

Instrumentalism

Instrumentalism is one of a multitude of modern schools of thought created by scientists and philosophers throughout the 20th century. It is named for its premise that theories are tools or instruments identifying reliable means-end relations found in experience, but not claiming to reveal realities beyond experience.^[1] Its premises and practices were most clearly and persuasively stated by two philosophers, **John Dewey** (1859-1952) and **Karl Popper** (1902-1994). Independently, they defined the school quite similarly, but their judgments of its premises were irreconcilable.

Dewey was a practitioner of instrumentalism, accepting means-end relations as discoverable by joining inductive and deductive reasoning about experience. Popper was a critic of the school. He insisted that induction is not scientifically valid, and that realities can be known without experience. These contrary judgments endowed the school with the legacy of confusion and ambiguity described below.

This article gives the definition of instrumentalism accepted by these two philosophers. It explains the grounds of their irreconcilable judgments, which are still embedded in popular understanding of the school, and describes the practice of followers of each philosopher, demonstrating that neither philosopher's judgments have achieved universal assent, leaving the school's meaning and legitimacy in modern scientific inquiry indeterminate.

1 Definition

In 1925, John Dewey published an article entitled "The Development of American Pragmatism," in which he defined instrumentalism to distinguish it from schools known as "pragmatism" and "experimentalism." In 1956, Karl Popper published an article entitled "Three Views Concerning Human Knowledge," in which he defined instrumentalism to distinguish it from "essentialism" and a "third view"—his own—which he came to call "critical rationalism."

Dewey's article was republished in 1984 in *John Dewey: The Later Works*.^[2] Popper's article was republished in 1962 in *Conjectures and Refutations*.^[3] The following four premises defining instrumentalism are taken from these sources. Premises 1 and 2 were accepted by both philosophers and the general public. Premises 3 and 4 were and remain controversial.

1) Theories are tools-of-the-trade of thinking, seeking to map means-ends relationships found in experience.

Dewey:

"Instrumentalism is an attempt to establish a precise logical theory of concepts, of judgments and inferences in their various forms, by considering primarily how thought functions in the experimental determinations of future consequences."^{[2]:14}

Popper:

Instrumentalism endorses "the interpretation of scientific theories as practical instruments or tools for such purposes as the prediction of impending events."^{[3]:62-3}

2) Theories predict consequences of using means to achieve ends.

Dewey:

"The verification of a theory ... is carried on by the observation of particular facts."^{[2]:11}

Popper:

"... we submit [theories] to severe tests by trying to deduce from them some of the regularities of the known world of common experience."^{[3]:102}

3) Theory-development requires inductive reasoning, basing general statements on limited observations of facts-of-the-case.

Dewey:

An empirical philosopher must "... first find particular cases from which he then generalizes."^{[2]:11}

Popper:

I am "... an opponent of the widely accepted dogma of inductivism—of the view that science starts from observation and proceeds, by induction, to generalizations, and ultimately to theories."^{[3]:154}

4) There are no realities behind or beyond what can be known by applying instrumental theories.

Dewey:

"It is therefore in submitting conceptions to the control of experience ... that one finds examples of what is called truth."^{[2]:11}

Popper:

"A representation of instrumentalism can be obtained ... by omitting ... the universe of the realities behind the various appearances."^{[3]:108}

Instrumentalism is often identified with other schools which share some of these premises: positivism, pragmatism, operationalism, behaviorism, anti-realism, empiricism, consequentialism.^{[2]:3-5, 20-1 [3]:4-5, 62[4]} Its premises are further explored in *Instrumental and value-rational action*, *Instrumental and value rationality*, and *Instrumental value*.

2 Instrumentalism judged

Dewey and Popper disagreed on premises 3 and 4. Both expounded the primary grounds of their disagreement in the 1930s. In 1935, Popper published *Logic of Scientific Discovery*,^[5] in which he used traditional logical forms to criticize modern schools of thought, including instrumentalism. In 1938, Dewey published *Logic: the Theory of Inquiry*,^[6] in which he reconstructed traditional logical forms to make them usable by modern schools of thought. Neither of these volumes used the name instrumentalism, but both discussed and judged the premises above.

2.1 Popper's critique

The opening paragraph of Popper's *The Logic of Scientific Discovery* observed that all modern empirical schools accept premises 1 and 2, which he later identified with Instrumentalism:

A scientist, whether theorist or experimenter, puts forward statements, or systems of statements,

and tests them step by step. In the field of the empirical sciences, ... he constructs hypotheses, or systems of theories, and tests them against experience by observation and experiment.^{[5]:3}

Several paragraphs later, he admitted the popularity of induction—premise 3—but denied its capacity to generate logically true theories:

According to a widely accepted view—to be opposed in this book—the empirical sciences can be characterized by the fact that they use "*inductive methods*", as they are called. ...

It is usual to call an inference "inductive" if it passes from *singular statements* (sometimes also called "particular" statements), such as the results of observations or experiments, to *universal statements*, such as hypotheses or theories...

Now, it is far from obvious, from a logical point of view, that we are justified in inferring universal statements from singular ones, no matter how numerous; for any conclusion drawn in this way may always turn out to be false: no matter how many instances of white swans we may have observed, this does not justify the conclusion that all swans are white.^{[5]:3-4}

Popper's reference to swans recalls a famous historic error: the inductively-derived belief that all swans are white. He labelled the practice illogical: "Now in my view there is no such thing as induction. Thus, inference to theories, from singular statements which are 'verified by experience' (whatever that may mean), is logically inadmissible."^{[5]:18}

Popper rejected *inductive reasoning* in favor of *deductive reasoning* because he maintained that the former could not achieve logical form. Deduction can move from a self-evident universal statement, such as "All men are mortal", to true singular statements that every individual human is mortal, because the universal statement already embraces all singulars. But there can be no principle by which a singular statement can justify a universal, because no singular statement can report observing "all" of any kind.

For the principle of induction must be a [logically necessary] universal statement in its turn. ... To

justify it, we should have to employ inductive inferences; and to justify these we should have to assume an inductive principle of a higher order; and so on. Thus the attempt to base the principle of induction on experience breaks down, since it must lead to an infinite regress.^{[5]:5}

Popper rejected induction—premise 3—but not premise 2—the criterion of efficient means achieving consequences. He argued that deduction could serve modern science, not by assuming general statements to be true, but by providing general statements testable by their consequences. Falsification “works” when experience contradicts a theory’s predictions: “it must be possible for an empirical scientific system to be refuted by experience.”^{[5]:9, 18}

I can therefore gladly admit that falsificationists like myself much prefer an attempt to solve an interesting problem by a bold conjecture, *even (and especially) if it soon turns out to be false*, to any recital of a sequence of irrelevant truisms.^{[3]:231}

Popper rejected premise 4 because it denies the distinction between pure and applied science. He granted that science might apply empirical or instrumental theories, but asserted that epistemological or reality-based theories, revealing truths independently of experience, are equally valid.^{[5]:81–2} His evidence was that pure sciences such as mathematics and logic can make true statements without observing facts-of-the-case.

Logically true theories don't require establishing facts-of-the-case; they can be conjectural myths, derived from inspiration or chance, which are "... *psychologically or genetically a priori*, i.e., prior to all observational experience." They can also precede observation or recognition of similarities and differences.^{[3]:47–8}

The question of how it happens that a new idea occurs to a man—whether it be a musical theme, a dramatic conflict, or a scientific theory—may be of great interest to empirical psychology; but it is irrelevant to the logical analysis of scientific knowledge. The latter is concerned not with *questions of fact* ... but only with question of *justification or validity* ...^{[5]:7}

Instrumentalism's premise 4 denying logically-certain deductive truths threatens "... the idea of the objectivity of knowledge and of common standards of criticism

or rationality.”^{[3]:29} Because Instrumentalists claim that “truth” is always situational, they forfeit their capacity to explain sciences in which the instrumental criterion of judgment cannot be applied.^{[5]:11} In pure sciences, the criterion is logically-established truth, not what works or is useful given temporary conditions.

Summing up we may say that instrumentalism is unable to account for the importance to pure science of testing severely even the most remote implications of its theories, since it is unable to account for the pure scientist's interest in truth and falsity. In contrast to the highly critical attitude requisite in the pure scientist, the attitude of instrumentalism (like that of applied science) is one of complacency at the success of applications.^{[3]:114}

2.2 Dewey's reconstruction

Dewey's *Logic* of 1938 was very different from Popper's *Logic* of 1935. While Popper used traditional logical forms to criticize the modern practice of induction, Dewey reconstructed those forms. He addressed the problem of whether scientific inquiry “can develop in its own ongoing course the logical standards and forms to which *further* inquiry shall submit.”^{[6]:5} His affirmative answer is the substance of premise 4, which traditional logic led Popper to deny.

Dewey's *Logic* did not name instrumentalism or pragmatism, but argued that both schools treat theories as tools for producing consequences—premises 1 and 2. Consequences are “necessary tests of the validity of propositions, provided these consequences are operationally instituted and are such as to resolve the specific problem evoking the operations, ...”^{[6]:iv}

When Dewey analyzed induction—premise 3—he accepted its standard meaning of processes for developing general propositions from particular cases. He explained why Aristotle's application of this method to eternal forms and kinds was no longer acceptable.^{[6]:419–21}

Popper partially repudiated Aristotle's belief that superior intellects can “intuit the essence”^{[3]:12} of eternal forms by observing physically changing forms: each observed swan is an imperfect sample of universal-but-unobservable swan-ness. But he provided no rational means to carry out induction's necessary function of establishing the facts-of-the-case by relating singular observations of kinds to general statements about kinds. Dewey's instrumental analysis did provide such means by reconstructing both induction and deduction.^{[6]:432, 484–5}

One may think of a singular observation, i.e., “this swan is white”, as an isolated fact without general reference.

But Dewey insisted that such an observation necessarily involves the general meaning of “swan” as a particular kind of “bird”. If one were not familiar with a kind of animal having numerous well-established characteristics, one could not name it either “bird” or “swan”. Kinds, including species, do not exist apart from experience. They are created by inquiries which—contrary to Popper—use induction to distinguish stable characteristics of experience from accidental or irrelevant characteristics.

Dewey argued that modern science does not treat particular observations as knowledge of what is real: one does not assume, after a few observations, that whiteness is a defining characteristic of swans. Particular observations “are selectively discriminated so as to determine a problem whose nature is such as to indicate possible modes of solution.”^{[6]:424} Observations become facts-of-the-case only after being causally related to a problem.

Dewey supported this theoretical generalization with an example of medical knowledge. The case of malaria shows how modern induction avoids Popper’s charge of requiring endless observations.^{[6]:433–7}

After certain “singular” symptoms came to be recognized as constituting a disease, it was named malaria—literally “bad air”—as a common-sense conjecture about its cause—premise 1. Popper might have considered that conjecture to be testable by predicting that the disease would be absent in environments with “good air.” But testing a prediction about air quality could not have led to new insights. It was an insignificant fact-of-the-case.

When further observations—applying premise 3—identified the conjunction of parasites with the disease, experiments revealed the life-history of particular parasites and their relation to a particular kind of mosquito: anopheles. At each stage of inquiry, particular observations [inductions] led to general hypotheses [deductions] guiding further observations to establish logically-warranted particular and general propositions. Multiple theories generated by induction were used throughout the process of inquiry. They evolved from quite conjectural to quite confirmed generalizations, but never from “conjectural myths” to “truths” independent of observable life processes.

The result of this hypothetical-deductive sequence was to establish malaria as a specific kind of disease with a determinate etiology. Dewey affirmed the logical force of this demonstration. It provides the logical principle justifying induction, the possibility of which Popper denied.

When it is affirmed that inductive inference proceeds from what happens in some cases to what is true of all cases, the phrase “all cases” must, of course, be limited to all cases of specified *kind*. But if the kind is already determined in the “some” cases from which the in-

ference is said to proceed, the alleged inference is a matter of pure tautology, since a kind is the kind which it is.^{[6]:436}

With this logical principle, Dewey validated induction—premise 3—as well as his rejection of realms such as pure science capable of establishing objective truths unknowable by applied science—premise 4. He argued that warranted generalizations never exist apart from experience. They arise only in the process of inquiry, making invalid any claim to truths “logically prior to observation or recognition of similarities and differences.”^{[3]:47–8}

But the dependence of warranted theories on situational factors—induction—does not eliminate objective standards of judgment, as Popper feared. Both ends and means have consequences that can be judged more or less instrumentally efficient—premise 2.

There is no more fatal flaw in psychology than that which takes the original vague fore-feeling of some consequence [Popper’s conjecture] to be realized as the equivalent of a *thought* of an end, a true purpose and directive plan [Popper’s tested theory]. The thought of an end is strictly correlative to perception of means and methods. Only when and as the latter becomes clear [by induction] during the serial process of execution does the project and guiding aim and plan [theory] become evident and articulated. In the full sense of the word, a person becomes aware of what he wants to do [end-in-view] and what he is about only when the work is actually complete.^{[6]:60}

In summary, Dewey’s reconstruction of logic directly refuted Popper’s argument for rejecting induction and for maintaining the distinction between pure and applied science. His instrumentalism requires hypothetical-deductive operations to establish warranted means-ends assertions to solve problems—employing all four premises.

3 Instrumentalism practiced

Dewey and Popper never confronted their differences. Consequently, this advocate’s and this critic’s irreconcilable patterns of thought remain identified with the school. Current use of the name embraces this incoherent legacy.

To exemplify this continuing ambiguity, this article examines recent practice by scholars influenced by

each philosopher's view of instrumentalism. Economist Milton Friedman identified himself with the theory and practice of Popper, while philosopher Larry Hickman and economist John Fagg Foster identified themselves with Dewey. Should any of them be called adherents of instrumentalism?

3.1 Milton Friedman's practice of Instrumentalism

Milton Friedman (1912-2006) was a Nobel laureate in economics who contributed to the two branches into which economics is often divided: a pure value-free science—positive economics—and an applied normative science—political economy.^{[7]:19} He participated in the Mount Pelerin Society to which Karl Popper belonged. In 1953 he published an essay—"The Methodology of Positive Economics"—which came to identify him with instrumentalism despite never mentioning that school, or Popper, or Dewey.

Friedman explicitly embraced premises 1 and 2 when he identified the task of positive economics as providing "a system of generalizations or conjectures that can be used to make correct predictions about the consequences of any change in circumstances."^{[8]:4} But his position on premises 3 and 4 was ambiguous. Contrary to Popper, he appeared to approve of basing theoretical conjectures on facts-of-the-case provided by inductive observations—premise 3:

Full and comprehensive evidence on the phenomena to be generalized or "explained" by a hypothesis, besides its obvious value in suggesting new hypotheses, is needed to assure that a hypothesis explains what it sets out to explain—that its implications for such phenomena are not contradicted in advance by experience that has already been observed.^{[8]:12-13}

But he joined Popper in rejecting premise 4—that conjectures must derive from descriptively true assumptions. This rejection appears to make irrelevant the practice of relating theories to facts by induction.

... the relevant question to ask about the "assumptions" of a theory is not whether they are descriptively "realistic", for they never are, but whether they are sufficiently good approximations for the purpose in hand. And this question can be answered only seeing

whether the theory works, which means whether it yields sufficiently accurate predictions.^{[8]:15}

In words close to Popper's praise of false conjectures, Friedman praised purely mental hypotheses derived from inaccurate assumptions:

... the relation between the significance of a theory and the "realism" of its "assumptions" is almost the opposite ... Truly important and significant hypotheses will be found to have "assumptions" that are wildly inaccurate descriptive representations of reality, and, in general, the more significant the theory, the more unrealistic the assumptions ...^{[8]:14}

Friedman's 1953 essay provoked extensive criticism from both orthodox and heterodox economists. In 1959, economist Lawrence Boland published "A Critique of Friedman's Critics", in which he asserted that all critics were wrong because they failed to understand that Friedman was an Instrumentalist.

His methodological position is both logically sound and unambiguously based on a coherent philosophy of science—Instrumentalism.^{[9]:503}

So long as a theory does its intended job there is no need to consider the truth of its assumptions. ... This view of the *role* of theories is called "instrumentalism". It says that theories are convenient and useful ways of (logically) generating what have turned out to be true (or successful) predictions or conclusions.^{[9]:508}

The "coherent philosophy" which Boland identified with approval as instrumentalism included premises 1 and 2, acceptable to both Popper and Dewey—using theories as means to predict ends. But Boland left out of his definition premises 3 and 4—the premises Popper rejected along with the name. Because Friedman downplayed inductive operations and praised unrealistic hypotheses—mirroring Popper's position—Boland felt justified in praising him as an instrumentalist, although the same logic would justify praising Popper as an instrumentalist.

Boland's paper generated further debate over the meaning of instrumentalism and whether the school Popper rejected could be made acceptable. In 1989, economists

Abraham Hirsch and Neil De Marchi published a detailed analysis of Friedman's professional work, which found Friedman's practice inconsistent and Boland's interpretation misleading.

Karl Popper is not only responsible for the conception of "instrumentalism" as it is currently used, he is also its most severe critic. As a result it comes as something of a surprise to find Friedman characterized ... as both an instrumentalist and a "Popperian".^{[7]:91}

After analyzing Friedman's theoretical and practical writings, Hirsch and De Marchi reached convoluted conclusions. They agreed that Friedman sometimes practiced what Boland called instrumentalism, applying premises 1 and 2. But they also found much of his work compatible with Dewey's instrumentalism but not Popper's—applying premises 3 and 4.^{[7]:3,66,94}

Hirsch and De Marchi recognized the irreconcilability of Popper's "notions of deductive explanations" which avoid induction and Dewey's "process-view of inquiry" which requires both induction and deduction.^{[7]:223} They concluded that these represent "two types of instrumentalism."^{[7]:143} While Boland placed Friedman—with approval—in the tradition of Popper, they placed Friedman—with approval but contrary to Boland—more in the tradition of Dewey.

But rather than claim that a divided Instrumentalism embraces irreconcilable premises, Hirsch and De Marchi yielded the Institutional title to the more widely recognized interpretation of Popper. Still disagreeing with Boland's interpretation, they considered it less ambiguous to call Friedman a pragmatist in the tradition of Dewey.

We would have preferred to use the term 'instrumental' which, understood as problem solving, conveys a lot about Friedman's approach to positive economics. Unfortunately, the term has been pre-empted by the modern philosopher Karl Popper, and his disciple in economics Lawrence Boland, and used to stand for something very different from the central ideas in Deweyan thinking. Because of this we feel that there is less risk referring to Friedman's approach in economics as 'pragmatic', ...^{[7]:3}

This decision leaves unresolved the meaning and scientific legitimacy of both instrumentalism and pragmatism. Boland found instrumentalism acceptable as long as it rejects premises 3 and 4, while Hirsch and De Marchi found it unacceptable so defined.

3.2 Larry Hickman's practice of Instrumentalism

Larry Hickman (1942-), a professor of philosophy, became Director of the Center for Dewey Studies at Southern Illinois University in 1993. In 1990, he published *John Dewey's Pragmatic Technology*, expressing the current meaning and relevance of Dewey's instrumentalism, despite his decision not to use that label in his title.

Hickman's study places Dewey's pattern of thought in current philosophical context. He argues that it is best understood as a "philosophy of technology" and a modern version of pragmatism.^{[10]:2}

The feature of Dewey's critique of technology that renders it unique is his contention that tools or instruments cut across traditional boundary lines such as the psychical and the physical, the inner and the outer, and the real and the ideal. This idea, which Dewey cultivated and nourished until it grew into a methodology, was Dewey's instrumentalism.^{[10]:xii}

The very names that Dewey gives to his method—"pragmatism"..., "experimentalism", and "instrumentalism"—connote technological production and construction. Technology, since its earliest manifestation, has been interdefined with the use of tools and instruments. And what is unique about scientific technology, or what is most frequently called simply "modern science", is its use of instrumentation in order to conduct orderly and productive experimentation.^{[10]:58}

Hickman's first chapter repeats Hirsch and De Marchi's finding that multiple and irreconcilable meanings of Instrumentalism are common. He labels meanings incompatible with Dewey's thinking "naïve" and "straight-line" instrumentalism.

... Dewey rejected what I have called "straight-line instrumentalism", or the view that neutral tools are brought to bear on ends that are valued for reasons external to the situations within which those tools have been developed.^{[10]:12-13, 202}

Straight-line instrumentalism separates means from ends by treating theories as tools "in the mind;" as purely men-

tal conjectures. If theories are simply “in the mind”, then applying and testing them can likewise be “in the mind”, accomplished by symbol manipulation rather than by instrumental actions. This interpretation makes premises 3 and 4 unnecessary, leaving premises 1 and 2, which were acceptable to Popper.

Hickman follows Dewey in arguing that theories are not “in the mind” but are statements of potential ways of acting that are tested by application in concrete situations.^{[10]:113} Competent inquiry starts by judging a situation to be undesirable and seeks an “end” judged more desirable. It creates theoretical and physical tools as “means” to that end. Both mental and physical tools, when they work, become technological artifacts, available for further inquiries and knowings.

This sequence of competent inquiry expresses Dewey's endorsement of all four premises of Instrumentalism as a technological enterprise.

The principal reason for calling inquiry technological, then, is that it is the means of effective control of an environment that is not what we wish it to be. Inquiry is in this way differentiated from other forms of activity. It produces something new ... What Dewey thought significant about inquiry, and what he thought discloses its technological character, is that *every reflective experience is instrumental to further production of meanings, that is, it is technological.*^{[10]:40-1}

Hickman defends Dewey's theory and practice against other philosophers claiming the name instrumentalism, but does not himself adopt that name. Whether “pragmatic technology” used in his title is a satisfactory new name for this school remains doubtful, since neither words has a well-established meaning.

3.3 John Fagg Foster's practice of Instrumentalism

John Fagg Foster (1907-1985) earned his doctorate in economics at the University of Texas. His dissertation advisor was Clarence Ayres, a leading institutional economist and expert on John Dewey's thought.^[11]

Foster taught economics at the University of Denver from 1946 to 1976. In 2000, his student Marc Tool published *Value Theory and Economic Progress*, a survey of Foster's thinking and teaching. Tool identifies Dewey's instrumentalism as one root of Foster's analysis:

John Dewey's contribution ... is to develop and extend the instrumentalist method of log-

ical inquiry. ... Fosters theory of social inquiry, then, is rooted philosophically in the instrumentalism of John Dewey ...^{[12]:xi}

Tool shows how Foster related Dewey's analysis to the field of economics through the universal factor of technology. As early as 1942, in “John Dewey and Economic Value”, Foster called Dewey's analysis a “technological theory of value”,^[13] a name which Hickman endorsed in 1990 and Tool endorsed in 2000. In that early paper, Tool notes,

Foster shares Dewey's view that technological change “is the chief determining condition of social relationships and, to a large extent, of actual cultural value in every advanced industrial people, while they have reacted intensively into the lives of all “backward” people.”^{[12]:77}

Foster argued that existing technology determines in every society the possible instrumental efficiency of institutions designed to correlate behavior; for example, a society can't design patterns for, or solve problems of, space travel before technology makes such travel possible. This generalization, derived by induction, he called the principle of technological determination. Tool quotes Foster:

The principle of technological determination is simply that social problems can be solved only by adjusting the institutional structures involved in the problems so as to bring them into instrumentally efficient correlation with the technological aspects of the problems. What is meant by “instrumentally efficient correlation” is that the instrumental functions of the institutions in question be carried on at a level of efficiency tolerable to the members of the institution in view of the possibilities indicated by those same technological factors.^{[12]:92}

Tool finds Foster following Dewey in treating theories as tools judged by how well they work to solve problems—premises 1 and 2.

At bottom, the creation and verification of hypotheses is demonstrably the preeminent focus and application of instrumental logic in pursuit of social problem solving.

... hypotheses are ... initial conceptions of possible causal connections awaiting, thorough inquiry, confirmation, revision or rejection. Scientific social inquiry requires that hypotheses become instruments for guiding inquiry both in direction and in substance.^{[12]:22}

Foster also followed Dewey in endorsing induction and rejecting claims to knowledge unrelated to experience—premises 3 and 4.

Foster's perception of social (and economic) inquiry indicates that the initiation, formulation and application of warranted knowledge requires that judgments continuously be made concerning the selection of topic, the choice of data, the logical ordering of data, and the plausibility, pertinence, and explanatory capacity of causal hypotheses.^{[12]:63}

Tool shows that Foster consistently applied the four premises constituting instrumentalism, even though he rejected the caption "instrumentalism." Foster judged that naming a school an "ism" turns its premises into a static ideology endorsing conclusions reached rather than practical tools for open-ended inquiry.^{[12]:129ff} Tool closes his study with the caption "instrumental value theory" often used by Foster himself: "As is now evident, instrumental value theory provides the meaning of, and an intellectual strategy for, economic progress."^{[12]:209}

4 Current status of Instrumentalism

This article shows that Dewey and Popper remain sources of both definitions of and confusion over the meaning of Instrumentalism. Despite near universal acceptance of premises 1 and 2—treating theories as instruments of inquiry which are tested by the instrumental criterion of judgment, none of the men above chose to call himself an instrumentalist. The name is most often invoked by critics, claiming the school represents the failure of premises 3 and 4.^{[14][15]}

5 References

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