ON THE INTERPRETATION OF NOMIC NECESSITY:  
A REQUIREMENT FOR A SCIENCE OF MARKETING

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ABSTRACT

The authors borrow analytical concepts from the Philosophy of Science to address the "Is marketing a Science" debate. A requirement for a science is that all lawlike statements must possess nomic necessity. That is, statements must exclude accidental generalizations. However, it has been professed that lawlike statements in the social sciences do not possess such a criterion. The Levels of Necessity are examined and implications for marketing are discussed.

Is Marketing a Science?

Perhaps the oldest controversy in the marketing literature concerns the issue of "Is marketing a science?" The controversy originated with the early writings of Converse (1945) and remained a heated debate through the 1950's and 1960's. During the late 1960's, many of the substantive issues underlying the marketing science controversy were revitalized with the emergence of the "nature of marketing" debate fueled by Kotler and Levy (1969), Luck (1969), Dawson (1971) and others. Again, this controversy left many questions unanswered.

Later, Hunt (1976) fused the two major controversies by developing a conceptual model of the scope of marketing. Hunt used his conceptual model along with various analytical methods borrowed from the philosophy of science literature to address the "nature of marketing" and the "marketing science" debates. However, the issue of whether or not marketing or any of the social sciences is a science was still unclear due to the criterion of the existence of laws in a science. That is, all lawlike statements in the social sciences are not laws of strict universal form, thus they fail on the criterion so necessary for a discipline to become a science—falsifiability. Laws in the social sciences are probabilistic or statistical in nature. Therefore, statements of lawlike nature in the social sciences are fundamentally not falsifiable, and it is this criterion of falsifiability or testability that distinguishes between science and nonscience.

According to Hunt (1976), the role of laws play a vital part in determining whether or not marketing is a science. The development of laws in marketing is a requirement for explaining and ultimately predicting marketing phenomena. That is, laws or lawlike statements will provide predictive power which is necessary for the scientific understanding and control of marketing phenomena. However, is it possible to have statements of lawlike nature in marketing? Can lawlike statements in the social sciences satisfy the criterion of falsifiability? If so, marketing is indeed a science. The purpose of this paper is to demonstrate that marketing may, in principle, produce statements of lawlike nature.

The Nature of Laws

A statement must possess four criteria in order to be considered lawlike (Hunt 1976). First, the statement must be a generalized conditional. It must be of an "IF...THEN" form, indicating that if one event or set of circumstances exists, a second event or set of circumstances will be attendant. Secondly, the statement must have some empirical content. This criterion eliminates statements about anything whose existence cannot at least be empirically tested. It also eliminates definitions or tautological statements. The requirement of empirical content insures that a law will have some observable connection with the "real world." Thirdly, to be considered a law, the statement must be systematically integrated into a larger field of scientific knowledge. It is the goal of science to present a unified view of the world around us. Thus, with the addition of this criterion, Hunt (1976) is stating that we desire not only empirical support for a law, but theoretical support as well.

Carl Hempel (1966) is not in total agreement on this point, but he does agree that the status of relevant scientific theories will have a bearing on what will or will not be judged to be a law. However, Hempel does point out several notable exceptions to Hunt's "systematically integrated" criterion. The laws of Galileo, Boyle and Kelper were accepted prior to receiving theoretical support. Hempel restates this criterion as follows:

(A) statement of universal form...will qualify as a law if it is implied by an accepted theory...but even if it is empirically well confirmed—it will not qualify as a law if it rules out certain hypothetical occurrences...which an accepted theory qualifies as possible.

The final criterion, nomic necessity, is the one most discussed in the philosophy of science literature. Nomic necessity is the requirement that the statement must go beyond being true in fact, to a statement which is true by necessity; which must be true.

Nomic Necessity

Hunt (1976) suggests that all lawlike statements must contain nomic necessity. In order to possess nomic necessity there must be a direct relationship which is associative in nature between the occurrences of the phenomena. Nomic necessity implies that the statement is deducible from law, something that would not be true of an accidental generalization.

Other authorities view nomic necessity as the basis for an explanation, whereas an accidental generalization is not. This viewpoint is confusing in that an accidental generalization might accidently explain the phenomena. For example, if one states that "all men in this room are wearing tennis shorts," one does not have necessity, yet this statement might indeed have some explanation. That is, suppose that the men in the room are all cold. We can explain why they are cold because all men are wearing tennis shorts.

A third view of nomic necessity is that accidental generalizations are not supported by empirical evidence but can be under certain conditions of observation. For example, suppose that under ideal conditions of observation, one observed that all men in the room were wearing tennis shorts.
Through this observation, one does in fact have empirical evidence for accidental generalizations. It has also been stated that "positive instances" lead to confirming weight for laws but not to accidental generalizations. That is, if one saw an apple fall from a tree it would be a positive instance that the law of gravity is in fact a law. Whether positive instances tend to confirm a proposition depends not only on the proposition but also on what else is known. Suppose one knows that the country club is hosting two tournaments, a tennis and softball tournament. In addition, celebration parties will be held in two rooms for the two sports. If one knows this and sees a man in tennis shorts walk into one of the rooms, then one can add confirming weight to the assertion that all men in the room are in tennis shorts.

Therefore, the question of what nomic necessity is and how it is interpreted remains a major problem. Hunt (1976) suggests that "the answer lies in the fact that generalizations that exhibit nomic necessity have a kind of hypothetical power which is different from accidental generalizations." The statement "Because A occurs B will also occur" possesses hypothetical power. The reason accidental generalizations lack hypothetical power is because of what is known as "counterfactual conditionals."

Counterfactual Conditionals. According to Hunt (1976), counterfactual conditionals can be used to prove that accidental generalizations lack power. The basis of counterfactual conditionals is that basic premises of the statement are not true. For instance, the example Hunt uses "all the coins in my pocket are half dollars" is a generalization. The counterfactual would be "If this coin (which is not a half dollar) were placed in my pocket, it would be a half dollar." The statement is obviously false and as such is counter to the fact. A second example that Hunt presents will also be examined. The statement "In any survey, the percentage of people who express intentions to purchase a brand is directly proportional to the square root of the percentage of informants who currently use the brand" can be proven to possess nomic necessity because the counterfactual supports the conditional. However, consider the following: "If the usership of brand X had been 16 percent (it actually is only 4 percent), then in this survey the percentage of people who expressed an intention to purchase would have doubled." This statement is a counterfactual but this time it supports the generalization and can be said to satisfy the criteria of nomic necessity.

Achinstein (1971) presents another perspective on counterfactual conditionals. The major problem with counterfactuals is that they are subjective. Achinstein has stated, "What is meant by saying that law supports a counterfactual, or simply that the counterfactual can be defended by appeal to the law, even though there need be no implication." For instance, consider the earlier example "All men in this room are in tennis shorts." The counterfactual might be "If you are similar to a man in this room, then you must be in tennis shorts." The problem lies in formulating the counterfactual. Should the counterfactual be very specific or can it be general? If so, how does this affect the generalization? If the counterfactual is not stated properly, it is possible to change the entire meaning of the statement. According to Achinstein's perspective, it would seem difficult to totally and convincingly rule out necessity because of a counterfactual conditional. The counterfactual might, therefore, be quite useful in some instances.

The question, what is nomic necessity and is it a pure requirement for a law, remains unanswered. More importantly, if an agreement is made as to what constitutes nomic necessity, then can the probability or statistical laws of the social sciences ever possess such a criterion?

Levels of Necessity

Popper (1959) offers, perhaps, the best explanation of necessities. Necessities are set up into three hierarchical levels with each level representing a much stronger necessity. For example, Popper's necessities can be illustrated as follows:

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<th>Continuum of Necessities</th>
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<tr>
<td>TECHNICAL NECESSITY ↓</td>
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<td>PHYSICAL OR NATURAL NECESSITY ↓</td>
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<tr>
<td>LOGICAL NECESSITY</td>
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The most vigorous of all necessities is a logical necessity. Under absolutely no conditions can a logical necessity ever be proven false. For example, the statement "all bachelors are unmarried men" is logically necessary. Popper (1955) indicates that it is possible to explain logical necessity in terms of universality. That is, a statement is logically necessary if it is deducible from a statement function which is satisfied by every model. In other words, a statement which possesses logical necessity is true in all possible worlds. Logical necessity is the only level of necessity which completely rules out accidental generalizations.

Physical or natural necessity may be a universal statement with an accidental character. Thus, it is not a truly universal law as it can be proven false. Popper (1959, p. 433) defines natural necessity by the following definition:

A statement may be said to be naturally or physically necessary if, and only if, it is deducible from a statement function which is satisfied in all worlds that differ from our world, if at all, only with respect to initial conditions.

Thus, whether or not a statement which possesses physical necessity is a law or only looks like a law will depend upon those certain initial conditions. If one can find those initial conditions in which the stated law turns out to be invalid, one can show that it was not necessary. For instance, Popper (1959) gives his example of the moa, a huge bird no longer in existence whose bones have been found in New Zealand swamps. Biologically, a moa should live 60 years or longer. However, an assumption is made that the initial conditions surrounding the moa were far from ideal due to the existence of a virus. Thus, no moa ever reached the age of 50. Therefore, based on our assumptions the statement "All moas live less than 50 years" is a true, universal statement since no moa in the universe ever lived longer than 50 years (Popper 1959). On the other hand, this universal statement is not a universal law, because it is possible for a moa to live longer. The original statement is true due to an accidental condition—the presence of a virus—and in fact no moa did live more than 50 years. Although, moas live longer under more favorable conditions and their actual maximum attained age was of an accidental nature.

The least vigorous of all necessities is a technical necessity. This is when a phenomena can occur with the assistance of man or a man-made object. A technical necessity is a possibility; it is something that can also be proven false. For example, the statement "No man-made aircraft can travel faster than one-half the speed of light" possesses technical necessity. That is, presently with human technology it is not possible to travel one-
half the speed of light. However, in some point in time technology may allow us to travel one-half the speed of light. Thus, the opening statement can, with a change in initial conditions, become invalid. Thus, if necessities are placed on a continuum, there can be instances in which a necessity can be lawlike but still possess an accidental character. That is, conditions are possible to prove the statement invalid. If there can be some agreement that there is not a precise demarcation between a statement which possesses nomic necessity and one that does not and that necessities can lie on a continuum, then the lawlike statements in the social sciences could possess a "degree" of necessity.

Continuum of Exactness

A concept which parallels the levels of necessity is the continuum of exactness (Rescher 1970). That is, within the realm of science there exists a continuum with one pole being the more mathematical discipline such as physics. Whereas, the opposite pole would be the more behaviorally-oriented social sciences. The use of mathematical terms is a luxury that some science can afford, but it should not be the defining characteristic of a science (Rescher 1970). The ability to understand, predict, and control phenomena should characterize a science.

Many argue that the social sciences are not a science due to the inexact nature of its laws or lawlike statements. That is, lawlike statements in the social sciences cannot be falsified. It is true, that under certain conditions it is difficult to truly test hypotheses in the social sciences because of its probability laws. However, being exact is not one of the criteria for a science. Understandably, exactness is preferable to inexactness. But according to Rescher (1970), it must be stated that if a discipline studies its domain in an objective and reasoned fashion, and if this study yields explanations and predictions, then indeed it is a science. In addition, lawlike statements in the social sciences can be falsified. For example, let us assume that a marketing "law" states "Under conditions A, the consumer will purchase B in 80 percent of all cases." Now, we observe consumers under condition A, and they continually do not select B. Eventually, we must reject this "law." In this fashion, a probabilistic law may be tested and falsified.

At this point, the following conclusion can be presented. First, it is not so true that the sciences fall into two neat categories, the exact and the inexact. Even within physics, in such cases as studies of extreme low temperatures or in application of theory developed in the sterility of the lab, certain "rules of thumb" and expert judgments come into play. There is not a sharp demarcation between the exact and inexact sciences, rather, there is a continuum of exactness. Secondly, while the laws and theories of the social sciences may be less exacting, therefore lack a sense of certainty, they may be of use to one who wishes to understand, or perhaps influence, the social environment.

Nomic Necessity

"Marketing has not discovered nomic laws because the discipline deals with too many interrelated variables."1 These multivariable interactions preclude the one-to-one relationships found in the more exact sciences. Therefore, one does not find nomic laws of a if-then form in the social sciences. Although, it is possible in marketing to discover relationships which hold within restricted sets of circumstances much like those found within the realm of technical necessity.

Technical necessity limits a lawlike statement's application to a restricted set of circumstances. It could be argued that binding a law by the present level of technology is in no way superior to binding it by the current state of any other variable. Therefore, a discipline characterized by multivariable relationships will be operating at the level of technical necessity which has been generalized as "bounded necessity." By this it is meant that a laws' applicability is restricted to a specific set of circumstances. Thus, laws possessing technical necessity are causal in nature, yet are not necessarily always going to occur exactly the same way in every circumstance.

The social sciences might, therefore, possess "nomic tendency." That is, lawlike statements in the social sciences do possess necessity-technical necessity. However, due to the multivariable relationships, laws in the social sciences can never possess logical necessity. Relationships in the social sciences are analogous to a dependent variable with several independent variables. No single independent variable will always be locked to the dependent variable, as all variables will be operating in a functional relationship. Thus, nomic tendency exists in a situation with multiple variables where the phenomena under study are causal in nature, yet not bound to be each time.

Conclusions

After considering the evidence, marketing is indeed a science. If the purpose of science is to explain, predict and control, and laws are necessary for explanatory power, then there should be no question that there are lawlike statements in marketing. If one adheres to the strict criteria for laws (i.e., nomic necessity), it can be argued that lawlike statements in marketing possess a level of necessity-technical necessity, and it is nomic tendency that fuels our laws.

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