Competence and Incompetence Training,

Impact on Executive Decision-Making Capability:

Advancing Theory and Testing

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ATTESTATION OF AUTHORSHIP

I hereby declare that this submission is my own work. To the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning (University Postgraduate Centre, 2009, p.96).

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ABSTRACT

"Two-level theories explain outcomes with causal variables at two levels of analysis that are systematically related to one another" (Goertz & Mahoney, 2005, p. 497). This thesis analyses the systematic relationship between level one, the environment of dynamic complexity theory, and level two, cognitive decision-making theory. The second-level literature on competence theory suggests that we train executives to make incompetent, rather than competent, decisions. One of several problematic decision-making tools often taught in business schools is the Boston Consulting Group (BCG) market-share/growth matrix. This device causes practitioners to focus on competitor-oriented objectives and neglect profit objectives. Ultimately, competitor-oriented objectives harm performance.

First-level literature adds the culpability of environmental context theory to this problem. Simon (1956) posits that competency is dependent upon cognition together with – and often superseded by – the context. Dynamic complexity permeates the context of managerial decisions. With the proposition that incompetency derives from the systematic relationship between cognition and environment, this thesis pursues knowledge about the impact of incompetency training, and counter-incompetency training, in an environment of dynamic complexity.

Experiments were conducted to test 13 hypotheses, working with 541 executives-in-training and experienced practitioners in North America and New Zealand. The research in this thesis extends research to date on the BCG device with two key differences. Armstrong and colleagues (1994, 1996, 2007) identify incompetence but do not test the effects of training or solutions for incompetence, and earlier treatments rely upon competitor profit levels that are, in reality, indeterminable. The research reported here first confirms the general level of incompetent decision-

making found in earlier work, then tests various tools for their efficacy in improving executive decisions. Tools considered include the open system non-deterministic strategy formulation metaphors of Weick's (2007) sensemaking/tool-dropping, and Gigerenzer's (2006) heuristics. Additionally, the elimination of competitor profit information from the ten treatments of this thesis research provides realistic information for a decision maker in this context.

Keywords: sensemaking, tool-dropping, heuristics, competence, decision-making, ecological rationality, emergent strategy, non-deterministic metaphor, dynamic complexity, executive training.

CHAPTER ONE

INTRODUCTION, RESEARCH FOCUS

1.1   Research Background

Thomas Kuhn presents the interesting idea that as scientific models age then frequently anomalies, or paradigm disruptions, appear (1996). When this happens the scientist who challenges the dominant paradigm may find it difficult to publish his/her ideas and may generally suffer antagonistic peer pressure from the paradigm community. Such paradigm disruption was championed by Armstrong in the 1990s, concerning the efficacy of matrix decision-making metaphors. Armstrong and others noted the limited empirical evidence that supports the efficacy of the Boston Consulting Group (BCG) matrix, with its focus upon competitors and preoccupation with market share (Armstrong & Brodie, 1994). Their paper,"Effects of portfolio planning on decision-making: Experimental results," drew immediate critical attention.

Armstrong and Collopy (1996) then published further research results supporting this thesis in another paper, "Competitor orientation: Effects of objectives and information on managerial decisions and profitability." Together, the studies incorporate laboratory experiments and interviews with over 2300 managers and managers-in-training, as well as extensive field studies and a longitudinal, six-year analysis of corporate performance.

In a third publication a decade later, "Competitor-Oriented Objectives: Myth of Market Share," Armstrong and Green (2007) affirm Kuhn's prophecy that challenging a dominant theory meets heavy resistance from those who have invested in it. In their attempts to publish their research adverse reactions from reviewers to their evidence significantly slowed their progress. Some reviewers were so challenged by the

controversial findings that they suggested the laboratory experiments and field collected data were deficient and unconvincing. Armstrong and Green conclude, "Despite evidence from diverse laboratory and field studies…the myth of market share lives on" (2007, p.130).

This thesis is inspired by Armstrong's work, and the research reported here extends earlier findings regarding the efficacy of the BCG and other matrix models used by business managers when making decisions. The conundrum of the BCG heuristic still exists; but the cause and training solutions extend beyond those factors reported by Armstrong and colleagues (1994, 1996, 2007).

1.2   Research Problem, Propositions, Issues and Contributions

"Human rational behaviour is shaped by a scissors whose two blades are

the structure of task environments and the computational capabilities of

the actor" (Simon, 1990, p.7).

Executives benefit from using systems thinking in environments of dynamic complexity. Systems thinking incorporates a variety of tools for decision-making whilst operating in an environment of dynamic complexity. The tools include the BCG metaphor as well as sensemaker's tool-dropping, and decision heuristics (Clausewitz, 1908; Quinn, 1980; Senge, 1990; Todd & Gigerenzer, 2000; Weick, 1995). The present study proposes and examines theoretical propositions in competency theory applicable to systems thinking by executives relating to contexts in firms. The work of Armstrong and Brodie (1994), Armstrong and Collopy (1996), and Armstrong and Green (2007) is extended beyond their matrix model studies. Their studies provide empirical evidence to show that substantial numbers of executives make decisions that

cause their companies to become less, not more, profitable and may even lead to their firms' demise. They demonstrate this despite these executives having merely followed strategies that frequently appear in marketing textbooks, books on effective marketing strategy, and the portfolio matrix literature. Armstrong and his colleagues clearly show the inadequacy of using an inappropriate decision heuristic. Their work does not extend into training, decision aids or tools to improve decision-making.

The central problem addressed by this thesis is how to train rationally-bounded executives for competent decision-making in an environment of dynamic complexity. This thesis also tests the systems thinking adapted by Gigerenzer and colleagues (2009), and Weick (2007). Extending Armstrong's work, these authors suggest that decision heuristics increase the sense and decision-making competency of executives in firms. A major contribution of this thesis is to provide evidence regarding how decision competency can improve through training in the use of Weick's sensemaking and Gigerenzer's simple heuristics. Executives-in-training can learn to adapt to their environment by discarding misleading information and rely instead on uncomplicated, non-deterministic, metaphorical heuristics and tool-dropping. Sensemaking and decision heuristics are now briefly described.

1.2.1 Sensemaking

People cognitively attempt to make order of the contexts in which they find themselves. When interruption inevitably occurs, people recover by adapting to the new environment. "Order, interruption, recovery, that is sensemaking in a nutshell" (Weick, 2006, p. 1731). People – and animals – attempt to make sense of disruption in their environment then attempt to recover. Sensemaking is the process of creating situational

awareness and understanding in environments of high complexity or uncertainty in order to adapt to interruption (Weick, 2006). Explicit sensemaking is "a motivated, continuous effort to understand connections (which can be among people, places, and events) in order to anticipate their trajectories and act effectively" (Klein, Moon, & Hoffman, 2006, p. 71). As far as we know, even animals have always relied on automatic (implicit) sensemaking and heuristics to solve adaptive problems (Hutchinson & Gigerenzer, 2005; Woodside & Wilcox, 2009).

1.2.2   Heuristics

Cognitive heuristics are described variously as those rules people apply to reduce complex inferential tasks to simple cognitive operations (Cervone and Peake, 1986); as inferential rules of thumb (Allison et al. 1990); and as simple schemas or decision rules (Axom et al. 1987). Humans automatically adopt cognitive heuristics in order to minimize the use of mental processing capacity for everyday, repetitive, tasks, to allow specific issues to be cognitively managed. Like sensemaking, they also apply to the animal kingdom, as Hutchinson and Gigerenzer (2005) and Woodside and Wilcox (2009) illustrate.

Managerial decision making heuristics are a particular subset of cognitive heuristics, and Todd & Gigerenzer describe them as simple, non-deterministic decision metaphors that can work well or poorly in appropriate or inappropriate contexts (Todd & Gigerenzer, 2000). People are exposed to informational cues in their environment that trigger a decision, which is often simply an automatic, seemingly mindless, response. These decision heuristics are generally efficient cognitive processes as they save cognitive processing time and are based on previously successful decisions. However, such cues – and the consequent heuristic responses – may or may not be

helpful in decision-making depending on their appropriateness in a given context

(Gigerenzer & Brighton, 2009).

1.3   Research focus

Managerial decisions are often repetitive, so the tools managers use may become

heuristics for them – where a problem was effectively solved on one occasion by

applying a particular tool then the use of that tool may be triggered by a similar decision

situation arising. The Boston Consulting Group matrix is one such tool, that has

enjoyed wide popularity in business schools and with managers around the world.

Armstrong and various colleagues, mentioned above, have conducted research

using the BCG matrix as an example of heuristic behaviour in management decision-

making. The particular decision tool is a good example, as evidence abounds that

foucussing on market share is often a sub-optimal strategy that often results not in

profitability but in losses (Armstrong & Brodie, 1994).

Kotler and Keller (2008) have heavily qualified the use of the BCG decision

matrix in their latest *Marketing Management* textbook, explaining how it can be a

harmful tool in many managerial environments. Nevertheless, the use of the BCG

matrix still seems to be common (Armstrong and Green, 2007).

With the practice of marketing strategy continually shifting in response to the

realities of the dynamically changing marketplace, educators are encouraged to

reconfigure strategy education. Weick suggests educators employ sensemaking tools to

enhance student learning (Weick, 2007).

This research is based on the earlier research showing that managerial decision

tools, such as the BCG matrix, can lead to incompetent decisions. An incompetent

marketing or managerial decision is one which uses an inappropriate tool in a particular

environment, such that profitability is threatened rather than enhanced.

Specifically, the research reported here extends Armstong's work to not only confirm his belief that the BCG matrix is still commonly misused and results in incompetent decisions, but also to include remedial suggestions about sensemaking and tool-dropping as methods of training competent decision-making.

1.4   Method

To test the research hypotheses, ten discrete experimental studies are run and reported. Each study uses a unique scenario and elicits responses in a closed-system, post-test and control-group design. The research requires 50 participants per group to achieve reasonable statistical power in each experiment (Field, 2005). The expected findings will strengthen and extend the theories and management training programmes relating to competency-based training in sense and decision-making, including the value of inoculating executives from thinking and acting incompetently.

For the evaluation of decisions made by executives in specific management contexts the thesis looks to the work of Armstrong and colleagues (1994, 1996, 2007), and others. Of particular importance is research conducted through simulations of decision experiments (Green & Armstrong, 2004), which provide a guide for this work, even though their methods are not strictly replicated. In Chapter 2 the methods utilized by this previous research are explained in more detail and in Chapter 3 changes to this work in the method utilised here are explicated.

1.5   Thesis Outline

Chapter One: Introduction

In Chapter One the problem addressed in the thesis research is identified and discussed,and from this discussion a research focus is formed. This focus is "how to

train rationally bounded executives for competent decision-making in an environment of dynamic complexity."

Chapter Two: Theory Development

Level One Theory refers to the broader theoretical foundations of systems thinking within the decision-making, strategy formulation process. An open system perspective focuses on those incremental activities that create value whilst realising organisational vision. In particular, Simon's (1956) "environmental blade" of dynamic complexity is discussed and placed within a modern context.

Level Two Theory refers to the individual decision-maker and how s/he makes their decision. Here, Simon's (1956) "cognitive blade" provides a good framework to discuss the relevant literature in management competence theory, including research showing that increasing levels of strategic planning education relates to increasing frequency of making incompetent decisions. Review of literature on problematic heuristics reveals the problem. Corrective systems thinking tools are introduced and discussed. These tools include sensemaking, tool dropping and simple heuristics.

Chapter Three: Method

Hypothetical deductive explanatory theory testing (Phillips & Pugh, 2007) extends the work of Armstrong et al (1994, 1996, 2007). This study makes changes to Armstrong's methods by excluding his "competitor profit" variable in order to achieve experiment realism (Bailey, 1982). The extensions made to the methods used previously include testing the heuristic and sensemaking propositions of Weick (2007), and Gigerenzer (2000, 2005, 2009) within the experimental framework.

Chapter Four: Experiment Results

The data is collected from 541 respondents, including both executives-in-training and experienced practitioners. Following in Armstrong's footsteps this categorical decision data is analysed using hypothesis testing through cross tabulation with Chi square analysis. Additionally, Anova and simple linear regression analysis are also used in the analysis where appropriate (Field, 2005).

Chapter Five: Conclusions and contribution

Analysis of the data addressing thirteen posited hypotheses allows conclusions concerning both decion-making and training for both educators and practitioners. The value of the studies are identified and discussed. A key finding of this research indicates that "incompetency training" does increase the incidence of poor managerial, marketing, decisions, especially in comparison with competency training. This chapter closes with conclusions about the research problem and the implications for theory and practice, the research limitations and suggestions for further research.

1.6 Chapter conclusion

Armstrong and colleagues (1994, 1996, 2007) launched a scientific revolution when they began questioning the efficacy of long-held theories about the tools executives use to make decisions; in particular, they proposed that the cognitive application of the BCG heuristic leads to incompetent decisions.

This research acknowledges Armstrong's baseline proposition. However, modification of his research design through elimination of competitor profit from the experimental conditions attains more experimental reality. The research then extends Armstrong's work and focuses on how to train rationally bounded executives for competent decision-making in an environment of dynamic complexity. The method to

review this problem is hypothetical deductive research (Phillips & Pugh, 2007). The additional theories invoked include Simon's (1958) cognitive/context theories, the non-deterministic metaphors of Weick's (1993) sensemaking, and Gigerenzer's (1999, 2009) heuristics.

Theory development through review of the extant literature follows in Chapter 2. This development commences with consideration of the dynamic complexity of the environment as posited by Simon (1958), and then proceeds with cognitive strategies for making effective decisions within this environment.

CHAPTER TWO

THEORY DEVELOPMENT

2.1   Introduction

Simon (1990) proposes the metaphor of the mind and world fitting together as the blades of scissors; the two must be well matched for competent decision-making. Using the cognitive blade alone will not allow the scissors to cut.

Level One explores the literature on the environment, in Simon's terms, initially reviewing the dynamic and complex strategy formulation process as shown in Figure 2.1. Level Two explores the literature on cognitive decision-making theory, ultimately relating cognitive systems thinking theories with the Level One theoretical environment of dynamic complexity (Senge, 1990).

2.2   Level One, Simon's Environmental Blade: Dynamic Complexity

Early lessons in environments of dynamic complexity

Many years ago, a father and his son were building sandcastles at the beach. As the building progressed, the son became distraught with the waves washing over the sand structures. His father remarked, "Son, building a business is like these sand castles. You build and build and build, and the waves keep washing over each system or procedure after you put them in place". (Joseph Spanier, *circa* 1951)

2.2.1   Competence Theory

While Ruth (2006, p. 213) emphasizes that "competency has no accepted definition," the present study refers to competence as the conjunction of knowledge, capability, decision, implementation, and assessment effectiveness in reference to a

choice in a context including doing something versus doing nothing, as well as crafting and selecting an appropriate choice from two or more alternative options. In simpler terms, competency within this context implies that appropriate management tools are applied in specific situations such that a profit-optimising decision is made.

Competence theory and research stress that a context is a necessary condition for understanding and nurturing explicit competence. The world (a given context) is a key for understanding the workings of the mind (Czerlinski, Gigerenzer, & Goldstein, 1999). Ruth (2006) also stresses this polarity in his development and extension of the ecological metaphor of intellectual landscape to the field of management, with particular reference to management development programmes.

2.2.2 *Environmental-experience Versus Workings-of-the-mind*

Do businesses get more value from experienced or knowledgeable executives? Of course they need both, but one can discern a difference in the effects of these two variables. Dreyfus and Dreyfus (2005) developed a model of skills acquisition. Their model is a ladder where students climb toward expertise. The bottom rung of this ladder is novice, where beginners first learn the rules of the game. Students advance up the ladder taking on additional responsibility through to advanced beginner, to competent, then proficient, arriving finally at expertise. The authors note that the highest stage of expertise comes through experience and intuition gained by adaptation to the environment. They conclude that expertise diminishes through over-reliance on calculative rationality. Other authors have commented on this environmental versus cognitive ability especially in the context of shared experience within group activities (Melone, 1994), and the results of research on expert/novice differences in decision-making (Barrick David, Murray, & Alexander, 1991; Dreyfus & Dreyfus, 2005; Kolb, 1981; Melone, 1994).

2.2.3   Senge's Environment of Dynamic Complexity

Senge (1990) proposes the leverage necessary in solving most management problems involves coping with an environment of dynamic complexity. Dynamic complexity is indicated by subtle cause and effect, or when time intervenes between applications of a stimulus without timely response. He identifies specific marketing problems as examples of these phenomena:

> Balancing market growth and capacity expansion is a dynamic
>
> problem. Developing a profitable mix of price, product (or
>
> service) quality, design, and availability that make a strong
>
> market position is a dynamic problem. Improving quality whilst
>
> lowering total costs, and satisfying customers in a sustainable
>
> manner, is a dynamic problem. (Senge, 1990, p 72.)

Senge (1990) implies the phenomenon of equifinality, when he suggests the indicators of subtle causes or effects and time interventions.

2.2.4   Equifinality

When analysts are confronted with complex causal patterns they may think about these numerous variables in terms of necessary and sufficient conditions (as in fuzzy set analysis). Equifinality exists in an open system when a given state can be reached by many potential means (Fiss, 2007; Goertz & Mahoney, 2005; Mahoney & Goertz, 2006). Equifinality contrasts with orderly closed systems, wherein direct cause- and effect relationships exist (Bailey, 1990).

2.2.5   Porter's Call for Environmentally Sensitive Dynamic Theories of Strategy

Porter (1991) recognises the difficulty context places on developing a truly dynamic theory of strategy. He called for the academic community to develop a dynamic theory of strategy which, of necessity, must deal with both internal firm issues and with constraining environmental factors. He describes the criteria necessary for a dynamic theory of strategy. First, this dynamic theory of strategy must allow for environmental change. He notes that when environmental change is rapid or relatively continuous the analytical problem is complicated. Second, a dynamic theory must address how the firm chooses between new options; the fundamental question becomes: does the environment shape the options, or does the firm shape its options through creative decision making processes. Finally, because of the random nature of the environment, a truly dynamic theory of strategy must allow for the role of luck. The problem with developing a dynamic theory of strategy is the unavailability of deterministic models. A dynamic theory of strategy requires flexible, non-deterministic, models to guide decion-making.

2.2.6   Strategy Process in an Environment of Dynamic Complexity

Figure 2.1 displays a dynamic, open system, non-deterministic model of the strategy process. There are three primary concepts that, when joined together, depict the strategy process. The model displays the organisation's value on the vertical axis, and time on the horizontal axis. The star represents the vision of the firm. Incremental processes are represented with the staggered arrow. Each one of these concepts makes a contribution to the dynamic complexity of the organisation.

Figure 2.1 Strategy Formulation Process
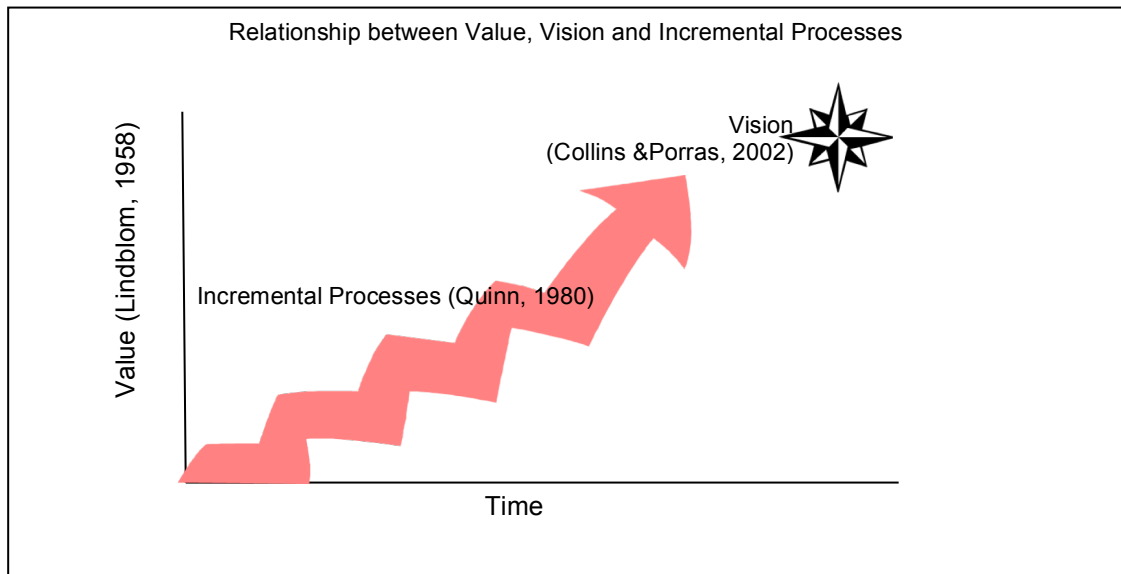
Adapted from Lockhart (2007)

2.2.7   *Value complexity*

Internal Value. In his essay, with the oxymoronic title, "The Science of Muddling Through," Lindblom (1959) describes the decision-making process of public administrators. He contrasts linear decision/policy formulation with the experimental, incremental approach to decision/policy formulation. An antecedent to his theory is the independent variable of value/goal differentiation that exists within complex organisations. The multitude of different stakeholders that hold an interest in public organisations and their differential pressures and demands upon the organisation ultimately affect administrator's formulation of policies and decisions. Lindblom's muddling addresses the complexity of differential values thrust upon executives by various stakeholders in a public administration context. For example, whilst planning new motorways through existing communities, administrators deal with environmental concerns, the rights of private property owners, and the needs of the broader motoring constituency. With the variety and complexity of different stakeholder's values public administrators formulate strategy incrementally over time.

External Cultural Value. Business executives adapt to the values of their external environment. For example, within developing nations executive decision making is influenced by their national economic environment. The economic development phenomenon over the past 45 years has been manifested by transformations in many countries around the Globe, notably China, Korea, India, Taiwan, Singapore and Hong Kong. One value objective of the developing economies has been growth. China has attained this goal through restructuring (Nelson & Pack, 1999). Trade liberalisation has also been a primary value objective for the developing economies which increases competition and promotes trade efficiency (Kim, 2000). Development is often about improving living standards through poverty alleviation, market access and participatory governance. For many developing economies, their targeted value is access to Western markets (Wade, 2003). The East maximizes its' wage advantage to achieve market share. This environment influences the value proposition of their business executives. The need to maximise their low wage advantage results in a mindset which focuses on market share over short term profit (Lall & Albaladejo, 2004).

2.2.8   *Vision complexity as a function of paradox*

Highly visionary companies are in the habit of dealing with a whole range of complexities. Collins and Porras (2002) address these complexities as paradoxes. They call for executives to embrace the genius of the 'AND' while overcoming the tyranny of the 'OR'. They provide a list of examples that managers of visionary companies encounter. Below, Table 2.1 lists some of the paradoxes encountered by visionary companies.

Table 2.1 Genius of the AND, Tyranny of the OR

Purpose beyond profit	AND	pragmatic pursuit of profit
A relatively fixed core ideology	AND	vigorous change
Conservatism around the core	AND	bold, , risky moves
Big Hairy Audacious Goals	AND	incremental progress
Ideological control	AND	operational autonomy
Extremely tight culture	AND	ability to change and adapt
Investment for long term	AND	short-term profit
Philosophical, visionary	AND	superb daily execution
Organisation aligned with core ideology	AND	organization adapted to its environment

Adapted from Collins and Porras (2002, p.44)

Collins and Porras concluded that visionary companies do not simply balance paradoxes; a visionary company does both at the same time:

Balance implies going to the midpoint, fifty-fifty, half-and-half.

A visionary company doesn't seek balance between short-term

and long-term, for example: it seeks to do very well in the short-

term and very well in the long-term…Irrational? Perhaps. Rare?

Yes. Difficult? Absolutely. But as F. Scott Fitzgerald pointed

out: The test of a first-rate intelligence is the ability to hold two

opposed ideas in the mind at the same time, and still retain the

ability to function (Collins & Porras, 1994, p.45).

Other Scholars have contributed wisdom on how paradoxes become an issue when formulating vision. Schultz and Hatch addressed the vision formulation paradox

from a corporate branding viewpoint. Their research conducted inside the LEGO

Company uses action research, where they observed participants and acted as outside

Table 2.2 Vision alignment

Cycle 1: Stating the Vision.
Paradox: *External versus Internal*; promises management wants to make to stakeholders versus promises stakeholders want to hear.
Cycle 2: Involving Stakeholders.
Paradox: *Heritage versus Relevance*; timeless organisational heritage versus current brand relevance and emotional appeal.
Cycle 3: Integrating Vision, Culture and Image.
Paradox: *Globalversus Local*; global coherence and brand isolation versus local adaptation and brand fragmentation.
Cycle 4: Linking Vision to Culture.
Paradox: *Centralisation versus Decentralisation*; centralisation with a corporate brand versus decentralisation under a brand umbrella

observers. Their data and salient insights include the paradoxes executives must

address when formulating vision. Table 2.2 identifies four cycles during the process of

aligning the three concepts of management vision, employee culture, and stakeholder

image. The four cycles and the process of aligning these three concepts each have

inherent paradoxes which organisations must overcome (2003).

Schultz and Hatch (2003) do not provide a deterministic solution for paradox

resolution on any of the four paradoxes listed above. In each case their solution equates

to assessing the experience of several other firms, thereby seeking clues for resolution.

Paradox is a word often used to describe phenomena that appears to be contrary to logic (Eisenhardt, 2000). Scholars, when they are willing to define the word, provide a multitude of different and varying definitions that are often ambiguous (Cameron & Quinn, 1988). Morgan identifies paradox as a metaphor, in organisation science one finds paradox used generally in the context of decision-making (1988). In addition, the concept of change seems to be an overriding phenomenon and often brings about the concept of paradox (Quinn, 1980). Changes are often manifested by pluralism, that is, people realigning themselves into different sub groups or reorganising into a different grouping (Glynn, Barr, & Dacin, 2000; Kilduff & Dougherty, 2000; Lindblom, 1959; McKinley & Scherer, 2000; Morrison & Milliken, 2000; Rittel & Webber, 1973). Alongside change, conflict often occurs (Amason, 1996), the environment often appears chaotic, and the direction of the organisation may appear nonlinear (Eisenhardt, 2000). As tensions mount, old stakeholder relationships change and discussion occurs between divergent groups (Wendt, 1998). During negotiations a win/win end- result may occur. Win/win may often be referred to as both/and thinking (Collins & Porras, 2002; Gibson & Birkinshaw, 2004). Ultimately an ever-evolving direction of the system emerges (Mintzberg & Waters, 1985; Quinn, 1980).

2.2.9 *Process Complexity*

Review of the strategy formulation process reveals more interruption than order (Weick, 2006). The literature informs us that social entropy, drawing upon the second law of thermodynamics, permeates all dynamic organisations and is manifested through disequilibrium (Bailey, 1990). "Muddling," as discussed previously, is a concept coined by Lindblom (1959) when he explain incrementalism in public policy environments.

The logic of incrementalism was researched by Quinn (1980), who found that managers developed their most important strategies incrementally. Collins and Porras (2002) call for managers to develop their skills by adopting the "Genius of the AND", and avoid the "Tyranny of the OR" (p. 43-46). Their research found that managers must accept the paradox and live with seemingly contradictory ideas simultaneously. With the prevalence of non-deterministic metaphors, nonlinear incrementalism and bounded rationality, vindication ensues for Hamel's comment that "the strategy industry doesn't have a theory of strategy creation" (1998, p 10).

2.2.10 Conclusion to Level One Theory on the Environment of Dynamic Complexity

The literature clarifies the status of some of the complexity inherent in the strategy formulation process environment. Eisenhardt and Zbaracki conclude:

> Research in strategic decision-making…neglect[s] important
> ways in which decision makers think, behave, and feel. In
> addition, the existing empirical research is often distant from the
> normative concerns of complex organizations at the heart of
> strategic management. Thus, the opportunity is here for richer
> visions of strategic decision makers and decision-making. (1992,
> p. 35)

Eisenhardt and Zbaracki (1992) suggest that the complexity within strategy formulation revolves around man's bounded rationality. Clausewitz called for a genius to formulate strategy which assumed rationality, yet implied intuition (1812). Ralph

Stacey also addressed this complexity when he described the strategy process as a nonlinear, multidirectional, emergent concept (1995). Lindblom (1959) informs us of the complexity of the value proposition that can impact executives depending upon the stakeholder environment. Value complexity was also addressed within the developmental status of a national economy as exemplified herein with perspectives on the developmental economics of the East.

Strategy formulation occurs within an open system environment of dynamic complexity. Dynamic complexity exists throughout the entire process and operating structures of the organisation. The solution to our environmental chaos transpires through non-deterministic adaptation to that which people cannot control (Simon, 1990).

Explicit competence theory, training, and research in management focus on the cognitive decision-making activities of understanding, describing, predicting, and controlling. For cognitive decision-making in dynamic complex environments this thesis reviews the literature in Part Two by addressing Senge's system's thinking (1990), the Armstrong and colleagues' closed system research (1994, 1996, 2007) and then the open system propositions of Weick's sensemaking (2006), and Gigerenzer's selection and use of heuristics (Gigerenzer & Brighton, 2009).

2.3   Level Two, Simon's Cognitive Blade: The Focal Problem

The strategy industry has a secret: *there is no theory*.
Anyone who claims to be a strategist should be intensely
embarrassed by the fact that the strategy industry doesn't have a
theory of strategy creation! It doesn't know where bold, new
value-creation strategies come from. There's a gaping hole in the
middle of the strategy discipline. No, let me put that differently:

there's no foundation to the strategy discipline.(Hamel, 1998, p.

10)

Hamel (1998) is referring to the absence of closed system deterministic cause and effect models. There certainly are open system non-deterministic metaphors; especially those generative metaphors that help create perception and sense of our experience (Schon, 1983).

2.3.1 Systems Thinking

Systems' thinking requires specifying micro-relationships within a gestalt view of a system, starting with viewing our systems as open by seeing wholes rather than parts. "Today, systems thinking is needed more than ever because we are becoming overwhelmed by complexity" (Senge, 1990, p. 69). The tools tested here for systems thinking are the metaphors of sensemaking, tool-dropping, and heuristics.

2.3.2 Sensemaking

Order, interruption, recovery, that is sensemaking in a nutshell.

And organizing is the act of trying to hold things together by such

means as text and conversation, justification, faith, mutual effort

(heedful interrelating), transactive memory, resilience,

vocabulary, and by seeing what we say in order to assign it to

familiar categories (Weick, 2006, p. 1731).

As an extension of this reality, Weick (2007) reminds us of an ancient Chinese proverb: "In pursuit of knowledge, everyday something is acquired; in pursuit of wisdom, everyday something is dropped" (Lau Tzu, 531 BC). People can learn to drop one's tools to gain lightness, agility, and wisdom. "Complicate yourself" if you want to

acquire the ability to adapt to change; a rather startling command from someone that suggests you drop your tools (Weick, 1979). Further clarification on the meaning of tool-dropping comes to light when Weick states that complication is not the endpoint of understanding. Executives often assume that they have arrived once their thinking is as complex as the environment they are managing, but there is always more. Ultimately, one needs to move on to profound simplicity by dropping those perspectives that have become useless, redundant and even contradictory (Weick, 2007).

Weick (2007) offers several ideas of when and how to drop those tools that become inappropriate for the context at hand. The two following extensions are particularly appropriate here.

2.3.3   *Drop your Confused Complexity*

Executives live in a complex world. As they grow older, they acquire more experience and understanding of their environment. In the human aging and maturing process, they move from superficial simplicity to confused complexity. Schutz (1979) suggested they could cut through this confusion by moving from confused complexity to profound simplicity by dropping useless and contradictory concepts. Weick provides an example of this phenomenon from the fire-fighting community. He reports that forest fire fighters boil down their many rules to a simple acronym LCES. Forest fire fighters never put themselves into a high-risk situation unless they first have Lookouts, assured Communication, two Escape routes, and Safety zones (2007).

2.3.4   *Drop your Focus on Decision-making*

Learning to hold one's tools lightly shifts the focus from decision-making to sensemaking. Decision makers often take pride in their decisions, defend their position and refuse to listen to those who speak against it. Adopting a sensemaking attitude

causes a decision-maker to become less defensive and more open to change. "A decision is something you polish. Sensemaking is a direction for the next period" (Weick, 2007, pp. 10-14).

2.3.5   *Heuristics: competence and incompetence*

Students of strategy become accustomed to the non-deterministic metaphor as a tool to explain strategic concepts. In his explanation of non-deterministic metaphors, Audebrand uses the example of the Boston Consulting Group's growth-share matrix (BCG). He describes how this metaphor uses a cash cow, a dog, a star and a question mark to help decision makers allocate cash between their product portfolios (2010). Armstrong and colleagues exposure of the BCG model as a tool leading to incompetence reveals the non-deterministic nature of this heuristic. Metaphors and heuristics help us deal with the ever-changing environment, but they can be misleading (Tsoukas, 1991). As non-deterministic models, their utility in a changing environment can quickly dissolve as Armstrong and Green (2007) have so aptly demonstrated.

The extant literature in management competence theory includes research showing that increasing levels of strategic planning education can increase frequency in making incompetent decisions. Armstrong and Green (2007) describe a previously unpublished study by Armstrong and Collopy, (see also Armstrong & Collopy, 1996) with Wharton School MBA students participating in a semester-long course organised around a computer simulation involving executive decision-making. When the participants were allocated into 21 decision-making groups by level of prior strategic planning education, Armstrong and Collopy found that "less profitable decisions were made by 38% of the low-education, 46% of the intermediate-education, and 55% of the high-education groups" (1996, p.194).

The portfolio-planning culprit. In field studies of 129 firms, Slater and Zwirlen (1992)

conclude that those firms whose strategies are consistent with portfolio planning models

had lower returns to shareholders. Capon, Farley, and Hulbert (1987, pp. 316-317)

report that, on average, firms that used the Boston Consulting Group portfolio matrix

reported lower returns on capital than those that did not use them. Thus, certain

management tools receiving substantial number of citations with widespread coverage

in education programs in management serve to increase levels of executives'

incompetency. Ramos-Rodriquez and Ruiz-Navarro (2004) identify 50 works that have

the greatest impact on strategic management research (and in wide use in MBA

programs) by counting citations in the Strategic Management Journal (an A-star journal

in the Australian Deans Council Report on journal quality). Porter's (1980) competitor-

oriented work ranks first in the Ramos-Rodriquez and Ruiz-Navarro's (2004) study --

"an extraordinary distinction for a book that contains no evidence on this topic,"

comment Armstrong and Green (2007, p. 128). "Market Share: A Key to Profitability,"

(Buzzell, Gale, & Sultan, 1975) is also among the 50 most influential works and the

eighth most cited work from 1980-6 in the Ramos-Rodriquez and Ruiz-Navarro's

(2004) study.

Market share culprit. Using an historical research approach, Golder (2000) describes in

substantial detail the fallacious reports in the popular and educational training literature

on the seemingly positive influence of brands' market shares on firms' survival rates.

Golder's research revealed the inaccuracy of widely reported evidence and conclusions

regarding market share and firm survival. The following statements (or their

implications) were erroneous: "leading brands outsell their rivals for years and

sometimes decades" (Carpenter & Nakamoto, 1994, p. 285); "19 out of 25 companies

who were market leaders in 1923 were still the market leaders in 1983 sixty years later"
(Kotler, 1997, p. 352).

Golder (2000) points out that Carpenter and Nakamoto's (1989) statement about
leading brands refers to a study from *Advertising Age* (1983). These findings appear to
be the basis of Kotler's (1997) report. Golder finds the brand share data for the 1983
Advertising Age study was purposefully selected to support the share-survival
proposition. The original 1923 book revealed the finding about the commonly
referenced data that "19 out of 25" market leaders maintained their leadership for at
least 60 years. The finding of long-term leadership was widely reported in marketing
textbooks, journals and in mass-market publications. The results unfortunately, were
from a biased sample of categories. The original 1923 study was not conducted on 25
categories, but rather on 100 categories (Hotchkiss & Franken, 1923). The chosen
sample of 25 categories were selected in order to demonstrate long-term leadership.
The *Advertising Age* study was therefore flawed and the reports of long-term leadership
were overstated (Golder 2000, p. 162).

Golder conducted his own study of all 100 brands in the 1923 study. From
several sources that he identified in his article (2000), he presented detailed evidence
supporting the findings that more of the leading brands in 1923 failed than remained
leaders, , and more of the top three brands in 1923 failed than remained among the top
five brands. He also found that market shares over this prolonged period were not
stable; regressions of rank-order market share versus time show a significant decrease in
market position over time. Interestingly, the long-term success or failure of brands was
proportional to the strength or weakness of their starting positions; however, even the
most successful brands in 1923 had a rate of long-term leadership (42%) much lower
than that currently believed for all leading brands.

Golder (2000) applies historical research to examine the forces that associate brand leadership with survival for the few brands where brand leadership continued over several decades. He identifies chewing gum as the category and Wrigley's as the brand that exhibited a lasting share leadership and survival relationship. "Wrigley had dominated chewing gum for the past nine decades. By 1923, Wrigley had sold the leading brand for more than ten years and was one of the strongest brands in the 1923 study of market leaders. Golder attributed Wrigley's early success to building strong brands through extensive advertising. Since 1923, Wrigley's success was primarily based on three factors: maintaining and building strong brands, focusing on a single product, and being in a category that did not change much" (Golder 2000, p. 165).

Golder's (2000) findings support Armstrong and Green's (2007) conclusion, "…it does not follow logically that seeking higher market share will improve profits or firm survival. Rather, the correlation between market share and profitability is more logically interpreted as showing that firms with better offerings tend to achieve higher market shares" (Armstrong & Green 2007, p.116).

2.3.6   The Experience Curve Strategy

The experience curve, like the BCG, can be a two-edged sword. It encourages firms to cut costs in order to increase volume and thus propelled the firm down its cost curve faster than competitors could move down theirs, but it can also encourage firms to cut prices. In other words, they should price low to prevent competitors from catching up. Lieberman (l987, p. 451) conclude that the experience curve produces incentives that "often intensify competition and reduce profits."

To assess the impact of exposure to the experience curve concept (Kiechel, 1981 pp.139-140), some subjects in Armstrong and Collopy's (1996) study received a description advocating the use of the experience curve concept. The decisions of those

97 subjects were compared with those from 137 control subjects (in the same administrations) who received no information about the experience curve. More experience-curve subjects selected the less profitable than did control subjects (59% versus 45%).

In a rather startling study, Abramson, Currin, and Sarin (2005) conclude that simply providing information on competitors' market shares leaded to lower profits. In simulations using executive MBA students, Abramson *et al*. (2005) told subjects to maximise their aggregate profit to contribute to their course grade. Individual subjects managed each of the five firms in each simulation. While all firms were in the business of providing health care plans, each had different plans and cost structures and started with different customer profiles. Simulations comprised of over eight rounds with a week between each round. With competitors' profits provided, subjects set lower prices than with profit information withheld. With competitors' market-share figures made available to subjects in six further simulations participants set their firms' prices even lower.

2.3.7   *Zero-sum Versus Non-zero-sum Game*

When playing a game for many trials and given feedback about their relative score, almost 90% of subjects' chose competitive/low-profit strategies (Kuhlman and Marshello, 1975). They played as if the 'winner takes all' or they may have assumed they were playing a zero-sum game. Results may have been different if they had assumed a cooperative/profit maximising context of a non-zero-sum game. Kuhlman and Marshello summarised research from three similar studies. The percentage of people that selected competitor-oriented responses ranged from 21 to 49 percent depending on game instructions and payoffs. Liebrand and Vanrun (1985) report similar results across cultures (Armstrong & Green, 2007). Such findings increases the

generalisation of prior findings that use a zero-sum game to test the effect of providing

information to subjects on their cumulative score relative to the other player's score, for

example: Messick and McClintock (1968); Messick and Thorngate (1967); Scodel,

Minas, Ratoosh, and Lipetz (1959).

Abramson et al. (2005), Armstrong and Brodie (1994), Armstrong and Collopy

(1996), and Armstrong and Green (2007) each conclude the same point in separate

studies. These show lower effectiveness in decision making with the use of

management training information and aids that nurture decision-makers toward

competitor orientations, than not having such training information and aids available for

decision-making. These studies do not examine whether or not instruction for subjects

focusing on own brand's profits and ignore competitors' profits, or focusing on own

brand's profits and ignore competitors brands' market shares, or offer subjects long-run,

real-life, information on the negative market share and survival relationship that serve to

increase these subjects' effectiveness in decision-making.

2.4   Conclusion: Simon's Cognitive Blade: The Focal Problem

In summary, there is evidence that many models taught in business schools and

practiced in the marketplace are defective when applied in an inappropriate context. The

BCG decision matrix, with its focus upon competitor strategies and learning curves is

one such tool. Research to date has made clear the prevalence of incompetency

training, but little work has offered suggestions about ways to remedy the situation.

The focus of this thesis is to confirm and extend the existing research in this area

regarding the concept of training competency. This thesis is concerned with how to add

value using entire process systems thinking and a sensitive approach to training with

heuristic and sensemaking tools. Trainers can design management training programmes

to achieve explicit competency among executives by providing training in "dropping

tools" (Weick, 1996, 2001, 2007) and using heuristics that make us smart (Gigerenzer, Todd, & Group, 1999)

2.5   Hypotheses Development

A summary table (Table 2.3) of hypotheses is included for convenience, but in this section the rationale for each hypothesis, based upon the literature discussed above, is explained. The explanation is made in four categories; baseline hypotheses, main, training, and moderation hypotheses. The first set provide confirmation that the effect noted by Armstrong is still evident, and that introducing competitive and market share information generally makes decisions poorer. The second set contain the main thesis here, that although use of the BCG matrix and the Experience Curve typically lead to poor decisions, provision of corrective materials can lead to more competent decisions being made. The third training set contain hypotheses that allow various competency-training ideas to be tested, while the final set deal with a few extraneous variables that might moderate the effects noted in the main study. All the scenarios are appended, and their specific content and layout discussed in the next, research method chapter.

2.5.1   *Baseline Research Hypotheses*

The basic control group in the experiments (that are described in detail shortly), consists of a "no extraneous information" condition. Respondents are faced with a scenario that offers a simple choice between selecting a low price that yields a 49.1% market share but only $10m profit against a high price that yields only a 48.6% market share but $20m profit (Scenario 10).

In this situation it is hypothesized that respondents will make their strategic decision favouring a high-price, high-profit choice. This is described here as a competent decision; making profits is what business is about and in the absence of any other information a rational, sensible choice will optimize the profitability of the

Table 2.3 Summary of Hypotheses

No.	Content	Scenario
H10	When faced with no decision information other than price and profit, respondents will tend to select the most profitable option.	10
H1	The introduction of competitor information to the decision will result in more respondents selecting the incompetent, lower-priced, alternative, even with the market share and profit information for the decision-maker's company remaining the same	1
H2	The higher market share number attached to a low price decision will result in a greater proportion of (incompetent) low-price decisions being made	2
H3	When respondent decision makers are primed with BCG information, a greater proportion will make an incompetent, low-price decision.	3
H4	Provision of materials showing that the BCG and the Experience Curve lead to lower profitability increases competent, high-price decision-making.	4
H5	Provision of materials showing that the BCG and the Experience Curve lead to lower profitability plus materials explaining the fallacy about these tools increases competent, high-price decision-making	5
H6	Provision of materials showing that the BCG and the Experience Curve lead to lower profitability, materials explaining the fallacy about these tools, plus "drop your tools" materials to BCG/EC and materials increases competent, high-price decision-making	6
H7	Provision of information about rational decision-making will reduce the proportion of competent (high-price) decisions.	7
H8	Training decision-maker respondents to use a small heirarchy of simple heuristics will lead to a greater proportion making a competent, high-price, decision.	8
H9	Inducing cognitive overload by the introduction of irrelevant information will cause a greater proportion of incompetent, low-priced, decisions to be made.	9
H11	The share of participants selecting the low-price strategy is higher for participants having more versus less formal training in management education.	-
H12	The share of participants selecting the low-price strategy is higher for participants having less versus more experience in management	-
H13	The share of Eastern participants selecting the low-price strategy is higher than Western	-

enterprise. Note that each hypothesis has a matching scenario with the same number.

H10: When faced with no decision information other than price and profit, respondents will tend to select the most profitable option.

Hypothesis 1 is similar to the first described (H10), in that the market share and profitability results linked to a (competent) high-price decision and an (incompetent) low-price decision remain the same, but competitor information is introduced to the decision. Unlike Armstrong and his colleagues' scenarios, no competitor profits are quoted, simply the market shares (calculated as the obverse of the decision-makers' company information). This is because in a real-world situation market shares can be estimated from external data, but profit cannot be calculated without access to internal cost data usually unavailable to competitors. It is expected that as soon as competitor information is introduced, then the proportion of less competent (low-price) decisions will rise. This difference should be statistically significant.

H1: The introduction of competitive information will result in less competent decisions being made.

Hypothesis 2 tests exactly the same behaviour as Hypothesis 1. The difference is that the market share linked to a low-price/low profit strategy is increased substantially (from 41% to 56%) and the competitor's market share likewise adjusted. It is expected that this information will lead to a yet higher absolute level of low-price (incompetent) decisions. As this, the difference between Scenario 1 and 2 used to test this hypothesis, is a matter of degree (amount of market share) rather than substance (the profit related to a high-price and low-price strategy and the principle remain constant), the difference may be small and thus only different in absolute rather then in terms of statistically significance.

H2: The introduction of more favourable (at a constant low profitability) market

share information will result in a greater proportion of incompetent, low

-price, decisions being made.

2.5.2 *Main Research Hypotheses*

Hypothesis 3 approaches the heart of the research. As revealed in the

exploration of the literature, the BCG matrix and the Experience Curve theory upon

which it is based typically do not lead to competent decisions being made. Profit is the

objective of business, not market share and share has not historically been causally

linked to profits. In this experiment a scenario is introduced that uses the same profit

and share data as in previous scenarios, but respondents are primed with BCG and

market share materials (taken from text books) before being asked to make their

decisions. There is a strong expectation that this will result in a greater proportion of

incompetent, low-priced, decisions being made.

H3: When respondent decision makers are primed with BCG information, a

greater proportion will make an incompetent, low-price decision.

Hypothesis 4 tests the idea that when given proper training, and shown that

market share and experience curve effects are dependent on environmental conditions

and are not a reliable determinalistic predictor of profitability, then more competent

decisionmaking occurs (Armstrong & Collopy, 1996; Anterasian & Graham, 1989;

Montgomery & Wernerfelt, 1991; Mueller, 1992; Tschoegl & Yu,1990). A scenario is

introduced with material to this effect and added to the baseline decision information.

The BCG and Experience Curve material is not present, so the effect of the scenario

should be to focus decision attention upon the profits rather than the competition. This

hypothesis has particular significance with regard to the teaching of strategy in a

business school envirnoment, as it provides information about the possibility of teaching strategy in a classroom.

H4: Provision of materials showing that the BCG and the Experience Curve lead to lower profitability increases competent, high-price decision-making

2.5.3   Research Hypotheses about Training

This set of hypotheses follows from H3 and H4, by testing a number of ways suggested in the literaure in which competent strategic decision-making can be taught or trained in a classrooom setting and not just through experience. Hypothesis 5 is the first of these, and it takes the testing a step further by first exposing decision-makers to the BCG/EC materials and then explaining their dangers. This is not the same as simply encouraging a focus away from market share as in the previous experiment, but it is expected that the effect may be similar and that more competent decisions will be made (more akin to the profit-focussed decisions in Hypothesis 10 than in the share-focussed decisions in Hypothesis 3).

H5: Provision of materials showing that the BCG and the Experience Curve lead to lower profitability plus materials explaining the fallacy about these tools increases competent, high-price decision-making

Hypothesis 6 takes this idea yet further, and provides decision materials as in the previous decision scanario, about BCG and EC leading to poor decisions, but adds yet more material about "dropping your tools." The expectation is that this provision should lead to an even higher proportion of respondents making better, more competent, decisions.

H6: Provision of materials showing that the BCG and the Experience Curve lead to lower profitability, materials explaining the fallacy about these

tools, plus "drop your tools" materials to BCG/EC and materials increases competent, high-price decisionmaking

There is much work that shows that in few managerial decision situations does a determinalistic approach yield satisfactory results. Over-analysis tends to engross the decision-maker in detail whilst obscuring the simple objectives of the decision, the simple heuristcs that could guide a favorable decision. This hypothesis is tested by creating a scenario with a prompt about rational decision-making, showing a method of calculating a weighted average decision model.

H7: Provision of information about rational decision-making will reduce the proportion of competent (low-price) decisions.

The contrary concept to rational decision methods is to allow the decision to be determined by using a simple heuristic. If the decision material is scanned and then a very few heirarchical heuristic rules set that will attain the desired outcomes, then application of these rules will result in a competent decision. In Scenario 8 this is explained to the respondent decision-makers before they are asked to make their pricing strategy decision. The expectation is that there will be a greater proportion of competent decisions made than for the scenario using BCG and experience Curve prompts, but no difference to the baseline Hypothesis 10. Indeed, the scenario to test Hypotheses 10 (Scenario 10) implicity contains just such a simple heuristic by providing limited information – make profit!

H8: Training decision-maker respondents to use a small heirarchy of simple heuristics will lead to a greater proportion making a competent, high-price, decision.

Hypothesis 9 is a placebo condition, where the respondents are simply distracted from the decision at hand with some irrelevant pricing materials taken from a textbook. The expectation is that respondents will suffer some cognitive overload which will result in a greater proportion of them making incompetent, low-priced, decisions as they fall back on a familiar (flawed) heuristic regarding market share.

H9: Inducing cognitive overload by the introduction of irrelevant information will cause a greater proportion of incompetent, low-priced, decisions to be made.

2.5.4 Moderating Hypotheses

The following three hypothesis are all somewhat peripheral, but necessary. They concern the generalisation issue and have significance to the validity of the results of the main hypotheses testing in that they reflect upon the sample adequacy. The three areas of concern that have been put forward in the literature about competence concern the level of formal training in management education of the respondents, the level of managerial decision-making experience they have, and their ethnicity.

H11 tests the overall effect of education level on the competency of decisions, as reported by Armstrong and Collopy (1996). The share selecting the lower-price and higher market share versus the higher-price and lower market share strategy should be higher for participants having more versus less formal training in management education according to his research. The rationale offered by Armstrong and his various colleagues in support of this support of this claim is that formal training programmes in management often stress competitor-oriented objectives to the deteriment of competency. Certainly, their prior research includes the finding that participants with more management education made less profitable decisions (Armstrong & Collopy,

1996, p. 194). The expectation of this research is that a similar result will eventuate here, or at least that higher education will not lead to more competent decisions.

> H11: The share of participants selecting the low-price strategy is higher for participants having more versus less formal training in management education.

Hyothesis 12 follows a similar train of thought. In this instance it is thought by researchers that the best way to learn to make good decisions is to practice them; therefore experienced managers should make more competent decisions than management acolytes. There is prior evidence that this is the case (Barrick David, et al., 1991; Dreyfus & Dreyfus, 2005; Kolb, 1981; Melone, 1994), hence Hypothesis 12:

> H12: The share of participants selecting the low-price strategy is higher for participants having less versus more experience in management

Finally, there is a suggestion that Asian managers tend to use market share as a decision heuristic as in very low-labor cost economies this may well lead to profitability. Certainly, there is a body of work endorsing the fact that managers in developing economies make decisions on market share rather than firm profitability (Kim, 2000; Lall & Albaladejo, 2004; Nelson & Pack, 1999; Wade, 2003).

> H13: The share of Eastern participants selecting the low-price strategy is higher than Western

The next Chapter describes the research method used to address these hypotheses, and provides details of how the data was collected. This is followed in turn, by a results chapter before the thesis summarises and concludes.

CHAPTER THREE

RESEARCH METHOD

3.1   Introduction

The focal point of this thesis is testing the Armstrong and colleagues (1994, 1996, 2007) theory regarding the factors that cause some heuristics to be defective tools in executive decision making. This research looks for explanations, generalisations, and theories for understanding why executives make incompetent decisions and how they could be trained to make competent ones. There are many research methods that could be utilized for this purpose, from conducting surveys and subsequent statistical analysis to conducting in-depth interviews with decision-makers. However, in order to extend Armstrong's work and to claim at least some comparability to it, the experimental research methods he used are best adopted.

The work reported here is not a replication, though. A replication requires the researcher to duplicate the original research in every way possible, and here there are several key changes made to the original design to better claim a contribution (Bailey, 1982; Phillips & Pugh, 2007). These changes are explained in the following pages as the original Armstrong design is discussed.

3.2   The Experimental Method

3.2.1   Categorical Data Analysis of Nominal Measures

The data collected from variables in Armstrong's experiments are primarily nominal or categorical measures (1994, 1996, 2007). Armstrong and Brodie (1994) collected categorical data to provide data to address their hypotheses. The dependent variable is provided by a dichotomous choice in a pricing decision; high versus low

price. In their experiment they set up their independent variable as a single scenario situation designed to bias thinking, requiring the respondents to make a decision between a high or low price. Strength of association is summarised through modification of the chi-square statistic to take into account sample size and degrees of freedom, along with practical significance testing using frequency ratios. The analysis therefore focuses on frequencies and the number of decisions that accumulate in either the high or low-price (Field, 2005, p. 693).

3.2.2   *Validity issues in experiments*

Bailey (1982) reports the effectiveness of experiments as superior to surveys for reasons of longitudinal analysis and control. Longitudinal analysis is described as providing the opportunity to study phenomenon over time and in more than one interval. This research is an extension of the research of Armstrong and colleagues (1994, 1996, 2007) and their longitudinal work. Control in experiment designs occurs through the reality that the environment is artificial, and allows the experimenter to minimise extraneous factors thereby reducing the chance of error. Control in this study was increased by artificially embedding into the experiment design consistent variables of time, price, and market share. This artificial environment increased control but also introduced a negative factor by decreasing the opportunity for respondents to react naturally outside of this controlled and perhaps unrealistic environment. Such a choice, between reliability and validity, is often a struggle for researchers.

Competent and incompetent decisions were determined by Armstrong with the rationale that a profit orientation is more effective than a market share orientation; those respondents selecting the low-price strategy are categorised as incompetent and those selecting the high-price strategy are categorised as competent. This device has been

utilized in the study reported here, as well, so that some comparability between the studies, conducted some years apart, can still be made.

The Armstrong and colleagues' treatments include competitor market share and profit data. This inclusion of profit for the competitor is unrealistic because practitioners rarely have access to competitor's product profitability information to assist decision-making. Therefore, the treatments of the research in this thesis do not include competitor profit information.

An artificial environment involves the trade-off between control and the natural environment. This dilemma causes experiments to be less widely used in social sciences than in those physical science disciplines where the artificial environment has less impact on results. The experimenter, after specifying the cause and effect variables must be aware of mediating or moderating variables that cannot be controlled. "The extent to which the investigator can control the relevant variable...is called the degree of 'closure' (Bailey, 1982, p.226)". Three control scenarios and one placebo control are used in this study to help compensate for extraneous variables and maintain a high degree of closure.

3.3   Unit of Analysis and Sample

Practicing executives and executives-in-training are designated as the unit of analysis. The sample of this unit of analysis is drawn from three universities with worldwide representation in their student bodies. Practitioners from North America and Australasia are included among the respondents. This is different, again, from the Armstrong experiments, which were conducted only with MBA students.

3.4   Operational Hypotheses

The objective of this research is to extend Armstrong's work and include propositions from the work of Weick and Gigerenzer. The experiment series tests each of the ten hypotheses developed and discussed in the previous section, each involving 50 respondents who each read one of the ten appropriate scenarios before making their strategic pricing decision. Three additional hypotheses test the effect on decision selection of respondents' education, experience, and culture using data from the whole dataset. The single dependent variable is executive competence – measured by selection of either high price for competence determination, or low-price for incompetence determination.

3.5   Materials, Scenario Configuration for Control Experiments

Exhibits of all experiment materials, Scenario 1 through 10 accompanied by the relevant extra information, are reproduced in Appendix C. The control condition is contained in Scenario 10, which is illustrated below in Table 3.1. This is labelled the "nocebo" condition as it contains no placebo, no information of any sort other than price alternatives matched to a forecast profit resulting over the next decade from the adoption of the strategies. L-Guys is the name given to the respondents' imaginary company.

Table 3.1 Scenario 10 (nocebo)

Expected Profits and Market Shares over Ten Years		
Outcomes	L-Guys' Low-Price Strategy	L-Guys' High-Price Strategy
For L-Guys	$10.2 million profit	$20.4 million profit

Scenarios 1 and 2 also contain no exhibits to assist in decision making, but some other information is provided on the decision form, as in Table 3.2. Scenario 1 is shown in Table 3.2, where it can be seen that competitor information concerning market share is included. T-Guys is the name given to the imaginary competitor company. Scenario 2 is very similar, but the market share figure corresponding to a low price decision is increased.

Table 3.2 Scenario 1

Expected Profits and Market Shares over Ten Years		
<u>Outcomes</u>	L-Guys' <u>Low-Price Strategy</u>	L-Guys' <u>High-Price Strategy</u>
For L-Guys	$10.2 million profit **49.1% market share**	$20.4 million profit 48.6% market share
For T-Guys	$? profit **50.9% market share**	$? profit 51.4% market share

Each experiment has such a decision sheet, but experimental scenarios are provided with extra materials designed to address the relevant hypotheses, as discussed in the hypothesis development section, above.

3.6   Procedure

The 10 experiments are run using a post-test design with control group. Thus the 541 respondents are spread between treatments, with a minimum of 50 respondents involved in each of the 10 experiments. This number is considered reasonable, given

that the major method of analysis is chi-square (which requires at least 6 responses for each cell), but that some ANOVA analysis is also used.

3.7   Data collection

Participants in the study are executives and managers-in-training to become executives. The participants include executives and managers participating in postgraduate programmes from business schools in New Zealand and the United States. Data collected on the amount of prior training relating to management decision-making includes the primary national culture with first language learned, nationality, and living location from birth to age 15. The exercises are conducted either in classroom settings or through Internet access. In both instances the respondents work individually and an endevour was made to make the situations as similar as possible. As Armstrong and Collopy (1996, p. 191) note, this use of captive participants reduces self-selection bias.

Classroom distribution of hard copies of the research instruments occurs through proctors. The instruments are sequential, so that random distribution occurs and uniform quantities of each scenario are controlled. 288 hard copies were administered within three university settings, the respondents remaining annonymous. The remaining 313 experiments were conducted through an Internet research site, www.Surveymethods.com. The digital on-line entry was conducted in computer labs in university environments and through personal computers. The business administrations occured through email invitation. Target groups of business people were sent an invitation to participate online and provided the URL, and asked to complete the short exercise at their personal convenience. The random allocation of the online scenarios occurs after the participant logs into the URL. Once logged on to the site, participants are requested to select one of 10 random numbers which then page-jumps them to the

corresponding scenario. Average time to read the material and make a decision is 6 minutes.

Table 3.3

Distribution of Research Instruments

Venue	Hard Copy Classroom	Digital Entry Online	Total
AUT	90	155	245
Business	0	54	54
SFSU	109	11	120
SJSU	29	93	122
Total	**228**	**313**	**541**
Opt out	2	0	543

3.8 Validity and Reliability Issues

External validity. Armstrong and Collopy (1996) set a standard regarding the issue of demand effects by using care to avoid disclosing the purpose of their study to participants until after the experiments were complete – this same protocol is adopted in this study. Attention is given to help maximise the ability to generalise study results for other persons, places and times. Threats to external validity are avoided by large sample size and multiple geographic locations.

Construct validity. To assess whether information in the scenarios in the Armstrong and Collopy (1996) study allowed for profit maximisation, the scenarios were presented to economics and finance professors with experience in teaching microeconomics and financial management. Each faculty member received the

scenarios and was asked to assume that he or she was acting as an economic advisor to the firm. Each was asked to conclude and state which price in each treatment relates to the highest profit for L-Guys. Each faculty member was asked if further information was necessary to answer this question (Armstrong & Callopy, 1996). Construct validity is thus assured for the present study.

Internal validity. Threats to internal validity include effects preceding causes, lack of co variation, and the existence of plausible alternative explanations (Trochim & Donnelly, 2007). The Armstrong team focused on linear, deterministic model thinking rather than systems, non-deterministic model thinking (Woodside, 2010). In their experiments a relationship between the cause of high price or low price decision and effect of profit was artificially created to verify the bias a particular scenario would have when the effect was a foregone conclusion. Systems' thinking is intuitive; where the axiom is that every influence is both cause and effect. For example, marketers often consider the choice between low cost and high quality. They need to consider that lowering costs and increasing quality can be achieved simultaneously over time. Basic improvements in work processes can eliminate expensive rework; for example, efficiency in logistics through streamlining transportation, warehousing and procurement can improve customer service levels while reducing costs. Marketers can competently decide between both high quality and low cost if they wait for one objective while they focus on the other (Senge, 1990).

In this thesis the dependent variable is competence, not profit. The treatments in this research extend the Armstrong studies by using many more situations, but provides different information for a decision-maker in that treatments state the market share for the competitor but not the profit for the competitor.

Reliability. The data collected in this study is nonparametric, so it is not possible to compute reliability as there is no variance of mean scores. However, a reliability

estimator in the form of internal-consistency reliability was employed by inserting and testing four separate control scenarios. These four controls yielded consistent results (Trochim & Donnelly, 2007).

3.9   Ethics

See Appendix A, for the complete AUTEC Ethics Application for this thesis. The design and practice of this research project implemented each of the three principles of the Treaty of Waitangi (Partnership, Participation and Protection) in the relationships between the researcher and all other participants.

3.9.1   The Principle of Partnership

This research is positioned so that both the researcher and the participant recognised the atmosphere of mutual respect. This occurred because this project is conducted as a joint venture. Successful partnership relationships require trust between all parties. To help establish this trust, respondents are informed in the Instruction Sheet that they may obtain a copy of the research outcomes. The participants are encouraged, as research partners, to provide more ideas regarding the topic upon completion of their decision input. Participants are informed that the final report may use their anonymous comments and their privacy and confidentiality was secure. As many respondents are students, the study will be of benefit to them as results will be available to their lecturers' to help aid in curriculum development.

3.9.2   The Principle of Participation

The research is conducted on the basis of informed and voluntary consent. The participants are free to ask questions if they have any concerns about the procedure or

meaning of the decision input. When and where the decision scenario will be conducted is discussed with the potential participants beforehand to make sure that it is appropriate to the participants. The participants are assured that withdrawal from the research at any time and this will not lead to any disadvantages to them.

3.9.3   The Principle of Protection

The researcher is aware of the need to respect the values, practices and beliefs of the culture and social groups of all participants during the research process. Participants are assured of confidentiality. Participants have the opportunity to opt out of responding to the decision input process. The researcher is sensitive to any discomfort from the respondents, and informs them that they need not make a decision if they are uncomfortable. The researcher will always protect interviewees from any discomfort or psychological harm.

3.9.4   Ethics made Operational

The ethics protocol is operational in this research as witnessed by the following three documents: Information Sheet, Instructions Sheet; and Decision Form (see Appendix B). These three documents are designed with the informed, anonymous and voluntary consent of respondents before collecting data. The hard copy Decision Form provides a final opportunity for a respondent to opt out at the very end of the survey. Participants completed the hard copy survey form in classroom environments and two respondents opted out by ticking that option at the end of the session. These two opt out forms were immediately destroyed. All hard copy Decision Forms include the following statement: *"I choose to withdraw my input from this survey*. Your tick-mark

here will result in withdrawal and destruction of your input and your decision and comments will not be a part of this study.   ( )"

The people that responded online (n=313) through www.surveymethods.com were also given the option to withdraw by simply not completing the survey and logging off their computer. No information is collected from those people that choose to logoff prior to completing the survey, and therefore the number that chose to do so is not available.

3.10   Research Benefits

The proposed research will benefit business students, educators, and practitioners by providing an explanation of how levels of competency may be addressed. The unit of analysis is executives, and executives in training. The benefits may reveal those environmental factors that enable or disable executives as they attempt to operate in environments of dynamic complexity.

3.11   Conclusion

This study includes a series of ten laboratory treatments that extend the research of Armstrong and his colleagues; as well as the research of Weick, Gigerenzer and his colleagues to examine alternative management training information and tools designed either to increase executives' competency or incompetency. Kenneth Bailey (1982) reports on the advantages and disadvantages of using experiments and Trochim and Donnelly (2007) discusses the issues of validity. The specific issues of experimental design and validity are addressed as related to the study at hand. The ten operational hypotheses are introduced. These ten hypotheses are numbered commensurate with the ten scenarios. The research benefits are described followed by ethical considerations as

encouraged by New Zealand's Treaty of Waitangi. The next Chapter reports the results of the experiments.

CHAPTER FOUR

FINDINGS

4.1   Introduction

This chapter presents findings from ten mutually exclusive experiment treatments. The participants of each treatment were assigned randomly from a pool of executives and executives-in-training. This sample comprises of executives currently prcticing in industry, and executives-in-training from three universities. Ten decision exercises (see Appendix C) are the instruments in the study.

A complete set of these ten scenarios includes forty-four pages of information forms, instruction sheets, decision forms, scenarios, and exhibits. Each respondent read only one of ten scenarios, so that they only had at most a few pages of information and instructions to read.

After reading their scenario, each respondent then made one decision by selecting either a high-price or low-price option and completed the experiment by providing six items of demographic information. The average time for an individual to read and complete the survey was six minutes.

Following the discussion of subjects and instruments, this chapter reviews the results with data on response rates for each demographic question and then the frequency rates of decisions by scenario.

4.2   Respondent profile, general

Respondents were obtained from three universities and practitioners from North America and New Zealand. The university venues include Auckland University of Technology, School of Business, graduating and post graduate students; San Francisco State University, MBA programme, located at the University's downtown postgraduate

executive education centre; an San Jose State University, undergraduate School of

Business. Experienced practitioners were accessed from North American and New

Zealand through informal business associations. Table 4.1 displays the allocation of

respondents by venue and programme.

Table 4.1

Respondents, Program/Venue

Programme	Venue				
	Auckland University of Technology	Business	San Francisco State University	San Jose State University	**Total**
BBus	145	0	0	122	**267**
MBA	100	0	120	0	**220**
Business	0	54	0	0	**54**
Total	**245**	**54**	**120**	**122**	**541**

AUT BBus respondents were from graduating, final year Marketing Strategy

classes. SJSU BBus respondents were from the undergraduate Business School.

MBA respondents were from the Master of Business Administration programme,

Marketing discipline classes. Business respondents are practicing executives accessed

from an international trade association headquartered in the USA, the marketing

department staff of a New Zealand division of an international business headquartered

in the USA, and members of a California high school graduating class of 1961.

4.3   Respondent profile, demographics

Table 4.2

Education

Education level	Frequency	Percent
No managment education	192	35.5
Bachelor's degree	182	33.6
Post grad	60	11.1
Master's degree	95	17.6
Post Master's	12	2.2
Total	541	100.0

Table 4.3

Business Experience

	Frequency	Percent
None	235	43.4
1 to 5 yrs	207	38.3
6 to 10 yrs	43	7.9
10 yrs	56	10.4
Total	541	100.0

Table 4.4

First Language

	Frequency	Percent
English	339	62.7
Other	202	37.3
Total	541	100.0

Table 4.5

Early Residence

	Frequency	Percent
Asia	184	34.0
Africa	22	4.1
Australasia	97	17.9
Europe	28	5.2
N America	203	37.5
S America	2	.4
U Kingdom	5	.9
Total	541	100.0

The East/West designation is assigned based upon the respondents' first language, Nationality, and early domicile.

Table 4.6

East / West

	Frequency	Percent
East	212	39.2
West	329	60.8
Total	541	100.0

4.4   Assignation to Experimental Groups

Table 4.7

Assignment of Respondents to Treatments

Scenario and Hypothesis Number	Number of Respondents	Percent
1	54	10.0
2	54	10.0
3	52	9.6
4	52	9.6
5	68	12.6
6	52	9.6
7	51	9.4
8	52	9.6
9	53	9.8
10	53	9.8
Total	541	100.0

4.5   Addressing the Hypotheses

4.5.1   Hypothesis 10

Hypothesis 10 provides the control group, "When faced with no decision information other than price and profit, respondents will tend to select the most profitable option." This is the basic business decision and, as expected, most followed the sensible course and (competently) made the high-price decision.

Table 4.8

Responses to Scenario 10

Scenario, Hypothesis number	Condition	High-price competent decision	Low-price incompetent decision	Total
10	A price choice linked to a 10yr market share prediction of 49.1%	41 (77.4%)	12 (22.6%)	53

4.5.2   Hypothesis 1

This hypothesis is designed to test the idea that the explicit introduction of competitive material, even though implicitly included in Scenario 1, will cause the respondents to focus upon the competition, and thus to choose a poor, low-price, option. Formally, the hypothesis reads: "The introduction of competitor information to the decision will result in more respondents selecting the incompetent, lower-priced, alternative, even with the market share and profit information for the decision-maker's company remaining the same." That this is the case seems clear from Table 4.1 but, in fact, the difference between Scenarios 1 and 10 are not significant by chi-square test.

Table 4.9

Responses to Scenario 1

Scenario, Hypothesis number	Condition	High-price competent decision	Low-price incompetent decision	Total
1	A price choice linked to a 10yr market share prediction of 49.1% With competitor share included	38 (70.4%)	16 (29.6%)	54

4.5.3 Hypothesis 2

H2 includes testing a second control treatment with a lower profit level associated with a higher market share (i.e., 56% versus 44% share for a competitor) versus the first control test, in Scenario 1, of a 49% versus a 51% share for the competitor.

Table 4.10

Responses to Scenario 2

Scenario, Hypothesis number	Condition	High-price competent decision	Low-price incompetent decision	Total
2	A price choice linked to a 10yr market share prediction of 56% With competitor share included	33 (61.1%)	21 (38.9%)	54

Again, a chi-square test reveals no significant difference between these results and those for Scenario 1, despite the difference in the raw counts (Chi-square = 1.028, DF = 1, p < .38, phi = .098. However, there is a significant difference by chi-square between the proportions of those making incompetent decisions between Scenario 10, the base condition with no competition, and Scenario 2, where market share linked to a low-price decision is higher and the competitors share is also mentioned (p = .069).

4.5.4 Hypothesis 3

H3: "When respondent decision-makers are primed with BCG information, a greater proportion will make an incompetent, low-price decision." This is the key hypothesis to confirm that the effect noted by earlier research is still pertinent (i.e. Armstrong and colleagues (1994, 1996, 2007)). That is, when BCG matrix analysis and Experience Curve materials are read by the respondent before s/he makes a decision, then it is expected that there will be a difference between the responses here compared to each of the baseline Scenarios, with or without competition being mentioned, as noted by other researchers.

At this point the earlier three responses, to scenarios 10, 1 and 2 are also included in the Table, to allow easier identification of the emerging trend.

Table 4.11

Responses to Scenario 10, 1, 2 and 3

Scenario, Hypothesis number	Condition	High-price competent decision	Low-price incompetent decision	Total
10	A price choice linked to a 10yr market share prediction of 49.1%	41 (77.4%)	12 (22.6%)	53
1	A price choice linked to a 10yr market share prediction of 49.1% With competitor share included	38 (70.4%)	16 (29.6%)	54
2	A price choice linked to a 10yr market share prediction of 56% with competitor share included	33 (61.1%)	21 (38.9%)	54
3	A price choice linked to a 10yr market share prediction of 56% with competitor share and BCG materials included	24 (46%)	28 (54%)	52

In this instance, the difference noted between Scenario 3 results and Scenario 2 is statistically different (chi-square = 2.38, D.F. = 2, $p < .304$, phi = .15). A scan of the proportion of those making poorer decisions are thus far bearing out the expectations of the research.

Comparing the shares of subjects selecting the incompetent decision indicates a significant increase in incompetency among the three groups (.30 to .39 to .54), F = 3.347, p < .038. η^2 = .041 (Table 4.13). The analysis indicates a significant trend; as incompetency primes increase (scenarios 1 to 2 to 3), shares of subjects selecting the incompetent solution increases (p < .011).

Table 4.12

Impact on Incompetency Training on Incompetency Choice

Scenario Number	Mean	N	Std. Deviation	Std. Error of Mean
1	.296	54	.46091	.06272
2	.389	54	.49208	.06696
3	.539	52	.50338	.06981
Total	.4063	160	.49267	.03895

			Sum of Squares	DF	Mean square	F	p
Decision * Scenario	Betw'n groups	(Combined)	1.58	2	.789	3.45	.038
		linearity	1.55	1	1.55	6.57	.011
		Deviation from linearity	.029	1	.029	.123	.762
	Within groups		37.02	157	.236		
	Total		38.59	159			

To this point, though, little has been shown that has not been shown before, even though extra controls and a more realistic control element have been introduced to the experiments. The next set of experiments takes the research further, and tests a number of training devices to see if they can counteract the tendency to use a misleading heuristic.

4.5.5 Hypothesis 4

The first training tool used in this study subset is an exhibit of evidence from the literature that shows why attempting to beat the competition actually hurts a firm's performance. The tool comprises of a list of findings from the literature that reports on the negative relationship between market share and profits.

Table 4.13

Responses to Scenario 4, training impact

Scenario, Hypothesis number	Condition	High-price competent decision	Low-price incompetent decision	Total
4	A price choice linked to a 10yr market share prediction of 56% With competitor share and materials advising against competitive decisions included	38 (73.1%)	14 (26.9%)	54

Once again, the proportion of incompetent decisions is greater than in the case of Scenario 2 (chi-square = 7.898, D.F. = 3, p < .048, phi = .187). A further analysis, re-arranging the results to run from the lowest proportion of incompetent results to the highest, shows again that the linear trend is statistically significant.

Table 4.14

Training Impact on Incompetency Decision Making

Scenario number	Mean	N	SD	Std. Error of Mean
S4	.269	52	.448	.062
S1	.296	54	.461	.063
S2	.389	54	.492	.067
S3	.538	52	.503	.069
Total	.3726	212	.485	.033

ANOVA

			Sum of Squares	DF	Mean square	F	p
Decision * Scenario	Betw'n groups	(Combined)	2.32	3	.772	3.40	.019
		linearity	2.12	1	2.12	9.32	.003
		Deviation from linearity	.199	2	.099	.438	.646
	Within groups		49.56	208	.227		
	Total		38.59	211			

Findings show the significant impact competency training (i.e., presenting evidence in sentences) has on decreasing incompetent decision-making versus the control condition. Readers of both scenario 4 and 2 receive information that L-Guys gains a 56.7% market share for the low-price option. Low-price strategy selection is lower in scenario 4 versus scenario 2 and 3, yet all three groups have the same market shares in their respective scenarios. Training tools indicate competitor-oriented objectives hurts performance. Scenario 4 trains with evidence-based information cited from extant literature that setting competitor-oriented objectives hurts a firm's performance (Armstrong & Collopy, 1996).

4.5.6   Hypothesis 5

Hypothesis 5 is similar to H4, but follows the pattern of increasing the warnings against the BCG concept, in order to provoke yet more competent decisions; "Provision of materials showing that the BCG and the Experience Curve lead to lower profitability *plus* materials explaining the fallacy about these tools increases competent, high-price decision-making."

Table 4.15

Responses to Scenario 5, training impact

Scenario, Hypothesis number	Condition	High-price competent decision	Low-price incompetent decision	Total
5	A price choice linked to a 10yr market share prediction of 56% With competitor share and materials advising against competitive decisions plus more materials about the fallacy of BCG included	27 (38.7%)	41 (61.3%)	68

In this instance there is no significant effect noted, it is apparently enough simply to warn against a competitor focus.

4.5.7   Hypothesis 6

The same progressive loading of warning materials is continued with Hypothesis and Scenario 6. Here the materials provided are quite extensive. All the readings included in Scenario 5 are included, plus yet more material on "dropping your tools."

Table 4.16

Tool Dropping Impact on Incompetency

Scenario, Hypothesis number	Condition	High-price competent decision	Low-price incompetent decision	Total
2	Control, with competitive market share information	33 (61%)	21 (39%)	54
6	A price choice linked to a 10yr market share prediction of 56% with competitor share, BCG materials plus materials warning about competitive focus, BCG and advice to drop tools included	19 (36%)	33 (64%)	52

The difference above is statistically significant, but in the unexpected direction (Chi-square = 6.44, D.F. = 1, p < .011, phi = .246). This hypothesis test failed as, in retrospect, several possible explanations for the effect noted can be suggested. Cognitive overload is an obvious culprit; the multiple explicit exhibits appear to be both confusing and contradictory, perhaps causing respondents to revert to implicit incompetent thought patterns (Woodside, 2009). There could also be an order effect (if "dropping your tools" instruction had been read first instead of last (if they were read at all) then a different result may have eventuated).

4.5.8 Hypotheses 7 and 8

Gigerenzer (1999, p. 27) suggests that close analysis is often deleterious to making good decisions, as often the objectives of the decision become concealed in detail. Hypothesis 7 tests this idea; "Provision of information about rational decision-making will reduce the proportion of competent (low-price) decisions." Respondents are primed with Franklin's rule, which suggests that a calculated weighted average decision yields superior results.

Hypothesis 8 revolves around Geigerenzer's claim that use of simple decision heuristics will result in a better decision than using a device such as Franklin's Rule. The hypothesis is phrased " Training decision-maker respondents to use a small heirarchy of simple heuristics will lead to a greater proportion making a competent, high-price, decision."

There is, however, no statistical difference whatsover between the ratios of competent and incompetent decisions between the two conditions and the original, "no information except competitor informaton" control group (Chi-square = .151, D.F. = 2, p < .927, phi = .031

Table 4.17

Hypothesis 7, using analytical devices

Scenario, Hypothesis number	Condition	High-price competent decision	Low-price incompetent decision	Total
2	Control, with competitive market share information	33 (61%)	21 (39%)	54
7	A price choice linked to a 10yr market share prediction of 56% with competitor share, and material about Franklin's weighted average decision model included.	33 (35%)	18 (65%)	52
8	A price choice linked to a 10yr market share prediction of 56% with competitor share, and material about the use of simple, hierarchical heuristics included	33 (36.5)	19 63.5)	

4.5.9   Hypothesis 9, added text materials

Table 4.18

Difference between responses to Scenarios 10 (nocebo)

Scenarios 1, 2 and the "placebo" Scenario 9

Scenario, Hypothesis number	Condition	High-price competent decision	Low-price incompetent decision	Total
10	A price choice linked to a 10yr market share prediction of 49.1%	41 (77.4%)	12 (22.6%)	53
1	A price choice linked to a 10yr market share prediction of 49.1% With competitor share included	38 (70.4%)	16 (29.6%)	54
2	A price choice linked to a 10yr market share prediction of 56% with competitor share included	33 (61%)	21 (39%)	54
9	A price choice linked to a 10yr market share prediction of 56% with irrelevant text-book material included	34 (64%)	19 (36%)	52

This Hypothesis reads "Inducing cognitive overload by the introduction of irrelevant information will cause a greater proportion of incompetent, low-priced, decisions to be made." In this condition respondents are provided with a number of text-book items about matters only very peripherally relevant to the decision at hand. The idea is that reading all this material will induce cognitive overload and result in a poor decision.

There is no statistical difference by chi-square test between the responses to Scenarios 9 and 2, but there is between Scenarios 10 and 9 (Chi square = .676, df = 1, cut-off (p = .05) = .455). Thus, adding extra material is unhelpful, it does not improve on a situation where competive information is provided and results in more incompetency than the base scenario where no information other than projected profits are given. Textbook coverage of demand curves, costs and profits, taught in isolation from contextual realities fail to impart decision wisdom.

4.6   Hypotheses concerning possible moderators

There are three hypotheses tested in this section, all concerning possible moderators of the effects of providing information about competitor shares, BCG matrix and other competitor-focused materials on incompetence already found. It was earlier stated that education, culture and experience might all moderate the effects noted above. According to literature already discussed here, the more managerial education one has, then the greater chance there is that, in these research scenarios, a low-price, incompetent decision will be made. Experience, on the other hand, is purported to be a good teacher, and the greater a respondent's decision-making experience the more competent his/her decisions should become. Finally, it was earlier discussed that Asians may possibly make a low-price, high-market share decision and yet be "competent," as that choice is sometimes made in low labour cost markets.

An initial test of the hypotheses is presented here by converting the categorical data for education, experience and ethnicity to dummy variables in a regression equation with "Competent decisions" as the dependent variable. The analysis uses all the data, amalgamated for every condition thus far tested.

Table 4.19

Regression analysis, effect of Education, Experience and Ethnicity

on competent decision-making

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.374	.041		9.221	.000
	Education	.030	.048	.030	.625	.532
	Experience	-.108	.046	-.110	-2.325	.020
	East, West	.127	.044	.128	2.921	.004

a. Dependent Variable: Decision

The equation is significant, but the R^2 value (.032) is very small indeed, showing that these variables have little effect. In fact, the effect for education is statistically insignificant, while both ethnicity and experience do have a significant overall effect on the competency of the decision. Each of these variables is now investigated in depth.

4.6.1   Hypothesis 11

In the work of Armstrong and Collopy (1996) they report a significant effect (at $p = .05$) for education; the initial analysis, reported above, suggests that there is no such effect here. There is an issue of comparability, though, in that Armstrong and Collopy used only first and final-year MBA students, while the study reported here has a wider sample base. The following tables show first, the absolute difference between education levels in the present study and, second, a comparison to Armstrong and Collopy's study results. The results are hardly contradictory, given the lack of sample comparability,

but it does seem clear that offering a management education does not make a student a better decision-maker.

Table 4.20a

Education's Overall Impact on Incompetency (H11)

Education		Competent, high price	Decision Incompetent, low-price	Total
None	Count	119	73	192
	Percentage	62.0%	38.0%	100.0%
Bachelors	Count	104	78	182
	Percentage	57.1%	42.9%	100.0%
Postgraduate	Count	111	56	167
	Percentage	66.5%	**33.5%**	100.0%
Total	Count	334	207	541
	Percentage	61.7%	**38.3**%	100.0%

Chi-square = 3.213, D.F. = 2, p < .201, phi = .077 (i.e., not significant).

Table 4.20b

Comparison of Armstrong and Collopy's and the present study's results

Armstrong & Collopy (1996)	N	% Low-price	Spanier (2011)	N	% Low-price
Low Education	236	38%	No Education	192	38%
Intermediate Education	227	46%	BBus	182	43%
High Education	88	55%	Post Graduate	167	33%

4.6.2   Hypothesis 12

Numerous authors posit that executives in East Asia make decisions based on increasing market share rather than organisation profitability (Kim, 2000; Lall & Albaladejo, 2004; Nelson & Pack, 1999; Wade, 2003). Executives within these societies may thus make a competent decision by selecting a high market share option even at a lower profit (Lindblom, 1959).

Once again, testing this hypothesis is difficult, this time for two reasons. First, ethnicity information is gathered and calculted on the basis of first language and place of early residence, but not on ethnic self-identification – possibly the Asians in the sample group do not "feel" Asian. Moreover, the research reported here was conducted in English-speaking western business environments, where many ethnically Asian participants might act as a Westerner.

Nevertheless, there is some early indication, through the regression analysis, that a difference based upon a crude east/west classification does have an impact upon the results. A further investigation, by Chi-square test, does show a significant effect, as Table 4.19, following, shows.

Table 4.21

Impact of ethnicity on decision

		Decision		
		Low Price	High Price	Total
East	Count	100	112	212
	% within East	**47.2%**	52.8%	100.0%
	% within Decision	48.3%	33.5%	39.2%
	% of Total	18.5%	20.7%	39.2%
West	Count	107	222	329
	% within West	**32.5%**	67.5%	100.0%
	% within Decision	51.7%	66.5%	60.8%
	% of Total	19.8%	41.0%	60.8%
Total	Count	207	334	541
	% within East and West	38.3%	61.7%	100.0%
	% within Decision	100.0%	100.0%	100.0%
	% of Total	38.3%	61.7%	100.0%

Chi-square = 11.709, D.F. = 1, p < .001, phi = .147

To verify the main effect that this thesis has sought to show, that BCG and other competition-focussed training leads to poorer decisions, the table below shows the results of each hypothesis studied thus far with and without the Asian responses included in the dataset.

A scan of the data in Table 4.20 shows that the main effect still stands for the reduced sample set that results when data from Asians are removed. The only exceptions are peripheral to the main thesis.

Table 4.22

Results with and without Asians included in Respondent group

Scenario	Condition	Whole sample			Sans Asians		
		High price	Low price	Different to control	High price	Low price	Different to control
10	Base, no competition info.	41	12		25	6	
1	Base with competition info.	38	16	No $p = .411$	21	9	No $p = .334$
2	Base with higher market share	33	21	**Yes** $p = .069$	25	8	**No** $p = .59$
3	BCG and experience curve	24	28	Yes $p = .001$	14	16	Yes $p = .006)$
4	With anti-market share literature	38	14	No $p = .661$	26	8	No $p = .683)$
5	Both pro- and anti-mkt share	41	27	**Yes** $p = .046$	29	13	**No** $p = .264$
6	As 5 plus dropping your tools	19	33	Yes $p < .001$	11	22	Yes $p < .001$
7	Rational judgment materials	33	18	No $p = .115$	24	6	No $p = .949$
8	Simple heuristics	33	19	No $p = .119$	26	9	No $p = .538$
9	General pricing material added	34	19	No $p = .135$	22	10	No $p = .278$
	Comparison: S1	38	16	Yes	21	16	Yes
	S3	24	28	$p = .011$	14		$p = .067$

4.6.3   Hypothesis 13, Experience

Prior research reports that participants with more experience in management make more competent decisions (Barrick, David, & Lord, 1991; Dreyfus & Dreyfus, 2005; Melone, 1994). This is a fairly logical prediction, as one would hope that as managers gain experience and, probably, seniority, that they would come to more and more rely on the simple heuristic that the business of business is profit, not market share. The data in Table 4.21 generally bears this logic out.

Table 4.23

Experience's Impact on Incompetency, H13

Experience (in years)		High-price, competent decision	Low-price, incompetent decision	Total
None	Count	130	105	235
	Percent	55.3%	**44.7%**	100%
1 - 5	Count	138	69	207
	Percent	66.7%	33.3%	100%
6 - 10	Count	27	16	43
	Percent	62.8%	37.2%	100%
11+	Count	39	17	56
	Percent	69.6%	**30.4%**	100%
Total	Count	334	207	541
	Percent	61.7%	38.3%	100%

Chi-square = 7.73, D.F. = 3, p < .05, phi = .12

4.7   Results Summary

The subjects of this set of experiments are executives and executives-in-training. The 541 participants – from practicing executives in industry and in-training executives from three universities – were randomly assigned to experimental treatments. The instrument used to conduct the experiments contain a set of ten scenarios to which

participants were asked to respond. Following the discussion of subjects and individual instruments this Chapter reviewed the results of data concerning the ten research hypotheses, plus three ancilliary hypotheses concerning potential environmental modifiers.

Ten scenarios and 13 hypotheses are analysed. These experiments evaluate incompetence training by testing sets of independent treatment variables including competence and incompetence training. Controls were utilised, including one "nocebo" treatment containing only projected market share linked to a price level decision, and one "placebo" with innocuous training aids. Three additional variables tested include the demographics of East/West, number of years in decision making experience and education levels.

The early hypotheses confirm Golder's determination that executive focus on competition and market share causes incompetence, which is the first of the major contribution of this thesis. In particular, Hypotheses 1, 2 and 3, confirm and update the research findings of Armstrong and colleagues (1994, 1996, 2007) and consistently show that competitive information, BCG and portfolio are training for incompetence.

The most critical extension of Armstrong and others' work is shown as Hypotheis 4 is addressed. When the study participants are given the competitive focus but then shown the folly of such a focus, the level of competent decisions immediately rises significantly. This is a focal finding, showing that competency can be trained.

Other testing met with mixed response. Weick's (2007) "complicate yourself but then drop tools" idea was tested but the test failed, as there was so much information in the scenario that it is hard to pinpoint the cause resulting incompetent decisions. It is true, though, that Weick's idea is implicitly borne out in other scenarios, where when respondents were encouraged to drop their BCG and experience curve tools then better decisions are made.

There is also a possible confound relating to results showing Gigerenzer's (1999) simple heuristics and Franklin's Rule are equally effective. The scenario training simple heuristics could have itself been ambiguous and confusing. Participants were instructed on how to use the simple heuristic tool in a situation of deciding the best person for a job, and then expected to use this tool to decide between a high or low price for a product. Again, simple heuristics are embedded in many of the treatments, though. The most obvious is that the best decisions were made in response to Scenario 10, where only a projected profit figure was given connected to a price decision – there is no simpler or more effective business decision heuristic than to do what yields most profit.

The findings here update and, to a point, confirm the Armstrong and Collopy finding that post graduate education leads in incompetence training; this work finds that management education does not improve decion-making skills.

The findings of Kim (2000); Lall and Albaladejo (2004); Nelson and Pack (1999); and Wade (2003), that managers within developing economies make decisions based upon the prevailing value structure of their environment, is confirmed. Market share appears to be the prevailing value executives in developing economies have pursued in order to achieve high employment levels for their populace. Nevertheless, when Asian data are removed from the dataset the same pattern of decision behaviour emerges for Asians are included.

Business decision-making does, as expected, tend to result in better choices, although the differences between various experience levels is not extreme.

CHAPTER FIVE

CONCLUSIONS AND DISCUSSION

5.1   Introduction

The following discussion first deals with the first contribution of this thesis, the confirmation of prior research about poor decision-making. Discussion then moves on to the major contribition of this study, that competency training can remedy the situation. Third, the discussion moves to the various training tools and why or why not they performed as expected and, finally in this section, the ancilliary hypotheses about education levels, experience and ethnicity are discussed. In the final section of the chapter, some suggestions for further research are made, based upon the limitations of the thesis work and extending the theory yet further.

5.2   Conclusions about Research Hypotheses

Figure 5.1

Overall level of Competent Decisions, Percentage in each scenario
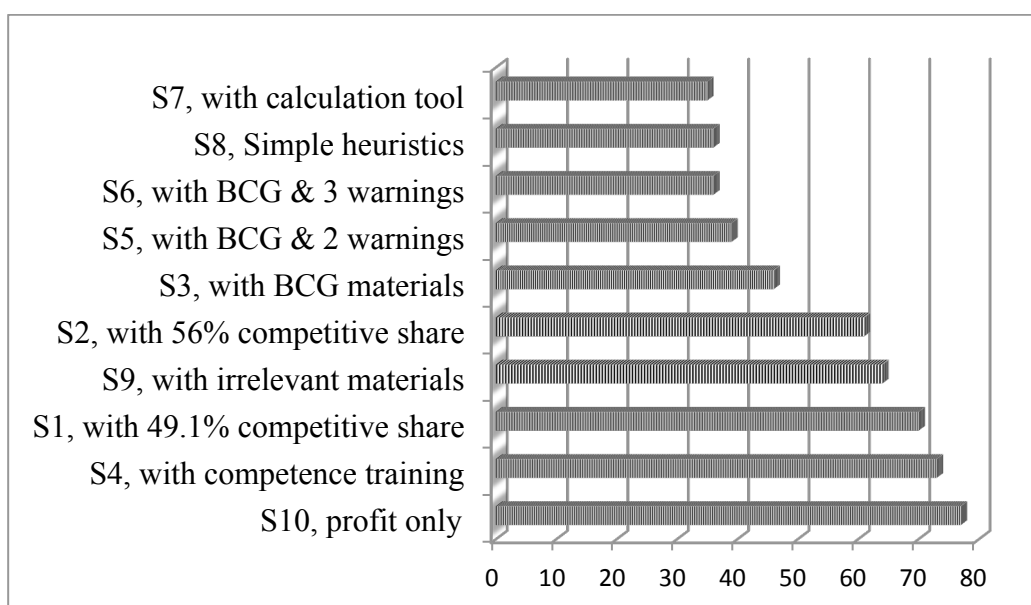
5.2.1   Conclusions about confirmation of incompetent managerial decisions

The first contribution this research makes is to confirm the earlier work of Armstrong & Brodie (1994), Armstrong and Collopy (1996) and Armstrong and Green (2007), who found that business schools were teaching incompetency rather than competency in managerial decision-making. This is a dramatic and important statement; it is from our business schools that many business leaders emerge and it is of serious concern if a major function such as decision-making is being taught poorly. The issue is not quite as clear-cut as managers simply making bad decisions, however. The Armstrong and Collopy, and Armstrong and Brodie work is concerned specifically with the Boston Consulting Group decision matrix, which focuses the decision-makers attention not upon the strengths of their own organization, but upon the competition. These authors were able to show quite clearly that this focus is flawed, and thus the BCG matrix itself is also flawed.

At a deeper level there is still an issue, though. The issue is that human beings automatically fall into habitual thought patterns, called cognitive heuristics, as a way of dealing with cognitive overload. Thus, if an executive makes a decision and the results are satisfactory, it would be a very human failing to use the same decision if the same issue surfaces at a later point in time. The problem with this, of course, is that businesses exist in a dynamic environment and a decision tool that is appropriate in one environment may be quite inappropriate in another.

The first contribution of this thesis, then, is to extend the work of Armstrong and his various colleagues to address the basic issue of business executives relying upon flawed decision tools. The way in which the earlier work has been extended in this respect is threefold. The first way is that this work adds rigor to the earlier work with the provision of a control group. In fact, several control groups are provided. This

allows the results of each subsequent experimental treatment to be compared to the control group rather than simply utilizing a between-group comparison.

The second way is rather subtler, and pertains to the content of the scenarios upon which each experimental treatment is based. In the earlier work information was provided not only about the decision-makers' company profit and market share projections associated with a particular price decision, but also with the competing companies' profit and market share information. This is unrealistic, as a corporate executive rarely, if ever, has information about competitors' profit rate. In the work reported here participants in the experiment were only given information about their own company and a projected market share for the competition. This is far more realistic, as a competitor's market share can be computed in the competitive situation posited in this research, of a duopoly market.

The third way in which the original research has been extended pertains to the participants in the research. Earlier research tested only executives in training in MBA programs, those exposed or not exposed to strategy courses. The current research extended this to undergraduate students and to executives practicing in business. In a sense this complicates the issue, as it makes direct comparisons to the original research difficult but, on the other hand, it adds to the generalization of the original findings.

In the event, the findings illustrated in the previous chapter clearly show that decision-makers are still making the fundamental errors that their predecessors in prior research made. When participants are simply provided with a pricing decision linked to a projected profitability level the decisions are eminently sensible and are based on the simple heuristic that the business of business is to make profit. A high price decision linked to higher profitability rates over the next ten years is deemed a competent decision, as against low-priced decision linked to lower profitability. Very similar

results to earlier work show that this fundamental heuristic is indeed a help to decision-makers.

In the current research explicit competitor information was introduced, in Scenario 1, and the resulting decision pattern compared to the scenario (S10) where the competitive information is implicit rather than explicit (decision-makers were given their own companies' projected profit and market share but not the projected market share of the competitor). A third control scenario (Scenario 2) was then introduced, increasing the projected market share of a competitor in relation to a higher price (competent) decision (from 49.1% to 56%), and thus tempting decision-makers to focus yet more closely upon competitive information. A test by Chi-square shows no statistical difference between the decision proportions made in response to either Scenario 10 and Scenario 1, or Scenario 1 versus Scenario 2, but there is a small difference between responses to the two extreme situations of Scenarios 10 and 2.

At this point the critical test is introduced. In this treatment decision-makers are faced with the same dilemma as in Scenario 2, but in Scenario 3 are primed with BCG matrix information before they make their decision. As in earlier research there is a dramatic reduction in competent decisions being made, from over 70% to only 44%. This is very much in line with the earlier research and comprises a first contribution of this thesis.

Thus the original research has been extended to conducting the work with more rigor (using a control group), more external validity (not providing competitors profits), and with greater generalization (extending the participant group beyond MBA students).

5.2.2 Conclusions about training competent managerial decision-making

The major contribution of this work is not simply to confirm prior research but to extend it to show that appropriate training can largely counteract the natural tendency

of decision-makers to fall back on familiar decision heuristics. This section of work is largely guided by the work of Carl Weick's (1993) about sensemaking, and Gigerenzer's (1999, 2009) "simple heuristics" ideas.

The clearest and most dramatic evidence that training can indeed overcome incompetent decision-making practice is provided in analysis of the responses to Scenario 4. In this scenario the same information as was provided in Scenario 3 is given (i.e., respondents were primed with BCG matrix information prior to their decision-making) but also exposed to materials that warn them against concentrating on competitive information. In this situation once again over 70% of participants make a competent, high-priced, decision. This indicates very clearly that competent decision-making can be trained, and constitutes a major contribution of this work.

Figure 5.1 (repeated)

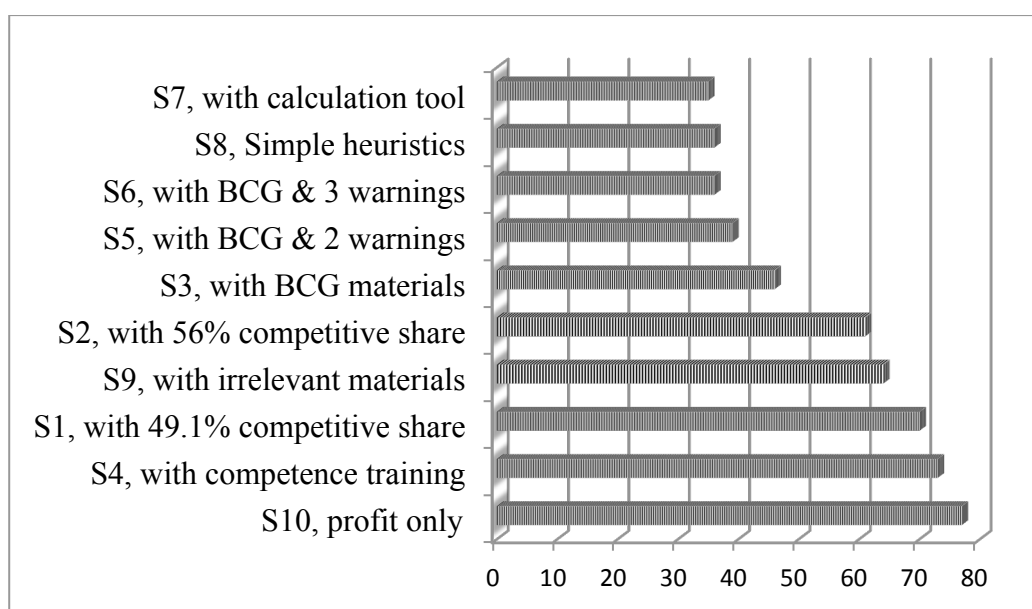**Overall level of Competent Decisions, Percentage in each scenario**

Figure 5.1, repeated above, illustrates these results very clearly. The pattern of decision-making illustrates a linear trend, which was earlier found to be statistically

significant, where the control (simple profit heuristic) treatment and Scenario 4 (where

competence has been trained), result in the most competent decisions being made. The

introduction of competitive information results in somewhat poorer decisions being

made and the introduction of BCG materials has a major impact upon competent

decision-making.

The data in Figure 5.1 illustrates an apparent anomaly in the case of Scenario 9.

In this scenario participants were exposed to largely irrelevant textbook materials about

pricing before they made their pricing decision. It appears that this material was

ignored by decision-makers, who then fell back on their basic heuristics of profitability

and, perhaps, competitive action.

This result indicates very clearly that simply reading textbook materials without

placing them in context within an interactive environment does not help produce

competent decisions. The does have implications for how strategy should be taught;

these implications are discussed a little later in this chapter.

Scenario 7 is the other standout situation graphically illustrated in Figure 5.1.

Exposure to a deterministic quantitative decision-making method results in the poorest

decisions being made. This finding is quite unequivocal and strongly significant

statistically.

5.2.3   Inconclusive hypotheses' about competence training

In Scenarios 5 and 6 the simple warnings about concentration upon competitive

action guiding decision-making were extended and emphasized. In Scenario 4 a simple

warning resulted in a high level of competent decision-making even after respondents

had been exposed to the BCG materials; it was hypothesized that if stronger warnings

were made then even more competent decision-making would occur. That this is not

the case is evident from the results previously reported and in the data contained in

Figure 5.1. The increasing level of poor decisions being made as more warnings are provided does tend to suggest that respondents were becoming overwhelmed by information and, in their confusion, ignored the warnings entirely and were thus strongly influenced by the BCG materials (Woodside, 2001).

This is conjectural, however, as there could be alternative explanations. For instance, it may have been that the respondents simply did not read the materials when they saw how much material was present, so that cognitive overload is not the issue as much as laziness or time pressure. Again, an order effect may have been present. Simon's ideas about "dropping your tools" was placed last in the material, on every occasion. It is quite possible that had this material been presented first then a more effective decision may have resulted.

Thus neither Hypothesis 5 nor Hypothesis 6 has been successfully addressed. It is possible to speculate that the conventional wisdom of "keeping it simple" is as appropriate here as it is elsewhere, but the way does lie open for further research to clean up this rather confused area.

The results to the decisions scenario addressing Hypothesis 8 are, perhaps, the most disappointing. The idea behind this scenario is that a superior way of making a decision is to first determine some simple heuristics and then apply those heuristic rules to the decision situation (Czerlinski, J., Gigerenzer, G., & Goldstein, D. G.,1999). In this instance, however, the explanation of the technique to the respondents was not as clear as it might have been. The application used to describe the tool was a personnel-hiring decision, and it seems quite likely that the respondents were unable to translate use of the tool from that environment to a pricing decision. Certainly, the results from the scenario are among the poorer of the whole experiment set in terms of match to expectations.

Although the conjecture made above is only that, a conjecture, there are grounds for believing it a reasonable explanation. Scenario 10 is the baseline scenario, where only information about projected profitability associated to a price level was provided to the decision-makers. As already discussed, this scenario produced the highest number of competent, high price/high profit decisions. In a very real sense this scenario represents a simple heuristic (although not a small hierarchy of them as in prior work). Respondents are only given one clue, profitability, and this is far clearer than explaining a model where simple heuristics are placed in a small hierarchy and then applied to a decision situation, as in Scenario 8. Again, this hypothesis has not been clearly addressed and leaves the way open for future research.

5.2.4.1 Hypotheses' about potential moderators, Education

Three potential moderators were identified through a search of the literature, length of business decision-making experience, education level and ethnicity, or race. These moderators are in interesting and important in their own right but have a particular importance here because of the wider sample base used in this research. It is possible that each of these variables might create an alternative explanation of the effects identified in Hypotheses 1–10.

Of these potential moderators, education level is perhaps the most central to this thesis, and Armstrong and Collopy (1996) do have as a central tenant and a central finding of their research that the more managerial education someone receives, then the less competent their managerial decisions become. The experimental results reported in this thesis certainly do not contradict Armstrong et al's, but they are a little different, as the graph in Figure 5.2 shows.

There are several potential explanations for the difference between the two sets of results illustrated in Figure 5.2, that could possible come from an improving attitude

to teaching decision-making in business schools, but actually are more likely to do with

sample comparability. The Armstrong and Collopy (1996) sample selection protocol

Figure 5.2

Percentage of incompetent decisions by education levels, two studies
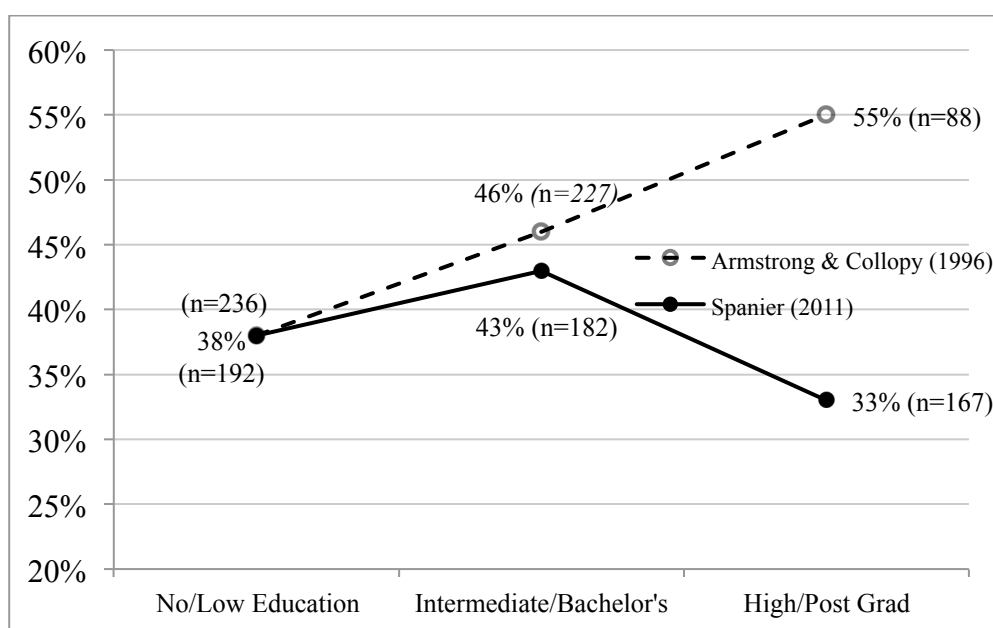
placed subjects just entering the management program into a "low" group. Those who

had courses in strategic planning were put in a "high" group, and the rest were placed in

an "intermediate" group. This classification potentially creates ambiguity because

subjects within each group differed with respect to their prior management education

and the treatments were not balanced across education levels (Armstrong and Collopy,

1996, p.193-194).

In the current study's education classification protocol, categories are self-

selected by respondents based upon their choice of personal education level attained.

The way in which the thesis research respondents are selected unfortunately places the

present research in the same predicament as Armstrong, and inhibits a direct

comparison. This is because the sample here is composed of undergraduate students

(with no business experience whatsoever), practitioners (who may have experienced significant short course managerial education) and graduate students including MBA and some Master of Business students. The Master of Business students are less experienced but more "research sensitive" than the MBA students and may have been in a position to better understand what the research was seeking, and therefore introducing a response bias.

The difference between undergraduate students and postgraduate students in the Figure that looks so clear is, in fact, not statistically significant. Therefore, the Figure actually exaggerates the difference between the two datasets and tends to obscure the fact that both studies do actually find that the more education a businessperson has the poorer the decisions become. That the highest classification of education level in both studies is quite different probably explains the difference in the findings.

This is still a damning indictment of management education in business strategy, and re-emphasizes the contribution this thesis makes with the finding that competent decision-making can be taught. The implications of training are significant and will be briefly highlighted at the end of this chapter.

5.2.4.2 Hypotheses' about potential moderators, Experience

A second potential moderator of the main effect found in this thesis related to the level of business experience of respondents. There seems little doubt from the results reported here that experience is informative, and that greater business experience does seem to lead decision-makers to wiser decisions.

This conclusion is unsurprising in itself, but is also very much in accord with Gigerenzer's 'simple heuristic' idea. As executives gain experience it seems likely that their remuneration and bonus incentive systems as well as the speed of their climb-up the corporate ladder is a result, in part, of their profitability statistics. It is easy to

understand how the more senior and the more experienced an executive becomes the more they understand the value of the simple heuristic that the best decision is the one that yields the greatest profit rather than the greatest market share or any other misleading heuristic.

5.2.4.3 Hypothesis about potential moderators, Race

Finally, this work deals with the important potential moderator of race. This thesis builds from a simple premise, that is, making a pricing decision that leads to a larger market share but a smaller profit is an incompetent decision. There is a great deal of evidence that this is occurs frequently, and the companies who concentrate upon market share at the cost of profits do not last long in the marketplace. This logic may not hold for Asians. For various reasons, probably linked to cheap labour and the desirability of creating work for large populations; executives in many Asian cultures view a strategic decision based upon market share to be competent. This view casts doubt upon the findings of this thesis, as a fair proportion of sample participants are Asian.

The prior discussion reports on the validity of the method of categorizing respondents as Asian or Western. Many of the respondents categorised as Asian because of their first language and the early domicile may, in fact, have self-identified as Western had the opportunity been presented to them. This is because the data were collected in American and New Zealand universities in the English language. Not withstanding this issue, some evidence appears in the data analysis section that it appears to be true that many Asians consider a strategic decision based upon market share to be both logical and competent. Both regression analysis and analysis by chi square show that overall Asians made more low price/high market share decisions (defined here as incompetent) than did Western respondents.

Removing the Asian responses from the dataset, however; the same pattern emerges in the Western data as it does for the whole data set. This is not to say that this difference is not important, but simply that the process of ethnically categorizing Asian students participating in a Western education system is fraught with difficulty. This difficult situation remains unresolved, but at least the challenge it made to the basic assumptions of the research has been met.

5.3   Advancing the Body of Knowledge through further research

The theory concerning business decision-making has been enhanced here already; it has been demonstrated that competent decision-making can be taught, or trained. Several of the hypotheses tested here were about the type of training that best achieves the end desired; unfortunately several of the tests did not realize clear-cut results. These shortcomings in the current research lead to further opportunities for future research to advance the body of knowledge and enhance both theoretical understanding and managerial practice regarding making strategic decisions and teaching executives in training appropriately.

The idea of dropping your tools is implicit in several of the scenarios used in this experimental research, but the only time it was invoked explicitly was in conjunction with a number of other tools (in Scenario 6) so it is hard to isolate cause and effect. Future research could clarify this issue by presenting respondents with a decision scenario but first exposing them to BCG and Experience Curve materials but also include a brief synopsis of Weike's (2007) tool dropping ideas. The expectation would be that a very high level of competent decisions would be made consequently.

Similarly, the question of cognitive overload is of great interest but has not been clearly decided by analysis of this research data. Again in Scenario 6, three different sets of material were shown to respondents before they made their decision. It would be

of value to have had one set of material but expand it to provide several treatments with the same basic idea content but significantly more materials to read. This would yield more satisfactory data about the effect of cognitive overload.

It was discussed in the previous section, Gigerenzer's idea about simple cognitive heuristics were not explicitly tested here. A repetition of this scenario using a simplified explanation of selecting a hierarchical list of simple heuristics to use in making a decision, and setting the explanation with a pricing context, may well result in a very different decision and to the one that is manifest here.

This thesis is not concerned with cross-cultural research, and yet the possibility that East and West have different definitions of competent decisions raises an interesting peripheral question, in addition to the cross-cultural question itself. That is, that this research – as earlier research – has been concerned with the negative aspects of a competitive focus and in particular Boston Consulting Group strategic decision matrix. Yet there are other decision heuristics that can be very useful in their place yet can yield disastrous results if applied in the wrong context. The product life cycle springs to mind. It would be of very considerable interest both to theory and practice to substitute some other decisions heuristic for the BCG matrix to see if the same pattern of decisions arises. This type of research would answer the question of whether the results here are truly relevant to Simon's (1990) scissor blades (a mismatch of technique to environment leads to incompetent decisions) or whether it is the flawed nature of the BCG heuristic being applied that is causing the incompetence.

5.4   Implications for strategy training executives

There is evidence in the results of this research to show that good decision-making can be taught, or trained, in business schools. There is no doubt that participative teaching, where teachers can lead students through decision processes

within real-life case study settings, are a superior way of teaching strategy than lectures or guided reading. The research here has shown clearly that simply reading about decision-making techniques does not assist students learn to apply those techniques in a sensible manner. Finally, both the scissor-blades analogy and the drop your tool ideas are very real and very useful. That is, students do need a kitbag of management decision-making tools, but they need to learn (i.e., be trained) to drop them and let simple heuristics determine the most useful tool to use within a particular decision environment.

The author of this thesis is a strategy teacher, and has had many months to ponder upon the implications of this work for the betterment of his teaching. The following brief description of the action he took is not part of the examinable thesis yet may be of interest to a reader at a later date.

5.4.1 An application of the advanced theory

The lessons learned from this study were applied in a marketing strategy class. Students were exposed to a computer simulation, business case studies, and ten business decision-making metaphors. These metaphors/models include Blue Ocean Strategy (Kim & Mauborgne, 2005), The Balanced Score Card (Kaplan & Norton, 1996), Vision Building (Collins & Porras, 1996), Brand Alignment (Reinartz & Kumar, 2002), The Learning Organisation (Slater & Narver, 1995), Resilience (Hamel & Valikangas, 2003), Industry Five Forces (Porter, 2008), Relationship Marketing (Grönroos, 1995), and Mismanagement of Customer Loyalty (Reinartz & Kumar, 2002).

Students were trained to adapt the metaphors as heuristics when making decisions. They adapted the metaphors into heuristic cues (analogous to simple heuristics) and dropped the irrelevant aspects (analogous to dropping your tools). As they played through the simulation over a twelve-week period, they applied ten

mutually exclusive, non-deterministic, metaphors of marketing decision-making. They

simultaneously applied these same techniques to business case study analysis. They

learned to rely on their heuristic intuition by focusing on salient cues and dropping

unnecessary or irrelevant cues as they synthesized future options for the business case.

They were trained to be sensitive to the global commercial environment and constantly

aware of the non-deterministic nature of metaphors. This occurred as they experienced

a competitive industry environment and felt the pleasure of victory, and chagrin of

defeat. In the case study they formulate a conclusive statement on how the metaphor

applies, or does not apply to the salient issue of the case with. The student completes

the study by identifying various future options available to move the business

organisation into the future. Ultimately, after these simulation and case study exercises,

students learn to adapt a wide range of strategy decision-making metaphors to an ever-

evolving environment.

5.5   Concluding remarks

A dynamically complex technological, social, competitive environment is

today's business reality. Many systems analysts fight complexity with complexity by

devising increasingly complex solutions to an ever increasing complex problem, but this

is, in fact, the antithesis of real systems thinking. Ultimately, systems thinking

simplifies problems by focusing on the deeper patterns lying behind the events and

details. "It appears that we have latent skills as system's thinkers that are undeveloped,

even repressed by formal education in linear thinking" (Senge, 1990, p. 73). Senge goes

on to demonstrate how all causal attribution spoken in everyday English are highly

suspect, as they are embedded in linear ways of seeing only partially accurate,

inherently biased and describe portions of reciprocal processes. These cause and effect

attributions often leave out the entire processes (1990). The implication is that

determinstic tools must be used with caution, as they often operated in an unrealistic micro-environment.

This thesis analyses the systematic relationship between cognitive decision-making theory and an environment of dynamic complexity. Cognitive decision-making theory analysed through hypothetical deductive tests, indicates that competence and incompetence in a predetermined context may be taught and tested through the environmentally sensitive application of heuristics. The East-West differential for incompetent decision-making reveals the salience of contextual adaption in dynamic environments. Cognitive and contextual theories together explain causal variables at separate levels of analysis as they relate to one another systematically (Goertz & Mahoney, 2005, p. 497).

Simon (1950) posits that competent decision-making is a function of the tools we chose to use for the appropriate context. Executives appear to select tools based upon the complexity of the problem and the time available to collect and analyse information (Gigerenzer, 1999). With plenty of time, in a closed system linear environment where cause and effect are stabilised over time, the normative quantitative approach to data collection and tools of inferential statistical analysis proceeds satisfactorily (Field, 2005). On the other hand, whilst formulating strategy the business executive deals with an environment of enormously dynamic complexity. This open systems environment results in a continuous chain of causality, equifinality, and tools utilising the attributes of non-deterministic metaphorical analysis are superior (Senge, 1990; Goertz & Mahoney, 2005).

This thesis has made a modest contribution to managerial decision-making theory, by developing the insightful and exciting work of Armstrong, Brodie, Collopy and other management experts. There are questions unanswered, though, and the journey is by no means over.

Appendix A: Application for Ethics Approval for Research Projects

Auckland University of Technology Ethics Committee (AUTEC)

EA1

APPLICATION FOR ETHICS APPROVAL FOR RESEARCH PROJECTS

Please read the notes at the end of the form before submitting this application.

A. General Information

A.1.   Project Title

If you will be using a different title in documents to that being used as your working title, please provide both, clearly indicating which title will be used for what purpose.

Thesis Title: *Management Competence and Incompetence: Theory and*

Training

Working Title: *Pricing Decisions in Marketing Environments*

A.2.   Applicant Name and Qualifications

When the researcher is a student (including staff who are AUT students), the applicant is the principal supervisor. When the researcher is an AUT staff member undertaking research as part of employment or a staff member undertaking research as part of an external qualification, the applicant is the researcher. Staff should refer to Section 11.4 of Applying for Ethics Approval: Guidelines and Procedures to check requirements for ethics approval where they are studying at another institution.

Professor Roger Marshall

A.3.   Applicant's School/Department/Academic Group/Centre

Faculty of Business, Marketing and Advertising Department

A.4.   Applicant's Faculty

Faculty of Business

A.5.   Student Details

Please complete this section only if the research is being undertaken by a student as part of an AUT qualification.

A.5.1. Student Name(s):

Noel Spanier

A.5.2. Student ID Number(s):

0974803

A.5.3. Completed Qualification(s):

BA, University of California, Berkeley

MBA, San Francisco State University, California

MMgmt, Massey University, Auckland

A.5.4.   E-mail address:

nspanier@aut.ac.nz

A.5.5.   School/Department/Academic Group/Centre

Faculty of Business, Marketing and Advertising Department

A.5.6.   Faculty

Business

A.5.7.   Name of the qualification for which this research is being undertaken:

PhD

A.5.8.   Research Output

PhD Thesis

A.6.   Details of Other Researchers or Investigators

Please complete this section only if other researchers, investigators or organisations are involved in this project. Please also specify the role any other researcher(s), investigator(s) or organisation(s) will have in the research.

A.6.1.   Individual Researcher(s) or Investigator(s)

Please provide the name of each researcher or investigator and the institution in which they research.

Professor A.G. Woodside, Boston College and Adjutant AUT University

A.6.2.   Research or Investigator Organisations

Not applicable

A.7.   Are you applying concurrently to another ethics committee?

No

A.8.   Declaration

The information supplied is, to the best of my knowledge and belief, accurate. I have read the current Guidelines, published by the Auckland University of Technology Ethics Committee, and clearly understand my obligations and the rights of the participant, particularly with regard to informed consent.

Signature of Applicant	Date

(In the case of student applications the signature must be that of the Supervisor)

Signature of Student	Date

(If the research is a student project, both the signature of the Supervisor, as the applicant, and the student are required)

A.9.   Authorising Signature

Signature of Head	Name of Faculty/Programme/School/Centre	Date

B. General Project Information

B.1. Project Duration

B.1.1. Approximate Start Date of Primary Data Collection

Upon AUTEC approval, ~March 2010

B.1.2. Approximate Finish Date of Complete Project

December 2010

B.2. Are funds being obtained specifically for this project?

If your answer is yes, then you must complete section G of this Application Form.

No

B.3. Types of persons participating as participants

Please indicate clearly every one of the following categories that applies to those participating in your research.

B.3.1. Researcher's students

No

B.3.2. Adults (20 years and above)

Yes, post-graduate students, business,executives and alumni accessed from New Zealand and North American Universities and trade associations.

B.3.3. Legal minors (16 to 20 years old)

No

B.3.4. Legal minors (under 16 years old)

No

B.3.5. Members of vulnerable groups

e.g. persons with impairments, limited understanding, etc. If your answer is yes, please provide a full description.

No

B.3.6. Hospital patients

No

B.3.7. Prisoners

No

B.4. Does this research involve use of human remains, tissue or body fluids which does not require submission to a Regional Ethics Committee?

e.g. finger pricks, urine samples, etc. (please refer to section 13 of the AUTEC Guidelines). If your answer is yes, please provide full details of all arrangements, including details of agreements for treatment, etc.

No

B.5.   Does this research involve potentially hazardous substances?

e.g. radioactive materials (please refer to section 15 of the AUTEC Guidelines). If your answer is yes, please provide full details.

No

B.6.   Research Instruments

B.6.1. Does the research include the use of a written or electronic questionnaire or survey?

If your answer is yes, please attach to this application form a copy of the finalised questionnaire or survey in the format that it will be presented to participants.

Yes, please find attached a set of the ten(10) scenarios: *Pricing Decision Scenario.* Participants will be given the opportunity to select one of two pricing options from one of the randomly allocated scenarios.

B.6.2. Does the research involve the use of focus groups or interviews?

If the answer is yes, please indicate how the data will be recorded (e.g. audiotape, videotape, note-taking). When interviews or focus groups are being recorded, you will need to make sure there is provision for explicit consent on the Consent Form and attach to this Application Form examples of indicative questions or the full interview or focus group schedule.

No

B.6.3. Does the research involve the use of observation?

If the answer is 'Yes', please attach to this application a copy of the observation protocol that will be used.

No

B.6.4. Does the research involve the use of other research instruments such as performance tests?

If the answer is yes, please attach to this application a copy of the protocols for the instruments and the instruments that will be used to record results.

No

B.6.5. Who will be transcribing or recording the data?

If someone other than the researcher will be transcribing the interview or focus group records or taking the notes, you need to provide a confidentiality agreement with this Application Form.

Participants will be recording their own choice between two pricing options available to them as outlined in the Information Sheet.

B.7.   How does the design and practice of this research implement each of the three principles of the Treaty of Waitangi (Partnership, Participation and Protection) in the relationships between the researcher and other participants?

Please refer to Section 2.5 of AUTEC's Applying for Ethics Approval: Guidelines and Procedures *(accessible in the Ethics Knowledge Base online via http://www.aut.ac.nz/about/ethics) and to the relevant Frequently Asked Questions section in the Ethics Knowledge Base.*

1) *The principle of partnership.* This research has been positioned so that both the researcher and the participant recognise the atmosphere of mutual respect. This will occur because this project will be conducted as a joint venture. Successful partnership relationships require trust between all parties. To help establish this trust, respondents are informed in the Instruction Sheet that they may obtain a copy of the research outcomes. The participants will be encouraged, as research partners, to provide more ideas regarding the topic upon completion of their decision input. Participants will be informed that the final report may

use their anonymous comments and their privacy and confidentiality will be secure. As many of the respondents will be students, the study will be of benefit to them as results will be available to their lecturers' to help aid in curriculum development.

2) *The principle of participation* has been applied for recruiting participants and in the design of the decision input sheet. The research will be conducted on the basis of informed and voluntary consent. The participants are free to ask questions if they have any concerns about the procedure or meaning of the decision input. When and where the decision scenario will be conducted will be discussed with the potential participants beforehand to make sure that it is appropriate to the participants. The participants are assured that withdrawal from the research at any time and this will not lead to any disadvantages to them.

3) *The principle of protection* requires the researcher to respect the values, practices and beliefs of the culture and social groups of all participants during the research process. Participants are assured of confidentiality. Participants will have the opportunity to opt out of responding to the decision input process. The researcher will be sensitive to any discomfort from the respondents, and inform them that they need not make a decision if they are uncomfortable. The researcher will always protect interviewees from any discomfort or psychological harm.

B.8. Does this research target Maori participants?

No

B.8.1. If 'Yes", what consultation has been undertaken when designing the research?

Please identify the group(s) with whom consultation has occurred and provide evidence of their support and any impact this consultation had on the design of the research. Researchers are advised to read the Health Research Council's Guidelines for researchers on health research involving Maori, available via the Ethics Knowledge Base.

B.9. Does this research target participants of particular cultures or social groups?

Please refer to Section 2.5 of AUTEC's Applying for Ethics Approval: Guidelines and Procedures (accessible in the Ethics Knowledge Base online via http://www.aut.ac.nz/about/ethics) and to the relevant Frequently Asked Questions section in the Ethics Knowledge Base.

No

B.9.1. If 'Yes" please identify which cultures or social groups are being targeted and how their cultures or social groups are being considered in the research design.

B.9.2. If your answer to B.9 was 'Yes", what consultation has occurred with these cultures or social groups in the design of the research?

Please identify the group(s) with whom consultation has occurred and provide evidence of their support and any impact this consultation had on the design of the research.

B.10. Is there a need for translation or interpreting?

If your answer is 'Yes', please provide copies of any translations with this application and any Confidentiality Agreement required for translators or interpreters.

No, research will be conducted with English speaking respondents.

C. Project Details

C.1.　　Aim of project:

The aim of the project is to discern the pricing decision-making process of participants when exposed to varying forms of business information. The specific hypotheses to be tested are:

H_1: Most (i.e., 70 %+) participants in the base (control) condition select the more profitable decision.

H_2: The share of participants selecting the low-price strategy will be substantially higher in scenario 2 (the beat competitor scenario) than the control condition.

H_3: The share of participants selecting the low-price strategy will be higher in scenario 3 versus 2. Scenario 3 participants receive information and training in using Boston Consulting Group's growth-share matrix and experience curve.

H_4: The share of participants selecting the low-price strategy will be lower in scenario 4 versus scenario 2 and 3. Scenario 4 provides evidence-based information that setting competitor-oriented objectives hurts a firm's performance.

H_5: The share of participants selecting the low-price strategy will be higher in scenario 5 versus scenario 4 but lower than participants in scenario 3. Scenario 5 includes both incompetency (BCG information) and competency (evidence-based information) on setting competitor-oriented objectives.

H_6: The "drop your [inappropriate for the context] tools" information in scenario 6 should tip the balance for the competency training (evidence-based information) and participants will stop using the BCG information in scenario 6.

H_7: Most participants in scenario 7 will select the low-price strategy; more participants in scenario 7 will select the low-prices strategy than participants in scenarios 1 or 2.

H_8: Most participants in scenario 8 will select the high-price strategy. A greater share of participants in scenario 8 versus scenarios 1 and 2 will select the high-price strategy.

H_9: Increasing the cognitive effort by adding non substantive information increases the share of participants selecting the low-price strategy: the share of scenario 9 participants selecting the low-price strategy will be higher that the share of scenario 1 or 2 participants.

H_{10}: The share of participants selecting the low-price strategy will be higher for participants having more versus less formal training in management education.

C.2. Why are you proposing this research?

Research Benefits: The proposed research will benefit business students, educators, and practitioners in providing an explanation of how levels of competency may be addressed. The context is a marketing environment and will be reflective of marketing curriculum as currently tutored at post graduate levels. The benefits may reveal those environmental factors that enable or disable marketing managers as they attempt to make decisions in complex environments.

C.3. Background:

Please provide sufficient information, including relevant references, to place the project in perspective and to allow the project's significance to be assessed. Where appropriate, provide one or two references to the applicant's (or supervisor's) own published work in the relevant field.

This project proposes and examines theoretical propositions in competency theory applicable to sense and decision-making by executives relating to contexts in firms. The thesis extends prior work by Armstrong and Collopy (1996) and Armstrong and Green (2007) that substantial numbers of executives decisions are less profitable and lead to their firms' demise due to following strategies that frequently appear in marketing textbooks, books on effective marketing strategy, and portfolio matrix literature. Do such literatures train executive to make incompetent decisions? If so, are theory and tools available to counteract such incompetency training--to assist executives in competent sense and decision-making? This thesis tests theoretical proposals by Gigerenzer and colleagues and Karl Weick for increasing sense and decision-making competency in firms. Implementing the thesis includes running 10 of 17 proposed scenarios using post-test only scenarios with control group design. The proposal includes planning on a total of 50 participants per group (450 total participants) to achieve reasonable statistical power in the scenarios. The expected findings should strengthen and extend the theories and management programmes' practice relating to competency-based training in sense and decision-making.

C.4. Procedure:

C.4.1. Explain the philosophical and/or methodological approach taken to obtaining information and/or testing the hypothesis(es).

Design of the Study: The proposed study includes a series of laboratory scenarios that replicates and substantially extends the research of Gigerenzer and his colleagues and Armstrong and his colleagues to examine alternative management training information and tools designed either to increase executive decision competency or incompetency. Subject pools of business executives (alumni and practitioners) and advanced students-in-training to become executives will serve as participants in these scenarios.

C.4.2. State in practical terms what research procedures or methods will be used.

Implementing the thesis includes running 10 of 17 proposed exercises using post-test only scenarios with control group design. The proposal includes planning on a total of 50 participants per group (450 total participants) to achieve reasonable statistical power in the decision-making.

C.4.3.   State how information will be gathered and processed.

The exercises will be conducted in classroom settings and through the internet with the participants working individually.   As Armstrong and Collopy (1996, p. 191) note, this use of captive participants reduces self-selection bias.

C.4.4.   State how your data will be analysed.

To assess whether or not the information in the scenarios allow for profit maximization, they will be presented to economics and finance professors with experience in teaching microeconomics and financial management. Each faculty member will receive the scenarios and be asked to assume that he or she has been asked to be an economic advisor to the firm.   Each will be asked to conclude and state which price in each treatment relates to the highest profit for L-Guys.   Each faculty member will be asked if further information is necessary to answer this question.

C.4.5.   Provide the statistical or methodological justification for this.

Statistical hypotheses testing using Z-tests, t-tests, Chi-square tests, and multiple regression analysis (MRA) will be done to compare the shares of participants in scenario versus control groups for selecting the high (low) pricing strategy solution.

C.5.   References

Please include the references for your responses to this section in the standard format used in your discipline.

Armstrong, J. & Green, K. (2007). Competitor-Oriented Objectives: Myth of Market Share. *International Journal of Business,, Vol. 12*, pp. 117-136.

Armstrong, J. S., & Collopy, F. (1996). Competitor orientation: Effects of objectives and information on managerial decisions and profitability. *Journal of Marketing Research, 33*(2), 188-199.

Czerlinski, J., Gigerenzer, G., & Goldstein, D. G. (1999). How good are simple heuristics? In G. Gigerenzer, P. M. Todd & A. R. Group (Eds.), *Simple heuristics that make us smart* (pp. 97-118). New York: Oxford University Press.

Gigerenzer, G., & Brighton, H. (2009). HomoHeruisticus: Why Biased Minds Make Better Inferences. *Cognitive Science, 1*, 107-143.

Klein, G., Moon, B., & Hoffman, R. F. (2006). Making sense of sensemaking I: Alternative perspectives. *IEEE Intelligent Systems, 21*(4), 70-73.

Ruth, Damian (2006). "Frameworks of managerial competence: limits, problems and suggestions", *Journal of European Industrial Training*, vol. XXX, no. 3, p. 206-226.

Weick, K. E. (1993). The collapse of sensemaking in organizations -the Mann Gulch disaster. *Administrative Science Quarterly, 38*(4), 628-652.

Weick, K. E. (1995). *Sensemaking in organisations*. Thousand Oaks, CA: Sage.

Woodside, A., & Wilcox, C. (2009). Contingency theory and meta-analysis of behavioral primacy and imprinting treatment effects. In A. Columbus (Ed.), *Advances in Psychological Research*. Coral Gables, FL: Nova Science Publishers, Inc.

D. Participants

D.1.   Who are the participants?

Postgraduate business students, alumni and practitioners

D.1.1. What criteria are to be used in recruiting the participants?

Advertising through dissemination of Information Sheets to post-graduate students and practitioners from New Zealand and North America

D.1.2. What criteria are to be used for selecting participants from those recruited?

Participants will be allowed to freely and anonymously volunteer or decline to participate in the project. They may opt out at any time from the survey up to the point of submitting their anonymous data.

D.1.3. Are there any potential participants who will be excluded?

If your answer is yes, please detail the criteria for exclusion.

No, unless the potential participant voluntarily, through action or inaction, declines to participate.

D.2.   Are there any potential conflicts of interest or possible coercive influences in the professional, social, or cultural relationships between the researcher and the participants (e.g. dependent relationships such as teacher/student; parent/child; employer/employee; pastor/congregation etc.)?

Yes

D.2.1. If your answer was 'Yes', please identify the nature of the relationships concerned and provide full information about the processes being incorporated into the research design to mitigate any adverse affects that may arise from them.

Relationships, teacher/student is the primary dependent relationship that may have possible coercive influences. There will be no dependent relationship when alumni or practitioners are the participants.

Processes to be put in place will include the following steps:

1) Permission will be obtained to conduct this decision exercise during class time from the appropriate Head of Department and class lecturer. The value of this research to the curriculum will be explained during the permission obtaining process.

2) An in-class announcement will be made, and information sheet handed out in-class several days prior to the intended decision exercise.

3) The in-class announcement to the participants will be made by the researcher, not the attending lecturer. The lecturer will be precluded from making this announcement to avoid conflict of interest. The researcher will be precluded from announcing to any of his or her own classes in order to mitigate conflict of interest. The researcher will make it clear that there is no right or wrong answer, and that the researcher has no interest in the individual decision of any participant. Anonymity will be maintained as the researcher will not be able to identify who is participating in the survey.

4) On the day of the decision exercise, ten minutes of class time will be set aside to proceed with the exercise. Each student will be given an Instruction Sheet, a Scenario, and a Decision Sheet. Students are under no obligation to proceed with the exercise. Once they proceed, they may withdraw at any time up until they hand in their decision. If they do not want to proceed they simply hand the package in with no decision made, or check 'I choose to withdraw' at the bottom of the decision form. Anonymity will be maintained.

5) The researcher has no interest in the decision any individual participant makes.

D.3. How many participants will be selected?

450

D.3.1. What is the reason for selecting this number?

Coherent statistical sample size

D.3.2. Provide a statistical justification where applicable, if you have not already provided one in C.4 5. above.

See above

D.3.3. Is there a control group?

Yes: 10% of all respondents, randomly selected.

D.4. Describe in detail the recruitment methods to be used.

If you will be recruiting by advertisement or email, please attach a copy to this Application Form

Announcement in the form of the attached Information Sheet will be circulated in postgraduate classes and through alumni and trade organisations. Access of the associations newsletters, websites and email data bases will have permission and then utilised to distribute the Information Sheet.

D.5. How will information about the project be given to participants?

(e.g. in writing, verbally). A copy of information to be given to prospective participants is to be attached to this Application Form. If written information is to be provided to participants, you are advised to use the Information Sheet exemplar.

Verbal announcement and presentation of written Information Sheet

D.6. Will the participants have difficulty giving informed consent on their own behalf?

Consider physical or mental condition, age, language, legal status, or other barriers. If the answer is yes, please provide full details.

No, consent occurs through active participation with the option to decline participation.

D.6.1. If participants are not competent to give fully informed consent, who will consent on their behalf?

Only competent participants will be approached.

D.6.2. Will these participants be asked to provide assent to participation?

If the answer is yes, please attach a copy of the assent form which will be used. Please note that assent is not the same as consent (please refer to the Glossary in Appendix A of the AUTEC Guidelines and Procedures.

No, all participants will be post-graduate students and/or alumni and practitioners.

D.7. Will consent of participants be gained in writing?

If the answer is yes, please attach a copy of the Consent Form which will be used. If the answer is No, please provide the reasons for this.

No, AUTEC advises that if the survey is anonymous, i.e. the researcher will be unable to identify who is participating, then a Consent Form may not be necessary and a statement to the effect that consent will be indicated by completion of the survey in the Information Sheet as well as at the beginning of the survey will suffice. The researcher will not be able to identify who is participating in the research.

D.8. Will the participants remain anonymous to the researcher?

Please note that anonymity and confidentiality are different. If the answer is yes, please state how, otherwise, if the answer is no, please describe how participant privacy issues and confidentiality of information will be preserved.

Yes, the research will not be able to identify those participating in the research.

D.9. In the final report will there be any possibility that individuals or groups could be identified?

If the answer is yes, please explain how and why this will happen.

No, the breadth of the data collection will span from New Zealand to North America.

D.10. Will feedback or findings be disseminated to participants (individuals or groups)?

If the answer is yes, please explain how this will occur and ensure that this information is included in the Information Sheet.

Yes, please see the attached Instruction Sheet. Participants may access findings on the www.surveymethods.com website.

D.11. Will the findings of this study be of particular interest to specific cultures or social groups?

If your answer is 'Yes', please identify how the findings will be made available to them.

No

E. Other Project Details

E.1. Where will the project be conducted?

Please provide the name/s of the Institution/s, town/s, city or cities, region or country that best answers this question.

New Zealand; AUT University; University of Auckland; Massey University, Auckland. USA: Boston College, Massachusetts; San Francisco State University; UC Berkeley.

Industrial Fabrics Association International, St. Paul Minnesota; Harvard Alumni Association, San Rafael, California,

E.2. Who is in charge of data collection?

Noel Spanier

E.3. Who will interact with the participants?

Noel Spanier, AUT lecturer Edwin Rajah, Professor Roger Marshall, Professor Arch Woodside.

E.4. What ethical risks are involved for participants in the proposed research?

Please consider the possibility of moral, physical, psychological or emotional risks to participants, including issues of confidentiality and privacy. Researchers are urged to consider this issue from the perspective of the participants, and not only from the perspective of someone familiar with the subject matter and research practices involved.

None

E.4.1. Are the participants likely to experience any discomfort, embarrassment (physical, psychological, social) or incapacity as a result of the research's procedures?

No, the concept of 'competency' will not be introduced to the participants during, before, or after the project.

E.4.2. If there are risks, please identify their probability and describe how they will be mitigated.

Please describe how these will be minimised or mitigated (e.g. participants do not need to answer a question that they find embarrassing or they may terminate an interview or there may be a qualified counsellor present in the interview or the findings will be reported in a way that ensures that participants cannot be individually identified, etc.) Possible risks and their mitigation should be fully described in the Information Sheets for participants.

A risk exists that participants could associate their decision to the concept of 'competency'. There is a potential for misinterpretation of this concept as it relates to management decision-making and this project. To mitigate this possibility, participants and their decisions will not be labelled or communicated at any time to be a decision reflecting competence or incompetence.

E.4.3. If the participants are likely to experience any discomfort, embarrassment, or incapacity, what provision for counselling has been made, either with AUT Counselling (who also provide an online service) or with other counselling professionals (this is to be at no charge to the participants)?

Please refer to section 2.3 of AUTEC's Applying for Ethics Approval: Guidelines and Procedures *in the Ethics Knowledge Base. If the answer is No, please explain the arrangements which have been made to have qualified personnel available to deal with unexpected adverse physical or psychological consequences?*

The counselling resources of AUT University will be made available to any participant who experience discomfort, embarrassment of incapacity as a result of this project.

E.5. What risks are involved for the researcher(s) in the proposed project (such as physical, social, psychological, or safety risks)?

If this project will involve interviewing participants in private homes, undertaking research overseas, or going into similarly vulnerable situations, then a Researcher Safety protocol should be designed and appended to this application.

This project does not involve interviewing participants.

E.6. Will there be any other physical hazards introduced to AUT staff and/or students through the duration of this project?

If the answer is yes, please provide details of management controls which will be in place to either eliminate or minimise harm from these hazards (e.g. a hazardous substance management plan).

No

E.7. Is deception of participants involved at any stage of the research?

If the answer is yes, please provide full details of and rationale for the deception. Please refer to Section 2.4 of AUTEC's Applying for Ethics Approval: Guidelines and Procedures *when considering this question.*

No

E.8. How much time will participants have to give to the project?

It has been tested that 10 minutes will be the most time required for a participant to choose between one of two pricing options.

E.9. Will any information on the participants be obtained from third parties?

If the answer is yes, please provide full details. This includes use of third parties, such as employers, in recruitment.

No

E.10. Will any identifiable information on the participants be given to third parties?

If the answer is Yes, please provide full details.

No, information of this type will not be collected and is unnecessary for the success of this project.

E.11. Provide details of any payment, gift or koha and, where applicable, level of payment to be made to participants.

Please refer to Section 2.1 of the AUTEC's Applying for Ethics Approval: Guidelines and Procedures *and Appendix A of that document for AUTEC's policy on Payment and Koha, especially in relation to recruitment.*

Not applicable

F. Data and Consent Forms

F.1. Who will have access to the data?

Noel Spanier, Professor Roger Marshall, Professor A.G. Woodside

F.2. Are there plans for future use of the data beyond those already described?

The applicant's attention is drawn to the requirements of the Privacy Act 1993 (see Appendix I). If there are future plans for the use of the data, then this needs to be explained in the Information Sheets for participants.

No

F.3. Where will the data be stored once the analysis is complete?

Please provide the exact storage location. AUTEC normally requires that the data be stored securely on AUT premises in a location separate from the consent forms. If you are proposing an alternative arrangement, please explain why.

AUT Universitypremises,Department of Marketing and Advertising, WU3.

F.4. For how long will the data be stored after completion of analysis?

AUTEC normally requires that the data be stored securely for six years. If you are proposing an alternative arrangement, please explain why.

Six Years

F.5. Will the data be destroyed?

If the answer is yes, please describe how the destruction will be effected. If the answer is no, please provide the reason for this.

Yes, by AUT controlled document destruction

F.6. Who will have access to the Consent Forms?

AUTEC advises that if the survey is anonymous, i.e. the researcher will be unable to identify who is participating, then a Consent Form may not be necessary and a statement to the effect that consent will be indicated by completion of the survey in the Information Sheet as well as at the beginning of the survey will suffice.

F.7. Where will the completed Consent Forms be stored?

Please provide the exact storage location. AUTEC normally requires that the Consent Forms be stored securely on AUT premises in a location separate from the data. If you are proposing an alternative arrangement, please explain why.

A Consent Form may not be necessary, however, if they become necessary then storage will be AUT University premises separate from the data forms: Department of Marketing and Advertising, WU3.

F.8. For how long will the completed Consent Forms be stored?

AUTEC normally requires that the Consent Forms be stored securely for six years. If you are proposing an alternative arrangement, please explain why.

Six years, if they become necessary

F.9. Will the Consent Forms be destroyed?

If the answer is yes, please describe how the destruction will be effected. If the answer is no, please provide the reason for this.

Yes, by AUT controlled document destruction

G. Material Resources

G.1. Has an application for financial support for this project been (or will be) made to a source external to AUT or is a source external to AUT providing (or will provide) financial support for this project?

No

G.1.1. If the answer to G.1 was 'yes', please provide the name of the source, the amount of financial support involved, and clearly explain how the funder/s are involved in the design and management of the research.

G.2. Has the application been (or will it be) submitted to an AUT Faculty Research Grants Committee or other AUT funding entity?

If the answer is yes, please provide details.

No

If the answer to G.2 was 'yes', please provide the name of the source, the amount of financial support involved, and clearly explain how the funder/s are involved in the design and management of the research.

G.3. Is funding already available, or is it awaiting decision?

Please provide full details.

Funding as an academic staff member through the annual Individual Development Fund (IDP) process is sufficient for this project.

> **G.4.** **Please provide full details about the financial interest, if any, in the outcome of the project of the researchers, investigators or research organisations mentioned in Part A of this application.**

There is no financial interest in this project.

H. Other Information

> **H.1.** **Have you ever made any other related applications?**

> *If the answer is yes, please provide the AUTEC application / approval number(s)*

No

I. Checklist

> *Please ensure all applicable sections of this form have been completed and all appropriate documentation is attached as incomplete applications will not be considered by AUTEC.*

Section A	General Information Completed	
	Signatures/Declaration Completed	
Section B	Project General Information Completed	
Section C	Project Details Completed	
Section D	Participant Details Completed	
Section E	Other Project Details Completed	
Section F	Data & Consent Forms Details Completed	
Section G	Material Resources Completed	
Section H	Other Information Completed	

Spelling and Grammar Check (please note that a high standard of spelling and grammar is required in documents that are issued with AUTEC approval)

Attached Documents (where applicable)

Participant Information Sheet(s)

Consent Form(s)

Questionnaire(s)

Indicative Questions for Interviews or Focus Groups

Observation Protocols

Recording Protocols for Tests

Advertisement(s)

Hazardous Substance Management Plan

Any Confidentiality Agreement(s)

Other Documentation

Before submitting this application, please note the following:

- ❖ *If you think that your research may be of low ethical risk, use the EA8RA self assessment form to make sure that this is the correct form for your application;*

- ❖ *Incomplete or incorrectly formatted applications will not be considered by AUTEC;*

- ❖ *Please check online for the most recent version of this form before submitting your application;*

- ❖ *Please do not alter the formatting of this form or delete any sections. If a particular question is not applicable to your research, please state that as your response to that question;*

This form needs to be submitted, along with all associated documents as follows:

- ❖ *In printed form;*

- ❖ *With the required signatures in sections A.8 and A.9;*

- ❖ *Single sided;*

- ❖ *Using clips rather than staples;*

- ❖ *By 4 pm on the agenda closing date at:*

  The AUTEC Secretariat
  Room WO201, WO Building
  56 Wakefield Street, City Campus.

- ❖ *The Internal Mail Code is D-89. If sending applications by Internal Mail, please ensure that they are posted at least two days earlier to allow for any delay that may occur.*

Appendix B: Survey Forms, Information, Instructions, Decision Form

Information Sheet	**AUT** UNIVERSITY TE WĀNANGA ARONUI O TAMAKI MAKAU RAU

Project title: Pricing Decisions in Marketing Environments
Project Supervisors: Professor Roger Marshall, Professor Arch Woodside
Researcher: PhD Candidate Noel Spanier; nspanier@aut.ac.nz

An Invitation

We are hoping to have 500 people with interest in marketing, both here and abroad, participate in this study over the coming months. If you have postgraduate training in management or administration, we invite you to participate in this 8 minute, six-question study. Please note that your participation is voluntary and you can withdraw any time during the research without any adverse consequences

What is the purpose of this research?

This study is to provide information about how marketing managers make pricing decisions from ten separate decision-making scenarios. Each scenario is set in a different context that may influence a decision maker when selecting between one of two pricing options. Each participant receives one scenario to make a pricing decision. The decision you make will be collated, then analysed to learn how the various contexts may influence price selection.

Can I join the study?

We would be delighted to have your input in this exercise. You do not require any special knowledge to participate in the survey. Anyone over the age of 20, has postgraduate training, and who can read and write in English may take part in the study. You join the study by receiving the survey form, proceeding to read the scenario and check mark your price choice on the Decision Form. A provision for confidential withdrawal from the survey appears on the Decision Form. If you are in a classroom or group environment this survey could occur during class time. If you do not choose to participate, we suggest you accept and read one of the surveys, and check the withdrawal box at the bottom of the Decision Form. Valuable classroom discussion may subsequently follow the survey in marketing class environments.

What do I have to do?

Each participant is to read a short scenario about a product pricing decision. From one of ten randomly selected pricing contexts, you are asked as a marketing manager to select a Low Price or a High Price for your company's (L-Guys) one product, make a brief comment on why you made that decision, and include basic generic demographic information.

What will happen in this research?

After reading the Pricing Decision Scenario you proceed to respond to six questions, one on pricing strategy and the remaining personal demographics. After completing the Decision Form you turn-it-in and are free to take leave from the survey.

What are the discomforts and risks?

We do not anticipate any discomfort or risk to you when you participate in this study for the following reasons. Firstly, the pricing scenarios call for normal decisions that may be influenced by the context for making pricing decisions. Secondly, the exercise does not require you to provide any sensitive information about you or your organisation.

How might any discomfort and risk be alleviated?

However, should you experience any discomfort, you can confidentially opt to withdraw from the study any time before, during or prior to turning in the Decision Form. Any information collected is then destroyed. Please note we would like to emphasize that all information obtained from your participation will be kept anonymous.

How will my privacy be protected?

Please note that all information obtained from individual participants in the survey is confidential. This is a voluntary study and any participant can confidentially withdraw from the study. The researchers have no interest in matching individual participants with the decision or comments they make. Once you turn in your Decision Form, you may not withdraw because we will have no way to identify which survey is yours.

What are the benefits?

The information collected is used to contribute toward research ultimately leading to a PhD degree at AUT University, Auckland, New Zealand. The proposed research may also benefit business students, educators, and practitioners in providing an explanation of how various contexts influence decision-making.

What are the costs of participating in this research?

The cost to you is approximately 10 minutes of your time in total. The median time to date is 8 minutes and 30 seconds.

What opportunity do I have to consider this invitation?

Once you have received the survey form, you may confidentially withdraw before submitting the Decision Form by simply checking the, 'I choose to withdraw' box at the bottom of the Decision Form.

How do I agree to participate in this research?

Whereas this survey is anonymous, i.e. the researcher will be unable to identify who is participating, a Consent Form is not necessary. Your consent will be indicated by completion of the survey. You may opt to withdraw from the research even after starting to participate in the study.

What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified to the Project Supervisor, Professor Roger Marshall, roger.marshall@aut.ac.nz, (629) 921 9999 ext. 5478. Concerns regarding the conduct of the research should be addressed to the Executive Secretary, AUTEC, Madeline Banda, madeline.banda@aut.ac.nz, (629) 921 9999 ext. 8044.

Approved by the Auckland University of Technology Ethics Committee on 28 April 2010. AUTEC Reference number 10/18.

Instruction Sheet	AUT UNIVERSITY TE WĀNANGA ARONUI O TAMAKI MAKAU RAU

Project title: **Pricing Decisions in Marketing Environments**
Project Supervisors: **Professor Roger Marshall, Professor Arch Woodside**
Researcher: **Noel Spanier**

What do I have to do?

Each participant is to read a short scenario about a product pricing decision. From one of ten randomly selected pricing contexts, you are asked, as a marketing manager to select a Low Price or a High Price for your company's (L-Guys) one product, make a brief comment on why you made that decision, and include basic generic demographic information.

What will happen in this research?

Participants are provided with a Pricing Decision Scenario and a Decision Form. After reading the Pricing Decision Scenario, you then proceed to make your decision on the Decision Form by checking one of two options. After completing the Decision Form, you turn-it-in and are free to take leave from the survey.

What opportunity do I have to consider this invitation?

Once you have received the survey form, you may confidentially withdraw before submitting the Decision Form by simply checking the, 'I choose to withdraw' box at the bottom of the Decision Form.

Please feel free to ask questions.

Questions will be answered at any time during this survey.

Do you want the results of this survey? You may access this URL:
.
 http://www.surveymethods.com/EndUser.aspx?AC88E4FEADEBFCF6A9

Please allow eight weeks for us to enter the data following your response today.

Approved by the Auckland University of Technology Ethics Committee on 28 April 2010. AUTEC Reference number 10/18.

Decision Form

Please respond with a tick (√) or write your answer to the following six questions.

1) Which pricing strategy do you select for L-Guys, please tick your one choice:

( ) the low price strategy   **( )** the high price strategy

Please write a reason or two for your decision:
_____
_____
_____
_____
_____

You may expand your written reason by continuing to write on the backside of this form .

2) Please tick **your highest level of education** related to management decision-making:

( ) No management decision-making education   ( ) Bachelor's degree

( ) Post graduate education   ( ) Master's degree

( ) Post Master's degree education

3) Please tick **your highest level of experience** related to management decision-making.

( ) No management decision-making experience   ( ) One to five years experience

( ) Six to ten years experience   ( ) More than ten years experience

4) Please tick the first language you learned:

( ) English   ( ) A language other than English

5) What is your nationality: _____

6) Please tick that world region which best describes your domicile from birth to age 15.

( ) Asia
( ) Africa
( ) Australasia
( ) Europe
( ) North America
( ) South America
( ) United Kingdom

This concludes the study, thank you for your participation

I choose to withdraw my input from this survey. Your tick mark here will result in withdrawal and destruction of your input and your decision and comments will not be a part of this study…**( ).**

Appendix C: Research Scenario Exhibits

Each Scenario (1-10) is proceeded by:

1. Information Sheet (Appendix B)
2. Instruction Sheet (Appendix B)

Each Scenario (1-10) is followed by:

Decision Sheet (Appendix B)

Scenario 1

Pricing Decision Scenario

You are a marketing manager of a manufacturing firm, known as L-Guys, Inc. As the company's marketing manager, you are responsible for all marketing decisions and strategies, including the pricing structure of the firm's products.

Recently your company introduced a new highly technical product, and you have been asked to set the pricing strategy for this product. You calculate the present value of the total profits expected for your firm over the next ten years.

You are aware that your main competitor, T-Guys, Inc., intends to introduce a product that is very similar to the one that your firm has just introduced. You should assume that the competitor's product is as good as yours in every way that is important to the market, and the market is the same for both products. Therefore, the pricing strategy that you formulate for your product might take into account this competitor's decisions. You estimate the following results for each strategy:

Expected Profits and Market Shares over Ten Years

Outcomes	L-Guys' Low-Price Strategy	L-Guys' High-Price Strategy
For L-Guys:	$10.2 million profit 49.1% market share	$20.4 million profit 48.6% market share
For T-Guys:	? profit 50.9% market share	? profit 51.4% market share

Note: **?**= unknown, profit information on T-Guys' product are unavailable to L-Guys' executives

---

Scenario 2

Pricing Decision Scenario

You are a marketing manager of a manufacturing firm, known as L-Guys, Inc. As the company's marketing manager, you are responsible for all marketing decisions and strategies, including the pricing structure of the firm's products.

Recently your company introduced a new highly technical product, and you have been asked to set the pricing strategy for this product. You calculate the present value of the total profits expected for your firm over the next ten years.

You are aware that your main competitor, T-Guys, Inc., intends to introduce a product that is very similar to the one that your firm has just introduced. You should assume that the competitor's product is as good as yours in every way that is important to the market, and the market is the same for both products. Therefore, the pricing strategy that you formulate for your product might take into account this competitor's decisions. You estimate the following results for each strategy:

Expected Profits and Market Shares over Ten Years

Outcomes	L-Guys' Low-Price Strategy	L-Guys' High-Price Strategy
For L-Guys:	$10.2 million profit 56.7% market share	$20.4 million profit 48.6% market share
For T-Guys:	? profit 43.3% market share	? profit 51.4% market share

Note: **?** = unknown, profit information on T-Guys' product are unavailable to L-Guys' executives

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Scenario 3

Pricing Decision Scenario

You are a marketing manager of a manufacturing firm, known as L-Guys, Inc. As the company's marketing manager, you are responsible for all marketing decisions and strategies, including the pricing structure of the firm's products.
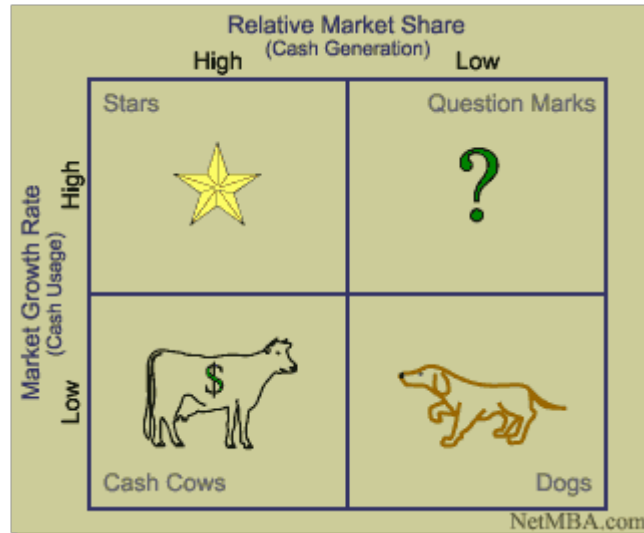
Recently your company introduced a new highly technical product, and you have been asked to set the pricing strategy for this product. You calculate the present value of the total profits expected for your firm over the next ten years.

You are aware that your main competitor, T-Guys, Inc., intends to introduce a product that is very similar to the one that your firm has just introduced. You should assume that the competitor's product is as good as yours in every way that is important to the market, and the market is the same for both products. Therefore, the pricing strategy that you formulate for your product might take into account this competitor's decisions. You estimate the following results for each strategy:

	L-Guys' Low-Price Strategy	L-Guys' High-Price Strategy
Outcomes		
For L-Guys:	$10.2 million profit 56.7% market share	$20.4 million profit 48.6% market share
For T-Guys:	? profit 43.3% market share	? profit 51.4% market share

Expected Profits and Market Shares over Ten Years

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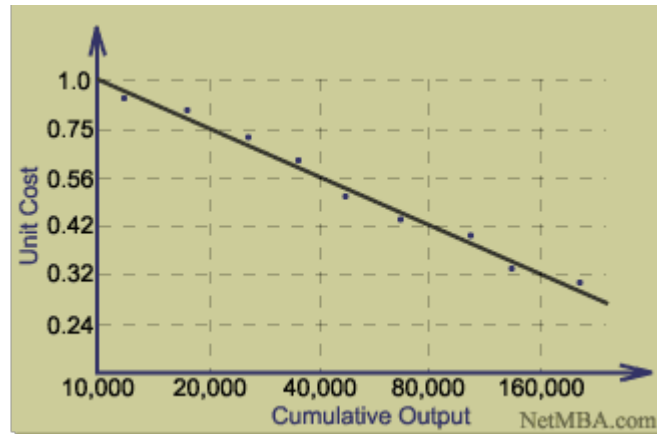
You may use the information on the following pages to make your decision

Scenario 3

Exhibit A. Boston Consulting Group (BCG) Growth Share Matrix

BCG Growth-Share Matrix is a portfolio-planning model developed by Bruce Henderson of the Boston consulting group in the early 1970's. It is based on the observation that a company's business units can be classified into four categories based on combinations of market growth and market share relative to the largest competitor, hence the name "growth-share". Market growth serves as a proxy for industry attractiveness, and relative market share serves as a proxy for competitive advantage. The growth-share matrix thus maps the business unit positions within these two important determinants of profitability. This framework assumes that an increase in relative market share will result in an increase in the generation of cash. (http://www.netmba.com/strategy/matrix/bcg/)

Scenario 3

Exhibit B. The Experience Curve

The experience curve has important strategic implications. If a firm is able to gain market share over its competitors, it can develop a cost advantage. Penetration pricing strategies and a significant investment in advertising, sales personnel, production capacity, etc. can be justified to increase market share and gain a competitive advantage.

When evaluating strategies based on the experience curve, a firm must consider the reaction of competitors who also understand the concept. Some potential pitfalls include:

- The fallacy of composition holds: if all other firms equally pursue the strategy, then none will increase market share and will suffer losses from over-capacity and low prices. The more competitors that pursue the strategy, the higher the cost of gaining a given market share and the lower the return on investment.
- Competing firms may be able to discover the leading firm's proprietary methods and replicate the cost reductions without having made the large investment to gain experience.
- New technologies may create a new experience curve. Entrants building new plants may be able to take advantage of the latest technologies that offer a cost advantage over the older plants of the leading firm.

(http://www.netmba.com/strategy/experience-curve/).

Scenario 4

Pricing Decision Scenario

You are a marketing manager of a manufacturing firm, known as L-Guys, Inc. As the company's marketing manager, you are responsible for all marketing decisions and strategies, including the pricing structure of the firm's products.

Recently your company introduced a new highly technical product, and you have been asked to set the pricing strategy for this product. You calculate the present value of the total profits expected for your firm over the next ten years.

You are aware that your main competitor, T-Guys, Inc., intends to introduce a product that is very similar to the one that your firm has just introduced. You should assume that the competitor's product is as good as yours in every way that is important to the market, and the market is the same for both products. Therefore, the pricing strategy, which you formulate for your product might take into account this competitor's decisions. You estimate the following results for each strategy:

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Outcomes	L-Guys' Low-Price Strategy	L-Guys' High-Price Strategy
For L-Guys:	$10.2 million profit 56.7% market share	$20.4 million profit 48.6% market share
For T-Guys:	? profit 43.3% market share	? profit 51.4% market share

   Note: ? = unknown, profit information on T-Guys' product are unavailable to L-Guys' executives

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You may use the information on the following page to make your decision

Scenario 4

Exhibit
Evidence on the Relationship between a Market Share and Profitability,
Market Share and Firm Survival

- Economists frown on competitor-oriented objectives (Mueller 1992). They consider the proper objective of business to be profits, not market share.

- Anterasian and Graham (1989) examined the performance of a sample of 42 businesses drawn from a federal trade commission report. There eight manufacturing industries had experienced a boom-bust cycle from 1974 to 1977. Those firms that sought stability in sales by giving up market share during the 1974 boom in their industry achieved higher profits during the subsequent downturn.

- Studies that have used a longitudinal rather than a cross sectional approach, find a negative relationship between market share and profits. Anterasian and Graham (1989) analyzed data on 42 firms in industries that had cycles; companies that lost market share during growth periods tended to be more profitable over the cycle than firms in the same industry that gained market share.

- Tschoegl and Yu (1990), in a study of the liquor market, found that a higher market share did not help in gaining further share and did not produce stability in the firm's sales.

- Montgomery and Wernerfelt (1991) examine the performance of six large U.S. Brewers from a 1969 to 1979, a period characterized by large changes in market share; using returns on stocks, they concluded (p. 958) that gains in market share were associated with "the destruction, rather than the creation, of firm value."

- In Armstrong and Collopy (1996) follow-up study using data on firm survival rate relating to the firm objectives of the 200 firms in Lancillotti (1958) study, all for profit-oriented firms survived, while four of the six competitor-oriented companies failed. Thus, competitor-oriented firms were less likely to survive (p = .07 by the Fisher Exact Test).

Scenario 4

Exhibit References

Anterasian, C., & Graham, J. L. (1989). When it's good management to sacrifice market share. *Journal of Business Research, 19*(3), 187-213

Armstrong, J., & Collopy, F. (1996). Competitor orientation: Effects of objectives and information on managerial   decisions and profitability. *Journal of Marketing Research, 33*(2), 188-199

Montgomery, C. A., & Wernerfelt, B. (1991). Sources of Superior Performance: Market Share versus Industry Effects in the U.S. Brewing Industry. *Management Science, 37*(8), 954-959

Mueller, D. C. (1992). The corporation and the economist. *International Journal of Industrial Organization, 10*(2), 147-170.

Tschoegl, A. E., & Yu, C.-M. J. (1990). Gibrat's law in marketing: The case of liquor brand sales. *International Journal of Research in Marketing, 7*(4), 249-262.

Scenario 5

Pricing Decision Scenario

You are a marketing manager of a manufacturing firm, known as L-Guys, Inc. As the company's marketing manager, you are responsible for all marketing decisions and strategies, including the pricing structure of the firm's products.
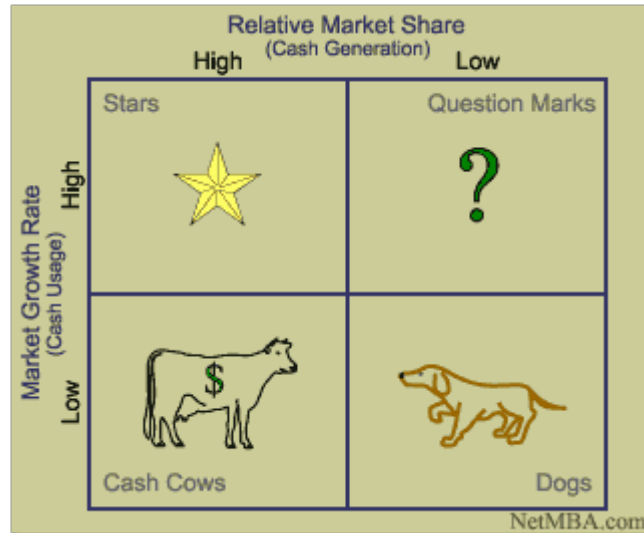
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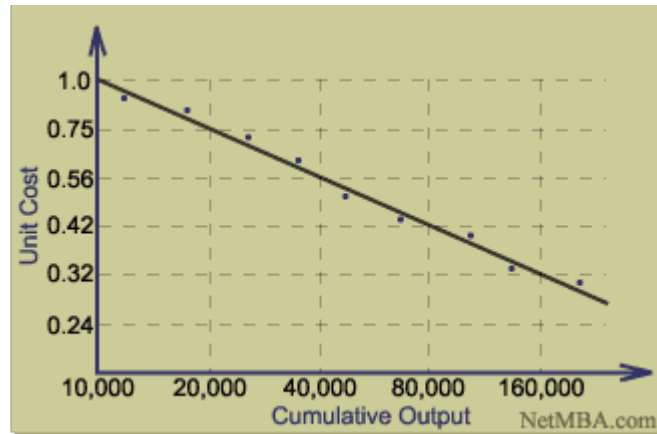Note: ? = unknown, profit information on T-Guys' product are unavailable to L-Guys' executives

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Scenario 5

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When evaluating strategies based on the experience curve, a firm must consider the reaction of competitors who also understand the concept. Some potential pitfalls include:

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Scenario 5

Exhibit C
Evidence on the Relationship between a Market Share and Profitability,
Market Share and Firm Survival

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Scenario 5

Exhibit C References

Anterasian, C., & Graham, J. L. (1989). When it's good management to sacrifice market share. *Journal of Business Research, 19*(3), 187-213

Armstrong, J., & Collopy, F. (1996). Competitor orientation: Effects of objectives and information on managerial   decisions and profitability. *Journal of Marketing Research, 33*(2), 188-199

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Scenario 6

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Expected Profits and Market Shares over Ten Years

Outcomes	L-Guys' Low-Price Strategy	L-Guys' High-Price Strategy
For L-Guys:	$10.2 million profit 56.7% market share	$20.4 million profit 48.6% market share
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Exhibit A. Boston Consulting Group (BCG) Growth Share Matrix

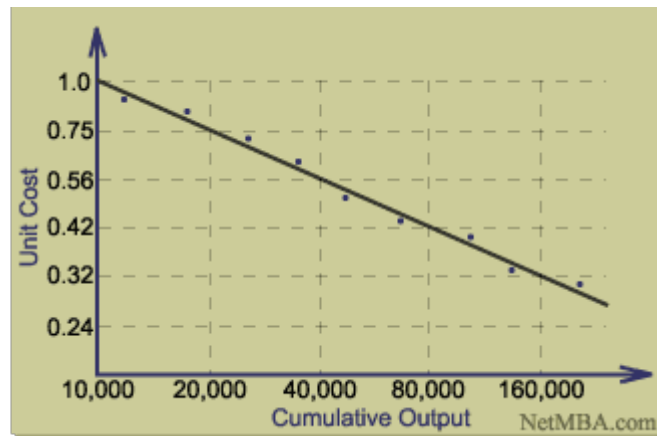BCG Growth-Share Matrix is a portfolio planning model developed by Bruce Henderson of the Boston consulting group in the early 1970's.The matrix is based on the observation that a company's business units can be classified into four categories based on combinations of market growth and market share relative to the largest competitor, hence the name "growth-share". Market growth serves as a proxy for industry attractiveness, and relative market share serves as a proxy for competitive advantage. The growth-share matrix thus maps the business unit positions within these two important determinants of profitability. This framework assumes that an increase in relative market share will result in an increase in the generation of cash. (http://www.netmba.com/strategy/matrix/bcg/)

Scenario 6

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Exhibit D. Lessons in Learning to Drop One's Tools

Learning to drop one's tools to gain lightness, agility, and wisdom tends to be forgotten in an era where leaders and followers alike are preoccupied with knowledge management, acquisitions, and acquisitiveness. Nevertheless, human potential is realized as much by what we drop as what we acquire.

At least 23 wild land firefighters have died in four separate incidents since 1990 with their tools beside them. In every case, they died within sight of safety zones that could have been reached if they had been lighter and moved faster. For example, at the South Canyon disaster outside Glenwood Springs, Colorado, 14 firefighters were killed on July 6, 1994, when they failed to outrun a fire that exploded through a stand of oak trees just below them. One firefighter, whose body was found a mere 250 feet from safety at the top of the ridge, was still wearing a backpack and still had a chainsaw in his hand.

Implications for teaching/learning excellence.

So, what does the phenomenon of "dropping one's tools" have to do with teaching/learning excellence? Let me suggest four extensions of the idea that might emulate your own thoughts about the role that dropping tools might play in the development of excellent teaching that furthers the development of human potential.

1. DROP YOUR CONFUSED COMPLEXITY: William Schultz (1979) argues that the act of understanding progresses through three stages: superficial simplicity, confused complexity, and profound simplicity. To move from superficial simplicity is to acquire many, sometimes conflicting perspectives. However, to continue moving and to move from confused complexity to simplicity is to cut through the confusion "drop" those perspectives that are redundant, useless, secondary, and contradictory. I take my lead on this from the firefighting community, which has found that their 56 firefighting rules boil down to four. Those four, summarized in the acronym, LCES, advise firefighters that they should not put themselves into a high-risk situation unless they first have lookouts, assured communication, escape routes (2), and safety zones.

2. DROP YOUR FIXATIONS: first, voice aloud an expanded symptom review. Second, voice an expanded list of what diagnoses might fit those symptoms. Third, voice a plan to eliminate diagnoses one by one. The striking finding is that when people start to vocalize this review, they stop fixating on just one possibility. In many cases, trainees come up with the correct answer in as little as 90 seconds.

3. DROP YOUR FOCUS ON DECISION-MAKING: learning to hold one's tools lightly shifts the focus from decision-making to sense making. In the words of the late Paul Gleason (personal conversation, 1996), one of the most revered wild land firefighters in the world: "If I make a decision it is a possession. I take pride in it, I tend to defend it and not listen to those who questioned. If I make sense then this is more dynamic and I listen, and I can change it. A decision is something you polish. Sense making is a direction for the next period."

4. DROP YOUR TACTICS THAT MUDDY LEARNING ABOUT DROPPING: There are at least three tactics that seem relevant if one wishes to convey the wisdom of dropping one's tools. These three include comparison, awareness, and refinement. To sensitize people to the consequences of dropping, compare performance with and without the tool. Learn how much of a difference it makes (Weick, 2007).

Scenario 6

Exhibit References

Anterasian, C., & Graham, J. L. (1989). When it's good management to sacrifice market share. *Journal of Business Research, 19*(3), 187-213

Armstrong, J., & Collopy, F. (1996). Competitor orientation: Effects of objectives and information on managerial   decisions and profitability. *Journal of Marketing Research, 33*(2), 188-199

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Tschoegl, A. E., & Yu, C.-M. J. (1990). Gibrat's law in marketing: The case of liquor brand sales. *International Journal of Research in Marketing, 7*(4), 249-262.

Weick, K. (2007). Dropping your tools: on reconfiguring management education. *Journal of Management Education, 31*(1), 5-16.

Scenario 7

Pricing Decision Scenario

You are a marketing manager of a manufacturing firm, known as L-Guys, Inc. As the company's marketing manager, you are responsible for all marketing decisions and strategies, including the pricing structure of the firm's products.

Recently your company introduced a new highly technical product. You have been asked to set the pricing strategy for this product. You calculate the present value of the total profits expected for your firm over the next ten years.

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Note: ? = unknown, profit information on T-Guys' product are unavailable to L-Guys' executives

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You may use the information on the following pages to make your decision

Scenario 7

Exhibit: Steps in Rational Decision-Making

- When facing two or more alternatives in solving a problem, transform the information on relative information available on each alternative to standard scores. For example, standard scores might range from 0.0 to 1.0.
- Weight the importance of each piece (cue) of information. For example, assume that you used a constant sum of ten points to apply to three cues. You can assign the ten points evenly or weigh the importance of one cue much more (e.g., 8) than the other two cues; you might assign each of the other two cues a value of 1 each - or weigh the importance of one cue as 2 other cue as zero.
- For each alternative, multiply each cue's standard score by the cues weight and sum across all the weighted cues.
- Select the alternative with the highest sum as your answer.

- **Example**: Jane is deciding on which of two Americans to hire as a project manager to work in her firm's headquarters in Germany: Linda or Tom. She wants to hire the best person for the job - the one that is going to perform the job to the highest level. Linda can read German, but has poor language speaking ability in the German language. Linda graduated from Cambridge University with honors in humanities. Linda's current job is a senior project manager at a small firm in Chicago. Tom is fluent in both reading and speaking German. Tom graduated from the University of Kentucky in the U. S. with a Masters in Business Administration. Tom's current job is a junior project manager in a large firm in Chicago. Jane selected the following cues to evaluating Linda and Tom (and assign the following importance weights to each cue: German language ability (2), University quality (1), relevancy of training to the job (3), job experience (4), and gender (0). (Jane prefers to hire a male but believes that gender is not relevant to the job.)

- Jane uses a 0.0 to 1.0 score to standardize her evaluations of Linda and Tom across the four cues (multiplies each score for each cue by the cues importance weight and sums).

Cue	Cue Weight	Evaluation of Linda		Evaluation of Tom	
German language ability	2	.3	[.06]	1.0	[2.0]
University quality	1	1.0	[1.0]	0.3	[0.3]
Relevancy of training to job	3	.5	[1.5]	0.7	[2.1]
Job experience	4	.8	[3.2]	0.4	[1.6]
Gender	0	.2	[0.0]	0.8	[0.0]
Sum			**[6.3]**		**[6.0]**

The sum of scores for Linda and Tom are close (6.3 versus 6.0); Linda has the highest summed score. Jane selects Linda for the job.

These steps in rational decision-making maybe applicable to the pricing strategy problem to help you in deciding which price to set.

Scenario 8

Pricing Decision Scenario

You are a marketing manager of a manufacturing firm, known as L-Guys, Inc. As the company's marketing manager, you are responsible for all marketing decisions and strategies, including the pricing structure of the firm's products.

Recently your company introduced a new highly technical product, and you have been asked to set the pricing strategy for this product. You calculate the present value of the total profits expected for your firm over the next ten years.

You are aware that your main competitor, T-Guys, Inc., intends to introduce a product that is very similar to the one that your firm has just introduced. You should assume that the competitor's product is as good as yours in every way that is important to the market, and the market is the same for both products. Therefore, the pricing strategy, which you formulate for your product might take into account this competitor's decisions. You estimate the following results for each strategy:

Expected Profits and Market Shares over Ten Years

Outcomes	L-Guys' Low-Price Strategy	L-Guys' High-Price Strategy
For L-Guys:	$10.2 million profit 56.7% market share	$20.4 million profit 48.6% market share
For T-Guys:	? profit 43.3% market share	? profit 51.4% market share

Note: ? = unknown, profit information on T-Guys' product are unavailable to L-Guys' executives

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You may use the information on the following page to make your decision

Scenario 8

Exhibit: Steps in Using the Take-the-Best Decision Rule

- Heuristics are efficient cognitive processes that ignore information. In contrast to the widely held view that less processing reduces accuracy, the study of heuristics shows that less information, computation, and time can in fact improve accuracy. Research shows that the take-the-best heuristic provides more accurate solutions in some contexts than more complex thinking processes.

- Take-the-best consists of three building blocks:

    1. Search rule: Search through cues in order of their validity.

    2. Stopping rule: Stop on finding the first cue that discriminates between the subjects (i.e., cue. values are 0.0 to 1.0)

    3. Decision rule: Infer that the object with a positive cue value (1) has a higher criterion value.

- Take-the-best is a member of the one-good-reason family of heuristics because of its stopping rule: Stop searching after finding the first cue that enables an inference to be made. Take-the-best simplifies decision-making by both stopping after the first cue and by ordering cues unconditionally by validity.

- Example: Jane is deciding on which of two Americans to hire as a project manager to work in her firm's headquarters in Germany: Linda or Tom. She wants to hire the best person for the job - the one that is going to perform the job to the highest level. Linda can read German, but has poor language speaking ability in the German language. Linda graduated from Cambridge University with honors in humanities. Linda's current job is a senior project manager at a small firm in Chicago. Tom is fluent in both reading and speaking German. Tom graduated from the University of Kentucky in the U.S. with a Masters in Business Administration. Tom's current job is as a junior project manager in a large firm in Chicago.

- Jane assigns a high cue value (1.0) to one cue only: job experience. Jane concludes that Linda has more job experience than Tom. Jane selects Linda for the project manager job in Germany.

The Take-the-Best decision Rule may be applicable to the pricing strategy decision to help you in deciding which price to select.

Scenario 9

Pricing Decision Scenario

You are a marketing manager of a manufacturing firm, known as L-Guys, Inc. As the company's marketing manager, you are responsible for all marketing decisions and strategies, including the pricing structure of the firm's products.

Recently your company introduced a new highly technical product, and you have been asked to set the pricing strategy for this product. You calculate the present value of the total profits expected for your firm over the next ten years.

You are aware that your main competitor, T-Guys, Inc., intends to introduce a product that is very similar to the one that your firm has just introduced. You should assume that the competitor's product is as good as yours in every way that is important to the market, and the market is the same for both products. Therefore, the pricing strategy, which you formulate for your product might take into account this competitor's decisions. You estimate the following results for each strategy:

	Expected Profits and Market Shares over Ten Years	
Outcomes	L-Guys' Low-Price Strategy	L-Guys' High-Price Strategy
For L-Guys:	$10.2 million profit 49.1% market share	$20.4 million profit 48.6% market share
For T-Guys:	? profit 50.9% market share	? profit 51.4% market share

Note: **?**= unknown, profit information on T-Guys' product are unavailable to L-Guys' executives

You may use the information on the following page to make your decision

Scenario 9

Exhibit. Information on Setting Price

- One of the most difficult, yet important, issues you must decide as an entrepreneur is how much to charge for your product or service. While there is no one single right way to determine your pricing strategy, fortunately there are guidelines that will help you with your decision. Here are some of the factors that you might consider.

- **Positioning**-How do you positioning your product in the market? Is pricing going to be a key part of that positioning? If you are running a discount store, you are always going to be trying to keep your prices as low as possible as (or at least lower than your competitors). On the other hand, if you're positioning your product as an exclusive luxury product, a price that's too low may actually hurt your image. The pricing has to be consistent with the positioning. People really do hold strongly to the idea that you get what you pay for.

- **Demand curves** -How will your pricing affect demand? You're going to have to do some good basic market research to find this out, even if it's informal. Get 10 people to answer a simple questionnaire, asking them, "Would you buy this product/service at X price? Y price?" For a larger venture, you'll want to do something more formal, of course -- perhaps hire a market research firm. But even a sole practitioner can chart a basic curve that says that at X price, X' percentage will buy, at Y price, Y' will buy, and at Z price, Z' will buy.

- **Cost** - Calculate the fixed and variable costs associated with your product or service. How much is the "cost of goods", i.e., a cost associated with each item sold or service delivered, and how much is "fixed overhead", that is, it doesn't change unless your company changes dramatically in size? Remember that your gross margin (price minus cost of goods) has to amply cover your fixed overhead in order for you to turn a profit. Many entrepreneurs under-estimate this and it gets them into trouble.

Environmental factors - Are there any legal or other constraints on pricing? For example, in some cities, towing fees from auto accidents are set at a fixed price by law. Doctors, insurance companies and Medicare will only reimburse a certain price. What possible actions might your competitors take? Will too low a price from you trigger a price war? Find out what extra factors may affect your pricing. (Allen, 2010)

Exhibit Reference

Allen, S. (2010). How much should you charge for your product or service?   Retrieved from http://entrepreneurs.about.com/od/salesmarketing/a/pricingstrategy.htm

Scenario 10

Pricing Decision Scenario

You are a marketing manager of a manufacturing firm, known as L-Guys, Inc. As the company's marketing manager, you are responsible for all marketing decisions and strategies, including the pricing structure of the firm's products.

Recently your company introduced a new highly technical product, and you have been asked to set the pricing strategy for this product. You calculate the present value of the total profits expected for your firm over the next ten years. You estimate the following results for each strategy:

	L-Guys' Low-Price Strategy	L-Guys' High-Price Strategy
Expected Profits and Market Shares over Ten Years		
Outcomes	$10.2 million profit 49.1% market share	$20.4 million profit 48.6% market share

Appendix D: Keyword Definitions

Definitions adopted by researchers are rarely uniform. These definitions

establish the positions taken in this thesis:

competence -- herein we take Simon's (1956) focus on environmental suitability or

environmental adaptation as a key attribute for competent managerial decision-making.

environment of dynamic complexity--in the context of organizational decision-

making, manifested in relationships and processes by:

    a. interruption (Weick, 2006);

    b. social entropy, drawing upon the second law of

        thermodynamics, resulting in disequilibrium (Bailey, 1990);

    c. muddling as coined by Lindblom's (1959);

    d. incrementalism as researched by Quinn (1980);

    e. paradox as reported by Collins and Porras (2002), and Handy

        (1994);

    f. situations where cause and effect are subtle, and where the

        effects over time are not obvious, as discussed by Senge

        (1990, .p 71).

equifinality -- in an open system, an effect may be brought about by a variety of causes,

some necessary and, or sufficient (Goertz & Mahoney, 2005).

heuristics -- efficient cognitive processes that ignore some information or cues that may

or may not be effective depending on their appropriateness to a given context.

Heuristics reduce effort. They are not guidelines for reaching a goal, unless viewed as

reducing effort compared to an optimisation model. They are non-deterministic in that they do not indicate causality. Heuristics reside within the typology of metaphors (Gigerenzer & Brighton, 2009).

method -- research technique or tool used to gather data (Bailey, 1982, pg. 32).

methodology -- the philosophy of the research process. This includes the assumptions and values that serve as a rationale for research and the standards of criteria the researcher uses for interpreting data and reaching conclusions (Bailey, 1982, pg. 32).

non-deterministic metaphor -- according to The Oxford English Dictionary (Simpson & Weiner, 1989, p. 676), a metaphor is "the figure of speech in which a name or descriptive term is transferred to some object different from, but analogous to, that to which it is properly applicable" (e.g., "my French has gone a bit rusty"). Metaphors involve the transfer of information from a relatively familiar domain (variously referred to as source or base domain, or vehicle) to a new and relatively unknown domain (usually referred to as target domain or topic) (Johnson-Laird, 1989; Ortony, 1975; Vosniadou & Ortony, 1989). In the previous example, there is a transfer of information from the more known behaviour of metals (i.e., the source domain) to the less known phenomenon of retention of linguistic knowledge i.e., the target domain (Tsoukas, 1991, p. 568). The non-deterministic nature of metaphor results from its inability to indicate causality.

sensemaking -- order, interruption, recovery. That is sensemaking in a nutshell. And organizing is the act of trying to hold things together by such means as text and conversation, justification, faith, mutual effort (heedful interrelating), transactive

memory, resilience, vocabulary, and by seeing what we say in order to assign it to familiar categories (Weick, 2006, p. 1731).Sensemaking includes both explicit and implicit mental processes of constructing, framing, creating, and rendering a view e.g., an executive's mental model of how things get done in an organization. Related to decision-making, sensemaking includes automatic and controlled scanning of memory and environments for framing issues. Sensemaking is meaning creation based on current and prior interpretations of thoughts generated from three sources: external stimuli, focused retrieval from internal memory, and seemingly random foci in working memory; such sensemaking is constructed on cultural pilings held unconsciously in long-term memory. Consequently, meta-sense-making efforts are always incomplete; that is, all of us possess an incomplete ability to understand the process and outcomes of our own sensemaking (Woodside, 2001, p. 415).

strategy -- a mental tapestry of changing intentions for harmonizing and focusing our efforts; a basis for realizing some aim or purpose in an unfolding and often unforeseen world of many bewildering events and many contending interests (Boyd, 2007).

tool-dropping -- in the context of sensemaking; consider the tools of traditional logic and rationality. These tools presume that the world is stable, knowable, and predictable. To set aside those tools is not to give up on finding a workable way to keep moving - it is only to give up one means of direction finding that is ill suited to the unstable, the unknowable, and the unpredictable. To drop the tools of rationality is to gain access to lightness in the form of intuitions, feelings, stories, improvisation, experience, imagination, active listening, and awareness in the moment, novel words, and empathy. All of these illogical activities enable people to solve problems and enact their potential (Weick, 2007).

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