**Study Materials**

**Theories of Intelligence**

**Spearman’s Two-Factor Theory of Intelligence**

**Propounded by:** Charles E. Spearman (1904)

**Main features of Spearman’s Two-Factor Theory of Intelligence**

1. Spearman introduced the idea that intelligence consists of **two factors**:
   1. **General Factor (g):**
      * Common to all intellectual activities.
      * Represents overall mental ability or general intelligence.
      * Example: A student good at mathematics often shows ability in reasoning and problem-solving in other areas too.
   2. **Specific Factor (s):**
      * Unique to each particular task or subject.
      * Explains why a person may excel in one subject but not necessarily in another.
      * Example: A student may be excellent in drawing but average in science.

**Educational Implications:**

* General intelligence (g) should be developed through reasoning, problem-solving, and critical thinking activities.
* Specific abilities (s) can be improved with subject-based training and practice.

**2. Thorndike’s Multifactor Theory of Intelligence**

**Propounded by:** Edward L. Thorndike (1920s)

**Main Features:**

* Thorndike opposed Spearman’s idea of a single “general intelligence.”
* He suggested intelligence is **composed of numerous independent elements** rather than one single factor.
* Identified **three major types of intelligence**:
  1. **Abstract Intelligence:** Ability to understand and manage ideas and symbols. (e.g., solving math problems)
  2. **Mechanical Intelligence:** Ability to deal with concrete objects and physical relationships. (e.g., operating machines)
  3. **Social Intelligence:** Ability to understand and deal with people, social situations, and relationships.

**Educational Implications:**

* Education should provide opportunities to develop different types of intelligence.
* Importance of **practical learning, social interaction, and real-life experiences** in education.

**3. Guilford’s Structure of Intellect (SI) Theory**

**Propounded by:** J.P. Guilford (1950s–1967)

**Main Features:**

* Intelligence is not a single entity but a **complex structure**.
* Guilford proposed a **three-dimensional model** of intelligence:
  1. **Operations:** Types of mental processes (e.g., cognition, memory, divergent thinking, evaluation).
  2. **Contents:** The kinds of information (e.g., visual, auditory, symbolic, semantic, behavioral).
  3. **Products:** The forms in which information is processed (e.g., units, classes, relations, systems, transformations).
* Combining these three dimensions, Guilford initially identified **120 abilities**; later revised to **150 abilities**.

**Educational Implications:**

* Emphasis on **divergent thinking** (creativity) in addition to convergent thinking (logical reasoning).
* Education should promote problem-solving, originality, and innovation.
* Individual differences should be recognized, as students may excel in different intellectual abilities.

**Comparison of the Theories**

| **Aspect** | **Spearman (Two-Factor)** | **Thorndike (Multifactor)** | **Guilford (SI Model)** |
| --- | --- | --- | --- |
| Nature of Intelligence | General + Specific | Numerous independent abilities | Multidimensional (120–150 abilities) |
| Focus | General mental ability | Practical, social, and abstract abilities | Creativity, divergent and convergent thinking |
| Approach | Quantitative (factor analysis) | Qualitative and practical | Analytical and structural |
| Educational Implication | Develop reasoning + subject skills | Train different forms of intelligence | Encourage creativity and problem-solving |

**Summary for Students**

* **Spearman** emphasizes the role of **general intelligence (g)** supported by specific abilities.
* **Thorndike** rejects “general intelligence” and stresses **different types**: abstract, mechanical, and social.
* **Guilford** presents the most complex model, recognizing intelligence as **multidimensional** with over 120 distinct abilities.