

Coming to Conclusions Based from Evidence: The Double-Movement of Reflective (Critical) Thinking

John Dewey defines a certain kind of thinking he claims is more valuable and powerful which he called “reflective thinking” but we would call “critical thinking” today. Here is his definition for “reflective thinking” from his book [How We Think](#): “Active, persistent, and careful consideration of any belief or supposed form of knowledge in light of the grounds that support it, and the further conclusions to which it tends, constitutes reflective thought” (6).

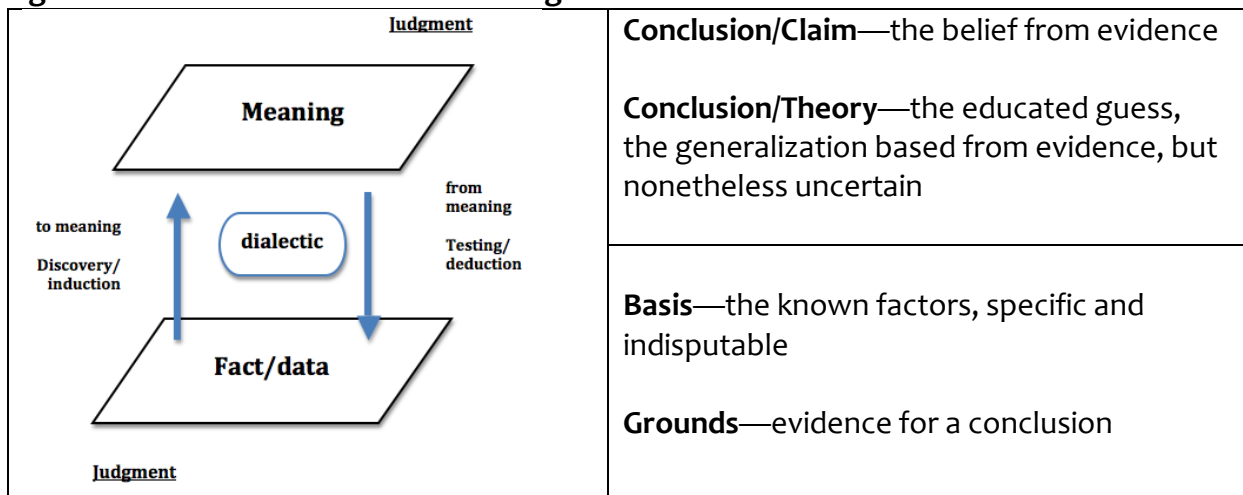
Dewey’s reflective thinking, inference, and metaphor all revolve around a similar mental movement that Dewey calls the “double-movement” of reflection. This movement really is about how we reach a conclusion or meaning based from available evidence.

Critical Thinking, in particular, is useful when applied to some question or problem with no easy or clear answer.

Dewey's "double-movement" of reflection

"There is thus a double movement in all reflection: a movement from the given partial and confused data to a suggested comprehension (or inclusive) entire situation; and back from this suggested whole—which as suggested is a meaning, and idea—to the particular facts, so as to connect these with one another and with additional facts to which the suggestion has directed attention" (Dewey 79).

Diagram of Double-Movement of Thinking:



Key Term: Inference--What is an "inference?"

Definition: An inference is a belief (or statement) about something unknown, made on the basis of something known.

I feel a cool breeze and think, "Is it going to rain?" Maybe. To test this theory, I look up at the sky and see a dark cloud (a known fact). Based upon the dark cloud, I INFER that it will rain. I see the cloud; I infer the rain.

“We stop and think, we *de-fer* conclusions in order to *in-fer* more thoroughly” (108).

This double-movement of thinking describes the mental moves we make to come to a conclusion based from evidence:

“we consider the possibility and nature of the connection between the object seen and the object suggested. The seen thing is regarded as in some way the ground or basis of belief in the suggested thing; it possesses the quality of evidence.

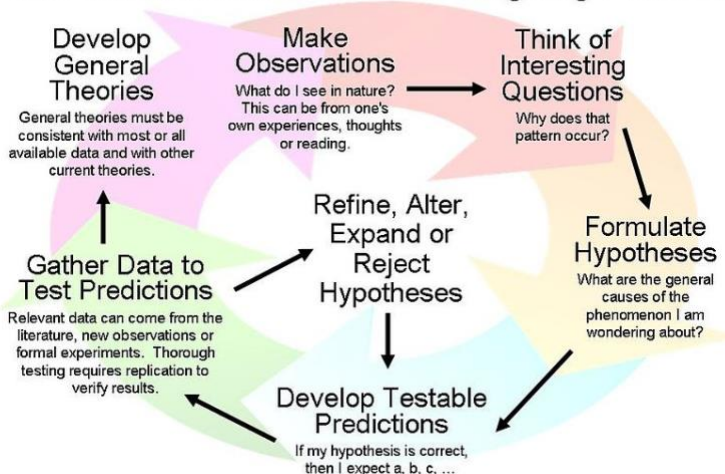
This function by which one thing signifies or indicates another, and thereby leads us to consider how far one may be regarded as a warrant for belief in the other, is, then, the central factor in all reflective or distinctly intellectual thinking”(7-8).

... “Thinking... is defined accordingly as that operation in which present facts suggest other facts (or truths) in such a way as to induce belief in the latter upon the ground or warrant of the former” (9).

The Sequence (or consequence) of Reflective/Critical Thinking:

(i) a felt difficulty	What is this? What does this mean?
(ii) its location and definition	What is this “problem” (question) really about? What’s its special character?
(iii) suggestions of possible solutions	It could be this? It could be that? It could be something else?
(iv) development by reasoning of the bearings of the suggestion	Let me see if it is this? Does this make sense? Let me see if it is that? Does that make sense?
(v) further observation and experiment leading to its acceptance or rejection; that is, the conclusion of belief or disbelief [confirmation or negation of the suggestion]	Let me double-check this. Let me verify it. Let me accumulate reasonable grounds for this conclusion.

The Scientific Method as an Ongoing Process



The Reflective Thinking Process resembles the Scientific Method

except

the end point in the Scientific Method is a Theory and for Reflective/Critical Thinking it is a Conclusion or Belief that is either

confirmed or rejected/negated

Analysis of a Complete Act of Thought Following the Sequence of Reflective Thinking

2. "Projecting nearly horizontally from the upper deck of the ferryboat on which I daily cross the river, is a long white pole, bearing a gilded ball at its tip. It suggested a flagpole when I first saw it; its color, shape, and gilded ball agreed with this idea, and these reasons seemed to justify me in this belief. But soon difficulties presented themselves. The pole was nearly horizontal, an unusual position for a flagpole; in the next place, there was no pulley, ring, or cord by which to attach a flag; finally, there were elsewhere two vertical staffs from which flags were occasionally flown. It seemed probable that the pole was not there for flag-flying.

"I then tried to imagine all possible purposes of such a pole, and to consider for which of these it was best suited: (a) Possibly it was an ornament. But as all the ferryboats and even the tugboats carried like poles,

this hypothesis was rejected. (b) Possibly it was the terminal of a wireless telegraph. But the same considerations made this improbable. Besides, the more natural place for such a terminal would be the highest part of the boat, on top of the pilot house. (c) Its purpose might be to point out the direction in which the boat is moving.

"In support of this conclusion, I discovered that the pole was lower than the pilot house, so that the steersman could easily see it. Moreover, the tip was enough higher than the base, so that, from the pilot's position, it must appear to project far out in front of the boat. Moreover, the pilot being near the front of the boat, he would need some such guide as to its direction. Tugboats would also need poles for such a purpose. This hypothesis was so much more probable than the others that I accepted it. I formed the conclusion that the pole was set up for the purpose of showing the pilot the direction in which the boat pointed, to enable him to steer correctly."

From pages 69-70 of *How We Think*.

i. a felt surprise/difficulty:

notices flagpole-looking object but it is horizontal and in a bad place for a flag pole.

ii. location and definition of the difficulty

What is this object? What is it for? It doesn't fit as a flag pole, so what is it?

iii. suggestions of possible solutions/answers

1. could be an ornament
2. a terminal of a wireless (radio) telegraph
3. might be to point out direction boat is moving

iv. develop reasoning on the bearings of the suggestion (what reasoning and evidence/grounds is there for this interpretation?)

1. hypothesis rejected because all ferryboats and tugboats carry them
2. more natural place for a pole for the wireless (radio) would be higher; rejected also on previous grounds from #1.
3. discovers pole lower than pilot house so steersman could easily see it

v. further observation and experiment leading to acceptance or rejection

--makes further observations and found the steering pole hypothesis to be "more probable than the others" and ends with conclusion that the pole was set up for the purpose of showing the pilot the boat's direction

