2-3 Organisation and improved recall

This section will concentrate on thinking and specifically how we organise our thoughts, how we make sense of our world and how we remember (or sometimes forget) what is relevant.

Psychologists who study thinking are working in the area of **cognitive psychology**. Cognition means knowledge so cognitive psychologists are interested in what knowledge people have, how they have acquired this knowledge and how they use this knowledge. This means that the areas they study include attention, perception, memory, problem solving and language.

Organising our thoughts involves:

- using mental images
- forming concepts (putting information into categories)
- developing schemas (constructing mental packages of related information).

We will now look at these three types of organisation in more detail.

2-3a Using mental images

As adults, we tend to do most of our thinking in words. However numerous experiments have been carried out that support the suggestion that we will remember verbal or written information better if we also form a mental image of the information. The mental image will give us another cue when we come to recall the information. In addition the effort we make in forming the image will help to fix it in our memory. This works best if the images we form are large colourful and bizarre as we tend to remember distinctive items rather than everyday items.

Using mental images when you first start to learn a new language has proved very effective for helping people grasp basic vocabulary. This is the key word technique. For example take the French word ‘poubelle’ (pronounced pooh-bell) which translates as ‘bin’ in English. The first step is to think of an English word or words that sound like the French word or part of the French word. This will give you your key word. Then you make a mental picture of the key word with the English translation. So in this example you could picture yourself lifting the lid off your bin which has turned into a bell and holding your nose because of the ‘pooh’.

Figure 1 La poubelle

This might sound complicated, but doing it is much simpler than describing it. It is very successful as well as being a lot less effort and more fun than learning lists of vocabulary by repeating the words over and over again.

Michael Raugh and Richard Atkinson (1975) developed this key word technique and carried out an experiment on two groups of participants. The participants were asked to learn a list of 60 Spanish words but only half of them were taught to use the key word technique. When they were tested later the participants using key words scored an average of 88 per cent compared to only 28 per cent for the participants who did not use key words.

This study by Raugh and Atkinson is a good example of a simple experiment. The experimenters had two groups of participants and they manipulated one difference between the two groups. The experimental group were taught to use key words and the control group were not. Both groups were then given a memory test. In experiments the thing that the experimenter manipulates is called the **independent variable** and the thing that the experimenter measures is called the **dependent variable**. When researchers design experiments they do need to consider whether any other factors or variables might be influencing their results. It is important that the experimenter tries to eliminate or control these variables.

Activity 1: Identifying variables

0 hours 5 minutes

In the Raugh and Atkinson experiment can you identify the following variables?

1. the independent variable
2. the dependent variable
3. a variable that should be controlled.

Discussion

1. The independent variable is the variable that the experimenter manipulates so this is the instruction to use the key word technique.
2. The dependent variable is the variable that alters as a result of the manipulation of the independent variable. The experimenter measures this variable and it is the number of Spanish words recalled.
3. One variable that the experimenter might need to control is to make sure that none of the participants had learnt any Spanish before the experiment as this could affect their score on the memory test.

End of discussion

A number of **mnemonics** or memory strategies are based on using mental images. A mnemonic is a strategy for improving memory and you are probably familiar with several

mnemonics such as the rhyme ‘30 days hath September, April, June and November, all the rest have 31 except February which has 28…’ or ‘Richard Of York Gave Battle In Vain’ to remember that the rainbow is made up of Red, Orange, Yellow, Green, Blue, Indigo and Violet.

2-3b Forming concepts

When we think about the world one of the ways that we organise our thoughts is by putting them into categories. This process of developing categories is called **concept formation**. For example ‘animal’ is a concept that contains other sub-concepts and then further sub-concepts. We could divide animals into birds, fish, mammals, etc. We could then divide birds into robins, sparrows, owls, etc. When we apply our concepts we tend to use a set of defining features. For example we would classify the sparrow as a bird because it has a number of defining features that we associate with birds such as wings, feathers, beaks and flying. However although we may have a set of defining features for a concept such as a bird we don't apply these rigidly. Penguins and ostriches are still classified as birds even though they don't fly.

Activity 2: Defining a simple concept

0 hours 5 minutes

What makes a table a table? We all have a concept of what a table is and can easily recognise a table whether it is a dining table, garden table or coffee table. Can you take a moment to write a list of the defining features of a table?

Discussion

Most people when asked this relatively simple question will tell you that a table has a flat surface, four legs to raise it off the ground and you can put things on it. They may add other features such as it is an item of furniture or it is often but not always made of wood, but the first three features are the most frequent responses.

End of discussion

However look at the picture below.

Figure 2 A non-typical table

This table doesn't have four legs but most of us would still recognise it as a table as it has a flat surface that we can put things on.

Similarly our definition of a table as a piece of furniture with a flat surface with four legs could just as easily be applied to a stool.

Figure 3 A stool

So while we would find it difficult to specify a way of distinguishing between a small occasional table and a stool we would not walk into someone's living room and sit on their occasional table because it shares the same the features as a stool. So our concepts are not clearly defined and seem to depend on what we expect to do with an object rather than how we define them. You may have heard the phrase ‘fuzzy concept’ which reflects our difficulty in providing precise definitions.

So we recognise the object in Figure 2 above as a table because we could use them to put things on such as a book, our drink or an ornament. The object in Figure 3 is a stool because we would sit on it. We will group objects within the same category or concept if we do the same thing with them.

We use concepts so automatically that we are rarely aware that we are using them. Perhaps it is easier to see this process in action when we observe children developing their thinking as they struggle to develop concepts. Children often make mistakes by **overgeneralising** a concept that they are trying to get to grips with. They may have developed a concept for a dog as an animal with hair, four legs and a tail, but then they may also apply this label to a cat or a sheep or even a horse. Similarly they may learn that the tall person with the deep voice is called Daddy and then may embarrassingly identify any passing man as Daddy.

2-3c Schemas

A **schema** is the word psychologists use to describe a mental framework in which you would file all your knowledge about certain objects, situations, groups of people and even yourself. It would include the whole package of your thinking when you think about something. For example, if you apply concept formation to the word dentist you would probably categorise dentist as an occupation. However if you list everything that you associate with the word dentist this would give you your dentist schema. Your schema may include items such as a waiting room, dread, a dentist's chair, the sound of the drill, the smell of the antiseptic mouth wash and so on.

The term schema (plural schemas or schemata) was used by an influential Swiss psychologist named Jean Piaget. Piaget, who died in 1980, spent over 50 years investigating the way that children developed their thinking or cognitive skills. He proposed that they did this by developing schemas which are built up from their experience of the world.

It is as if your memory is a huge filing cabinet and each file in the cabinet is a schema. If you opened the schema labelled ‘going to the cinema’, it would contain all your knowledge about trips to the cinema (e.g. buying a ticket, sitting in the dark, seeing a film, other people around, eating popcorn). If you visited a cinema that you have never been to before you wouldn't have to start from the beginning in trying to work out what to do. You would simply activate your ‘going to the cinema’ schema to guide your actions. In this way schemas help us deal more efficiently with the world around us so when we encounter a new situation we can apply our knowledge of similar past situations to help us act appropriately.

A lot of the knowledge that we hold in our schemas will be shared with other people who have had similar experiences to ourselves. However where our experiences are different our schemas will also be different. For example, if you love football your schema for football will contain a lot of detailed information about particular teams, leagues, championship competitions and even the intricacies of the off-side rule. If you dislike football your football schema may only include the information that it is an outdoor game involving a ball, a number of players and an audience and that you should avoid it whenever possible.

Schemas can help us recall information as they provide an organising framework so that the information is stored appropriately and they can provide cues to prompt our memory.

John Bransford and Marcia Johnson (1972) carried out a number of experiments which illustrated the role of schemas in our understanding and recall of information. In one experiment the participants were read the passage below and then asked to recall it as accurately as possible. However half of the participants were given a title for the following passage and the other participants were given the passage without the title.

"The procedure is actually quite simple. First you arrange things into different groups… Of course, one pile may be sufficient depending on how much there is to do. If you have to go somewhere else due to lack of facilities that is the next step, otherwise you are pretty well set. It is important not to overdo any particular endeavour. That is, it is better to do too few things at once than too many. In the short run this may not seem important, but complications from doing too many can easily arise. A mistake can be expensive as well… At first the whole procedure will seem complicated. Soon, however, it will become just another facet of life. It is difficult to foresee any end to the necessity for this task in the immediate future, but then one never can tell. After the procedure is completed one arranges the materials into different groups again. Then they can be put into their appropriate places. Eventually they will be used once more and the whole cycle will have to be repeated. However, that is part of life."

(*Bransford and Johnson 1972 p. 722*)

Most people report that they have great difficulty in understanding the passage let alone trying to recall the details. However if you reread the passage with the title, 'Washing Clothes' in mind everything should fall into place. The title provides a schema so that the information can be stored appropriately and recalled more easily.