A Comparison of Terminology Used by Giere and Underwood  
(Adapted from work by Dan Herms, Ohio State University)

**Theoretical Model** (Giere): A generalized explanation of observed phenomena.  
This is the same concept as the **Model** of Underwood (or "General Model" i.e. p. 385).

  e.g., models of celestial mechanics or interspecific competition.

**Theoretical Hypothesis** (Giere): contingent statement asserting that some real system corresponds to the theoretical model.

Underwood does not explicitly define an equivalent term, but captures the essence of the idea on page 385, when he discusses the invocation of a "general model" in a new situation, which will then require testing.

  e.g., "Halley's comet behave according to model of celestial mechanics."
  e.g., The distribution of Species A can be explained by the model of interspecific competition.

**Prediction** (Giere) equals **Hypothesis** (Underwood): contingent statement logically deduced from **Theoretical Hypothesis**.

**Logical Null Hypothesis** of Underwood: comprises all alternative possibilities to the **Prediction** (Hypothesis). Underwood uses the **logical null hypothesis** as tool that allows use of the refuting argument to disprove alternatives to the prediction. Giere presents no corresponding concept.

**modus tollendo tollens** (logical basis of disproof) in Underwood is the same as the **Refuting Argument** of Giere

**Statistical Null Hypothesis** of Underwood is a statistical rather than theoretical concept. The hypothesis is generally a statement that there is no difference between two or more populations of interest. Giere, who does not address the probabilistic nature of sampling data, presents no corresponding concept.

  e.g., The reproductive success of southern pine beetles is the same in loblolly pine, Virginia pine, and longleaf pine. By convention, the hypothesis if rejected if data indicate less than a 5% probability that the null hypothesis is true.

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