

# **“Discovery and Application of Marketing Principles: Major Academic Contributions from the 20th Century”**

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Presented at the  
Society for Marketing Advances Conference  
November 2000

## **Preface**

First of all, I'd like to thank the Society for Marketing Advances. It is a great honor for me to receive the SMA/JAI Press Distinguished Scholar Award for 2000 and to share it with such eminent scholars as Philip Kotler and Gerald Zaltman.

The transparencies used for my presentation are provided here. In addition, descriptive material has been added. Links have been provided to papers that are in full text on the web.

## Problem

Important discoveries from academic research in marketing are rare, and getting rarer.

This is based on casual empiricism; in other words, I discussed this issue with a number of colleagues. The problem has been noted in an empirical study in economics, “The Iron Law of Important Papers” (Holub et al. 1991). The iron law is that the number of important papers rises linearly while the total number of papers rises exponentially. As a result, important papers are a smaller percentage of total papers published.

## Defining Importance

“Important research” is defined here as findings about methods, models, or phenomena that are:

1. **Surprising:** changes in behavior are recommended. In other words, the new findings suggest different decisions or approaches.

This is difficult to achieve. For example, Michel (1981) found that ten-year old children could predict the outcomes of 12 of 17 classical studies in psychology.

2. **Reliable:** successful replications & extensions.

Replication is regarded as a cornerstone of science by leading scientists, yet it is seldom used in marketing (as shown in next overhead).

3. **Valid:** empirical research shows that it produces better predictions or decisions than current procedures.

Chamberlin (1890) claimed that sciences using the multiple hypotheses grow more rapidly. There is much evidence to support this view (Armstrong, Brodie & Parsons 2001). However, the method of multiple hypotheses is rare in marketing, as shown below. Perhaps as a result, Armstrong (1991) found that knowledge of consumer behavior theory did not produce valid predictions (see below).

## Defining Importance (cont.)

4. **Useful:** the changes would have substantial economic or psychological benefits.
5. **Implemented:** the changes are used successfully by marketing managers or researchers.

The term “successfully” is a key here. For example, portfolio matrix methods such as BCG are often used, despite the fact that they are not successful (Armstrong & Brodie 1994).

## Published Replications in Marketing

Hubbard & Armstrong (1994) conducted an audit of 1,120 papers in the JM, JMR & JCR published from 1974 to 1989. Replications are not published and extensions are rare.

Type of study	Percentage of space devoted to these studies
Replications	0
Extensions	1.1

The importance of replications is shown by the fact that few extensions provide full support for the original study.

Outcomes of extensions	Number of studies
Conflicting results	12
Partial support	5
Full support	3

## Use of Multiple Hypotheses in Research on Marketing

Armstrong, Brodie and Parsons (2001) examined 1,700 empirical papers from six major marketing journals covering 1984 - 1999. Most studies advocate a favored hypothesis. Few use the method of competing hypotheses.

Percent of empirical studies that:

Use multiple competing hypotheses	=	13
With major variations	=	3
And with conditions in hypotheses	=	1
And with evidence of application (estimated)	=	0.1

On the other hand, Armstrong (1980b) shows that advocacy seems to be an easier path to fame for researchers.

## Predictive Validity of Theory on Consumer Behavior

Armstrong (1991) provided short descriptions of 20 studies to subjects. The studies were taken from the *Journal of Consumer Research*. Subjects were then asked to predict how the study turned out for the 105 hypotheses in these studies. The expectation was that academics that do research on consumer behavior would be able to use their knowledge of theory and thus make more accurate predictions. Indeed, the studies opened with extensive descriptions of relevant research to support their hypotheses (and their studies supported these hypotheses). As seen below, the academics were unable to predict the outcomes.

	Percentage correct (# of predictions)	Percentage expected by <i>JCR</i> board
Academics	51.3 (360)	80
Practitioners	58.3 (270)	65
High-school students	56.6 (1,106)	55

In fact, academics were no more accurate than high-school students.

As shown in the last column, the findings were surprising to members of the *JCR* editorial board.

## Some Ways to Identify Important Discoveries in Marketing from the 20<sup>th</sup> Century

### 1. Examine mass media coverage.

When important discoveries are made in chemistry, psychology, medicine, or engineering, they are reported in the mass media.

We recently attempted a 20-year search using the keywords “marketing and academic” the *NY Times* and the *Wall Street Journal*. We found no articles about marketing findings from this limited search.

### 2. Determine what has been discovered by asking:

- academics.

I have started to ask academics to nominate findings (see questionnaire at the end).

- consultants.

### 3. Find out what new findings are used by practitioners. This could involve:

- critical incidents surveys to assess techniques and concepts that have been successfully used by practitioners.
- questionnaires

### 4. Examine literature for important principles.

- Textbooks
- Prize-winning papers
- Frequently cited papers

### 5. Invite nominations for important findings to be summarized on an “impact site.”

- Ask an expert panel to rate nominations against the criteria.



## Important Findings Identified by Leading Experts

Here is a sample of findings described in this special issue of *Management Science* (from Bass & Wind 1995).

1. Consumers react more strongly to price increases than to price decreases.
2. Price advertising leads to lower prices.
3. Advertised promotions increase store traffic.
4. A firm requires ability and motivation to sustain returns from strategic actions.
5. Some empirical generalizations are better than others.

As with the other findings in this special issue, they are not surprising, nor do many of them do well against the other criteria such as replication.

## Important Findings Identified From Textbooks on Marketing Principles

In many fields, such as medicine, physics, chemistry, and civil engineering, basic textbooks summarize key findings from the field. We should expect this in marketing. Does it happen?

Armstrong & Schultz (1993) examined nine marketing textbooks published for 1927 to 1988. Four doctoral students found 566 normative statements.

- None of them was supported by empirical evidence.
- Only 20 of the statements were rated as meaningful.

Twenty marketing professors then rated the 20 meaningful principles:

- None of the principles was judged to be surprising.
- Nine of the 20 principles were judged to be nearly as correct when their wording was reversed.

Here is an example of one of the principles that scored best against the criteria: “A careful analysis of the causes of sales returns should be carried out by the retailer with a view to overcoming them.”

## Impact Sites Can Aid Dissemination of Findings

In my view, key findings from an area should be easy to find and to apply. This might be accomplished by summarizing the findings as principles and then posting them on a website. The website should allow for open peer review so that the principles can be challenged, updated, and refined.

I have been working on the development of such a site for forecasting:



### **Forecasting Principles**

(<http://hops.wharton.upenn.edu/forecast>)

and, though less developed, for advertising:



### **Expert System for Advertising Persuasion**

(<http://hops.wharton.upenn.edu/~esap>)

Such sites have advantages over textbooks in that they can report on the latest findings. They have advantages over journals in that they can summarize knowledge for use by researchers and practitioners.

Ideally, the listings on such a site should be screened by a diverse group of experts who adhere strictly to the criteria for importance.

# Nominations for an Impact Site: Findings Meeting the Criteria

I provide brief descriptions of findings that I believe to satisfy the criteria. The descriptions do not describe the principles in full. I have also indicated some of the key researchers. To be sure, there have typically been many researchers associated with each of these findings. In some cases, I have also provided key references. This is only a preliminary list to get things started.

## **Applications of economics:**

Auctions, e.g., airline seats (proposed by Julian Simon)

## **Strategy:**

Objective setting improves group effectiveness (E. A. Locke)

Formal planning improves corporate profits (I. Ansoff)

Cooperative behavior pays off (R. Axelrod 1984; A. Kohn 1968)

## **Survey research techniques:**

Question wording (S. Payne; S. Sudman & N. M. Bradburn 1982)

Representative surveys (G. Gallup and others in 1930s and earlier)

Survey design (D. Dillman 1999)

## **Forecasting:**

Judgmental bootstrapping (R. Dawes 1971)

Exponential smoothing (R. G. Brown)

Simple models dominate (S. Makridakis et al. 1981)

Combine forecasts

## **Consumer behavior:**

Sunk costs (H. Arkes)

Cognitive dissonance (L. Festinger)

## **Managerial decision making:**

Biases in judgment (A. Tversky & D. Kahneman)

Decomposition (H. Raiffa)

Socially irresponsible decisions (S. Milgram 1974)

Judgmental bootstrapping (R. Dawes 1971)

## **Product:**

Conjoint analysis (P. Green)

Quasi-contracts for product liability control (P. Huber 1988)

## **Pricing:**

Fairness (R. Thaler)

Endowment theory (R. Thaler)

Effects of risk on willingness to pay (R. Thaler)

Price elasticity (G. Tellis)

## **Advertising:**

Persuasion principles (R. B. Cialdini 1984, 1993)

Advertising elasticity (G. Tellis)

## **Distribution:**

Website design principles (D. Mayhew 1992)

## Conditions Favorable to Discovery of Principles

1. Objectives should be clear.  
The researcher should be close to the problem (Gordon & Marquis 1956).
2. Freedom to study.  
Time and money are available; for example, more time should be spent on research and less on teaching (Hancock 1992).
3. Findings easily available.
4. Research Innovations are rewarded.

## What Individual Researchers Can Do

1. Strive for important findings: use the “Press release test.” Assume that your study was as successful as it could be. Write a press release telling why the findings are important. Be aware, however, that Armstrong & Hubbard (1991) found that a few journals receive important papers to review – and when they do, the reviewers reject them. See below for some ideas about important topics.
2. Use the method of multiple hypotheses. Armstrong, Brodie & Parsons (2001) found that this is not common in marketing.
3. Include conditions in hypotheses, prior to doing the study (Greenwald et al. 1986).
4. If you have something to report, write clearly (Armstrong 1980a). Unfortunately, if you have discovered nothing of value, the normal strategy is to write an obscure paper.
5. Be persistent; Armstrong (1996) reports on the trials and tribulations of publishing. You might have experienced the same problems.
6. Write an impact statement about your research and put it on your website.

In short, violate the **Author’s Formula**, shown on the next page.

## The Author's Formula

The following guidelines were based on my review of the empirical research (Armstrong 1982). A more extensive review (Armstrong 1997) added support.

1. **Do not** examine important problems,
2. **Do not** challenge existing beliefs,
3. **Do not** obtain surprising results,
4. **Do not** use simple methods,
5. **Do not** provide full disclosure, or
6. **Do not** write clearly.

## Some Important (but Dangerous) Questions for Research in Marketing

1. Does increased consumption improve happiness? (R. Easterlin; T. Juster)
2. How can we get people to reduce consumption of . . . (food, alcohol, drugs)?
3. How can you convince people to accept new ideas? (e.g. *More Guns, Less Crime*, J. Lott attempts this. The reactions have been vicious).
4. How can we reduce socially irresponsible decisions by marketing managers? (Armstrong 1985)
5. When is de-regulation helpful to consumers? (Winston 1993)
6. Should we allow new customers and producers to live in the U.S.? (J. Simon)
7. When is it beneficial for the government to deceive people to change their behavior (e.g., dangers of smoking; K. Viscusi)?
8. When is it beneficial to force people to use certain products? (e.g., education)



## Some Important (but Dangerous) Questions for Research in Marketing (cont.)

9. Is it beneficial to force people to pay for products they do not need or want? (e.g., abortion services? education? football stadiums?)
10. Does EDLP improve market efficiency?
11. How should you select a name for a new product (or company)?
12. Could we improve effectiveness by reducing the number of marketing managers? If so, under what conditions?
13. How can we convince marketing managers to use existing knowledge to improve decision making?
14. How can we convince people to waste fewer resources (e.g., electricity)?
15. How should a company defend against false accusations (e.g., breast implants, asbestos)?
16. How can we optimize the number of people killed or injured by consumer products (e.g., autos, toys, pets)?

If a topic does not generate a “hey, that’s interesting!” reaction from the real world, look for another topic.

## More Questions: Where Evaluation Research is Relevant

1. How to reduce use of harmful decision aids, such as
  - BCG (Armstrong & Brodie 1994),
  - Models with market share as the objective (Armstrong & Collopy 1996),
  - Focus groups (Fern 1982),
  - Box-Jenkins (Makridakis et al. 1982), and
  - Statistical significance (Cohen 1994; McClosky & Ziliak 1996).
2. Are there any conditions under which the following aids improve predictions or decisions? I have been unable to find any.
  - M. E. Porter's pronouncements,
  - Mission statements (& visions).

## What Journals Can Do

(support provided in Armstrong 1997)

1. Do not ask reviewers for publication recommendations (editors should make the decisions). (See, for example, Gans & Shepard 1994, where leading economists thought that their most important findings were not well received by journal reviewers.)
2. Eliminate “fairness” as a consideration (e.g., no blind review for authors). While there is some bias, more recent research suggests that the costs seem to outweigh this.
3. Provide more journal space for studies that use multiple hypotheses.
4. Invite papers from successful researchers. This can be requested for important topics. (This procedure is used by the *Journal of Economic Perspectives*.)
5. Use results-blind reviewing. (Or accept papers based on design alone; the author would then complete the study.)
6. Discourage reporting of statistical significance (McClosky & Ziliak 1996; Cohen 1994).
7. Put methodological details on web. The printed version of the paper would stress the findings, why they are important and the evidence.
8. Publish all papers submitted, along with open peer review. (The web makes space inexpensive.)

## What Professional/Academic Organizations Can Do

1. Create impact sites.

By summarizing what is known on a topic, it might help to identify needed research and make it easy to implement principles.

2. Rate schools, departments, and faculty on their research impact.

The “University of Maryland study” did this effectively and with a low budget (Kirkpatrick & Locke 1992). Such ratings might encourage researchers to focus on high impact research.

## What Business Schools Can Do

It is in the interest of major business schools to support research (Armstrong & Sperry 1994).

1. Reward faculty for favorable impact.
  - Request impact statements by individual faculty for past and future work.
  - Summarize impact by department on websites.
2. Use outside review boards to assess impact.

## References

Armstrong, J. S. (1977), "Social irresponsibility in management," *Journal of Business Research*, 5, 185-213.

Armstrong, J. S. (1980a), "Unintelligible management research and academic prestige," *Interfaces*, 10 (April), 80-86.

Armstrong, J. S. (1980b), "Advocacy as a scientific strategy: The Mitroff myth," *Academy of Management Review*, 5, 509-511.

Armstrong, J. S. (1982), "Barriers to scientific contributions: The author's formula," *Behavioral and Brain Sciences*, 5, (June), 197-199.

Armstrong, J. S. (1991), "Prediction of consumer behavior by experts and novices," *Journal of Consumer Research*, 18, 251-256.

Armstrong, J. S. (1993), "Principles involving marketing policies: An empirical assessment," *Marketing Letters*, 4, 253-265.

Armstrong, J. S. (1996), "Management folklore and management science: On portfolio planning, escalation bias and such," *Interfaces*, 26 (July-August), 25-55 (includes commentary).

Armstrong, J. S. (1997), "Peer review for journals: Evidence on quality control, fairness, and innovation," *Science and Engineering Ethics*, 3, 63-84.

Armstrong, J. S. (1998), "Management science: What does it have to do with management or science," *Marketing Bulletin*, 9 (May), 1-15.

NOTE: Underlined papers are in full text on Scott Armstrong's website  
<http://hops.wharton.upenn.edu/people/faculty/armstrong.html>

## References (cont.)

- Armstrong, J. S. & R. Brodie (1994), "Effects of portfolio planning methods on decision making: Empirical results," *International Journal of Research on Marketing*, 11, 73-84.
- Armstrong, J. S., R. Brodie & A. G. Parsons (2001), "Hypotheses in marketing science: Literature review and publication audit," *Marketing Letters*, (forthcoming?)
- Armstrong, J. S. & F. Collopy (1996), "Competitor orientation: Effects of objectives and information on managerial decisions and profitability," *Journal of Marketing Research*, 33, 188-199.
- Armstrong, J. S. & R. Hubbard (1991), "Does the need for agreement among reviewers inhibit the publication of controversial findings?" *Behavioral and Brain Sciences*, 14, 136-137.
- Armstrong, J. S. & T. Sperry (1994), "Business school prestige: Research versus teaching," *Interfaces*, 24 (March-April), 13-22.
- Axelrod, R. (1984), *The Evolution of Cooperation*. New York: Basic Books.
- Bass, F. M. & J. Wind (1995), "Introduction to the special issue: Empirical generalizations in marketing," *Marketing Science*, 14, No. 3, G1-G5.
- Chamberlin, T. C. (1890), "The method of multiple working hypotheses," reprinted in *Science*, 148 (1965), 754-759.
- Cialdini, R. B. (1984,1993), *Influence: The Psychology of Persuasion*. New York: William Morrow.

NOTE: Underlined papers are in full text on Scott Armstrong's website  
<http://hops.wharton.upenn.edu/people/faculty/armstrong.html>

## References (cont.)

- Cohen, J. (1994), "The earth is round ( $p < .05$ )," *American Psychologist*, 49, 997-1003.
- Dawes, R. M. (1971), "A case study of graduate admissions: Application of three principles of human decision making," *American Psychologist*, 26, 180-188. Dillman, D. (1999), *Mail and Internet Surveys*. New York: John Wiley.
- Fern, E. F. (1982), "The use of focus groups for idea generation: The effects of group size, acquaintanceship and moderator on response quantity and quality," *Journal of Marketing Research*, 1, 13-36.
- Gans, J. S. & G. B. Shepard (1994), "How the mighty are fallen: Rejected classic articles by leading economists," *Journal of Economic Perspectives*, 8, 165-179.
- Gordon, G. & S. Marquis (1956), "Freedom, visibility of consequences and scientific innovation," *American Journal of Sociology*, 72, 195-202.
- Greenwald, A. G., A. R. Pratkanis, M. R. Leippe & M. H. Baumgardner (1986), "Under what conditions does theory obstruct research progress?" *Psychological Review*, 93, 216-229.
- Hancock, T., J. Lane, R. Ray & D. Glennon, "Factors influencing academic research productivity; A survey of management scientists," *Interfaces*, 22, No. 5, 26-38.
- Holub, H. W., G. Tappeiner & V. Eberharter (1991), "The iron law of important papers," *Southern Economic Journal*, 58, 317-328.
- Hubbard, R. & J. S. Armstrong (1992), "Are null results becoming an endangered species in marketing," *Marketing Letters*, 3, 127-136.

NOTE: Underlined papers are in full text on Scott Armstrong's website  
<http://hops.wharton.upenn.edu/people/faculty/armstrong.html>



## References (cont.)

- Hubbard, R. & J. S. Armstrong (1994), "Replications and extensions in marketing: Rarely published but quite contrary," *International Journal of Research in Marketing*, 11, 233-248.
- Huber, P. (1988), *Liability: The Legal Revolution and its Consequences*, New York: Basic Books. [For a review of Huber's book, see Armstrong, J. S. (1990), *Journal of Marketing*, 54, 117-118.]
- Kirkpatrick, S. A. & E. A. Locke (1992), "The development of measures of faculty scholarship," *Group and Organizational Management*, 17, No. 1, (March), 5-23.
- Kohn, A. (1986), *No Contest*. Boston: Houghton Mifflin. [For a review see Armstrong, J. S. Journal of Marketing, 52, (1988), 131-132.]
- Makridakis et al. (1982), "The accuracy of extrapolation (time-series) methods: Results of a forecasting competition," *Journal of Forecasting*, 1, 111-153.
- Milgram, S. (1974), *Obedience to Authority*. New York: Harper and Row.
- McClosky, D. N. & T. Ziliak (1996), "The standard error of regressions," *Journal of Economic Literature*, 34, 97-114.
- Mischel, W. (1980), "Metacognition and rules of delay," in J. H. Flavell and L. Ross (eds), *Social Cognition Development*. Cambridge, England: Cambridge University Press.
- Sudman, S. & N. M. Bradburn (1982), *Asking Questions*. San Francisco: Jossey-Bass.
- Winston, C. (1993), "Economic deregulation: Days of reckoning for microeconomists," *Journal of Economic Literature*, 31, 1263-1289.

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<http://hops.wharton.upenn.edu/people/faculty/armstrong.html>

# Questionnaire for Marketing Professors

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What are the most important research findings for marketing made by academics in the 20<sup>th</sup> century? You could view these as empirical generalizations, discoveries, principles, guidelines, or laws. This includes new methods, models, or phenomena. Importance is defined as those that are:

1. **Surprising:** changes in behavior are recommended,
2. **Reliable:** successful replications and extensions,
3. **Valid:** empirically based research shows that it produces better predictions or decisions than current procedures,
4. **Useful:** the changes would have substantial economic or psychological benefits, and
5. **Implemented:** the changes have been used successfully by marketing managers or researchers.

Note: The academic making the discovery does not have to be a marketing professor.

Please describe one discovery (or more) that meets the above criteria:

Other comments:

Provided by (please print: optional)

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Date:

Keep confidential as to source?

NO

YES