

Piaget's theory: Conservation

The specification says...

Piaget's stage theory and the development of intelligence: Development of conservation. McGarrigle and Donaldson's 'naughty teddy study'.

Piaget's conservation studies



In the picture (left) a child is shown two glasses of coloured water. Is the quantity of water the same?



In this picture (left) I now pour the water from one glass into a taller, thinner glass.

Is the quantity of water in the new glass the same?



Young children say no – the level of water is higher and therefore it looks like there is more water.

They are not yet able to conserve the quantity – in other words, they don't fully understand that quantity can't change.

What is meant by ...

Conservation The ability to realise that quantity remains the same even when the appearance of an object or group of objects changes. For example, the volume of liquid stays the same when poured between vessels of different shapes.

Conservation

On the previous spread we said that Piaget changed the way we understand children's intellectual development – they don't simply learn more, it is also the way they think that changes. The concept of **conservation** is one example of how thinking changes.

Piaget's study of conservation

Piaget demonstrated that younger children find it difficult to understand the idea that quantities do not change, as shown on the left. Younger children think quite differently from older children who might say to themselves 'Well it does look like more but I know there can't suddenly be more water'.

Piaget demonstrated this with number as well as volume. He showed children two identical rows of six counters each, equally spaced. Young children correctly reasoned that each row of counters had the same number. However, when the counters in one of the rows were pushed closer together, younger children struggled to conserve and usually said there were fewer counters in the row.

McGarrigle and Donaldson's 'naughty teddy study'

James McGarrigle and Margaret Donaldson (1974) challenged Piaget's results.

The researchers wondered if Piaget's results were due to the fact that the children saw the counters being changed and therefore assumed that this deliberate change meant there actually was a change in the number of counters.

Aim

McGarrigle and Donaldson wanted to see whether the child's reaction would be different if there was no deliberate change in the row of counters, i.e the change was accidental.

Method

There were 80 children in the study all from Edinburgh in Scotland; 40 of the children were at nursery schools (mean age 4 years 10 months) and 40 were from primary school (mean age 5 years 10 months).

The children were introduced to a naughty teddy who was liable to escape from his box and try to mess up the toys and spoil the game. The children were then shown two rows of counters: one with four red counters and one with four white counters.

The teddy jumped out of his box and pushed the counters in one row about, in a haphazard fashion. He transformed the display by making one row look smaller.

Before and after the transformation each child was asked the same question while the researcher pointed to each row in turn, 'Is there more here or more here or are they both the same number?'

Results

About 41% (33 out of 80) of the children gave the correct answer ('they are the same number in each row') if the display was changed deliberately.

About 68% (54 out of 80) of the children gave the right answer if the change was accidental.

For the primary children both figures were higher than for the nursery school children.

Conclusions

This study shows that the traditional method of testing conservation underestimated what children can do. In this study, many of the nursery school children did conserve quantity. Piaget said that children of this age couldn't do this.

However, there were still age differences. The primary school children (mean age 5 years 10 months) did better overall than the nursery children (mean age 4 years 10 months). This does support Piaget's idea that the way children think changes as they get older.

(Note: Altogether the study involved four tests: number equal (reported above), number unequal (there was one row of four counters and one row of five counters), length equal (two lengths of string) and length unequal.

Named study in specification



Bear with me and I'll tell you about the 'naughty teddy'.

Evaluation

The sample

Point: One weakness is that the primary age children all came from one school.

Explanation: The reason the primary children did better than the nursery children might be due to differences in educational background. It might be that the primary school drew on a more educated group of families and the reason they coped better on the task was because their language was better developed. In Chapter 6 we discuss the possible link between lower-class families and less developed language, see page 163.

This suggests that it might not be reasonable to compare the two groups of children because other factors could explain the differences. This challenges the validity of the conclusions.

The change was not noticed

Point: One weakness is that the children's better performance in the accidental condition may be because they didn't notice any change had taken place.

Explanation: The children may have been more likely to say that both rows were the same because they were distracted by the teddy and didn't realise anything had changed. So why would they change their answer?

This was a suggestion made by Chris Moore and Douglas Frye (1986) who showed that, if the naughty teddy actually took away a counter the children still said the rows were the same.

Therefore the distraction of the naughty teddy meant the young children just weren't looking. It didn't mean they were conserving.

EXTRA: Challenges Piaget

Point: One strength of this study is that it challenges some of Piaget's assumptions.

Explanation: This research was important in making people question Piaget's original work. The way Piaget designed his research appears to have confused young children. They actually are more able but the way he questioned them didn't make sense to them.

This is an important part of the scientific process. Researchers' ideas should be challenged and refined.

Stretch and challenge

Doing research with children is not something that is recommended for students. However, if you have a younger brother or sister, or a family friend with a young child, you might try out one of the conservation tasks.

Make sure your young participant does not feel they are being 'tested' – you are not doing this to discover anything earth shattering. You are just doing it so you get a sense of the problems of doing research with young children.



Yes there is a link between conservation of water (and other things) and Piaget's concept of conservation. When you conserve water, you save it so there is enough left. When children conserve volume they are saving it – they are keeping it the same.

Apply it – research Naughty teddy

A child psychologist decided to repeat (replicate) McGarrigle and Donaldson's 'naughty teddy' study. She recruited 50 children aged four years old from a number of nursery schools in Bristol. For 25 of the children, the psychologist deliberately moved a line of coins closer to each other. For the other 25, the naughty teddy 'accidentally' pushed the coins together. The psychologist noted how many children believed there were fewer coins in the line.

Questions

1. Identify the target population for this study. [1 mark]
2. Briefly explain the difference between a target population and a sample. [2 marks]
3. Explain how the psychologist could have selected the children using random sampling. [3 marks]
4. Explain one strength and one weakness of random sampling. [2 marks + 2 marks]

Study tip

Learn the method

Make sure that you know the method of a research study in detail as you can be asked to design studies in certain topic areas that are always very similar to an existing investigation. Learning the method therefore gives you more information when attempting these types of questions.

Check it

1. Use your knowledge of conservation to explain how the thinking of a 7-year-old child could differ from a 5-year-old child. [3 marks]
2. Describe what Donaldson's 'naughty teddy' study shows about the development of conservation. [3 marks]
3. Describe and evaluate Donaldson's 'naughty teddy study'. In your answer include the method used, the results obtained and the conclusion drawn. [9 marks]