Ch. 5: Culture and Cognition

Culture and Perception
- Perceptual Processes
  - Bottom-up: Stimulus → Receptors → Brain, feature analysis
  - Top-down: Effects of context, interpretation of sensory input
- Culture & Biology
  - May explain some perceptual effects (Mountain & Risch, 2004)
  - Taste sensitivity to PTC: artificial chemical that tastes bitter to 70% of people, from 58% of Aborigines to 98% of Indigenous people of America (left)
  - Inherited sensitivity of bitterness receptors; recessive gene in Europeans?
- Experience: may operate in counter-intuitive ways (+1)

Experience and Discrimination of Speech Sounds
- Hindi has two ts that sound identical to English speakers
- All born to recognize speech sounds from any language, but without support from environment, capacity is lost

Object Recognition
- Priming: Cue to object helps recognition; spreading activation
- Ethnic Faces as Primes and Targets (Eberhardt et al, 2004)
  - 30 ms prime: Black Face, White Face, Abstract shape
  - Picture of gun slowly revealed over 41 picture frames
  - # Frames to identify
    - Prime Black: 19.26
    - White: 23.58
    - Abstract: 24.97
  - Related to later studies on implicit measures of Racism and Stereotypes
- Winnipeg cases where police saw “knife” instead of screwdriver and (perhaps) cell phone

Optical Illusions
- Mueller-Lyer (MJ5.1, below)
- Horizontal-Vertical (MJ5.2, left)
- Ponzo (MJ5.3)
- Vary with culture (+1)
Cultural Influences

- Rivers (1905)
  - England, rural India, New Guinea
  - ML: English stronger effect
  - HV: English weaker effect
  - Became more interested in ethnography, and his psychological research declined

- Segall et al. (1963, 1966):
  - 2,000 participants from Africa, Philippines, USA
  - ML stronger for 3 industrial (carpentered) groups (right)
  - HV stronger for 14 non-industrial groups with horizon as part of landscape

Explanations for CC effects

- Environmental (top)
  - Zulus (Gregory, 1966): ‘circular culture’; huts round, plough in curves, few possessions with corners or straight lines; ML illusion small effect (-1)
  - Carpentered world hypothesis: Experience with right angles and edges promotes perception of depth from line drawings (bottom)
  - But age effects?
  - Contour sensitivity and retinal pigmentation
  - Symbolizing 3D in 2
  - Front-Horizontal foreshortening

Pictures and Depth Perception

- Anecdotal / Unsystematic Reports
  - Some early missionaries described limitations in native people’s perception of pictures
  - Not firm evidence upon which to draw conclusions

- Hudson (1960)
  - Line drawings (M&J5.4, +1)
  - Varied cues for perception of depth
  - 6 outline drawings with different depth cues or corresponding photographs of models (more realistic)
  - Size, Superposition, Elevation, Linear Perspective (+1)
  - Asked: What do you see? What is man doing? Which is nearer to the man, the elephant or antelope?
  - Examined percentage 3D responses for 11 Samples
    - Adults/Children, Whites/Blacks, different education levels
    - Results (+2)

- Summary and Explanation
  - Some Bantu did not use relative size (or other cues) as cues for depth, neither did some Whites
  - Differences related to education and exposure to European cultures more than race
    - Literate ( schooled) Bantu more likely to perceive depth
    - Labourer homes few reading materials or pictures
    - Homes of Blacks, even graduates and teachers, often lacked pictures
  - Confounding variables complicate interpretation
    - Pictorial stimuli may be more or less familiar to groups
      - But similar results with photographs
      - Participants seemed to understand: e.g., those choosing elephant as nearer thought hunter was aiming at elephant
    - Differences in motivation?

Types of Picture Used by Hudson

- Sources: Hudson (1960, p. 186).

Perception of Faces

- Later studies on memory for faces
- Walker & Tanaka (2003)
  - Same-Different task
  - 2 successive stimuli (faces): respond same or different?
  - Faces morphed to vary along East Asian to Caucasian dimension (+1)

- Method
  - 72 Caucasian and 38 East Asian undergraduates
  - 200 trials: Face (1 sec) → Mask (1 sec) → Test (same or different?)
  - Subjects pressed key to indicate same (physically identical) or different
  - Correct Rejection: Respond Different when Faces Different
  - Social Experience Questionnaire: measured experience with other ethnic groups.

- Results (+2)
Example of W&T Stimuli

W&T Results
- Correct Rejections
  - Better scores when same than different ethnicity
- Social Experience Questionnaire
  - Number closest friends in HS of other-race
  - Number Caucasians / East Asians you talk with a week during recreation activities (sports, parties, clubs, etc.)

Number of people of other ethnic group participants interact with

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Female</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caucasian</td>
<td>1.9</td>
<td>2.4</td>
</tr>
<tr>
<td>East Asian</td>
<td>4.0</td>
<td>5.4</td>
</tr>
</tbody>
</table>
- Experience significant predictor of accuracy (r), but only for East Asian participants

Culture & Attention

- Binocular Rivalry (Bagby, 1957)
  - Different pictures shown to each eye: one picture dominates
  - 12 American, 12 Mexican adults
  - 10 slide pairs (e.g., baseball / bullfight, blonde American girl / dark Mexican girl, ...)
  - Dominance measured by order reported and time each seen
  - % Selecting American in N trials
    | N = 0-1 | 2-4 | 5-7 | 8-10 |
    |-------|-----|-----|------|
    | Amer  | 0%  | 0%  | 25%  | 75%  |
    | Mex   | 58% | 42% | 0%   | 0%   |
- Role of past experience
  - Familiarity, personal significance / preference, ...

Culture and (Episodic) Memory

- Holistic vs Analytic Cognition (T5.1 +1)
  - Masuda & Nisbett (2001): American and Japanese subjects viewed animated scenes (top). Recalled same number of focal objects (figures), but Japanese recalled more background objects (ground). Study 2 results for recognition (below)
  - Individual & group emotions (F5.7)
  - Japanese vs American environment primes & context changes

Table 5.1 Analytic versus Holistic Cognitive Patterns

<table>
<thead>
<tr>
<th>Domain</th>
<th>Analytic Cognition</th>
<th>Holistic Cognition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attention</td>
<td>Field independent</td>
<td>Field independent</td>
</tr>
<tr>
<td>Narrow</td>
<td>Broad</td>
<td></td>
</tr>
<tr>
<td>Focus on salient objects with intent to manipulate them</td>
<td>Focus on relationship of elements, background overall similarity</td>
<td></td>
</tr>
<tr>
<td>Categorization</td>
<td>Taxonomic, focus on a single dimension or shared property</td>
<td>Thematic, focus on functional relationship or overall similarity</td>
</tr>
<tr>
<td>Association</td>
<td>Dispositional</td>
<td>Dispositional</td>
</tr>
<tr>
<td>Tasks and attributes of individuals determine events</td>
<td>External forces, context, and situations determine events</td>
<td></td>
</tr>
<tr>
<td>Reasoning</td>
<td>Analytic</td>
<td>Holistic</td>
</tr>
<tr>
<td>Use of formal logic</td>
<td>Middle Way philosophy</td>
<td>Tendent vectors are likely</td>
</tr>
</tbody>
</table>

Culture and (Episodic) Memory

- Episodic vs. Semantic Memory: memory for events vs. knowledge
- Kinds of Episodic Memory: Short-Term or Working Memory, Long-Term Memory
- Some CC Universals?
  - Memory and aging (left)
    - Crook et al (1992): similar declines with age for American and Belgian
Short-Term Memory

- Store 5-9 units for few seconds. Lost unless actively rehearsed
- Reading rate effect (right, +1)
- Chinese reading faster than English and digit span longer (9.9 vs 6.6)
- STM important for more complex tasks

<table>
<thead>
<tr>
<th>#</th>
<th>Engl</th>
<th>Arabic</th>
<th>Hebrew</th>
<th>Chinese</th>
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<tbody>
<tr>
<td>0</td>
<td>Zero</td>
<td>سیفر</td>
<td>Ef-es</td>
<td>Ling</td>
</tr>
<tr>
<td>1</td>
<td>One</td>
<td>وحید</td>
<td>AH-aht</td>
<td>Yee</td>
</tr>
<tr>
<td>2</td>
<td>Two</td>
<td>اتحین</td>
<td>شتاه-یهمن</td>
<td>Uhr</td>
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<td>3</td>
<td>Three</td>
<td>ثالاثا</td>
<td>شاه-لیتش</td>
<td>Sahn</td>
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<tr>
<td>4</td>
<td>Four</td>
<td>اربا’ا</td>
<td>Ar-bah</td>
<td>Suh</td>
</tr>
<tr>
<td>5</td>
<td>Five</td>
<td>خماسة</td>
<td>هاش-میش</td>
<td>Woo</td>
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<tr>
<td>6</td>
<td>Six</td>
<td>سیتا</td>
<td>سهش</td>
<td>Lyo</td>
</tr>
<tr>
<td>7</td>
<td>Seven</td>
<td>سابا’ا</td>
<td>شه-ویه</td>
<td>Chee</td>
</tr>
<tr>
<td>8</td>
<td>Eight</td>
<td>ثامانیا</td>
<td>شمو-نیه</td>
<td>Bah</td>
</tr>
<tr>
<td>9</td>
<td>Nine</td>
<td>تیسا’ا</td>
<td>تای-شاه</td>
<td>Jo</td>
</tr>
<tr>
<td>10</td>
<td>Ten</td>
<td>اشہرا</td>
<td>Es-air</td>
<td>Shur</td>
</tr>
</tbody>
</table>

Long-Term Memory for Word Lists

- Recall Level
  - Cole et al. (1971): Nonliterate African subjects did not do well with lists of words
  - Scribner (1974): Educated Africans recalled lists as well as Americans; Uneducated Africans recalled less

Other CC LTM Effects

- Memory for Stories (Oral Traditions)
  - Ross & Millson (1970): Ghanian college students with tradition of story-telling remember stories better than Americans
  - Rubin (Memory in Oral Traditions: The Cognitive Psychology of Epics, Ballads, and Counting-out Rhymes)
    - Argues that oral traditions contain “memorization devices”: themes, imagery, rhyme and rhythm, repetition, stock characters
  - Classical mnemonics: method of loci, ...

Category Organization and Recall

- Given lists of category words (e.g., furniture, clothes, ...), people who cluster recall more items
- Ethnic differences in clustering and recall cited by Jensen and other proponents of IQ differences (discussed later)

- Franklin (1997)
  - Are people from different ethnic groups (Black, White) equally familiar with words and categories?
  - Compared Black and White adolescents (grades 10-11) on two types of material
    - Standard Categories: Tools (drill, axe, saw), Utensils (spoons, plate, cup), Clothing (shirt, hat, socks)
    - “Black” Categories: Drugs (smoke, coke, ups), Dances (bump, latin, grind), Soul Foods (greens, cornbread, chittlins)
  - Whites better on standard categories and Blacks on “black”
Culture and Face Recognition

- Meta-analysis (Bothwell et al., 1989)
  - Same-race bias (+1)
    - Higher Hit rate: say Old when Old
    - Lower False Alarm rate: say Old when New
  - Implications for eye-witness testimony
- Theories
  - Attitudes toward people
  - Orienting strategies (perception)
  - Contact Hypothesis: differential familiarity; mixed results
  - Individuating experiences important (e.g., basketball fans)

Meissner & Brigham (2001) Meta-Analysis

Figure 1. "Mirror-effect" pattern demonstrated in hit and false alarm responses to own-race and other-race faces.

Categorization

- People categorize and label on basis of similarities
- Categorize in terms of best examples of basic forms
  - Called prototypes
- Universal Categories?
  - Emotion (Ch. 8)
  - Colours: some subtle effects of language
- Differential use of categorical relations
  - Tendency to categorize certain ways varies across cultures; more common in West (schooling?)

Sample Stimuli from Classification Studies

- Triads allow for classification in three different ways
- Subjects select two objects that belong together (or select object that does not belong)

Categorization: Sorting Tasks

- Order varies with age in West
  - Colour → Shape → Function (e.g., tools)
- Greenfield et al. (1966)
  - Adult Africans
  - Sorted by colour
  - Culture or Education?
- Evans and Segall (1969)
  - Uganda Children and Adults
  - Colour preference among unschooled, not schooled
- Glick (1975): Kpelle of Liberia
  - Sorted 20 objects: Used functional groups (e.g., knife with orange, potato with hoe), rather than categories
  - Functional classification more common in everyday life, categorical in school
  - Researchers asked "How would fool do it?": Then sorted into categories
- Russian peasants (Luria)
  - Unschooled Russian peasants had much difficulty grouping objects: saw entire collection as related and often refused to say why some objects would go together and others not
  - ‘Look,” we said, “here you have three wheels and a pair of pliers. Surely, the pliers and the wheels aren’t alike in any way, are they?”
  - “No, they all fit together. I know the pliers don’t look like the wheels, but you’ll need them if you have to tighten something in the wheels.”
- East Asians
  - Chiu (1972): Chinese children sorted by shared contextual or functional relations, rather than category
  - e.g., given man, woman, and child, American children put adults together, whereas Chinese grouped woman and child
  - Replicated by Ji et al (2004) with American and bilingual Chinese participants: differences not due to language
  - Not due to schooling as in studies in Africa
Thinking: Problem-Solving

- Cole et al. (1971)
  - Device with button, panels, and slots
  - 2-step solution: press button for marble, insert marble in slot
  - American children under 10 did not solve, but adults did
  - Liberians of all ages and education had difficulty
  - Possible bias: familiarity with such devices
  - Liberians solved analogous task of locked box and keys
  - Ability to solve depends on context / familiarity with specific device

Reasoning

- Russian peasants (Luria, 1976) believed answer CAN ONLY be based on experience
  - e.g., Syllogism: “In far north, where there is snow, all bears are white. Novaya Zemlya is in far north and there is always snow. What colour are bears?”
  - Answers: “We always speak only of what we see; we don’t talk about what we haven’t seen. [prompt] Your words can be answered only by someone who was there, and if a person wasn’t there he can’t say anything on the basis of your words. [prompt] If a man was 60 or 80 and had seen a white bear and had told about it, he could be believed, but I’ve never seen one and hence I can’t say. That’s my last word.”
  - Logic in north Russia
    - Truth requires first-hand knowledge
    - Refuse to accept abstract premises
    - Luria concluded logical reasoning artificial and learned in school
  - Less difficulty when task changed to evaluating another person’s thinking (Cole et al., 1971)
  - Scribner (1979): hypothetical nature of reasoning was challenge

Creativity

- Creative individuals (Sternberg & Lubart, 1995)
  - Divergent thinking, hard work, risks, accept ambiguity
- Similar qualities in other cultures
  - Khaleefa et al. (1996): Sudanese
  - Simonton (1996): Japanese history
  - Satoh (1996): Japanese kindergarten programs
- Differences
  - Shane et al. (1995) studied 1,228 people from 30 countries
  - High UA: work through norms, rules, procedures
  - High PD: gain support from authority or build broad base
  - High Collectivism: build cross-functional support

Dialectical Thinking

- Nisbett, Peng, et al
  - Hypothesized
    - Chinese more Dialectical thinking; less likely to emphasize exclusion and contradiction and to compromise different positions (F5.8, right)
    - Related to history (Tao), but perhaps also Collectivism?
    - Naïve dialectivism: truth always somewhere in middle

Counterfactual Thinking

- Hypothetical thinking, often about past and associated with regret: “If only”
  - More regret over inaction in various cultures

Culture and Dreams

- Differences in manifest content: e.g., aggression in children living in dangerous areas
- Interpretations of dreams differ: cultural folk wisdom in some cultures, supernatural elements in others (e.g., ancestors)

Culture and Time

- Hofstede’s Long- vs. Short-Term Orientation: Asian countries LTO (T5.2)
- Cultures vary in speed of walking, accuracy of clocks, speed of transactions at post office, …

Culture and Perception of Pain

- Much evidence for top-down processes
  - Phantom limb, Gate control theory, Distraction, Meditation
- Cultural differences in pain tolerance?
  - Some cultural practices appear to involve extraordinary pain regulation, but “natural” explanation (e.g., fire-walking)
- Hypotheses for Culture Differences
  - Biological/genetic?: e.g., Chinese babies more intense response
  - Language: Sapir-Whorf hypothesis
  - Cultural display rules & expression of pain: e.g., Indians less expressive & more tolerant than USA
  - Cultures value stoicism & tolerance (“god’s will” “grin and bear it”), especially for certain painful events (e.g., childbirth, circumcision, …)
Culture and Intelligence

• IQ Testing controversial
  – Many benefits in applied settings: e.g., education (Binet), occupation
  – Harmful, part of racist policies: e.g., eugenics, immigration, children in remedial programs, ...

• Traditional View
  – Cognitive competencies: capacity to reason and think
  – Diverse Models and Measures: Ravens Progressive Matrices (nonverbal, right), Wechsler (+1)

• Cultural/Ethnic Differences
  – Much attention to White-vs. Black-American
    • Difference of 1 SD (15 units)
    • e.g., children in Kent County, Ontario (right); note overlap!
    • Difference often reduced when other factors controlled (e.g., social class)
  – Also other cultural/ethnic differences
    • Asians tend to score higher than Euros
    • Social class differences (+1) and pattern of differences

Variation within group

• Much controversy about origin of differences in intelligence among individuals and groups
  – Genes and Environment are two major categories of influence: both important, AND their interaction (see later slide)
  – Much of research has been at individual level: NB! may not explain group differences (above)

Causes: Genetic Factors

• Underlying Biological Factors
  – IQ not directly inherited; biochemical processes that benefit/harm IQ performance
  – Speed of neuronal transmission, brain size, neurotransmitters, ...
• Twin and Relatedness Studies (+1)
  – \( r = .82 \) (Jensen, 1970) for Identical Twins
  – Burt controversy
  – An estimated 40% or more of in-group variation

Adoption Studies

– Adopted child’s IQ more similar to biological parent than adoptive parent, especially when older

Selective Breeding Studies

– Animals bred for “intelligence” (maze learning, below)
Genetically similar people have more similar IQ scores (also environment effect discussed later).

Causes:

Environmental / Cultural Factors
- Enriched rearing of animals
  - Intelligence, neuronal development...
- Flynn effect
- Social Class?
- Head Start and related preschool programs

Causes: G x E Interaction
- Effect of one variable depends on levels of another variable
  - e.g., effect of E depends on G (and vice versa)
- Cooper & Zubeck
  - Selective Breeding Studies
  - Bred maze-bright and maze-dull rats
  - Reared in impoverished, normal, or enriched environments
  - Predictions? (observed at right)

Bias: Are Tests Appropriate for Minority Children?
- Norms inappropriate?
  - Reflect composition of population
- Examiners white
  - Many studies show no effect of examiner, but stereotype threat (+1)
- Minorities handicapped in test-taking skills
  - Skills, anxiety, motivation,
  - These skills also affect school / work performance
- Results lead to inferior education
  - Tests not sole basis for placement
  - Tests reduce opportunity for subjective judgments
- Content Bias
  - Wrong predictions about differential difficulty
- Predictive Validity
  - Predicts reading and arithmetic equally for Whites, Blacks, Hispanics in USA

Bias: Steele and Stereotype Threat
- Performance of Blacks in college (Steele, 1997)
  - 62% do not complete college in 6 years vs. 41% national rate, Lower GPAs, Under-represented in mathematics and natural sciences
- Stereotype threat
  - Situational threat that affects members of stigmatized group
  - Emotional reaction disrupts performance
- Results lead to inferior education
  - Tests not sole basis for placement
- Tests reduce opportunity for subjective judgments
- Content Bias
  - Wrong predictions about differential difficulty
- Predictive Validity
  - Predicts reading and arithmetic equally for Whites, Blacks, Hispanics in USA

Concept of Intelligence
- Meaning of intelligence varies across cultures
  - Some cultures include social skills or personality factors related to success (e.g., friendly, cautious)
- M&J (4th ed. p127): “Because of enormous differences in ways cultures define intelligence, may be difficult to make valid comparisons from one society to another.” [may be ‘was’ ‘is’ in last edition]
- More liberal definitions in West, as well
- Gardner’s Multiple Intelligences
  - Standard: Logical-Math, Verbal-Linguistic, Visual-Spatial
  - But also: Musical, Bodily-Kinesthetic, Interpersonal, Naturalist
- Many critics: lack of evidence, based on intuition, redefines intelligence, ...