Today's Advertising Laws: Will They Survive the Digital Revolution?

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Even advertising has scientific laws, empirical patterns that generalize across a wide range of known conditions. These empirical generalizations provide us with benchmarks, predictions, and valuable insights into how the digital revolution may affect advertising. More than ever we need systematic research to understand the generalizability of our research findings.

INTRODUCTION

This special issue of the *Journal of Advertising Research* (*JAR*) on empirical laws is based on an invitation-only conference at held at the Wharton School, University of Pennsylvania in December 2008. The conference brought together over 100 thought leaders from industry and academia to present and discuss empirical generalizations about how advertising and media work. The conference (www.futureofadvertising.wordpress.com) and this special issue of *JAR* are studies directed by the "Future of Advertising" project of the SEI Center (www.seicenter.wharton.upenn.edu) at the Wharton School.

A SPECIAL ISSUE

Things were complicated enough for advertisers and advertising researchers when, almost overnight, we found ourselves in the middle of a digital revolution. The fragmentation of traditional media is a great challenge for advertisers. On top of this, we have a range of new media, and, just as importantly, we are seeing radical new models of advertising—different ways that consumers can interact with advertising, new targeting opportunities, delivery of totally different audience profiles, different capacities for reach in both time and space, and so on.

Empowered consumers have far more control over how they receive their entertainment and news—and, hence, their advertising exposure. Our measurement systems are struggling to catch up, while, at the same time, technology is making possible the collection of metrics that previously we could only dream of having.

Advertising management today means much more than commissioning content for commercial media. Advertisers now have to embrace the art of influencing (rather than controlling) media such as word of mouth, social networks, product placement, and a variety of other new advertising opportunities.

These changes bring opportunities. But, in doing so, they put incredible pressure on advertisers. It is so much easier to get things wrong now; the risks of what senior managers call "losing money on advertising" are climbing . . . even when advertising productivity was not high to start with. We can either stumble blindly into this brave new world, or we can take stock of what we really know and seek to apply this knowledge to the changes we see around us.

> *The development of an inventory of substantive generalizable findings is useful not only from the point of view of advancement of science in marketing, but also from the point of view of advancing managerial applications. . . .* (Bass and Wind, 1995)

In this special issue, our focus is on fundamental knowledge—empirical generalizations with long "use-by" dates that hold across a wide range of known conditions. Our aim is to collect a list of what is currently known with some certainty. We

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hope that this valuable collection of knowledge will help marketers navigate the tremendous changes in the advertising environment, providing them with something of a compass (or at least a rail against which to steady themselves in rough seas).

The future is always uncharted, but one of the core benefits of science has been to give us some predictive capability. Reliable prediction comes only from established empirical laws. These are patterns, relationships between things that have been observed over and over again across a wide set of conditions.

If you heat water to 100°C, it boils. This occurs if you heat the water with gas or electricity, regardless of the size or shape of the pot, regardless of the material the pot is made from, irrespective of whether you heat it slowly or quickly, during day or night, and so on. This generalization has held across time since its formulation in 1742 (immune to all the changes in the world that have occurred since that time) and across countries. Indeed this law will hold today in millions of kitchens throughout the world. It generalizes across time, countries, and cultures. So we can have great confidence in the prediction that this law gives—and we will be able to cook our pasta, rice, or potatoes tonight.

The predictive value of any law is extremely useful in its own right, but by documenting the conditions under which the law does and does not hold we also gain great insight into why the world is the way it is. Empirical generalizations then are the building blocks of scientific explanatory theory (Bass, 1993), and history has taught us that theory not built on empirical laws most often turns out to be wrong. The world is astonishingly complicated and counter intuitive, so armchair theorizing regularly lets us down.

Without the bedrock of scientific laws, deep thinking by the best and most learned minds has an unproductive tendency to produce elaborate theories that are plain wrong. Western medicine for nearly 2000 years built a complex edifice of theory based on the idea of humorial imbalance, intermingled with astrology (another theoretical endeavor that ignored the need for empirical laws). The results for practice were terrible, as anyone unfortunate enough to be attended to by a medieval doctor can attest. Doctors, bleeding patients to balance their humors, caused countless deaths.

EVEN ADVERTISING HAS LAWS

Contrary to popular belief, the social sciences—including marketing—lend themselves to empirical laws (Ehrenberg, 1993). For example, the reach of an advertising campaign increases with spend, but not monotonically—so the reach return on spend diminishes, quite rapidly after a point. This is true for a wide range of conditions, including different media. This pattern is fundamental practical knowledge for anyone planning an advertising campaign (yet such core knowledge is not always taught in marketing courses).

Underlying this empirical generalization is another about viewing rates having highly skewed distributions—a few heavy viewers and a "long tail" of lighter viewers. New media appear to show the same predictable distributions (Park and Fader, 2004). Laws like this shine a light to guide us through the digital advertising revolution.

It is a common misconception that scientific laws in the physical sciences are different, that physical laws are somehow absolute and inviolate. Nobel laureate Herbert Simon (1968) eloquently points out that any chemistry student can easily show violations to Boyle's law, and that anyone with a rock and a feather can "disprove" Galileo's law of falling bodies, showing that physical science laws are also approximate. As empirical accounts of deviations grow, we refine and limit the conditions under which a law applies. Einstein's theory of relativity did not mean that Newton's laws were wrong; they just do not apply at velocities approaching the speed of light. It is natural that we gradually refine a law, or replace it with one with similar accuracy, but even greater generalizability.

Scientific laws, even in the physical sciences, are approximate. One of the key purposes of science is to simplify and, therefore, understand our complex world. So scientists are more interested in a simple law/model that is known to hold (albeit approximately) over a wide range of conditions than a complex model that fits very well, but to a very limited range of conditions.

Advertising laws are not different, they are just fewer and less developed than we might like. One has to look to find laws, and look further to refine them. And, in this regard, marketing researchers have a poor track record. We waste a lot of research by treating each study as "stand alone" (Ehrenberg, 1966). Even worse, when laws exist we tend to overlook them, consistently trying to formulate new models—each one in ignorance of the established empirically grounded knowledge. Funds for marketing R&D are limited; we cannot afford to keep making these mistakes (see Uncles and Wright, 2004, for suggestions how to avoid these mistakes).

A solution is to take a multiple-sets-of-data approach. And even if we have a single set of data, we can slice it up based on known differences (e.g., men compared with women, print compared with TV advertising exposure, early-evening viewing compared with late-evening viewing). We then can start looking for patterns that generalize across the conditions. If we fit a single model to the one data set, we not only lose this insight, but we also lose the opportunity to discover a model that generalizes across many or all of the conditions we have studied.

Traditional statistical training in business schools almost always teach a "best-fit" modeling approach rather than seeking to uncover a model that fits well over different conditions. This needs to change if we are to uncover more marketing laws.

WHAT ARE EMPIRICAL GENERALIZATIONS?

"Empirical generalizations" is a fancy term for what also are known as natural laws or scientific laws, events that occur in repeating patterns.

An example: Many thousands of years ago, our ancestors noted that the pinpricks of light in the sky at night moved throughout the evening. And they noticed that this happened every evening. Further study showed that they all moved together, except for a few that did not. (Ancient Greeks called them "*asteres planetai*" or "wandering stars." We now call them them "planets.") Yet more study revealed an annual pattern. Over time, these empirical patterns were well documented, and it became possible to predict where a star would be at any time of the year. These incredibly practical empirical generalizations became the basis for navigation for many years. Eventually the patterns were distilled into a heliocentric model that used the earth's spinning to explain the stars (and our sun's) "movement"—a very counterintuitive idea at the time, but one that fits all the empirical patterns that had been collected. And, of course, without these laws, we never would have arrived at this radical new world view.

It seems trivial to point out that our ancestors also noted that the predictable movement of the stars happened in good and bad weather, during peace and war time, and so on. But this is very important because it reveals what the patterns depend on and, thereby, gives us insight into what causes what, what is important, and what is irrelevant. Kings or priests could pass edicts, but they could not stop the stars following their law-like path.

Of course, as knowledge accumulated, people began to refine their findings: The rising and setting of stars vary depending on the time of year and where you are standing—knowledge that was useful for agriculture and for navigation. And a vital part of any empirical generalization remains documenting where a pattern holds and where it does not; what circumstances matter and which do not.

LAWS AND THEORY

Historically, the terms "theory" and "law" are used interchangeably. Whether a set of laws given one title or the other appears to be simply due to historical accident, hence we refer to "Newton's laws" and "Einstein's theory." The marketing philosopher of science Shelby Hunt, however, defines a (well-developed scientific) theory as a set of systematically integrated laws (Hunt, 1991). This is an important point: several laws can "fit together" to give a new world view.

Darwin's theory of natural selection, for example, essentially is a story told by three laws that he scribbled into his notebook in 1838 (20 years before the publication of his *Origin of the Species*):

Three principles will account for all:

1. *grandchildren. like. grandfathers*
2. *tendency to small change . . . especially with physical change*
3. *great fertility in proportion to support of parents.*

Darwin realized that three law-like patterns (inheritance of traits, with slight random mutations, and the fact that all species produced far more offspring than would survive) together told a story of competition for survival, natural selection, and the evolution of species (see Darwin and Quammen, 2008).

So empirical generalizations rapidly become deeply theoretical. But theory that is not built on laws seldom lasts the test of time.

When a law-like pattern is discovered, it instantly begs an explanation why the generalization happens to fit the facts. This explanation—this proposed mechanism—then is tested by the search for particular boundary conditions. The explanation needs to hold up as conditions are shown not to affect the law and boundary conditions are discovered. For example, an explanation for marketing's famous Double Jeopardy law cannot be particular to a product category, for it has been shown to hold for hundreds of categories. So an explanation of this law has to apply to brand choice, attitudes, and TV viewing, to name just a few of the generalized conditions.

If the empirical generalization is "current users of a brand are twice as likely to

THAT'S ALL VERY WELL IN PRACTICE, BUT DOES IT WORK IN THEORY?

In the 1840s a Hungarian doctor, Semmelweis, was intrigued and disturbed by a well-documented empirical pattern: Mothers were many times more likely to catch a fever that killed them in one maternity ward of Vienna hospital than others.

Pregnant women knew of this rather awful, law-like pattern and would beg not to be admitted to the deadly ward. Semmelweis began looking for other patterns that overlaid this one, examining differences in climate, crowding, and so on between the maternity wards.

This led to another empirical observation that would form the basis of his simple theory: Medical students were far more likely to move from working in the next-door mortuary to the ill-fated maternity ward. His inspiration for a possible causal mechanism came when a friend died after being accidentally cut with a scalpel that was used in a postmortem.

Semmelweis speculated that something—"cadaverous particles"—was being brought by the doctors from the morgue to the maternity ward, and so instituted a practice of medical students washing hands with chlorinated lime after working with cadavers. The death rate consequently plummeted.

But, in spite of these bold empirical results, which were carefully documented, the reaction from the medical community was not supportive—it was even hostile. There were various reasons, but many were on theoretical grounds; Semmelweis' empirical patterns should not have existed—they did not fit with the theories of the day.

Then, as is often the case now, theory was held in high regard . . . even if it was based on no scientific laws. Yet the existing theories could not account for this new empirical generalization, that hand washing was associated with a dramatic reduction in fatalities.

Unfortunately, instead of being lauded for his scientific breakthrough, an increasingly frustrated Semmelweis ended up committed to a mental institution, where he died.

These medical cases remind us that even the best educated members of society can be led astray by "theory" based on logic and argument rather than empirical patterns. We need a good deal of empirical observation across a wide range of conditions as the basis for our theoretical conjecture and then we need more empirical tests.

recall its latest magazine advertising campaign than nonusers," this might be explained several ways, for example:

- that magazine advertising is usually targeted to brand users;
- that consumers avoid advertisements for brands they do not use;
- that consumers are better able to encode memories for already familiar brands.

If this empirical law then is shown to hold for a less-targeted medium such as TV, the first explanation can be rejected. If this law holds for a medium where avoidance is difficult (such as some sponsorship), then the second explanation appears incorrect. Conversely, if sponsorship turned out to be a boundary condition where the law does not hold, then the second explanation has passed a test.

WHERE DO ADVERTISING LAWS COME FROM?

To develop a scientific law, you need to observe an empirical event, show that it repeats, and start documenting conditions (with multiple studies and sets of data) under which the pattern does and does not occur. Many of the papers at the Wharton School December 2008 conference did just that, while others based their discussion and insight on already established empirical generalizations.

Scientific laws require empirical (i.e., real world) content and hence depend on data. This was the cornerstone of the scientific revolution, and a bold departure from the philosophical world of the ancient Greeks and theological world of medieval times—scientists did not just think they also got their hands dirty with data [or as Indiana Jones quips in his 2008 movie adventure, *Indiana Jones and the Kingdom of the Crystal Skull*, "If you want to be a good archaeologist, you've got get out of the library!" (http://en.wikiquote.org/wiki/Indiana_Jones_and_the_Kingdom_of_the_Crystal_Skull)].

Fortunately, advertisers have much data, which, in spite of imperfections, are still rich for mining for empirical generalizations.

In reality the development of empirical laws seldom rests on brute empiricism, but rather theory; even if it is largely just guesswork or intuition, it guides the choice of what conditions to look for as potential boundary or modifying conditions (Simon, 1968). And as further replication studies outline the law's generalizability, empirically grounded theory emerges. Knowing what does and does not affect a relationship crafts an explanatory theory—which is why Bass (1993) said that empirical generalizations are the building blocks of science.

Empirical laws don't always *start* with observing a pattern in the real world. Speculation derived from existing

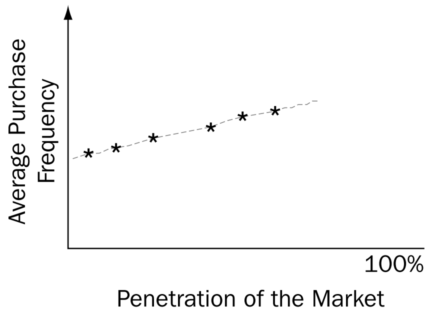

Figure 1 Graphical Representation of Marketing's Double Jeopardy Law.

theories, folklore, anecdotes, or even gossip can send us off looking for a pattern. Many of advertising's theories, checklists, and rules of thumb have this sort of basis. This is fine so long as these principles are then empirically tested and eventually turned into empirical laws, otherwise marketing practice risks being like medieval medicine.

WHAT EMPIRICAL LAWS LOOK LIKE

Empirical laws can often be expressed as "if/then" type statements. For example, marketing's Double Jeopardy law (Ehrenberg, Goodhardt, and Barwise, 1990) says that larger brands have more customers and those customers are slightly more loyal. This can be expressed as, "*if* a brand has higher market share than a rival, *then* it will have a larger customer base that is also slightly more loyal" or "*if* two rival brands have similar market share, *then* they will also have similar sized customer bases." A statement like either of these easily can be turned into a normative "do this" statement: "If you want to substantially grow your market share, then you need to get more customers."

Empirical laws can also be expressed algebraically or shown graphically, e.g., Double Jeopardy as $w = wo/(1 - b)$ or as shown in Figure 1.

THE NEED FOR MULTIPLE SETS OF DATA

A scientific law:

- must be about the real world (in this case, advertising), not just a logical statement (i.e., "sales revenue rises if you make more sales") (Hunt, 1991);
- must have been observed a number of times;
- should have been observed across a wide variety of conditions.

We must be able to say something about the conditions under which it generalizes, and the conditions under which it does not.

We can discover interesting things with a single set of data, but, by itself, a single data set cannot really tell us anything about the generalizability of our finding. We don't even know if we'll get the same result if we immediately do the study again.

It is a common mistake to think that statistically significant results are generalizable, when actually all these significance tests tell us is that our discovery probably is not merely an artifact of random sampling variation. A significance test does not tell us the conditions under which the law does or does not hold; we are still just guessing about which population/circumstances our finding generalizes. Hall and Stamp (2004) made this mistake in their otherwise worthy attempt to catalog empirical generalizations, *Meaningful Marketing: 100 Data-Proven Truths*.

We always learn something from repeating a study on another set of data. A perfect replication must, by definition, give us the same finding and so tells us nothing. A perfect replication is practically impossible, however, so a very close replication gives us, at the very least, a bit more confidence that the original result was not due to some undocumented error or fluke event. If the finding holds firm across deliberately manipulated conditions (e.g., different researchers, different product category, different country, different commercials, different media, different segments), then we not only gain confidence in our finding, but we also learn about its generalizability—and this is the key to prediction and deep explanation.

THESE ARE NOT EMPIRICAL LAWS

It has been observed that many of the supposed generalizations in marketing practice (Cierpicki, Wright, and Sharp, 2000) and literature are "either tautologies, truisms, or so overly general that they are of very limited use in developing marketing science" (Halbert, 1965, p. 66). It is, therefore, worth pointing out the sort of statements that appear law-like, but fail on essential criteria (see Hunt, 1991, p. 105 for further examples and discussion):

- "If God is not happy with the advertising then it will not work" is not a valid law. Because God is not empirical so we cannot check if He really was happy or not.
- Tautological statements (e.g., "the advertising will lift sales or not") are not empirical generalizations because they are true simply by logic and so do not really say anything about the real world.
- The law-like statement "trial purchase occurs only if the consumer possesses a sufficiently favorable attitude" (Rossiter, 1987) is rendered tautological and unfalsifiable by the word "sufficiently"—because whether the unobservable attitude is judged sufficient depends on whether the consumer made the trial purchase. So the statement becomes meaningless. "If you don't allocate adequate media weight then your advertising will fail" is similar, unless "adequate" can be specified independently of campaign success or failure.

THREE COMMON MISCONCEPTIONS ABOUT SCIENTIFIC LAWS

Empirical laws don't tell a manager what to do

Marketing is a professional practice and managers have goals they want to achieve. Thus there is added value in taking a descriptive law and expressing it as a normative law. For example, if the empirical generalization is that advertising in multiple media generates higher sales than the same dollars spent on a single media, then we can easily craft a normative statement "to generate higher sales spread your advertising dollars over multiple media." All normative laws contain an assumption about a goal (whether or not it is explicitly stated).

Empirical laws are of no value unless they are turned into prescriptive statements

Normative statements are useful, and so are descriptive statements because they provide benchmarks and norms. Newton's laws are purely descriptive, but of great practical value to any engineer, pilot, or rocket scientist. Anyone familiar with marketing's Double Jeopardy law (Ehrenberg, Goodhardt, and Barwise, 1990) can predict the level of repeat purchasing a brand will obtain if it reaches a particular level of market share. At face value this might seem disappointing because the law does not say how to get that level of market share. But this is unreasonable: Newton's laws don't say how to build a rocket either. There is plenty of room of creativity and engineering—for both rocket scientists and marketers.

Managers should try to beat the law

Empirical laws describe the way the world is. They help us explain and predict. They are to be used, not beaten. In physics, escape velocity is a consequence of the law of conservation of energy.[1] Rocket scientists don't seek to beat this law; they use it to design rockets that will actually work.

[1] *Perpetual motion machines try to beat this law. Patent offices routinely receive patent requests for such devices though none have been built. While no scientific law is absolute and a boundary condition may be discovered one day, readers would be prudent not to invest in business ventures based on building a perpetual motion machine.*

- "If you are successful then you can become arrogant" is similar. The problem with this (the 19th "Immutable Law," according to Ries and Trout, 1994) is that the conditions are not specified; of course you could become arrogant, or not, whether you are successful or not. So this is not an empirical law because it really says nothing.

The key point is that every empirical law must be potentially falsifiable; it must say something meaningful about the real world. There must be *potential* for some real-world data to show that the law is wrong and needs to be amended. The above examples fail because it is impossible to ever prove them wrong with empirical data.

WILL OUR ADVERTISING LAWS SURVIVE?

Empirical generalizations are based on historical data. Given the dramatic changes in the business environment, the question arises regarding the value of our current empirical laws and their applicability and relevance to the changed conditions of today and the uncertain conditions of tomorrow.

The more we know about the generalizability of an empirical law, the better equipped we are to answer such questions. This points up the value of replication and extension studies, deliberate research attempts to see how far laws generalize—a call that has been made many times previously (Hubbard and Armstrong, 1994).

There are some empirical generalizations that have not only stood the test of time, but they have been examined by different researchers, using different methods. They are known to hold for different media, in different countries, and so on. Such robust laws are more likely to keep on working. (This reasoning might be inductive, but it needn't necessarily be naive. If we know what factors the law is immune to, and we know what factors are changing in the world, then we can make intelligent evaluations of whether or not the law will continue to apply.) For example, in this Special Issue, we have laws concerning TV viewing that have held for decades across a wide variety of conditions. Accordingly, Sharp, Beal, and Collins (p. 211) argue, in spite of the many changes wrought by the digital revolution TV, that advertising will continue to retain much of its power. Similarly, Rubinson (p. 220) pulls together a diverse range of studies examining the effectiveness of TV advertising and finds there is no evidence that TV advertising is losing effectiveness. Jamhouri and Winiartz (p. 227), across many countries, examine consumer perceptions of the impact of advertising on them and report a related conclusion. Binet and Field (p. 130) find that campaigns that included TV in their mix outperformed those that did not.

WHAT NEXT?

While the array of laws presented in this Special Issue is exciting and of immense practical value, it is immediately apparent that not enough is known about each law's generalizability—where it does and does not hold. We need more systematic research across a wide range of conditions, at very least different media. We need R&D to examine which laws are surviving the digital revolution.

And we need more laws.

Not all our scientific laws of advertising may survive the digital revolution, but they may help us to survive it! JAR

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