

Neuro-diversity and Software Development

Dr. Sal Freudenberg



"Summer colours" by Beshef. Shared under Creative Commons 2.0



Dr. Temple Grandin

[HBO movie trailer](#)

[Temple at Google 1](#)

[Temple at Google 2](#)

Empirical evidence

- Autism occurs more often in families of physicists, engineers and mathematicians Baron-Cohen et al (1998)
- Mothers of autistic kids are more likely to work in highly technical occupations - Windham et al (2009)
- Significantly more autism in children in IT rich regions - Roelfsema et al (2011)
- ASD students more likely to choose STEM subjects – Wei et al (2003)



[Different types of Thinker](#)



Historical Studies of Programmers

"My mouse isn't working right" by Nina Matthews Photography. Shared under Creative Commons 2.0.

Chunking

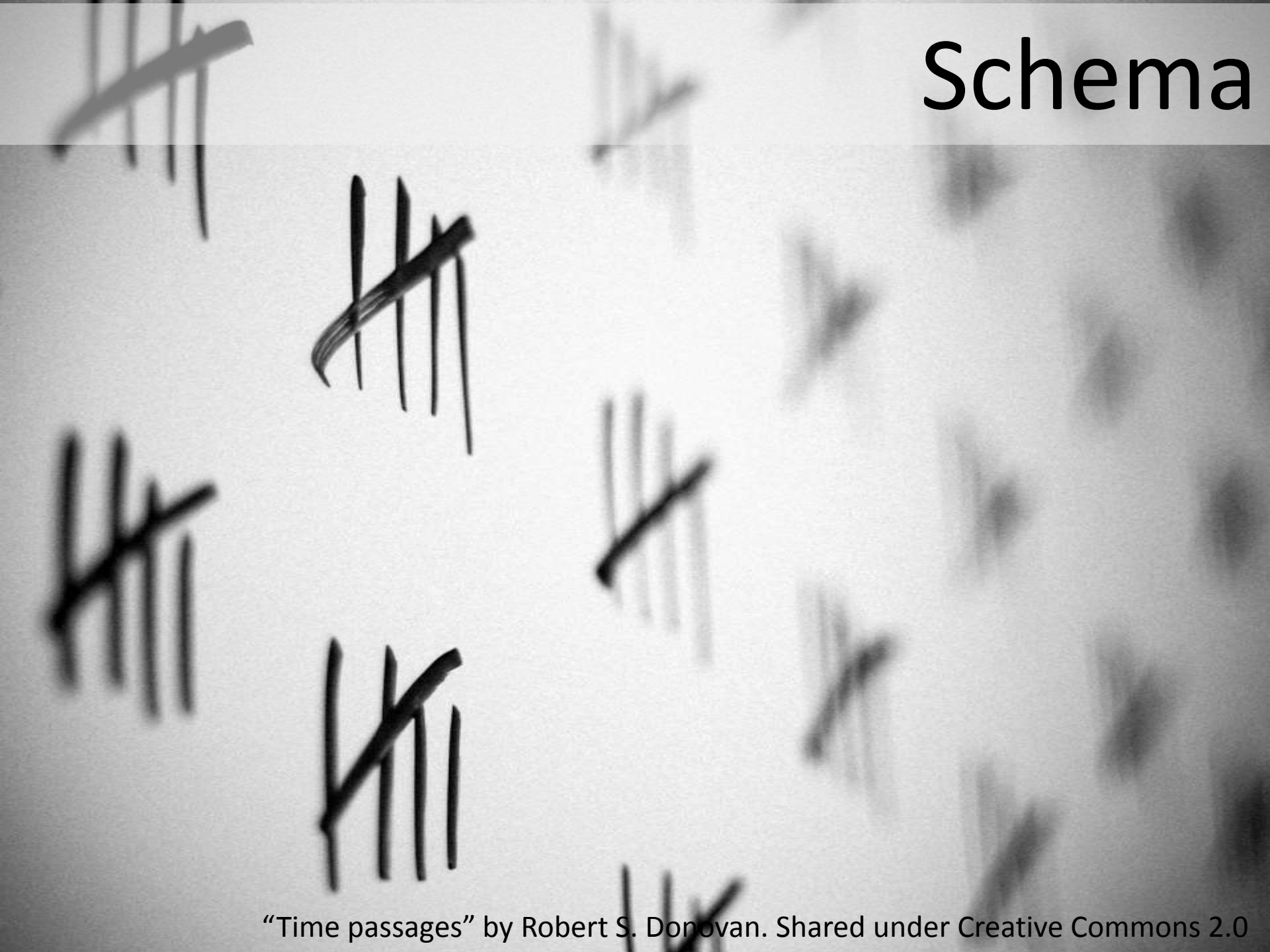


“Lost Battle?” by Elvind Barstad Waaler, shared under Creative Commons 2.0

Beacons



Schema



“Time passages” by Robert S. Donovan. Shared under Creative Commons 2.0


```
BEGIN
```

```
Sum := 0;
```

```
Count := 0;
```

```
REPEAT
```

```
  READLN(number);
```

```
  IF number <> 99999 THEN
```

```
    BEGIN
```

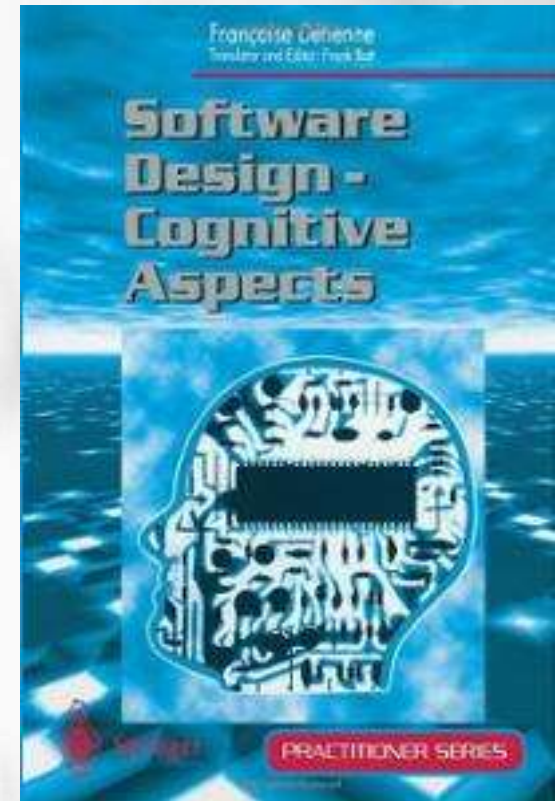
```
      Sum := Sum + number
```

```
      Count := Count + 1
```

```
    END;
```

```
  UNTIL number = 99999
```

.....



BEGIN

Sum := 0;

Count := 0;

REPEAT

 READLN(number);

 IF number <> 99999 THEN

 BEGIN

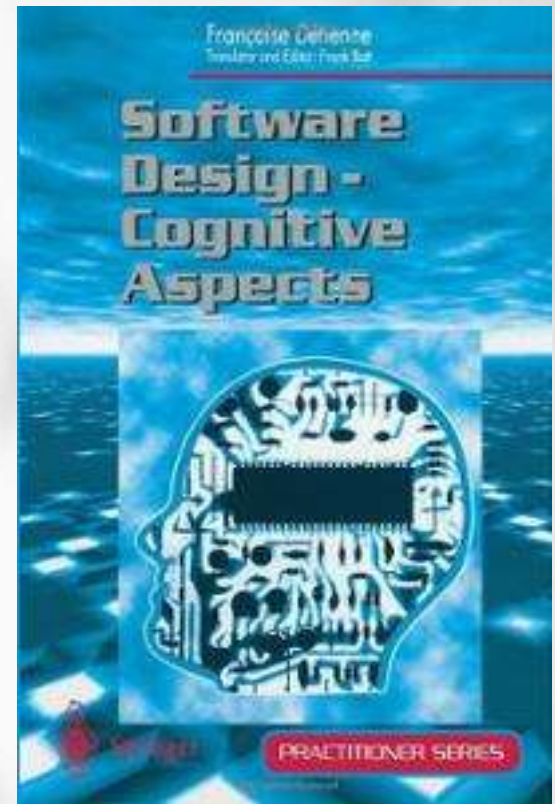
 Sum := Sum + number

 Count := Count + 1

 END;

 UNTIL number = 99999

.....

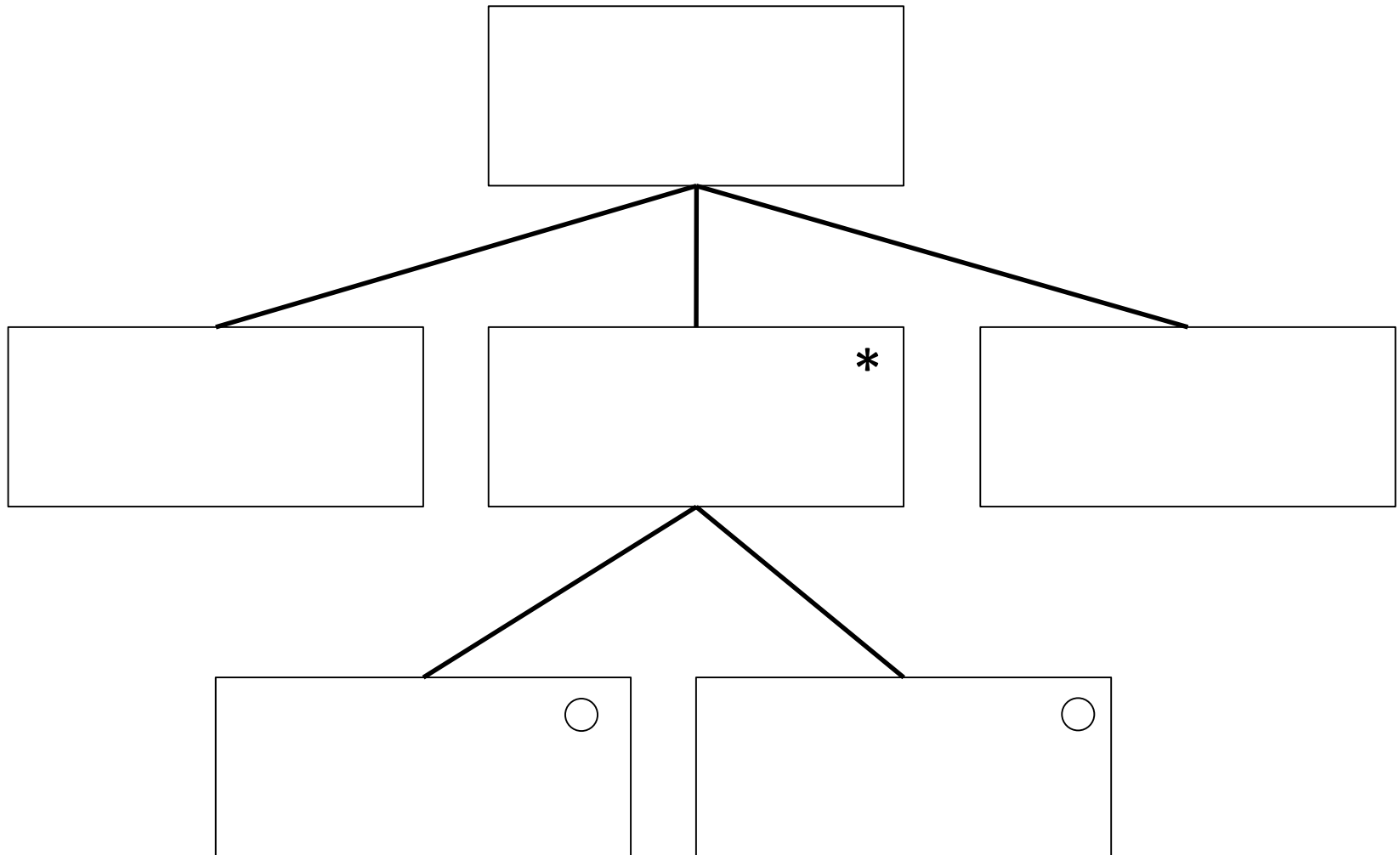


Hierarchical Decomposition

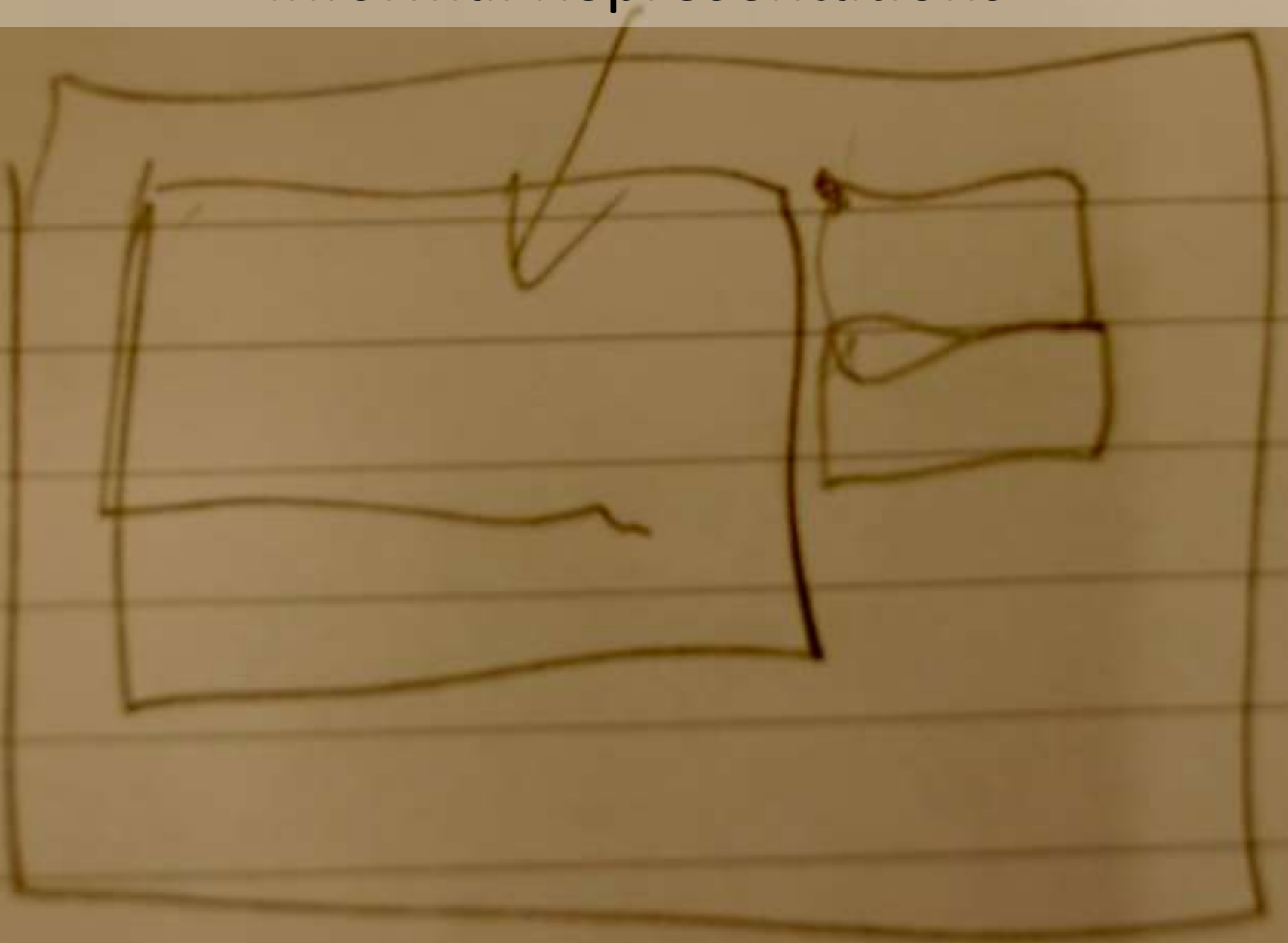


“58.365” by Romana Klee. Shared under Creative Commons 2.0

Formal Representations



Informal Representations

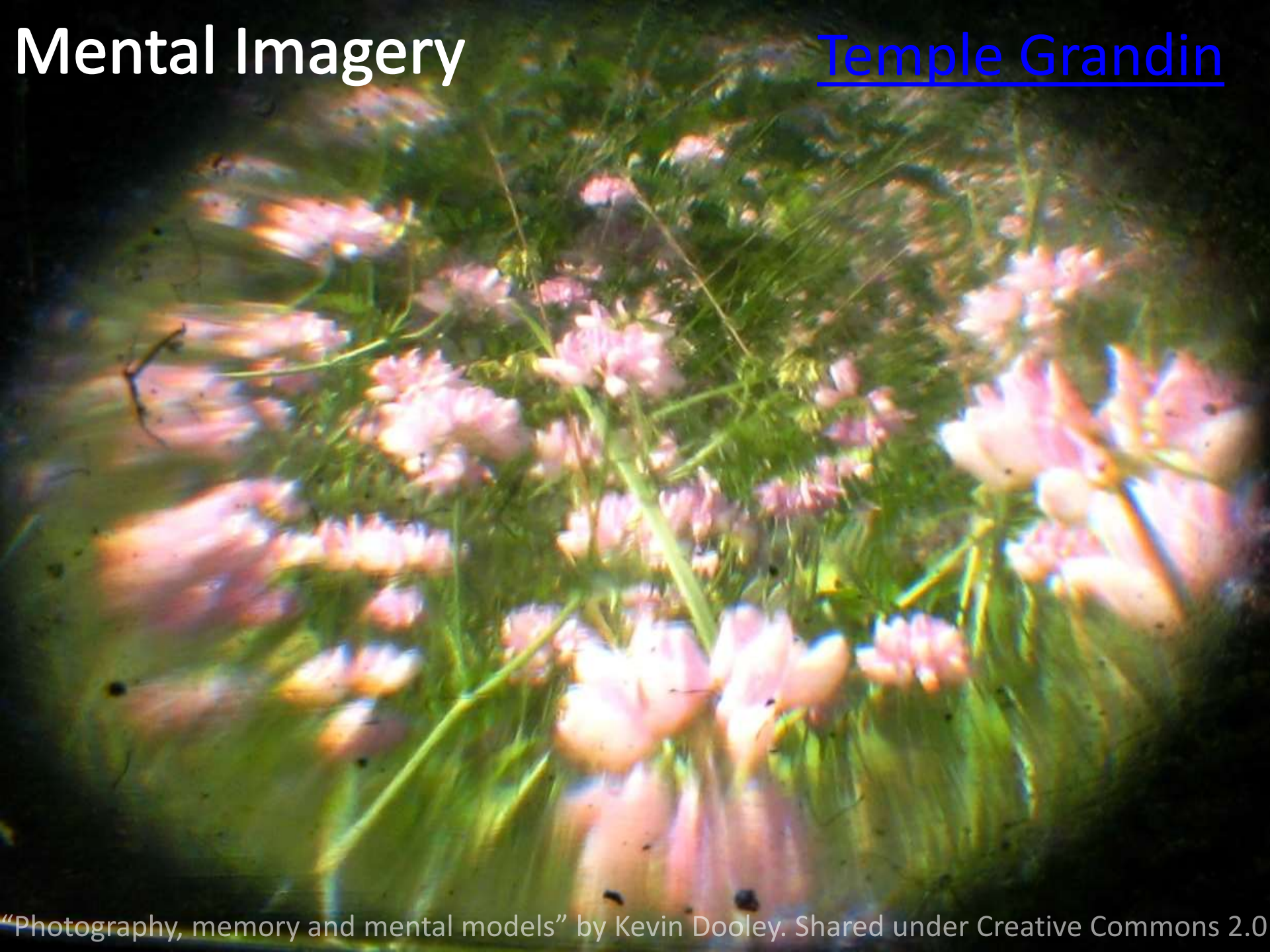




Tacit knowledge

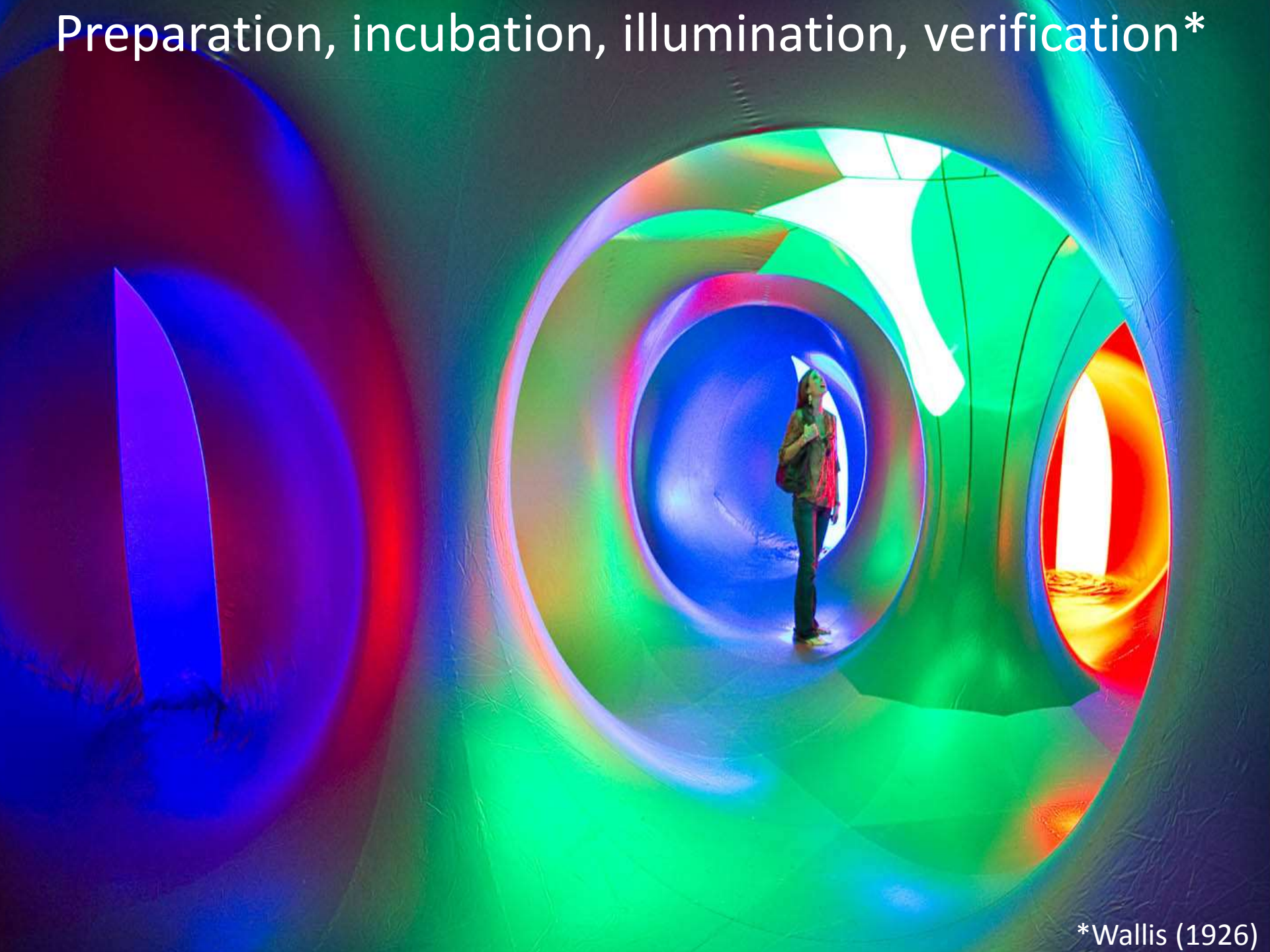
Mental Imagery

[Temple Grandin](#)



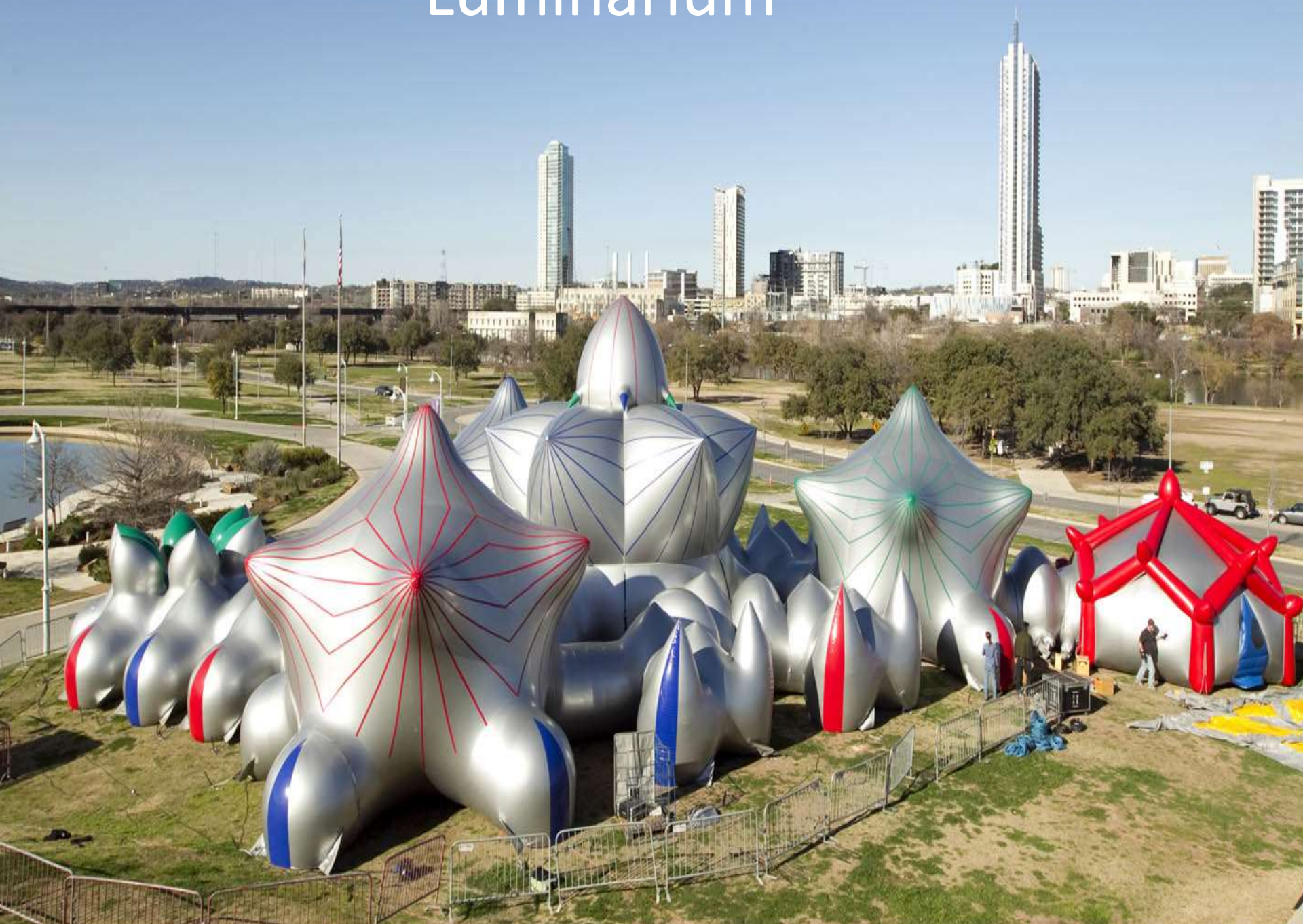
“Photography, memory and mental models” by Kevin Dooley. Shared under Creative Commons 2.0

Preparation, incubation, illumination, verification*



*Wallis (1926)

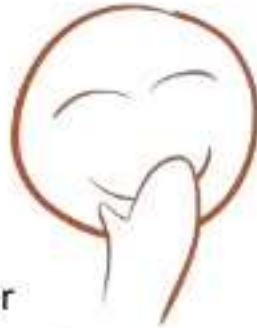
Luminarium



Things that help us let go



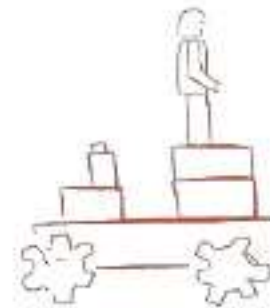
novelty



laughter



dissonance

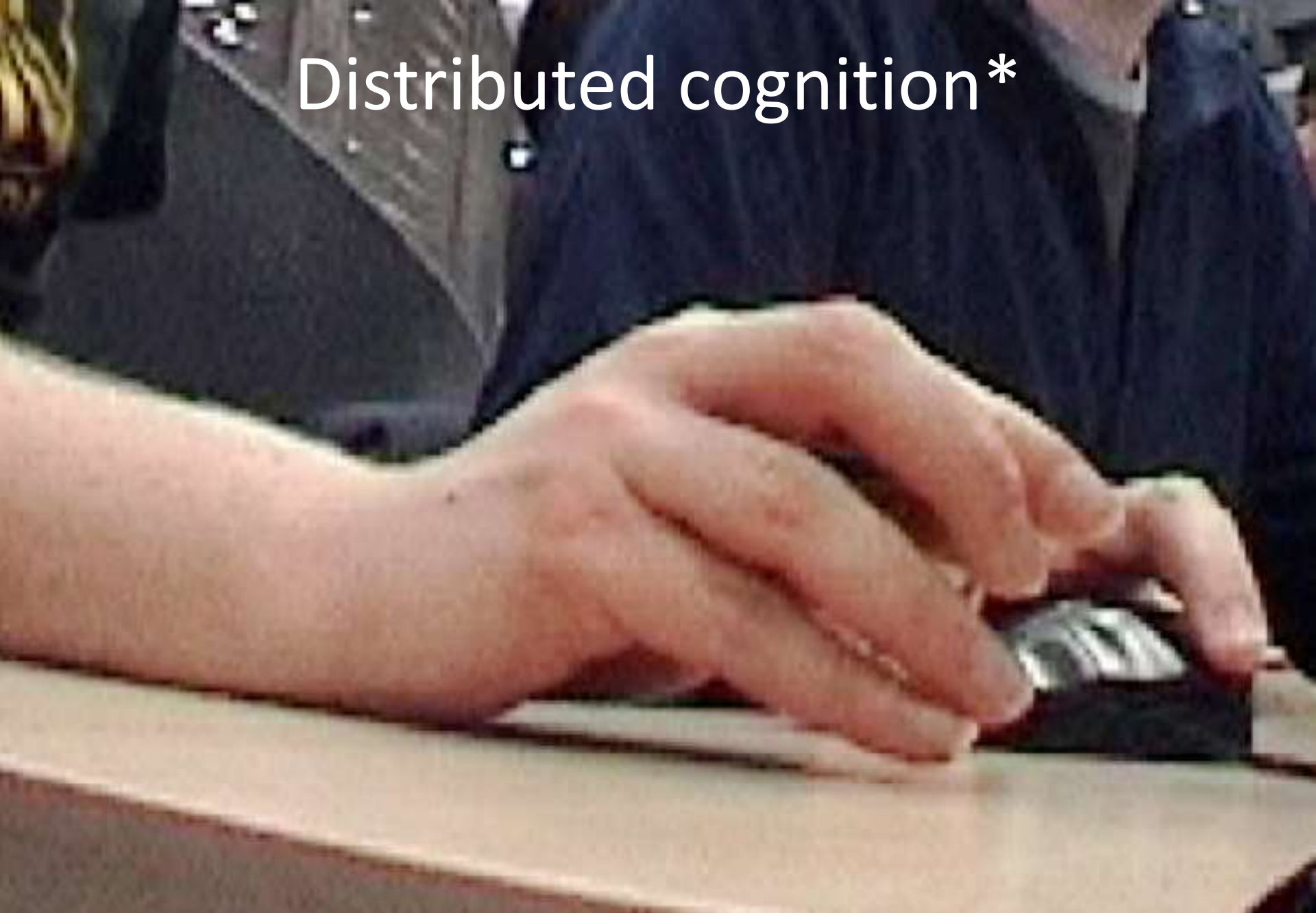


play

metaphor

imagining the future

Distributed cognition*



*"Cognition in the Wild" by Ed Hutchins

Peripheral Awareness



Legitimate Peripheral Participation*



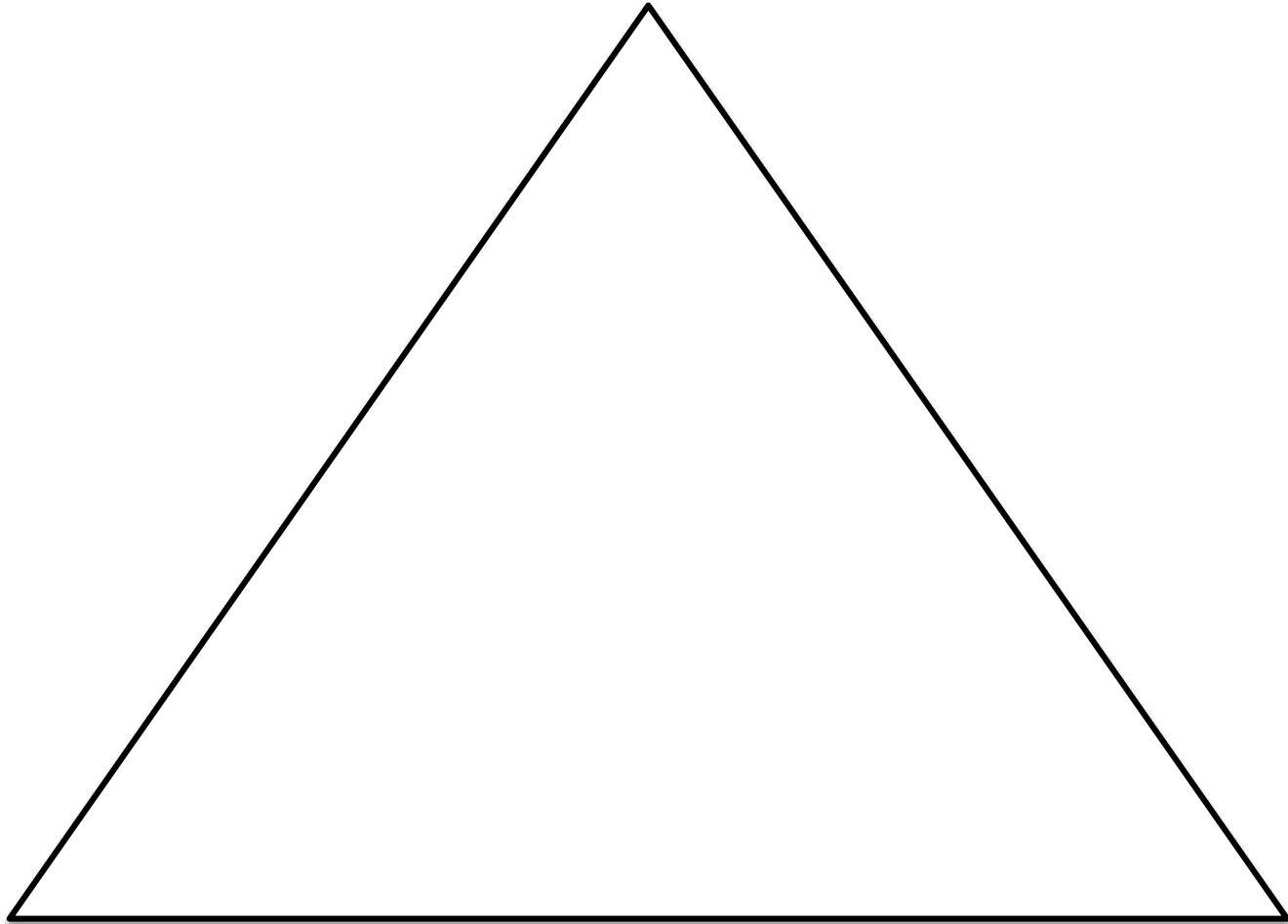
*Lave & Wenger

Collaborate





Language and Communication



Social and Emotional

Flexibility of thought



Sensory Processing Disorder



“Vintage Scales” by Kool Cats Photography. Shared under Creative Commons 2.0

One size doesn't fit all



"Newsroom panorama" by David Sim. Shared under Creative Commons





“First cuppa of the new year” by ScottBungalow. Shared under Creative Commons 2.



Thank you



- “Autism occurs more often in families of physicists, engineers, and mathematicians”, Baron-Cohen S., Bolton P., Wheelwright S., Scahill V., Short L., Mead G., and Smith A. in *Autism*, 1998, p.296-301
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