supposed to determine which parts of a scientific theory the constructive empiricist is to believe—including those theories that we must use in order to determine the content of the distinction. There is therefore a fundamental *circularity* in the constructive empiricist's distinction, which many take to be vicious.

Another complaint is that the constructive empiricist's distinction is *epistemologically dishonest*: that since a phenomenon counts as observable, provided there are *some* circumstances under which we would observe it (even if these circumstances could never actually be realized), there are no sound principles for privileging, say, our claims regarding the moons of a distant planet over those regarding the microscopic organisms in a petri dish. However, while this consideration may put some pressure on the constructive empiricist's contention that the aim of science is empirical adequacy, it must be remembered that the position itself does not depend upon an epistemological distinction between the claims of our scientific theories.

This last point has been made more explicit in van Fraassen's later work, where constructive empiricism is presented as part of a broader conception of empiricism and of the epistemology of the philosophy of science more generally. In van Fraassen's view, (scientific) rationality is to be thought of as a matter of *permission* rather than *obligation*—there are no universally applicable rules of inference, and an agent is justified in holding any set of beliefs provided they are not self-undermining. Specifically then, it cannot be a compelling objection to the constructive empiricist that our scientific claims regarding both observable and unobservable phenomena are on an epistemological par, since questions of justification are now inseparably bound up with questions of our epistemic *values*.

Consequently, constructive empiricism is no longer to be thought of as a rival to scientific realism but simply an alternative; and the challenge for the scientific realist, the constructive empiricist, and even the instrumentalist is merely to show that the position of each meets their own internal standards of philosophical adequacy.

Paul Dicken

See also Empiricism; Explanation, Theories of; Logical Positivism/Logical Empiricism; Metaphysics and Science; Observation and Theory-Ladenness; Realism and Anti-Realism in the Social Sciences; Scientific Method

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INTELLIGENCE

Societies often differ as to which traits receive emphasis in defining intelligence: rote memory in preliterate societies, mapping among Australian Aboriginals, and so forth. On the other hand, disciplines such as philosophy or social science have also tried to pinpoint intelligence. This entry reviews various theoretical attempts at defining and measuring intelligence and raises some critical ethical points associated with such attempts.

Definitions and Theories

Different thinkers give different definitions of intelligence. Arthur Jensen thinks of it as *g* (the general intelligence factor derived from factor analysis of a variety of mental tests). This concept ranks mental skills in terms of their cognitive complexity: It places solving an arithmetic problem as more "intelligence loaded" than tasks of rote memory. Robert Sternberg believes that conventional IQ tests measure the analytic skills useful in schools and ignore creativity and practical intelligence (say, how to get people to cooperate). Howard Gardner is even more inclusive and applies the label "intelligence" to the cognitive operations of musicians and sports people.

David Wechsler, who designed the IQ tests most often used today, was more pragmatic. He used 10 subtests that collectively measure a variety of mental skills: mental acuity, or the ability to learn quickly and accurately and analyze novel situations;

information processing, or the ability to absorb information quickly about others and the world; memory and working memory, the latter referring to your ability to manipulate what is in your mind; mapping; the vocabulary we need to learn, analyze, and communicate; sufficient basic information; and learning to attack problems.

Many reject such definitions of intelligence as too imprecise. This may be a mistake, as signaled by the philosophy of science. Definitions of seminal concepts need to be general enough to accommodate a variety of proposals about *measurement*. No one would want a definition of "celestial influence" specific enough to dictate a choice between Ptolemy's sky geometry, Newton's concept of gravity, and Einstein's notion that mass affects the shape of space. No one would want a definition of the "origin of species" that dictates a choice between Darwin and creationism. Seminal concepts do not dictate which theories are viable; that is the role of theory building and evidence.

The philosophy of science does brand a certain tendency in psychology a mistake: A definition must not preempt the role of a measuring instrument. For example, Jensen once defined intelligence as what IQ tests measure. This allows no room for IQ tests to improve. No one would define heat as what the thermometers of any given time measured. It was a struggle to develop adequate thermometers, and even today, under extreme conditions, we have to develop new measuring devices.

Measurement

Given their dominance, it is worth describing the Wechsler subtests and the cognitive skills they measure: Block Design and Visual Puzzles (mental acuity); Coding and Symbol Search (information processing); Mental Arithmetic and Digit Span (working memory); Vocabulary (verbal communication); Similarities (classification); Arithmetic (numeracy); Information (acquaintance with the mechanics of the modern world); Comprehension (knowledge of everyday life).

It is often objected that such tests are biased because they measure mental traits valuable primarily in a modern industrial society. In response, it is claimed that that is what they are designed to do. However, three points are legitimate.

First, the fact that people who have not yet entered modernity and do badly on IQ tests should not be interpreted as meaning that they lack cognitive capacity. Wechsler does not assume that all societies would weigh mental skills the same. Rote memory would be more important in preliterate societies, mapping among Australian Aboriginals, and so forth. As shown by massive IQ gains over time, even our own (Western) ancestors in 1900 would have had very low IQs scored against current norms. That is because they placed less weight on analytic skills and more on the utilitarian skills they needed in everyday life. The people of developing nations are beginning to make huge IQ gains as they enter modernity.

Second, Jim Heckman and others have shown that noncognitive factors, such as motivation and self-discipline, are at least as important as IQ in predicting academic success. Third, the jury is still out on whether there are valid measures of creativity and practical intelligence or even whether or not the Wechsler tests miss these traits.

There is a debate among specialists as to the significance of massive IQ gains over time. That there have been such huge intelligence gains seems improbable. There is general agreement that human brains have no greater cognitive potential at conception than they did in 1900. There is general agreement that we are better at the analytic and classification skills that schools and professions value more today than in the past. Rather than saying our minds are more intelligent, it may make sense to say that they are more *modern*.

Ethics

Ethical problems in definitions and measurement of intelligence immediately surface: individual rights versus group membership (affirmative action policy to achieve ethnic balance), justice (as equal treatment) versus equity (equal treatment qualified by equal opportunity), utilitarian considerations (efficiency) versus individual self-esteem (employment for all), justice versus self-interest (renting your spare room to a Black male rather than waiting for, say, a Korean American female, as some do), and so on.

These problems are not solved by the slogan that we should treat everyone as an individual rather than as a member of a group. This stance can be used against affirmative action as well as against racism. Moreover, people tend to treat other people as members of a group when information about individuals is expensive. A landlord cannot afford private detectives and, therefore, uses race as a cheap information-bearing trait.

Ethical controversies in the area of intelligence and in particular over attempts to link genetics and IQ have been extremely acrimonious, as evidenced by the furor over Hans Eysenck's and others' views in the recent past. Controversies such as these often mingle philosophy and social science, blurring the distinction.

Ethical problems such as the foregoing are complicated by the question of whether ethnic differences are environmental or partly genetic. Affirmative action as a temporary expedient is different from affirmative action as a permanent option. Flynn has argued that IQ differences are primarily environmental, but other scholars who have looked at the same evidence differ. Another ethical problem is this: Should speaking the truth be qualified by its consequences? John Stuart Mill would have said that the truth cannot be racist and that the consequences of suppressing truth to spare feelings are counterproductive for everyone, including the group concerned.

James R. Flynn

See also Cognitive Sciences; Cultural Evolution; Ethical Impact of Genetic Research; Racial Critiques of Social Science Applications; Scientific Method

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Intention, Social Psychology of

In our everyday lives, we use the term *intention* in the sense that our intentions are not always realized by our actions. It is this problem of *weakness of the will* or the *intention–behavior gap* that the psychology of intentions has studied. Under this conception, intentions are virtually indistinguishable from goals.

To elucidate the characteristics of such intentions or goals, this entry first discusses the weakness of the will. Next, self-regulation strategies of intention formation (goal setting) and implementation (goal striving) are introduced. Finally, the role of context for goal pursuit is highlighted—in particular, the activation of nonconscious goals and the elicitation of the "feeling of doing" or of the experience of conscious will.

Weakness of the Will

Weakness of the will has been one of the first puzzles philosophy has tried to grapple with (since the time of Socrates and Plato), but it is also central to social sciences. Weakness of the will is exhibited when agents fail to successfully pursue their intentions. A primary challenge in goal pursuit is therefore setting (committing to) goals that are not only attractive but also feasible. One method for bolstering such wise goal setting is mental contrasting of future and reality. This self-regulatory strategy asks the agent to imagine achieving a desired future outcome (e.g., getting an A in an upcoming exam) and then to imagine the most critical obstacle of reality standing in the way of achieving this future (e.g., an invitation to a party). The juxtaposition of the desired future and its obstacle automatically highlights both the perceived valence and the perceived feasibility of goal attainment. Consequently, mental contrasting strengthens commitment to and striving for goals that are perceived as not only attractive but also feasible and helps people stay away from or disengage from (attractive) goals that cannot be reached.

Goal Setting

Goals may vary not only in commitment but also in content. For instance, goals may be promotion or prevention oriented (promote good grades vs. prevent bad ones), and these facilitate goal attainment depending on whether they match the individual's self-view (ideal vs. ought) and the chosen means (eagerness vs. vigilance). Goals may contain learning versus performance outcomes (e.g., learning to solve vs. showing that one can solve problems), whereby the former type of goal fosters goal attainment when people must cope with setbacks. Finally, goals with specified standards (e.g., study for 2 hours per day) promote success more effectively than goals that keep the desired outcomes vague (e.g., study hard).