Psycholinguistic Approaches to SLA
Connectionist/emergentist models

• Known as constructivist approaches

• Learning does not rely on an innate module, but rather it takes place based on the extraction of regularities from the input. (example: Frequency accounts)

• The approach is exemplar-based

• N. Ellis: “comprehension is determined by the listeners’ vast amount of statistical information about the behavior of lexical items in their language.”

• Learning is seen as simple instance learning (rather than explicit/implicit induction of rules), which proceeds based on input alone; the resultant knowledge is seen as a network of interconnected exemplars and patterns, rather than abstract rules.
• **Connectionism: Parallel Distributed Processing (PDP)**

• PDP is a neural network that is generally biologically inspired in nature. It consists of nodes that are connected by pathways. Within connectionism, pathways are strengthened or weakened through activation or use.

• Learning takes place as the network (i.e., the learner) is able to make associations, and associations come through exposure to repeated patterns.

• What about L1 interference?
• The Competition Model:

• It relies on the establishment of cues and the strength of cues.

• The Competition Model was developed to account for the ways monolingual speakers interpret sentences.

• The Competition Model is based on the assumption that form and function cannot be separated.

• MacWhinney, Bates, and Kliegl (1984, p. 128), “the forms of natural languages are created, governed, constrained, acquired and used in the service of communicative functions.”

• Principles of the model: Speakers must have a way to determine relationships among elements in a sentence. Language processing involves competition among various cues, each of which contributes to a different resolution in sentence interpretation. Although the range of cues is universal (i.e., the limits on the kinds of cues one uses are universally imposed), there is language-specific instantiation of cues and language-specific strength assigned to cues.
The cows eat the grass

Cues:

Word order

Meaning of lexical items

Animacy criteria

Morphology (subject-verb agreement)

(8-3) Giovanna ha comprato il pane.
    Joan has bought the bread

(8-4) Allora, compio io il vino.
    then buy I the wine
    “Then, I’ll buy the wine.”

(8-5) Ha comprato il vino Aldo.
    has bought the wine Aldo
    “Aldo has bought the wine.”

(8-6) No, il vino l’ha comprato Antonella.
    no the wine it (obj.) has bought Antonella
    “No, it’s Antonella who bought the wine.”
For second language acquisition, the question is: How does one adjust one’s internal speech-processing mechanisms from those appropriate for the native language to those appropriate for the target language?

Does one use the same cues as are used in the NL and are those cues weighted in the same way as they are in the NL? Or, do these mechanisms from the native language act to constrain interpretation as one is trying to understand a rapidly fired message in the target language?
Possibilities

• In L2 sentence interpretation, the learner’s initial hypothesis is consistent with sentence interpretation in the NL.

• Meaning-based comprehension strategy takes precedence over a grammar-based one.
Processing Approaches

• Processability theory:

• It relies on the concept of a linguistic processor.

• Processability Theory (cf. Pienemann, 1999, 2007) proposes that production and comprehension of second language forms can only take place to the extent that they can be handled by the linguistic processor.

• Understanding how the processor works allows predictions to be made about the developmental paths that learners take.

• Within this approach, there is a Processability Hierarchy, which, in short, states that the processor checks on the match between the grammatical information within a sentence.
<table>
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<tr>
<th>Developmental stage</th>
<th>Example</th>
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| **Stage 1: Single stage** | Single words.  
Single units. | What?  
What is your name? |
| **Stage 2: SVO** | Canonical word order with question intonation. | It’s a monster?  
Your cat is black?  
You have a cat?  
I draw a house here? |
| **Stage 3: Fronting (wh- word/do)** | Direct questions with main verbs and some form of fronting. | Where the cats are?  
What the cat doing in your picture?  
Do you have an animal?  
 Does in this picture there is a cat? |
| **Stage 4: Pseudo inversion: yes/no questions, verb to be** | In yes/no questions an auxiliary or modal (e.g., can/could) is in sentence-initial position.  
In wh- questions the verb to be and the subject change positions. | Have you got a dog?  
Have you drawn the cat?  
Where is the cat in your picture? |
| **Stage 5: Do/auxiliary second Q-word → auxiliary/modal → subject** | Auxiliary verbs and modals are placed in second position after wh- question words and before subjects (applies only in main clauses/direct questions). | Why (Q-word) have (auxiliary) you (subject) left home?  
What do you have?  
Where does your cat sit?  
What have you got in your picture? |
| **Stage 6: Can inversion, negative question, tag question** | Can inversion: wh- question inversions are not present in embedded clauses.  
Negative question: A negated form of do/auxiliary is placed before the subject.  
Tag question: An auxiliary verb and a pronoun are attached to the end of a main clause. | Can you see what the time is?  
Can you tell me where the cat is?  
Doesn’t your cat look black?  
Haven’t you seen a dog?  
It’s on the wall, isn’t it? |
• Pienemann (1999) established a hierarchy relevant to the ordering of procedures, as follows:

1. no procedure (e.g., single word utterances)
2. category procedure (e.g., adding a plural morpheme to a noun)
3. noun phrase procedure (e.g., matching gender, as in *la casa* [the house], where both determiner and noun are feminine)
4. verb phrase procedure (e.g., movement of elements within a verb phrase)
5. sentence procedure (e.g., subject–verb agreement)
6. subordinate clause procedure (e.g., use of a particular tense based on something in the main clause)
Information-Processing: Automaticity, Restructuring, and U-shaped Learning

• Automaticity refers to control over one’s linguistic knowledge.

• Restructuring refers to the changes made to internalized representations as a result of new learning.
Within this framework, second language learning is viewed as the acquisition of a complex cognitive skill. To learn a second language is to learn a skill, because various aspects of the task must be practised and integrated into fluent performance. This requires the automatization of component sub-skills. Learning is a cognitive process, because it is thought to involve internal representations that regulate and guide performance ... As performance improves, there is constant restructuring as learners simplify, unify, and gain increasing control over their internal representations (Karmiloff-Smith 1986). These two notions – automatization and restructuring – are central to cognitive theory.

(McLaughlin, 1987, pp. 133-4)
• Bialystok (1978), argued that explicit knowledge can become implicit through the use of practice.

• Second language acquisition, in this view, takes place by the initial use of controlled processes. With time and with experience in specific linguistic situations, learners begin to use language more automatically, thus leaving more attentional resources for new information that requires more control.
Restructring

• In terms of child language acquisition, McLaughlin described restructuring in the following way: “Restructuring is characterized by discontinuous, or qualitative change as the child moves from stage to stage in development. Each new stage constitutes a new internal organization and not merely the addition of new structural elements” (1990a, p. 117).

• Destabilization is a consequence of restructuring and often results in what are known as U-shaped patterns
U-Shaped Learning

- U-shaped patterns reflect three stages of linguistic use. In the earliest stage, a learner produces some linguistic form that conforms to target-like norms (i.e., is error-free). At Stage 2, a learner appears to lose what he or she knew at Stage 1. The linguistic behavior at Stage 2 deviates from TL norms. Stage 3 looks just like Stage 1 in that there is again correct TL usage.
STAGE 1  Accurate and appropriate use of -ing  STAGE 3

He is taking a cake.

STAGE 2
Incorrect use of -ing

He take a cake.

STAGE 3

He is taking a cake.

Figure 8.2 Schema of U-shaped behavior: use of -ing.
Psycholinguistic Constructs in SLA
Attention

• Attention refers to “the concentration of the mental powers upon an object.”

• Schmidt (2001) claims that it “appears necessary for understanding nearly every aspect of second and foreign language learning” (p. 6).
Attention

• Tomlin & Villa (1994): proposed three components to attention:
  • Alertness (readiness to receive incoming stimuli)
  • Orientation (direction of resources to stimulus)
  • Detection (registration of stimulus).

• Detection is the major component and is what drives learning. Detection does not entail awareness and, consequently, learning can take place without awareness.
Attention

- Noticing hypothesis (Schmidt, 1990)

- Awareness (through attention) is necessary for noticing which in turn is essential for learning.

- Schmidt and Frota (1986) suggested that “a second language learner will begin to acquire the target like form if and only if it is present in comprehended input and ‘noticed’ in the normal sense of the word, that is consciously” (p. 311). Learning requires that a learner be actively involved or attending to L2 forms in order for learning to take place.
Working Memory

• Working memory refers to the structures and processes that humans use to store and manipulate information.

• Working memory Vs. Short-term memory:
  • working memory focuses on the manipulation of information rather than just the storage of information

• Miyake and Shah (1999) provide a useful definition: “working memory is those mechanisms or processes that are involved in the control, regulation, and active maintenance of task-relevant information in the service of complex cognition, including novel as well as familiar, skilled tasks” (p. 450).

• Example: Baddeley-Hitch model

• Baddeley (2000) extended this model to include a fourth component, an episodic buffer, which is the holder of information that includes and integrates other information (e.g., visual, semantic, phonological).
Working Memory

• Working memory: “a multicomponent system responsible for active maintenance of information in the face of ongoing processing and/or distraction” (p. 770). One's ability to maintain information is the result of domain-specific storage (with processes of rehearsal) and “domain-general executive attention” (p. 770). (Conway, Kane, Bunting, Hambrick, Wilhelm, and Engle, 2005)

• Working memory has a capacity

• Memory measurement: reading span task

• L1 and L2 memory scores and correlation (significant)

• An important part of learning a new language is the ability to retain relevant information long enough to figure out what it means or to analyze it syntactically. It therefore stands to reason that those who have the capacity to do this to a greater extent would also be those who are more successful at learning all aspects of language.
Monitoring

• Central to Krashen’s model

• The learned system has a special function—to serve as a Monitor and, hence, to alter the output of the acquired system.

• The Monitor cannot be used at all times. There are three conditions that must be met, although Krashen claimed that, whereas these are necessary conditions, they are not necessarily sufficient because the Monitor may not be activated even when all three conditions have been satisfied. The three conditions for Monitor use are as follows:

1. *Time*. Learners need time to consciously think about and use the rules available to them in their learned system.

2. *Focus on form*. Although time may be basic, one must also be focused on form. Learners must be paying attention to how they are saying something, not just to what they are saying.

3. *Know the rule*. In order to apply a rule, one has to know it. In other words, one has to have an appropriate learned system in order to apply it.