

Explaining empirically successful marketing theories: the inductive realist model, approximate truth, and market orientation

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Abstract Some marketing theories are empirically successful, while others are not. When a marketing theory is empirically successful, is its success a result of miraculous good fortune or something else? For example, market orientation (MO) theory has been empirically successful: it explains and predicts numerous marketing phenomena. What explains the empirical success of MO theory? This article furthers the development of the philosophy of science foundations of marketing research by detailing the recently developed, “inductive realism” model of theory status and using the model to articulate scientific realism’s approximate truth as an explanation of the empirical success of marketing theories, in general, and MO theory, in particular. This article (1) briefly reviews the approaches to explaining the empirical success of science, with particular emphasis on scientific realism’s “no miracles” argument in favor of the approximate truth explanation, (2) discusses the problems associated with realists’ efforts to conceptualize “approximate truth,” (3) focuses on MO as a case-example of an empirically successful marketing theory and develops a “partial formalization” of MO theory for analysis purposes, (4) details the new, “inductive realist” model of theory status and applies the model to MO theory, (5) shows how the model accommodates the fact that, at times, sociological/political factors influence theory acceptance in science, (6) discusses whether political or other inappropriate factors have influenced MO theory’s success, (7) discusses the inductive realist approach to approximate truth and applies it to MO theory.

Keywords Market orientation · Philosophy of science · Scientific realism · Approximate truth · Theory acceptance · Inductive realism

Because all marketing research presumes an ontology (what does the research assume to exist?), a methodology (what procedures are to be followed?), and an epistemology (how are knowledge-claims to be evaluated?), all marketing research has philosophical foundations. Since marketing’s philosophy debates in the 1980s-90s, scientific realism has been argued to be the most appropriate philosophy of science foundation for marketing research (Easton 2002; Hunt 2010). First proposed in marketing by Bagozzi (1980) and then further developed in Hunt (1990), scientific realism is associated with philosophers such as Boyd (1984), Kuipers (2000), Leplin (1984), Manicas (1987), McMullin (1984), Niiniluoto (1999), Psillos (1999), Putnam (1975), and Siegel (1983, 1987). Scientific realism, following Hunt (1990), is defined as the view that:

- the world exists independently of its being perceived (classical realism);
- the job of science is to develop genuine knowledge about the world, even though such knowledge will never be known with certainty (fallibilistic realism);
- all knowledge claims must be critically evaluated and tested to determine the extent to which they do, or do not, truly represent, correspond, or accord with the world (critical realism); and
- the long-term success of any scientific theory provides reason to believe that something like the entities and structure postulated by that theory actually exists (inductive realism).

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The advantages of scientific realism, realists argue, are that it is coherent (without being dogmatic); it is critical (without being nihilistic); it is open (without being anarchistic); it is tolerant (without being relativistic); and it is fallible (without being subjectivistic). Equally important for marketing, realists argue that their “no miracles” argument—alone among philosophies of science—can account for the fact that some marketing theories are empirically successful (Hunt 2010).

How, then, does scientific realism claim to *account for* empirically successful marketing theories? Scientific realism provides the following explanation of the success of a theory: “theory *X* is empirically successful *because* theory *X* is approximately true.” For example, the marketing theory that is labeled “market orientation” (MO) (which is further developed in this article) is widely regarded to be empirically successful. That is, numerous empirical studies find a positive relationship between market orientation and business performance (e.g., Cano et al. 2004; Deshpandé and Farley 1999; Ellis 2006; Grinstein 2008; Hult and Ketchen 2001; Kirca et al. 2005; Kumar et al. 2011; Liao et al. 2011; Menguc and Auh 2006; Min et al. 2007). Scientific realism’s explanation of MO’s empirical success is that market orientation theory is approximately true.

However, what does it mean to claim that successful marketing theories such as MO theory are *approximately* true? Realist philosophers have been notoriously unsuccessful in explicating the concept of “approximate truth.” Starting with the failure of Popper’s (1963) verisimilitude project, efforts to explicate “approximate truth” have all encountered significant problems. These difficulties have led antirealist philosophers to claim that the concept of approximate truth is “hopelessly vague,” in that “we have no concrete idea what it means to claim that these theories are approximately true” (Barrett 2003, p. 1206, 1216). Even realist philosophers, such as Niiniluoto (1980, p. 446), have at times lamented, “No one has been able to say what it would mean to be ‘closer to the truth,’ let alone offer criteria to determine such proximity.”

In addition to realism’s problem of articulating approximate truth, realism’s critics in marketing claim that realism describes a “fairytale” version of objective science, in which only empirical testing influences the acceptance of theories in science (Peter 1992; Peter and Olson 1983). For relativist/constructivists, “scientific knowledge is every bit as affected by sociological criteria as it is by reality itself—whatever we take that to mean” (Anderson 1982, p.15). Therefore, a satisfactory philosophy of science for marketing should be able to show how theory acceptance in science is (at least at times) affected by sociological and political factors. Marketing’s current version of scientific realism (e.g., Easton 2002; Hunt 2010), critics maintain, contains no theory or model of how sociological/political factors in science influence theory acceptance in those cases when, in fact, they do.

Recent work in the philosophy of science literature suggests that it is now possible to address both the “approximate truth” and “sociological/political” problems associated with marketing’s version of scientific realism. This work suggests that it is possible to conceptualize “approximate truth” in a manner that avoids the problems of previous attempts, while at the same time preserving for scientific realism its claim that realism—and realism alone—can explain the empirical success of science. Also, this work provides a model of theory acceptance in science that, when modified, can account for the influence of sociological/political factors, when such factors are, indeed, influential. Specifically, using science’s eradication of smallpox as a case-example of empirical success, Hunt (2011a) develops what he calls the “inductive realist” model of theory status in science, which he uses to define *approximate truth*. Specifically, the inductive realist model equates (1) “the linguistic expression identified as theory *X* is approximately true” with (2) “it is likely that the specific entities, attributes, and relationships posited by theory *X* are something like the entities, attributes and relationships of some true theory, *X**.” Hunt (2011a) then uses the inductive realist model and its approach to approximate truth to explain the empirical success of “smallpox theory.”

However, no one has applied the inductive realist model of theory status and its approach to approximate truth to a marketing theory—and just because a model explains empirical success in medical science does not mean it can explain the empirical success of theories in marketing. Indeed, it could be the case that the inductive realist model works well for the biological sciences (such as medicine) but not for the social sciences (such as marketing).

The purpose of this article is to further develop the philosophy of science foundations of marketing research. Specifically, the objective of this article is to show how the inductive realist model of theory status can be used to explain why some theories in marketing are empirically successful when, indeed, they are. Accomplishing this objective requires several things. First, it requires an example of an empirically successful theory in marketing. Therefore, this article uses what we will call “market orientation (MO) theory” as an example. Because MO is customarily considered to be a latent concept, rather than a *theory*, we will propose eight foundational premises that, we argue, may be considered to underlie the hypotheses tested in MO empirical works. These premises are put forward as a proposal for future discussion and analysis, rather than as representing a consensus of MO researchers.

Second, the inductive realism model of theory status that has been developed in the realist philosophy of science literature does not accommodate the fact that, at times, sociological/political factors influence theory acceptance in science. Therefore this article proposes a modification of the inductive

realist model that shows clearly how, at times, sociological/political factors influence theory acceptance in science. Third, most readers will be unfamiliar with the debates in the philosophy of science literature concerning (1) how to explain the empirical success of science and (2) the great difficulty of conceptualizing “approximate truth” as a potential explanation for science’s success. Therefore this article provides a brief overview of the philosophy of science literature with respect to explaining the success of science and the nature of the problems of explicating “approximate truth.”

The best way to begin is to review the approaches to explaining the success of science, with particular emphasis on scientific realism’s “no miracles” argument in favor of the *approximate truth* explanation and the problems associated with efforts to conceptualize the concept, “approximate truth.” Then, I use MO as a case-example of an empirically successful marketing theory and provide a “partial formalization” of MO theory for analysis purposes. After detailing the “inductive realist” model of theory status, I apply it to MO theory, show how the model accommodates the fact that, at times, sociological/political factors influence theory acceptance in science, and discuss whether political or other inappropriate factors have influenced MO theory’s success. The article then explicates the inductive realist approach to approximate truth and applies it to MO theory. Specifically, the article argues that the claim: “MO theory is approximately true” equates with: “it is likely that the specific entities, attributes, and relationships posited by MO theory are something like the entities, attributes, and relationships of some true theory, MO*.” Finally, the article points toward areas for future research. Therefore, not only does this article contribute to explicating the philosophy of science foundations of marketing research, it also contributes to the development of market orientation theory.

Explaining the empirical success of science

One of the most famous sentences in all philosophy of science is Putnam’s (1975, p. 75) claim: “Realism is the only philosophy that does not make the success of science a miracle.” The claim has come to be called the “no miracles” argument: “If scientific theories weren’t (approximately) true, it would be miraculous that they yield such accurate observational predictions” (Boyd 1984, p. 43). Indeed, “the best explanation of the instrumental reliability of scientific methodology is that background theories are relevantly approximately true” (Psillos 1999, p. 80). Because of the claim of scientific realists that the *only* other explanation of the success of science is that it is a miraculous, “cosmic accident” (Mikkelsen 2006, p. 441), many philosophers of science have attempted to provide an antirealist explanation of the success of science.

For example, van Fraassen (1980) argues that the “empirical adequacy” of a theory may be used to explain the theory’s success. However, Musgrave (1988) shows that explaining the success of a theory by its empirical adequacy is, essentially, the same as explaining true, observational consequences by noting that all the theory’s observational consequences are, indeed, true. That is, it is much “like explaining why some crows are black by saying that they all are” (Musgrave 1988, p. 242). As a second nonrealist example, Fine (1986) proposes that theories are empirically successful because the world is constructed *as if* science’s theories were true. However, this is not a viable *antirealist* explanation because it relies on the claim that truth will lead to success. Indeed, Leplin (1987, p. 27) concludes that Fine’s approach “presupposes the realist explanation . . . [and] is actually parasitic [on it].” The efforts of Stanford (2000) constitute a third, supposedly antirealist, example. He proposes that a theory, say, T_1 , is successful because of its predictive similarity to another, unknown, theory, T , which is the “true theoretical account of the relevant domain” (p. 275). Psillos (2001, p. 347) points out that, among its other problems, Stanford’s (2000) purportedly *antirealist* explanation of science’s success, because it relies on the supposed truth of some theory T , actually falls within the scope of the realist explanation.

In conclusion, numerous philosophers of science have attempted to construct an antirealist explanation of the empirical success of science. All such attempts have failed or have surreptitiously incorporated realism’s “approximate truth.” However, articulating scientific realism’s *approximate truth* has proved problematic.

The problems of conceptualizing approximate truth

Attempts to develop a formalized, quantitative account of approximate truth began with Popper’s verisimilitude project. Consider two theories, t_1 and t_2 . Popper (1963) sought a way to justify the assertion that, though both t_2 (e.g., Newton’s theory of motion) and t_1 (e.g., Aristotle’s theory) are, strictly speaking, false, t_2 is, nonetheless, more approximately true or closer to the truth than t_1 . His approach was to define “truth-content” as the total number of all true propositions that can be derived from a theory and “falsity-content” as the number of all false propositions that can be derived. For Popper (1963, p. 233), t_2 is more approximately true than t_1 , or closer to the truth than t_1 , or (in his words) has more “verisimilitude” than theory t_1 , if it passes the following test:

Assuming that the truth-content and the falsity-content of the two theories t_1 and t_2 are comparable, we can say that t_2 [e.g., Newton’s theory of motion] is more

closely similar to the truth, or corresponds better to the facts, than t_1 [e.g., Aristotle's theory], if and only if either: (a) the truth-content but not the falsity-content of t_2 exceeds that of t_1 , or (b) the falsity-content of t_1 , but not its truth-content, exceeds that of t_2 .

Therefore, if the truth-content of t_2 exceeds that of t_1 , science progresses toward the truth even when t_2 is subsequently falsified because t_2 has more verisimilitude than t_1 . That is, science progresses by means of abandoning partially true, but falsified, theories (e.g., Aristotle) in favor of theories with more verisimilitude (e.g., Newton).

The evaluations of the verisimilitude approach by Miller (1974), Tichy (1974, 1978), and Grünbaum (1976) revealed numerous problems. In particular, these works showed that the conditions for determining the verisimilitude of theories could only work when the theories are *true*. Therefore, because Popper's philosophy of "bold conjectures and refutations" was meant to apply to theories that were *false*, his verisimilitude approach to defining approximate truth failed. Even before the formal critiques of his approach, Popper had recognized its problems, and he counseled, "I do think that we should not conclude from the failure of my attempts to solve the problem [of defining verisimilitude] that the problem cannot be solved" Popper (1972, p. 372).

Popper's counsel spawned the efforts of other realists to explicate approximate truth. All have encountered problems, including Niiniluoto's (1987) similarity approach, Oddie's (1987) likeness position, Schurz and Weingartner's (1987) focus on "relevant consequences," and Kuipers (1987) "descriptive truthlikeness." A major problem confronting most approaches to explicating approximate truth is that they attempt to estimate a distance-function relationship between absolute truth and approximate truth. Kuipers (2000, p. 258) argues against such a quantitative approach to truthlikeness because "there is nothing like a natural real-valued distance function between the structures of scientific theories, let alone something like a quantitative comparison of theories based on such a distance function."

Psillos (1999) also argues against attempting to explicate approximate truth by means of a formal, quantitative approach, and he argues that the best approach might be "a more definite qualitative explication of the notion of truthlikeness" (p. 278). Hunt (2011a) agrees with Psillos (1999) that a qualitative, rather than quantitative, approach to articulating approximate truth has more promise, and he ties his conceptualization of approximate truth to his "inductive realist" model of theory status, a version of which is shown in Fig. 1. This model will be developed in detail and applied to MO theory, our case-example of an empirically successful marketing theory. First, however, we need to provide a "partial formalization" (Hunt 2010) of MO theory for analysis purposes.

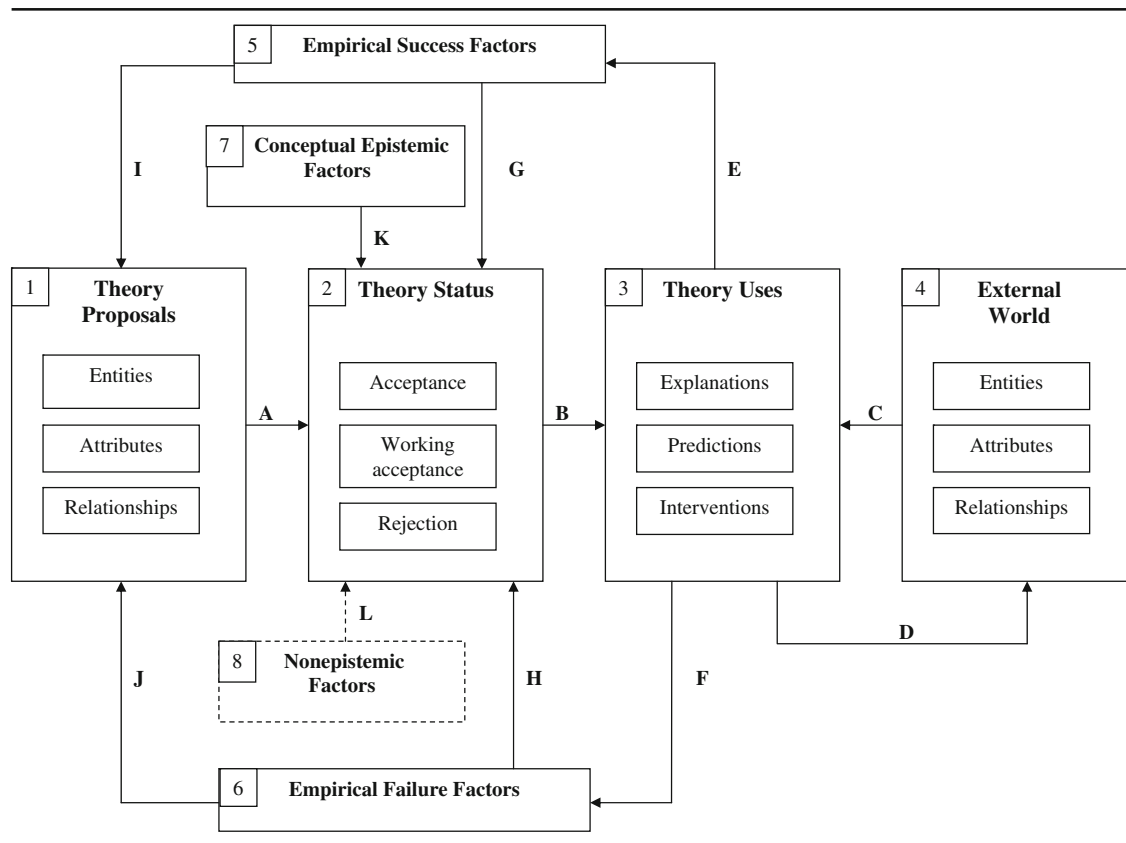
Market orientation theory

"Market orientation" is most commonly viewed as a latent construct that implies a normative strategy. As a latent *construct*, MO identifies a firm that is, among other things, oriented toward its present and potential customers and competitors. Although the construct is not directly observable, there are empirical indicators for firms that have an MO orientation. As a normative *strategy*, MO is the systematically related set of statements that prescribes what firms should do to become market oriented and to take advantage of MO's allegedly favorable outcomes.

The idea of MO as a construct traces to the marketing concept, a marketing cornerstone since its articulation and development in the 1950s and 1960s. The marketing concept is a set of three normative claims: (a) all areas of the firm should be customer-oriented, (b) all marketing activities should be integrated, and (c) profits, not just sales, should be the objective. As conventionally interpreted, the concept's customer-orientation component, that is, knowing one's customers and developing products to satisfy their needs, wants, and desires, has been considered paramount. Historically contrasted with the production and sales orientations, the marketing concept is considered to be a philosophy of doing business that should be a major part of a successful firm's culture (Baker et al. 1994; Wong and Saunders 1993). For Houston (1986, p. 82), it is the "optimal marketing management philosophy." For Deshpandé and Webster (1989, p.3), "the marketing concept defines a distinct organizational culture . . . that put[s] the customer in the center of the firm's thinking about strategy and operations."

In the 1990s, the marketing concept morphed into market orientation. In this view, for Webster (1994, pp. 9, 10), "having a customer orientation, although still a primary goal, is not enough. Market driven companies also are fully aware of competitors' product offerings and capabilities and how those are viewed by customers." At the same time, Narver and Slater (1990) and Slater and Narver (1994) were characterizing MO as having the three components of customer orientation, competitor orientation, and interfunctional coordination. And Kohli and Jaworski (1990, p. 6) defined MO as "the organizationwide *generation* of market intelligence pertaining to current and future customer needs, *dissemination* of the intelligence across departments, and organizationwide *responsiveness* to it" (*italics in original*).

Because of its allegedly positive outcomes on firm financial performance, writers began recommending market orientation as a firm or business unit *strategy*. The fundamental normative imperative of MO *strategy* has become that, to achieve competitive advantage and, thereby, superior financial performance, firms *should* systematically (1) gather intelligence on



Source: Hunt (2011b). Reprinted by permission. Box 8 and Path L are dashed to indicate that, though nonepistemic factors sometimes influence theory status (a positive claim), scientific realism maintains that it is inappropriate for them to do so (a normative claim).

Fig. 1 The Inductive Realist Model of Theory Status. *Source:* Hunt (2011b). Reprinted by permission. Box 8 and Path L are dashed to indicate that, though nonepistemic factors sometimes influence theory

status (a positive claim), scientific realism maintains that it is inappropriate for them to do so (a normative claim)

present and potential customers and competitors and (2) use such intelligence in a coordinated way across departments to guide strategy recognition, understanding, creation, selection, implementation, and modification (Kumar et al. 2011; Hunt and Derozier 2004; Ruekert 1992).

However, as pointed out by Crittenden and Peterson (2011, p.70) in this journal, “theory development involves constructs and propositions, whereas theory testing utilizes variables and hypotheses.” That is, the various hypotheses tested using MO as a construct imply some underlying, positive theory. As a positive *theory*, MO is the systematically related set of statements that provides the foundation for testing hypotheses that relate the concept of market orientation to its antecedents and outcomes, for example, “market orientation is positively related to financial performance.” What, then, is the implied, positive theory that incorporates the MO construct and that underlies normative, MO strategy? What is required is what Hunt (2010) calls a “partial formalization” of MO theory, as exemplified by the “foundational premises” that Vargo and Lusch (2004) proposed for their service dominant logic.

Based on a composite of the MO works previously cited, plus reviews of MO and associated empirical works (e.g., Day 1994; Deshpandé and Farley 1998; Hunt and Morgan 1995; Hurley and Hult 1998; Jaworski and Kohli 1996; Kirca et al. 2005; Siguaw et al. 1998), I propose that the following eight statements may be considered to be the foundational premises (FP) of the beginning of what might be called “market orientation theory.” I emphasize that the following premises and their accompanying rationales are presented as a proposal for future discussion and analysis. It is not the case that all researchers investigating the sources and consequences of market orientation would agree with all the premises. However, I do suggest that these eight premises represent a useful starting point for promoting the development of MO *theory*.

FP1. Firms have *orientations*, (e.g., a production orientation and a financial markets’ orientation), which constitute basic ways of understanding firms, managing firms, and competing with other firms. To varying degrees, these orientations may become,

through time, embedded in firms' cultures. **Rationale:** The word "orientation" implies that firms are facing toward some things in their environments. By virtue of "facing toward," firms pay more attention to certain issues, problems, and opportunities than to others. **FP1** must be the starting point for MO theory because, if firms do not have orientations of various types, then no firm could have the orientation in question, that is, a *market* orientation. Also, because organizational cultures evolve through time, strategically chosen orientations (basic ways of understanding firms, managing firms, and competing with other firms) can become culturally embedded.

FP2. One firm orientation is given the label "market orientation" by both business practitioners and academics. **Rationale:** A large number of studies suggest that many firms claim to be and aspire to be "market oriented." For example, Kohli and Jaworski's (1990) original field interviews showed that the concept "market orientation" was meaningful to managers as a basic way of managing their firms and competing with other firms. After the finding that "market orientation" was meaningful to managers, the academic literature exploring the nature of, the antecedents of, and consequences of market orientation virtually exploded.

FP3. A market oriented firm has an organizational capability that enables it to systematically (a) gather market intelligence pertaining to current and future customers (e.g., their needs, wants, tastes, and preferences) and current and potential competitors (e.g., their strengths, weaknesses, and market offerings), (b) disseminate the intelligence across departments, and (c) respond to the intelligence in terms of market offerings (e.g., goods and services). **Rationale:** Conventionally, market orientation is considered to be *either* an organizational capability or a dimension of a firm's culture that emphasizes intelligence gathering, dissemination, and responsiveness (Homburg and Pflesser 2000). The view argued here is that MO is not best characterized as, "either/or." Rather, because (1) a market orientation is something at the organizational level that can be purposefully developed and (2) some firms are *better* at being market oriented than others, the view here is that MO is an organizational capability (or competence) that, consistent with **FP1**, may through time become embedded in a firm's culture.

FP4. Major antecedents of market orientation include, among other things, three sets of factors: (1) top management factors (e.g., "walking the walk," as well as "talking the talk"), (2) interdepartmental factors (e.g., interaction and coordination), and (3)

organizational systems (e.g. reward systems and training). **Rationale:** As to the importance of top management factors, over two decades ago, Shapiro (1988, p. 123) observed that it is "unlikely that any company ever became market oriented with a bottom-up approach; to make it happen, you need the commitment and power of those at the top." As to interdepartmental factors, interaction and coordination are argued to lead to more information sharing and use. As to organizational systems, reward systems and training are argued to motivate employees and equip them with the skills necessary to implement a firm's objective of being more market oriented. As to all three factors taken collectively, the meta-analytic review of Kirca et al. (2005) supports the view that they are *foundational*.

FP5. As a result of being market oriented, there will be favorable customer consequences (e.g., customers' satisfaction, loyalty, and perceptions of quality). **Rationale:** Because a market oriented firm's market offerings will be, when compared with competitors that are not market oriented, better tailored to, more responsive to, and anticipate better, its customers' needs, wants, tastes, and preferences, customers will be favorably disposed to a market oriented firm.

FP6. As a result of being market oriented, there will be favorable employee consequences (e.g., organizational commitment, team spirit, customer orientation, and job satisfaction). **Rationale:** When a market oriented firm's market offerings are better tailored to, more responsive to, and anticipate better, its customers' needs, wants, tastes, and preferences, this will foster positive attitudes of employees toward their firms. Among other things, the positive attitudes result from employees' recognizing that, in today's hypercompetitive environment, their job security is related to how well their firm's market offerings match ever-changing customer demands.

FP7. As a result of being market oriented, firms will achieve a marketplace position of competitive advantage (as long as the costs of being market oriented are not excessive and competitors are less market oriented). **Rationale:** The nine-celled competitive position matrix of Hunt and Morgan (1995), which is based on relative resource-produced value versus relative resource costs, identifies cells 2, 3, and 6 as positions of competitive advantage and cells 4, 7, and 8 as positions of competitive disadvantage. As found by Kumar et al. (2011), when a market oriented firm's market offerings are better tailored to, more responsive to, and anticipate better, its customers' needs, wants, tastes, and preferences, customers will value the firm's market offerings highly, which will

contribute to enabling the firm to occupy one of the three marketplace positions of competitive advantage in the nine-celled, competitive position matrix.

FP8. As a result of being market oriented, there will be favorable organizational consequences (e.g., financial performance and innovativeness). **Rationale:** The intelligence generated by a market oriented firm will contribute to its developing more innovative market offerings. That is, the market offerings will be viewed by customers as better tailored to, more responsive to, and anticipate better, their needs, wants, tastes, and preferences. This will result in the marketplace positions of competitive advantage identified in **FP7**, which, in turn, will result in market oriented firms achieving superior financial performance.

The preceding eight premises may be viewed as the foundations of the theory implied by the research on market orientation. As noted previously, numerous empirical studies find a positive relationship between market orientation and business performance. Also as noted, scientific realism's explanation of MO's empirical success is that market orientation theory is approximately true. But what, precisely, does it mean to claim that MO theory is *approximately* true? I next develop the inductive realism model of theory status and use it to explicate the concept of "approximate truth," in general, and the approximate truth of MO theory, in particular.

The inductive realist model of theory status

Figure 1 shows the key concepts and their relationships in Hunt's (2011b) inductive realist model of theory status. The model shows the processes in science that are involved in theory acceptance and rejection. The "heart" of the model is comprised of Boxes 1 through 4, "Theory Proposals," "Theory Status," "Theory Uses," and "External World." Box 1 shows that science (interpreted here to include both individual scientists and scientific communities) proposes theories. These theories are viewed to be linguistic expressions that typically contain *entities*, which are proposed to have *attributes* (i.e., properties, characteristics, and causal powers). The entities are also proposed to form relationships, for example, laws, propositions, and hypotheses, that constitute structures and mechanisms, which may be causal or noncausal.

The model is explicitly realist in two ways. First, the entities represented in Box 1 may be observable or unobservable, for "a realist holds that a valid scientific explanation can appeal to the in principle non-observable" (Manicas 1987, p. 10). As discussed in detail in Hunt (2003, p.77), the philosophy of science that scientific realism replaced,

logical positivism/empiricism, maintained that unobservable, "theoretical terms" such as market orientation did not have a real existence. Instead, a term such as market orientation was a logical construction, a shorthand way of talking about "observables." Therefore, logical positivism/empiricism, in modern measurement terms, would imply a *formative* measurement model (Diamantopoulos and Winklhofer 2001; Fornell and Bookstein 1982; Howell 1987) in empirical tests. That is, the causal arrows would go from the observable constructs (or "items") to *form* the unobservable, theoretical term, market orientation.

In contrast, because scientific realism maintains that unobservable constructs can have a real existence and be potentially causal, scientific realism accommodates a *reflective* measurement model. Therefore, for scientific realism, the items (measures) can be reflective indicators of the actually existing (but unobservable) entity, market orientation. That is, the causal arrows can go from market orientation to the items (measures). The upshot of the preceding discussion is that structural equation modeling always assumes a realist philosophy of science, not a positivist philosophy.

The second way that the model is realist is that the theories (entities, attributes, and relationships) identified in the linguistic expressions in Box 1 are understood to be *about* the external-to-the-linguistic-expressions' world of entities, attributes, and relationships in Box 4. That is, the world exists independently of its being theorized about. The sharp distinction between the linguistic expressions in Box 1 and the world of Box 4 is a major characteristic that distinguishes realism from relativism (e.g., Olson 1982) and philosophical idealism, the view that "all reality is mental (spiritual, psychical)" (Angeles 1981, p. 120).

The rest of this section will detail the specific paths of the model. Path A in the model shows that, through time, the theories proposed in Box 1 are evaluated by scientists and their communities. Any particular theory is accorded the status of acceptance if it is considered to be the best theory available to "account for" (i.e., to explain and predict phenomena in) its domain (Shapere 1985, p. 642). Therefore, an accepted theory will be recommended as the one most appropriate for guiding interventions (actions) in the specific domain of the world in Box 4 that is associated with the theory. The criteria used to evaluate a theory include prominently the theoretical evidence for the theory, as shown by Path K from Box 7, labeled "Conceptual Epistemic Factors." This evidence is probative for truth, but does not involve direct empirical testing. The theoretical evidence includes the theory's nonempirical, epistemic virtues, for example, its internal consistency and its coherence with other accepted theories. (The model highlights evaluative criteria associated with *empirical* evidence in the context of Paths G and H, which are discussed below. Also, the role of nonepistemic factors and Path L are discussed below.)

A second major status in Box 2 is that of working acceptance, in which a theory, though acknowledged by most scientists as not the best theory for a domain (or most scientists are unaware of the theory), is considered worthy of further pursuit by particular scientists or sub-communities of scientists. When a theory has working acceptance for particular scientists, it may or may not be recommended by them as suitable for guiding interventions in the world of Box 4, even though they view it as suitable for *working on*. That is, the model distinguishes the context of “acceptance” of a theory from that of the “pursuit” of a theory, as recommended by Laudan (1977, p. 108).

The third major category in Box 2 is rejection, in which a theory is judged to account for a particular domain so poorly that most members of a scientific community view further pursuit on it as unwarranted. Theories with a status of rejection are also viewed as being inappropriate or unreliable for guiding interventions in the world of Box 4.

Path B from “Theory Status” to “Theory Uses” shows that theories with different status in Box 2 are used differently. First, *accepted* theories are used to explain past and present phenomena in the theories’ domains, to predict future phenomena in tests of the theories (to further explore, to “flesh out,” their boundaries and characteristics), and to guide practical interventions in the world of Box 4. Second, theories with the status of *working* acceptance are used by their advocates, detractors, and theory-neutral investigators “as a good basis for further research” (McMullin 1984, p. 35). Such research may consist of theoretical or empirical explorations to determine whether and under which circumstances such theories might be accepted. Third, *rejected* theories are not used by most scientists working in a theory’s domain, except when additional evidence surfaces. The additional evidence that prompts re-evaluations of rejected theories often involves anomalies with respect to accepted theories, as famously argued by Kuhn (1962).

Path C shows that the entities, the entities’ attributes, and the relationships (structures/mechanisms) among the entities that exist in the external world represented by Box 4 influence the outcomes of the use of theories in Box 3. Specifically, they influence whether the explanations, predictions, and interventions will be successful or unsuccessful. Individual scientific communities have norms for when the explanations, predictions, and interventions are “close enough” or “good enough” to warrant the label “success.” An example of such a norm would be, “these results are probative because they are significant at the .05 level.”

Path D shows that the use of theories in Box 3 can sometimes influence the existence and nature of the entities in Box 4. That is, even though the theories in Boxes 1 and 2 are linguistic expressions and are independent of the world in Box 4, the *use* of theories to explain and predict phenomena and

guide interventions can change certain characteristics of the world being explained, predicted, and intervened *in*.

Paths E and F, in conjunction with Boxes 5 and 6, show that scientists and their communities employ their norms to evaluate or judge the outcomes of using theories to explain, predict, and intervene in the world of Box 4. Specifically, Path E and Box 5 indicate the instances of the uses of a theory that are judged to be empirical successes. Path F and Box 6 show instances that are judged to be empirical failures. Paths G and H in the model show that the successes and failures of a theory at explaining phenomena, predicting phenomena, and intervening in the world of Box 4 are factors that influence the theory’s acceptance/rejection. That is, the successes and failures of a theory constitute the empirical portion of the evidence for/against it. The total evidence for/against the theory includes the theoretical evidence (represented by Box 7 and Path K) and the empirical evidence (Paths G and H).

Paths I and J indicate that the successes in Box 5 and failures in Box 6 are also factors that influence the scientific *understanding* of the theories in Box 1. That is, the successes and failures contribute to providing a deeper, more detailed, more complete understanding of the entities, attributes, and relationships posited by the theories related to the empirical successes and failures. This understanding often results in significant revisions in what are posited to exist in the world represented in Box 4.

The label “inductive realism” is appropriate for the model because it accepts the view that “the long-term success of a scientific theory [as shown in Box 1] gives reason to believe that something like the entities and structure postulated by the theory actually exists [in the world represented in Box 4]” (McMullin 1984, p. 26). Note, however, the important qualifications that McMullin (1984) places on the realist claim about the relationship between empirical evidence and belief in, or in the model’s terms, acceptance of, a theory. First, the successes (Box 5) must occur over a significant period of time. That is, it is the cumulative record of successes, not some unique empirical test. Second, the successes *give reason* to accept a theory, but not *conclusive* warrant for the acceptance of a theory. That is, even with many successes, the entities and structures posited by the theory in Box 1 may not exist in Box 4. Third, the successes give reason to believe (accept) that the theoretical structures posited in Box 1 are *something like* the structures that exist in Box 4, not that they are *exactly like* the structures.

Finally, with respect to Fig. 1, Box 8 and the path L were not in the original model proposed in Hunt (2011a). They are added in this amended version of the model to highlight the fact that, at times, nonepistemic factors, such as sociological factors and political motives do, indeed, play a role in science. At times, the acceptance and rejection of theories by scientific communities are influenced by sociological,

political, and source-of-funding factors. However, in interpreting the nonepistemic factors in Box 8 and Path L, three points are emphasized here.

First, when scientific communities have been shown to be influenced by nonepistemic factors, the behaviors of the individual scientists in the communities are considered newsworthy and scandalous, and the reputations of the communities themselves are tarnished. Therefore, the behaviors are clearly considered to be violations of the ethical norms of science. Second, the scientific realism advocated here maintains that sociological, political, and funding factors *should not* play a role. Indeed, the purpose of the dashed lines surrounding Box 8 and constituting path L is to highlight the view that such factors should not play a role. Third, if it were the case that scientific communities *routinely* allowed improper sociological, political, and funding factors to be “every bit” (Anderson 1982) as important as epistemic factors (both conceptual and empirical) in their acceptance of theories, then the philosophy of science, as well as science itself, is back to the “no miracles” problem. That is, it is generally acknowledged that science has a long history of being empirically successful. As Brodbeck (1982) argued, if Newton’s laws are primarily sociological, political, and funding-source *constructions*, rather than approximations of actual *reality*, what explains the fact that scientists could use Newtonian physics to successfully send a craft to the moon and then get it back safely? Everyone acknowledges that the moon landing was a great achievement. Was it also a coincidence of cosmic proportions?

MO theory and the inductive realist model

Using the example of “smallpox theory,” Hunt (2011a) shows that the inductive realist model can be used effectively to understand theory acceptance and approximate truth in medical science. But just because the model can explain empirical success in medical science does not imply that it can effectively explain the empirical success of theories in marketing. Therefore, using the eight foundational premises of MO theory as a case-example, this section applies the inductive realist model to marketing.

We begin by noting that the entities proposed in the foundational premises of MO theory include such entities as “firms,” “orientations,” “market orientation,” “market intelligence,” “customers,” “market offerings,” and “financial performance.” Note also that the use of “gathers,” “disseminates,” and “responds” in FP3 implies certain characteristics or attributes of the entity “market orientation.” Furthermore, note that the phrase “as a result of” in FP5, 6, 7, and 8 implies a type of causal relationship. It is not the case that MO theory proposes that market orientation and favorable customer consequences are simply correlated.

The favorable customer consequences are *the result of* market orientation. Also, the conjunction of market orientation with its antecedents and consequences forms *structures*, which may then, for example, be explored with the use of structural equation modeling and other multivariate methods. For example, the “conceptual framework” that Kirca, Jayachandran, and Bearden (2005) use as a foundation for their meta-analytic review of market orientation is the kind of structure of relationships that the inductive realist model anticipates.

Now consider the types of entities in MO theory. Although the entities proposed are mostly unobservable, latent variables, many will have observable or tangible manifestations. For example, “market intelligence” may involve tangible computers and computer output. Also, MO theory proposes that the entities labeled in Box 1, for example, “customers,” and “market offerings,” have a real existence, as represented in Box 4 of the model.

As to the scientific status of MO theory, the theory was first proposed in the early 1990s (e.g., Kohli and Jaworski 1990; Narver and Slater 1990; Webster 1994). These original proposers of the theory viewed it with “working acceptance.” It was a theory worth working on. What followed were years of research and hundreds of articles devoted to conceptualizing, discussing, evaluating, and testing MO theory. As to testing MO theory, Liao et al. (2011) identify over five hundred articles in over 150 journals that have provided theoretical and empirical evidence relative to the theory. Similarly, Kirca et al. (2005) locate a total of 418 effects from 130 independent samples reported in 114 studies. After two decades of theoretical evaluation and empirical testing, both marketing academics and practitioners generally accept MO theory as a good guide for strategic interventions, as noted in Box 3 of the model. Indeed, inserting “market orientation” into standard search engines now yields hundreds of thousands of “hits.” Market orientation as a latent construct, a normative strategy, and an (implied) positive theory, has achieved broad acceptance in the marketing community.

Now consider Path D, which maintains that interventions sometimes change the world represented in Box 4. Note that the purpose of competitive strategy is to gain some competitive advantage vis a vis one’s competitors. As resource-advantage theory points out, competition is the constant struggle for resources that will provide marketplace positions of competitive advantage and, thereby, superior financial performance (Hunt and Morgan 1995). If all firms have access to the same resource, then the resource will no longer provide an advantage to any specific firm. Therefore, MO would become “simply a cost of doing business in many industries” (Liao et al. (2011, p. 307). Kumar et al. (2011) explore just how sustainable the advantage of being market oriented is. Using repeated surveys of top managers at 261

firms over a nine-year period, they find a positive effect for market orientation on sales and profits, but this effect is greater for early adopters than later adopters. They conclude, “we advise firms not to abandon their market oriented strategy because it is the cost of competing, particularly in these turbulent times” (p. 28).

As to MO theory’s empirical successes and failures, as shown in Boxes 5 and 6, Kirca et al. (2005) report a grand mean of $r=.32$ for the correlation between market orientation and performance in their sample of 114 studies. They identify four studies as not supporting a positive, significant relationship, including Au and Tse (1995), Bhuian (1997), Greenley (1995), and Sargeant and Mohamad (1999). Although these studies find no positive relationship, none of them finds a significant negative relationship. Similarly, Liao et al. (2011) reviewed 38 studies on the relationship between MO and performance. They find that 36 of the studies reported a positive relationship, two reported no relationship, and none reporting a negative relationship. For them, therefore, “the evidence is overwhelming in favor of a relationship” (p. 303). They caution readers, however, to keep in mind that there is a confirmation bias in science. That is, “it is impossible to determine just how many authors and/or editors would have given up on an article when no relationship was determined, especially given the preponderance of evidence in the literature that such a relationship exists” (p. 303).

Concerning the time-frame for the empirical tests of MO theory, the model reminds marketers that the empirical tests must take place over a significant period of time. The two decades for testing MO theory would seem to qualify. Also, the model maintains that the empirical successes give *reason* to believe that the entities and relationships in MO theory exist, not conclusive warrant for their existence. Finally, the model maintains that the empirical successes give reason to believe that *something like* the structure of relationships posited by MO theory exists. It does not give reason to believe that the exact, posited relationships exist.

As to Paths I and J in the model, the empirical successes and failures of MO theory have led to a deeper understanding of market orientation. For example, because of MO theory’s empirical successes, “the literature seems to have moved past the establishment of a relationship between MO and performance ... [to] the moderating and mediating effects” of additional variables (Liao et al. (2011, p. 303). Indeed, studies show how the MO-performance relationship is moderated by competitive environment, manufacturing firms vs. service firms, operating effectiveness, human resource policies, quality orientation, and relationship commitment. Also, the studies show how MO is related to channel collaboration, cultural characteristics, international marketing, internal marketing, supplier relationships, and relationship marketing (Kirca et al. 2005; Liao et al. 2011).

Finally, consider Path L from Nonepistemic Factors to Theory Status. Have political or other inappropriate factors played a role in MO theory’s acceptance? It is reasonable to believe that it is in the self interests of the marketing academic discipline to find a positive relationship between MO and performance. Therefore, there is reason to believe that researchers might tend to view their findings in a manner that is favorable to the MO-performance relationship. At the same time, however, it is worth noting that studies on the MO-performance relationship have been conducted by a large number of scholars and published in a wide range of journals. Therefore, it is also reasonable to believe that at least *some* researchers would have reported strong negative findings, if such negative relationships were really there. So far, no scandals have arisen in connection with studies of the MO-performance relationship. Therefore, a reasonable interpretation of the fact that no scandal has arisen is that there is no scandal there.

MO theory and approximate truth

Why has MO theory been empirically successful? Realism purports to explain the empirical success of MO theory on the basis that MO theory is approximately true. Before articulating inductive realism’s proposal for approximate truth, I first discuss what truth and approximate truth are *not*. First, truth is not an entity in Box 4. Truth is not “out there” for scientists to study. Therefore, the model denies the view of some critics of realism who maintain that realists must assume that “there is an immutable truth out there which scientists can study” (Zinkhan and Hirschheim 1992, p. 83). Rather than being “out there” in Box 4, truth is an attribute of beliefs and linguistic expressions. Specifically, it is an attribute of the kinds of linguistic expressions as those proposed by science in Box 1, including those expressions denoted by the labels “theories,” “laws,” “propositions,” and “hypotheses.”

Second, truth is not an attribute of linguistic expressions that can be known with certainty. That is, inductive realism does not equate “truth” with “truth with certainty.” Therefore, the inductive realist view is a *fallibilistic* realism (Hunt 1990), which maintains that, though the job of science is, indeed, to develop genuine knowledge about the world, such knowledge will never be known with certainty: there is no “God’s eye” view. Instead, for scientific realism, “To claim that a scientific proposition is true is not to claim that it is certain; rather, it is to claim that the world is as the proposition says it is” (Siegel 1983, p. 82).

If to claim that a scientific proposition in Box 1 in the model is true is to claim that the external world, as represented in Box 4, is as the proposition says it is, what does it mean to say that the world is *approximately* what the

proposition says it is? The inductive realist approach equates the meaning of (1) “the linguistic expression identified as theory X in Box 1 is approximately true” with (2) “it is likely that the specific entities, attributes, and relationships posited by theory X are something like the entities, attributes, and relationships of some true theory X^* .” Therefore, accepting a theory (in Box 1) as approximately true is warranted when the evidence related to the theory is sufficient to give reason to believe that *something like* the specific entities, the attributes of the entities, and the relationships, structures, and mechanisms posited by the theory is *likely* to exist in the world external to the theory (Box 4).

There are several key qualifications to the inductive realist conceptualization of approximate truth. First, by *evidence*, the approach means the total evidence, including both theoretical evidence (Path K) from Conceptual Epistemic Factors (Box 7) and the empirical evidence (Paths G and H) from a theory’s successes (Box 5) and failures (Box 6). Second, the “something like” in the definition of approximate truth does not imply *exactly* like. Rather, “something like” implies that there exist entities, attributes, and structures in Box 4 that are similar to, in important ways, the entities, attributes, and structures posited in Box 1.

Third, the “likely to exist” in the definition of approximate truth does not equate with “true with probability p ,” in which “ p ” is considered to be a calculable number. Instead, the inductive realist approach maintains that, as Bunge (1967, p. 319) so aptly puts it, there is a “weighing” of the theoretical and empirical evidence. With regard to the empirical evidence, a key consideration in the “weighing” is the proportion of empirical successes (Box 5) relative to empirical failures (Box 6). A theory’s high proportion of successes, relative to failures, gives reason to believe that the theory is approximately true. A theory’s high proportion of failures, relative to successes, gives reason to believe that the theory is likely false. Although the weighing of evidence occurs in all sciences, procedures and standards as to what counts as a sufficiently high proportion of successes for the ascription of “approximately true” to a theory is discipline and context specific.

As applied to MO theory, the claim that “MO theory is approximately true” equates with “it is likely that the specific entities, attributes, and relationships posited by MO theory are something like the entities, attributes, and relationships of some true theory, MO^* .” Furthermore, the theoretical and empirical evidence associated with MO theory, as previously discussed, provide warrant for ascribing to it the attribute, *approximately true*. Moreover, the explanation for the empirical successes of MO theory is MO theory’s approximate truth.

Finally, there has been much consternation in the MO literature concerning the fact that there have been multiple conceptualizations of market orientation (e.g., viewing it as

a capability versus an element of culture) and multiple measures (e.g., the measures put forward by Jaworski and Kohli (1993) and Narver and Slater (1990)). The analysis here, based on scientific realism, in general, and the inductive realist model, in particular, can shed light on the controversies. First, as the discussion of FP1 and FP3 shows, a significant part of one controversy stems from viewing MO in an *either/or* manner. Once one acknowledges that MO can be, in some firms, *both* a capability and an element of organizational culture, a portion of the controversy disappears. As Kaplan (1964, p.70) once pointed out, “the demand for exactness of meaning for and precise definition of terms” can result in “premature closure of our ideas.” Indeed, the “tolerance of ambiguity is as important for creativity in science as it is anywhere else.” So let it be with MO theory. The multiple conceptualizations actually complement each other.

Second, as to the problem of having multiple measures of MO, there is a long-standing strain within the philosophy of science that maintains that every concept in science should have one, and only one, measure or “operational definition.” The “one-concept, one-measure” view traces to the “operationalism” of Bridgman (1927, p.6) and its claim that “there must be only one operational definition for each scientific term.” Indeed the one-concept, one-measure view was carried to such an extreme that some operationalists refused “to ‘generalize’ from one instance of an experiment to the next if the apparatus had in the meantime been moved to another corner of the room” (Bergmann 1957, p.58).

Readers should note that the operationalists’ one-concept, one-measure view of measuring unobservable concepts paralleled that of the logical positivists, for the positivists did not acknowledge the existence of unobservable entities that could cause changes in observable entities. The advantage of the one-concept, one-measure view of measuring unobservable concepts is that if one uses the exact same measure in each study, one may (at least) be confident of measuring the same “thing” across studies. Therefore, for operationalists “intelligence” is whatever the Stanford-Binet test measures, and if one uses another test then one is not measuring “intelligence.” (In measurement theory terms, the items in the Stanford-Binet test *form* the construct “intelligence.”)

Scientific realism rejects the underlying premise of operationalism (that unobservable entities cannot exist and cause the observable indicators.) Therefore, consistent with the philosophy underlying Campbell and Fiske’s (1959) classic, multitrait-multimethod matrix, it is possible to have two different measures of the *same* construct. Applied to MO theory, scientific realism maintains that it is at least possible that the different measures used in the testing of hypotheses related to MO are measuring different aspects, different

manifestations of the *same* entity, that is, the entity that is being referred to as “market orientation.” Therefore, for scientific realism, just as there are several different, but valid, measures of “intelligence,” there may be several different, but valid, measures of MO. Thus, the existence of several measures, each of which is claimed to measure MO, does not, by itself, constitute a problem. Furthermore, the empirical evidence may be interpreted as suggesting that the multiple measures of MO are nonproblematic.

As to the empirical evidence, recall that the published reviews find (1) several scores of empirical tests that report a positive relationship between MO and financial performance, (2) only a few reporting nonsignificant results, and (3) none reporting negative results. Recall also that the tests involved different measures of MO. One way to interpret the findings is that the positive MO-performance relationship is made *more robust*, not more problematic, by the fact that different measures have been used. Indeed, it may be argued that all the measures used in the empirical tests have in common that the investigated firms that have higher performance also pay closer attention than their competitors to the needs, wants, tastes, and preferences of present and potential customers. Given the nature of competition, is this not what marketers would expect?

Conclusion

Scientific realism is claimed to be the most appropriate philosophy of science foundation for marketing research. A major advantage of realism is that it is the only philosophy that can explain the empirical success of marketing science, when indeed it is successful. For realism, marketing theories such as market orientation are successful because they are approximately true. However, scientific realism has a serious lacuna: realist philosophers have had great difficulties explicating what it means for a theory to be *approximately* true. Also, contemporary versions of realism contain no theory or model that shows how sociological/political factors influence theory acceptance in those cases when, in fact, they do.

This article makes several contributions to marketing theory and research. First, it details the new, inductive realism model of theory status in the context of marketing. This contribution is important because, though the inductive realist model has been shown to effectively explain theory acceptance and success in medical science, this does not imply that it can explain acceptance and the empirical success of theories in marketing. It is also important because, as a component of the realist conception of *science*, the inductive realism model is especially appropriate for research that is committed to the ideals of the Academy of Marketing Science.

Second, using the concept of market orientation as a starting point, this article develops a partial formalization of the foundational premises MO theory. Using the inductive realism model of theory status, in conjunction with the foundational premises of MO theory, enables us to contribute to a deeper understanding of several controversies concerning MO, including whether MO is a capability or an aspect of a firm’s culture and the “one-concept, one-measure” controversy.

Third, using the inductive realist model of theory status, this article explicates the concept of approximate truth and uses it to explain why MO theory has been empirically successful. For inductive realism, MO theory has been empirically successful because it is approximately true. In this view, “market orientation theory is approximately true” equates with “it is likely that the specific entities, attributes, and relationships posited by MO theory are something like the entities, attributes, and relationships of some true theory, MO*.” This contribution is important because, though previous versions of scientific realism advocated in marketing claimed to explain the success of marketing theories by means of approximate truth, they provided no satisfactory conceptualization of approximate truth.

Fourth, this article shows how the inductive realist approach can address the issue of what kinds of evidence can be used in ascribing approximate truth to marketing theories. That is, the evidence that is “weighed” includes both the theoretical evidence (path K in Fig. 1) and empirical evidence (paths G and H). Fifth, this article shows how political and other inappropriate factors do, at times, influence the acceptance and rejection of theories by scientific communities (by path H in Fig. 1). This contribution is important because previous versions of scientific realism proposed in marketing (e.g., Hunt 1990) had no provision for understanding how political and other inappropriate factors do, at times, influence the acceptance and rejection of theories in marketing and other scientific communities. However, with respect to MO theory, this article concludes that the available evidence suggests an absence of inappropriate factors.

As to further research, just because the inductive realist model of theory status has been shown to effectively explain theory acceptance and approximate truth with respect to MO theory does not imply that the model can be applied in other marketing contexts. For example, how could the model be applied to channels of distribution and consumer behavior theories? More research is needed here. A second area for further research is to explore the norms in marketing for theory acceptance. What specific proportion of failures versus successes is required for theory acceptance? Do these norms vary across marketing contexts? Third, under what circumstances in marketing do inappropriate factors influence theory acceptance? Qualitative analyses of specific

case-examples would be useful here. In short, there is much additional research to be done to further develop the inductive realist model of theory status.

In conclusion, Ernest Nagel was a strong advocate of logical empiricism, the philosophy of science that preceded scientific realism (Suppe 1977). One of his famous arguments concerned the problems related to the systematic explanation of phenomena in the social sciences. While he concluded that “none of the methodological difficulties often alleged to confront the search for systematic explanations of social phenomena is ... inherently insuperable,” he found that “the present state of social inquiry clearly indicates that some of the problems ... are indeed serious” (Nagel 1961, p. 503). Since his assessment, scientific realism as a philosophy of science, in light of the recently developed, inductive realist model, continues to make progress in addressing the philosophy of science problems associated with social science. Therefore, continuing to ground *marketing science* in scientific realism is appropriate, especially for those researchers committed to the ideals of the Academy of Marketing Science.

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