A Conceptual Guide to Museum Visitors’ Understanding of Evolution

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A Conceptual Guide to Museum Visitors’ Understanding of Evolution

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Research Questions

1. How do natural history museum visitors reason about evolution?
2. Does a novel conceptual framework, which is based on earlier research on the emergence of evolutionary ideas, successfully profile museum visitors’ reasoning patterns across diverse organisms?
3. Do different organisms elicit characteristic reasoning patterns?

Participants and Procedure

Participants
32 museum visitors (18-65 yrs) from three Midwest natural history museums (38% male; 97% non-Hispanic white; 3% multiracial)
Education Levels: 19% High School; 22% 2-year college; 60% 4-year college* (typical of science/natural history museums, Korn, 1995)

Procedure
Randomly selected visitors were asked to take part in an audio-taped interview in which they explained 7 evolutionary problems, each focused on a different organism. The term evolution was not mentioned.

Fixed presentation order: Fly, finch, HIV, diatom, ant, whale, human

Results: Reasoning Patterns

Overall: Across Organisms
• 72% informed naturalistic & novice naturalistic reasoning
• 28% informed & novice naturalistic & creationist reasoning

Dominant Reasoning Patterns
• 34% informed naturalistic reasoning
• 54% novice naturalistic reasoning
• 6% creationist reasoning
• 6% no dominant pattern

Thinking Patterns
• Informed Naturalistic Reasoning: Use of an evolutionary term or concept (e.g., variation, inheritance, selection)
• Novice Naturalistic Reasoning: Proposes a natural explanation, but relies on intuitive modes of reasoning
• Creationist Reasoning: Proposes supernatural rather than natural explanations; particularly God’s direct role

Coding
• Each reasoning pattern was marked up by 8-10 distinct themes
• The themes were based on research on the emergence of evolutionary concepts (e.g., Evans, 2001) and the content analysis.
• A content analysis of the 32 transcribed interviews identified 601 distinct conceptual units that mapped on to the above themes.

For each participant’s response to each organism, each theme was recorded as present (1) or absent (0), even if the theme was repeated.

Overall reliability 86-100%; All responses coded to 100% reliability

Summary and Conclusions

In contrast with the general public, which is 45% creationist (Gallup, 2004), only 28% of the sample exhibited creationist beliefs.
None of the visitors, though, were exclusively evolutionist. Instead, visitors were mixed reasoners using more than one of these reasoning patterns in different permutations across the seven organisms. Even so, most visitors did exhibit a dominant reasoning mode: 54%, informed naturalistic reasoners, 53%, novice naturalistic reasoners, 6%, creationist reasoners. The human/chimp problem elicited the most creationist reasoning, the HIV, diatom, fly and ant problems, the most novice naturalistic reasoning, and the finch, whale, and human/chimp problems the most informed naturalistic reasoning.

Figure 1: Reasoning Patterns By Organism. The percentage of participants endorsing at least one theme from each of the patterns.

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