

specify, in either of these examples, exactly how many cognitive processes occurred or in what sequence. This uncertainty typifies everyday situations: So much is going on so quickly that we can't even be sure of what information is being received or used. How, then, can cognition be studied with any precision?

This kind of problem is one all scientists face: how to study a naturally occurring phenomenon with sufficient experimental rigor to draw firm conclusions. The answer, for many, is to try to isolate the phenomenon and bring it (or some stripped-down version of it) into the laboratory. With this approach, the challenge is to decide what is essential and what is inessential about the phenomenon under study.

For example, in studying how memory works, psychologists have often used experiments in which people are presented with lists of words or nonsense syllables. The experimenters then control or systematically vary variables such as the complexity, length, frequency, meaningfulness, relatedness, and rate of presentation of items on the list along with the state of alertness, expertise, practice, and interest of the research participants. The experimenters assume that factors that increase or decrease performance in the laboratory will also increase or decrease performance under less controlled conditions. Furthermore, the researchers assume that although in everyday life people do not encounter material to be remembered in this manner, the processes of memory work in essentially the same ways in laboratory experiments as in everyday life. So if increasing the number of items to be remembered decreases memory

performance in a laboratory, then we can expect that needing to remember more information is more difficult than remembering less in an everyday situation.

The key challenge for all scientists, however, is to make sure the laboratory tasks they develop preserve the essential workings of the processes under study. The most rigorously controlled experiment is of, at best, limited value if the phenomenon being studied does not occur or occurs in significantly different ways outside the laboratory. Unfortunately, there is no simple or guaranteed way to ensure that laboratory tasks model everyday tasks. Therefore, students and other “consumers” of science must take a critical stance when considering how experimental situations apply to everyday ones. Throughout this book, we will look at how laboratory models do or don't accurately describe, explain, and predict cognitive processing in real life. We will also consider how situational and personal factors, such as people's level of development, personality variables, degree of expertise, gender, and cultural background, affect cognitive processing.

Before we discuss specific cognitive processes, however, an overview of the field of cognitive psychology will provide a useful framework within which to consider specific topics, experiments, and findings in the field. We will first examine the historical roots of cognitive psychology to see how the field has developed. Next, we will look at traditional and common research methods used in cognitive psychology. Finally, we will consider four paradigms, or schools of thought, that represent the current streams of thought in the field.