Making it Personal: Visitor Awareness and Understanding of Deep Time in the NMNH Paleobiology Halls

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Abstract

This study addresses National Museum of Natural History (NMNH) visitor awareness and understanding of deep time (earth's 4.6 billion year old history). After pursuing *how* people think of deep time, the study was switched to *do* people think of deep time and how the museum can spark an interest. The research involved three testing groups and a follow-up assessment involving physical timelines to take through the exhibit. After analyzing the data, it was concluded that a personal connection helps in understanding, but a follow-up study is needed for a more concrete result.

Research Questions

Does providing a timeline help a visitor focus on time in the exhibit?
Does providing a personal timeline help a visitor focus on time in the exhibit *more* than a general timeline?

Literature Review and Introduction

Preliminary research was done to understand diachronic thinking, geocognition, and previous studies on deep time. The following three articles provided the most insight:

1: A study where design students were asked to create a landscape that would visually show deep time. The ones that were most successful were those that used abstract notions of geological time.[1]

2: A study in the Grand Canyon's *Trail of Time* where researchers tested how visitors think and feel about the geological time displayed on the trail. They discovered that a range of processes are needed for the level of geocognition to deepen in visitors: such as understanding order of events and absolute duration.[2]

3. A study of the diachronic thinking in 7-12 year olds. This article provided the basic conceptual scheme, specifically in the temporal organization realm.[3]

The first question to be addressed was how visitors think of deep time, whether abstract, linear or visceral. After pilot interviews, it was quickly concluded that visitors do not regularly think of deep time. A formal study was then created to test how the museum could spark ideas of deep time. Based on the preliminary research, it was suggested that a personal connection might be beneficial for the thinking of deep time.

Methods

•The research study took place in the Triceratops exhibit area from July 26-28, 2011.
•A quasi-research experiment design was used.
•There were three research groups: Treatment A, Treatment B, and Control.
•Treatment A and B included timelines:

- •Treatment A: "General Timeline" displayed major earth events and their accurate ages. **(Figure 1)**
- •Treatment B: "Personal Timeline" displayed a third column that included the earth's major events compressed into a visitor's age (ranging from 13 to 85). **(Figure 2)**

•For all three groups, the visitors were asked to return after their visit in the exhibit for an assessment.
•The survey asked three "complete the sentence" questions unrelated to time. **(Figure 3)**
•Treatment A and B groups were presented with a short script that involved the age of Triceratops and at the end, the introduction of a timeline to take through the exhibit and return for assessment. The Control group was not presented a timeline or a script.

Data were analyzed using a comparative coding method. The following codes were derived by the researchers: Deep Time, Deep Time A (preliminary notion of deep time), relative time, sequence of events, absolute time, fact, human.

The survey revealed 144 visitor participants. 54 in Treatment A, 45 in Treatment B, 44 in the Control Group.

Instruments

Figure 1. General Timeline

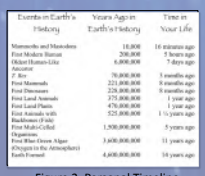


Figure 2. Personal Timeline

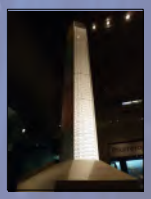


Figure 3. Paleobiology Halls Tower of Time

Figure 4. Survey/Assessment

Results

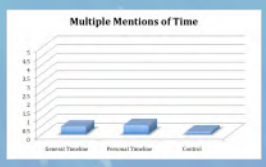
There are three major results for this research:

1. There was significant effect for treatment with more visitors making references to time in treatments than control. The x-axis are treatments A, B, C in all three charts.

Significance: F(2, 140)= 5.286, P<.01

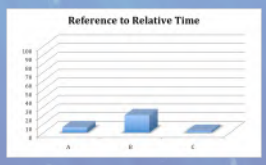
2. There was a significant effect of treatment for multiple mentions of time. The y-axis is the mean total mentions of time each condition.

Significance: F(2,140)= 4.954, P<.01



3. Although the values for all three conditions are small, there was a significant effect of treatment in favor of a personal timeline (Treatment B) for relative time.

Significance: F(2, 140)= 5.134, P<.01



The following significant code correlations were found:

Fact- DTA, r=.301, p<.05
Fact- Relative, r=-.177, p<.05
DT- Sequence, r=.176, p<.05
DTA- Relative, r=.367, p<01
Human- DT, r=.328, p<01
Human- Sequence, r=.404, p<01

Discussion

The data shows that visitors were thinking about time more in the assessment for both treatments over the control. The percentage of visitors who mention time more than once on the assessment is higher in the treatments as well. The presence of any treatment, whether personal or non-personal, seems to be beneficial for the introduction of deep time. The third chart shows that relative time (the closest time code to deep time) references were higher among visitors who received a personal timeline. This suggests that a personal connection sparks an interest in deep time. There were also significant correlations between the human code and the sequence of events code, which suggest that visitors are placing humans on the timeline, a further step to understanding geological time.

Future Work

The results show a positive correlation between any treatment and the thinking of deep time, but it is unknown which aspect of the treatment was helpful (paper timeline or intervention script). A future study on the effects of a paper treatment vs. a paperless treatment is suggested.

Acknowledgments

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References

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