The Journal of Mind and Behavior
Spring 1990, Volume 11, Number 2
Pages 225–232
ISSN 0271-0137

The Moon Is Not There When I See It: A Response to Snyder

Mark Garrison

Kentucky State University

In a series of articles, Snyder has developed the idea of simultaneous situations and that concept's implications for physics and psychology (1983a. 1983b, 1983c, 1984, 1986, 1988, and 1989). In recent articles (1986, 1989, 1990), he develops the application of the concept to the Einstein, Poldosky, and Rosen *Gedankenexperiment* that utilized spacelike separated events to solve the problem that arises in Bohr's complementarity interpretation of quantum mechanics. In the course of his most recent article (1990), Snyder made several criticisms of Garrison (1988) in order to strengthen Snyder's argument for a cognitive-interpretive activity in the *gedankenexperiment.* These criticisms are addressed and Snyder's Einsteinian realism is contrasted with Garrison's verificationist stance.

Snyder cites my article (Garrison, 1988), "Relativity, Complementarity, Indeterminacy, and Psychological Theory," quite frequently in his "On the Relation Between Psychology and Physics" (Snyder, 1990). Our common ground is that of the role of the observer and the observed world and the importance of relativity and quantum mechanics for psychology. Oddly though, while praising the importance of several of my points and my overall objective, the focus of his own argument appears to be premised upon challenging and correcting several "imprecise" statements that I made. Central issues of my argument are not considered in the development of his own argument, and I believe several of these are quite important to his interpretation. I shall focus my response by first addressing several of the "imprecise" statements, and then by responding to the reasoning of his argument. My intent is to draw several distinctions between my view and Snyder's with arguments partly based upon my earlier paper and partly upon the reasoning and evidence Snyder himself invokes.

As a preface to my response, I think it is important to state how I understand Snyder's claims about the relation between physics and psychology. As I understand it, his concept of simultaneous situations (Snyder, 1983b) can be applied to the

Requests for reprints should be sent to Mark Garrison, Ph.D., Division of Behavioral and Social Sciences, Kentucky State University, Frankfort, Kentucky 40601.

problem of the Einstein, Poldosky, and Rosen *Gedankenexperiment* (EPR). The EPR was a challenge to the orthodox Copenhagen interpretation of the quantum theory – the interpretation that led to Bohr's complementarity thesis as a means of resolving the incompatibility of the wave and particle pictures from classical physics as they are applied to quantum theory. Snyder claims that the existence of mutually exclusive perspectives in a single observer accounted for the apparent cognitive correlation that must occur in spacelike separated events. Snyder invokes statements by both Einstein and Bohr for evidence of the necessity of accepting this cognitive component.

In my article I did not address the notion of simultaneous situations because my attention was focused upon relativity as a paradigm for incommensurable perspectives from the point of view of the theoretical modalities, not the individual observational situation. I defined Snyder's view as an account for the relativity as applied to individual subjective experience. It remains my position that this is a limited application of the relativity paradigm to psychology (perhaps the equivalent of a special relativity theory). I believe that the difference between our views will be clarified below. Prior to discussing these differences, it is best to address a few of Snyder's challenges in order of their appearance.

Response

1. "Imprecise statements reflect the recent attempt by psychologists to gain the background in physical science . . ." (Snyder, 1990, p. 2) that historically earlier psychologists had. Though I am not certain of its relevance, my knowledge of modern physics (and calculus, though long atrophied) was prior to my knowledge of psychology. What though are the consequences of the rediscovery by psychologists of physics? According to Snyder, it is a fervent effort to apply physics to psychology. His goal runs counter to this interest, that is, he seeks to apply psychology to physics. It is unclear, though, exactly which imprecise statements have revealed this apparent weakness of the psychological enterprise.

2. Somehow, my discussion of physics reveals an implicit assumption regarding the nature of observation as *human observation* in physics. This Snyder considers to be either in error or ambiguous, however, I believe that I am quite aware of the instrumental nature of physical observation. I am at a loss to identify the passages that support Snyder's claim of my implicit assumption. My only discussion of measurement and observation in physics was in regard to the "judgment" of simultaneity and sequence of three timelike separated events (I did not use "timelike" in my article, but I want to stress this now to distinguish from spacelike separated events). The word judgment may somehow imply a human act of observation, but this human act is based upon the judgment of simultaneity so crucial to the earliest formulation of special relativity. Says Einstein in his 1905 paper, "We have to take into consideration the fact that

those of our conceptions, in which time plays a part, are always conceptions of synchronicity" (quoted from Saha and Bose's translation of "On the Electrodynamics of Moving Bodies," *Anallen der Physik* [1905], p. 891 in Shamos, 1959, p. 320). I do understand however, that should this assumption be taken as a natural, if not a logically sound and valid assumption now lost to physicists, then the acceptance of the cognitive component in spacelike separated events becomes more reasonable. Thus Snyder is identifying my purported confusion in order to gain tacit support for his position. While I have no objection, this is a bit of a roundabout means of gaining my support.

3. Perhaps the most damning critique by Snyder is of my "history" of the application of physics to psychology. In the course of his critique, he suggests that my unusual separation of the complementarity and indeterminacy into *separate* concepts comes originally from Lemert (1974) and that I did not properly credit Lemert. While there is what might be considered a sufficiently clear reference on my page 119, the rationale for separating these concepts has a much more compelling priority in their own history. Though complementarity and indeterminacy arose because of the same theoretical impasse, complementarity refers to the incommensurable aspect of the classical wave and particle pictures and indeterminacy refers to Heisenberg's uncertainty relation as it arose in the act of measurement—mathematical formula and all. That these then in turn apply to different aspects of psychological theory suggests that it should be acceptable to separate them in discussion. I was discussing the complementarity of the "pictures" generated by each modality of inquiry, and the consequence of indeterminacy that our acts of observation—whether they be instrumental or directly human—interfere with the observed object. These are sufficiently different topics as to require separate treatment. (I do not believe that Lemert is the first to separate these concepts.)

4. A second "history" reference was made regarding my citation (and dismissal) of Stephenson (1983) as an attempt to apply quantum physics to Q-sort methodology. In support of Snyder's analysis, I too found little relevance in Stephenson, but I did suggest that his efforts reflect a growing interest in psychology to draw upon examples from modern physics.

5. A third, and perhaps the most confusing, "history" reference was made concerning how I had interpreted Kuhn's (1962) contribution to the relation of physics to psychology. Somehow, Snyder has come to understand that I was saying that Kuhn had applied modern physics to psychology. What I said was that two "possible routes" were available for the integration of the lessons of theoretical physics into psychology. One of the routes would be the use of historical analysis "initiated by criticisms based upon Thomas Kuhn's analysis of scientific revolution" (Garrison, 1988, p. 114). Historians of psychology are now quite frequently turning to Kuhnian and post-Kuhnian historical anlysis to assess the scientific status of psychology. This does not suggest that Kuhn has applied the concepts of relativity and quantum mechanics to psychology. Textbooks

in the history of psychology reflect this interest in Kuhn as a means of assessing psychology, and one needs only examine some of the more popular for evidence of this view (see Brennan, 1986; Hergenhan, 1986; Marx and Cronan-Hillix, 1987).

6. Snyder suggests (1990, p. 5) that my dismissal of his work as "philosophical" allowed me to claim priority in the development of a relativity paradigm for psychology. While this may be the psychology of my article, it was not my intent. From my perspective, his description of simultaneous situations is, if not a philosophical statement of position, at least a metaphysical (i.e., "about the physical") position. My focus was, in this view, metatheoretical, or "about the theoretical." I hope to clarify this difference below, but with regard to my apparent "claim of priority" I made none and do not believe that any was implied. I argue in the course of the article that three concepts from physics have direct application to theoretical and methodological approaches in psychology (indeed, three distinct methodologies). Once applied, these concepts force a radical revision of our positivist ideas regarding causality, time, observation, and the ontological status of the subject. This is a markedly different approach from that of Snyder.

7. Following the challenge to my priority, Snyder suggests that my discussion of the temporal dimensions of relativity are imprecise. According to Snyder, "physicists consider that temporality is linked to causality and causality is limited by the empirically determined invariant velocity of light" (Snyder, 1990, p. 8). Einstein does not directly address the issue of causality in his discussion of special relativity, but instead focuses upon the problem of physical description as it is effected by the invariant velocity of light. The core of that description is the simultaneity, or synchronicity, of events, and whether two events will be synchronous for one observer and not synchronous for another (therefore, one event will precede the other, as I described on p. 120). Causality becomes of interest when the time-order relationship criterion of causality is violated as a consequence of the temporal relation of events becoming relative to the frame of reference of the observers (see Einstein in Shamos, 1959, p. 323; Einstein, 1956; Heisenberg, 1949, 1958, and 1971 for discussion of the same issue). My statements regarding relativity are not imprecise.

In Summary

It was not my intention to offer a history of the idea of applying concepts from modern physics to psychology. My purpose was to map the course of a few relevant ideas and attempts that had preceded my own, and to identify the two choices, as I saw them, for using physical theory to resolve a crisis of method that became evident as a result of Packer's (1985) analysis of psychological method. For the positivist perspective that psychology tends to hold, the existence of three competing methods is an untenable situation. The logic of my argument is

quite simple. If psychology has borrowed from the paradigmatic natural science the fundamental method (observe, measure, and predict), then the evolution of that paradigmatic science should be examined closely for implications that may change how psychology goes about its scientific work.

Analysis and Comment

With these more or less direct responses to Snyder's criticisms covered, I would like to discuss the substantive differences that arise in the context of his article. His dependence upon the concept of spacelike separated existants is at the center of our differences. Quantum mechanics has two basic interpretations, one represented by Bohr's anti-realism, the other by Einstein's realism. For Bohr, the classical descriptions of wave and particle could not precisely fit the reality described by quantum theory, so the concept of complementarity satisfies the "imprecision" (Krips, 1987) of the descriptions. Heisenberg, in a variation of this interpretation, supported a "verificationist" position—that there is nothing behind the indeterminacy. Einstein's view was that the classical concepts needed replacement with descriptions that would eliminate the indeterminate character and return physics to its previous precision (see Krips, 1987, pp. 1-5). Essentially, there are three distinction positions, that of Bohr, that of Heisenberg, and that of Einstein. Bohr's and Heisenberg's positions would be considered anti-realist for slightly different reasons (see also Redhead, 1987; Sachs, 1988).

Snyder's efforts to support the EPR experiment with the concept of simultaneous situations requires the addition of an observing mechanism that is not subject to the limiting invariance of the speed of light, but is instead capable of instantaneous decision and correlation. The argument for a cognitive component of spacelike separated events is a means to overcome Heisenberg's insistence that the measurements have real, instrumental verification and that the concepts arising from them be based upon this kind of verification. The instantaneous cognitive correlation avoids the issue of limits regarding physical measurement. To eliminate the problem of telepathic measurement at a distance, the *gedankenexperiment* creates a situation in which the experimenter makes a free choice of which quantity to measure at the moment the particle passes through the slit. The argument is also a means of overcoming the problem of classical terms not fitting reality. This problem gives rise to the complementarity thesis. If momentum and position can be measured precisely as a consequence of the experiment, then the problem of "renunciation" of one quantity as a result of knowing the other is no longer a problem.

Snyder must then be taking the realist position of Einstein and those who followed this view. Herein lies an unanswered potential contradiction: If there is some reality behind or beyond our measuring (perceiving ?) abilities, is not the notion of simultaneous situations one that requires a duality of perspectival reality and unseen reality? My position is that the theories in psychology verify

the nature of the objects of study *through the act of measurement itself*, not through the "thought experiment" that creates the unified, continuous human subject. As a scientist, I find Heisenberg's verificationist position much more palatable, and I believe that it should be rigorously applied to measurements in psychology.

This distinction is even clearer when one considers the nature of Snyder's simultaneous situations a bit closer. Heisenberg's uncertainty relation, thus the concept of indeterminacy, refers to the act of measurement in a single "observational situation" (after Lemert, 1974). The indeterminacy of this observational situation gives rise to the conceptual problem of the two classical pictures of waves and particles being imprecise and mutually exclusive (though perspectives of the same event). The complementarity thesis applies then to the perspectival situation determined by the decision to make a specific, limiting type of measurement. In effect, the perspectival situation determines which picture to follow, and the observational situation makes the two pictures incompatible.

Snyder has clearly indicated that the simultaneous situations involve mutually exclusive perspectives (1983a, 1990). His discussion of the EPR experiment demonstrates that he recognizes that an individual cannot have two observational situations simultaneously. The mutually exclusive quality of these perspectives arises due to the observational situations that cannot be reconciled *within* a single perspective (without this, the "mutually exclusive" quality would not obtain). However, his use of the simultaneous situation to argue for a cognitive component that has a non-interfering, determinate observational situation contradicts this analysis. His introduction of this concept suggests that the solution is in recognizing that "a fundamental relation between situations exists" (Snyder, 1983b, p. 394). That fundamental relation is the concept of quanta, a cognitive event (or the "human" in human observation) that has mutually exclusive manifestations in the classical wave and particle descriptions. Since I know of no such non-interfering cognitive observation, Snyder's concept remains metaphysical (in a good sense, I hope).

Conclusion

Now we should consider the question Einstein posed for us: Does the moon exist when I am not looking at it? As I understand Snyder's concept of simultaneous situations, it is possible that from one perspective the existence of the moon must be verified by my looking at it and that from another it exists independently of my verification. These are "mutually exclusive perspectives concerning psychological phenomena [that] can be maintained simultaneously by an individual" (Snyder, 1990, p. 6). My question is how? Is it that once I hold the position that the moon exists, that view becomes part of a simultaneous situation that includes my observation, when I step outdoors, that there is no moon tonight? Or is it the case that until I renounce my scientific verificationist position that I cannot experience in a pre-scientific manner the unified, continuous

existence of the moon?

The observational situations of physics are defined by single methods yet they produce these indeterminate results. The observational methods that support my knowledge of the moon arise separately, some in rigorously defined observations, some in pre-scientific, pre-reflective modes (to use a term from phenomenology). However, my selection of visual light does not renunciate the possibility of lunar cycles, circadian rhythms, and gravitational effects, also giving evidence that the moon is still there. The mutually exclusive character of these observations can only arise when the measurements made by these methods *cannot* be translated into the kind of measurement based in visible light. In fact, these various scientific and pre-scientific measures probably can be *synchronized*. My pre-scientific reflection of the regular cycles of the moon (perhaps even my memory of a romantic moon) continue to translate into an affirmation of the existence of the moon even when I adopt the observational situation based solely upon visual verification. The problem only arises within the observational situation that must renunciate other observational situations. Einstein's question misconstrues the verificationist's position (that is, that existence depends upon verification), implying that any measure completely excludes another measure. In quantum mechanics, the wave-particle dilemma arises because of the incommensurable nature of the observations and measurements, not because of the difficulty of humans conceiving the problem.

While Snyder's concept has merit, mutual exclusion is not guaranteed as a consequence of the invocation of simultaneous situations. The simultaneous situations principle should apply only to sets of observational situations for which there exists a fundamental incommensurability of verification. Actually, because of the invariance of the velocity of light, and because of my pre-scientific, lived world approach to the reality of visual phenomena, Snyder's concept of simultaneous situations demands quite correctly that when we look at the moon we respond to Einstein: "Since the moon is not there when I see it, *how can it be there when I do not?*"

References

Brennan, J. (1986). *History and systems of psychology* (second edition). Englewood Cliffs, New Jersey: Prentice-Hall.

Einstein, A. (1956). *The meaning of relativity* (fifth edition). Princeton: Princeton University Press.

Einstein, A. (1961). *Relativity: The special and the general theory* [R. Lawson, Trans.]. New York: Crown Publishers.

Garrison, M. (1988). Relativity, complementarity, indeterminacy, and psychological theory. *Journal of Mind and Behavior, 9,* 113–136.

Heisenberg, W. (1949). *The physical principles of quantum theory* [C. Eckart and F.C. Hoyt, Trans.]. New York: Dover.

Heisenberg, W. (1958). *Physics and philosophy: The revolution in modern science.* New York: Harper and Row.

Heisenberg, W. (1971). *Physics and beyond.* New York: Harper and Row.

Hergenhan, B. (1986). *An introduction to the history of psychology.* Belmont, California: Wadsworth.
Krips, H. (1987). *The metaphysics of quantum theory.* Oxford: Clarendon Press.
Kuhn, T. (1962). *The structure of scientific revolutions.* Chicago: University of Chicago Press.
Lemert, C. (1974). Sociological theory and the relativistic paradigm. *Sociological Inquiry, 44,* 93–104.
Marx, M., and Cronan-Hillix, W. (1987). *Systems and history in psychology* (fourth edition). New York: McGraw-Hill.
Packer, M. (1985). Hermeneutic inquiry in the study of human conduct. *American Psychologist, 40,* 1081–1093.
Redhead, M. (1987). *Incompleteness, nonlocality, and realism: A prolegomenon to the philosophy of quantum mechanics.* Oxford: Clarendon Press.
Sachs, M. (1988). *Einstein versus Bohr: The continuing controversies in physics.* La Salle, Illinois: Open Court Press.
Shamos, M. (Ed.) (1959). *Great experiments in physics.* New York: Holt, Rinehart and Winston.
Snyder, D. (1983a). The relativity of psychological phenomena. *Journal of Mind and Behavior, 4,* 75–85.
Snyder, D. (1983b). On the nature of relationships involving the observer and the observed phenomenon in psychology and physics. *Journal of Mind and Behavior, 4,* 389–400.
Snyder, D. (1983c). Standards of truth in perspectival framework for psychological phenomena. *Psychological Reports, 52,* 359–362.
Snyder, D. (1984). Mental activity and physical reality. *Journal of Mind and Behavior, 5,* 417–422.
Snyder, D. (1986). Light as an expression of mental activity. *Journal of Mind and Behavior, 7,* 567–584.
Snyder, D. (1988). On complementarity and causal isomorphism. *Journal of Mind and Behavior, 9,* 1–4.
Snyder, D. (1989). The inclusion in modern physical theory of a link between cognitive-interpretive activity and the structure and course of the physical world. *Journal of Mind and Behavior, 10,* 153–172.
Snyder, D. (1990). On the relation between psychology and physics. *Journal of Mind and Behavior, 11,* 1–18.
Stephenson, W. (1983). Quantum theory and Q-methodology: Fictionalistic and probabalistic theories conjoined. *Psychological Record, 33,* 213–230.