I. Evaluating Arguments

On February 16, 2006, Boston Globe published an article entitled “New directions in closing income gap” by Noah Berger. Read this article and answer the following questions.

1. What is the principal conclusion of the article?

2. Is the argument inductive or deductive? How do you know?
   (Hint: Deductive arguments: starts with premises, non-surprising conclusion, truth of the premises guarantees conclusion. Inductive arguments: starts with the conclusion, supports it with premises, conclusion involves generalization (goes beyond what is stated in the premises), truth of the premises does not guarantee the truth of the conclusion)

3. The article has a number of premises. Identify at least one premise in the article along with the principal evidence used to support that premise.
   (Hint: Premises are statements that make factual claims. Normative statements (what should or should not be) are NOT premises)

II. Levels of Measurement
1. **Nominal** – Only names for attributes, no ordering is implied, least precise. Examples: race, sex, job classification, employment status, etc.

2. **Ordinal** – Ordering of attributes is possible. Distances between attributes have no meaning. Example: Your understanding of QR (very low, low, satisfactory, very good, outstanding)

3. **Interval** – Interval between values can be interpreted, distance between attributes is meaningful, computing average is possible, but ratio does not make sense (80F is not twice as hot as 40F), the zero is arbitrary.

4. **Ratio** – Most precise. Meaningful absolute zero. Fractions or ratios can be constructed. In social science, most ‘count’ variables are ratio. For example, number of students in QR class (you can have zero students and construct meaningful ratios).

**Exercise:**

What is the level of measurement of the following variables?

1. Number of people below poverty line
2. Your opinion of the usefulness of the QR class (highly useful, useful, somewhat useful, not useful)
3. Your state of residence
4. Age
5. Income
6. Time in calendar years

**III. Measurement Validity**

1. **Validity**: A variable is a valid measure of a concept if it is a relevant as a representation of that concept, i.e., it measures what it is supposed to measure.

2. **Types of validity**:
   a. Face validity: whether the indicator appears, on the face of it, to measure the concept it is intended to measure. Example: QR mid-term exam as an indicator of the skills learned in QR.
   b. Consensual validity: If several persons in different situations agree that the indicator is a valid measure of the concept. Example: GPA on transcript as an indicator of past academic performance.
   c. Correlational validity: If the indicator correlates strongly with other valid indicators of the concept. Example, Level of satisfaction with the social security program in a community may be correlated with the social security payments received by the families within the community.
   d. Predictive validity: If the indicator correctly predicts a specified outcome. Examples, GRE scores to predict academic success in graduate school.

**IV. Measurement Reliability**
1. **Reliability**: Measurement process assigns the same score to the phenomenon over repeated measurements, provided the phenomenon remains unchanged. Reliability indicates the repeatability of the measurement.

2. **Two major threats to reliability**: Subjectivity: relies on the judgment of the observer or of the respondent; Lack of precision: margin of error is high.

3. **Improving reliability**: Test-retest reliability: measure the same phenomenon multiple times over a relatively short time – does it yield consistent results; Parallel forms reliability: administer questions on the same topic multiple times during a survey; Interrater reliability: measurement should not vary depending on the observer.

**Exercise:**

1. A measuring tape is used to measure the height of 10 students. Suppose the true height of all students is known. It is noticed that the tape always measures 2 inches more than the true height of all the ten students. Is the measurement process valid? Is it reliable? Is it biased? Why or why not?

2. The MCP committee decides to abandon the GRE and the GPA and asks the applicants to furnish their height. It then selects the tallest students for admission. Is this indicator valid? Why or why not?