MARKETING SCIENCE
Vol. 35, No. 1, January–February 2016, pp. 1–9
ISSN 0732-2399 (print) | ISSN 1526-548X (online)

http://dx.doi.org/10.1287/mksc.2015.0974
© 2016 INFORMS

Editorial

The Exploration-Exploitation Tradeoff and Efficiency in Knowledge Production

K. Sudhir
Yale School of Management, New Haven, Connecticut 06520, k.sudhir@yale.edu

Marketing Science is in a very healthy state as the premier journal for quantitative research in marketing. Since its inception, it has led the way in bringing novel and innovative methodologies and expanding into new substantive areas of inquiry. The journal is now at the cusp of its next stage of creativity and innovation. I outline new research possibilities due to big data, behavioral field studies, and managerial interest in substantive areas such as health, sustainability, emerging markets, innovation, and entrepreneurship. As quantitative marketing's leading journal, *Marketing Science* should aid the field in the efficient production of in-depth, valid, current, and relevant knowledge across the breadth of the discipline. To this end, I will actively manage incentives for exploitation and deepening of existing competencies in established areas while supporting exploration and broadening into newer, riskier topics at *Marketing Science*. To increase the field's overall efficiency of knowledge production, I suggest a lexicographic approach to reviewing where the incremental contribution threshold is primary and demands on quality of execution be driven by what is needed for proving the validity of the incremental contribution claims.

1. Introduction

Over the last 35 years, *Marketing Science* has established itself as the premier journal for quantitative research in marketing. We owe an incredible amount of gratitude to the founding fathers of the journal for their vision and each of the eight past Editors-in-Chief (EiCs)—Don Morrison, Subrata Sen, John Hauser, Rick Staelin, Brian Ratchford, Steve Shugan, Eric Bradlow, and Preyas Desai—for their efforts in raising *Marketing Science* to its current preeminent position. Each of the EiCs has contributed to the development of the field and the journal by supporting and nurturing new areas and methods during their period of stewardship.

In particular, I would like to recognize the outstanding efforts of my immediate predecessor, Preyas Desai. As a field, we owe Preyas our sincere thanks for his selfless, tireless, and effective stewardship of the journal over the last five years. I am also personally grateful for his generosity of time and effort in helping me with the transition. In his unique way, Preyas nudged, persuaded, and seamlessly made big changes at the journal including the transition to a Senior Editor (SE) structure, described in Desai et al. (2014) and the introduction of a code replication and data disclosure policy described in Desai (2013).

I will continue with the SE structure and the code and data policy. The SE structure helps authors and the journal, because scholars with greater expertise select review teams and make final decisions. The manageable workload allows editors to provide greater attention for each paper, and the time to discover and support high risk-high payoff papers. Beyond the immediate improvement in decision quality, the moderate workload also increases the pool of research-active scholars who are willing to serve as SEs and EiC, and that is important for the long-term health of the journal.

The replication and disclosure policy first initiated by *Marketing Science* had immediate spillover effects in catalyzing similar policies at our sister journals. Beyond its immediate and important quality assurance role, the policy will have even greater long-term impact as a skill and knowledge diffusion accelerator by significantly reducing barriers to entry for new scholars both within and outside the United States.

The new SE team (in alphabetical order) consists of Yuxin Chen, Avi Goldfarb, Ganesh Iyer, and Peter Rossi. As EiC, I will also act as one of the SEs. All submitted papers initially come to me, and I will assign it to the appropriate SE based on author request and paper fit. The SE will select the associate editor (AE) and two reviewers (with AE input). The SEs and I will ensure a timely, efficient, and high quality review process. The review process at *Marketing Science* is by and large timely and efficient with a reputation for quality feedback; so we build on a solid foundation. We will avoid endless rounds of reviewing and generally

terminate the review process for papers that do not appear to converge after two major rounds of review.

In this editorial, I describe my strategic vision for *Marketing Science* and how it will guide my editorial policy. As quantitative marketing's leading journal, I believe the overarching mission of *Marketing Science* should be to aid in the efficient production of research-based knowledge across the entire breadth of the discipline. The knowledge production needs to be adaptive to changes in marketing practice and the external marketing environment. This strategic goal will guide two key elements of my editorial policy. First, I will provide an environment that supports deeper work exploiting the field's already strong competencies in established areas, while simultaneously encouraging exploration of new and evolving areas of inquiry that keeps the field fertile, adaptive, and current. Second, to ensure that the field is efficient in its production of new knowledge—be it exploitative or exploratory—I suggest a lexicographic approach to reviewing, where papers are first assessed for a threshold level of potential incremental contribution, and conditional on crossing the threshold, the journal will demand only the *minimal* level of execution quality that validates the incremental contribution claim of the paper. I will explain why the lexicographic approach is efficient for the field.

The editorial is organized as follows. Section 2 offers my assessment of the current state of *Marketing Science*. Section 3 is the bulk of the editorial, in which I explain my strategic vision for the journal and the principles that will guide my editorial policy. Section 4 concludes.

2. The State of *Marketing Science*

Marketing Science is in a very healthy state, widely considered to be the most prestigious place to publish in quantitative marketing. Its awards—the Bass dissertation-based best paper award, the Little best paper award and the Long-Term Impact award are the most prestigious and sought after awards in the field.[1] From its inception, the journal has published papers of authors from the very best schools and continues to do so. There is also a welcome secular trend towards greater diversity in the author pool from across a wide range of schools both within the U.S. and internationally (Murthi et al. 2015). This is very good for the long-term relevance and health of the journal as it reflects the greater dispersion of top research talent both within North America and globally across Europe, Asia, and Australia-New Zealand.

Marketing Science achieved its premier position by leading the field in introducing new and innovative models and methods, while simultaneously expanding the range of substantive questions we study. Quantitative marketing had its origins in the application of ideas from operations research (OR) to decision theoretic and resource allocation marketing problems (also referred to as marketing analytics) and this was reflected in the work published in the marketing department at *Management Science*. The OR-based marketing analytics tradition continues to play an important role at *Marketing Science.* Since its founding, *Marketing Science* led the field in the embrace of economics for marketing analysis. In the 1980s, it pioneered the use of game theory based analytical models and utility theory based choice models in marketing. From the mid to late 1990s, it embraced empirical modeling of consumer and firm choices grounded in economic theory, explicitly recognizing informational, strategic, and dynamic considerations of the various agents—often referred to as empirical industrial organization or structural econometric models. *Marketing Science* also led the way with Bayesian statistics and time series econometric methods in the mid-1990s. Throughout, the journal has continued to build on the field's traditional strengths in areas such as conjoint methods and stochastic models.

Marketing Science has been at the leading edge in introducing new and richer customer behavior data. From the arrival of scanner data in the 1980s, to online search and purchase data of the late 1990s and early 2000s, to mobile search and purchase data over the last five years, and the fusion of data across physical, online, and mobile channels, there has been an unprecedented opportunity to understand consumer and market behavior and improve marketing efficiency. Eye tracking and consumer shopping path data have produced important research substreams. Detailed sales force performance data has led to innovations in salesforce analytics.

Marketing Science has led from the front on empirical modeling innovations and best practices. Examples include richer modeling of consumer heterogeneity, separation of state dependence from heterogeneity, accounting for endogeneity and selection in observed market outcomes, modeling of forward-looking behavior, modeling of firm, competition, and channel behavior, and an explicit and careful focus of the sources of identification in secondary data used for marketing analysis. Today, these ideas have diffused to become fairly standard in the quantitative marketing lexicon and analysis.

The recent emphasis on understanding identification in complex models through simpler model-free evidence has led to an auxiliary and important benefit. Scholars now increasingly scout for data that have the appropriate identifying variation either through natural experiments or generate such data through field experiments. This trend towards simpler and

[1] Papers published in the marketing department at *Management Science* and nominated papers from other INFORMS journals are also eligible for the awards. Award winners often tend to be *Marketing Science* papers.

more transparent research methods is welcome for many reasons. First, it helps us focus on substantive issues and better quality data and unburdens us from the necessity of methodological sophistication to obtain valid substantive causal results. Second, it expands the range of scholars that can participate in the mission of *Marketing Science*—to produce robust quantitative marketing insights that guide managerial practice. *Marketing Science* will and should continue to remain the field's leading venue for methodological and modeling innovations, but better data and simpler, transparent methods now provide an alternative publication route at *Marketing Science*.[2]

As the marketing journal that engages both theory and empirical scholars, *Marketing Science* has contributed to many conceptual innovations in marketing, through a rigorous theoretical and empirical lens, creating a virtuous cycle of interaction where theory generated hypotheses aids empirical work and empirical findings lead to refinements of theoretical models. As an example, in moving the field from a transactional orientation to a customer relationship orientation, the area of customer relationship management (CRM) has benefited from the scholarship of both theoretical and empirical scholars. Substantive topics around this broad umbrella include theoretical and empirical work on loyalty programs, customer satisfaction, targeting and personalization in customer acquisition, retention and cross-selling, cross-customer spillovers, and network externalities. With the emergence of Internet and mobile based search and transactions, the area continues to remain vibrant. We need to continue to support theoretical and empirical work, creating an environment for virtuous cycles of feedback between the two.

In short, *Marketing Science* has been at the leading edge of embracing new theoretical and empirical modeling and methods, new data, and new substantive questions over the last three decades. It has more than fulfilled the vision of the founding fathers of the journal. I look forward to the opportunity to build on these core theoretical and empirical strengths to raise the journal and the field to greater heights.

3. Managing Research Based-Knowledge Production

As quantitative marketing's leading journal, for *Marketing Science* to prosper, the field as a whole should prosper. *Marketing Science* should therefore aid the field in the efficient production of in-depth, valid, current, and relevant research-based knowledge across the breadth of the discipline. I discuss below the two key elements of my editorial policy in pursuit of this strategic role of the journal. The first is to manage the exploration-exploitation tradeoff in knowledge production across established and emerging areas. The second involves how to be more efficient in producing valid knowledge for the field.

3.1. The Exploration-Exploitation Tradeoff in Knowledge Production

As the literature on resource allocation and organizational learning and evolution notes (e.g., March 1991), there is a tradeoff for the field and the journal in allocating time and effort on exploration and exploitation in the generation of new knowledge. While exploitation involves refinement and extension of existing competencies and paradigms, exploration involves experimentation with new areas and topics. Exploitation is less risky and has higher chances of success. It helps the field develop distinctive competencies, but in a changing environment, it can also trap the field in suboptimal but stable equilibria. Exploration is more risky, with higher chances of failure, but it allows us to be more adaptive and responsive to changing market environments. As Kuhn (1970) notes, fields are naturally biased towards exploitation—the deeper study of established research areas within established paradigms. But the field and the journal need to balance these two tradeoffs; we need to create an environment where the incentives are right for scholars with both exploitative and exploratory mindsets to succeed. Gatekeepers (SEs, AEs, editorial review board (ERB)) tend to be more supportive of exploitative work as they are typically chosen for their expertise in these areas. We need to therefore consciously be open to exploratory work.

The SE team and I at *Marketing Science* are humble enough to know that our ability to predict what will be important in the future is limited, but we are committed to ensure that we do not lose innovative and area-defining exploratory papers that come through our journal evaluation process because of lack of editorial support. We want our scholar base to invest in such work, knowing that they would have a supportive SE team at *Marketing Science* that would "have their back," as long as the work is of high quality, even if there are no natural supporters within the field for such work.

That said, there are a few initiatives and areas that I would like to purposefully call out for exploratory support at the journal, where I believe we can get the greatest payoffs from exploration at this point. I organize my discussion around three themes: (1) big data; (2) behavioral field studies; and (3) new substantive areas.

[2] Even if one can obtain causal results with field experiments and quasi-experiments, model based analysis will remain important in marketing scholarship. First, counterfactuals are important for policy recommendations outside the market conditions in which the experiment occurred. Second, the range of situations in which field experiments are feasible or natural experiments are available will far exceed those where they are not.

3.1.1. Big Data. "Big Data" will transform our field in ways that we cannot predict yet. As a field and as a journal, we should be prepared to embrace the changes Big Data will bring to marketing scholarship. *Marketing Science* will publish a special issue on Big Data commissioned by Preyas Desai and co-edited by Pradeep Chintagunta, Dominique Hanssens, and John Hauser later this year. Clearly, the special issue is just the tip of the iceberg with respect to scholarship in this area. While every new data revolution in the past has led to advances in the field of marketing science, Big Data will have a greater and longer-lasting influence on our field in terms of its substantive and methodological impact.

Though it would be hard to fathom all of the changes that Big Data would bring over the long-term, it may be worth considering a few immediate ways in which big data will impact our research and scholarship. For a science focused on understanding causal relationships between variables of interest to marketers, big data will provide a tremendous boost. The massive growth in the volume of data collected, the variety of structured and unstructured data, and the velocity with which streaming data arrives provide us many more combinations of opportunities to understand new causal relationships across a larger set of variables relevant to marketing. Big data technologies also make it easier to run field experiments of various kinds either at large scale or selectively on small samples both within digital companies and in more traditional ones to help tease out hard to detect effects in small samples (e.g., advertising). Fortunately, most of such work—whether they involve secondary data analysis or field experiments—fall within our existing paradigms of research, and therefore are not likely to be lost in the review process. In fact, many of these papers may not be even seen as "big data" papers, even though these newer and better quality data were made possible due to big data technologies involving sensors, distributed data storage and processing, etc. Some may therefore perceive big data as merely hype and simply "old wine in a new bottle." Such a viewpoint may be a disservice to the field, as big data indeed has the potential to take the field in new directions. I outline some possibilities next.

First, a new set of practical challenges that are particularly unique to the nature of big data will arise. How does one translate large volumes of unstructured data from video, audio, and text to structured data with minimal loss of fidelity to generate maximal insights? How does one handle large volumes of data at scale? How does one embed big data into real time automated decision making? What is the ideal tradeoff between speed and accuracy when embedding data into real time decision making? These areas have not been central to our research in the past. While economics and statistics have been dominant base disciplines in quantitative marketing over the last three decades, practical questions such as the above will require us to engage better with fields such as computer science and also return to our OR roots. These fields have a different set of tastes and metrics of quality and incremental contribution. We need to understand fundamental research in areas such as machine learning and natural language processing from computer science, and algorithmic innovations from computer science and OR and apply these appropriately in marketing contexts. Further, it would be worthwhile to adapt these techniques to address econometric challenges associated with endogeneity, selection, etc. that are central to many marketing problems, but are not so central in computer science and OR. Engaging our distinctive competencies with cutting edge competencies from these disciplines, we can enhance marketing scholarship. The field may need to recruit young Ph.D.s from OR and computer science and our best scholars should engage actively with these scholars to accelerate knowledge production at the leading edge of innovation. As a journal, *Marketing Science* needs to be open to the possibilities that emerge from such scholarship.

Second, big data infrastructures break down data silos within organizations. This allows managers and analysts to easily see data connections across marketing, sales and service, operations, accounting, and human resources. The breakdown of silos is a tremendous opportunity to expand the research focus of our field beyond the traditional marketing levers—the 4Ps of product, price, promotion, and place to take a broader organizational perspective. For example, how do sales and service hiring, retention, and incentives impact customer and market outcomes? How do supply chain strategies (such as level of stocks, yield management, number of firms to source from) and use of sustainable sourcing strategies impact a firm's positioning, competitive position, and market impact? In the big data world, any of the managerial levers that impacts customer choice and market outcomes can and should be a legitimate area of inquiry for marketing scholars. In 2011, the marketing area at *Management Science* published a special issue titled "Marketing Within the Enterprise and Beyond," that explored marketing's interface with other functional areas. That kind of cross-functional thinking should become mainstream and an important opportunity for knowledge generation with the breakdown of functional silos. If we do not take the broad view, our field will become marginalized over time, as fields such as operations management, organizational behavior, information systems, and managerial accounting will be in better positions to generate the knowledge necessary for managers to impact customer and marketing outcomes that marketing cares about.

Marketing Science should be at the forefront of cross-functional research facilitated by big data as it relates to customer and market outcomes.

Finally, there are interesting practical questions that are relevant even today, but have not received much attention in the research literature. As companies seek to leverage Big Data to perform evidence-based marketing (and management more broadly), the issue of how managers can use the data most effectively is gaining in importance. How can we present data in summarized form or visualization that is digestible by decision makers in a way that enhances decision making or facilitates coordination across the organization? Such work will require a combination of insights on decision making research to generate useful summarization and visualization on dashboards at various levels of the organization in combination with field experiments within and across organizations to understand whether, when, and how they improve marketing outcomes. The skills needed for this type of research is not standard in quantitative marketing, but may need to be imported from management scholars who conduct research within organizations.

3.1.2. Behavioral Field Studies in Marketing. Marketing is an eclectic field with multiple base disciplines and research paradigms; and we should be justifiably proud of this tradition of being willing to use the right tools to address the right questions. One challenge, however, is that often research streams operate in parallel with limited interactions between them. Thus, as a field, we are not able to capitalize on the potential from research interactions across base disciplines and research paradigms. As discussed earlier, the interaction between analytical game theory and empirical research is a knowledge production success story in quantitative marketing. At the intersection of behavioral and quantitative marketing, there is a large missed opportunity.

While behavioral scholars primarily do laboratory studies, quantitative marketers primarily work with field data. Quantitative marketing scholars should be particularly interested in whether behavioral levers based on psychological theory that have been tested in the lab can be leveraged by managers in the field. Marketing scholars can accumulate theoretically and managerially valuable knowledge by studying the effectiveness of conceptual replications of behavioral theories in different field contexts (Lynch et al. 2012).

Let me provide a few examples of how behavioral field studies can add to our knowledge. Comparing the elasticities of various costless behavioral levers supported by insights from behavioral research (e.g., message framing) with costly economic levers such as pricing, advertising, and personal selling using field experiments is both theoretically and managerially useful. When multiple behavioral levers are simultaneously tested through appropriate conceptual replications within an experiment, we can learn about the relative elasticities of behavioral levers—useful in practical policy and managerial settings, where the most effective behavioral lever has to be chosen.

A common critique of such measured elasticities among behavioral scholars is that the magnitude of the effects is largely a function of the idiosyncratic treatments and contexts. For quantitative scholars, this should not be a real concern. Estimated elasticities in quantitative research with respect to economic levers such as price and advertising are also a function of contexts such as product categories, target customer populations, and (usually unobserved) advertising messages. Quantitative marketing has created generalizable knowledge through meta-analysis of elasticities across a large number of studies. In fact, by publishing results in different contexts, we understand how these effects vary across contexts and populations and how such effects vary by moderating factors. These insights add to the science and are also valuable to managers. A second critique of behavioral studies is that the mechanism underlying the impact of behavioral levers is hard to tease out as precisely in the field as in laboratory experiments. Rather than see the cup as half empty when viewed through the reference point of laboratory experiments, reviewers should be encouraged to see the cup as half-full, relative to the reference point of secondary data commonly used in quantitative research, where such identifying variation is naturally impossible to obtain. With this lens, behavioral field experiments augment secondary data (in the spirit of natural experiments) with identifying variation. As with secondary data, we can continue to look for heterogeneous treatment effects with respect to different segments, interaction effects of behavioral levers with economic levers, etc. in the analysis to generate a rich set of insights from behavioral field studies. When such behavioral field experiments are seen as augmenting secondary data with a new kind of identifying variation, it is easy to see how they fit squarely within the mission of *Marketing Science*.

There has been a recent surge in the use of field experiments in marketing; partly aided by the ease with which field experiments can be conducted in digital environments especially in the areas of targeting and personalization. Even in non-digital areas of marketing, field experiments have had an significant impact in the area of behavioral economics; this stream of research is close to the intersection of quantitative and behavioral marketing. Farther from mainstream marketing, field experiments have had an important impact in development economics, where the research has been in poor, developing countries trying to understand a variety of incentive, framing, and informational levers

in improving adoption of ideas, products, and technologies among the poor. By demonstrating the effect of these levers in the field, both behavioral economics and development economics have had a significant impact among policy makers. By embracing field experiments with economic and behavioral levers in a number of emerging areas, such as societal marketing, non-profit marketing, sustainability, green marketing, health marketing, and marketing in emerging markets, we can substantially enlarge both the scope of our research and our field's impact on practice.

3.1.3. Substantive Areas. An oft-mentioned complaint is that quantitative marketing scholarship is overweighted on topics where rich data are readily available through secondary sources. A casual look at the empirical papers we publish does suggest that there is much greater work around frequently purchased categories with scanner data, durable goods categories such as cars, entertainment products such as movies, and topics around Internet/mobile search and purchase behavior. This is not surprising, given that detailed secondary data allow us to do sophisticated research that supports credible causal claims with little time or effort spent on data collection. As discussed earlier, this is part of the excitement among marketing scholars around big data.

The field needs answers to research questions in areas where data are not easily available. As the old story goes, it will not serve us well "to search for keys only where the light is." One problem is that as a field, we do not adequately recognize or reward scholars for primary data collection, or for assembly of datasets that help open new areas of research. When the best minds in our field can study important substantive questions unconstrained by where data are easily available, knowing that their efforts to assemble useful data would be rewarded by the field not just in terms of publication but also by broader recognition such as awards and greater spotlight, we will draw people towards such research.[3] At the margin, I will be extra supportive of work that introduces new data as long as they cross reasonable quality thresholds.

Our focus on studying problems where secondary data can be readily acquired has led us to "knowledge darkness" in many classical and emerging topics. For example, there is relatively scant attention to classical areas such as B2B marketing, social, and non-profit marketing among quantitative marketers. Areas such as innovation and entrepreneurship have not received much attention in marketing, though at many business schools, marketing and entrepreneurship sit together as one department. It would be important for some of our best minds to provide both conceptual guidance and empirical research on these topics.

In terms of newer areas, quantitative marketing can gain much from research on emerging markets and international marketing. Last year, Preyas Desai published a special section on emerging markets (which I co-edited with Kannan Srinivasan). The published papers included theory, secondary data, and field experiment based papers—reflecting how new substantive areas can provide opportunities for scholars with different methodological expertise. In our editorial to the special section, we articulated why the large cross-sectional variation across and within emerging markets, as well as the speed of temporal variation across many new types of variables that are relevant to marketers, makes emerging markets a particularly valuable place to mine for opportunities to answer research questions that can aid both our understanding of markets and marketing.

Areas such as health/wellness and sustainability are gaining in importance in MBA education as well as managerial interest. Marketing knowledge and tools can be valuable for managers navigating these areas. We should aspire to produce knowledge grounded in research on these topics. Interestingly, many economists, operations, and management scholars are using marketing tools and concepts to contribute to scholarship in these areas. It would serve us well to remain central and relevant to the debates around these big management issues with our research. I hope theoretical, empirical, and behavioral marketing scholars will all contribute to knowledge development in these emerging areas.

3.2. The Efficiency-Validity Tradeoff in Knowledge Production

The mission of *Marketing Science* is to add to our knowledge of quantitative marketing—whether it is on substantive questions or methodologies. Let us call the incremental contribution to knowledge of a paper, idea quality. The journal also plays a certification role—results published in *Marketing Science* are trusted to be valid because of the use of appropriate and robust research methods—let us call this execution quality. How should we set appropriate thresholds of *idea quality* and *execution quality* so as to increase the field's efficiency in knowledge production without sacrificing the validity of the results?

3.2.1. Incremental Contribution versus Execution Quality. Ellison (2002) uses a short-hand to describe two aspects of a paper's quality: q-quality (idea quality as determined by the originality and importance of the incremental contribution) and r-quality (execution quality as measured by generality and robustness of claims, extensions, and clarity of contribution with

[3] The data release policy at *Marketing Science* explicitly notes that scholars cannot use data for their own research without authors' permission. I believe authors allowing others to do further research using their data will have greater impact and broader recognition long-term.

respect to existing literature). In general, q-quality is the scarcer commodity and is intrinsic and harder to improve through the review process, while r-quality may be enhanced more easily with additional effort in the review process. If reviewers and authors view q-quality and r-quality as compensatory, the field suffers as researchers allocate inefficiently higher effort on improving the more elastic (to effort) execution quality relative to the less-elastic idea quality.[4]

To prevent such inefficient allocation of effort, the journal can use a lexicographic approach in evaluating papers in the review process. Every paper should be first judged on whether the incremental contribution–idea quality–is large enough for publication. Then, conditional on incremental contribution, the journal should demand the minimal level of execution quality to ensure that the paper's incremental contribution claims are valid. Sometimes, the idea quality may be intertwined with execution quality, because the question may have been raised in previous research but the quality of the evidence presented is not yet fully convincing. When generating convincing evidence for a big idea itself is the key incremental contribution, the incremental contribution may be the new data or a clever experiment/analysis that helps conclusively establish the effect.

From the discussion above, one can see why some of our current reviewing practices are inefficient and lead to author frustration. For example, it is common in the review process to demand "state of the art" methods or use a long checklist of robustness and generalizability checks, even if they are not critical to prove the contribution claims. Furthermore, it may be helpful to evaluate the tradeoffs involved in terms of time and effort required of the authors, relative to the increased confidence in the validity of already strong results. In the lexicographic reviewing framework, it is clear that demanding newer/more sophisticated methods and robustness/generalizability checks are superfluous unless not doing them will invalidate the results. This recognition can limit wasteful and inefficient effort by scholars that could be otherwise used to produce new knowledge for the field.

In general, we should strive for simpler and transparent analysis when it can produce valid results and correct insights as it will increase impact and the reach of the knowledge. The journal wants to publish important results that change received wisdom and add to our incremental base of knowledge. It is only to this end that it values execution issues such as validity, clarity, and transparency. Methodological sophistication is needed only if it aids in getting valid results; but it is not always required to obtain valid results. For example, better data can add new knowledge more convincingly with straightforward methods. A field experiment using randomization or data with a clean identification strategy involving a natural experiment may be more convincing in certain situations, even with less sophisticated analysis.[5]

An additional challenge for exploratory work in establishing incremental contribution is that in the absence of previously published papers, the conventional wisdom (null hypotheses) will be unclear. Even if an exploratory paper overturns conventional wisdom, reviewers often unknowingly revise their priors and claim the ideas are already known. The human mind is remarkably good at adapting and accepting good ideas! In the absence of published papers documenting extant thinking, it is harder for the authors to document conventional wisdom and prove the incremental contribution. With fewer published papers whose alternative explanations need to be ruled out, there may be fewer robustness checks and other types of sensitivity analysis, which often tend to be markers of execution quality in the review process. Reviewers therefore almost always underestimate the incremental contribution and execution quality of exploratory papers. We need to adjust for such systematic underestimation of quality by reviewers for exploratory papers in making evaluations and recommendations. To be clear, I am not suggesting we accept weak papers in the name of exploration. I am suggesting that we should recognize the high potential for underestimation of both q-quality and r-quality by the review team for exploratory work and accordingly adjust for such biases during evaluations. Such sensitivity from the review team in general and the SEs in particular can re-balance the risk-reward tradeoffs for creative scholars who take risks to explore new substantive and methodological areas.

3.3. Review Process Guidelines

From the discussion above, it is clear that for the efficient production of knowledge that spans the breadth of our discipline and is adaptive to evolving market environments, we need to (1) improve author incentives to focus on idea quality and (2) manage incentives for exploration and exploitation. Where appropriate and feasible, I will commission special issues/sections to

[4] Lehmann et al. (2011) discusses the issue and recommends some actions that the field can take.

[5] I do not mean that papers in the experimentalist tradition are always simpler, transparent and more convincing than structural models. Keane (2010) discusses differences in the structural and experimentalist traditions in the extent to which they make assumptions explicit or implicit and the benefits and costs involved in the two approaches. A well-specified structural model with clearly laid out assumptions can be more transparent and provide greater clarity on what needs to be improved to make results valid. In recent years, the greater emphasis on model-free evidence for identifying variation and key assumptions in structural models has meant that the experimentalist approach is being increasingly embedded within papers using structural approaches.

spark research on new exploratory topics. But in the steady state, changing evaluation criteria for papers is the more robust approach to change incentives and produce the needed knowledge more efficiently. I therefore outline the following reviewing guidelines to accomplish these goals.

First round submissions: Reviewers and AEs. Reviewer reports for a first round submission should address the following three elements. (1) State level of enthusiasm for the potential incremental contribution and explain rationale. (2) State critical and major improvements in idea quality and execution quality needed to achieve the incremental contribution necessary for publication; and clearly explain why these are important. (3) Provide a list of minor improvements in execution to make the paper better, ideally with well-explained rationales.

AEs will evaluate the opinions of reviewers about the incremental contribution and the "critical"/minor improvements classification and provide recommendations to the authors. To the extent they can evaluate, AEs should consider the tradeoff between time and effort relative to incremental value and the importance of achieving the paper's overall goals in making recommendations about critical/minor improvements to the authors.

Revisions: Reviewers and AEs. In evaluating revisions, the reviewers/AEs/SEs should ensure that the incremental contribution thresholds are met. Often authors put significant effort into improving minor execution quality issues which may require substantial work, without addressing the critical questions around incremental contributions hoping that reviewers will look upon the effort favorably and accept the paper. To establish the right norms, that prevent equilibrium misallocation of effort in the field towards the more elastic (to effort) execution quality, review teams should continue to hold authors accountable for the paper's incremental contribution, independent of execution quality improvements in revisions.

Senior Editors. SEs will make two key assessments. First, they will judge whether a paper is exploratory and creates a new area of substantive or methodological knowledge or is exploitative in that it deepens a well-established stream. The SE will take higher risks in judging threshold levels of contribution and execution quality for the exploratory papers. As explained earlier, they should recognize that in less established areas, the review team is likely to be more negative. Therefore SEs should place more weight on the arguments and rationales of the most positive member of the review team, to the extent those arguments are correct.

Second, the SEs will also assess the critical/minor request classifications from the reviewers and AEs. They will assess whether faith in the new knowledge would be invalidated if the recommended robustness check or new method is not used. If the results will not be invalidated, we should consider whether the additional confidence in incremental contribution by addressing the review team's request is worth the time and effort involved. We should not let "perfect be the enemy of good enough" by placing difficult new demands on the authors, who have reasonably well established their claim.

If the paper meets the potential incremental contribution threshold and critical issues raised appears doable, the SEs will offer the "revise and resubmit" option. If there is potential for high incremental contribution, but there are too many execution quality issues in the initial submission, the SEs will offer the "reject, but resubmit" option. The option allows *Marketing Science* to nurture risky, but high potential papers for the field. It also helps the journal benefit from the constructive feedback offered by its review team with an option to potentially publish a revised paper if it meets the idea and execution quality thresholds.

3.4. The Rigor-Relevance-Impact Debate

As a professional field, we want our research to be relevant to practitioners and have an impact among managers and policy makers. We need to ensure that our general interest and policy related work is appreciated by the general public. We are not where we should be on these dimensions and need to improve on creating impact. We need to become better at translating our general interest and policy-relevant work for the mass media and social media outlets and managerially relevant work to appropriate business and trade press outlets. I will continue to improve our efforts to publicize *Marketing Science* articles in the media so that the work of our authors can gain greater visibility and thus promote the overall impact of the field. I will also seek to use the journal's social media presence to both connect with our academic stakeholders and increase the journal's external visibility.

Sometimes, our lack of impact is blamed on "rigor." To the extent, "rigor" is used to describe needless methodological sophistication at the expense of transparency and clarity, that we described above I agree. We need to reclaim the word "rigor" for its positive meaning in scientific work—in its focus to obtain valid results through careful and thorough work—because rigor is the currency of trust in our results and the path by which *Marketing Science* achieved its stature. We should not give up on rigor to the extent that our goal is to obtain valid results. The reviewing process outlined above requires that our papers be rigorous to establish our contribution claims, but the primary emphasis should be on incremental contribution.

My faith in the importance of rigor for practice has been reinforced over the years, in working with companies through the Yale Center for Customer Insights. The disciplined conceptual and methodological clarity

that we gain from the rigor demanded by our journals in the pursuit of validity of our claims provide us as scholars the intellectual muscle to break down seemingly intractable problems faced by companies into manageable solutions.

I believe that one big reason for our relative lack of impact on practice compared to some of our sister fields such as economics, OR, and computer science is that we lack Ph.D. trained practitioners in industry and policy making institutions. These fields produce an excess of doctoral students than can be absorbed by academia, who then move to industry and government, where they spread cutting edge ideas of their field within their practice areas and consult with academic colleagues when faced with difficult industry challenges. These Ph.D. trained practitioners recognize that those who remain in academia are likely to be more at the cutting edge of innovation, and have more insights on problems that face industry. Therefore they promote the value of research collaboration with academia. By contrast, MBA students have a limited understanding of our research. When we introduce our research ideas in the MBA classroom, it is mostly at a superficial level. Therefore, the MBA students often do not see marketing academics as "go-to" people to address big challenges they face in industry. If the practical impact of our scholarship is an important criterion for us as a field, we need to produce more Ph.D.s who will do the job of translating our cutting edge research in practice and serve as ambassadors for our ideas within companies. That of course is unlikely in the short-run. The new M.S. students in data analytics coming out of several business schools might be an important key to the greater impact of the research of quantitative marketing scholars on practice. This makes me more positive about the likely influence of our work on practice going forward.

4. Conclusion

The journal and our field are both in a very healthy state. *Marketing Science* has led the field of quantitative marketing in introducing novel models, methods, research approaches, and expanding substantive areas of enquiry over 35 years of its existence, but the best years are ahead. The journal and the field are ideally positioned at the cusp of a period of extraordinary opportunity for creativity to blossom.

I will dedicate my term as EiC to maximize the long-term potential for the growth of our field and the journal. First, I will manage the exploitation-exploration tradeoff effectively so that *Marketing Science* is welcome for both authors who wish to deepen our knowledge in existing areas of research, and those who seek to broaden our field into new and potentially important areas of inquiry. Second, by encouraging a lexicographic approach to reviewing, where the incremental contribution threshold is primary and demands on execution quality are limited only to prove the validity of the incremental contribution claim, I will seek to increase the efficiency of knowledge production in the field. *Marketing Science* will strive to remain the premier quantitative marketing journal as the field evolves by being *the journal of first choice for ALL scholars in quantitative marketing*.

Acknowledgments

The editorial has benefitted from discussions and comments from Eric Bradlow, Pradeep Chintagunta, Preyas Desai, J. P. Dubé, Tülin Erdem, John Hauser, Don Lehmann, John Lynch, Leigh McAlister, Leif Nelson, Subrata Sen, Jiwoong Shin, Duncan Simester, Kannan Srinivasan, Rick Staelin, Gal Zauberman, and the Senior Editor team.

References

Desai PS (2013) Editorial–*Marketing Science* replication and disclosure policy. *Marketing Sci.* 32(1):1–3.

Desai PS, Feinberg F, Iyer G, Sudhir K, Winer R (2014) Editorial–New editorial structure for *Marketing Science*. *Marketing Sci.* 33(2):163–164.

Ellison G (2002) Evolving standards for academic publishing: A *q-r* theory. *J. Political Econom.* 110(5):994–1034.

Keane MP (2010) Structural vs. atheoretic approaches to econometrics. *J. Econom.* 156(1):3–20.

Kuhn TS (1970) *The Structure of Scientific Revolutions*, 2nd ed. (University of Chicago Press, Chicago).

Lehmann DR, McAlister L, Staelin R (2011) Sophistication in research in marketing. *J. Marketing* 75(4):155–165.

Lynch JG, Alba JW, Krishna A, Morwitz V, Gurhan-Canli Z (2012) Knowledge creation in consumer research: Multiple routes, multiple criteria. *J. Consumer Psych.* 22:473–485.

March JG (1991) Exploration and exploitation in organizational learning. *Organ. Sci.* 21:71–87.

Murthi BPS, Rao RC, Ratchford BT (2015) Invited Editorial—A descriptive analysis of publications in *Marketing Science* over its history. *Marketing Sci.* 34(6):779–786.