

# Individual Differences in Epistemic Goals and the Acceptance of Evolution

Thomas D. Griffin (tgriffin@uic.edu)

Department of Psychology (M/C 285), 1007 W. Harrison Street  
Chicago, IL 60607 USA

**Keywords:** Beliefs; Reasoning; Affect; Conceptual Change.

Gallup polls over the past two decades have consistently shown that nearly half of the people in the United States reject the basic concepts in the theory of evolution (ToE) and common descent. Public rejection of a scientific theory that is so strongly supported by evidence from numerous branches of science (NAS, 1998) has sparked some alarm within the scientific and educational communities. A common reaction is to place the blame at the foot of poor science education (e.g., Miller, Scott, & Okamoto, 2006).

One might assume that those who reject evolution simply fail to understand it and its evidence, or lack the reasoning skills to understand how the conclusions of evolution are compelled by the evidence. These assumptions focus upon deficits to the cognitive system, suggesting that disbelief results from the absence of declarative knowledge or the proper reasoning algorithms to operate on that knowledge.

However, deviations from normative belief may not always result from computational constraints, but rather from epistemic goals or thinking dispositions that are orthogonal to the normative goals of accuracy, or rationality (e.g., Stanovich & West, 1997). Many people may simply choose not to apply evidence-based reasoning processes to the question of human origins, deliberately guiding their beliefs and disbeliefs via coherence with affective goals. Many U.S. students find the ToE affectively aversive (Brem, Ranney, & Schindel, 2003). Thus, even those who possess the requisite knowledge and reasoning skills are likely to reject evolution, if affective goals are central in belief formation. The domain of human origins may evoke particular affective concerns that override epistemic goals of accuracy. There may also be a domain-general influence, whereby people with a general tendency to rely on an epistemic goal of affective coherence are more likely to be influenced by the affective concerns evoked by a topic like human origins.

## Method

A sample of 640 college students reported their disbelief or belief on two logically exclusive theories of human origins (evolution, and *direct* special creation), and on theories about five non-origins topics (romantic attraction of opposites, parental influence on personality, ethnicity and IQ, UFOs, and ESP). Respondents also completed a self-report measure of epistemic goals (EGs) for each topic that assessed the degree to which their belief or disbelief on each topic was the result of evidence-based reasoning or coherence with affective goals (Griffin & Ohlsson, 2001).

## Results

The EG scores for the two origins theories were combined to form an origins-EG score. The EG scores on the five non-origins topics were entered into a factor-analysis yielding a single factor that accounted for 61% of the variance. This result suggests a domain-general individual difference in relying upon an evidence or affect when forming beliefs across topics. Factor scores were used as a general-EG measure.

Binary logistic regressions revealed that the odds of adopting a scientifically supportable position on human origins (i.e., belief in evolution and disbelief in special creation) were strongly predicted by both the origins-EG and the general-EG measures. The odds of accepting evolution (and rejecting a theory of special-creation that contradicts it) increased by nearly 10-fold for each standard unit increase in origins-EG scores, and the odds nearly doubled for each unit increase in general-EG scores.

These results suggest that low acceptance of evolution may be partially a product of people relying upon affective epistemic goals rather than accuracy goals that would be served by evidence-based reasoning. Also, a general lack of commitment to accuracy goals over affective goals may be one factor that determines how and therefore what a person believes within the domain of human origins.

## References

- Brem, S. K., Ranney, M. & Schindel, J. E. (2003). The perceived consequences of evolution: College students perceive negative personal and social impact in evolutionary theory. *Science Education*, 87, 181-206.
- Griffin, T. D., & Ohlsson, S. (2001). Knowledge versus beliefs: A necessary distinction for predicting, explaining, and assessing conceptual change. In L. R. Gleitman and A. K. Joshi (Eds.), *Proceedings of the Twenty-Third Annual Conference of the Cognitive Science Society*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Miller, J. D., Scott, E. C., & Okamoto, S. (2006). Science Communication: Public Acceptance of Evolution. *Science*, 313, 765 – 766.
- National Academy of Sciences (1998). *Teaching About Evolution and the Nature of Science*. National Academy Press, Washington, DC.
- Stanovich, K. E., & West, R. F. (1997). Reasoning independently of prior belief and individual differences in actively open-minded thinking. *Journal of Educational Psychology*, 89, 342-357.