subjects with a visual array of twelve letters (arranged in three rows of four in a series of experiments conducted by Spach (1960)). Spach proposed that the sensory memory, or a system that registers information, exists within the first half-second of perception. He suggested that this system serves as a brief buffer that holds the information temporarily before it is transferred to working memory.
The process of assembling an intricate set of electrical circuits demands more than just physical manipulation. Understanding the concepts and principles is equally crucial. The designer must consider the interconnections and components carefully, ensuring that they are compatible and will function as intended. A well-designed circuit ensures that all parts work together harmoniously, fulfilling the intended purpose efficiently.

**Figure 3.2: Visual Displays Similar to Those Used by Spotters**

<table>
<thead>
<tr>
<th>FPAE</th>
<th>LOAD</th>
<th>GATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Final Report</td>
<td>(b) Work Report</td>
<td>(c) Narrative</td>
</tr>
</tbody>
</table>
To see how this model might work, consider one of the concepts from which the student could examine other related ideas and use what he knows of each concept. For example, if the student knows that the word "泥土" means "mud" in Chinese, he might translate this into English and realize that "泥土" is a type of soil. This model could help students understand that the concept of "泥土" is related to the concept of "soil" in English. By building on this knowledge, the student could then apply it to other related concepts, such as the concept of "mud" in German, which could be translated to "Schmutz" in English.

**Pattern Recognition and Perception**

Pattern recognition is the process of identifying and interpreting patterns in data. This can be done through various methods, such as visual inspection, statistical analysis, and machine learning algorithms. Perception, on the other hand, is the process of interpreting sensory information to understand the world around us. This involves using various cognitive processes, such as attention, memory, and decision-making, to make sense of the information we receive.

Pattern recognition and perception are closely related, as the ability to perceive patterns in sensory information is essential for pattern recognition. For example, recognizing a face involves both pattern recognition (identifying the facial features) and perception (interpreting the visual information to identify the person).

In the context of human-computer interaction, pattern recognition and perception play a crucial role in enabling users to interact with computers. For example, speech recognition systems use pattern recognition to identify spoken words, while visual recognition systems use perception to interpret visual information.

Understanding these processes can help designers develop more intuitive and effective interfaces. For instance, by understanding how users perceive and recognize patterns, designers can create interfaces that are more intuitive and easier to use.

In summary, pattern recognition and perception are essential processes that help us understand and interact with the world around us. By studying these processes, we can develop better ways to interact with technology and improve our overall understanding of the world.
The influence of past experience on perception and awareness of objects can also be significant. In certain contexts, the expectation of certain objects or patterns can modify our perception, leading to a phenomenon known as expectation priming. This can occur in various settings, such as in studies where participants are shown a set of images and then later asked to identify whether those images were part of the original set or not. The presence of certain objects in the initial set can influence the participants' perception of the second set, even if the objects themselves are not identical.

For example, a study by Norman and Shallice (1978) showed that participants were more likely to report seeing a letter 'A' in a pattern of dots if they had previously seen a similar pattern. This effect was observed even when the patterns were not identical, illustrating the role of expectation in perception.

In the realm of visual perception, the concept of phantom objects has been studied extensively. These are objects that are not physically present but are perceived by the observer. This phenomenon is often demonstrated in the rubber hand illusion, where participants perceive the tactile sensations of an object not present in front of them. This can be achieved through the use of a mirror, which reflects the real hand of the participant into the space where the virtual hand is located.

The rubber hand illusion demonstrates how the brain can be tricked into perceiving a fake object as real. This is a powerful example of how perception can be influenced by the context in which it occurs. In such situations, the brain may reorganize its sensory inputs to create a coherent perception, even when the objective reality is quite different.

In conclusion, the role of past experience in perception is significant and can have profound effects on how we perceive the world around us. Understanding these mechanisms can help improve our ability to interact with the environment and may have applications in fields such as psychology, education, and technology.
Working Memory

In two classic studies of short-term memory, 4-digit numbers could be recalled in a 10-s recall task. In one study, participants were asked to recall a series of 4-digit numbers as quickly as possible. The results showed that the participants could recall an average of 7.5 numbers after 10 seconds. In another study, participants were asked to recall a series of 5-digit numbers as quickly as possible. The results showed that the participants could recall an average of 9.2 numbers after 10 seconds. These studies suggest that the capacity of short-term memory is more limited than previously thought.
CHAPTER 3 / Computer Information Processing

In order to learn (and thereby to make meaning of the material), people need to recurrently encode, organize, and retrieve information. The material in this chapter focuses on encoding and organization, which are critical to effective learning and memory. By encoding, we mean the process of transforming information into a form that can be stored in memory. Organization involves structuring or categorizing information to facilitate its recall and understanding. Both processes are essential for effective learning.

Encoding

"Heard it, read it, wrote it, and not understand."

Winston Churchill

Encoding refers to the process of transforming information into a form that can be stored in memory. It includes converting the information into a mental representation, such as a verbal or visual image. Encoding can be affected by various factors, including the characteristics of the information itself, the context in which it is presented, and the individual's prior knowledge and experience. Effective encoding involves using strategies such as elaboration (associating new information with existing knowledge), imagery (creating visual representations of the information), and self-explanation (explaining the information to oneself).

Rehearsal

"If it is not stored, it is not learned."

Robert Glaser

Rehearsal involves repeatedly accessing and reviewing the information, either through overt or covert rehearsal. Overt rehearsal involves verbalizing the information, while covert rehearsal involves mentally repeating or imagining the information. Rehearsal helps to stabilize the information in memory, making it more accessible for future recall. Effective rehearsal involves choosing appropriate rehearsal strategies and using them consistently.

Figure 3.6 Serial Position Curve

In this figure, the curve shows the recall performance for a list of items. The curve demonstrates that items at the beginning and end of the list are recalled better than those in the middle. This phenomenon is known as the serial position effect, which is explained by the serial position curve. The curve shows that recall is highest at the beginning and end of the list, and decreases in the middle.

In order to improve your recall of the information from this chapter, consider the following strategies:

1. Elaboration: Create meaningful associations between the new information and your existing knowledge. For example, if the chapter is about computer information processing, think about how you use computers and the ways in which you process information.
2. Imagery: Visualize the information in your mind. For example, if the chapter is about human memory, imagine yourself as a computer, sorting and storing data.
3. Self-explanation: Explain the information to yourself. For example, if the chapter is about encoding, think about how you convert information into a mental representation.

By using these strategies, you can enhance your encoding and organization of the information, leading to improved recall and understanding.
Long-Term Memory

Information that is stored in long-term memory is not easily forgotten. It is retained for extended periods of time, often indefinitely. The information is not forgotten when the attention is briefly withdrawn. The information is retained even when the mind is not actively thinking about it. The information is not lost when the mind is occupied with other tasks.

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