

Access Psychology: Can Psychology Be a Science?

To answer this question, a definition of science must first be established. This is not as straightforward as one might think as interpretations vary, and are the cause of some debate. The American Heritage Science Dictionary appears to encompass the general consensus, and defines science as: “The investigation of natural phenomena through observation, theoretical explanation, and experimentation, or the knowledge produced by such investigation. □ Science makes use of the scientific method, which includes the careful observation of natural phenomena, the formulation of a hypothesis, the conducting of one or more experiments to test the hypothesis, and the drawing of a conclusion that confirms or modifies the hypothesis.” Put simply, it seems that for a field to be considered a science, it must utilise observation and experimentation to confirm or falsify a hypothesis. The word science itself comes from the Latin word *scire*, meaning know, implying that knowledge is gained through science.

To question psychology’s status as a possible science, it is necessary to examine theories related to the field that are possible to falsify or to repeat; to see if they can be tested using scientific methods of hypothesis, observation and experimentation.

Developmental Psychologist Jean Piaget’s influential Theory of Cognitive Development has many elements that can, and have been, scrutinised in a scientific manner. His theory suggests that children pass through four distinct age stages of cognitive development, briefly outlined here:

1. The Sensorymotor Stage (0-2), itself split into six sub-stages, is essentially when “the child learns about, and starts to control, its environment through the senses and motor (movement) abilities.” (Benson, 1998).
2. The Pre-operational Stage (2-7), also subdivided, is so called because “Piaget believes that the child is not yet capable of logical thought” (Twining, 2001). In this stage, the child learns to speak and eventually understands that people see things differently.
3. The Concrete Operational Stage (7-11) is when a child can perform mental operations, so long as the objects are visible (concrete, rather than abstract).
4. The Formal Operational Stage (11+) occurs when mental tasks can be performed using abstract ideas; that a child can manipulate concepts and ideas hypothetically.

A number of studies have been carried out in relation to Piaget's theory. In one of his own studies, conducted with Inhelder in 1956, he showed children a model of three mountains and asked them to describe the scene from the perspective of someone else on the other side of the mountain. In the experiment, it was only when the children had reached the ages of seven or eight that they were able to do so, showing that younger children were still egocentric; that they could only see the model relative to their own position.

Is Piaget's study scientific? It is certainly an experiment, and it is observable. It is unclear what Piaget's exact hypothesis was, but it may have been something like: "Are children able to view things from another person's perspective?" As with other sciences, it is possible to modify the hypothesis further. For example, once it was established that some children are not able to describe something from another person's viewpoint, a further hypothesis might have been: "At what age do children gain the ability to see things from another person's perspective?" It is possible to falsify the hypothesis because it is clearly testable, and the experiment can be replicated and/or modified. The study has resulted in a clearer understanding of children's mental perception and, consequently, the acquisition of knowledge; the essence of science.

Thorndike's Law of Effect principle, which stemmed from his observations of domestic cats trying to escape from a cage, is another theory that has prompted others to conduct further experiments. Twining (2001) explains that; "He observed (note that observation is always the first stage in the scientific process) the cats made fewer and fewer random attempts to escape and that their behavior became more and more deliberate and directed at 'operating' in such a way as to escape." B.F. Skinner extended the research with his Operant Conditioning Chamber. In one study a rat was placed inside the chamber and observed. Food was released when the rat pressed a lever within the chamber, which the rat did with increasing frequency. Skinner carried out a similar experiment with a pigeon, pecking at a disc rather than pressing a lever.

According to Allport (1947) the goals of science are "Understanding, prediction and control above the levels achieved by unaided common sense". By applying his assertion when considering if Thorndike's principle is scientific, it can be noted that both a prediction and control have been used, and that an understanding of behavior has been reached. A prediction or hypothesis could have been generated e.g. "will the animal learn that by

behaving in a certain manner it will be rewarded?" The animals' environment was certainly controlled by the experimenter, while the knowledge generated can be used to create new hypotheses. Thorndike's and Skinner's particular experiments are limited because they were only tested on animals, but they are useful in showing that behavior can be modified using reinforcement, which have prompted controlled observations of human behavior.

Sigmund Freud's Psychoanalytic Theories contain many ideas. Their scientific credibility is discussed below, after two of the key concepts are outlined.

Freud believed that humans possess a conscious (the awareness we have when awake), a pre-conscious (containing memories of dreams) and an unconscious (containing secret wishes and fears; these thoughts are hidden and unavailable to us). Another of Freud's psychoanalytical principles is that the personality has three parts: the id, the ego and the superego. "Each of these is pulling the personality in its own direction, thus creating a dynamic tension (hence "psychodynamic")." (Twining, 2001). Each part develops in sequential order. The id is inborn and alone for a few years, operating by The Pleasure Principle. i.e. the baby selfishly seeks pleasure and gratification. The ego is next, developing from about two years and operates by The Reality Principle, whereby it battles with the id, knowing that it is unrealistic to always have its own way. Finally, at about age three, the superego begins to develop, gaining maturity after puberty. The superego monitors the id-ego battle and is the "moral watchdog that stops us from doing wrong." (Benson, 1998).

Freud is probably the most famous of all psychologists, so it is logical to include at least some of his work in a debate such as this. An obvious question might be "can Freud's theories be tested scientifically?" It does seem difficult to generate any hypotheses that might test, for example, if there really is an unconscious, or if there is an id present at birth. There may be signs that appear to support the claim - a baby is evidently selfish in its wants - but there is no way of proving or disproving the claim. If science is "to know", then it must be concluded that Freud's Psychoanalytic Theories are unscientific; we don't *know* if there are three personality "pieces" pulling us in different directions, and we don't *know* if we have a conscience that stops us from doing wrong. It is a measure of Freud's influence, however, that words like "conscience" and "subconscious" are freely used today.

Another theory that it seems difficult to associate with science is Abraham Maslow's Hierarchy of Needs. The Humanistic Psychologist believed that a series of human needs must be satisfied, eventually reaching "Self Actualisation", once all the needs have been fulfilled. He argued that physiological needs (food, oxygen etc.) must be satisfied before moving "up the ladder" to the next step: safety needs (protection, familiarity etc.) and so on through the levels: love and belongingness, esteem needs, cognitive needs, aesthetic needs and finally self actualisation. Maslow asserted that self actualisation is the instinctual need of humans to make the most of their abilities and to strive to be the best they can.

Turning, again, to the dictionary's definition of science, it is hard to formulate a hypothesis with which to test Maslow's theory. It does not seem possible to draw any conclusions that confirm or falsify his assertions. It is possible to prove that a person needs oxygen to live but is it possible to prove or *disprove* that a person needs aesthetic beauty to fulfill their potential? Is it even possible to define beauty? One person might view a photograph and agree that the subject possesses beauty, but another person might disagree.

It appears, in conclusion, that there is no easy answer to the question "can psychology be a science?" It might be a more worthwhile exercise to divide psychology into its separate fields and ask the question of each. It could be argued that the behaviorist approach is the most scientific, focussing on what people do, rather than how they think; something that is observable. The approach ignores speculation while putting emphasis on objectivity. Conversely, most of Freud's theories within the psychodynamic approach seem untestable, unfalsifiable and, ultimately, unscientific. The question and answer sessions associated with psychoanalysis rely on introspection, of which there is scientific doubt. As for humanistic psychology, Maslow himself refuted psychology as a science, stating: "The uniqueness of the individual does not fit into what we know of science. Then so much the worse for the conception of science." (Maslow, 1968).

There are further considerations. Psychological experiments tend not to yield laws of nature in the way of other "pure" sciences. Piaget might state that, as children age, they are able to perform more complex mental processes, yet not all children are the same; some will advance quicker than others. There are also, for example, cultural differences to take into account; people's behavior depends on their environment, and research on

humans lacks external validity. In contrast, a ball will always fall back to earth (physics) and water freezes at zero degrees. The debate of psychology as a science will probably remain a debate for some time.

References

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