The Measurement of Consciousness

Aman Chawla

Abstract

In this brief note, the author discusses how consciousness may be measured.

Suppose consciousness is nonlocal in space and time. What does it say about the measurement of consciousness? Even though matter, in the quantum description, is nonlocal, we can still measure it. This is undertaken in quantum measurement theory. Since material instruments are required for the measurement of matter, it would be a mental instrument or an instrument based on consciousness that alone could measure consciousness. A clear instrument then is our own local consciousness or that of another person.

Suppose we have a local consciousness instrument (LCI) and with it we wish to measure the nonlocal consciousness (NC). To make a measurement we would need to somehow couple the LCI with the NC which we wish to measure. Let us say that LCI exists in (ΔX, ΔT) spacetime coordinates. NC exists (by the Special Theory) but we cannot say where and when it exists. How are we then to perform the coupling? Let us look to quantum measurement theory for inspiration.

Suppose we are using quantum meters to detect gravitational waves. In this case the meter is a local device while the gravitational wave, being an emanation of a gravitational mass, is an extended object in spacetime whose position is constantly changing and whose time of existence is from instant of emission to infinity. We have thus different spacetime characteristics of the instrument and its object (the wave) but yet we can perform a quantum measurement via coupling. The instrument's time of existence is much shorter than that of the gravitational wave.

Let us say the NC "emits" a wave at a time t1 in the LCI's frame of reference (with respect to the LCI). This is a wave of NC which couples with the LCI. How can we, the possessor of the LCI, extract information about the NC from the LCI-NC coupling? Post-coupling, we can only examine the LCI. Let us say before the coupling, the LCI had a property A which had a value a. After coupling the value changes to a'. Taking the difference a - a', we would have measured the transformation of the LCI as a result of coupling. Does the coupling, once initiated, ever terminate? Suppose it did terminate. This would mean in the LCI's frame there would be a time t2 when it is no longer coupled to NC, such that t2 $>$ t1. So for t2-t1 duration the coupling persisted, as per the LCI's frame. This would mean that the coupling is a local phenomenon. This would contradict the fact that it was a wave from NC that was coupled to the LCI and would imply that no coupling ever took place. Thus we have a proof by contradiction that coupling with NC, once initiated, never terminates. This means that as per the LCI, coupling lasts from t1 to infinity. Which means that at any future time point one can examine the LCI. Which means permanent transformation of LCI has taken place. The property A will have the value a' from t1 onwards. Let us now come back to the hypothesis that the NC emits a wave at a time t1. Were the NC a local entity, to emit a wave would imply that a part of it left it and thus it got diminished. However since it is nonlocal, no part can be ever said to 'leave' it. This implies either that the NC cannot emit waves or that it emits waves that remain within it. The former would be a limitation which we do not accept for the NC. Thus the latter must hold.

At t1 in the LCI's frame, NC emitted a wave that coupled NC to LCI, a wave which however, remained within NC. If the wave remained within NC, then the coupling was performed within NC which implies that LCI remains within NC. Thus t1 in the LCI's frame is also within NC. This means that NC exists at all times. LCI has a spatial extent which remains within NC. This means that NC exists at all spatial positions. So the spacetime location of the LCI can be arbitrary. There is no preferred position in space and time for the coupling to take place. Our conclusions are: 1. Coupling with NC, once initiated, never terminates. 2. NC exists at all spacetime positions.

Is there a preferred frame for the NC? The question is how do we decide 'when' and 'where' the NC emits its wave? But the question is a flawed, local question. To ask when and where NC emits a wave is to also give a time and place to the NC which is a contradiction. Thus the NC doesn't emit a wave in spacetime. Yet it can emit waves since it has no limitations. To resolve this dichotomy we would have to posit that the NC emits its waves to the LCI, at a "point" which is the borderland between locality and nonlocality. So it behoves us to place the LCI at this borderland. In light of postulate 2, we can say that the best (or suitable) LCI is one that is placed in this borderland. Which means that apprehension of NC by LCI takes place at the borderland between locality and nonlocality. This borderland cannot be located in spacetime, for if it were that would disjoin it from nonlocality completely. At the same time this borderland exists. So where and when does it exists? It exists everywhere and at every time. It is nonlocal itself. To measure NC we must place the LCI in a nonlocal borderland. Being a nonlocal borderland LCI would have no spacetime position in it. Which means LCI cannot be even located in this borderland. Which means that the LCI would have to be the borderland. Thus each LCI is the borderland where locality meets nonlocality. This means that the consciousness of each LCI is nonlocal. This means that LCI is a part of NC, for if there were to be a NC outside NC, that would delimit NC and NC can have no delimitations.

So does the NC emit a wave? If so to whom or to what does the NC emit a wave? If the NC emitted a wave, it would lie in (be a part of) the consciousness of NC and so it would be a nonlocal wave. So the wave cannot be located in space and time. If it exists, it must exist in all space and all time. Thus the wave must be identical with the NC. Which is to say that the wave or connection between NC and LCI is ever and everywhere. Which means that this connection, once established is unbreakable. To say it is established at t1 is to maintain a local posture. If the reader is interested in apprehending NC, it is better for him or her (in light of Postulate 2) to abandon this posture and take up the posture that there can be no separation between LCI and NC. That is, every LCI is NC. A plurality is being identified with NC. But NC is not quantifiable (were it, it would be local) and so no problem arises.

Now if the NC can but doesn't emit waves, then there cannot be a contact between LCI and NC since wave is just a stand-in for some form of contact. (One can continue the above developed argument by just replacing wave

by some form of contact mechanism.) So if there is a mechanism for NC and LCI to interact, then every LCI is NC. Should there be a mechanism? Suppose there were no mechanism for the interaction. Then the interaction could not take place. Which is to say the NC could not interact with LCI, any LCI. This would imply that either consciousness is local (which contradicts Postulate 1) or NC is limited. Both of these are contradictions. Thus there must be a mechanism for the interaction. Hence, conclusively, every LCI is NC.

Either LCIs don't exist, in which case consciousness doesn't exist and so we need not bother with a theory of consciousness (which by the way is a materialist position). Or, LCIs do exist and this result is applicable. Thus the special theory when combined with the general theory leads to the result that every conscious human being's consciousness is NC. In other words, our own local consciousness is nonlocal consciousness. To measure NC and determine its characteristics or properties it suffices to therefore self-examine our own local consciousness. A paradox which masquerades in many different forms, stands resolved: how can the finite plumb the infinite, or how can a salt doll plumb the salty ocean?