

# Investigating cultural influences on natural scene perception

Daniel Barratt [db.msc@cbs.dk](mailto:db.msc@cbs.dk)

Viktor Smith [vs.msc@cbs.dk](mailto:vs.msc@cbs.dk)

Patrick Wang (University of Sydney)

Hao Yu (Chinese Academy of Sciences, Beijing)

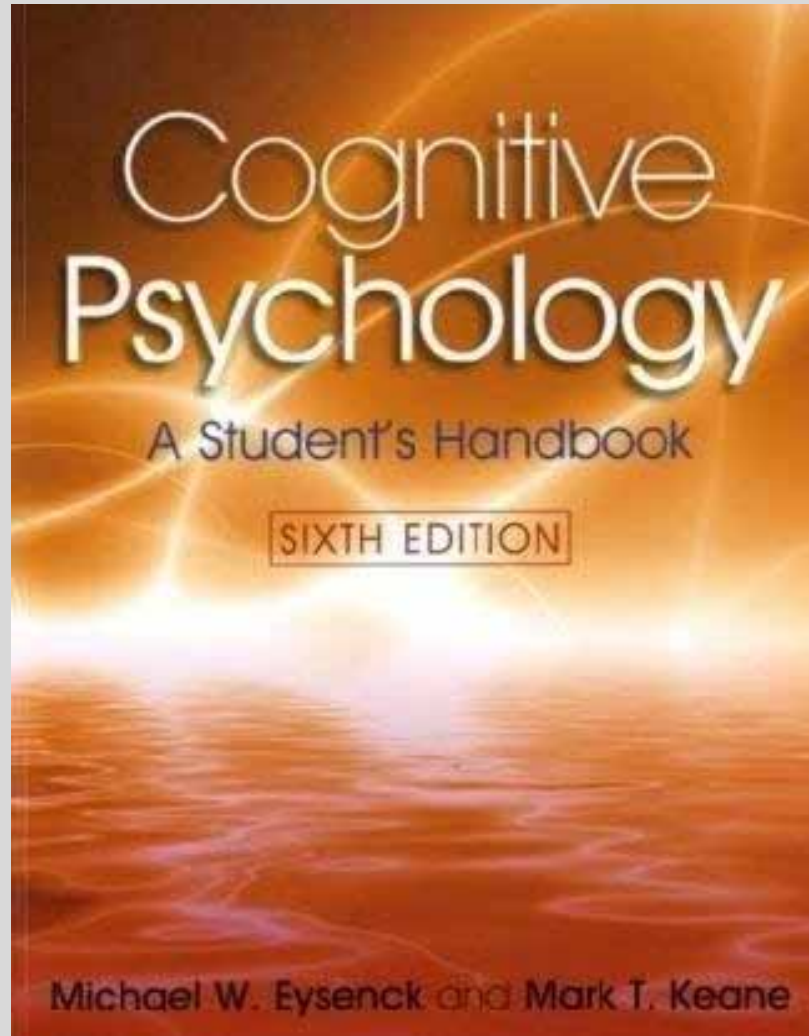
## **Plan for presentation**

- (1) Universal vs. cross-cultural psychology**
- (2) Cultural influences on cognition**
- (3) Cultural influences on scene perception**
- (4) Cultural ET (eye tracking) study**



**(1) Universal vs.  
cross-cultural psychology**

## From universal psychology and the universalist hypothesis ...



A long-held assumption in the field of cognitive science is that the fundamental nature of human cognitive faculties is **universal** and that cultural differences are only superficial.

*perception*

*attention*

*memory*

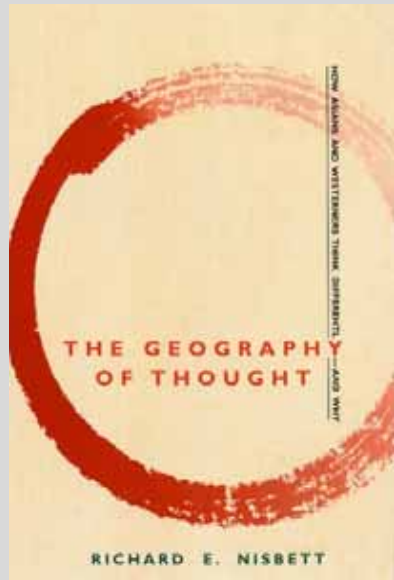
*language*

*higher cognition*

*emotion*

*consciousness*

## ... to cross-cultural psychology and the geography of thought



### Westerners:

- Cognitive style = **analytical thinking**.
- **Categories and rules**.
- Attend more to **focal objects** in a visual scene.

### East Asians:

- Cognitive style = **holistic thinking**.
- **Similarities and relationships**.
- Attend more to **backgrounds and relations** between objects.

# Defining the West and East



## Defining analytic and holistic thinking

The essence of **analytic thinking** is to *analyse*, or break down, the world into individual objects (as relatively *independent* units), thus separating those objects from their situational context. Objects are regarded as having certain properties or essences, and as behaving according to certain rules. This focus allows for categorisation, explanation, and prediction. (Commentators also point to the Greek tradition of debate in the marketplace and the political assembly.)

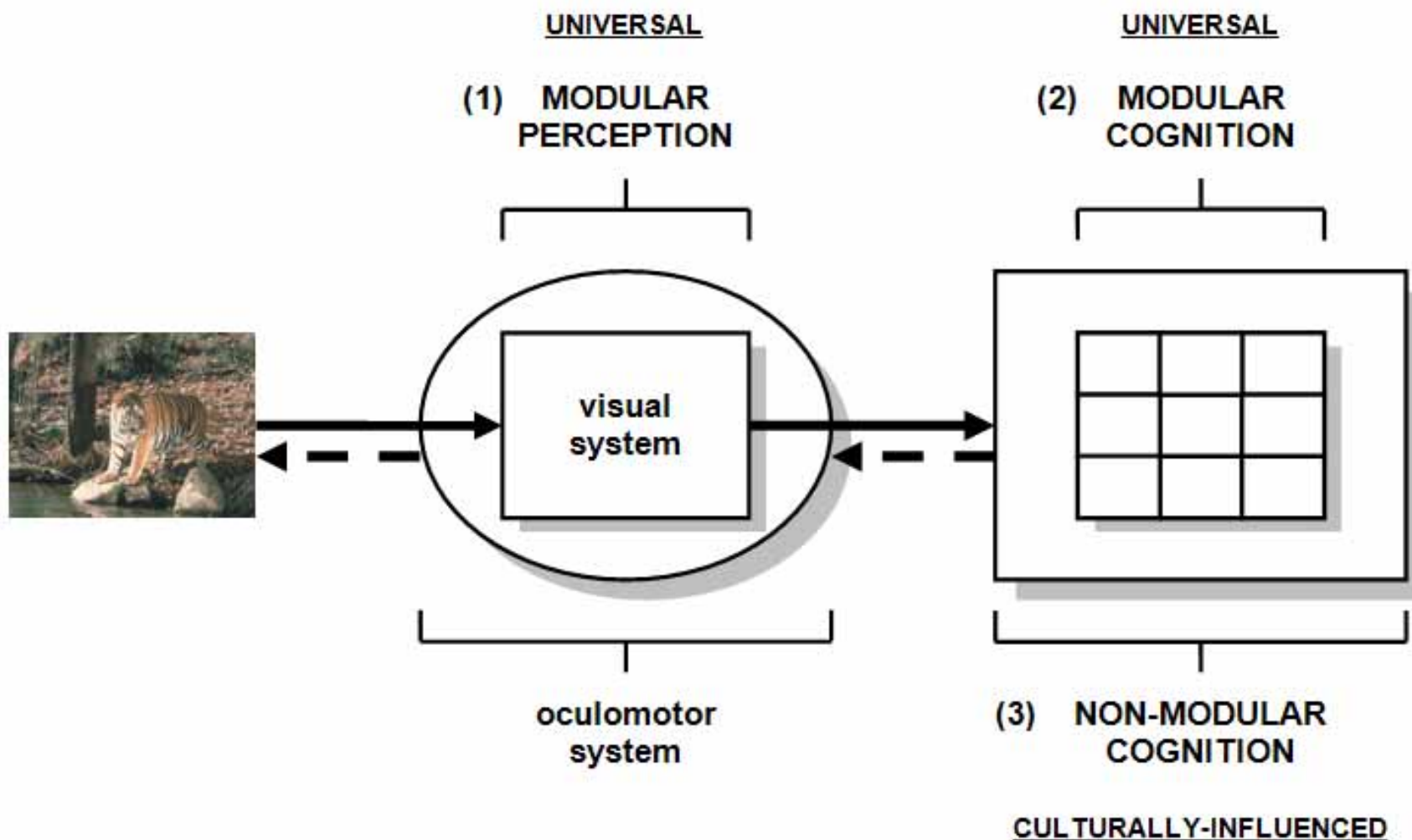
The essence of **holistic thinking** is to look at the *whole* by considering how different objects (as *interdependent* units) relate to each other within the situational context described. One advantage of this approach is the acknowledgement of complexity; a disadvantage is that theories tend to be less specific and thus less conducive to explanation and prediction. (Commentators also point to the Chinese concern for social harmony and the avoidance of confrontation.)



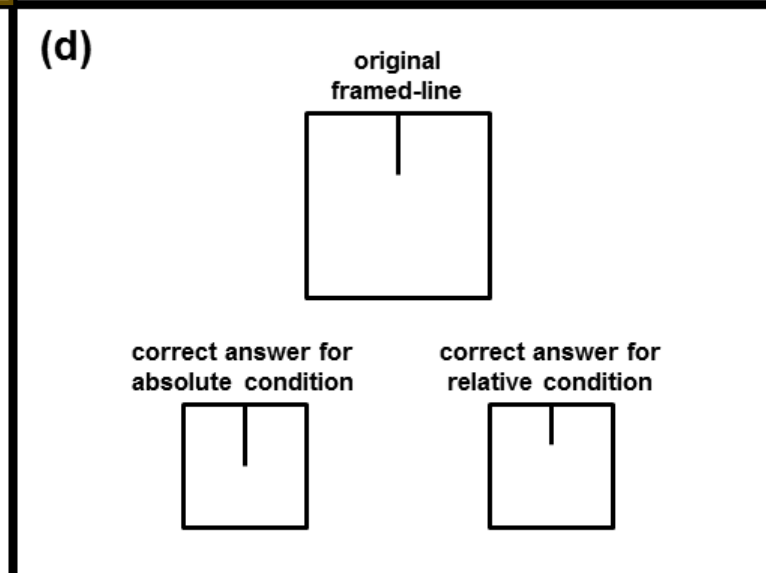
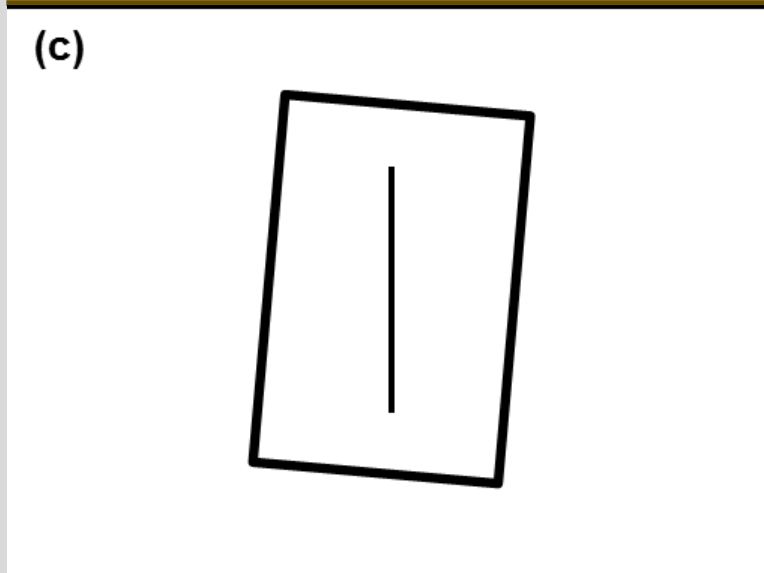
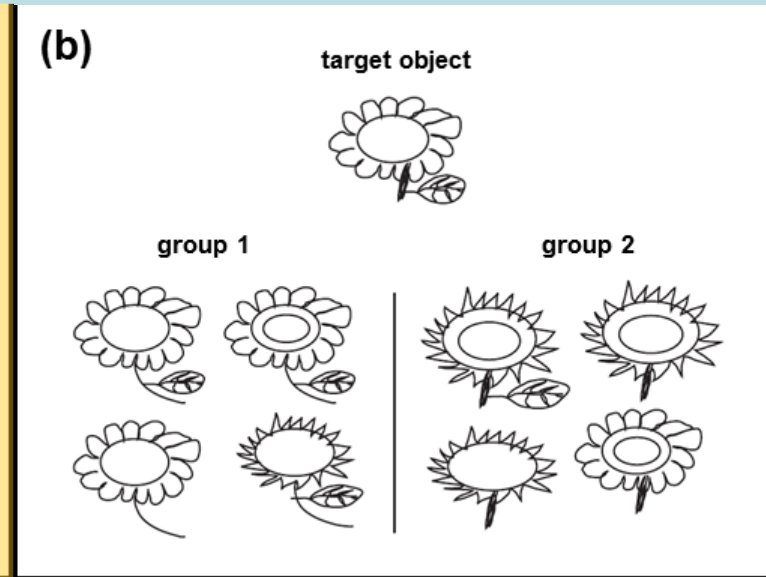
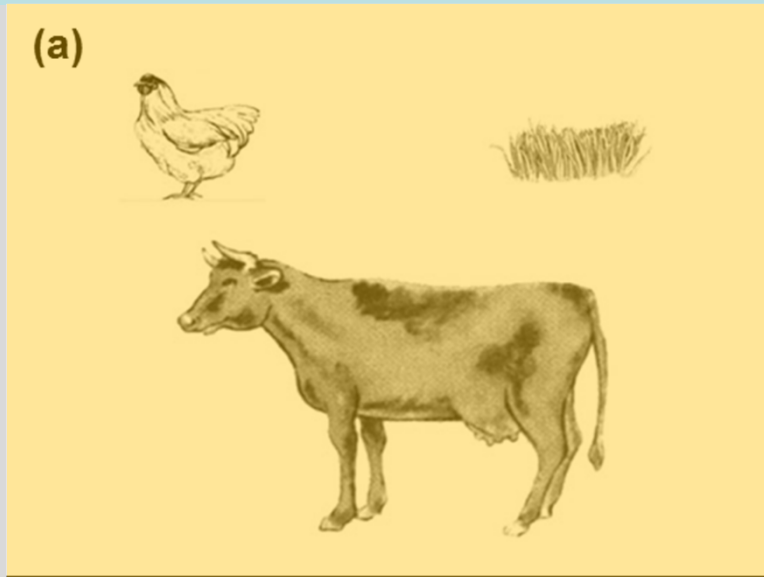
## **(2) Cultural influences on cognition**



# Cultural influences on cognition: Where do they fit in?



# Classic studies: Object categorizations and perceptual judgements



# Higher cognition: Logical, causal, and dialectical reasoning

## Argument 1:

All birds have ulnar arteries.

(All eagles are birds.)

Therefore, all eagles have ulnar arteries.

## Argument 2:

All birds have ulnar arteries.

(All penguins are birds.)

Therefore, all penguins have ulnar arteries.

## Causal reasoning:

- *How we reason about the causes that give rise to an observable event.*

## Fundamental attribution error (FAE):

- *We are more likely to attribute the causes of another person's behaviour to internal dispositional factors rather than external situational factors.*

## Dialectical reasoning:

- *How subjects deal with a contradiction between two pieces of information (or a conflict between two groups of people).*

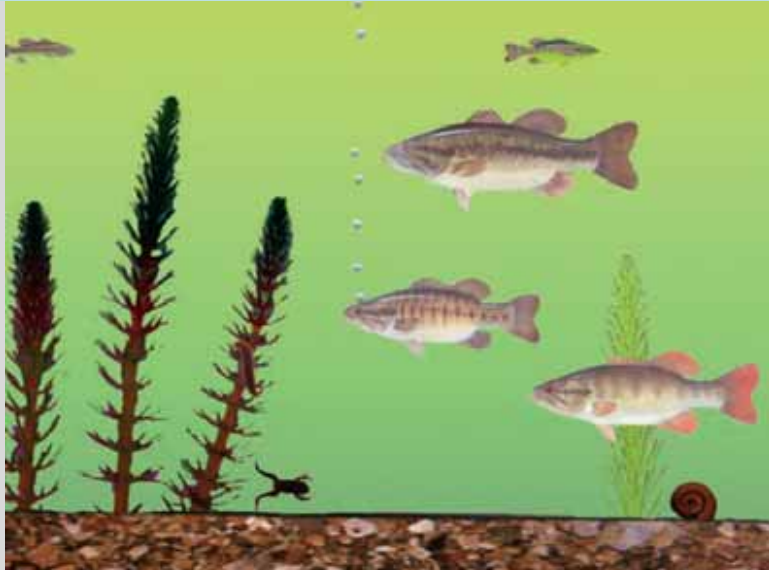
## Dialectical proverbs:

- *E.g., "too humble is half proud".*

## Non-dialectical proverbs:

- *E.g., "one against all is certain to fall".*

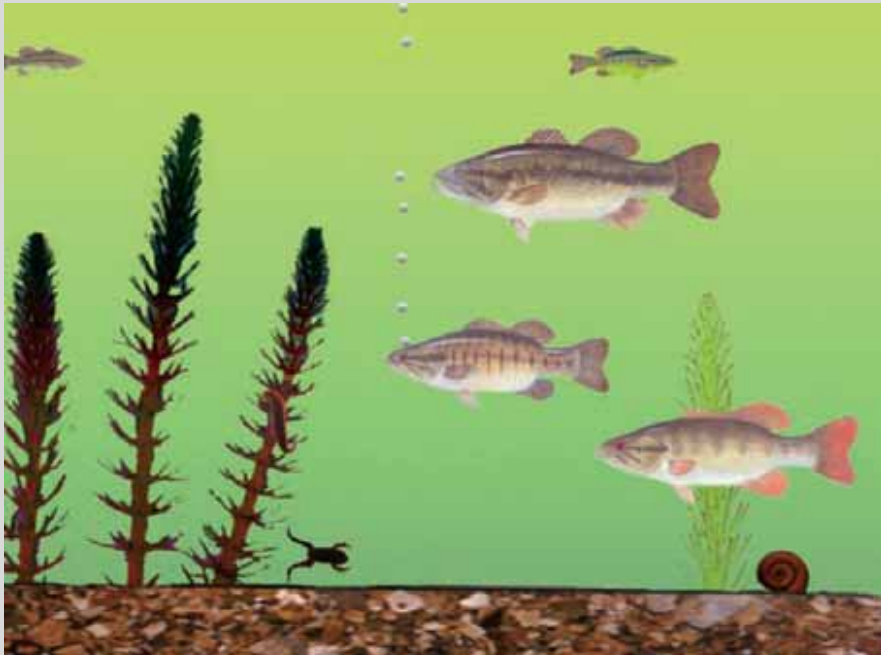
# Scene perception: Verbal report, change detection, eye tracking





**(3) Cultural influences on scene perception**

# Method 1: Verbal report



## Masuda & Nisbett (2001):

- *Subjects shown 20-second animated vignettes (each one shown twice).*

## Main finding:

- W: *Reported more information about salient focal objects.*
- E: *Reported more information about the field and about relations between objects.*

## Method 2: Change detection (1)



See “change blindness” and the flicker paradigm  
(Rensink, O’Regan, & Clark, 1997)

## Method 2: Change detection (2)



### Masuda & Nisbett (2006):

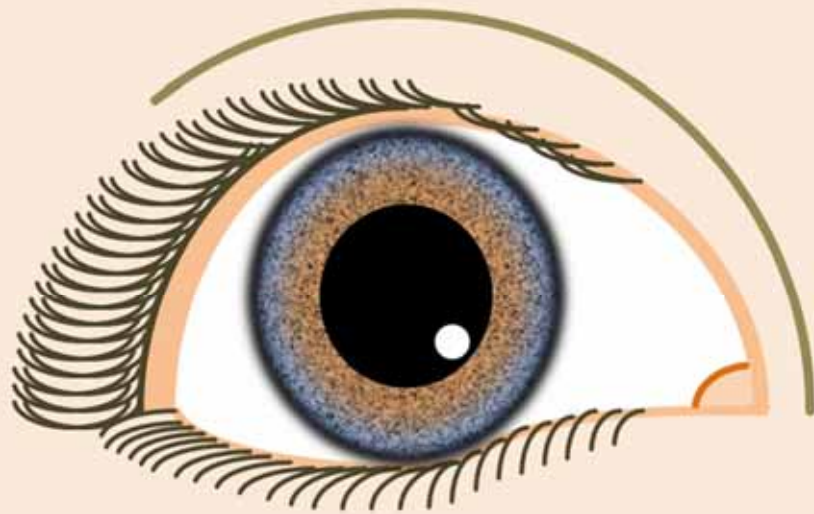
- *Subjects shown:*
  - 30 pairs of still images (flicker paradigm).
  - 5 pairs of 20-second animated vignettes (each one shown twice).

### Main finding:

- W: More sensitive to focal object changes (RTs / verbal report).
- E: More sensitive to contextual changes (RTs / verbal report).



## Method 3: Eye tracking (1)



## Method 3: Eye tracking (2)



### Chua, Boland, & Nisbett (2005):

- *Study phase: 36 pictures of focal object (animal or non-living entity) against complex background + rating task.*

### Main finding:

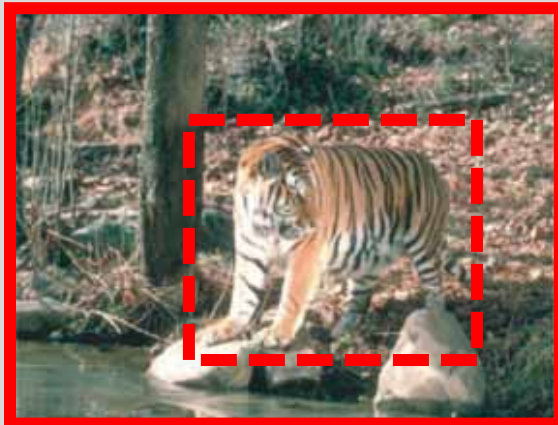
- *W: Made more fixations on focal objects, and looked at focal objects more quickly.*
- *E: Made more saccades to the background.*

### But main finding contradicted by:

- *Rayner, Li, Williams, Cave, & Well (2007).*
- *Evans, Rotello, Li, & Rayner (2009).*

# Miscellaneous: Aesthetic preferences

observer / user



artist / designer



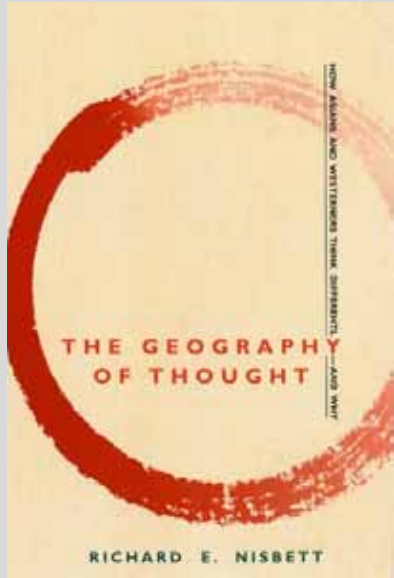
Masuda, Gonzalez,  
Kwan, & Nisbett  
(2008)





## **(4) Cultural ET study**

# Research project 1: Cultural influences on scene perception



## Westerners:

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- **Categories and rules**.
- Attend more to **focal objects** in a visual scene.

## East Asians:

- Cognitive style = **holistic thinking**.
- **Similarities and relationships**.
- Attend more to **backgrounds and relations** between objects.

# Research project 2: “FairSpeak” project on food-to-consumer communication



## Who and where?



**East Asian (Chinese) group:**  
Renmin University, Beijing, N=52 (+40)

**Western (Danish) group:**  
Copenhagen Business School, N=34

**Central (Russian) group:**  
Moscow State Linguistic University, N=42

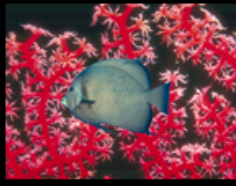
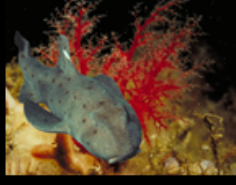




*Basic experimental setup*



# Study 1: Natural scenes + eye tracking (Nisbett stimuli x36)



# Study 1: Natural scenes + eye tracking (Rayner stimuli x24)



# Study 1: Natural scenes + eye tracking (trial procedure)

1,500 ms



5,000 ms



- 1 (表示非常不喜欢)
- 2
- 3
- 4 (表示无所谓)
- 5
- 6
- 7 (表示非常喜欢)

- 1 ( don' t like at all )
- 2
- 3
- 4 ( neutral )
- 5
- 6
- 7 ( like very much )

# Study 2: Food packages + eye tracking

请选择其中一件商品, 并告诉主试你的选择。

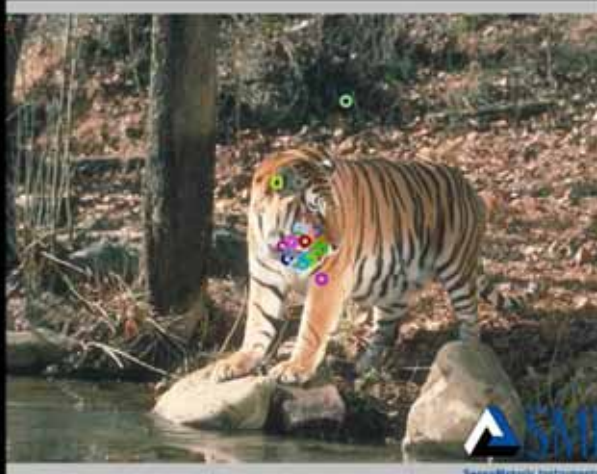
现价: 0.00 元





***ET data visualizations***

# ET data visualizations



红茶

原价: 14.90 元, 现价: 0.00 元



奶油

原价: 3.00 元, 现价: 0.00 元



风干火腿

原价: 16.00 元, 现价: 0.00 元



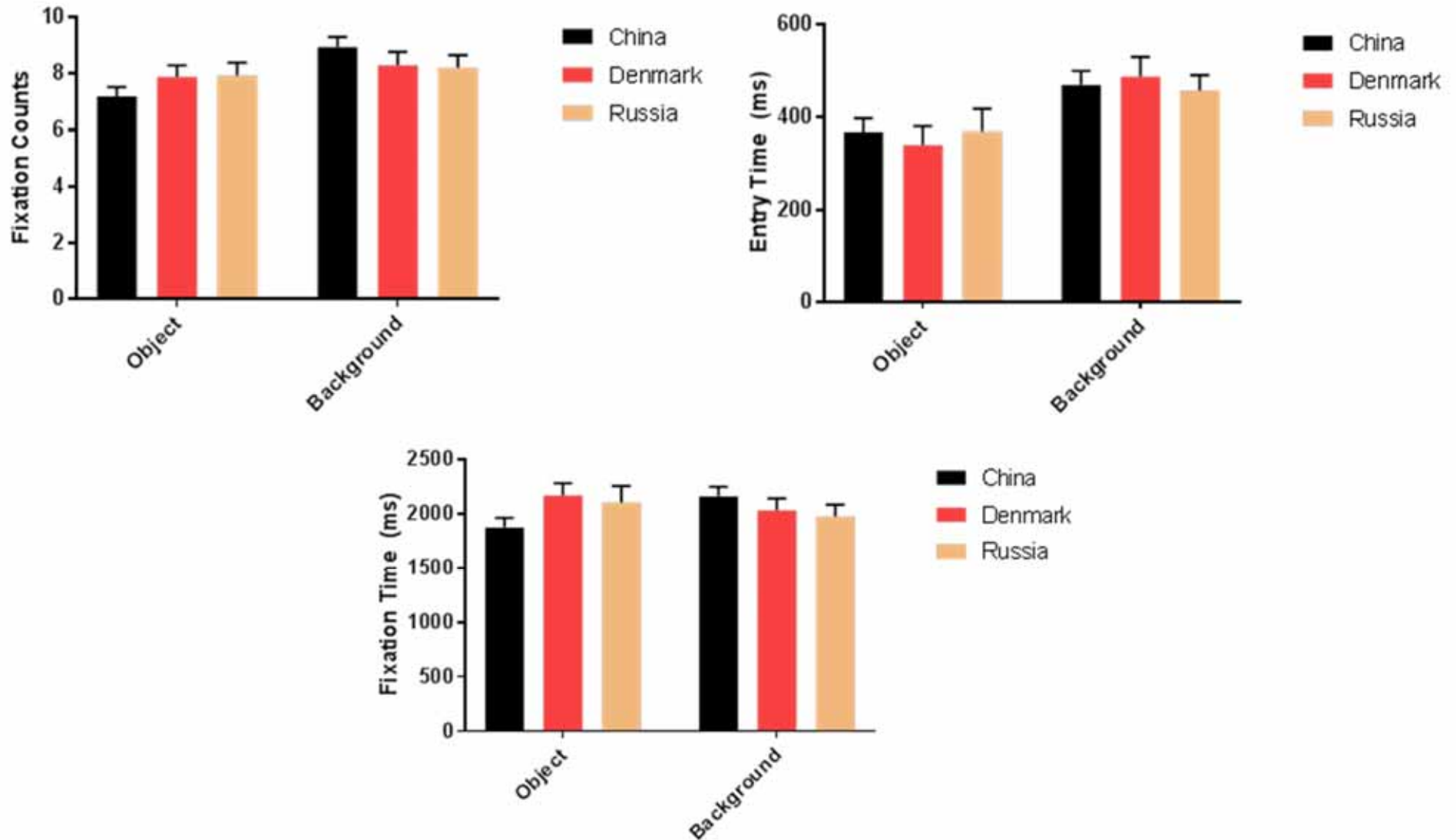
***Analysis of ET data***

## Areas of interest (AOIs)





# Analysis of ET data (Nisbett stimuli only)



# How to measure analytic/holistic perception: Fixation dispersion and saccade amplitude (?)



## **Discussion questions**

**Problems with the original study by Chua, Boland, & Nisbett (2005)?**

**Problems with the original stimuli and free viewing task?**

**Identifying focal objects and backgrounds?**

**Correct statistical tests?**

**New “Cultural ET” study with new stimuli  
(to be run on EyeLink system in both Denmark and China)**

**Thank you!**

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