UNIT 8
MEASUREMENT IN MARKET RESEARCH

1. MEASUREMENT AND SCALING

- Measurement: The process of assigning numbers or symbols to characteristics of objects (e.g., consumers, brands, advertisements) according to a set of pre-specified rules. Measurement is the decision to use a number (like out of 5) to represent an abstract idea (like "Satisfaction").

- Scaling: The actual creation of a continuum upon which measured objects are located. Scaling is the tool you use—the actual 5-point scale itself.

2. SCALE CHARACTERISTICS AND LEVELS OF MEASUREMENT

Scales differ based on the properties their numbers possess. There are four basic characteristics, and the highest characteristic a scale possesses determines its level of measurement.

2.1 Description

The scale uses unique labels or descriptors to differentiate between objects (e.g., names, numbers, letters). Every object has a unique identifier. (This is the only characteristic of a Nominal Scale).

2.2 Order

The relative size or magnitude of the scale values can be determined; one value is greater than another. We can rank items. We know A is better than B, but not by how much.

2.3 Distance

The differences between any two scale points are **equal** and meaningful. The difference between 1 and 2 is the same as the difference between 4 and 5.

2.4 Origin

The scale has a unique, fixed starting point or a **true zero point** (meaning the complete absence of the characteristic being measured). Zero actually means "nothing" (e.g., 0 units sold, 0 income).

3. PRIMARY SCALES OF MEASUREMENT

These are the four fundamental types of scales, arranged from weakest (least information) to strongest (most information).

3.1 Nominal Scale

- Description only.

- Numbers serve only as labels or tags for identifying and classifying objects.

- **Example:** Gender (1=Male, 2=Female), Brand Choice (1=Coke, 2=Pepsi, 3=Other).

3.2 Ordinal Scale

- Description and **Order**.

- Numbers indicate the relative ranking of objects, but the distance between the ranks is unknown and not necessarily equal.

- **Example:** Market ranking (1st, 2nd, 3rd), Social Class (High, Medium, Low), Preferences (Most to Least Preferred).

3.3 Interval Scale

- Description, Order, and **Distance**.

- The distances between adjacent scale points are equal, but the zero point is arbitrary (not a true zero).

- **Example:** Temperature in Celsius/Fahrenheit, Attitude Scales (e.g., Likert, Semantic Differential). A score of $40\circ$ isn't twice as hot as $20\circ$.

3.4 Ratio Scale

- Description, Order, Distance, and **Origin** (True Zero).

- Possesses all four properties, allowing for meaningful ratios to be calculated. Zero indicates the total absence of the property.

- **Example:** Income, Age, Weight, Market Share, Number of units purchased. (A market share of 10% is twice as large as 5%).

4. SCALE EVALUATION

Once a scale is created, researchers must evaluate its quality based on its accuracy and consistency.

4.1 Measurement Accuracy

The goal of measurement is to achieve a true score, free of error.

- **Measurement Error:** The extent to which the observed score is different from the true score.

- **True Score Model (Textbook):**

  $$XO = XT + XS + XR$$

Where:

- XO: **Observed Score** (The answer recorded)

- XT: **True Score** (The actual level of the characteristic)

- XS: **Systematic Error** (Constant bias, affects the mean)

- XR: **Random Error** (Fluctuating bias, affects consistency)

- **Systematic Error:** An error that consistently affects the measurement in the same way (e.g., a poorly phrased question that makes everyone slightly disagree). It is **predictable bias**.

- **Random Error:** Error that varies randomly from one respondent to the next (e.g., a respondent being momentarily distracted or having a bad day). It affects the **precision** of the measurement.

4.2 Reliability (Consistency)

Reliability is the extent to which a measurement scale is free from random error and yields consistent results if repeated.

- **Test-ReTest Reliability:** Administering the same scale to the same respondents at two different points in time. If the scores are similar, the instrument is stable and reliable.

- **Alternative Forms Reliability:** Constructing two equivalent versions of a scale and administering both to the same respondents. High correlation between the two forms indicates reliability.

- **Internal Consistency Reliability:** Assessing whether the different items that make up a multi-item scale are measuring the same characteristic. This is typically measured using Cronbach's alpha (α).

4.3 Validity (Accuracy)

Validity is the extent to which a scale measures what it is supposed to measure. A valid scale must first be reliable.

Type of Validity	Simpler Explanation
Content Validity	**Does it cover everything?** A subjective, systematic evaluation of how well the scale's content represents the entire domain of the construct being measured. (e.g., A test on "Math Skills" should include Algebra, Geometry, and Calculus, not just addition).
Criterion Validity	**Does it correlate with other outcomes?** Measures whether the scale performs as expected in relation to a relevant outcome or criterion variable. (e.g., Does a "Product Attitude" score predict the **actual purchase** (the criterion)?).
Construct Validity	**Does it measure the theory?** Measures how well the scale taps into the abstract theoretical concept or construct it was designed to measure.
Construct Sub-types	**Convergent Validity:** The scale correlates highly with other known, validated measures of the *same* construct. **Discriminant Validity:** The scale does *not* correlate with measures of *different* constructs.

4.4 Generalizability

Generalizability is the degree to which a measurement can be applied across different populations, settings, and methods of measurement.

Can this scale be used effectively on people of different ages, in different countries, or collected through different methods (online vs. phone)? If a scale works well only in one specific context, its generalizability is low.