Cognitive approaches to second language acquisition (SLA) focus on the internal mental processes involved in language learning. They view the learner as an active, cognitive agent who forms, tests, and revises hypotheses about the target language. These theories contrast with behaviorist views that saw language learning as a process of habit formation and mimicry.

Universal Grammar (UG)

Universal Grammar (UG) is a theory proposed by Noam Chomsky, which posits that humans are born with an innate, genetically-determined set of principles that are common to all human languages. This "language faculty" or "language acquisition device" (LAD) explains how children are able to acquire their first language so quickly and effortlessly despite the "poverty of the stimulus" (i.e., the incomplete and often incorrect linguistic input they receive). UG provides a blueprint or framework for language, guiding children as they unconsciously figure out the specific rules of the language spoken around them.

Role of Universal Grammar in First and Second Language Acquisition

- **First Language (L1) Acquisition:** The role of UG in L1 acquisition is widely accepted by many linguists. It is seen as the primary mechanism that allows children to learn their native language's complex grammatical system without explicit instruction. The principles of UG are "on" at birth, and the child's environment merely sets the parameters for the specific language they're acquiring.
- **Second Language (L2) Acquisition:** The role of UG in L2 acquisition is a subject of much debate. Three main positions exist:
    1. **Full Access:** Some researchers argue that L2 learners have direct and full access to UG, just like L1 learners. This suggests that SLA is essentially the same as L1 acquisition.
    2. **Partial Access:** This view holds that L2 learners have only partial or indirect access to UG. They may be able to use some of the principles and parameters, but their L1 might interfere, or the access may be filtered through other cognitive processes.
    3. **No Access:** The most skeptical view suggests that UG is only available during the critical period for L1 acquisition and is not involved in L2 learning. From this perspective, L2 learning relies on general cognitive abilities and problem-solving skills rather than an innate, language-specific faculty.

Principle and Parametre Theory

The **Principles and Parameters (P&P) Theory** is a framework within UG. It proposes that the innate linguistic knowledge consists of a set of **principles** and a set of **parameters**.

- **Principles:** These are universal rules that are true for all languages (e.g., all sentences must have a subject, though it might not be overtly spoken). These principles are invariant and part of the innate language faculty.
- **Parameters:** These are language-specific "switches" that can be set to different values. The learner's environment provides the input that "sets" these parameters. A classic example is the **pro-drop parameter**, which determines whether a language allows sentences without an overt subject pronoun. For example, the parameter is "on" for Spanish ("Hablo español" - "I speak Spanish"), but it is "off" for English ("I speak English"). Learning a language, under this theory, is essentially a matter of setting these parameters correctly.

Projection Principle

The **Projection Principle** is a central principle within UG's P&P framework. It states that the syntactic structure of a sentence is "projected" from the **lexical properties** of the words within it. Every word (especially verbs) comes with its own set of requirements for the other words it needs to be combined with (e.g., a transitive verb like "eat" requires a subject and an object). The Projection Principle ensures that the syntactic structure of a sentence is consistent with these lexical requirements at every level of the grammar. This principle is key to explaining how a finite lexicon can generate an infinite number of grammatically correct sentences.

Language Learning Through Association and Connectionism

In contrast to the nativist, rule-based approach of UG, other cognitive theories view language learning as an associative process.

- **Language Learning through Association:** This idea, rooted in behaviorism, suggests that language is learned by forming mental connections between words, concepts, and sounds. For example, a learner associates the sound /dɔg/ with the image of a dog after hearing it repeatedly in the presence of the animal. While this theory can explain some aspects of vocabulary learning, it struggles to account for the complex, creative nature of language, such as a child's ability to produce novel sentences they've never heard before.
- **Connectionism: Connectionism**, or **Parallel Distributed Processing (PDP)**, is a modern cognitive approach that builds on the concept of association but offers a more sophisticated model. It proposes that the brain consists of vast networks of simple, interconnected processing units (similar to neurons). Language knowledge is not stored as explicit rules but as the **strength of connections** between these units.
    - **How it works:** When a learner is exposed to linguistic input, a pattern of activation is created in the network. Through repeated exposure, the connections between units that fire together are strengthened, and connections that don't are weakened. Over time, the network learns to recognize patterns and regularities in the input. For example, a connectionist model can learn the past tense of verbs,

including irregular forms like "went," by tracking the statistical regularities of how these verbs appear in input, without ever needing to learn an explicit "add -ed" rule.

- **SLA implications:** Connectionist models suggest that language acquisition is a gradual, bottom-up process of building statistical associations from a large amount of input. This framework is particularly useful for explaining how learners acquire patterns and regularities (e.g., in phonology, morphology, and syntax) without conscious rule learning.