Understanding How You Solve Problems:

A Method Towards Understanding Self-Meaning

By Garrett Barden

Problem-solving is part of our everyday experiences. Whether the issue is big or small, we often get puzzled by something and look for ways to understand and come up with the 'best' solutions. But how much are *really* aware of this process in which questions are asked, hypothesis are raised, and judgments are made in an effort to problem-solving?

In the below, Philosophy scholar Garrett Barden proposes a useful experiment for thinking about **how we know what we know.** He uses the example of a sequence of letters and slowly deconstructs how we react to it and draw conclusions about its meaning. As you will note, his rather meticulous exercise works on four levels:

1 – Questioning: "What is…"

2 – Answering (Hypothesis): "It is…"

3 – Testing: "Is the hypothesis right or wrong?"

4- Judging: "It is right…" or "It is wrong"

Proposed in the 1960s, his thorough method, which he calls *Introspective Science*, gives you a powerful tool to form opinions based on a well considerate process. In times of instant opinions and lack of *real* dialogue in public debates his method is timelier than ever.

If you would like to learn more about his method, click here to watch our close reading session with him.

PART I

On Reading a Sentence

1. Look at the following letters :

   aabbcceeeeeeeffghhiiikllllmooooorsssttttww

Here I am presuming that you 'see them as' letters and not unfamiliar shapes. (see 3 below)

2. Now look at these letters:

   If all who bought tickets come there will be too few seats

3. You will have *seen* the first expression (1) simply *as* a sequence of letters. I have emphasised 'seen' and 'as'. Wittgenstein discussed 'seeing as'. I understand him to mean that we 'see' marks on the page but see them as, or understand them to be, some but not all of the letters used in the English alphabet. Some alphabets with which you may be familiar include more and some fewer letters. You see them as letters but as a sequence of letters they make no clear sense. You may notice that the letters included are in the familiar alphabetical order.

4. You might suspect that they were an expression in a code with which you were unfamiliar. That suspicion is a *hypothesis* - that is, provisionally, you take them to be an expression in code. The hypothesis is not only not necessarily true – that is, it does not necessarily express the reality – but, for present purposes, more importantly, is not something that you can see.

5. The second expression (2) is also a sequence of letters. But you 'see it as' that is, you understand it to be, a sentence that you understand. If someone who knew too little English to understand the sentence, you would try to translate it into a language known to that person. Whatever words you use in the translated sentence, what you are trying to do is to express your understanding of the English sentence into the language understood by the person who does not understand English.

6. Almost without noticing, however, you have *assumed* (hypothesised) that the person to whom you are talking understands what is involved in buying tickets to reserve a seat. And if that person was from a wholly different culture from yours you might discover that they understood your words taken separately but not what your words taken together (the sentence) meant.

7. That experience might reveal to you that to understand means to understand what is meant. If you tell someone that the co-ordinates of Cork Airport are 51.54N and 6.29W they may have little difficulty with the language but may have little or no idea of what is meant. They might well say: "I have no idea what you are talking about beyond that you are saying something about Cork airport". They have heard (experienced) what you said but they did not understand it.

8. What is the relation between the sequence of letters in (1) and the sentence in (2)? It is very likely that you already asked yourself that question. *But why did that question occur to you?* Perhaps because you took it for granted or suspected that I would not have written (1) and (2) unless there was some relation between them.

9. Once again you have assumed (hypothesised) that something is to be understood. When one raises a question one assumes that there is something to be understood but it may be that, sometimes, there is nothing to be understood, in other words, the question does not *properly arise*; the questioner has made an assumption that ought not to have been made.

10. However, once you have made the suggestion that there is a relation between the sequences of letters in (1) and (2) the question has, as matter of fact, arisen and will remain in your mind until you either forget about it, give it up, or succeed in answering it (to your satisfaction). The answer might be that there is no relation between the two sequences.

11. You might notice that sequence (1) does not contain all the letters in the English alphabet. A further question erupts: why not? On reading sequence (2) you notice that it too does not contain all the letters in the English alphabet. That, of course, is not an oddity; very few sentences contain all those letters. It is, fact, quite difficult to compose such a sentence.

12. Now the insight may come upon you that sequence (1) contains all and only those letters that make up sequence (2). That is a hypothesis and, before coming to a *judgement* you examine the second sequence in the light of the hypothesis or suggestion. (You will discover, if I have written the sequences correctly, that the hypothesis is correct.) Your discovery that the hypothesis is correct grounds the judgement: only the letters that occur in the second sequence occur in the first sequence.

13. The judgment may lead you to raise a further question. Why are different letters in sequence 1 repeated and why are some repeated more often than are others? That may lead you to ask how many times the letter 'a' in sequence (1) is repeated in sequence (2).

14. Other questions may occur to you. Or may not. When we try to understand something we try to ask relevant questions but they occur or do not to us –we sometimes say 'it strikes me to ask'. A Question may occur to you for which the Relevant Data to Come to an Answer are Obscurely Contained in the Second Expression (2 above).

PART II

1. There were more tickets for sale than there were available seats. The number of seats available is *given in code in the set of letters* in the sentence. The question is this: how many seats are available?

2. The sentence does not state how many seats are available.

Clearly, the sentence, read as a simple sentence in English, does not give the answer to the question as to how many seats were available. *If the answer is somehow contained in the sentence you will understand and judge the sentence to be in code.* You surmise (hypothesise) and conclude that it is in code - you do not *see* that it is.

3. Almost without noticing, it will *strike you* – that is, you will have the *insight* – that the sentence is a *set of letters that in some way includes a set of one or more numbers.*

4. Your question now becomes: how does this set of letters contain a set of numbers? (Of course, you accept that the set contains a set of numbers because I have said that it does and you *believe* me.)

5. When you begin to try to associate the letters with the numbers it will sooner or later occur to you - that is, you will have the insight - that there is an indefinitely large number of ways in which the letters can be associated with the numbers and you may suspect that there is no way in which any association is better than, or fundamentally different from, any other.

6. Except one.

7. If the sentence is typed differently *you will grasp a new kind of association* between the letters and numbers :

If aLL who bought tIckets coMe there wILL be to few seats.

8. The letters in capitals are in order of appearance : ILLIMILL

9. Each is a *Roman* numeral.

10. Put in the order in which Roman numerals are written to stand for a number, you get

   MLLLLIII. M=1000, L=50, I=1.

(Properly, LLLL would be written CC or 200 and the expression would be MCCIII or, in *Indo-Arabic* numerals, 1203.)

11. The suggested answer to the question as to how many seats are available is that there are 1203 seats available.

12. The *suggested answer* is the fruit of an insight into the data in the light of the question.

   Is the answer correct?

Are you convinced – fully convinced, more or less convinced? Convinced that it is the only correct solution?

You are now subjecting your insight to the *reflective question*: Is the suggested solution that is the fruit of my insight correct?

The answer to that question is one of these: Yes, it is correct; No, it is mistaken; I am not yet sure and, therefore, don't yet know.

13. Each of those answers is a *judgement for which you take responsibility* :

(i) 'Yes it is correct' means 'I have judged and take responsibility for my suggested conclusion being correct'; (ii) 'No, it is mistaken' means 'I have judged that it is mistaken and take responsibility for that conclusion'; (iii) 'I don't yet know' means that you are not yet convinced that your suggestion is correct or incorrect.

Are you in fact convinced that the number of seats available is 1203 or convinced that the number of seats available or still unsure?

14. If 1203 is the correct answer the reality is that there are 1203 seats available; if it is not correct, the reality is that there are not precisely 1203 seats available - there may be more or fewer; if you think that your suggested is uncertain, and may be true or false, then the reality is that there may be precisely 1203 available or some other number – more or fewer – of seats available.

15. What is the reality of the situation? The reality – that is, is what is in fact the case – is *known in true judgement*.

16. Why do you think that a particular judgment is true? Simply because you have judged the evidence to be sufficient. Think of this problem: a + b = 7. Find the possible values of a and b. The question is this: what are the possible values of a and b. You cannot make sense of the question unless you have understood that « a » and « b » represent numbers and that « 7 » represents a particular number expressed as a numeral in Indo-Arabic notation. You know what the signs « + » and « = » mean. Imagine for a moment that you have no idea what the shapes mean. Were you in that situation, you would have no difficulty seeing the shapes and even were someone to someone tell you that «+ » meant « and » or « plus » and so on you would still be puzzled. As a matter of fact you have been educated in a culture that includes simple arithmetic and algebra. You know that « a » and « b » stand for numbers and that when those numbers are added together (+) they equal (=) the number seven for which the familiar numeral is 7 and you know that the expression for the sequence of positive numbers is 0 1 2 3 4 5 6 7. You will at once understand that the problem facing you is to discover which sets of two numbers (a and b) when added equal 7. A moment's reflection will throw up the insight that the relevant sets are (o + 7), (1+6). (2 + 5) …It is worth remembering that a child in the first months of primary school would not have been able to solve the question.

17. What is *sufficient* evidence? Have you sufficient evidence to be happy with the suggested solution? That is a personal question. That fact that you will all agree does not mean that it is not personal. You agree because each person understands and each is convinced that the evidence is sufficient. But now return to the elucidation of the code.

PART III

Is the Code the Set of Roman Numerals?

1. I have said that the code is the set of Roman numerals. If you believe me, you do so because you have judged that I invented the sentence and the code and am telling the truth.

2. Could you have found that code by yourself? And, if you had suspected that it was the code, could you be sufficiently convinced that your suspicion was (a) *certainly* correct (b) *probably* correct (c) *possibly* correct.

3. Could the code be other than Roman numerals?

4. You might well judge that it could be and if you did come to that judgement, then you would no longer be convinced that your suspicion that it was a set of Roman numerals was certainly correct. Would you be convinced that it was probably correct? You would most likely be convinced that it was possibly correct.

5. Read the sentence again:

   If all who bought tickets come, there will be too few seats.

   In fact, as I have said, I intended Roman numerals to be the code.

6. Now, I ask if I can find another possible code that I did not invent or intend. This suggestion has occurred to me : the code is a number that can be spelled using only letters within the sentence : 1 cannot be spelled ; 2, 3, 4, 8 can be spelled ; 5,6,7,9,10,11,12,13,… cannot be spelled. The result of the hypothesis is that there are 2, 3 . 4, or 8 seats.

7. Taking it that there is no other code in the sentence – which is, perhaps, a provisionally plausible working assumption, is it a plausible hypothesis that there are only 2, 3, 4 or 8 seats ?

8. The question 'Is it a plausible hypothesis?' appears to be abstract but in reality it is *personal*:

   - 'Do **I** think that this is a plausible hypothesis?'

   - 'Do **I** take responsibility for this hypothesis?'

9. The numbers that can be spelled are 2,3 , 4 and 8 (as far as I have discovered), but how are they to be put together to make a number 2+ 3 + 4 + 8 or 2348 or some other number made up from some set of those numerals ?

PART 4

A Choice (?) Between Hypotheses.

1. One code yields the number 1203, the other – plausibly but not certainly -yields 2348.

   Without any further information which do you find more plausible?

2. The one that *I intended* yielded 1203.

   But there is a small stumbling block: 1200 would perhaps seem more plausible; 1203 might give you pause when comparing it with the second code (which I discovered but did not intend) of 2348 or some other number made from those numerals…

3. Is the best judgement that there is not sufficient evidence to prefer any one hypothesis over another or do you want to judge that best hypothesis is one of the possibilities and give some reason why you take it to be?

4. Notice that if you think the best judgment is that there is insufficient evidence for any one of the hypotheses, you are taking responsibility for that conclusion.

5. Perhaps someone will have come up with a solution that they take to be correct. That person will be, in principle, willing to give reasons to others for that conclusion; they will already have given reasons to themselves.

6. Can one be wrong? Of course, as I was when I overlooked the fact that 8 could be taken from the set of available letters.

7. Is my present suggestion that there is insufficient evidence for any particular answer certainly the correct answer? No.

   In C.S. Peirce's phrase it is *provisionally* true; for Lonergan, it is the *best available* opinion. They mean, I think, the same thing.

8. Has the real been reached?

   Perhaps, but we do not yet know. For what is real is given in the correct answer and we have as yet reached only the plausible.

9. 'Truth' is the asymptote of science: we *approach* always, we never reach it'.

10. In our *common sense* or *everyday judgments* we reach conclusions that it would be at least odd or foolish to reject.

11. When you read 'The End' at *the end* of these pages, it would be merely foolish to suppose that you misunderstood the words that the letters in that order indicated.

    And, had I written FIN instead of END you would not have thought that I referred to a fin on the back of a fish.

    Where the words appears on the page evokes your understanding and tends to confirm your judgement.

THE END