Online Experiments Introduction

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Social Decision Making Lab

Online Experiments

Online experiments provide many opportunities

- Wide range of participants
- Accessible platform
- Huge developers communities and tools

But we should be mindful of the state of mind of our participants

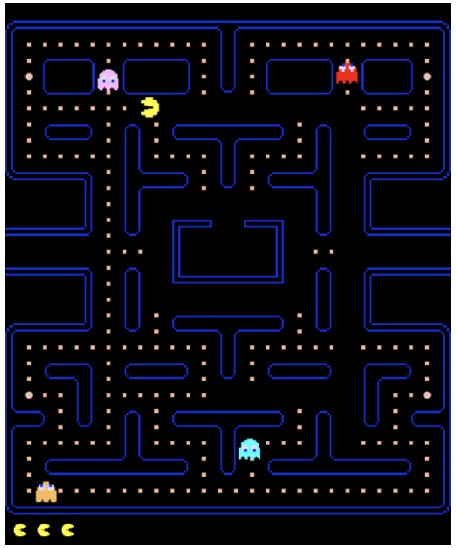
Photo by Tina Dawson on Unsplash

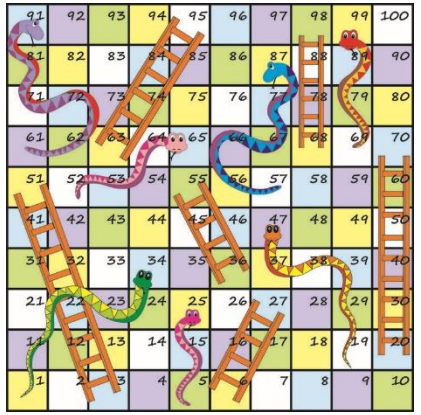
Outline

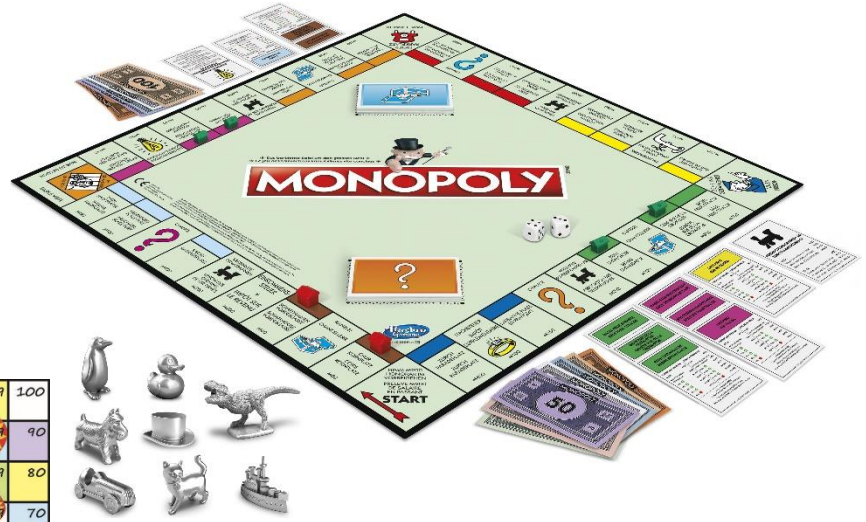
- Experimental design
  - Card-deck
  - Elaborate card-deck
  - Card-deck with memory (Board-Games?)
  - Video Games
- Metaphors

Experimental design

There are many manners in which we can build our experiments, and these will determine the most appropriate tool for the job.







Card-Deck

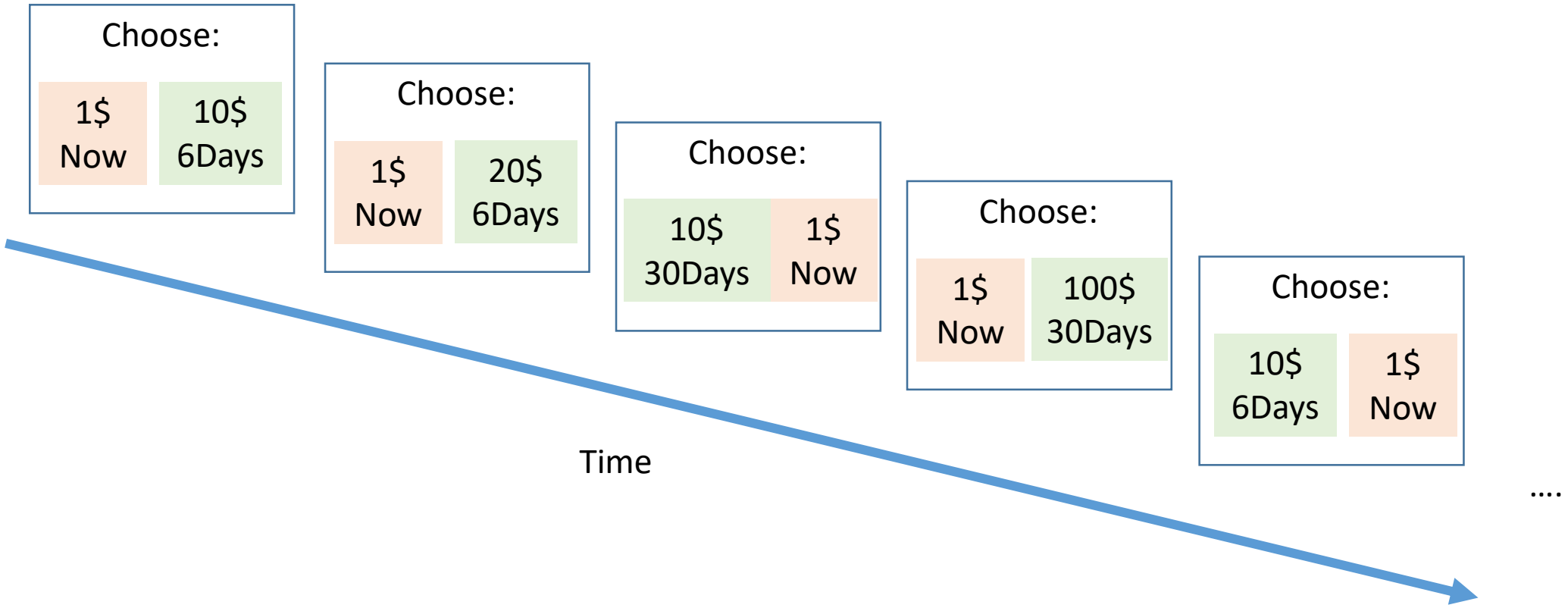
In a card-deck design each card is independent of all others, and the deck can be shuffled without affecting the experiment.

Each card is one trial in an experiment, or item in a survey.

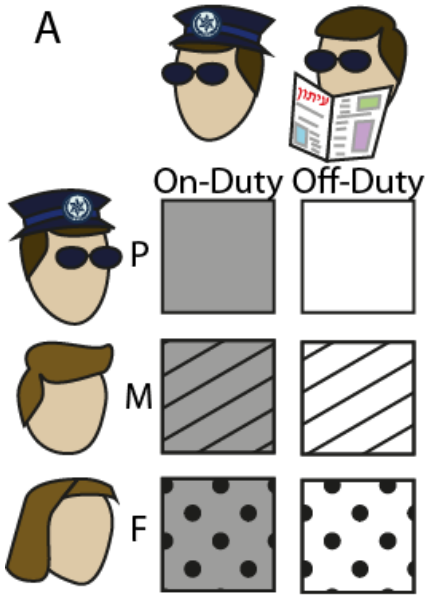
The participant usually provide his input, with no output, or with predefined output.

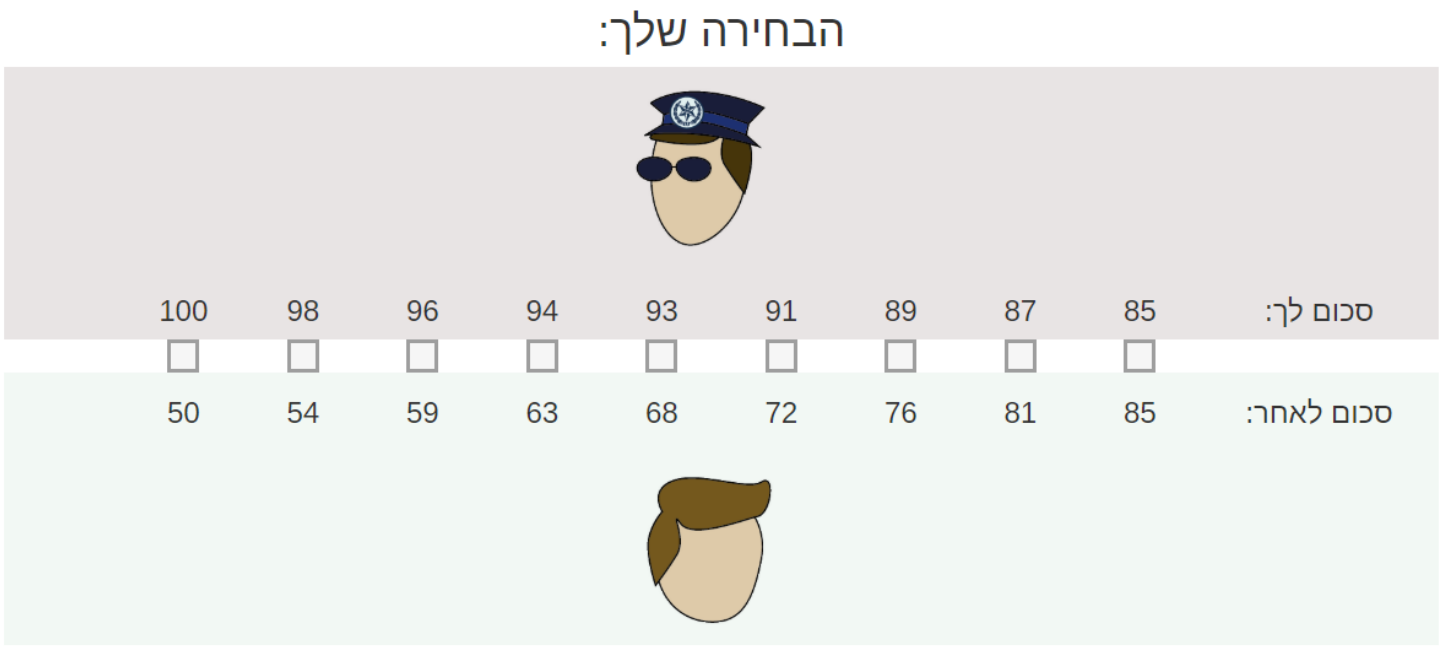
Survey platforms are useful: qualtrics, survey-monkey, survey JS, redcap, google forms

Card-Deck


Choose:
1$ Now
10$ 6Days
Choose:
1$ Now
20$ 6Days
Choose:
10$ 30Days
1$ Now
Choose:
1$ Now
100$ 30Days
Choose:
10$ 6Days
1$ Now
Time
....

Card-Deck





Cohen and Hertz, Public Administration Review, 2020, in press

http://socialbrain.haifa.ac.il/~uri/SLB_SVO_C/

Elaborate card-deck

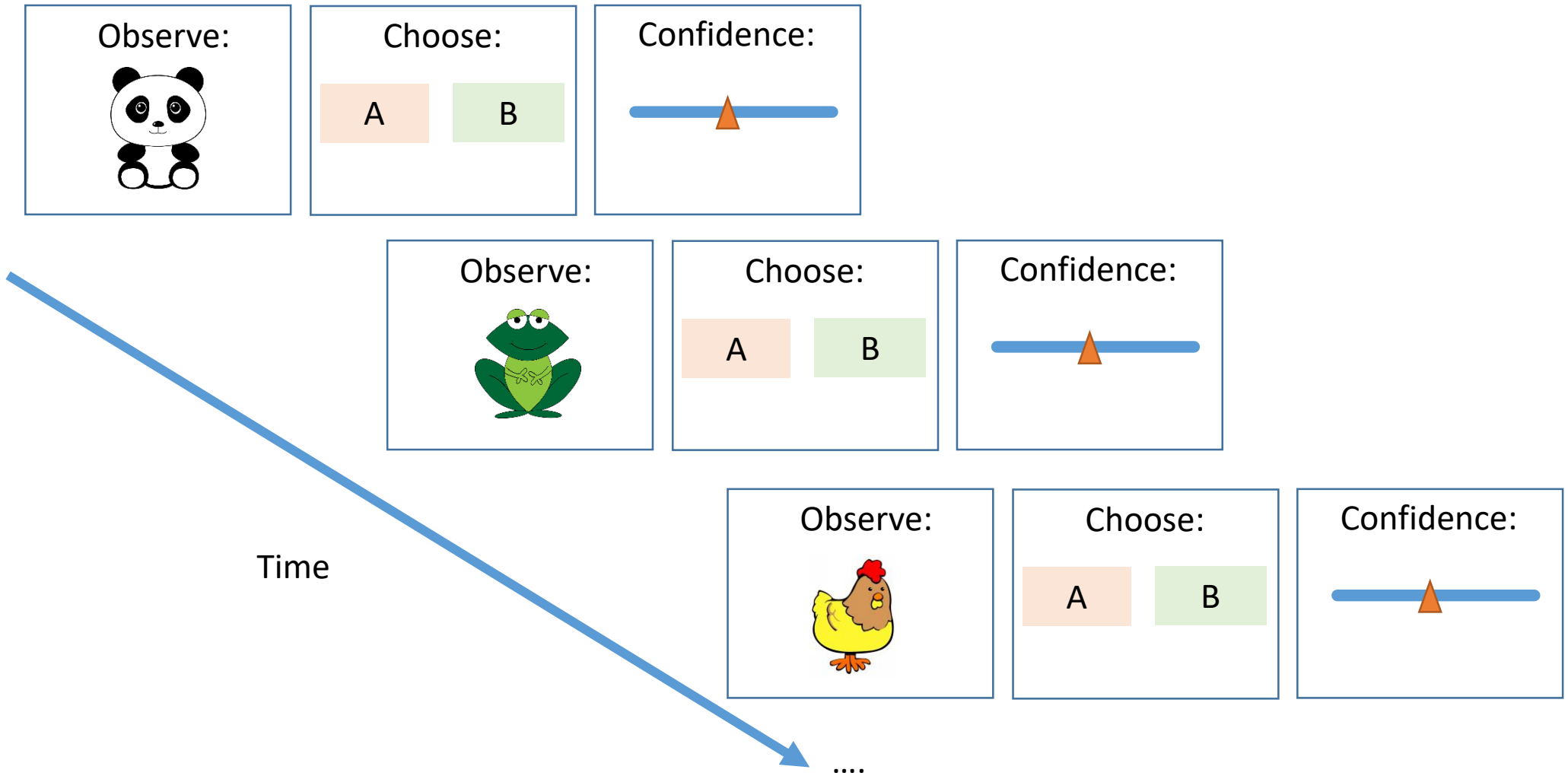
A single trial may include multiple stages – first observing a stimuli and then providing some inputs, for example.

This is very common in cognitive psychology.

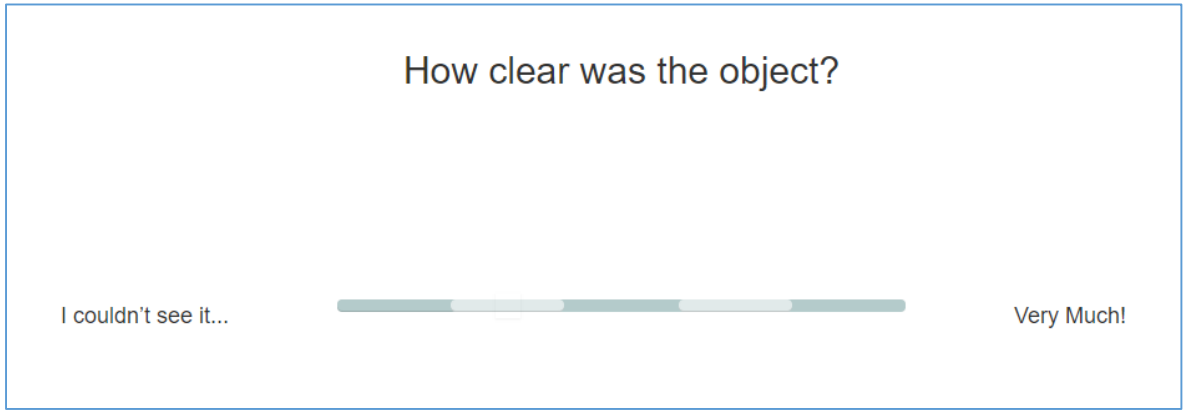
A survey engine may be able to accommodate this, for example by separating your stimuli and input to different pages.

However, if you care about timing you may want to consider using some scripting language – jspsych or psychopy for example.

Elaborate card-deck



Elaborate card-deck



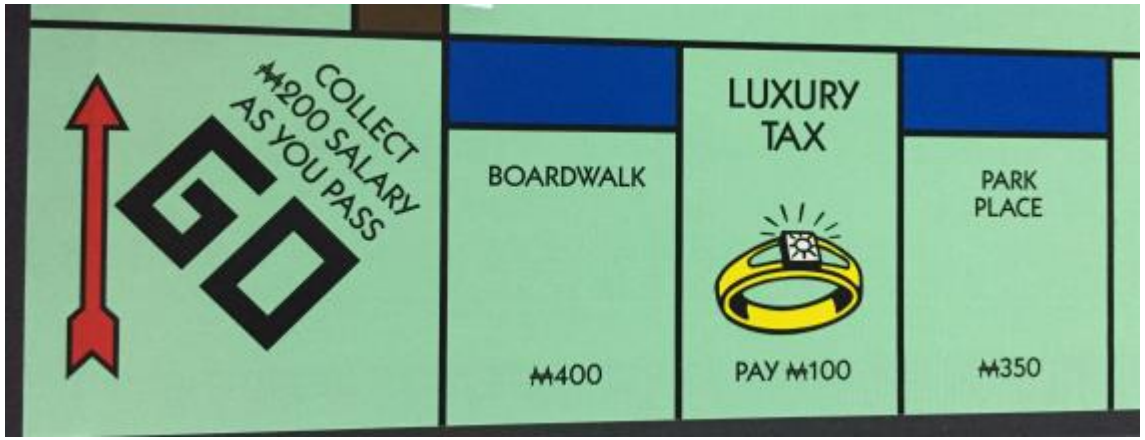
http://socialbrain.haifa.ac.il/~uri/HiddenImage_G/

Hertz, Blakemore, Frith, Journal of experimental psychology: Human perception and performance,2020, in press

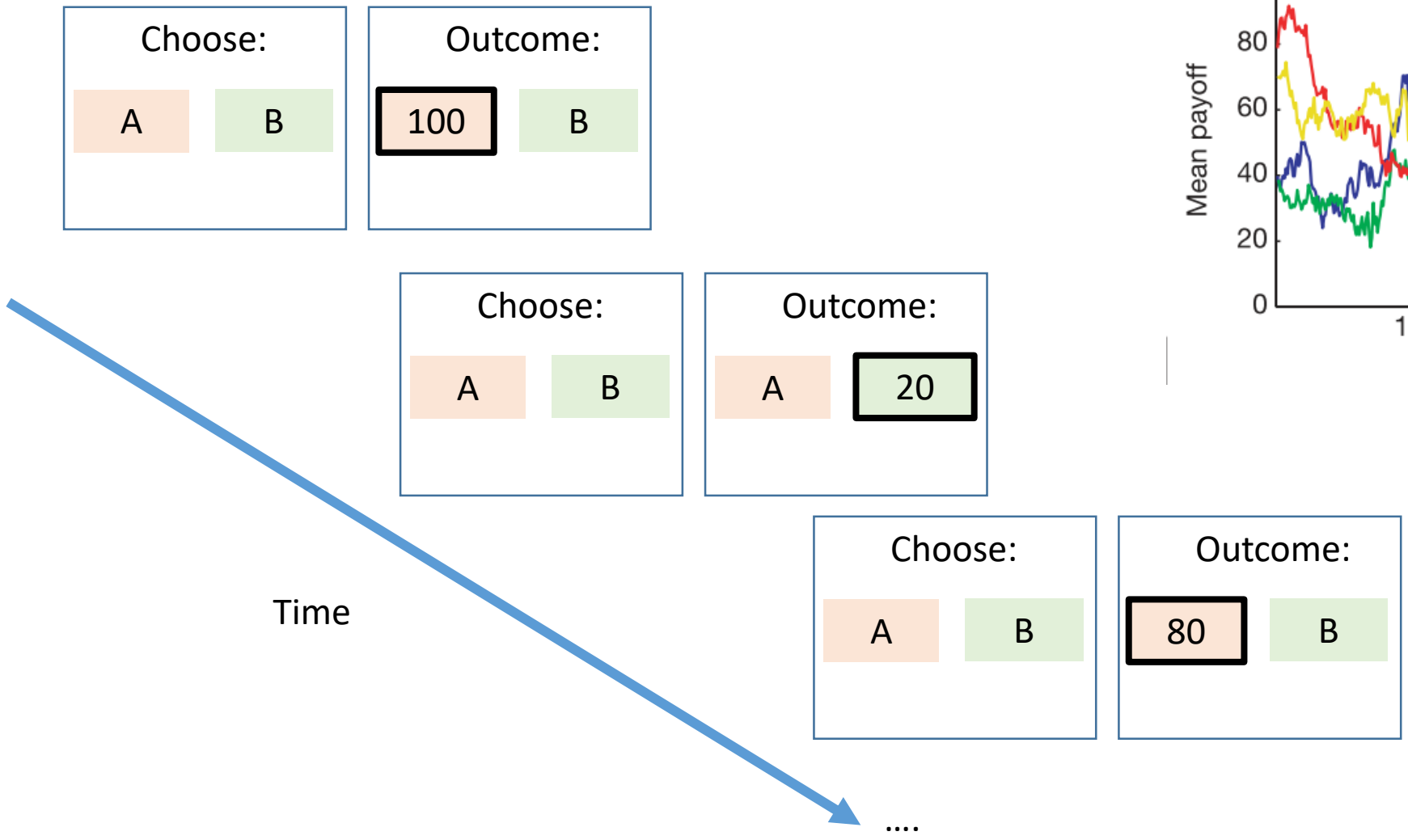
Card-deck with memory

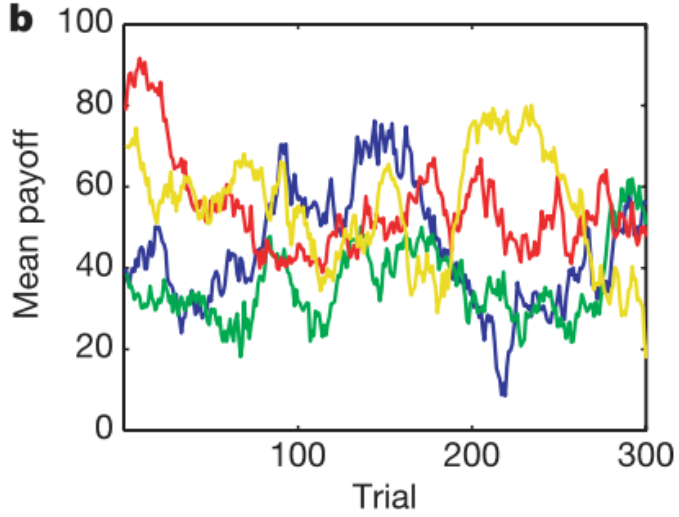
In this design general information stored in memory, or context, may affect the behaviour of the player in each trial. His actions affect this global information and future actions.

For example – landing on boardwalk with 400M or without may lead to different choices, and landing on boardwalk when the other player already owns it and Park Place is something very different.

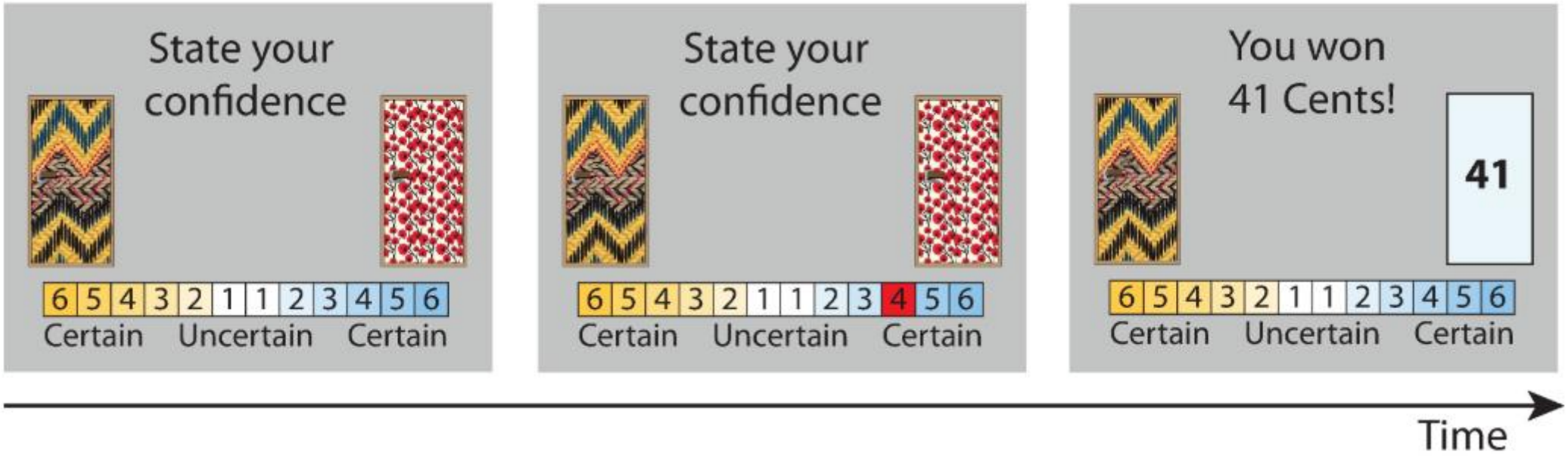


Card-deck with memory



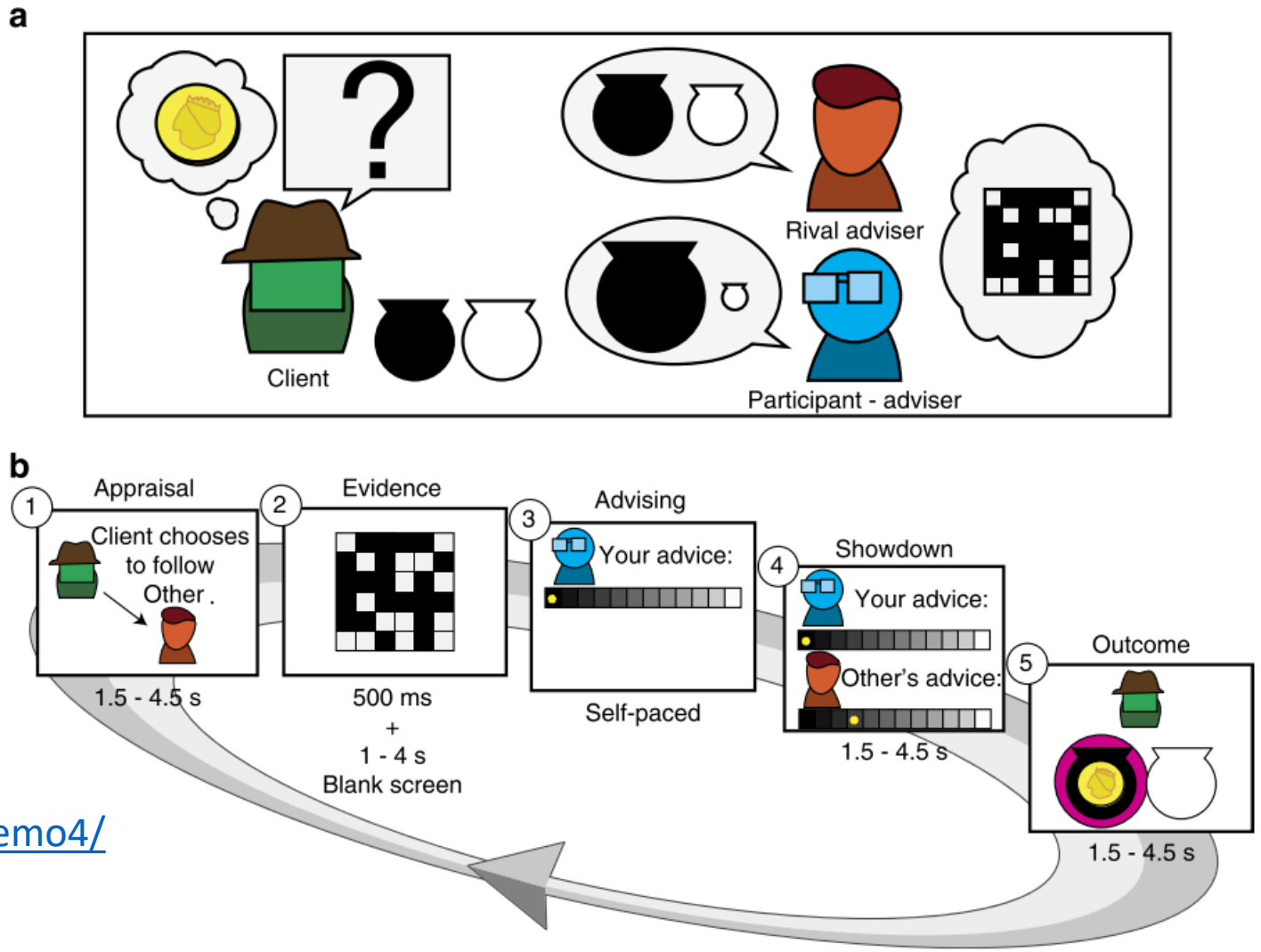


Card-deck with memory



Hertz et al. 2018 Plos One

Card-deck with memory



http://www.urihertz.net/AdviserDemo4/

Hertz et al. NatComm 2017

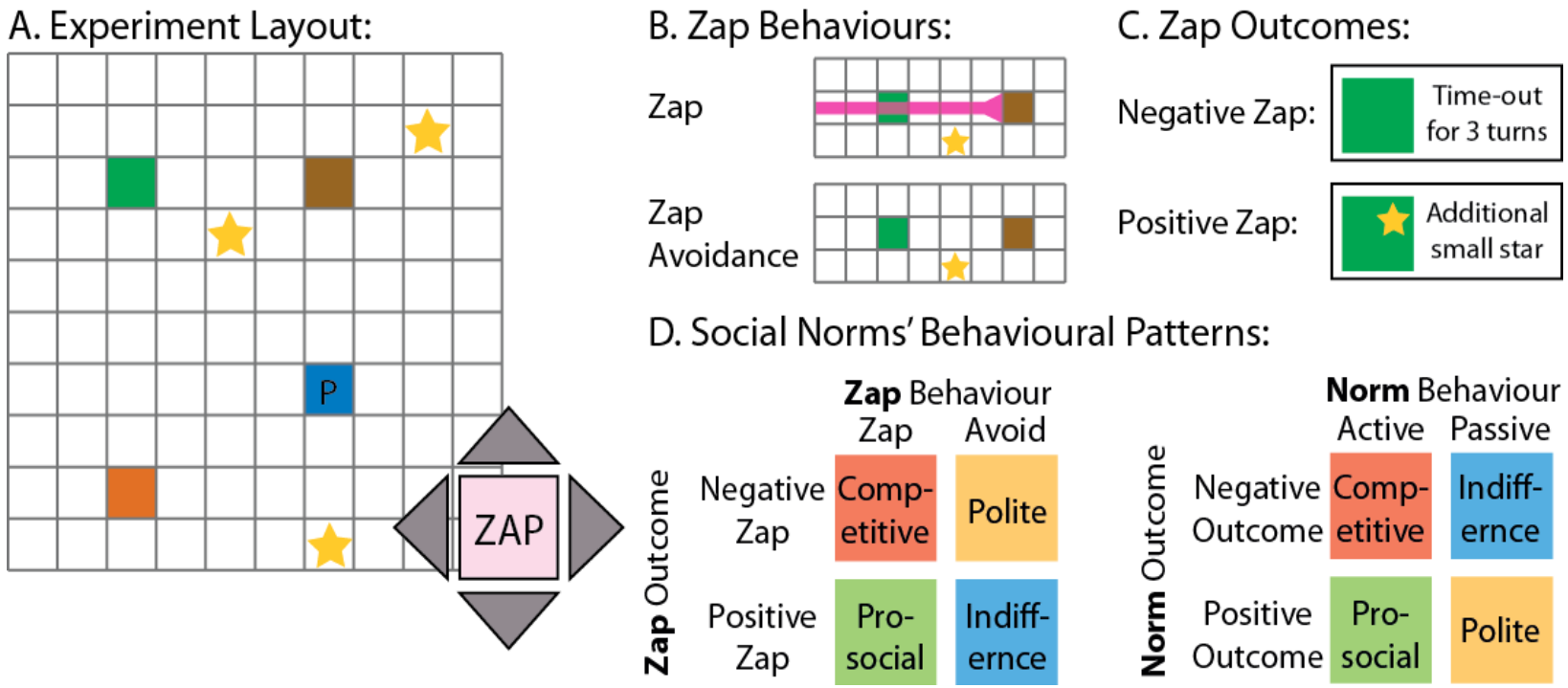
Video Games

We don’t have to be constrained by the standard trial-based design. A more natural flow of turn-based or free-play task can be useful to capture more natural and ecological behaviour.

There are great game engines around – phaser, unity, pygame and others.

You should decide how to store the data and analyse it while designing the game.

Video Games



http://socialbrain.haifa.ac.il/~uri/GridWorld/

Experimental Design

Trial-by-trial design is a very common design in neuroeconomics.

It also entails a trial-by-trial analysis, where we fit models to decisions, or seek out an equilibrium point (how much money in the future is equally selected compared with certain amount now).

It is also useful for trial-by-trial analysis of neural responses.

Participants in Online Experiments

Photo by Tina Dawson on Unsplash

Perspective Taking

terrified upset

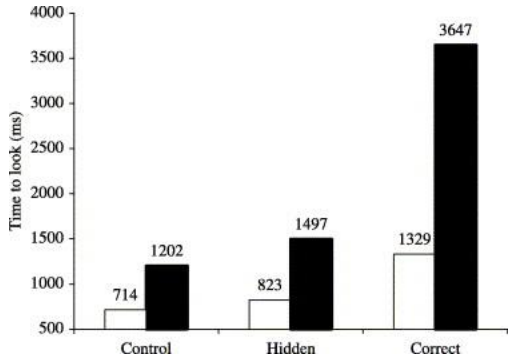
arrogant annoyed

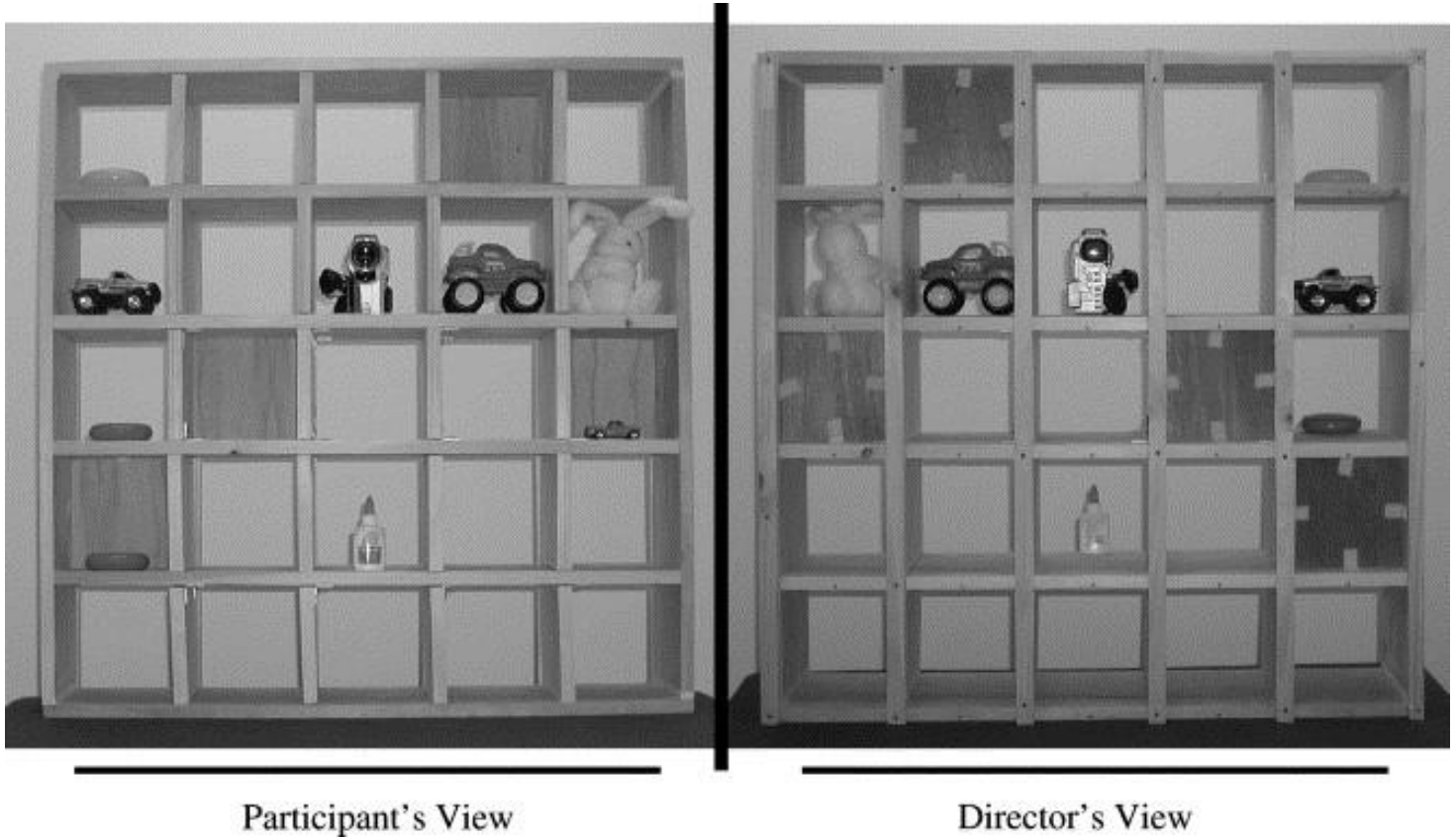
“Reading the Mind in the Eyes”

Theory of mind, Simon Baron-Cohen

Perspective Taking

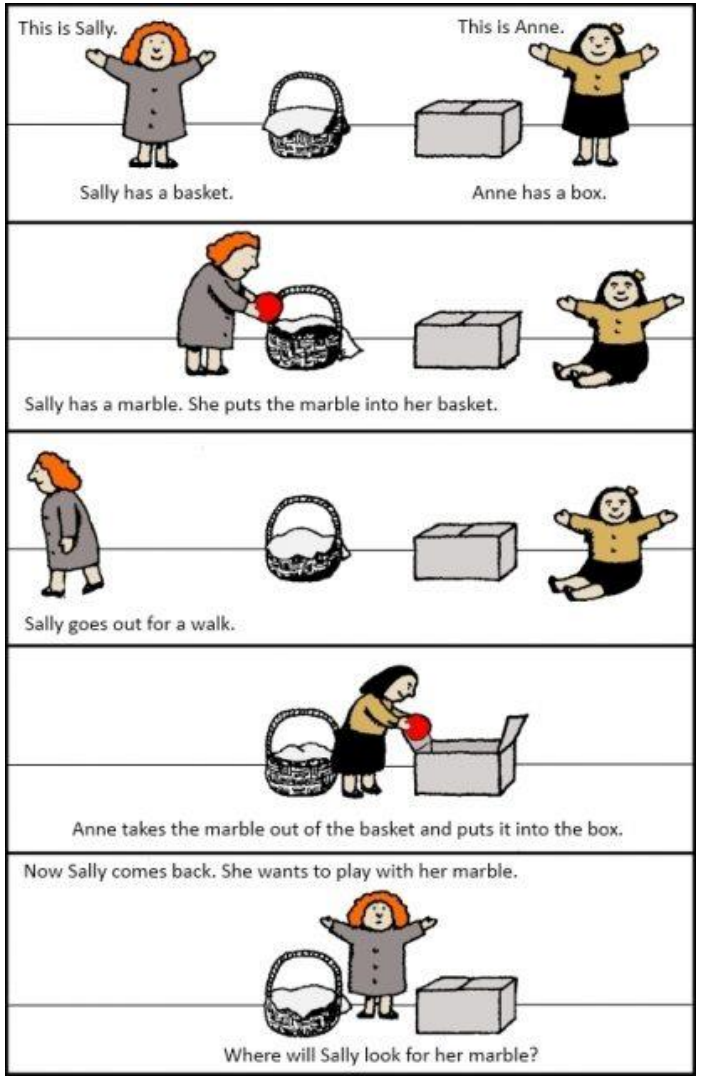
(The critical instruction from the director on this trial was to “move the small truck above the glue.”)





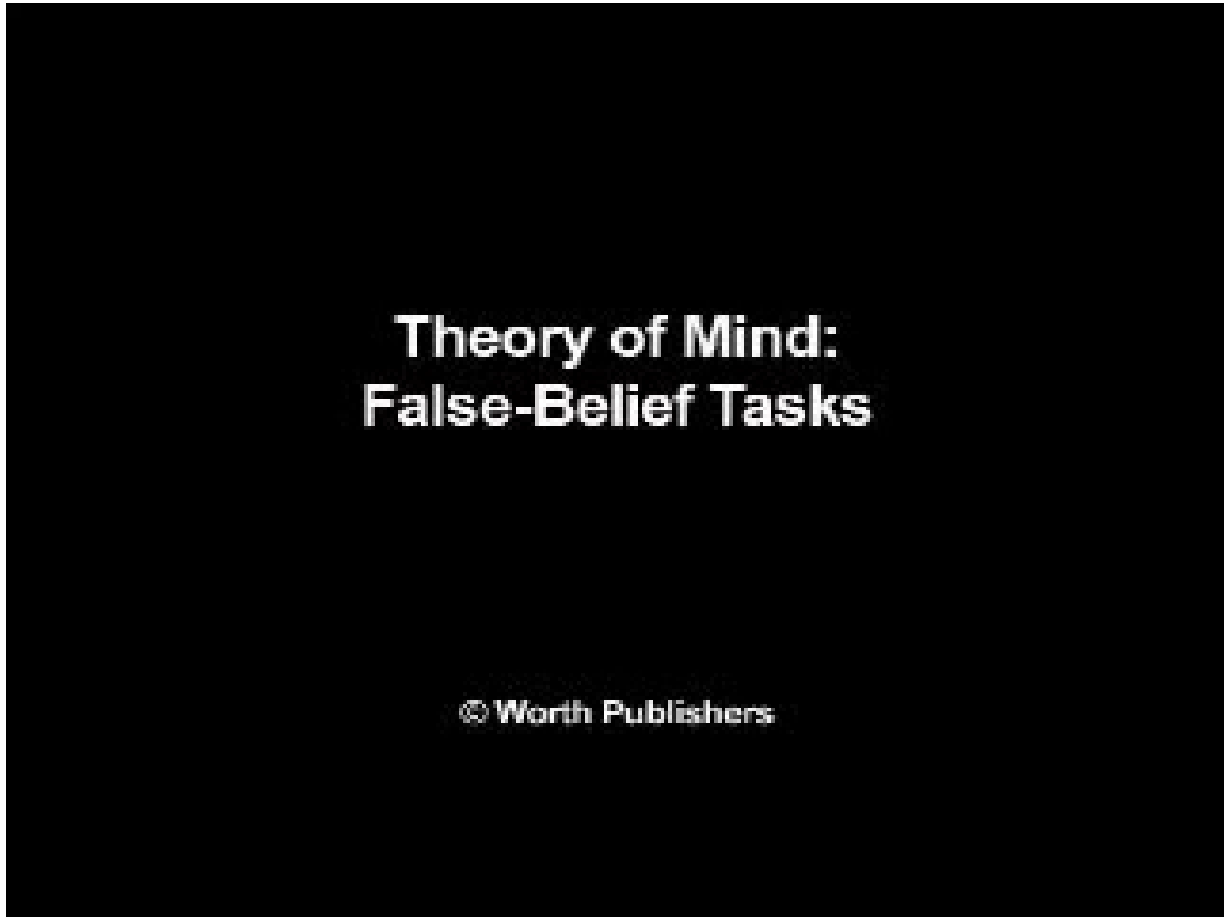
Perspective taking in children and adults: Equivalent egocentrism but differential correction. Epley et al. 2014

First order false belief



Simon Baron-Cohen, Alan Leslie and Uta Frith

First order false belief



Perspective Taking – the curse of knowledge

Table 1. Percentages of types of specification and designation in Experiment I

	Addressee					
	Child			Student		
	Cognitive load					
Specification	Low	Dual task	High	Low	Dual task	High
Full	69.3	8.0	8.7	34.0	6.0	9.3
Non-specified	4.6	65.3	69.3	26.0	10.4	72.7
Designation						
Technical term	17.3	87.3	87.4	56.0	89.3	88.0
Term + description	11.3	9.3	11.3	38.7	6.7	8.7
Description	82.7	12.7	12.6	44.0	10.7	12.0

Cognitive load and perspective-taking: applying the automatic-controlled distinction to verbal communication
CHRISTIAN RONAGEL 2000

Thinking like a participant

In all experiments (and in all conversations ever) we should aspire to take the perspective of our participant.

Our participants are:

Impatient, not hugely motivated, like to have fun, generally helpful.

If it is hard to understand the experiment, or to follow its' logic, we will have a lot of variability in the data, and low signal to noise ratio.

Instructions

Break them to multiple pages – one notion per page.

Add visual aids whenever possible.

Don’t forget anything.

Tutorials are great – guided trial is good.

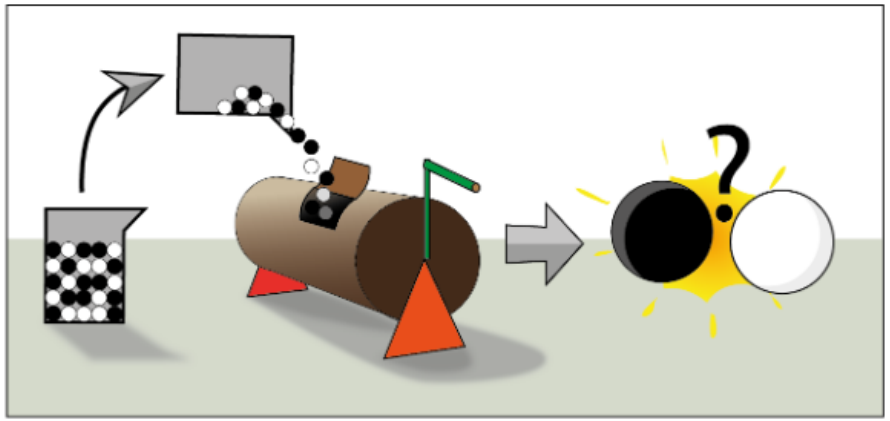
Get someone who do not know the task to test the instructions for you.

You can use attention question – ask some questions about the task before the experiment starts.

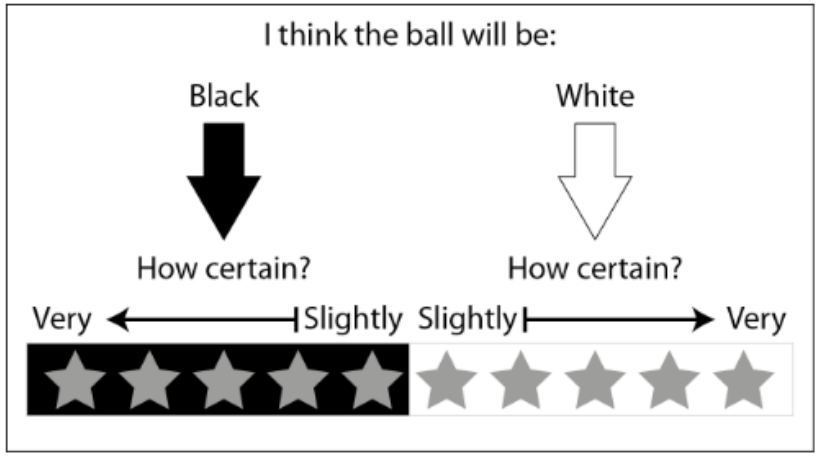
Instructions - example

Instructions - Part 1

In this game, you are playing a lottery where you have to guess whether the winning ball will be black or white.



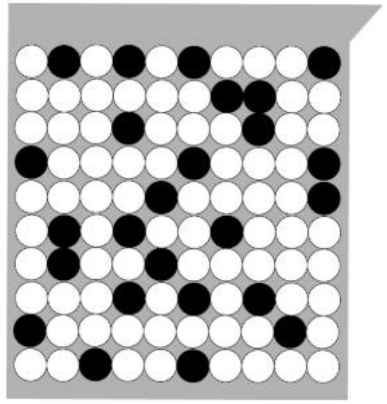
For each game, the machine will be filled with a rack of black and white balls. Sometimes there will be more white balls, sometimes more black balls. You will get to see the mix of balls before they are put into the machine and your job is to judge whether the winning ball is more likely to be black or white.



http://socialbrain.haifa.ac.il/~uri/Advice_SAUoH_B/

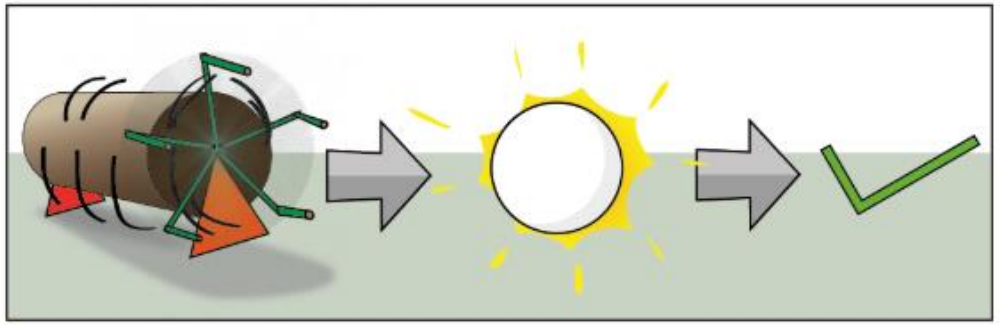
Instructions

Let's practice. Here are the lottery balls in the rack, just before putting them in the machine.
Show what colour you think the winning ball will be and how certain you are in your choice by clicking on a star on the sliding scale below.
We'll give you some feedback about how accurately you are guessing the colour of the most likely winning ball.



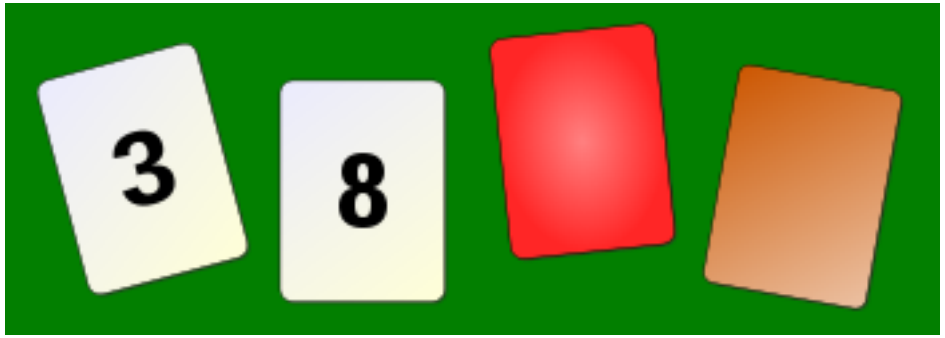
Black Uncertain White

We're about to start the games! To make things more difficult, the mix of lottery balls will only appear for a very short time before they go into the machine, so pay close attention.
Good luck!



Metaphors

Try to use concrete scenarios instead of abstract ones, if it does not interfere with your research question.

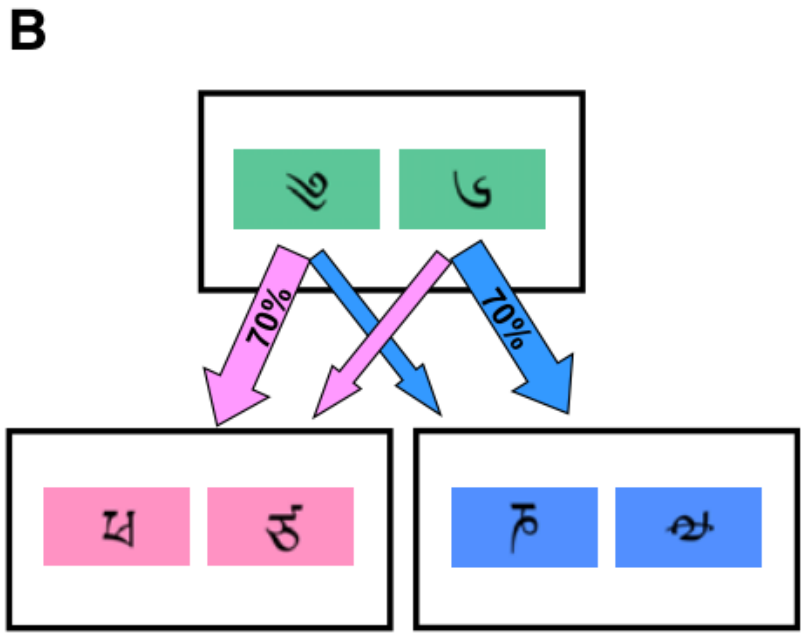


Each card has a number on one side, and a patch of color on the other. Which card or cards must be turned over to test the idea that if a card shows an even number on one face, then its opposite face is red?

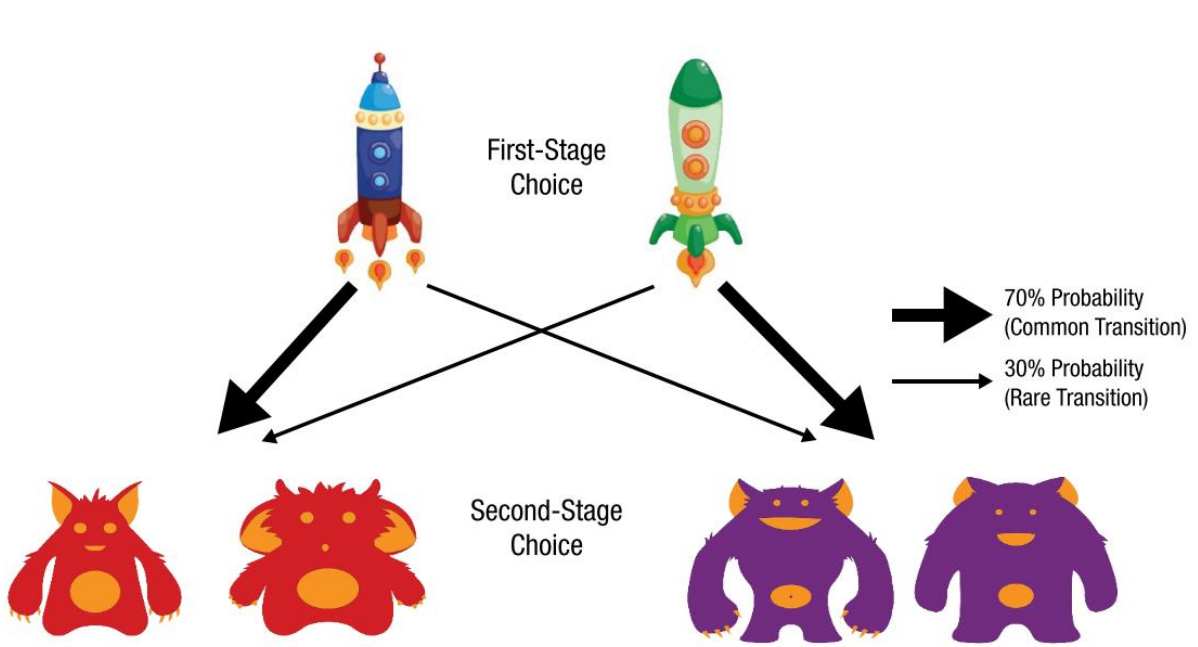
Each card has an age on one side, and a drink on the other. Which card(s) must be turned over to test the idea that if you are drinking alcohol then you must be over 18?

Cosmides, L.; Tooby, J. (1992). "Cognitive Adaptions for Social Exchange" (PDF). In Barkow, J.; Cosmides, L.; Tooby, J. (eds.). *The adapted mind: Evolutionary psychology and the generation of culture*. New York: Oxford University Press. pp. 163–228. ISBN 978-0-19-506023-2.

Metaphors

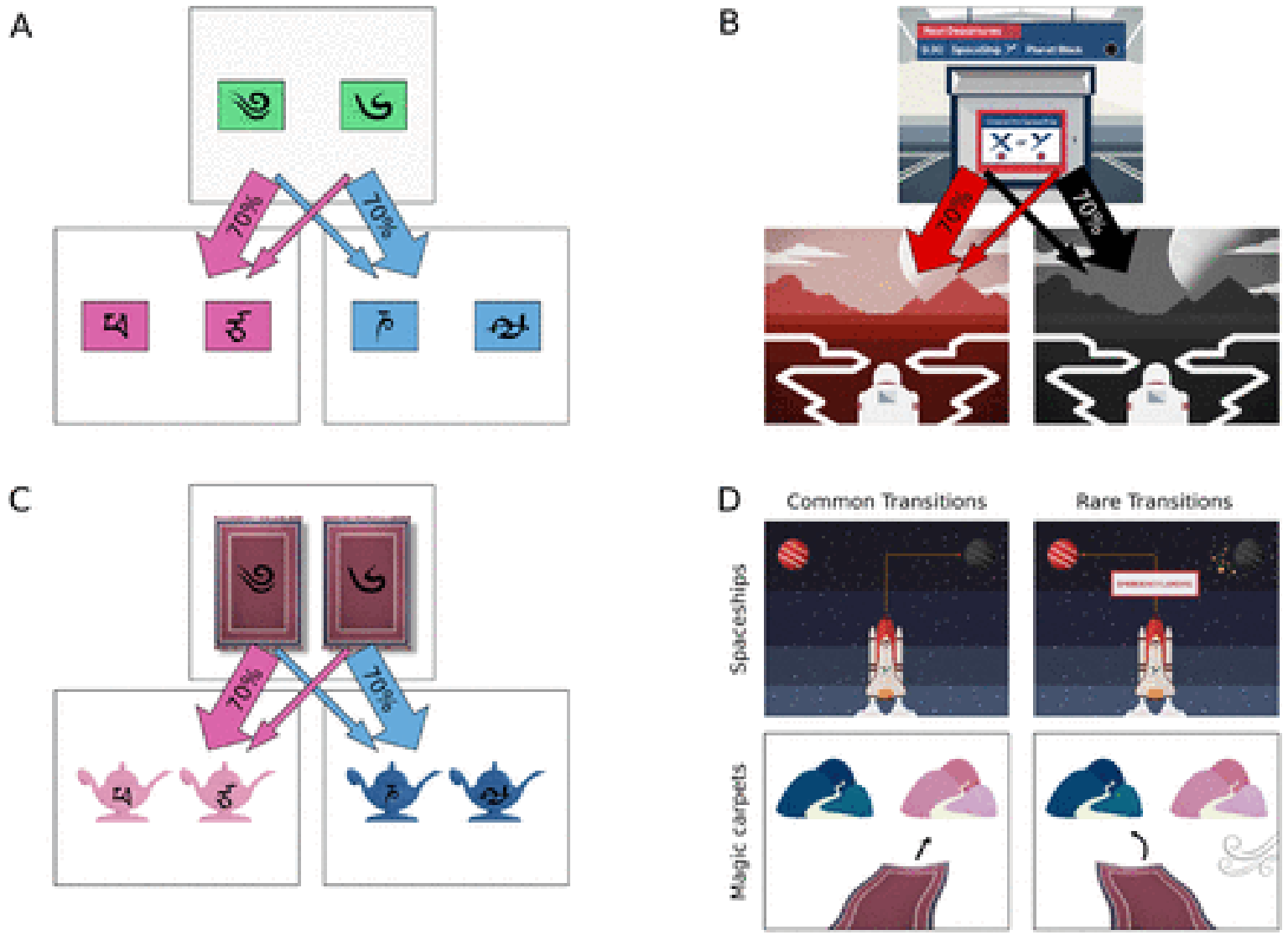


Daw et al. 2011



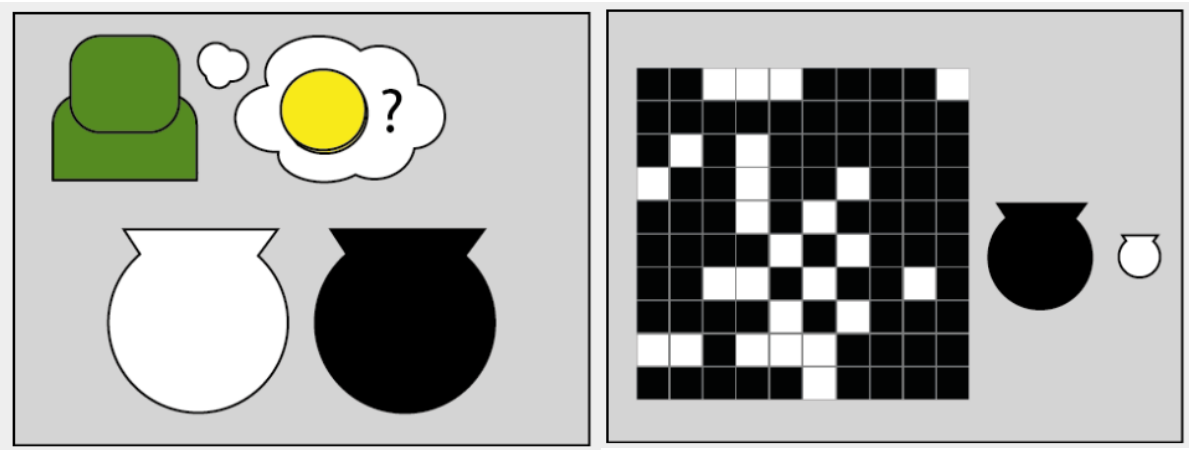
Decker et al. 2016

Metaphors



da Silva and Hare 2020

Metaphors



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