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## **COGNITIVE-CODE LEARNING THEORY AND FOREIGN LANGUAGE LEARNING RELATIONS**

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There are many competing theories on foreign language teaching. Teachers who have been trained in foreign-language education, bilingual education, ESL education, and related fields — such as linguistics — usually have learned about predominant second-language-learning theories and their correlated instructional implications (Fitzgerald, 1994:339). Cognitive -code learning theory (CCLT) is a theory of L1 and L2 studies and research. This view was developed in the 1960s as an alternative to Behaviorism (Richards & S. Rodgers (2014:26). CCLT is said to have briefly replaced behaviorism in the late 1960s. At this time, Chomsky's theory of Transformational generative Grammar, which claimed language is rule-governed and creative, strongly emphasized rule-governed nature of language and language acquisition, rather than habit formation: this trend gave rise to CCLT in which language learners are encouraged to work out grammar rules deductively for themselves.

According to Dulay et al. (1982:140), Chomsky and his followers, with their influential papers, influenced the theory of language, and also the theory of language learning 'overnight.' Chomsky alone started to bombard the background of the Behaviorist Approach by his establishment of a new approach called the Cognitive-code Approach, which, in turn, gave an offspring called Cognitive code-learning Theory within the influences of *Cognitive Psychology*. It was intended as an alternative to the Audio-lingual Method which stresses habit formation as a learn-by-doing-activity (Demirezen, 1988a:161) within the process of language learning; also, it is contrary to Behavioral perspective, the Developmental perspective and the Constructivist perspective. Because of emphasis of Cognitive Theory, which the initiator of CCLT, on studying a foreign language as a system of rules and rule-governed behaviors and knowledge, the cognitive approach is sometimes considered the modern version of the grammar-translation method.

CCLT is a subset of Cognitive- code Approach (Richards & Rodgers (2014). It was also advocated by cognitive psychologists and applied linguists such as J. B. Carroll (1916–2003) and K. Chastain (1971), in the 1960s. J. B. Carroll was an American psychologist known for his contributions to psychology and educational linguistics. CCLT is also based on Gestalt psychology which states learning should be holistic. Carroll and Chastain proposed the cognitive- code approach to the study of a second language as an alternative to the audio-lingual method dominant at the time. They advocated the conscious study of language rules as central to the learning of a foreign language.

CCLT is accepted as a merger of Chomsky's Transformational Grammar and Carroll's Psychology (Carroll, 1965). It is based on Gestalt psychology as well as formational Generative Grammar (Chastain, 1969:98). "...learning a language is a process of acquiring conscious control of the phonological, grammatical, and lexical patterns of the second language, largely through study and analysis of these patterns as a body of knowledge." (Carroll, 1966:102). A

conscious study of language rules as central to the learning of a foreign language. As a theory, it attaches more importance to the learner's understanding of the structure of the foreign language. Rule- deduction is a facility, which develops automatically with use of the language in meaningful situations within meaningful drillings.

By emphasizing mental processes, CCLT places itself in opposition to behaviorism, which largely ignores mental processes. Therefore, CCLT is briefly said to have replaced Behaviorism in the late 1960s. The term “cognitive-code” indicates any conscious attempt to organize foreign language teaching materials around a grammatical syllabus so as to make way for meaningful practice and practical use of language. One of its most important precepts is meaningful practice. Language practice is must be meaningful, then the learner understands the rules involved in practice in relation to the goal of gaining conscious control of the grammatical, lexical, and auditory patterns. Thus, CCLT represents a sharp contrast to the Audio-lingual Method which relies on pattern drills as a means of teaching syntax, with explicit explanation of grammatical rules.

### **1. Principles of Cognitive-code Learning Theory**

CCLT strongly stresses cognition in a foreign language as the hub of conscious and explicit learning of the grammatical rules as codes of that language. The following principles indicate that there are strong similarities between Mentalism and CCLT, both of which emphasized thinking, comprehension, rule-governing, and memory.

1. Learning occurs through cognitive memory structures, which perceive, process, store for short- or long-term recall and retrieve information, located in the brain. Learning occurs through internal processing of information.
2. The central precept of cognitive-code theory is to provide learners with opportunities for a great deal of meaningful practice in a second language.
3. Learning a second language requires explicit instruction and a study of the language as a complex and rule-governed system (Carroll, 1964). Students need to understand the linguistic rules before drilling can be implemented in practice.
4. Learning should be holistic; learning becomes easier when one treats the target as part of a structure or system and understands how it is related to the rest of the system (Gestalt Approach).
5. Learning a second/foreign language is a study of language as a complex system with the goal of gaining conscious control of the auditory patterns (segmental and supra-segmental phonemes) lexical (vocabulary) stock, and grammatical patterns.
6. Thinking, comprehension, and memory must be emphasized.
7. Language learning must be promoted as an active mental process rather than a process of habit formation, or learn-by-doing activity.
8. Classroom activities are designed to encourage learners to work out grammar rules for themselves through inductive reasoning.
9. Content over form must be emphasized.
10. Lessons must be highly structured around a deductive process, often giving “the rule of the day”.

11. The cognitive control works as follows: phonemes are to be learned before words, words before phrases, clauses before sentences, and simple sentences before compound, complex, and compound-complex sentences. This process will assist them anticipate the outcome or make inferences on what may happen next

12. Learners must work out grammar rules deductively for themselves.

13. The learner is an active processor of information processing; s/he is a thinking being.

14. The learner must be firmly at the center of the learning process.

15. Learning will only take place when the matter to be learnt is meaningful to the learner.

16. The conscious study of language rules is central to the learning of a foreign language.

17. Learning a language is a process of acquiring conscious control of the phonological, grammatical, and lexical patterns of the second language, largely through study and analysis of these patterns as a body of knowledge" (Carroll, 1966:102).

Apparently, above-given principles indicate that language learning is determined by the way which the mind observes, plans, organizes, and stores the information in short or long term memories. Building background precepts of CCLT aid the learners tie up the oncoming, new knowledge or experiences with previous experiences or knowledge by enabling them to process more difficult concepts or applications via building on a strong foundation in the target language.

## 2. Strength of the Cognitive-code Learning Theory

Cognitive-code learning refers to a theory of second language teaching and learning as a ferment of cognitivist psychology, structural applied linguistic, Chomsky's theories developed in the 1960s. CCLT has some advantages over the other foreign language learning and teaching theories:

1. It revived the re-emergence of grammar in the classroom.

2. It put more emphasis on guided discovery of the rules: this is the rule-governed nature of language.

3. It rejected the habit formation of Behaviorist theory. There is language acquisition rather than habit formation.

4. Learning is not a habit formation but requires cognitive processing and mental effort because learners are thinking beings.

5. It stressed on the learning of the rules via meaningful practice and creativity.

6. It liberated the teachers from the strait jackets of Grammar Translation Approach, Audio-Lingualism and Structural-situational methods.

7. It changed the attitude of teachers towards errors. The influence of cognitive-code learning on the subsequent methodological developments in second language teaching was felt in the evolution of error analysis and the need for contextualized grammar instruction (<http://www.elihinkel.org/downloads/cognitivecodelearning.pdf>). It enlightened the foreign language teachers in the treatment of student errors, which were accepted as natural happenings in the process of learning foreign languages. It must be noted that the studies on errors by Corder (1967) came out around this time.

8. With Chomskian revolution (1965, 1976, 1980, 1981a, 1981b, 1982) the attention of foreign language teacher turned to “deep structure” of language within more cognitive learning.

9. The theory attaches more importance to the learner's understanding of the structure of the foreign language than to the facility in using that structure, since it is believed that it provided the student has a proper degree of cognitive control over the structures of the language, facility will develop automatically with use of the language in meaningful situations (Carroll, 1966:102).

10. By means of the Presentation, Practice and Production methodology (PPP) learners gain a clear understanding of a grammatical rule before they practice it in meaningful contexts.

11. This theory emphasizes the role of learning in behavior and admits the possible role of inherited mechanisms. The duality of learning-with-heredity is well-illustrated in the area of language development and learning foreign languages.

12. It practically focuses on the individual student and his/her learning process and progress.

13. It involves very frequent assessments (like pop-quizzes) of the student's learning and retention since new skills and experiences build directly upon previous ones.

A Cognitive-code Approach claims that the process of education a foreign language education process must be one that activates multiple drilling and experiences which lead the students through direct involvement to discovery learning. The student would master the required Mastery of foreign language level before moving on to the next level of cognitive development.

### **3. Weaknesses of Cognitive-code Learning Theory**

It placed a great deal of emphasis on the development of a second language as a combination of skills. At its core, cognitive-code learning represents a theoretical, rather than a pedagogical approach. In part due to the fact that this theoretical proposal met with debate and skepticism (<http://www.elihinkel.org/downloads/cognitivecodelearning.pdf>):

1. CCLT is essentially a theoretical proposal because it did not lead to the development of any teaching method in relation to classroom procedures and activities.

2. There is little use of examples from authentic material.

3. It never took off in a big way; this theory did not gain support over time.

4. Human thinking is said to be an invisible process, and therefore cognitive processes are hypothetical constructs.

5. Human information processing is resembled computers, which perhaps oversimplifies the human mind; human brain is much more sophisticated than computer systems.

6. As a theory, it often ignores past experiences and culture influence while we process information.

7. CCLT does not consider individual personalities of people and how personalities are formed; there is too much emphasis on social context.

8. It is a depersonalized theory; in other words, it does not take into consideration feelings or unconscious actions or reactions.

9. It overlooks the influence of individuals' biology (DNA), learning differences in relation to hormonal processes and brain development.

10. It falls short in the explanation of relationship between two main concepts, which are observational learning and self-efficacy.

11. The cognitive emphasis on rules was taken as behaviorist rote drilling.

12. Another important criticism is that biology, genetics, culture, and past experience have not been sufficiently tested as factors in mental processing.

13. According to Carroll (1966:102), “the theory attaches more importance to the learner understands of the structure of the foreign language than to the facility in using that structure.

14. The cognitive-code approach did not have much appeal to language teachers whose training rarely entailed a detailed familiarity with grammar rules and abstract concepts of syntax (<http://www.elihinkel.org/downloads/cognitivecodelearning.pdf>)

15. Another disadvantage is that it is extremely time intensive on the part of the foreign language teacher or educator, who, acts as a facilitator, has to invest a huge amount of time and effort on a per student basis.

16. The teacher must be constantly evaluating and recording the needs of the students in different skills. S/he has to tailor learning drills and activities that improve the evolving educational needs and levels of the students. Therefore, such a procedure requires a great deal of time, strain, recordkeeping in forms of portfolios, and practicality in adjusting daily, weekly, and monthly in lesson plans.

17. This method had limited as the cognitive emphasis on rules and paradigms proved as unattractive as behaviorist rote drilling. There is also confusion for practitioners, with Nunan (2003:6) ascribing inductive reasoning to it, while Brown (2001:24) notes that proponents of a cognitive code learning methodology injected more deductive rule learning into language classes.

#### **4. and Foreign Language Learning and Teaching**

In order to understand the riddle of “how students learn”, there are three important preliminary key principles. The following key principles arrange the learner’s predisposition towards foreign language learning (<http://www.cdtl.nus.edu.sg/handbook/learn/cognitive.htm>):

- ***Learner readiness***

Motivation is an important part of learning, and instruction must be adapted to the learner’s cognitive abilities, experiences and contexts that make the student willing and able to learn.

- ***Spiral organization***

Instruction must be structured such that the learner continually builds upon what he/she has already learned. Revisiting the curriculum by teaching the same content in different ways reinforces and extends learning at different developmental levels.

- ***Discovery learning***

The learner learns by gathering information for himself/herself, testing the information and formulating rules. To do so requires a mind prepared with the necessary declarative, procedural and conditional knowledge. The teacher as guide ensures such learning by engaging in a dialogue that prompts inquiry, as well as structuring materials in such a way as to encourage extrapolation, and going beyond the information given and discovery of important principles.

Jonassen (1991:28–33) states the following instructional design principles, which have clear implications for the design of the learning environment.

- Create real-world environments that employ the context in which learning is relevant; provide multiple representations of reality; represent the natural complexity of the real world; focus on realistic approaches to solving real-world problems.
- Provide tools and environments that help learners interpret the multiple perspectives of the world.
- Present authentic tasks (contextualizing rather than abstracting instruction); provide real-world, case-based learning environments, rather than predetermined instructional sequences; enable context- and content-dependent knowledge construction.
- Focus on knowledge construction, not reproduction; foster reflective practice.
- Stress conceptual interrelatedness, providing multiple representations or perspectives on the content.
- Make learning internally controlled and mediated by the learner; instructional goals and objectives should be negotiated and not imposed; evaluation should serve as a self-analysis tool.
- Support collaborative construction of knowledge through social negotiation.

These are only some of the useful guidelines for instructional design which implies the relation of new experiences to and building on existing mental constructs behind language.

## **5. How much cognitive theory do English language teachers need to know?**

In the genes of cognitive theory, there is a great deal of intuitive appeal to the cognitive approach to teaching. The teachers, no matter native teacher or non-native, are ready to consider cognitive theory as the foundation for teaching if they apply the following issues that that distill the theoretical basis of cognitive foreign language learning.

It must be noted that the application of cognitive theory implies a responsibility to teach both content and process. The learner is at center stage; the teacher, educator, or instructor becomes a facilitator of learning, carrying the task of adapting the newly learned foreign language structures to the needs of learners. Cognitive psychology declares that the learners play a crucial and critical role in determining what they get out of instruction whether higher probability of learning is managed or not.

To begin with, diagnosis of mistakes or errors aids foreign language learning. Cognitive theory acknowledges the role of mistakes; therefore, a cognitive-minded foreign language teacher makes learners aware of the rules and should encourage students to create correct

structures in applying the rules. The teachers should make the learners understand the rules and complexity of the rules: the conscious study of language rules as central to the learning of a foreign language. The theory attaches more importance to the learner's understanding of the structure of the foreign language than to the facility in using that structure, since it is believed that provided the student has a proper degree of cognitive control over the structures of the language; facility will develop automatically with use of the language in meaningful situations (Carroll, 1966: 102). They must at the very least allow our students to induce the rules as what Chomsky proposed as the "creative aspect" of language use.

Cognitively- minded foreign language teachers pay attention to assimilation: assimilation of what has already been learnt or partly learnt since how new rules are presented is important. Once again it must be noted that the teachers should make the learner recognize the rules without explicit explanation by being sure that the learners have actually inferred them correctly. Cognitively- minded foreign language teachers should give students time to check on their understanding of the rules. They should detect what kinds of knowledge and experiences students bring to the new learning situation. They must encourage students to create correct applications of the learnt structures; in fact, students learn best under such conditions.

There is a fundamental relationship between language and culture. Foreign Language is at the heart of language teaching and learning. The way the teachers teach language reflects the way how much they have mastered and understood the target language as a profession.

In Cognitive theory, the teaching of grammar must be deductive. The foreign language learner, therefore, is helped by encouraging firstly getting a clear understanding of a grammatical series of rules. Before their practice and use, their applications in meaningful contexts are highly necessary in Cognitive theory.

In developing a professional stance to language teaching, it is important for the teachers to consider the target language as a code and social practice which must be balanced in the curriculum. Understanding the nature of the relationship between language and culture is central to the process of learning another language because culture plays a central role in the way how meanings are interpreted in social interaction; therefore, it is the language in its cultural context that creates meaning. Creation and interpretation meaning is done within a cultural framework in forms of ways of life, social values, beliefs, proxemics, kinesics, and the like. In language learning classrooms, in developing language capabilities in target language and its culture in the learners, there is a deadly need to engage them with the ways in which context affects foreign language learning.

Aiding the motivation of the learner, accommodation, meaningful drills, exploiting various relationships in these drills are needed. Knowledge of the "types of drills is a crucial issue for the teachers. In Cognitive Theory, language practice drills are employed to train learners to talk and to help them master the basic structural patterns of the target language. With small doses of repetition, comparison, contrasts for remedial purposes, many of the learners will succeed without practice and repetition not much learning can be achieved. The dangers of over-generalizing when forming new rules must be handled with care.

Can language learning proceed without conceptual awareness and knowledge of culture take place? One of its most important concepts in Cognitive Theory is meaningful practice, which is achieved when the learner is made to perceive the rules by himself or herself involved in practice. Students should be given the chance to share the concepts of their target language,



cultural world view measures, cultural practices, and its practical goal of enabling self-conscious management of popular risk perceptions. Thus, "cultural cognition" refers to the tendency of individuals to form beliefs about societal dangers, pragmalinguistic, sociopragmatic, and psychopragmatic failures. That's why in foreign language learning, meaningful learning is more than just the code of linguistic structures and rules: it also involves social practices of interpreting and making meanings.

## 6. Conclusion

CCLT came to the fore when Chomsky stated a severe attack on Behaviorist learning Approach in 1957. Behaviorism and structuralism were rejected by Chomsky's theory of language (1965), which refuses the learning theories of behaviorism. Chomsky argued that humans are born with a wired device, which he called language acquisition device (LAD), where Universal Grammar (UG) operates. CCLT accepts the Universal Grammar of Chomsky, which underlies all Grammars (Hinkel, 2006). Not everyone agreed with the Chomsky's theory of SLA.

Cognitive-code foreign language learning refers to a theory of second language teaching and learning rooted in cognitivist psychology, structural applied linguistics, and Transformational Generative Grammar developed from 1957 to 1960s. In the current perspective on second language learning, CCT is largely seen as an updated variety of the traditional grammar-translation method, with an attendant goal of overcoming the shortfalls of the audio-lingual approach (<http://www.elihinkel.org/downloads/cognitivecodelearning.pdf>). The Cognitive-code view of learning suggests that information is gathered and processed by our brain, and information processing is a cognitive view of learning. CCLT likens human thinking to the way computers process information. By definition, therefore, education must be viewed as a cognitive activity; that's why the term "cognitive" refers to the process of thinking, goal-setting, planning for future activities, solving problems, learning, storing information, and remembering.

Developments in CCT have definitely concrete Implications of for the teaching of a second language. For example, it has had a significant effect on ESP. Students are thought to develop strategies to find out meaning of reading materials in their study areas. CCLT seems to answer many of the theoretical and practical problems raised but not answered by Behaviorist Approach. It is seen as representing a much realistic road map of language and language acquisition much better than that of Behaviorism.

In addition, Richards & S. Rodgers (2014) indicate that *Situational Language Teaching* can be linked to cognitive-code learning. Moreover, PPP (presentation Practice Production) used in situational language teaching can be linked to *cognitive-code learning*, as well as to methods such as the Silent Way (Richards & S. Rodgers (2014: 26).

As it was widely debated in the 1960s, in SLA, the mainstream view still is the cognitive-code processing approach (Long, 1997; Gregg, 1989). But by the mid-1970s, the cognitive-code approach had all but disappeared among other competing theories of second language learning, and more specifically, due to the prominent rise of communicative language teaching (<http://www.elihinkel.org/downloads/cognitivecodelearning.pdf>).

## References

- Brown, D. H. (2001). *Teaching by principles: an interactive approach to language pedagogy*. NY: Pearson Longman.
- Carroll, J. B. (1965). The contributions of psychological theory and educational research to the teaching of foreign languages. *Modern Language Journal*, 49 (5).
- Carroll, J. B. (1966). The contribution of psychological theory and educational research to the teaching of foreign languages. In A. Valdman 108 (Ed.), *Trends in language teaching* (pp. 93–106). New York: McGraw-Hill.
- Chastain, K. (1969). The Audio-Lingual Habit Theory Versus the Cognitive Code-Learning Theory: Some Theoretical Considerations. *IRAL*, 7 (2), 97-106.
- Chastain, K. (1971). *The development of modern language skills: Theory to practice*. Philadelphia: The Center for Curriculum Development.
- Chomsky, N. (1965). *Syntactic structures*. The Hague: Mouton
- Chomsky, N. (1965). *Aspects of the theory of syntax*. Cambridge, Mass.: MIT Press.
- Chomsky, N. (1976). *Reflections on language*. London: Temple Smith.
- Chomsky, N. (1980). *Rules and representations*. Oxford: Basil Blackwell.
- Chomsky, N. (1981a). *Lectures on government and binding*. Dordrecht: Foris.
- Chomsky, N. (1981b). Principles and parameters in syntactic theory in Hornstein and Lightfoot.
- Chomsky, N. (1982). *Some concepts and consequences of the theory of Government and Binding*. Cambridge, Mass: MIT Press.
- Corder, S. P. (1967). The significance of learners' errors. *International Review of Applied Linguistics*, 5, 161-172.
- Demirezen, M. (1988a). Behaviorist theory and language learning. *Hacettepe Universitesi Eğitim Fakültesi Dergisi*, 3, 161-162.
- Dulay, H., Burt, M. & Krashen, S. (1982). *Language two*. Oxford: Oxford University Press.
- Gregg, K. (1989). Second language acquisition theory: The case for a generative perspective. In S. M. Gass and J. Schachter (Eds.). *Linguistic perspectives on second language acquisition*, 15-40. Cambridge: Cambridge University Press.
- Hinkel, E. (2006). Current perspectives on teaching the four skills. *TESOL Quarterly*, 40 (1), 109–131.
- Jonassen, D. (September 1991). Evaluating constructivist learning. *Educational Technology*. 31 (9), 28–33.
- Long, M. H. (1997). Constructive validity in SLA research: A response to Firth and Wagner. *Modern Language Journal*, 81 (3), 35-49.
- Nunan, D. (2003). *Practical English language teaching*. McGraw-Hill Education.
- Richards, J. C. & S. Rodgers, T. S. (2014). *Approaches and methods in language teaching*. Cambridge: Cambridge University Press.
- <http://www.elihinkel.org/downloads/cognitivecodelearning.pdf>
- <http://www.cdlt.nus.edu.sg/handbook/learn/cognitive.htm>