the color rule. The rule randomly assigned to the participant will remain the same for the whole duration of the experiment.

Back

Gain = 14 – Cost «@» - Cost «Yellow»

= 14 - 6 - 6 = **2**

	Cost «Yellow»= 6	Cost «Blue»= 4	Cost «Red»= 2
Cost «@» = 6	@ Gain= 14-6-6=**2**	@ Gain= 14-6-4=**4**	@ Gain= 14-6-2=**6**
Cost «%» = 4	% Gain= 14-4-6=**4**	% Gain= 14-4-4=**6**	% Gain= 14-4-2=**8**
Cost «#» = 2	# Gain= 14-2-6=**6**	# Gain= 14-2-4=**8**	# Gain= 14-2-2=**10**

Back