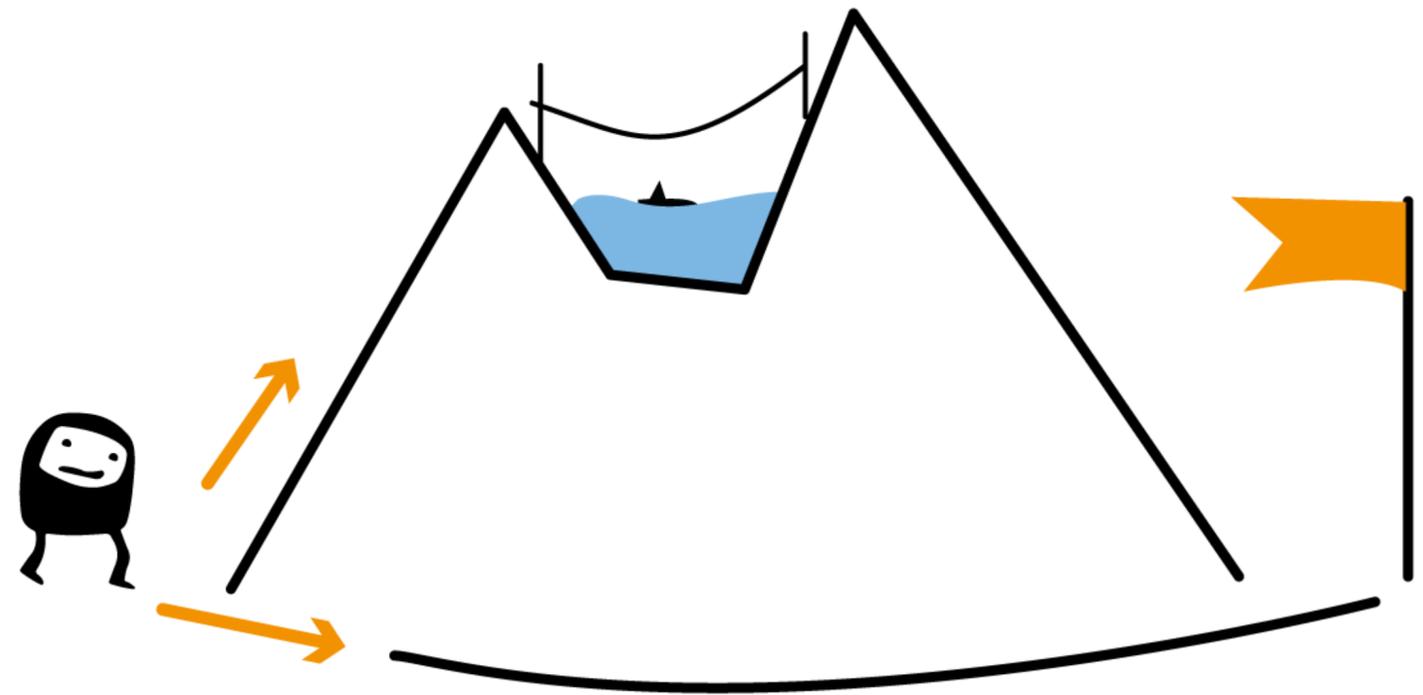


ADVANTAGEOUS DISADVANTAGES

HOW UNDESIRABLE THINGS CAN TURN INTO GOOD THINGS



EDUCATION: DESIRABLE DIFFICULTY

MAKING THINGS HARD ON YOURSELF

BUSINESS: ADVANTAGEOUS DISADVANTAGES

TURNING DISADVANTAGES INTO STRENGTHS

WORLD: HAPPY ACCIDENTS

UNDESIRED INCIDENTS CAN PRODUCE SURPRISING RESULTS

PSYCHOLOGY: PSYCHOLOGICAL REACTANCE

WANT WHAT YOU CAN'T HAVE

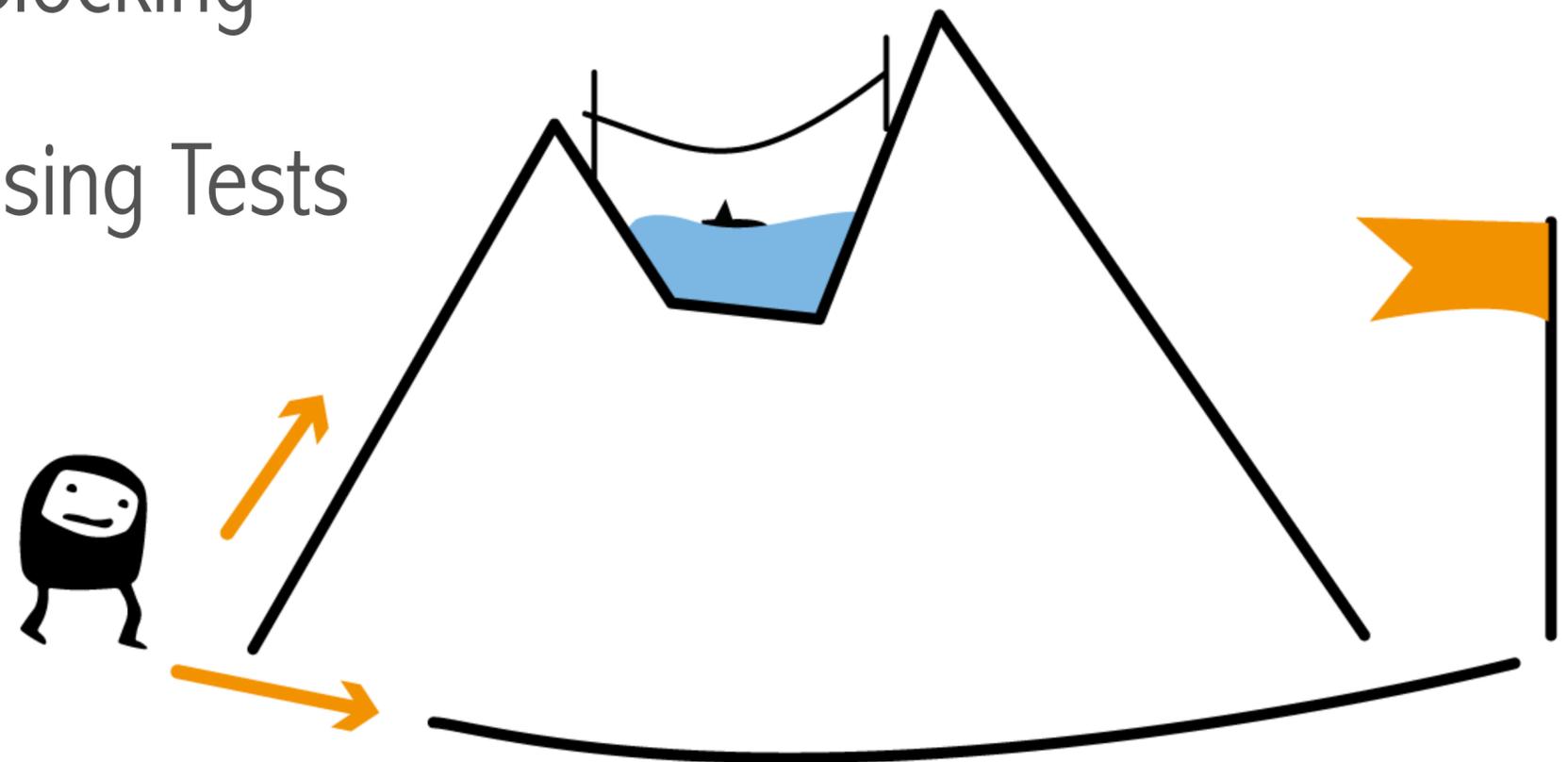
DESIRABLE DIFFICULTY

- **Elizabeth Ligon Bjork** and **Robert A. Bjork**
from University of California, Los Angeles
- Professors of Psychology
- Learning vs Performance
- Psychology and the real world: **Making things hard on yourself, but in a good way: Creating desirable difficulties to enhance learning** (2011)



4 DESIRABLE DIFFICULTIES

- **Varying** conditions of practice
- **Spacing** study or practice sessions
- **Interleaving** instead of Blocking
- **Generation** Effects and Using Tests



1. VARYING THE CONDITIONS OF PRACTICE

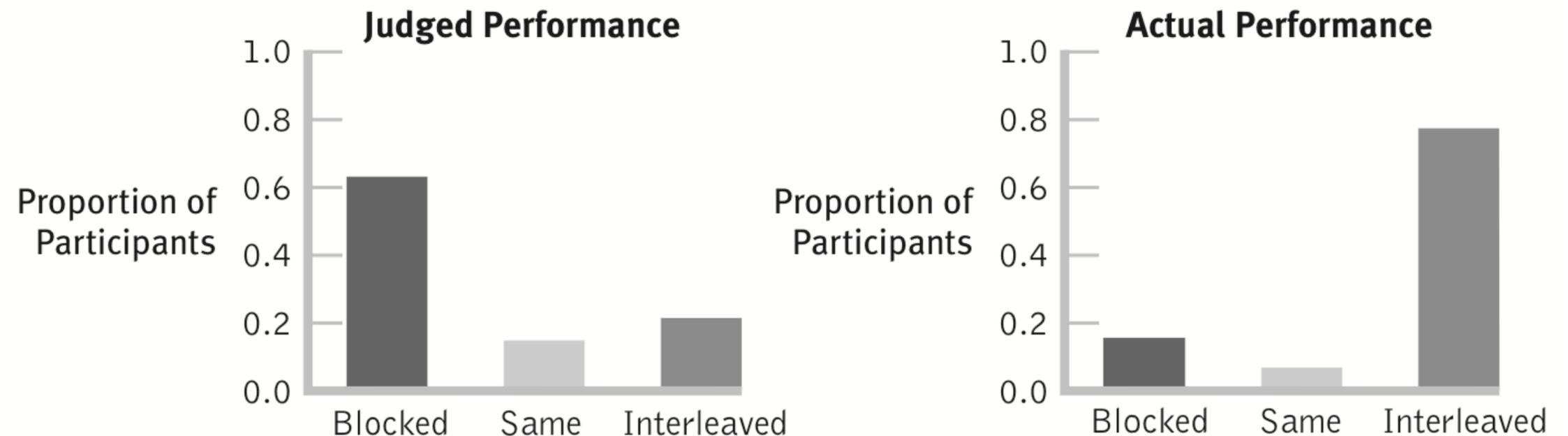
- ~~Find a quiet, convenient place and do all your studying there~~
- **No!** Vary the conditions (e.g. study same material in two different rooms)
- **Study:** Specific and varied practice of a motor skill. (Kerr & Booth, 1978)

2. SPACING STUDY OR PRACTICE SESSIONS

- **Massing** practice (e.g. cramming for exams) for **short-term** performance
- **Spacing** practice (e.g. distributing presentations, study attempts, or training trials) for **long-term retention**
- One of the most general and robust effects from research on learning and memory

3. INTERLEAVING VS BLOCKING

- Interleaving separate topics/tasks introduces spacing
- **Study:** Learning concepts and categories: Is spacing the “enemy of induction” (Kornell & Bjork, 2008)



4. GENERATION EFFECTS AND USING TESTS (RATHER THAN PRESENTATIONS) **AS LEARNING EVENTS**

- Generate an answer or solution instead of being presented one
- Rereading is ineffective
- Problem: Testing seen as assessment at the end, instead of part of learning

DESIRABLE DIFFICULTY

OUTSIDE THE CLASSROOM

Appreciate your challenges: No pain, no gain.



<http://www.youtube.com/watch?v=89xUz9fZBXA>

Nothing
worth having
comes easy.

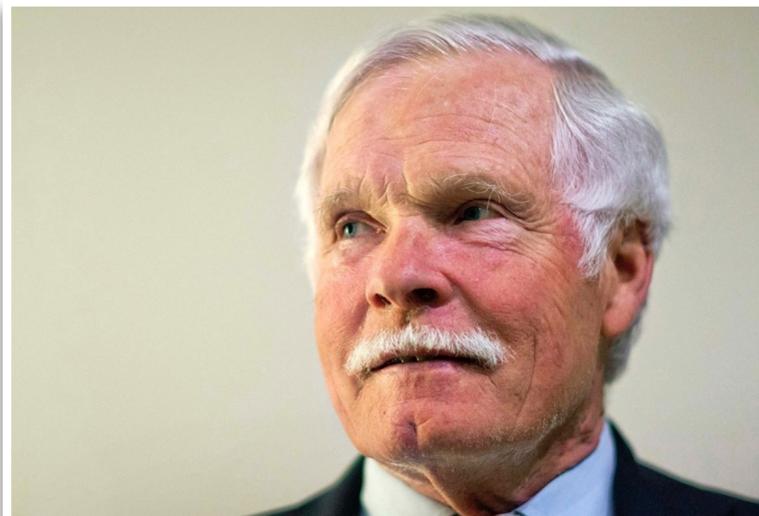
- Bob Kelso

ADVANTAGEOUS DISADVANTAGES

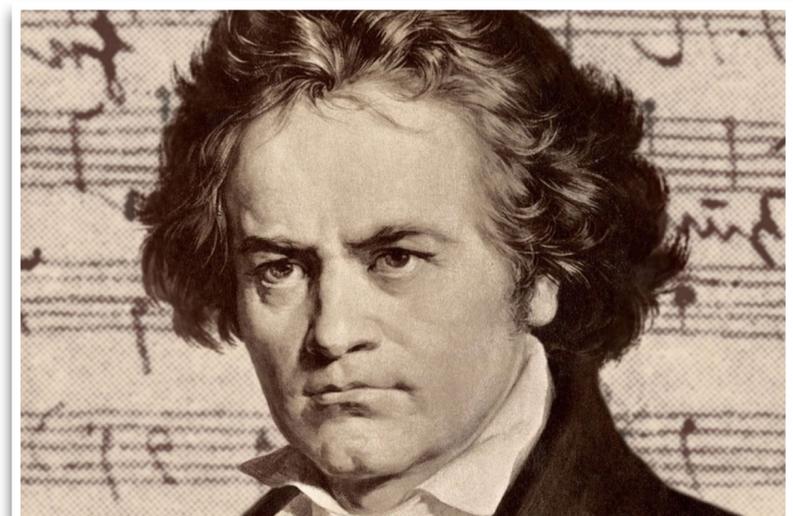
TURNING DISADVANTAGES INTO STRENGTHS



Steven J. Cannell: Dyslexia



Ted Turner: Bipolar disorder



Beethoven: Deaf

I've never met a
strong person with
an easy past.

- Unknown

HAPPY ACCIDENTS

UNEXPECTED CONSTRAINT LEADS TO BETTER RESULT

happy accidents in | art



happy accidents in **art**

happy accidents in **history**

happy accidents in **science**

happy accidents in **life**



<http://www.youtube.com/watch?v=pDSU6q6eD34>

PSYCHOLOGICAL REACTANCE

Reaction in response to regulations

PSYCHOLOGICAL REACTANCE

OR: WANT WHAT YOU CAN'T HAVE

Upside

Drives determination to achieve things

Downside

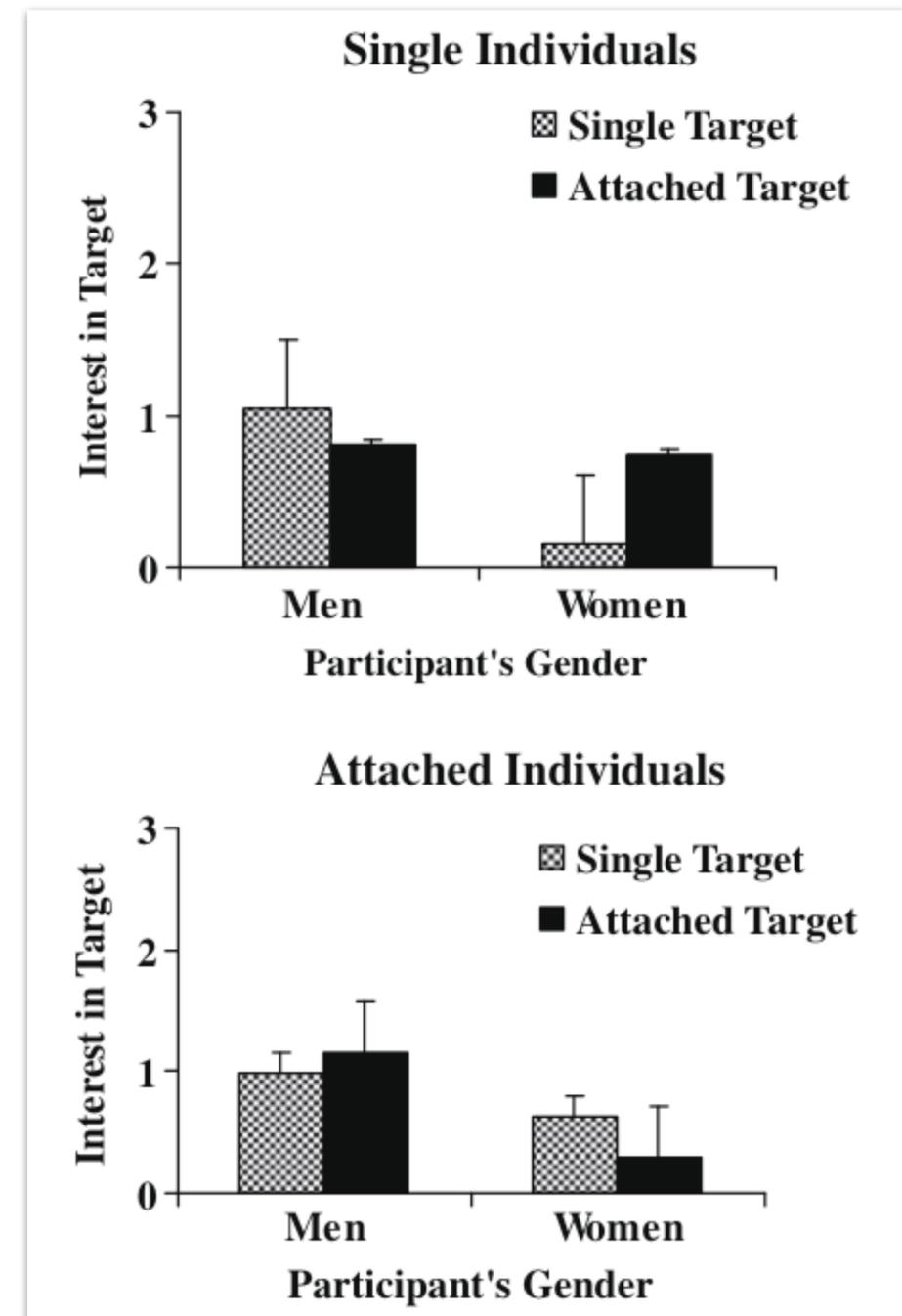
Overstepping moral code

Study: "Who's chasing whom?"

Explanation

- "Information-Gap Theory" by George Loewenstein
- Dopamine

No-win game





Discussion?!

Desired Difficulty
vs
Technology

