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Incompetency and Competency Training

Improving Executive Skills in Sensemaking, Framing Issues, and Making Choices

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This book is dedicated to Canada, Denmark, and Finland for the nations' frequently exercised cultural tolerance, avoidance of hubris, and competency in decision-making and acuteness in identifying and nonacceptance of incompetency training relating to issues in education, nuclear energy, weapons (guns), health care, religion, gender, and international affairs (e.g., calls to war in Vietnam, Iraq, and Syria).

Preface

This book covers the theory and practice of competency and incompetency training. Incompetency training includes the work of convicted investment confidence men (e.g., Bernie Madoff), President George W. Bush's messages about Iraqi weapons of mass destruction, most work of grief counselors, and product portfolio tools in MBA degree programs. The book provides substantial evidence that incompetency training is pervasive and effective. "Incompetency training" includes formal and informal instruction that consciously (purposively) or unconsciously imparts knowledge, attitudes, beliefs, and behavior (including procedures) that are useless, inaccurate, misleading, and/or will lower performance outcomes of the trainee versus no training or training using alternative training methods. "Imparts" in the definition refers to exposing a trainee to incompetency training; such exposure is not a guarantee that the training increases the trainee's incompetence. This book offers an early workbench model of incompetency training theory. The theory includes the proposition that executives and associates in firms, academia, and government organizations consciously as well as unknowingly offer incompetency training in many contexts. Increasing trainees' vigilance and ability to recognize exposure to incompetency training may help trainees to decrease the effectiveness (impact) of exposures to incompetency training—advancing incompetency training theory and knowledge of incompetency training practice may be necessary conditions for remedying negative outcomes that follow from trainees receiving such training. Available evidence supports the first proposition and, to a limited extent, the second proposition. The book includes a series of laboratory experiments on tools advocated in the literature as aids in increasing incompetency and/or competency. Reading this book provides a comprehensive review of the literature on (in) competency training.

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Foundations for Theory and Practice of Competence and Incompetence Training

An unfortunate proposition, confirmed by many research studies, is that human decision-making in general and management sense- and decision-making in particular, is imperfect (Kerr, MacCoun, & Kramer, 1996; Marewski, Gaissmaier, & Gigerenzer, 2010; Simon, 1960). In addition, several scholars in management claim that educational methods using different management paradigms serve to increase incompetency in thinking and deciding by executives (Armstrong & Brodie, 1994; Armstrong & Collopy, 1996; Armstrong & Green, 2007a). Businesses cannot afford to employ highly educated, highly-paid graduate managers who lack the competence to manage and lead their enterprises. Woodside (2012, p. 280) underlines this problem, "Training that results in inconsequential outcomes can represent substantial opportunity costs." For MBA degree-granting schools of management to remain relevant to management practice, they need to respond to employer demands to produce graduates with the ability to use relevant management knowledge and make competent decisions. Given the complexity of the market place and the demands from employers to deliver graduate managers who are able to deal with inherent complexities in real-life contexts, educationalists continually re-engineer curricula. This perspective is the foundation for the key questions this book examines.

This chapter introduces the reader to substantive background information about decision competence and incompetence training and the current state of knowledge regarding developing decision competence and decision incompetence. The next section outlines the research questions and key concepts. This introduction chapter concludes with the contributions of this book to the body of knowledge on competency and incompetency training.

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1.1 The Complexity of Competent Decision-Making

Dyer, Fishburn, Steuer, Wallenius, and Zionts (1992, p. 11) state, "Many real-world problems are so complex that one cannot reasonably expect to find an exact optimal solution." Thus, the first question that comes to mind is whether trainers can move learners to a level of high competency, and reduce incompetence and ineffective decision-making through andragogy. If it is possible, as Mintzberg (2004) and Boyatzis, Stubbs, and Taylor (2002) claim, what are the most effective ways to provide such education? Or more precisely, which andragogical methods or combination of methods are most effective in developing decision- and sense-making competencies? Second, are the theories, models and concepts taught incorrect, or is it the way in which these theories and tools are taught that cause MBAs and executives to apply these tools within inappropriate contexts? Finally, does some training to increase knowledge and decision competency actually result in incompetent decisions or actions? If so, are there other ways to prepare managers for their future roles? Is there training that will reduce this tendency for incompetency and improve the sense-making and decision-making of future executives? Which andragogical methods are most effective in developing decision- and sense-making competencies and reducing decision incompetency? Possibly surprising, scientific testing of the efficacy of change strategies to improve the effectiveness of executives' decisions—using treatment and control groups and random assignment of subjects to groups—is relatively rare. Exceptions to this conclusion are available (Armstrong & Collopy, 1996; Spanier, 2011; Wilson, 2011).

In addition to these questions, the study considers the following question. If necessary, how should management educators re-engineer the MBA curricula for the fast changing, global, and highly complex business environment in order to prepare future managers for their unknowable, unpredictable future? The next section introduces the problem; discusses the key concepts and leads into the methods used to address the problems, then presents a rationale for the use of these particular methods.

1.2 The Problem and Its Current Status

1.2.1 Evidence from the Real World

Educationalists and behavioral psychologists have intense interest in decision-making and sense-making competencies (Schank, 1994; Todd & Gigerenzer, 2007; Weick, 1995). After reviewing a substantial number of studies, a shocking theme emerges. Scholars doing rigorous research find that trainers (e.g. coaches, executive trainers, educationalists, and development officers) may be using tools or providing training—knowingly or unknowingly—that nurtures incompetence in most contexts (Armstrong & Collopy, 1996; Armstrong & Green, 2007a; Capon,

Farley, & Hulbert, 1987; Morrison & Wensley, 1991; Wilson, 2011; Woodside, 2012). Several examples of interventions that are less than effective—in some cases inadvertently causing increased crime rates, increased teen pregnancies, psychological distress and hastened people's deaths—are provided by Wilson's (2011, p. 4) in his book, *Redirect*. A telling example is the ineffective use of "Critical Incident Stress Debriefing" (CISD)—a set of psychological debriefing techniques—to prevent post-traumatic stress disorder in emergency workers who have been exposed to traumatic events. In 2003, psychologist McNally (cited in, Wilson, 2011, p. 6) recommends to "cease compulsory debriefing of trauma-exposed people." This drastic suggestion follows research comparing CISD with writing down thoughts and emotions (well after the event and in private), and found the latter more effective than the CISD. Not only did the results indicate that CISD is ineffective, but they also indicated that CISD treatment *caused* psychological problems. The generally accepted solution of offering the services of a well trained professional does more harm than good. Hundreds of fire and police departments that use CISD are wrong in assuming that "Offering people the services of trained professionals is better than asking them to sit and write by themselves" (Wilson, 2011, p. 5).

Woodside (2012, p. 280) defines this type of activity as "Incompetency training" that includes formal and informal instruction that consciously (purposively by the trainer) or unconsciously (unknowingly by the trainer) imparts knowledge, attitudes, beliefs, and behavior (including behavioral protocols) that are useless, inaccurate, misleading, and lower performance outcomes of the trainee versus no training or training using alternative training methods. This principal example and Woodside's definition quite naturally leads to questioning other formal training methods' and tools' effectiveness.

1.2.2 The Problem in Business Schools

Armstrong and Collopy (1996) and Armstrong and Green (2007b) report that substantial numbers of executives make ineffective decisions, based on frameworks, models, and concepts in textbooks and that these ill-selected strategies result in less profitable organizations and some companies' demise. Their empirical study shows that incompetent decisions increase in frequency with increased levels of strategic planning education. These findings of empirical studies, as well as the proliferation of examples in popular literature on incompetent business decisions, inform the primary concerns of the present study. Do business schools teach future managers to be incompetent decision-makers? Are the theories, models and concepts taught incorrect, or is it the way in which these theories and tools are taught that cause MBAs and executives to often apply these tools within inappropriate contexts? If so, are there other ways to prepare managers for their future roles and training that will reduce this tendency for incompetency, and improve the sense making and decision-making of future executives? There is clear evidence in the business environment that executives are less than competent frequently and make

ineffective decisions frequently. The popular business literature describes numerous examples of less than competent decisions. The evidence includes low impact cases such as the thousands of start-up small business enterprises failing annually (Campbell, 2005) to Air New Zealand's Ansett purchase and the resulting collapse of Ansett (Gottliebsen, 2003); to the Enron disaster with the resulting global financial crisis (Dickerson & Duffy, 2002).

Boyatzis et al. (2002, p. 151) investigate the question, "Can MBA and participants in executive education develop competencies related to outstanding managerial and leader performance?" Their literature review (Boyatzis et al., 2002) support the findings by Pfeffer and Fong (2002) and report on business schools' effectiveness in improving some competencies (goal-setting, self-confidence, information analysis, theory building and pattern recognition), while other skills remain unaffected or even decrease (persuasiveness, developing others, planning self-control, initiative and systems-thinking). Their empirical study concludes, "An MBA education can help people develop cognitive and emotional intelligence competencies needed to be outstanding managers and leaders. But we cannot use the typical lecture-discussion methods with their focus on knowledge acquisition" (Boyatzis et al., 2002, p. 160). One of the self-confessed design short-comings of this research project is the lack of clarity regarding which components of the MBA program are attributable to improving the three components of self-management, relationship management, and cognitive development. In line with Boyatzis et al. (2002) final suggestion, the present study investigates the impact of different pedagogical approaches to determine which educational method could be attributed with improving the cognitive development of MBA and executive students, as well as other competencies needed to make effective decisions within complex business environments.

Despite the criticisms and the evidence from the real-world that highly educated managers and executives still make incompetent decisions frequently following their graduations from top-ranked business schools, more MBAs enroll world-wide every year and employers continue to recruit MBAs for high-level positions (Simpson, 1987). The impacts of business schools' influence on the decisions middle and senior managers make will likely continue.

1.2.3 Central Philosophies

MBA schools are continually challenged to integrate and balance the need for technical competencies (such as auditing procedures, analyzing financial reports, designing recruitment procedures, streamlining the supply chain and segmenting the market to launch a new product) with the ever-growing demand for general soft skills (such as oral communication skills, networking, teamwork and problem solving skills, dealing with diverse cultures and skills levels, negotiating contracts and managing motivational levels). A delicate and skilled balancing act is required to deliver the requisite competencies to graduates through management

development and learning. The intention for the study here is not to add additional criticism to the body of literature on MBA programs but rather to investigate the effectiveness of some instructional methods in delivering decision competencies—and to aid educationalists in their pursuit of delivering managers with the requisite high competencies.

Regarding the concepts of teaching and learning, although suggesting only a small shift in the focus of teaching and learning, this slight shift is a key element in the philosophy of this study. Rather than to investigate and develop answers to the question, what do business schools need to teach in pursuit of management schools' charge to deliver the essential competencies required to manage and lead in the complex global business environment, this study responds to the questions, what and how do students need to learn? Not only does this central philosophy focus on the outcome for MBA students, but it also circumvents the controversial issues related to whose responsibility learning is, the teacher's or the learner's? These philosophical issues are well beyond the scope of this study. This research therefore subscribes to the student-centered experientialist orientation, and supports the notion that learning is a process of co-creation of knowledge, skills and attributes, where the student participates fully in the process and is not merely a recipient of pre-designed development programmes. Effective learning takes place when participants' skills, knowledge and beliefs are challenged (Keys & Wolfe, 1988).

This study does not attempt to investigate how important these cognitive skills rank in relation to other soft skills. The study does not attempt to examine whether a consensus occurs among diverse business schools and their various MBA programmes about the need to deliver sense- and decision-making skills. Further, no attempt is made to find support for claims that certain models or theories are incorrect or unacceptable. This study is based on twin hypotheses that it is important for future business leaders; and not all theories, concepts and models are valid, correct or useful, but theorists will keep on refining those that are not and research-based teaching will encourage relevance and rigor in curricula.

1.2.4 Masters in Business Administration (MBA)

Simon (1947, p. 1) informs, "Administration is the art of getting things done." Although he purports that all practical activities involves both deciding and doing, "It has not commonly been recognized that a theory of administration should be concerned with the processes of decision as well as with the processes of action." He continues by highlighting the need for administration theory to "include principles of the organization that will insure correct decision-making just as it must include principles that will insure effective action." According to Simon (1947), all social or professional actions involve intentional or unintentional decisions of what to act upon and what to relinquish.

In some cases this selection process is instinctive or habitual (as when driving a car or touch-typing a letter) (Schank, 1995). For other selections the process consists of a complex web of inter-linked choices and decisions, often based on extensive analysis, planning, design and implementation decisions (e.g., when marketing managers design a new marketing campaign to reactivate dormant clients, when managers select a venue to hold a sales conference, or when managers have to reprimand project teams for non-conformance. The list is endless.). Simon lists two common characteristics of the chain of decisions people make, firstly that at any moment there a multitude of alternative possible actions and secondly people narrow down the possible alternatives to the one which is acted out by some process of elimination or choice (Simon, 1976, p. 4). Simon hastens to add that the words 'choice' and 'decision' can be used interchangeably, but these words when used to describe the selection process do not necessarily include the common connotations of deliberate, rational of self-conscious thought.

1.3 Making the Cut

This study tests theoretical propositions by Brighton and Gingerenzer (2008), Gigerenzer and Brighton (2009) and Weick (1995, 2007) for increasing sense- and decision-making competencies of managers within contexts highly relevant to the firm.

1.3.1 Contextual or Ecological Rationality

Simon (1976) states that all decisions have three key limitations in common. They are grounded in incomplete information (bounded rationality), human decision-makers have limited alternative generation abilities, and human decision-makers have limited insight into the future consequences of the alternatives under consideration. Simon argues that decisions and cognitive strategies can only be judged as rational or irrational and optimal within the confines of their context (Simon, 1956, 1990). According to Simon, the internal cognitive capacities and the external environment that surrounds our rationality are closely linked. "Human rational behavior . . . is shaped by a scissors whose two blades are the structure of the task environments and the computational capabilities of the actor (Simon, 1990, p. 7). This analogy is an important representation of what it might take for management graduates to "make the cut." While external environmental factors may be immutable for the decision-maker, the internal cognitive capacity of the actor—here graduate managers—may be shaped by educational development or evolution (Todd, 2001; Todd & Gigerenzer, 2003). Educationalists expect, as part of the outcome when developing effective decision-makers, the development of students' ecological rationality (Todd & Gigerenzer, 2000, 2003, 2007). That entails students with the ability to make "good decisions with mental mechanisms whose internal

structure can exploit the external information structures available in the environment" (Todd & Gigerenzer, 2003, p. 144).

1.3.2 Fast and Frugal Heuristics

Gigerenzer and Murray (1987) propose fast and frugal alternatives to the complicated, time-consuming, and often defective probabilistic view of human decision-making. Early probability models of human thinking—where humans attempt to find optimal solutions—was popularized by George Boole (1854–1958) (quoted in Gigerenzer, 2008) In contrast, heuristics are fast and frugal cognition models (Gigerenzer, 2004). Heuristic cognition models focus on situations in which people need to act fast (rarely not of concern for logical models of the mind), the probabilities or utilities are unknown, and multiple goals and ill-defined problems prevent logic or probability theory from finding the optimal solution. In the real world, decision-makers must arrive at their choice using realistic amounts of time, information and computational resources (Gigerenzer & Todd, 1999). This study builds from the propositions of Gigerenzer and colleagues, "Human reasoning and decision making can be modeled by fast and frugal heuristics that make inferences with limited time and knowledge. Heuristics that are matched to particular environments allow agents to be ecologically rational, making adaptive decisions that combine accuracy with speed and frugality" (Todd & Gigerenzer, 2003, p. 148).

1.3.3 When Less Is More

Experimental evidence shows that experts use surprisingly little information in forming their judgments (Shanteau, 1992). In laboratory situations, people have been shown to use a single piece of information to make a choice, despite the availability of other pieces of information (Goldstein & Gigerenzer, 1999, 2002). In real life (as in the MBA assessments and my experimental laboratory) managers must select alternative courses of action despite an absence of the information necessary to complete rational decisions.

Even more surprisingly, some studies report on the effectiveness of simple decision algorithms (heuristics) that rely on a total lack of knowledge to make appropriate decisions (Todd & Gigerenzer, 2003, p. 149). Gigerenzer (2008, p. 21) clarifies the misconception that more information and more extensive computation is always better and paradoxically states that "good decisions in an uncertain world require ignoring part of the available information" (Gigerenzer, 2008, p. 22). Past information that is used to assist in prediction might be drowned by irrelevant information and the more complex the issue, the more likely it becomes that noise will need to be ignored to determine relevant and robust information. Having

insight into which data are relevant and which should be ignored is part of the decision-making problem, and the more complex the issue and the context, the more enabling forgetting and ignoring information may be (Gigerenzer & Brighton, 2009b; Marewski et al., 2010; Schooler & Hertwig, 2005). Klein, Moon, and Hoffman (2006) refute the myth that more information makes for better decisions. Their study also provides empirical support for the hypothesis that more information does not necessarily lead to better decisions, but it does affect confidence. Unfortunately, an increase in people's confidence is not balanced by increased correctness or improved performance. People are overconfident, despite their empirically evident incompetence (Omodei, 2005; Oscamp, 1965).

Very often organizational crises cause managers to stumble, and these crises often threaten their personal mental and cognitive stability as well as the stability—or possibly the survival—of the business. People are reluctant to adapt and the more intense the threat or risk, the less willing decision-makers are to drop what they know. "Dropping ones tools is a proxy for unlearning, for adapting, for flexibility" (Weick, 1995, p. 301). Weick (1988, p. 308) states, "It is our contention that actions devoted to sense making play a central role in the genesis of crises and therefore need to be understood if we are to manage and prevent crises."

1.3.4 Blink Before You Decide

Many studies report on the role of intuition, common sense, life experience, gut feelings, snap judgments and smart guesses in qualifying decisions (Gigerenzer, 2007, 2008; Gladwell, 2005; Goleman, 1998; Goleman, Boyatzis, & McKee, 2002; Simon, 1987; Wilson, 2002, 2011). These non-factual decision drivers do not absolve managers of the need to carefully research relevant information and knowledge, but practiced managers will easily admit that knowledge and evidence are often used merely as additional weapons to support decisions and already-made conclusions to people in authority and subordinates. It is important though, not to credit the intuitional faculties of managers with more legitimacy than seems merited. Gigerenzer (2007, p. 23) defines intuition as, "a judgment that is fast in consciousness, whose underlying mechanism is unconscious, yet is nevertheless strong enough to act upon." Goldstein and Gigerenzer highlight the need for careful research by concluding that "intuition alone sometimes can lead people to make bad decisions. Intuition works best, it seems, when a gut sense can be used to build on other kinds of data" (Goldstein & Gigerenzer, 2002, p. 43).

In an empirical study of 60 successful business entrepreneurs in California, the vast majority of respondents attest to weighing available information by referring to their intuitive feelings (Schooler & Hertwig, 2005). They report that even if the data seem to indicate one response and their "gut feel" indicated another, they would proceed with great caution or resist proceeding at all. Goldstein and Gigerenzer (2002) cite a simulation where volunteers attempt to predict the weather based on meteorological data and the role of experience and intuition in decision outcomes. According to their study, the data and mathematical probabilistic functions were so

complex that analytical reasoning was useless. But despite this complexity, volunteers improved their predictions after 50 trials to correct guesses about 70 % of the time, demonstrating the cumulative learning humans acquire through ongoing experience and trial and error. "The brain constantly registers decision rules about what works and what doesn't" (Goldstein & Gigerenzer, 2002, p. 43). "Every day that a leader spends in a given business or career, his [sic] brain automatically extracts the decision rules that underlie one turn of events or another, or the operating cause-effect sequences. This wisdom increases throughout a leader's career, even as the abilities to pick up new technical skills may wane" . . ."Gut feeling, in fact, has gained new scientific respect because of recent discoveries about implicit learning—that is, the lessons we pick up without being aware that we're learning them (Goldstein & Gigerenzer, 2002, p. 44). Goleman et al. (2002) later point out that it is important for managers to develop the emotional intelligence skills and attunement needed to receive the messages from their intuition.

Simon's bounded rationality theory stresses that human rationality is constrained by both internal (cognitive) and external (environmental) limitations (Todd & Gigerenzer, 2003). It is clear that—in addition to the organization's objectives and the internally available information and knowledge—the manager's own decisional premises play an important role in the synthesis of the completed decision. In some part the organization can influence this internal premise of the manager through organizational values and culture, loyalty and the employee's identifications with these, but not in full. This is because internal decision drivers may be independent of or only minimally influence by outside influence, also labeled in the literature as internal locus of control (Rotter, 1966). Research studies highlight significant individual differences in decision-making behavior. These differences are influenced by emotions, internal versus external locus of control (LC), cognitive moral development (CMD), principled moral reasoning capacity, economic value orientations; political value orientations and Machiavellianism (Gigerenzer, 2007; Hegarthy & Simms, 1978; Penn & Collier, 1985; Trevino & Youngblood, 1990). The present study does not include any attempts to assess the impact of internal identifications on the decision-making process or effectiveness.

1.3.5 The Effects of Other People on Decision Competence

Conventional wisdom includes the perspective that groups make better decisions than individuals because of their ability to accumulate information and build a large reservoir of relevant knowledge (Baron & Kerr, 2003; Forsyth, 2006). Scholars attribute improved outcomes to decision-makers ability to deal with more information and increase opportunities to deliberate correct and incorrect reasoning, factual statements, point out other group members' errors and reduce other limitations such as bias and personal preferences (Hilmer & Dennis, 2000; Schulz-Hardt, Frey, Luthgens, & Moscovici, 2000; Shaw, 1981; Stasser & Titus, 1985; Zimbardo,

Butler, & Wolfe, 2003). Other scholars, considering real-world settings, point out that pooling of individual perceptions and knowledge may only explain improved group decision competency in part (Michaelsen, Watson, Schwartzkopf, & Black, 1992). Empirical studies uncover other factors which may explain improved decision quality related to inter-personal feedback, diagnostic review and the concomitant improved meta-knowledge due to other people's critiques (Chalos & Pickard, 1985; Einhorn, Hogarth, & Klempner, 1977; Heath & Gonzalez, 1995; Kerr et al., 1996). Not all scholars agree that group decision-making improves the quality of the decisions.

The literature on group decision-making suggests that individual and collective decisions not only differ, but can be more or less effective, based on a number of cognitive, social, and contextual influences. An empirical study by Chalos and Pickard (1985), reveals significant differences in decision performance results between committee or group decisions and individuals. Explanatory factors highlighted by their study are "quality of information selection, cue weighting, and judgment consistency" (Chalos & Pickard, 1985, p. 635). Scholars in the areas of social cognition and social psychology provide evidence that groups do not always outperform individuals. Although interaction is likely to improve decision confidence, it does not necessarily improve decision quality (Heath & Gonzalez, 1995). The reasons proffered are, groupthink (a dysfunctional pattern of thought and interaction during group decision making, which is characterized by an overestimation of the group), closed-mindedness, pressures toward uniformity, and biased information search (where "group homogeneity" for a preferred alternative result in a predominantly biased search for information supporting the group view) and underestimation of risk (Janis, 1982; Kerr et al., 1996; Schulz-Hardt et al., 2000). In some cases group decision-making procedures do not only affect the (in)accuracy of decision making, but may also result in lower satisfaction of the participants, especially when dissenting minority groups or individuals feel groups fail to consider their opinions or group processes debilitate their capacity to raise alternatives for consideration (Ilgen, Hollenbeck, Johnson, & Jundt, 2005; Park & DeShon, 2010; Parker, 1993).

1.3.6 The Impact of Overconfidence and Blocking Dissent

"Decision confidence" is defined as the feeling of having made the correct or incorrect decision (Insabato, Pannunzi, Rolls, & Deco, 2010; Jonsson, Olsson, & Olsson, 2005). In a series of articles, Dunning and Kruger (1999, 2003) demonstrate that subjects in the lowest scoring quartile are not capable of judging their own level of incompetence and consistently over-estimate their capabilities in a wide range of tasks, including logical reasoning. Research by Hodges, Regehr, and Martin (2001) confirms these results and also illustrates that, despite exposure to the performance of others, lower tertile and quartile performers' assessment of their competency remain unchanged. In contrast to the under-achievers, research subjects with the

highest scores under-estimate their abilities, but are able to adjust their assessments after exposure to the performance of co-performers. The phrase "overconfidence in incompetence" is used to describe this phenomenon (Dunning, Johnson, Ehrlinger, & Kurger, 2003; Dunning & Kruger, 1999). Obvious dangers exist to this inability to recognize one's own incompetence. Some dangers identified in the literature are, inflated ideas of self-importance, mindless action, limited deliberation or before deciding, infrequent updating of both mental models and current hunches, limited research into alternatives or risk analysis resulting in poor quality assumptions and irrational recommendations (Brafman & Brafman, 2008; Dunning & Kruger, 1999; Nemeth, Brown, & Rogers, 2001; Weick, 2010). Over-confidence may also result in under-performance due to over-reliance on "intuition" which may reduce managers' willingness to engage in consultation and information gathering activities, or when they do, they consider their own opinion as superior, thus rejecting the cautionary input from others. An example of over-reliance on one person's decision-making competence, resulting in hundreds of untimely deaths, is the deadliest crash in airport history—the Tenerife airport disaster (Brafman & Brafman, 2008, p. 78). On 27 March 1977, Captain Van Zanten, a KLM pilot, started the procedure to take-off. The co-pilot starts dissent but is rebuffed. Without the voice of the blocker—the devil's advocate providing cautionary input—a deadly sequence of events unfolds, killing 583 people. There are numerous examples of highly experienced people and highly educated graduates in senior positions making incompetent and irrational decisions with serious repercussions, such as hundreds of dollars in losses (e.g. Enron) or worse, loss of hundreds of lives (Brafman & Brafman, 2008; Trevino & Youngblood, 1990; Weick, 1988, 1990, 2010).

Deliberate conflict or appropriate dissent can improve decision quality (Janis & Mann, 1977; Schwenk, 1988). In a series of articles, educationalist Schwenk (1984, 1988, 1990) suggests devil's advocacy to stimulate constructive conflict. Schwenk (1990) reports on the contradictory results of 16 different studies on the worth of devil's advocate dissent and recommends future research.

1.4 Method

The present study includes an in depth review of incompetency training and a series of laboratory experiments to examine the efficacies of alternative management training methods and tools, designed either to increase executives' competency or incompetency in decision-making. The study probes several propositions relating to the educational merit and impact of four teaching methods: goal-based learning; individual versus group interactive decision-making procedures; role-play or simulated interaction (SI); appropriate assertiveness through devil's advocate dissent.

The laboratory experiments investigate decision (in)competency, working with a total of 150 participants who receive four in-basket problems to investigate, analyze, and to complete case-based scenarios. Participants complete decision

exercises on four pre-tested business scenarios. The exercises range from low- to high-level cognitive decisions and cover a wide range of managerial topics. In part, implementing the study involved testing the propositions with a total of 150 respondents, with pre-test and post-test scenario and control-group design. The research design requires a total of 150 participants in order to achieve a reasonable number of units (statistical power) through the application of fuzzy set quantitative content analysis (fsQCA).

The research design has several major benefits. First, the design substantially extends the research of Weick and colleagues, Gigerenzer and Brighton, and Green and Armstrong (Gigerenzer & Brighton, 2009b; Green, 2002, 2005, 2010; Green & Armstrong, 2009; Weick, Sutcliffe, & Obstfeld, 2005) relating to training methodologies and alternative management development pedagogies to affect managerial competency or incompetency. Second, the study contributes to the body of knowledge and responds to the demand for rigorous, objective and compelling research made in the extant literature in the field of simulations and gaming (Anderson & Lawton, 2009; Feinstein & Cannon, 2002; Feldman & Lankau, 2005; Gosen & Washbush, 2004). Gosen and Washbush (2004, p. 286) report that, based on Bloom's taxonomy of learning and rigorous research design standard, "There have not been enough high quality studies to allow us to conclude players learn by participation in simulations or experiential exercises." Third, the high level of control over the experimental environment and the treatment variables offered by experimental laboratory research is of great value (Campbell & Stanley, 1963).

Managerial development is a continual series of experiential learning interventions and this study mirrors managers' progressions in real business contexts, thus ensuring high face validity (Hsu, 1989; Schippmann, Prien, & Katz, 1990). The ability to hold all other variables constant, whilst administering the treatment, is of extreme value to this study, hence the choice of laboratory experiments within the MBA context (Burns & Burns, 2008; Campbell & Stanley, 1963).

1.5 This Study's Implications

The findings extend the theories relating to management competency development and education in sense- and decision-making. Outcomes include advances in guidelines regarding new or improved tools to prevent graduate and practicing managers from thinking and making incompetent choices or decisions, and reductions in their inability to drop their tools and previously acquired knowledge—should the circumstances favor doing so. This study contributes to the body of knowledge regarding organizational knowledge, organizational learning, management development and experiential learning. A further contribution, of particular use to management practitioners and human resource recruitment and development specialists, is the value of the tested in-basket cases for use in management competency assessment and senior management selection.

Let us increase the vigilance of education providers regarding competency and incompetency training methods, and raise the awareness about unintentional incompetency training and its effect on trainees. The study provides management decision trainers responsible for re-engineering the MBA curricula (or other management education and development interventions) with empirically supported knowledge regarding four teaching methodologies. Implications for pedagogical and andragogical application of decision in-basket simulations has been thoroughly analyzed, resulting in detailed in-basket cases and checklists which can assist educators to design, implement and improve experiential learning tools such as simulated interactions and written simulations in the form of goal-based scenarios, for application in tertiary education.

This study extends the work of Armstrong (2003, p. 27; Armstrong & Green, 2005), Gigerenzer (2008; Gigerenzer & Brighton, 2009b), and Schank, Berhman, and Macpherson (1999). The research illuminates, through data gathering and fuzzy-set qualitative comparative analysis ("fsQCA"), the conceptual deductions in developing a theory of decision-competency development interventions (DCDI) and decision incompetency training (DIT) testing several theories in the same model. The study includes the hope to stimulate further research into decision competency development and executive training in sense-making and heuristics for MBA students and increase protégés own vigilance about the training they receive.

References

Anderson, P. H., & Lawton, L. (2009). Business simulations and cognitive learning: Developments, desires and future directions. *Simulation and Gaming, 40*(2), 193–216. doi:10.1177/1046878108321624.

Armstrong, E. K. (2003). Applications of role playing in tourism management teaching: Evaluation of a learning method. *Journal of Hospitality, Leisure, Sport and Tourism Education, 2*(1), 5–16.

Armstrong, J. S., & Brodie, R. (1994). Effects of portfolio planning methods on decision making: Experimental results. *International Journal of Marketing Research, 11*(1), 73–84.

Armstrong, J. S., & Collopy, F. (1996). Competitor orientation: Effects of objectives and information on managerial decisions and profitability. *Journal of Marketing Research, 23*, 188–199.

Armstrong, J. S., & Green, K. C. (2005). Demand forecasting: Evidence-based method. In L. Moutinho & G. Southern (Eds.), *Strategic marketing management: A business process approach*. Hampshire: Cengage Learning EMEA.

Armstrong, J. S., & Green, K. C. (2007a). Competitor-oriented objectives: Myth of market share. *International Journal of Business, 12*(1), 116–136.

Armstrong, J. S., & Green, K. C. (2007b). Competitor-oriented objectives: Myth of market share. *International Journal of Business, 12*, 117–136.

Baron, R. S., & Kerr, N. L. (2003). *Group process, group decision, group action*. Buckingham, PA: Open University Press.

Boyatzis, R. E., Stubbs, E. C., & Taylor, S. N. (2002). Learning cognitive and emotional intelligence competencies through graduate management education. *Academy of Management Learning and Education, 1*(2), 150–162.

Brafman, O., & Brafman, R. (2008). *Sway: The irresistible pull of irrational behavior*. New York: Broadway Books.

Brighton, H., & Gingerenzer, G. (2008). Bayesian brains and cognitive mechanisms: Harmony or dissonance? In N. Chater & M. Oaksford (Eds.), *The probabalistic mind: Prospects for Bayesian cognitive science* (pp. 189–208). London: Oxford Press.

Burns, R. B., & Burns, R. A. (2008). *Business research methods and statistics using SSPS*. London: Sage.

Campbell, A. (2005). *Business failure rates highest in first two years*. Retrieved April 24, 2011, from http://smallbiztrends.com/2005/07/business-failure-rates-highest-in.html

Campbell, D. T., & Stanley, J. C. (1963). Experimental and quasi-experimental designs for research on teaching. In N. L. Gage (Ed.), *Handbook on research on teaching*. Chicago: Rand McNally.

Capon, N., Farley, J. U., & Hulbert, J. M. (1987). *Corporate strategic planning*. New York: Columbia University Press.

Chalos, P., & Pickard, S. (1985). Information choice and cue use: An experiment in group information processing. *Journal of Applied Psychology, 70*(4), 634–641.

Dickerson, J. F., & Duffy, M. (2002, January 27). Enron spoils the party. *Time Magazine, 159*(5), 19–25.

Dunning, D., Johnson, K., Ehrlinger, J., & Kurger, J. (2003). Why people fail to recognize their own incompetence. *Current Directions in Psychological Science, 12*, 83–87. doi:10.1111/1467-8721.01235.

Dunning, D., & Kruger, J. (1999). Unskilled and unaware of it: How difficulties in recognizing one's own incompetence lead to inflated self-assessments. *Journal of Personality and Social Psychology, 77*(6), 1121–1134.

Dunning, D., & Kruger, J. (2003). Unskilled and unaware of it: But why? A reply to Krueger and Meuller (2002). *Journal of Personality and Social Psychology, 82*(2), 189–192. doi:10.1037/0022-3514.82.2.189.

Dyer, J. S., Fishburn, P. C., Steuer, R. E., Wallenius, J., & Zionts, S. (1992). Multiple criteria decision making, multiattribute utility theory: The next ten years. *Management Science, 38*, 645–654.

Einhorn, H. J., Hogarth, R. M., & Klempner, E. (1977). Quality of group judgment. *Psychological Bulletin, 84*(1), 158–172.

Feinstein, A. H., & Cannon, H. M. (2002). Constructs of simulation evaluation. *Simulation and Gaming, 33*(4), 425–440.

Feldman, D. C., & Lankau, M. J. (2005). Executive coaching: A review and agenda for future research. *Journal of Management, 31*, 829–848.

Forsyth, D. R. (2006). *Group dynamics* (4th ed.). Belmont, CA: Thomson.

Gigerenzer, G. (2004). Fast and frugal heuristics: The tools of bounded rationality. In D. Koehler & N. Harvey (Eds.), *Blackwell handbook of judgment and decision making* (pp. 62–88). Oxford: Blackwell.

Gigerenzer, G. (2007). *Gut feelings: The intelligence of the unconscious*. New York: Viking.

Gigerenzer, G. (2008). Why heuristics work. *Perspectives on Psychological Science, 3*, 20–29. doi:10.1111/j.1745-6916.2008.0058.x.

Gigerenzer, G., & Brighton, H. (2009). Homo Heuristicus: Why biased minds make better inferences. *Topics in Cognitive Science, 1*, 107–143. doi:10.1111/j.1756-8765.2008.01006.x.

Gigerenzer, G., & Murray. (1987). Thinking: From insight to intuitive statistics. In *Intuition as cognitive statistics,* Hillsdale, NJ: Lawrence Earlbaum Associates Inc.

Gigerenzer, G., & Todd, P. M. (1999). Fast and frugal heuristics. In ABC Research Group (Ed.), *Simple heuristics that make us smart*. New York: Oxford University Press.

Gladwell, M. (2005). *Blink: The power of thinking without thinking*. New York: Little Brown Company.

Goldstein, D. G., & Gigerenzer, G. (1999). The recognition heuristic: How ignorance makes us smart. In G. Gigerenzer, P. M. Todd, & A. R. Group (Eds.), *Simple heuristics that make us smart* (pp. 37–58). New York: Oxford University Press.

Goldstein, D. G., & Gigerenzer, G. (2002). Models of ecological rationality: The recognition heuristic. *Psychological Review, 109*(1), 75–90.
Goleman, D. (1998). *Working with emotional intelligence*. New York: Bantam Books.
Goleman, D., Boyatzis, R. E., & McKee, A. (2002). *Primal leadership: Realizing the power of emotional intelligence*. Boston: Harvard Business School Press.
Gosen, J., & Washbush, J. (2004). A review of the scholarship on assessing experiential learning effectiveness. *Simulation and Gaming, 35*, 270–293. doi:10.1177/1046878104263544.
Gottliebsen, R. (2003). *10 Best and 10 worst decisions of Australian CEOs (1992-2002)*. Camberwell, VIC: Penguin.
Green, K. C. (2002). Forecasting decisions in conflict situations: A comparison of game theory, role-playing and unaided judgment. *International Journal of Forecasting, 18*, 321–344.
Green, K. C. (2005). Game theory, simulated interaction, and unaided judgment for forecasting decisions in conflicts: Further evidence. *International Journal of Forecasting, 21*, 463–472.
Green, K. C. (2010). *Forecasting methods*. Retrieved November 19, from http://www.forecastingprinciples.com/index.php?option=com_content&task=view&id=16&Itemid=16
Green, K. C. & Armstrong, J. S. (2009, July). Role-thinking: Standing in other people's shoes to forecast decisions in conflicts. *MPRA Paper, 16422*, 1–8.
Heath, C., & Gonzalez, R. (1995). Interaction with others increases decision confidence but not decision quality: Evidence against information collection views of interactive decision making. *Organizational Behavior and Human Decision Processes, 61*(3), 305–326. doi:10.1006/obhd.1995.1024.
Hegarthy, W. H., & Simms, H. P. (1978). Some determinants of unethical decision behavior: An experiment. *Journal of Applied Psychology, 63*, 451–457.
Hilmer, K. M., & Dennis, A. R. (2000). Stimulating Thinking in Group Decision Making Symposium conducted at the meeting of the 33rd Hawaii International Conference on System Sciences, Hawaii.
Hodges, B., Regehr, G., & Martin, D. (2001). Difficulties in recognizing one's own incompetence: Novice physicians who are unskilled and unaware of it. *Academic Medicine, 76*(10), 587–589.
Hsu, E. (1989). Role-event gaming simulation in management education. *Simulation and Games, 20*(4), 409–438. doi:10.1177/104687818902000402.
Ilgen, D. R., Hollenbeck, J. R., Johnson, M., & Jundt, D. (2005). Teams in organizations: From I-P-O models to IMOI models. *Annual Review of Psychology, 56*, 517–544.
Insabato, A., Pannunzi, M., Rolls, E. T., & Deco, G. (2010). Confidence-related decision making. *Journal of Neurophysiology, 104*(1), 539–547.
Janis, I. L. (1982). *Groupthink* (2nd ed.). Boston: Houghton Mifflin.
Janis, I. L., & Mann, L. (1977). *Decision making: A psychological analysis of conflict, choice, and commitment*. New York: Free Press.
Jonsson, F. U., Olsson, H., & Olsson, J. (2005). Odor emotionality affects the confidence in odor naming. *Chemistry Senses, 30*, 29–35.
Kerr, N. L., MacCoun, R. J., & Kramer, G. P. (1996). Bias in judgment: Comparing individuals and groups. *Psychological Review, 103*(4), 687–719.
Keys, B., & Wolfe, J. (1988). Management education and development: Current issues and emerging trends. *Journal of Management, 14*, 205–229. doi:10.1177/-14920638801400205.
Klein, J. H., Moon, B., & Hoffman, R. R. (2006). Making sense of sensemaking 1: Alternative perspectives. *IEEE Intelligent Systems, 21*(4), 70–73.
Marewski, J. N., Gaissmaier, W., & Gigerenzer, G. (2010). Good judgments do not require complex cognition. *Cognitive Process, 11*, 103–121. doi:10.1007/s10339-009-0337-0.
Michaelsen, L. K., Watson, W. E., Schwartzkopf, A., & Black, R. H. (1992). Group decision making: How you frame the question determines the answer. *Journal of Applied Psychology, 77*(1), 106–108.
Mintzberg, H. (2004). *Managers not MBAs: A hard look at the soft practice of managing and management development*. San Francisco: Berrett- Koehler Publishers.
Morrison, A., & Wensley, R. (1991). Boxing up or boxed in? A short history of the Boston Consulting Group share/growth matrix. *Journal of Marketing Management, 1*(7), 105–129.

Nemeth, C. J., Brown, K., & Rogers, J. (2001). Devil's advocate versus authentic dissent: Stimulating quantity and quality. *European Journal of Social Psychology, 31*(6), 707–720. doi:10.1002/ejsp.58.

Omodei, M. M. (2005). More is better? Problems of self-regulation in naturalistic decision making settings. In H. Montgomery, R. Leipshitz, & B. Brehmer (Eds.), *How professionals make decisions* (pp. 25–42). Mahwah, NJ: Lawrence Erlbaum Associates.

Oscamp, S. (1965). Overconfidence in case-study judgments. *Journal of Consulting Psychology, 29*(3), 261–265.

Park, G., & DeShon, R. P. (2010). A multilevel model of minority opinion expression and team decision-making effectiveness. *Journal of Applied Psychology, 95*(5), 824–833. doi:10.1037/a0019939.

Parker, L. E. (1993). When to fix it and when to leave: The relationship among perceived control, self-efficacy, dissent and exit. *Journal of Applied Psychology, 78*, 949–959.

Penn, W. Y., & Collier, B. D. (1985). Current research in moral development as a decision support system. *Journal of Business Ethics, 4*(2), 131–136. doi:10.1007/BF00383566.

Pfeffer, J., & Fong, C. T. (2002). The end of business schools? Less success than meets the eye. *Academy of Management & Education, 1*, 78–95.

Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs: General and Applied, 80*, 1–28.

Schank, R. C. (1994). *What we learn when we learn by doing*. Evanston, IL: Northwestern University Press.

Schank, R. C. (1995). *What we learn when we learn by doing*. Institute for the Learning Sciences, Northwestern University. http://cogprintes.org/637/1/LearnbyDoing_Schank.html

Schank, R. C., Berhman, T. R., & Macpherson, K. A. (1999). Learning by doing. In C. M. Reigeluth (Ed.), *Instructional-design theories and models: A new paradigm of instructional theory*. Mahwah, NJ: Lawrence Erlbaum Associates.

Schippmann, J. S., Prien, E. P., & Katz, J. A. (1990). Reliability and validity of in-basket performance measures. *Personnel Psychology, 43*(4), 837–859.

Schooler, L. J., & Hertwig, R. (2005). How forgetting aids heuristic inference. *Psychological Review, 112*, 610–628.

Schulz-Hardt, S., Frey, D., Luthgens, C., & Moscovici, S. (2000). Biased information search in group decision making. *Journal of Personality and Social Psychology, 78*(4), 655–669. doi:10.1037/0022-3514.78.4.655.

Schwenk, C. R. (1984). Devil's advocacy in managerial decision-making. *Journal of Management Studies, 21*(2), 153–168.

Schwenk, C. R. (1988). Effects of devil's advocacy on escalating commitment. *Human Relations, 41*(10), 769–782. doi:10.1016/0749-5978(90)95501-A.

Schwenk, C. R. (1990). Effects of devil's advocacy and dialectical inquiry on decision making: A meta-analysis. *Organizational Behavior and Human Decision Processes, 47*, 161–176.

Shanteau, J. (1992). How much information does an expert use? Is it relevant? *Acta Pshychologica, 81*, 75–86.

Shaw, M. (1981). *Group dynamics: The psychology of small group behavior* (3rd ed.). New York: McGraw Hill.

Simon, H. A. (1947). *Administrative behavior: A study of decision-making processes in administrative organization*. New York: Free Press.

Simon, H. A. (1956). Rational choice and the structure of the environment. *Psychological Review, 63*, 129–138.

Simon, H. A. (1960). *The new science of management decision*. New York: Harper & Row.

Simon, H. A. (1976). *Administrative behavior* (3rd ed.). New York: The Free Press.

Simon, H. A. (1987, February). Making management decisions: The role of intuition and emotion. *Academy of Management Executive*, 58–59.

Simon, H. A. (1990). Invariants of human behavior. *Annual Review of Psychology, 41*, 1–19.

Simpson, J. C. (1987). Wall Street's courting of MBAs proceeds apace despite scandals. *Wall Street Journal*, p. 1.

Spanier, N. (2011). *Competence and incompetence training, impact on executive decision-making capability: Advancing theory and testing*. Doctoral thesis, Auckland University of Technology, Auckland, NZ.

Stasser, G. L., & Titus, W. (1985). Pooling of unshared information in group decision making: Biased information sampling during group discussion. *Journal of Personality and Social Psychology, 48*, 1467–1478.

Todd, P. M. (2001). Fast and frugal heuristics for environmentally bounded minds. In G. Gigerenzer & R. Selten (Eds.), *Bounded rationality: The adaptive toolbox* (Vol. Dahlem Workshop Report, pp. 51–70). Cambridge, MA: MIT Press.

Todd, P. M., & Gigerenzer, G. (2000). Simple heuristics that make us smart. *Behavioral and Brain Sciences, 23*(5), 727–741.

Todd, P. M., & Gigerenzer, G. (2003). Bounded rationality to the world. *Journal of Economic Psychology, 24*, 143–165.

Todd, P. M., & Gigerenzer, G. (2007). Environments that make us smart: Ecological rationality. *Current Directions in Psychological Science, 16*(3), 167–171.

Trevino, L. K., & Youngblood, S. A. (1990). Bad apples in bad barrels: A causal analysis of ethical decision-making behavior. *Journal of Applied Psychology, 75*(4), 378–385.

Weick, K. E. (1988). Enacted sensemaking in crisis situations. *Journal of Management Studies, 25* (4), 305–317.

Weick, K. E. (1990). The vulnerable system: An analysis of the Tenerife air disaster. *Journal of Management, 26*(3), 571–593.

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

Weick, K. E. (2007). Drop your tools: On reconfiguring management education. *Journal of Management Education, 31*(1), 5–16. doi:10.1177/1052562906293699.

Weick, K. E. (2010). Reflections on enacted sensemaking in the Bhopal disaster. *Journal of Management Studies, 47*(3), 537–550. doi:10.1111/j.1467-6486.2010.00900.x.

Weick, K. E., Sutcliffe, K. M., & Obstfeld, D. (2005). Organizing and the process of sensemaking. *Organizational Science, 16*(4), 409–421. doi:10.1287/orsc.1050.0133.

Wilson, T. D. (2002). *Strangers to ourselves: Discovering the adaptive unconscious*. Cambridge, MA: Harvard University Press.

Wilson, T. D. (2011). *Redirect: The surprising new science of psychological change*. London: Little Brown and Company.

Woodside, A. G. (2012). Incompetency training: Theory, practice and remedies. *Journal of Business Research, 65*(2012), 279–293. doi:10.1016/j.jbusres.2011.10.025.

Zimbardo, P., Butler, L., & Wolfe, V. (2003). Cooperative college examinations: More gain, less pain when students share information and grades. *Journal of Experimental Education, 71*, 101–126.

Chapter 2
Incompetency Training: Theory, Practice, and Remedies

Prelude

- "All in all, we carried out about 700 inspections at different 500 sites and, in no case, did we find any weapons of mass destruction." (Hans Blix, 2010—UN Chief Weapons Inspector between 1999 and 2003 reporting on outcomes of inspections before the March 2003 invasion of Iraq).
- "Intelligence gathered by this and other governments leaves no doubt that the Iraq regime continues to possess and conceal some of the most lethal weapons ever devised." (President George W. Bush, Address to the Nation on March 17, 2003—2 days before the U.S. lead invasion into Iraq).

Repeating a falsehood over and over again is one tool that is sometimes effective in incompetency training in some contexts. "See, in my line of work you got to keep repeating things over and over and over again for the truth to sink in, to kind of catapult the propaganda" (George W. Bush on 5/24/2005).

2.1 Introduction

The objectives of this editorial are (1) to suggest the need for developing accurate and useful incompetency training theory; (2) to propose a few initial propositions for theory development and empirically testing of incompetency training; (3) to offer commentaries on studies in the literature relevant to incompetency training and the tools useful for causing effective incompetency training; and (4) to advocate theory development and testing of remedies to eliminate incompetency training when possible and mitigate the effectiveness of incompetency training. Given that extensive literature supports the conclusion that incompetency training is pervasive and frequently effective, the study of competency training alone is insufficient in preventing effective incompetency training. Tenants of incompetency-training theory include the perspective that trainees need vigilance and meta-thinking (thinking

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about thinking) training to develop accurate knowledge and ability to recognize their exposure to incompetency training within specific contexts. Competency training needs to include focusing on overcoming incompetency training as necessary for acquiring effective antidotes to thwart highly effective (conscious and nonconscious) incompetency training.

Following this introduction, Sect. 2.2 offers a definition of incompetency training. Section 2.3 describes relevant theory and reviews literature on the efficacy of incompetency training. Section 2.4 asks what actions are necessary for overcoming incompetency training. Section 2.5 concludes with a call for papers that advance theory and evidence on the efficacy and remedies of incompetency training.

2.2 Defining Incompetency Training

"Incompetency training" includes formal and informal instruction that consciously (purposively) or unconsciously imparts knowledge, attitudes, beliefs, and behavior (including behavioral protocols) that are useless, inaccurate, misleading, and lower performance outcomes of the trainee versus no training or training using alternative training methods.

The definition implies subcategories of incompetency training are identifiable. "Passive incompetency training" includes instruction that has no measurable impact on improving the knowledge and capabilities of many trainees. The Doonesbury "trapped in a paper bag" cartoon in Fig. 2.1 illustrates passive incompetency training. True experiments with test and control groups or the use of quasi-experiments (Shadish, Cook, & Campbell, 2001) are necessary to test for the zero-impact hypothesis that is central to passive incompetency-training theory. The failure to find positive impact in higher education on knowledge and abilities of many students justifies the assumption that such experiments are necessary steps in measuring the extent of passive incompetency training.

Given that one characteristic of passive incompetency training is that such training is a "waste of time," such training is not passive because it gobbles-up time available for effective competency training. Thus, describing training that results in inconsequential outcomes as "passive" may be misleading.

"Active incompetency training" includes instruction that the trainer consciously or unconsciously designs to decrease useful knowledge and capabilities of trainees. President George W. Bush's speeches on evidence of weapons of mass destruction (WMD) in Iraq to justify the U.S. led March 2003 invasion are examples of active incompetency training. The weekly briefings for three years that President Bush received describing the failure of inspection teams to find WMDs in Iraq before the March 2003 invasion is one justification for assuming that he was consciously aware of engaging in active incompetency training—providing inaccurate information to achieve agreement and reduce disagreement among members of the U.S. Congress and the American public to justify his plans to invade Iraq.

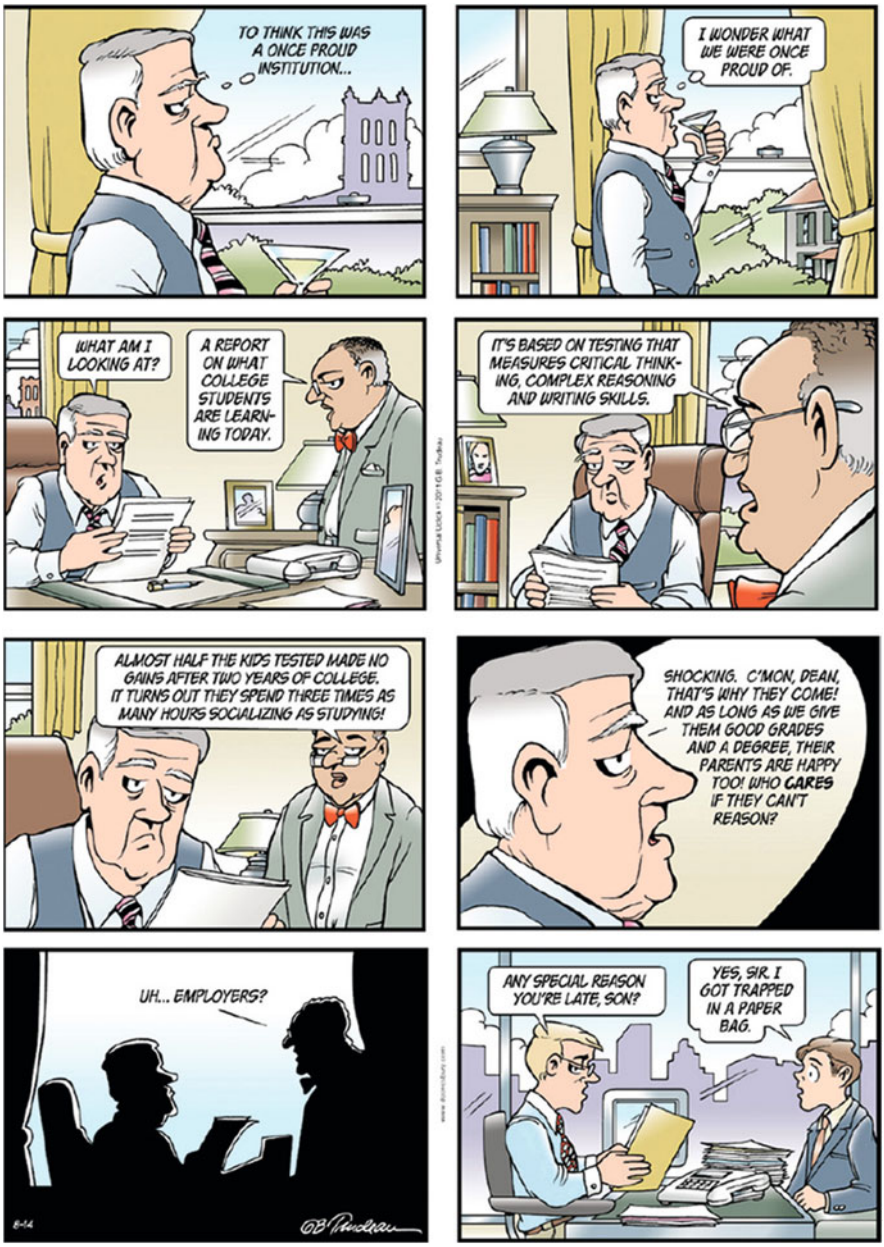


Fig. 2.1 Incompetency training story in Doonesbury. *Source*: www.doonesbury/strip/archive/2011/08/14, reprinted by permission of Universal Uclick

Many trainers (e.g., parents, educators, and executives) may be unaware that they may be providing incompetency training in some contexts and in the use of some learning tools. Many beliefs and behaviors that humans learn informally as children and in everyday life are inaccurate and harmful, for example, cultural training that women should remain home throughout their lives and not attend college or work as executives, they should not have voting rights, and they do not merit pay equal to men for performing the same work as men.

Some amount of informal training in everyday life represents passive incompetency training that usually goes unrecognized especially among those of us who utter, "I am not biased." For example, Bertrand and Mullainathan (2002) provide evidence from a field experiment showing that job applicants named "Emily" or "Greg" received significantly more (50 % more) invitations for job interviews than applicants named "Lakisha" or "Jamal" even when all had qualifications on paper that were similar. Humans often leap or blink (Galdwell, 2005) to conclusions, delusions, decisions, and actions—most of the time without considering the informal unconscious training supporting these leaps and outcomes and without considering whether or not such training reflects incompetency or competency (cf. Bertrand, Chugh, & Mullainathan, 2005; Gigerenzer, 2007; Wilson, 2002).

Trainers may be unaware of instances of engaging in formal (e.g., classroom) incompetency training leading to increases in knowledge, skills, and actions by trainees that are more negative, harmful, and/or useless in comparison to alternative training programs. For example, findings from surveys and experiments include reports of widespread use of product portfolio matrices (e.g., Boston Consulting Group's growth-share matrix) among business school professors and the discussion of such planning tools in management and marketing textbooks even though using such planning tools leads to making decisions with less desirable outcomes (i.e., lower profits) than not using them (see Anterasian, Graham, & Money, 1996; Armstrong & Brodie, 1994; Armstrong & Collopy, 1996; Armstrong & Green, 2007; Capon, Farley, & Hulbert, 1987; Morrison & Wensley, 1991; Spanier, Woodside, & Marshall, 2011). Anterasian et al. (1996, p. 74) offer the following suggestion for remedying this incompetency training, "...we suggest you find the portfolio models section and rip those pages out [of your textbooks]."

After reviewing a substantial number of empirical field and laboratory studies on the relationship of market share and profitability, Armstrong and Green (2007) conclude that the relationship is negative and statistically and substantively significant. While not recommending a business strategy to seek small versus large market share, they present substantial evidence that (1) firms having their primary objective of growing market share are less profitable and survive less frequently than firms having other primary objectives (e.g., earning a profit as the primary objective) and (2) training students in advocating market-share growth as a primary objective is substantial in business schools in North America and Europe.

> While advocates of market-share objectives have provided no evidence to support their contention, their writings seem to have had an effect on the academic research. Ramos-Rodríguez and Ruíz-Navarro (2004) identified the 50 works that have had the greatest impact on strategic management research by counting citations in the *Strategic Management Journal*. Porter's (1980) competitor-oriented work was ranked first; an extraordinary

distinction for a book that contains no evidence on this topic. With 44 citations (753 citations via Google. scholar as of 23 September 2011), Buzzell, Gale, and Sultan (1975) was also included among the 50 most influential works and was the eighth most cited work from 1980 to 1986. Management textbooks repeat the claim that increasing market share will improve profitability. For example, the authors of Europe's best-selling strategy textbook wrote: "Since companies with higher market share have more cumulative experience, it is clearly important to gain and hold market share" (Armstrong & Green, 2007, p. 128; Johnson & Scholes, 2002, p. 168).

2.3 Incompetency Training Theory

Figure 2.2 is a paradigm that builds from two propositions useful in developing a theory of incompetency training. The first proposition: incompetency training occurs in contexts at the individual and national levels. The second: incompetency training occurs purposively (consciously) as well as unknowingly (unconsciously). However, all incompetency training processes in Fig. 2.2 include a mix of unconscious and conscious processes to varying extents; the processes in the four quadrants vary in degree and are not completely distinct subcategories.

2.3.1 Purposive, Individual-Level, Incompetency Training

The first quadrant in Fig. 2.2 focuses attention on purposive incompetency training by trainers that is directed to increase incompetency in specific individuals (e.g.,

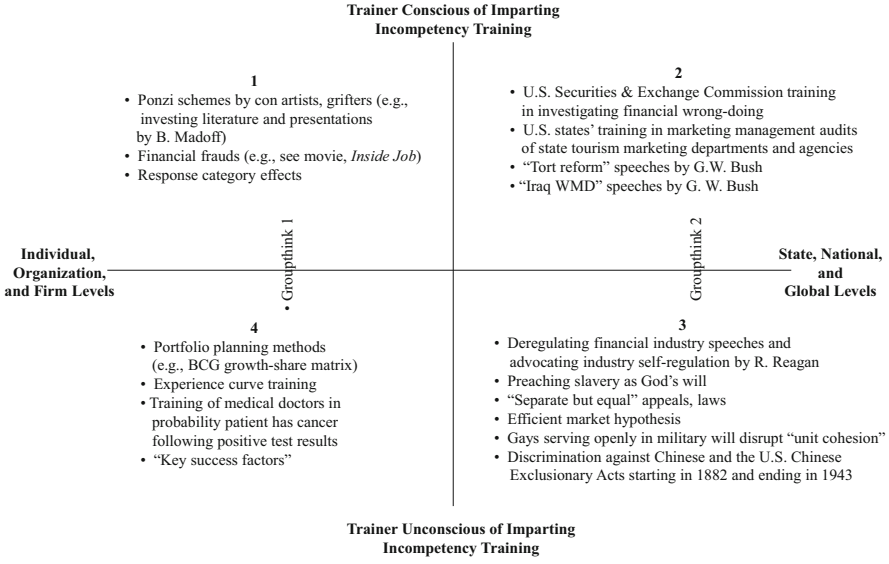


Fig. 2.2 Incompetency training paradigm and examples

consumers, students, and executives). The Bernard Madoff global Ponzi scheme, arrest, and imprisonment illustrate highly effective incompetency training of wealthy, highly educated, trainees—training in operation over more than a decade with investments in the scam reaching $36 billion.

From prison Madoff commented on the incompetency of U.S. Securities and Exchange Commission (SEC) regulators: "I was astonished. They never even looked at my stock records. If investigators had checked with the Depository Trust Company, a central securities depository, it would've been easy for them to see. If you're looking at a Ponzi scheme, it's the first thing you do" (Gendar, 2009). Since Madoff's arrest, the SEC has been criticized for its lack of financial expertise and lack of due diligence, despite having received complaints from Harry Markopolos (2011). The SEC's Inspector General, H. David Kotz, found that since 1992, six botched investigations of Madoff were completed by the SEC, either through incompetent staff work or neglecting allegations of financial experts and whistle-blowers (Wikipedia, 2011).

What is missing from reports on Madoff and SEC investigation incompetency is an in-depth independent investigation of the apparent incompetency training that SEC investigators receive—or possibly continue to receive in the SEC. For example, if Madoff is correct about the ease of uncovering his massive frauds, did/do SEC investigators receive training in examining stock trades posted with the Depository Trust Company? What training did/do SEC investigators receive in uncovering wrong-doing and incompetency? Assuming incompetency training occurred at the SEC throughout the 1990s and the first decade of the twenty-first century, what steps have been implemented since Madoff's arrest to eliminate such incompetency training and to create/verify competency-training programs? The development of incompetency-training theory would provide a helpful contribution toward justifying performance evaluations in Ph.D. dissertation studies of such theory. Incompetency-training theory would focus attention on identifying antecedent paths (i.e., causal recipes) leading to incompetency-training program development as well as processes of engaging in incompetency training, and the impacts of trainees receiving such training.

The 2010 movie, *Inside Job*, documents the widespread successful strategies in selling financial products known to be "crap" (U.S. Senator Carl Levin) by a leading firm in the financial industry. Here is a description of scene and verbal exchange between Senator Levin and the former Goldman Sachs executive in the movie and a commentary of the exchange:

> In a televised hearing, Senator Carl Levin asks a former executive at Goldman Sachs, "What do you think about selling securities which your own people think are 'crap'?" Levin is referring to confidential internal e-mail, now subpoenaed for this hearing. There is a disoriented pause. The pinstripe suited exec looks around himself in panic. Finally comes his response, as frightening as it is hilarious. "I think it is very unfortunate that anyone would state that opinion in an e-mail." The question is not "are we being ethical?", or even "are we doing good business?" but "how did we get caught?" (Adragh, 2010)

The movie's director, Charles Ferguson's (2011) brief acceptance speech for the 2011 Academy Award for Documentaries offers a chilling postscript to the movie,

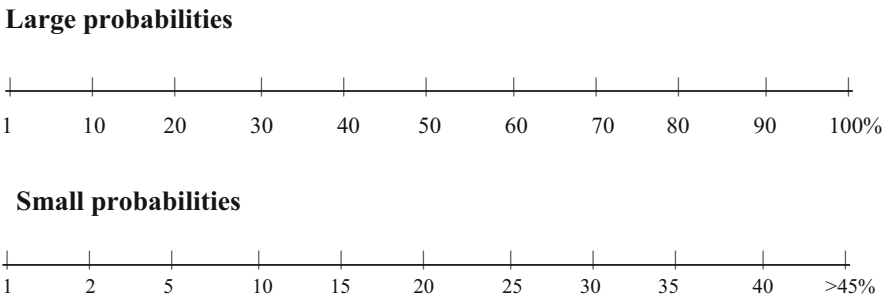


Fig. 2.3 What is the probability that the patient will harm someone? The two response scales show different categories for probabilities. *Source*: Slovic et al. (2000)

"Forgive me, I must start by pointing out that 3 years after our horrific financial crisis caused by financial fraud, not a single financial executive has gone to jail, and that's wrong." A remarkable documentary reporting on pervasive and highly successful incompetency training!

"Response category effects" appears in the first quadrant of Fig. 2.2. Slovic, Monahan, and MacGregor (2000) and Schwartz, Hippler, Deutsch, and Strack (1985) demonstrate that researchers can manipulate judgments of laypeople and professionals substantially simply by changing the choice of categories even after receiving training (see Fig. 2.3).

Even after receiving a tutorial in probability theory that included what is meant by harm, what a probability is, how probabilities are assessed, and an explanation and warning about category effects, the average probability response of predictions of the probability of a violent act by a person after reading a case study was 34 % when large probabilities were used but 22 % when small probabilities were used in the response scale—subjects in this study were members of the American Psychology-Law Society (Slovic et al., 2000).

Gigerenzer (2002) provides two possible antidotes to incompetency training to overcome category effects include reducing uncertainty in the minds of risk assessors, for instance, by providing them with statistical information about the actual violent behavior of inmates on parole or patients on weekend release. "As their knowledge increases, their uncertainty diminishes, and the category effect will eventually disappear. A second way is to dispense with response categories and use other tools for risk assessment, for example, an open-ended response format: 'Think of 100 patients like Mr. Jones. How many will turn violent within 6 months? _____ out of 100." (Gigerenzer, 2002, p. 195). A third antidote is having decision-makers practice answering before, during, and after coaching by an expert on counter-incompetency-training. Schank (1995) emphasizes the, not sufficient, but necessary condition of effective learning via practice. However, additional scientific evidence is necessary to test the efficacy of these training tools.

Note that "groupthink 1" appears partly in quadrants 1 and 4 to indicate that groupthink in particular is partly consciously and unconsciously an antecedent to

sense-making and decision-making by individuals and firms (Kellermanns et al., 2011). Janis (1972, 1982), analyzing policy decisions such as the Bay of Pigs invasion, the Cuban missile crisis, and the escalation of the Vietnam War, identifies in those that ended disastrously a cluster of symptoms for which he coins the term, "groupthink." Defined in Merriam-Webster's dictionary as "a pattern of thought characterized by self-deception, forced manufacture of consent, and conformity to group values and ethics," the official inquiries conducted on the Challenger and Columbia space shuttle disasters documents groupthink. Groupthink is likely a contributing factor in the failures of companies such as Enron and Worldcom, in some decisions relating to the second Iraq war, and most recently in the housing and mortgage-related financial crisis (Bénabou, 2009).

Park (1990) provides a meta-analysis of the results of 16 empirical studies on groupthink. The results of the analysis contradict the findings Janis claims about groupthink antecedents. Park (1990) concludes, "Despite Janis' claim that group cohesiveness is the major necessary antecedent factor, no research has showed a significant main effect of cohesiveness on groupthink." Park also concludes that research on the interaction between group cohesiveness and leadership style does not support Janis' claim that cohesion and leadership style interact to produce groupthink symptoms.

Details in case study research provide telling support for the perspective that several different alternative causal chains or recipes occur as complex antecedent conditions of groupthink behavior and subsequent negative (sometimes disastrous) outcomes (Kerr & MacCoun, 1996). For example, relating to groupthink 1 in Fig. 2.2, Tenerife KLM Flight 4805 747 takeoff disaster (crash of the KLM plane into a second 747 plane parked on the runway) at Tenerife Island resulting in the loss of 584 lives; relating to groupthink 2 in Fig. 2.2, the Vietnam War, the second American–led Iraq War, and the U.S. federal deregulation of the financial industry and de facto shut-down of regulator agencies starting with President Reagan though President G. W. Bush's administrations. Showing deference to a group member who is the recognized leader appears in many of groupthink causal chains. A strong authority (an "initiator" proposing a solution or presenting a defacto next course of action, see Brafman & Brafman, 2008) often overwhelms one or more other group members that often are natural members within groups, "blockers."

For example, the co-pilot of the Tenerife disaster initially gave a blocking message to the captain of the KLM Flight 4805 (Jacob Van Zanten), "Wait a minute," the copilot said in confusion. "We don't have ATC clearance." "I know that," Captain Van Zanten replied as he hit the breaks and stopped the takeoff. "Go ahead and ask." The co-pilot got on the radio and received airway clearance—approval of the flight plan. But the tower said nothing about the vital takeoff clearance. And yet, determined to take off, Van Zanten turned the throttles to full power and roared down the foggy runway. The co-pilot said nothing further. Both were killed along with 582 passengers and crew members in the deadliest airplane collision in history.

> The thick fog contributed to the disaster. Van Zanten couldn't see the Pan Am plane, the Pan Am pilot couldn't see him, and the tower controllers couldn't see either one of them. On top of that, the tower was undermanned, and the controllers were distracted by the day's events. Despite all these factors, though, the tragedy would never have occurred if Van Zanten hadn't take off without clearance. Why would this seasoned pilot, the ***head of safety*** at the airline, make such a rash and irresponsible decision? (Brafman & Brafman, 2008, p. 15, italics in the original)

Also important to ask, what enactments in the procedure of airplane takeoffs specifically and groupthink in general are examples of groupthink that are representative of incompetency training? What new protocols to can be built into training to reduce the risk that life-threatening errors in judgment are due in part to thinking and interactions among a pilot, co-pilot, and traffic controller?

> The National Aviation Safety Administration's (NASA's) research into plane crashes ultimately helped revolutionize aeronautical procedures. A new model for cockpit interactions was born: Crew Resource Management (CRM), which teaches pilots, among other skills, how to be effective blockers [in communicating to block bad decisions and actions] (Brafman & Brafman, 2008, p. 163).

CRM is distinctly designed to get away from "the captain is the man" view. Pilots are trained to communicate effectively and accept feedback, and crew members are taught to speak up when they see that their superior officer is about to make a mistake. When pilots spot a departure from safety procedures, they are ***trained*** to challenge the captain. The challenge takes the form of three steps that all Southwest pilots know by heart. "The first step is to state the facts"—for example, "Our approach speed is off." If that's ineffective, the next step is to "challenge." According to a CRM instructor Captain Cathy Dees, research shows that "generally the best way to challenge someone is to use their first name and add a quantifier to the fact. 'Mike, are you going to make it on this approach? Check you altitude... It's important to state the fact without being condescending'" (Brafman & Brafman, 2008, p. 166).

> If these two procedures fail, the third step is to "take action. If someone were flying an unstable approach—that means they were approaching the runway and they were perhaps too high or too fast, or not in a condition to make a normal approach—we would want them to ago around," Dees explained. The action would be to get on the radio and say, for example, "Southwest 1 going around, we're too high," And once you say something on the radio, the tower controller will cancel your landing clearance. And that way the action takes place without physically fighting over equipment in the airplane, which might aggravate the person flying. (Brafman & Brafman, 2008, p. 167)

One key to reduce groupthink processes is to train individual and working groups into how to effectively counter culture-based (e.g., showing deference to superior authorities) incompetency training. Pilots and co-pilots now receive refresher coaching instruction in countering such incompetency training. Note that step three represents a dynamic shift toward transparency; communicating the occurrence of an incompetency-in-context to others increases the likelihood that corrective action will occur (but sometimes not, see Markopolos, 2011).

The effectiveness in using devil's advocates and role-playing to counter incompetency training in groupthink receives substantial support in relevant literature (Armstrong, 1977; Cosier, 1978; Green, 2002; Schweiger, Sandberg, & Ragan, 1986; Schwenk, 1990).

The idea of coaching is a big one for reducing self-inflicted (e.g., hubris) and groupthink incompetency training. Consider the following coaching application to reduce incompetency training.

> California researchers in the early 1980s conducted a 5-year study on teacher-skill development in 80 schools, and noticed something interesting. Workshops led teachers to use new skills in the classroom only ten percent of the time. Even when a practice session with demonstrations and personal feedback was added, fewer than twenty per cent made the change—when a colleague watched them try the new skills in their own classroom and provided suggestions—adoption rates passed ninety per cent. A spate of small randomized trials confirmed the effect. Coached teachers were more effective, and their students did better on tests. (Gawande, 2011, p. 47)

Gawande (2011), a highly successful surgeon, reports on his decision and use of a coach. He hired Robert Osten, a retired general surgeon, whom he trained under during his residency. Gawande points out that it's never easy to submit to coaching, especially for those who are well along in their careers. "I'm ostensibly an expert. I'd finished long ago with the days of being tested and observed. I am supposed to be past needing such things. Why should I expose myself to scrutiny and fault-finding? I have spoken to other surgeons about the idea. 'Oh, I can think of a few people who could use some coaching,' has been a common reaction. Not many say, 'Man, could I use a coach!' Once I wouldn't have either" (Gawande, 2011, p. 53).

How many tenured professors would admit to benefitting from a coach observing them and suggesting improvements? Should coaching/mentoring be part of all instruction? One final observation by Gawande helps to answer these questions.

> There was a moment in sports when employing a coach was unimaginable—and then came a time when not doing so was unimaginable. We care about results in sports, and if we care half as much about results in schools and hospitals we may reach the same conclusion. (Gawande, 2011, p. 53)

If Schank's (2011) and Dewey's (1916/2011) perspective is accurate—learning by doing is necessary for real learning to occur—then the teacher-as-coach model follows naturally. However, Dewey (1916/2011, p. 38) observes, "That education is not an affair of 'telling' and being told, but an active construction process, is a principle almost as generally violated in practice as conceded in theory." If you are professor and reading this sentence, ask yourself, are you coaching your students while they learn-by-doing or are you mostly lecturing? Do you personally have a coach? When was the last time a coach came into your classroom? Would you feel more or less comfortable if your dean had a coach? Should the U.S. President have a coach?

2.3.2 *Purposive, Public Level, Incompetency Training*

The second quadrant in Fig. 2.2 recognizes planned incompetency training does occur at federal, state, and city government levels. This proposition is not to say that all training government units have the objective of increasing incompetency among employees in these units or in the public. Certainly the available evidence indicates that the training of financial investigators in the SEC is purposively incompetent. The lack of any public available data on testing of the effectiveness of training of financial investigators in the SEC as well as Markopolos' (2011) exchanges with the SEC, and Kotz's report on the failures of SEC investigators, implies that the SEC provides incompetency training to its investigators.

If the SEC's own inspector general and independent auditors confirm that incompetency training of investigators continues to occur at the SEC, the causes for such training might become clear. Most likely, incompetency training of government regulatory agencies occurs to reduce the effectiveness of agencies that cannot be eliminated by government and business leaders having authority to appoint commissioners to run these agencies—government leaders advocating industry self-regulation rather than government agencies with powers to investigate specific industries. This perspective follows from the findings of the U.S. Financial Crisis Inquiry Commission.

The causal chain of events in the recent financial world-wide meltdown includes the extreme deregulation of the U.S. financial industry beginning with Ronald Reagan's (1981–1989) ending of effective government regulatory agencies. The U.S. Financial Crisis Inquiry Commission reported its findings in January 2011. The report concludes that "the crisis was avoidable and was caused by:

- Widespread failures in financial regulation, including the Federal Reserve's failure to stem the tide of toxic mortgages.
- Dramatic breakdowns in corporate governance including too many financial firms acting recklessly and taking on too much risk.
- An explosive mix of excessive borrowing and risk by households and Wall Street that put the financial system on a collision course with crisis.
- Key policy makers ill prepared for the crisis, lacking a full understanding of the financial system they oversaw; and systemic breaches in accountability and ethics at all levels" (FCIC, 2011).

"Tort reform" is a second example of purposive, national, and state level, incompetency training. Tort reform refers to proposing changes in common law civil justice systems that would reduce tort litigation or damages. Tort reform advocates focus on personal injury common law rules.

Independent assessments indicate that tort reform advocates are engaging in incompetency training; an HBO documentary, *Hot Coffee* (Saladoff, 2011), describes instances of grave harm relating to the behavior of firms advocating tort reform. Eviatar (2009) summarizes arguments in favor of tort reform and evidence refuting these arguments.

> Gov. Rick Perry of Texas in the *Washington Examiner* boasts that Texas tort reform that capped injured patient's damages was the answer to his state's problems. And the American Medical Association has said it won't support any health reform bill that doesn't reduce liability for doctors. "If the bill doesn't have medical liability reform in it, then we don't see how it is going to be successful in controlling costs," James Rohack, president-elect of the organization, told Politico in March. "Why spend the political capital and energy in passing a bill if it is not successful?"
>
> So far Republicans have mostly focused on tearing apart any reform with a role for the federal government, portraying it as the government dictating how long old people get to live. But an undercurrent of those complaints is the insistence of doctors, hospitals, insurance companies and ideological conservatives that medical malpractice claims are out of control and a leading cause of rising health care costs.
>
> The health economists and independent legal experts who study the issue, however, don't believe that's true. They say that malpractice liability costs are a small fraction of the spiraling costs of the U.S. health care system, and that the medical errors that malpractice liability tries to prevent are themselves a huge cost– both to the injured patients and to the health care system as a whole.
>
> "It's really just a distraction," said Tom Baker, a professor at the University of Pennsylvania Law School and author of *The Medical Malpractice Myth* (2005). "If you were to eliminate medical malpractice liability, even forgetting the negative consequences that would have for safety, accountability, and responsiveness, maybe we'd be talking about 1.5 % of health care costs. So we're not talking about real money. It's small relative to the out-of-control cost of health care." (Eviatar, 2009)

Ralph Nader (2004) summarizes the case for relabeling "tort reform" as "tort deform." "Since it was founded, our nation's legislature has never attempted to federally tie the hands of judges and juries in the manner advocated by business interests today. The reason we are seeing tort deformers push the myriad pieces of legislation that would immunize doctors from malpractice responsibility; that would protect oil companies from cleaning up polluting components of gasoline from our drinking water sources; or that would make more onerous the ability of class actions to succeed against wealthy cigarette manufacturers, asbestos manufacturers and other corporations, is because they need only establish a few federal legislative precedents to open the tort deform floodgates. The resulting slippery slope would have lobbyists from every conceivable industry clamoring for their own set of legislated escapes from the law. Take the time to familiarize yourself with the tort deform debate—don't let Congress brush aside the most fundamental tenets of the judicial system, in case you are wrongfully injured or defrauded, to satisfy corporate avarice and greed."

The objective here is not to offer conclusive evidence that tort reform advocates are engaging in incompetency training. However, watching *Hot Coffee* and reading Baker's book do give warning that tort reform lobbyists and the speeches by former President George W. Bush and Texas Governor Rick Perry on tort reform are examples of incompetency training. Given the budgets being spent on such training and the recent successes in passing state laws supporting tort reform (9 states passed such laws by August 2011), the likelihood is high that such tort-reform incompetency training will achieve its trainers' objectives throughout this decade.

Purposive, state level, incompetency training includes the work by state agencies having the responsibility of marketing their states as tourism destinations. Woodside and Sakai (2003, 2009) provide reviews of state management mostly negative audit reports indicating continuing incompetency training in several American States, for example, the Hawaii Tourism Authority (HTA). The Woodside and Sakai (2009) study also indicates continuing (1987–2003) incompetency training by the Legislative Audit Office of Hawaii as well—its focus mainly on minor financial issues; no identification of sound marketing management practices necessary to implement to overcome incompetency training in the HTA.

2.3.3 State, National, Global Trainer Unconscious Imparting of Incompetency Training

Quadrant 3 in Fig. 2.2 includes trainers' unconscious imparting of incompetency training. The foundation for the success of such training includes appeals to core values and precedence of the trainers advocating beliefs and actions resulting principally in incompetent outcomes. Such trainers and their supporters are unconscious that their messages and actions lead principally to incompetency.

Referring to Hofstede's (1991, 2001) theory of the consequences of cultural values the explicit American core value causal recipe includes the combination of high individuality, high masculinity, low uncertainty avoidance, and low power distance. The American cowboy is an iconic representation of this value combination (Woodside, Hsu, & Marshall, 2011). Except in times of crises (e.g., the American Civil War, the Great Depression, World War II, the recent financial meltdowns), this value combination supports unconsciously the advocacy for less government, self-regulation rather than government regulation, government as the problem rather than the solution. The cowboy carries with him every thing that he needs—without a need for government.

Robert Brent Toplin, Professor of History at the University of North Carolina, Wilmington, and the author of a dozen books including *Radical Conservatism: The Right's Political Religion* (2006), offers compelling evidence supporting the observation of highly effective national, unconscious incompetency training.

> As the country's greatest modern champion of deregulation, perhaps Ronald Reagan contributed more to today's unstable business climate than any other American. His long-standing campaign against the role of government in American life, a crusade he often stretched to extremes, produced conditions that ultimately proved bad for business. . .
>
> Recent troubles in the American economy can be attributed to a weakening of business regulation in the public interest, which is, in large part, a consequence of Reagan's anti-government preaching. In the absence of oversight, lending became a wildcat enterprise. Mortgage brokers easily deceived home buyers by promoting sub-prime loans, and then they passed on bundled documents to unwary investors. Executives at Fannie Mae packaged both conventional and sub-prime loans, and they too, operated almost free of serious oversight. Fannie's leaders spent lavishly to hire sixty Washington lobbyists who showered

> congressmen with campaign funds. Executives at Fannie were generous to the politicians because they wanted to ward off regulation.
>
> Meanwhile, on Wall Street, brokerage firms became deeply committed to risky mortgage investments and did not make their customers fully aware of the risks. The nation's leading credit rating agencies, in turn, were not under much pressure to question claims about mortgage-based instruments that were marketed as Blue Chip quality. Government watchdogs were not active during those times to serve the interests of the public and the investors.
>
> The most influential person to call for a more powerful watchdog recently is Secretary of the Treasury, Henry Paulson. After responding to the credit crisis by working with the Federal Reserve to shore up and bail out floundering business organizations, Paulson has become the leading challenger to Reagan's outlook on government. During an August 10 interview on *Meet the Press* Paulson stressed over and over again that "the stability of our capital markets" requires "a strong regulator." Our regulatory system is badly "outdated," Paulson complained. Market discipline should be tightened by assigning a "regulator with the necessary power," said the Treasury Secretary.
>
> Henry Paulson never mentioned Ronald Reagan's name during the interview, but the implications of his remarks were clear. Reagan's views of the relationship between government and business helped to put the nation and the world into a good deal of trouble. It is time to recognize that the former president's understanding of economics was not as sophisticated as his enthusiastic supporters often claimed.
>
> Reagan deserves credit for serving as a vigorous defender of free markets, but he carried the idea to extremes. Ironically, the great champion of business enterprise advocated policies that have seriously hurt business here and abroad. (Toplin, 2008)

Quadrant 3 in Fig. 2.2 includes additional examples of high-impact, national-level, incompetency training driven by trainers' unconscious thinking, that is, without trainers who advocate these beliefs and actions recognizing the substantially incompetent outcomes that follow from such training. The examples (and sources for examining) this incompetency training include the following national-level propositions and laws:

- Slavery as God's will (see Weems, 2000)
- "Separate but equal" advocacy and laws (became dominant national logic and federal law in 1896 that ended in Brown v. the Board of Education in 1954)
- Efficient market hypothesis (advocated first by Fama, 1965 that an "efficient market" occurs that is defined as a market where there are large numbers of rational, profit-maximizers actively competing, with each trying to predict future market values of individual securities, and where important current information is almost freely available to all participants; identified as "bunch of junk" by money-manager Peter Lynch in 1995; cf. Ball, 1995; Fox, 2009)
- The U.S. Chinese Exclusionary Acts starting in 1882 and ending in 1943
- Gays threaten unit cohesion in the military (dominant view in the military starting in 1920 and recognized to be inaccurate in 2011 resulting in the repeal of "Don't ask, Don't Tell" regulation, cf. Lynch, 2008.)

2.3.4 Unconscious Individual and Firm Level Incompetency Training

Trainers unknowingly providing inaccurate, misleading, and sometimes dangerously wrong information and recommendations appear in quadrant 4 of Fig. 2.2. Examples of such incompetency training include:

- Geocentric theory (Ptolemy, 150CE/1952; Toomer, 1998) (that Earth is center of the universe) was the dominant logic among scholars and Christian religious leaders for 1500 years; Ptolemy's work provides much in competency training as well in the fields of mathematics, geography, as well as astronomy for several centuries; geocentric theory was finally superseded by heliocentric theory beginning in the sixteenth century in a three-century struggle that included the publication of Copernicus (1543) master work, *De revolutionibus orbium coelestium* (*On the Revolutions of the Celestial Spheres*); Copernicus mostly completed his masterwork by 1530 but hesitated for more than a decade to publish the complete version due to its highly controversial content (see Sobel, 2011); after publication, Martin Luther identified Copernicus to be a fool (Kuhn, 1957, p. 191); Copernicus (1543) was on the Roman Catholic Church's *Index of Forbidden Books* from 1616 until 1758 (Catholic Encyclopedia, accessed 2011).
- Portfolio planning methods (e.g., BCG growth-share matrix discussion below).
- Experience curve training—"Since companies with higher market share have more cumulative experience, it is clearly important to gain and hold market share" (Johnson & Scholes, 2002, p. 168). Johnson and Scholes (2002) suggest that following their recommendation would lead to improved profitability, "The link between performance and relative market share, which is emphasized by the experience curve work, is supported by the findings of the PIMS database. . ." (p. 365). Readers were also told that "these benefits of market share can be even more important in global markets" (p. 370). Training/information now given by medical doctors to patients that the patient has HIV after testing positive HIV tests (see Gigerenzer, Hoffrange, & Kleinbölting, 1991).
- Reports on "key success factors" in product innovation management (no one factor is sufficient or necessary for success; to reduce frequency of incompetency training outcomes, consider causal chains of factors as recipes of key success paths that associate with success rather than the net effect of each factor on success, see Woodside, 2009).

An example of firm-level incompetency training where the trainer is unaware of the negative impact of the training includes training by marketing and management professors in business school in describing product portfolio planning methods as well as focusing the trainee (i.e., students) on information about how the firm's decisions affect competitors' outcomes rather than focusing attention on profit of the trainees' firm. These methods include most classroom descriptions of the Boston Consulting Group (BCG) growth-share matrix.

In a classroom-setting experiment by Armstrong and Brodie (1994), subjects in a (baseline) treatment groups were asked to make a choice between two investment alternatives. Here are summaries of the two choices:

- Invest $1.5 million in a better way to make Digits. The forecasts are that, while this invention would not affect the final demand, it would product cost savings after taxes of about $500,000 per year for the next 10 years. After the initial outflow of $1.5 million, the invention would yield a net cash flow of $500,000 per year. Your sales forecasts for Digits show it holding steady for the next ten years. Digits has a modest current sales volume, is in a market that is not growing at all, and it has a small market share, about ¼ of the leading competitor. Digits now has barely adequate profits of $50,000 per year and it has negligible cash flow.
- The alternative investment is in the Sunbars product-line. The Sunbars division has an opportunity it feels would strength its position in the market. It proposes a new advertising campaign. The $1.8 million investment would generate after-tax profits of $400,000 the first year, $300,000 the second, and $100,000 per year for the next 8 years. Cash flow would be approximately the same as profits. Sunbars has a relative market share of 1.5 (vs. its leading competitor), and it is in a market growing 20 % per year. Cash flow from Sunbars is negligible. Sunbars produces an after-tax profit of $500,000 per year. Future prospects for Sunbars are good.

Rather than receiving the baseline treatment, some subjects were assigned randomly to receive information on the BCG planning matrix for identifying high and low sales growth by high and low market share product lines (a 2×2 matrix). Additional subjects were assigned randomly to receive information on the net present value (NPV) rather than the baseline or the BCG matrix information.

Armstrong and Brodie (1994, p. 78) report, "The most surprising result was that in 44.7 % (n = 228) of the decisions, subjects in control groups failed to select what was designed to be an obviously more profitable investment" (i.e., the Digits investment). A higher share of subjects (n = 296) receiving training (information) in the BCG matrix, selected the less profitable decision than the share of control group subjects (63.5 vs. 44.7 %). Training in competency (n = 232)—the NPV treatment—did reduce the share of subjects selecting the less profitable alternative versus the training in incompetency and the baseline treatment (37.1 vs. 63.5 vs. 44.7 %).

Indicating the unconscious thinking that goes hand-in-hand with teaching the BCG, "Capon et al. (1987, p 69) present evidence that it is the most widely used portfolio method in US firms. Morrison and Wensley (1991), in their survey of teachers at 34 business schools in the UK, found that the BCG matrix is taught at all schools and that warnings are seldom discussed" (Armstrong & Brodie, 1994, p. 74). In second series of studies, Armstrong and Collopy (1996) exposed 65 subjects in a base treatment group that made no mention of competitors. Here is the information provided to subjects in this base treatment:

You are the marketing manager of a manufacturing firm know as Big 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 5 years. You determine the following results for both strategies:

Expected profits over 5 years	
Low-price strategy	High-price strategy
$40 million	$80 million

Additional treatments included harm your major competitor versus beat your major competitor treatments; see Armstrong and Collopy (1996) for details.

When no information was provided about the performance of competitors, 14 % of the 65 subjects selected the less profitable decision. This finding might suggest that several rounds of practice in decision making may be necessary and/or training in additional methods in generating competent decisions are necessary to achieve 100 % competent decisions. In the harm the competitor treatment condition, 34 % of the 139 subjects selected the less profitable decision. In the best the competitor treatment 60 % of the 60 subjects selected the less profitable decision. Thus, subjects in the harm and beat treatments were two to more than four times more likely to select the less profitable decision as when no information was provided about competitors.

Kalra and Soberman (2008) provide similar findings in additional experiments using other scenarios. In reviewing additional studies, Kalra and Soberman (2008, p. 32) conclude, "These studies show that managers do not naturally gravitate to strategies that maximize outcomes. Griffith and Rust (1997) extend these ideas by demonstrating that managers place a high value on performance relative to competitors (and not absolute profits), even when they are explicitly instructed to maximize own profits and are compensated on the basis of their own profit performance."

Figure 2.4 summarizes findings in three sets of studies on the impact of baseline (control) treatments. The findings in Fig. 2.4 support the perspective that not mentioning (treatments a1 and a2) the concept "market share" in decision scenarios is likely to result in the lowest frequency of incompetency outcomes. Referring to "market share" only in reporting a focal firm's 49.1 % share with no mention of any competitor's share or competitors' shares resulted in 22 % of subjects selecting the incompetent decision, an incompetent outcome share lower than the share (27 %) following competency training to ignore market share information and focus on profitability—treatment c5 versus c4, respectively.

Many decision-makers appear to be inherently vigilant about share information rather than profit information to the extent that providing any information about competitors' market shares may cause them to select options that are incompetent in comparison to readily available more competent options. Lots of practice-in-doing—thinking and making decisions may overcome this incompetency bias toward beating competitors rather than increasing firm wealth. Schank (1995)

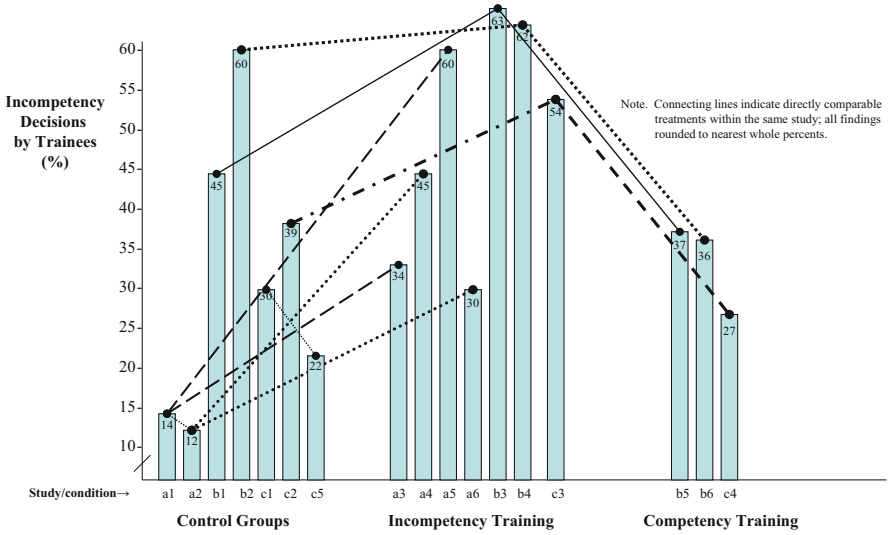


Fig. 2.4 Impacts on incompetency by incompetency and competency training. *Key* A&C = Armstrong & Collopy, 1996; A&B = Armstrong & Brodie, 1994; SWM = Spanier, Woodside, and Marshall, 2001. a1 = A&C, no information about competitor, 5 years time horizon; a2 = A&C, no information about competitor, 20 year time horizon; a3 = A&C, information on ability to harm competitor, 5 year time horizon; a4 = information on ability to harm competitor, 20 year time horizon; a5 = A&C, information on ability to beat competitor, 5 year time horizon; a6 = A&C, information on ability to beat competitor, 20 year time horizon; b1 = A&B, no competitor information given; b2 = A&B, both BCG and NPV information given middle-management subjects; A&B, b3 = A&B, BCG information given; b4 = BCG information given, middle-management subjects; b5 = A&B, NPV information given; b6 = NPV information given, middle-management subjects; c1 = SWM, no BCG, no competency training, focal firm with 49.1 % market share; c2 = SWM = BCG and competency training, focal firm with 56 % market share; c3 = SWM, BCG training, focal firm with 56 % market share; c4 = SWM, competency training; focal firm with 56 % market share; c5 = SWM, no BCG, no competency training, no competitor share directly mentioned; focal firm with a 49.1 % market share. *Note*: *Connecting lines* indicate directly comparable treatments within the same study; all findings rounded to nearest whole percents

emphasizes that learning new skills requires practice with opportunities to make mistakes and repetitive doing necessary tasks multiple times until the trainee acquires both implicit-tacit-unconscious abilities as well as explicit-conscious abilities to do all steps necessary accurately. Testing of Schank's competency-causing strategy is necessary to learn if, indeed, practice (possibly with coaching) overcomes exposure to incompetency training.

A meta analysis of the findings in Fig. 2.3 includes an average incompetency share for the seven control treatments equal to 31.7, standard error equal to 6.6; the average incompetency share for the seven incompetency training treatments is 49.7, standard error equal to 5.1; the average incompetency share for the three competency training treatments is 33.3, standard error equal to 3.2. Incompetency training overall is successful in increasing incompetency outcomes while competency

training is unsuccessful in reducing incompetency outcomes in comparison to the findings for the baseline control treatments. More powerful tools (possibly practice sessions, coaching before, during, and post decision-making, and visualizing potential outcomes using bar diagrams) are necessary to overcome the inherent bias favoring incompetence training.

Incompetency training about the high value of growing market share builds in part from frequent reporting in textbooks and articles of an article in Advertising Age (1983) representative of one form of incompetency training. The 1983 article reports on brand market-sales leadership from 1923 to 1983. In performing the historical method in marketing research, Golder (2000) reports the following observations.

> The original 1923 book [data on market-sales leadership in 1923] reveals a startling finding about the commonly referenced data that "19 out of 25" market leaders maintained their leadership for at least 60 years. Although this finding of long-term leadership has been widely reported in marketing textbooks and journals and in the mass-market publications, it is based on a biased sample. The original 1923 study was not done on 25 categories, but rather 100 categories (Hotchkiss & Franken, 1923). The sample of 25 categories was selectively chosen to demonstrate long-term leadership. Therefore, the Advertising Age study is dramatically flawed, and the report of long-term leadership are overstated. (Golder, 2000, p. 162)

Golder (2000) collected data in the relevant literature to examine market leadership in all 100 categories in the original report (Hotchkiss & Franken, 1923) for 1923–1997. Golder (2000, p. 163). His findings include the following observations. "More of the leading brands in 1923 failed than remained leaders. More of the top three brands in 1923 failed than remained among the top five brands. Market shares over this prolonged period are not stable; regressions of rank-order market share versus time show a significant decrease in market position over time."

The cherry-picking of data to support a trainer's (e.g., writer's perspective for the Advertising Age, 1983 article) perspective and discarding data that do not do so is representative incompetency training in the first quadrant of Fig. 2.2. Referrals to such inaccurate information as evidence supports an apparent unconscious bias in trainers that favors market share rather than profitability as the principal objective of the firm—quadrant 4 in Fig. 2.2.

Related to trainers unknowingly providing incompetency training (quadrant 4 in Fig. 2.2), Gigerenzer (2002) and associates (Chase, Hertwig, & Gigerenzer, 1998; Gigerenzer, Hoffrage, & Ebert, 1998) provide details of a study on how dangerous incompetency training can be. Counseling and literature for the public before and after HIV testing is intended to help the client understand the risks of HIV infection and the meaning of a positive and a negative result. The authors (Gigerenzer, 2002; Gigerenzer et al., 1998) report a field observation study where one of the authors (Axel Ebert) volunteered to go undercover to 20 public health centers to have 20 HIV tests. The centers are located in 20 German cities, including the three largest and they offer free HIV tests and counseling to the general public. Pretest counseling is mandatory, and this allowed Ebert to ask relevant questions, such as "Could I ever test positive if I do not have the virus? And if so, how, often does this

happen?" Of the 20 professional counselors Ebert met face-to-face, 14 were physicians and the others were social workers.

When it came to explaining Ebert's risk of being infected if he tested positive, most counselors lacked the ability even to estimate, much less to communicate the risks. The majority of counselors (13) incorrectly assured the client (Ebert) that false positives never occurred. Ten of the counselors asserted incorrectly that if a low-risk man tests positive, it is absolutely certain (100 %) that he is infected with virus. (Based on the best figures available, this probability is, in fact, around 50 %.)

An examination of hospital and government AIDS leaflets in the U.S. and Germany provide similar incompetency-training information. For instance, one leaflet, "Coping with HIV Disease," distributed by the Illinois Department of Public Health, leaves no room for uncertainty: "A person who is HIV positive has HIV disease". See Gigerenzer (2002, p. 139).

Trying to solve problems in uncertainty using conditional probabilities rather than natural frequencies is a major problem. Gigerenzer (2004) identifies the problem in a causal chain of factors in incompetency training by counselors (including most physicians and humans generally). Before reading on, please read the information and two questions in Fig. 2.5 and use the information to answer the questions. (Be sure to commit to your answers by writing them down.)

Hoffrage and Gigerenzer (1998) asked 24 physicians to answer the two questions appearing in Fig. 2.5. A second group of 24 physicians answered the same questions appearing in a different format (natural frequencies). The 48 physicians were assigned randomly to the two groups. All physicians answered the two questions working individually.

Predicting Breast Cancer from a Positive Mammogram Test

- To facilitate early detection of breast cancer, starting at a particular age, women are encouraged to participate at regular intervals in routine screening, even though they have no obvious symptoms. The following information is available about asymptomatic (i.e., showing no symptoms of a disease) women aged 40 to 50 who participate in mammography screening in a geographic region:
- The probability that one of these women has breast cancer is 0.8 percent in the geographic region. If a woman has breast cancer, the probability is 90 percent that she will have a positive mammogram. If a woman does not have breast cancer, the probability is 7 percent that she will still have a positive mammogram. What is the probability that she actually has breast cancer?
- Your answer: _____ percent

Predicting Colorectal Cancer from a Positive Hemoccult Test

- To diagnose colorectal cancer, the hemoccult test—among others—is conducted to detect occult blood in the stool. The hemoccult test is also known as FOBT, or fecal occult blood test. This test is used from a particular age on, but also in routine screening for early detection of colorectal cancer. Imagine you conduct a screening using the hemmocult test in a certain geographic region. For symptom-free people over 50 years old who participate in screenings using the hemoccult test, the following information is available for this region:
- The probability that one of these people has colorectal cancer is 0.3 percent. If a person has colorectal cancer, the probability is 50 percent that he will have a positive hemoccult test. If a person does not have colorectal cancer, the probability is 3 percent that he will still have a positive hemoccult est. Image a person (over age 50, no symptoms who has a positive test in your screening. What is the probability that this person actually has colorectal cancer?
- Your answer: _____ percent

Fig. 2.5 Using conditional probabilities in presentation formats for achieving highly-successful incompetency training. *Source*: from pages in Hoffrage and Gigerenzer (1998)

When answering the first of the two questions after reading the information appearing in conditional probabilities (in Fig. 2.5), the estimates ranged from 1 to 90 %. One-third of the physicians estimated the chances to be between 50 and 80 %. When the information was presented in probabilities, the median estimate was 70 %. The majority of physicians grossly overestimated the risk of breast cancer. Only 2 of the physicians reasoned correctly giving estimates of about 8 %; another 2 % estimated the chances near the percentage but for the wrong reasons.

When answering the second question in Fig. 2.5, extraordinary differences occurred among the physicians' estimates, which ranged from 1 to 99 %. "The most frequent estimate (50 %) was 10 times higher than the correct answer, which only 1 out of the 24 physicians reached when they received the information in probabilities" (Gigerenzer, 2002, p. 105).

How did the second group of physicians manage in answering following receiving the same information in natural frequencies? For the problem in the left side of Fig. 2.6, the majority of the 24 physicians responded with the correct answer, or close to it. Only five of the physicians who received the information in natural frequencies concluded that the chance of breast cancer given a positive mammogram was above 50 % (Hoffrage & Gigerenzer, 1998). Simply stating the information in natural frequencies helps to counter incompetency training.

"The implication of this finding is not to blame physicians' (or patients') inability to reason about probabilities. Rather, the lesson is to represent risks in medical textbooks and in physician-patient interactions in a way that comes naturally to the human mind. Natural frequencies are a simple, inexpensive, and effective method of improving diagnostic insight" (Gigerenzer, 2002, p. 44.)

Predicting Breast Cancer from a Positive Mammogram Test

- To facilitate early detection of breast cancer, starting at a particular age, women are encouraged to participate at regular intervals in routine screening, even though they have no obvious symptoms. The following information is available about asymptomatic (i.e., showing no symptoms of a disease) women aged 40 to 50 who participate in mammography screening in a geographic region:
- Eight out of every 1,000 women have breast cancer. Of these 8 women with breast cancer, 7 will have a positive mammogram. Of the remaining 992 women who don't have breast cancer, some 70 will still have a positive mammogram. Imagine a sample of women who have positive mammograms in screening. How many of these women actually have breast cancer?
- Your answer: _____ out of _____.

Predicting Colorectal Cancer from a Positive Hemoccult Test

- To diagnose colorectal cancer, the hemoccult test—among others—is conducted to detect occult blood in the stool. The hemoccult test is also known as FOBT, or fecal occult blood test. This test is used from a particular age on, but also in routine screening for early detection of colorectal cancer. Imagine you conduct a screening using the hemmocult test in a certain geographic region. For symptom-free people over 50 years old who participate in screenings using the hemoccult test, the following information is available for this region:
- Thirty out of every 10,000 people have colorectal cancer. Of these 30 people with colorectal cancer, 15 will have a positive hemoccult test. Of the remaining 9,970 people without colorectal cancer, 300 will still have a positive hemoccult test. Imagine a sample of people (over age 50, no symptoms) who have positive hemoccult tests in your screening. How many of these people actually have colorectal cancel?
- Your answer: _____ out of _____.

Fig. 2.6 Using natural frequencies in presentation formats for achieving highly-successful incompetency training. *Source*: from pages in Hoffrage and Gigerenzer (1998)

Using natural frequencies for the second problem (right side of Fig. 2.6) dispelled mental confusion. The responses were less scattered and ranged from 1 to 10 %. All the physicians came up with the correct or nearly correct answer. "As with the breast cancer screening, physicians' clouded thinking about what a positive hemoccult test means can be remedied [to a substantial extent] simply by presenting statistical information differently that it is presented in standard medical textbooks" (Gigerenzer, 2002, p. 105).

2.4 Actions Useful for Overcoming Incompetency Training

The study of incompetency training provides several insights that serve as propositions in creating useful theory of the processes causing such training to be successful and in designing-testing effective antidotes to counter. What becomes clear from such study is that incompetency training occurs in individual/firm and national/global contexts. Individuals, firms, governments, and national cultures can and do engage consciously and unconsciously in incompetency training.

Becoming aware of exposure to incompetency training requires training and a deep understanding of the conditions and contexts of how the mind performs badly and well rather than claiming that humans are irrational. Gigerenzer is correct in writing, "The key role of representation in thinking is often downplayed because of an ideal of rationality that dictates that whenever two statements are mathematically or logically the same, representing them in different forms should not matter. Evidence that it does matter is regarded as a sign of human irrationality. This view ignores the fact that finding a good representation is an indispensable part of problem solving and that playing with different representations is a tool for creative thinking" (Gigerenzer, 2002, p. 50).

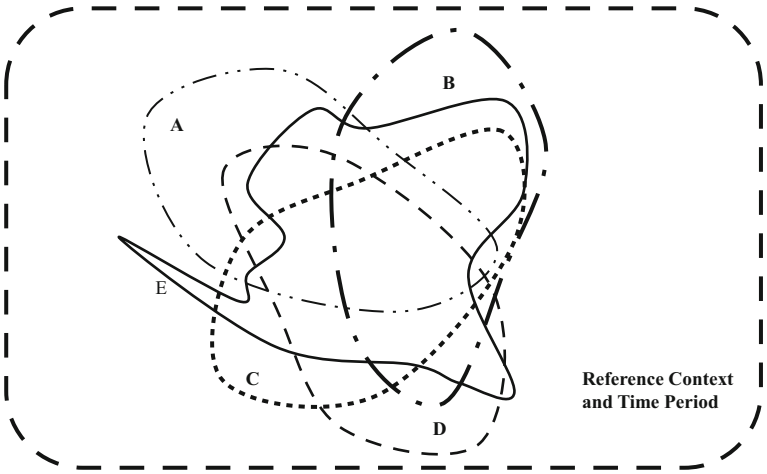
Creating effective antidotes to incompetency training likely requires deep knowledge about such training within specific contexts. Figure 2.2 shows four general context of incompetency training. Identifying these general contexts is one step toward building taxonomy of incompetency training processes. Becoming aware that incompetency training takes makes forms and varies by contexts supports the suggestion that creating, learning, and applying a multiple set of tools is necessary to disrupt such training processes and to counter the outcomes of such training.

Awareness and study of incompetency training in universities and management training programs may be a necessary (but not sufficient) step in replacing the dominant logic in many industries that self-regulation is sufficient for preventing abusive practices by firms and industries. How incompetency training works—the antecedents to and the nitty-gritty details of incompetency training processes in the SEC—remain unknown. Little to nothing is known about the antecedents to and similar training processes at the Federal Trade Commission and additional federal and state commissions and agencies.

Incompetency trainers supporting calls for self-regulation and ending government regulation of the financial industry grow silent for a short time when the failure of such self-regulation becomes dramatic. The 2008 American-led, global, financial meltdown was one such dramatic moment. The moment provided a window for passage of the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 (Dodd-Frank Act) that included establishing the Consumer Financial Protection Bureau.

Given the historical tendency to inaction and incompetency by federal agencies charged to regulate American industries, the CFPB needs to practice counter-incompetency training to stay free from industry control and to work effectively in achieving the objectives Congress set in enacting its creation. Counter-incompetency training programs need to become explicit in the operations of the CFPG as well as all federal and state regulatory commissions and agencies.

Figure 2.7 is a somewhat messy Venn diagram showing the presence of different tools in different combinations (conjunctive recipes). Figure 2.7 is an attempt to emphasize that the use of one to two tools to counter incompetency training likely will be insufficient in achieving 100 % elimination of such training. Franklin's (1987) law applies to trying to eliminate incompetency training—"Nothing is



A. Using natural frequencies and not probabilities to forecast events; use visual representations and not words alone
B. Using independent investigative reporting; historical marketing research; do not rely on second-hand reports or self-reports only
C. Using open-ended responses; avoid category effects in formatting answers to questions
D. Adopt devil's advocate and role-playing in meetings; do not rely on leader's views and traditional meeting procedures alone
E. Practice deciding/doing with a coach; do not make the decision alone or with subordinates only

Fig. 2.7 Counter-incompetency training tools and conjunctive recipes of using two to five tools in the same context. (**A**) Using natural frequencies and not probabilities to forecast events; use visual representations and not words alone. (**B**) Using independent investigative reporting; historical marketing research; do not rely on second-hand reports or self-reports only. (**C**) Using open-ended responses; avoid category effects in formatting answers to questions. (**D**) Adopt devil's advocate and role-playing in meetings; do not rely on leader's views and traditional meeting procedures alone. (**E**) Practice deciding/doing with a coach; do not make the decision alone or with subordinates only

certain but death and taxes." A reminder that in all human conduct, uncertainty is prevalent as the result of human and technical errors, limited knowledge, unpredictability, deception, and other causes (Gigerenzer, 2002).

Figure 2.7 serves to illustrate that including causal chains of counter-measures are more likely to be effective in preventing grave outcomes caused by incompetency training. Thus, even though problem-solvers and executives may never eliminate incompetency training, the dream may be achievable that counter-training will dramatically decrease the tragic outcomes that follow from incompetency training.

Note that the tools in Fig. 2.2 appear in a specific context. This follows from Herbert Simon's (1990, p. 1) most famous analogy, "Human rational behavior. . . is shaped by a scissors whose two blades are the structure of task environments [i.e., the context] and the computational capabilities of the actor."

Consider the following story on the relevancy of contexts. "The U.C.L.A. basketball coach John Wooden, at the first basketball meeting each season, even had his players practice putting their socks on. He demonstrated just how to do it: he carefully rolled each sock over his toes, up his foot, around the heel, and pulled it up snug, than went back over his toes and smoothed out the material along the sock's length, making sure there were no wrinkles or creases. He had two purposes in doing this. First, wrinkles cause blisters. Blisters cost games. Second, he wanted his players to learn how crucial seemingly trivial details could be. 'Details create success' was the creed of a coach who won ten N.C.A.A. men's basketball championships" (Gawande, 2011, p. 49).

2.5 Call for Papers

Incompetency training happens. The pervasive presence of learning-by-telling and the scarce implementations of learning-by-doing support this perspective. The American-led Vietnam War, the Second Iraq War, the most recent financial global crisis, instruction focusing on market shares versus profits, calls for industry self-regulation, the loss of 20 trillion dollars relating to the nonfunctioning federal regulatory commissions, the suicides by patients following misinformation about false positive HIV test results, the Tenerife disaster, the continuing incompetency of management audits by state auditing agencies of their states' tourism marketing programs, viewing gays as a threat to military unit cohesion, and tort reform legislation are example outcomes of conscious and unconscious incompetency training.

The usefulness of theory in sense-making is likely to increase by purposively studying the role of incompetency training in causing undesirable outcomes. Weick's (1996, 2001, 2007) application of the Mann Gulch fire disaster to organizational research and management education describes how seemingly competency

training can sometimes result in incompetent outcomes when the learner is present in specific contexts.

Weick (1996) offers several recommendations for "dropping one's tools" to achieve teaching excellence. These include drop your confused complexity; drop your fixations; drop your undifferentiated categories; drop your focus on decision making; drop your tactics that muddy learning about dropping; and drop your preoccupation with efficiency.

The last one is most relevant here. Weick (1996) calls on dropping preoccupation with efficiency that is, focusing on successes simplify assumptions, refining strategies, pouring resources into planning and anticipation, and deferring to authorities at higher levels in the organizational hierarchy. "These ways of acting are thought to produce good decisions; however, they also often allow unexpected events to accumulate unnoticed until those events become so complex that they are tough to deal with and have widespread unintended effects" (Weick, 1996, p. 14).

High reliability organizations (HROs) have a different set of priorities (Weick & Sutcliffe, 2001). "They drop the traditional ways of acting and pay more attention to failures than success, avoid simplicity rather than cultivate it, are just as sensitive to operations as they are to strategy, organize for resilience rather than anticipation, and allow decisions to migrate to experts wherever they are located. These may sound like odd ways to make good decisions, and that may be true. However, decision making is not what HROs are worried about. Instead, they are more worried about making sense of the unexpected. In that context, their attention to failure, simplification, operations, resilience, and migrating expertise makes perfectly good sense" (Weick, 1996, p. 14).

Weick's perspective here is a further justification for the direct study of incompetency training. Consequently, a second step is necessary following the U.S. Financial Crisis Inquiry Commission 2011 report (FCIC, 2011) to answer the question: What operational steps will work to overcome the incompetency training in the U.S. regulatory commissions and failure outcomes documented in the report? Little appears to be known about the inner-working and the operational incompetency of the SEC and other federal commissions. The sheer act of management auditing and fault-finding reporting is insufficient frequently for generating effective remedies (Woodside & Sakai, 2003, 2009).

Have procedures changed at the SEC and the Federal Reserve Board since the 2008 financial meltdown? Who knows? What changes are useful for shrinking incompetency training at these governmental agencies? How can we test the efficacy of the suggested changes? What do the results of such tests indicate? These questions are useful to address in responding to this call for papers.

Research and applications focusing on developmental management is necessary. "Developmental management" includes the study of theory, practice, and remedies of incompetency training and failures by individuals, organizations, and governments; developmental management focuses in particular on testing theory in field experiments on the effectiveness of alternative protocols to replace incompetency training via implementable protocols designed to achieve this objective.

References

Adragh, A. (2010).WikiLeaks, you, and me. Retrieved September 30, 2011, from http://arjunaardagh.wordpress.com/2010/12/03/wikileaks-you-and-me/

Advertising Age. (1983). Study: Majority of 25 leaders in 1923 still on top—"old standbys: hold their own". September 19, 32.

Anterasian, C., Graham, J. L., & Money, R. B. (1996). Are U.S. managers superstitious about market share? *Sloan Management Review, 37*(4), 67–77.

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

Armstrong, J. S., & Brodie, R. J. (1994). Effects of portfolio planning methods on decision making: Experimental results. *International Journal of Research in Marketing, 11*, 73–84.

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

Armstrong, J. S., & Green, K. C. (2007). Competitor-oriented objectives: The myth of market share. *International Journal of Business, 12*, 115–134.

Baker, T. (2005). *The medical malpractice myth*. Chicago, IL: University of Chicago Press.

Ball, R. (1995). The theory of stock market efficiency: Accomplishments and limitations. *Journal of Applied Corporate Finance, 8*, 4–18.

Bénabou, R. (2009). Groupthink: The delusions of organizations and markets. Working paper (NBER Working Paper No. 14764 Issued in March 2009). Princeton, NJ: Princeton University.

Bertrand, M., Chugh, D., & Mullainathan, S. (2005). Implicit discrimination. *The American Economic Review, 95*(2) (Papers and Proceedings of the One Hundred Seventeenth Annual Meeting of the American Economic Association, Philadelphia, PA, (May), pp. 94–98).

Bertrand, M., & Mullainathan, S. (2002). Are Emily and Jane more employable than Lakisha and Jamal? A field experiment on labor market discrimination. *American Economic Review, 94*, 991–1013.

Blix, H. (2010). Iraq inquiry: Former UN inspector Blix says war illegal. http://www.bbc.co.uk/news/uk-politics-10770239

Brafman, O., & Brafman, R. (2008). *Sway: The irresistable pull of irrational behaviour*. New York, NY: Doubleday.

Bush, G. W. (2003). Intelligence gathered by this and other governments.... http://whatreallyhappened.com/WRHARTICLES/WMDlies.html

Bush, G. W. (2005). See in my line of work.... http://whatreallyhappened.com/IMAGES/georgebushpropaganda.wma

Buzzell, R. D., Gale, B. T., & Sultan, R. G. M. (1975). Market share: A key to profitability. *Harvard Business Review, 53*(1), 97–106.

Capon, N., Farley, J. U., & Hulbert, J. M. (1987). *Corporate strategic planning*. Columbia: Columbia University Press.

Catholic Encyclopedia. (2011). Nicolaus Copernicus. Retrieved at http://www.newadvent.org/cathen/04352b.htm

Chase, V. M., Hertwig, R., & Gigerenzer, G. (1998). Visions of rationality. *Trends in Cognitive Science, 2*, 206–214.

Copernicus, N. (1543). De revolutionibus orbium coelestium. Nuremberg, private printing (400 copies).

Cosier, R. A. (1978). The effects of three potential aids for making strategic decisions on prediction accuracy. *Organizational Behavior and Human Performance, 22*, 295–306.

Dewey, J. (1916/2011). *Democracy and education*. New York: Simon and Brown.

Eviatar, D. (2009). Tort reform unlikely to cut health care costs. The Washington Independent, (August 19). Retrieved September 24, 2011, from http://washingtonindependent.com/55535/tort-reform-unlikely-to-cut-health-care-costs

Fama, E. G. (1965). The behavior of stock market prices. *Journal of Business, 38*, 34–105.

FCIC. (2011). Financial crisis inquiry commission releases report on the causes of the financial crisis. Retrieved September 24, 2011, from http://fcic-static.law.stanford.edu/cdn_media/fcic-news/2011-0127-fcic-releases-report.pdf
Fox, J. (2009). *The myth of the rational market*. New York: Harper Business.
Franklin, B. (1987). *Writings*. New York: Library of America.
Galdwell, M. (2005). *Blink: The power of thinking without thinking*. New York: Little, Brown.
Gawande, A. (2011). Personal best. *The New Yorker, 3*, 44–53.
Gendar, A. (2009, October 31). Bernie Madoff baffled by SEC blunders; compares agency's bumbling actions to Lt. Colombo. New York: Nydailynews.com. Retrieved September 23, 2011, from http://www.nydailynews.com/news/ny_crime/2009/10/31/2009-10-31_bernie_baffled_by_sec_blunders.html#ixzz0Vaymp8JU
Gigerenzer, G. (2002). *Reckoning with risk*. New York: Penguin.
Gigerenzer, G. (2004). Mindless statistics. *Journal of Socio-Economics, 33*, 587–606.
Gigerenzer, G. (2007). *Gut feelings: The intelligence of the unconscious*. New York: Viking.
Gigerenzer, G., Hoffrage, U., & Ebert, A. (1998). AIDs counselling for low-risk clients. *AIDS Care, 10*, 197–211.
Gigerenzer, G., Hoffrage, U., & Kleinbolting, H. (1991). Probabalistic Mental models: A Brunswikian thoery of confidence. *Psychological Review, 98*(4), 506–528.
Golder, P. N. (2000). Historical methods in marketing research with new evidence on market share stability. *Journal of Marketing Research, 23*(2), 156–172.
Green, K. C. (2002). Forecasting decisions in conflict situations: A comparison of game theory, role-playing, and unaided judgment. *International Journal of Forecasting, 18*, 321–344.
Griffith, D. E., & Rust, R. T. (1997). The price of competitiveness in competitive pricing. *Journal of the Academy of Marketing Science, 25*, 109–116.
Hoffrage, U., & Gigerenzer, G. (1998). Using natural frequencies to improve diagnostic inferences. *Academic Medicine, 73*, 538–540.
Hofstede, G. (1991). *Culture and organizations: Software of the mind*. London: McGraw-Hill.
Hofstede, G. (2001). *Culture's consequences*. Beverly Hills, CA: Sage (Revised ed.).
Hotchkiss, G. B., & Franken, R. B. (1923). *The leadership of advertised brands*. Garden City, NY: Doubleday, Page & Company.
Janis, I. L. (1972). *Victims of groupthink*. Boston: Houghton-Mifflin.
Janis, I. L. (1982). *Groupthink*. Boston: Houghton-Mifflin.
Johnson, G., & Scholes, K. (2002). *Exploring corporate strategy: Text and cases* (6th ed.). London: Financial Times-Prentice Hall.
Kalra, A., & Soberman, D. A. (2008). The curse of competitiveness: How advice from experienced colleagues and training can hurt marketing profitability. *Journal of Marketing, 72*, 32–47.
Kellermanns, F. W., Walter, J., Floyd, S. W., Lechner, C., & Shaw, J. C. (2011). To agree or not to agree? A meta-analytical review of strategic consensus and organizational performance. *Journal of Business Research, 64*, 126–133.
Kerr, N., & MacCoun, R. J. (1996). Bias in judgment: Comparing individuals and Groups. *Psychological Review, 103*, 687–719.
Kuhn, T. (1957). *The Copernican revolution*. Cambridge, MA: Harvard University Press.
Lynch, M. P. (2008). Don't ask, don't tell revisited: Debunking the unit-cohesion rationale for the continuing exclusion of gays from the military. *University of Louisville Law Review, 47*, 391–408.
Markopolos, H. (2011). *No one would listen*. New York: Wiley.
Morrison, A., & Wensley, R. (1991). Boxing up or boxed in? A short history of the Boston Consulting Group Growth/Share Matrix. *Journal of Marketing Management, 7*(2), 105–129.
Nader, R. (2004, July 12). The public deserves to hear the facts on tort reform. Retrieved September 24, 2011, from CommonDreams.org
Park, W. (1990). A review of research on groupthink. *Journal of Behavioral Decision Making, 3*, 229–245.

Porter, M. E. (1980). *Competitive strategy: Techniques for analyzing industries and competitors*. New York: The Free Press.
Ptolemy, C. (1950/1952). The Almagest: I-V, in Great Books of the Western World (Vol. 15, pp. 5–7, 14–24). Encyclopedia Britannica.
Ramos-Rodríguez, A.-R., & Ruíz-Navarro, J. (2004). Changes in the intellectual structure of strategic management research: A bibliometric study of the *Strategic Management Journal,* 1980–2000. *Strategic Management Journal, 25*(10), 981–1004.
Saladoff, S. (2011). *Hot coffee*. New York: DOCUDRAMA.
Schank, R. C. (1995). *Tell me a story: Narrative and intelligence*. Chicago, IL: Northwestern University Press.
Schank, R. C. (2011). *Teaching minds: How cognitive science can save our schools*. New York: Teachers College Press.
Schwartz, N., Hippler, H.-J., Deutsch, B., & Strack, F. (1985). Response categories: Effects on behavioral reports and comparative judgments. *Public Opinion Quarterly, 49*, 388–395.
Schweiger, D. M., Sandberg, W. R., & Ragan, J. R. (1986). Group approaches for improving strategic decision making: A comparative analysis of dialectical inquiry, devil's advocacy, and consensus. *Academy Management Journal, 29*(1), 51–71.
Schwenk, C. R. (1990). Effects of devil's advocacy and dialectical inquiry on decision making: A meta-analysis. *Organizational Behavior and Human Decision Processes, 47*(1990), 161–176.
Shadish, W. R., Cook, T. D., & Campbell, D. T. (2001). *Experimental and quasi-experimental designs for generalized causal inference*. Boston: Houghton Mifflin.
Simon, H. A. (1990). Invariants of human behavior. *Annual Review of Psychology, 1*, 1–19.
Slovic, P., Monahan, J., & MacGregor, D. G. (2000). Violence risk assessment and risk communication: The effects of using actual cases, providing instruction, and employing probability versus frequency formats. *Law and Human Behavior, 4*, 271–296.
Sobel, D. (2011). Popular perceptions of Galileo. *Proceedings of the International Astronomical Union*, *6*(S269), 7–12. UK: Cambridge University Press. doi:10.1017/S1743921310007209.
Spanier, N., Woodside, A. G., & Marshall, R. (2011). *Does training about the incompetent implications of product portfolio methods eliminate their impact in decision-making?* (40 p.) (Working Paper). Boston College, Carroll School of Management, Department of Marketing.
Toomer, G. J. (1998). *Ptolemy's Almagest*. Princeton, NJ: Princeton University Press.
Toplin, R. B. (2006). *Radical conservatism: The right's political religion*. Lawrence, KS: University Press of Kansas.
Toplin, R. B. (2008, September 8). Blame Ronald Reagan for our current economic crisis. George Mason University's History News Network. Retrieved September 25, 2011, from http://hnn.us/articles/53527.html
Weems, R. (2000). *Listening for God: A ministers journey through silence and doubt*. New York: Touchstone.
Weick, K. E. (1996). Drop your tools: An allegory for organizational studies. *Administrative Science Quarterly, 41*, 301–313.
Weick, K. E. (2001). Tool retention and fatalities in wildland fire settings: Conceptualizing the naturalistic. In E. Salas & G. Klein (Eds.), *Linking expertise and naturalistic decision making* (pp. 321–336). Mahwah, NJ: Lawrence Erlbaum.
Weick, K. E. (2007). Drop your tools: On reconfiguring management education. *Journal of Management Education, 31*, 5–16.
Weick, K. E., & Sutcliffe, K. M. (2001). *Managing the unexpected*. San Francisco, CA: Jossey-Bass.
Wikipedia. (2011). Retrieved September 23, 2011, from http://en.wikipedia.org/wiki/Bernard_Madoff
Wilson, T. D. (2002). *Strangers to ourselves: Discovering the adaptive unconscious*. Cambridge, MA: Belknap Press of Harvard University Press.
Woodside, A. G. (2009). Key success and failure paths in fashion marketing strategies. *International Journal of Global Fashion Marketing, 1*, 1–8.

Woodside, A. G., Hsu, S.-Y., & Marshall, R. (2011). General theory of cultures' consequences on international tourism behavior. *Journal of Business Research, 64*, 785–799.

Woodside, A. G., & Sakai, M. Y. (2003). *Metaevaluation: Assessing alternative methods of performing evaluations and audits of planned and implemented marketing strategies. Evaluating marketing actions and outcomes* (Advances in business marketing and purchasing, Vol. 12). Amsterdam: Elsevier.

Woodside, A. G., & Sakai, M. Y. (2009). Analyzing performance audit reports of destination management organizations and outcomes. *Journal of Travel and Tourism Marketing, 26*, 303–328.

Chapter 3
Understanding and Modeling Configural Causality

3.1 Introduction

A major objective of this study is to design developmental interventions or combinations of causal conditions (used interchangeably with "teaching methods") that include managers' use of appropriate heuristics and other decision-making tools to ensure decision competency and decision confidence. This study investigates the impact of four different tools, namely: role-play or simulated interactions in goal based scenarios; using inter-active decision-making strategies; employing a devil's advocate to cause dissent and in-depth discussion; and, knowledge-based decision aids in competency and incompetent decision-making. Furthermore, this research aims to improve understanding of why managers make incompetent decisions and explores how they can be educated or supported to make competent decisions. The study extends the work of Armstrong (2003), Armstrong and Green (2005), Gigerenzer (2008), Gigerenzer and Brighton (2009) and Schank, Berhman, and Macpherson (1999) and illuminates, through data gathering and critical analysis, the conceptual deductions in developing a new theory of Decision-Competency Development Interventions (DCDI) by testing several theories with the same model.

3.2 Research Design and QCA Procedures

3.2.1 General Overview of the Method and Operational Propositions

The study includes a series of laboratory experiments that examine alternative management training methodologies and tools designed either to increase executives' competency or incompetency in decision-making. The study probes several

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propositions relating to the educational merit and impact of four teaching methods: GBS; individual versus group interactive decision-making procedures; role-play or SI; appropriate assertiveness through devil's advocate dissent; and competency and incompetency decision aids. The study tests the 13 propositions arrived at in Chap. 2.

P_1: Training via GBS (a GBS represents a specific context-case) results in more competent decision-making than inactive teacher-centred knowledge learning. [Grounded in the theories related to GBS and case-based reasoning (CBR) in action learning (Schank, 1995; Schank et al., 1999) and traditional fact-based training versus educational drama.] P_2: Competency increases by adding formal assignment of a DA role-player versus natural, unguided group interactive decision-making (a placebo condition) to group discussions in making decisions. [Grounded in the theories related to DA and SI (Armstrong & Green, 2005, 2007; De Bono, 1985, 1999; Spanier, 2011), experiential training and educational drama (Schank, 1994; Schank et al., 1999; Schank, Fano, Jona, & Bell, 1993)] P_3: The introduction of incompetency training and decision aids such as the BCG and Priority matrices results in less competent decision-making, but associates with high decision confidence.

P_4: Role-playing introduced through CBR/GBS increases decision competency versus group inter-active decision-making alone. P_{5a}: Decision-making by an individual is more effective than group decision-making when the group uses no formal group-discussion protocols (e.g. formal role-playing as introduced through GBS). P_{5b}: Group interactive decision-making (GIDM) is more effective than individual decision-making when the group uses formal group-discussion protocols (e.g. formal role-playing as introduced through GBS).

P_6: Individuals trained in contextual influences on decision-making (e.g. drop-your-tools contexts) and the use of implicit thinking (e.g. "intuitive first choice/gut feeling") make more competent decisions, compared to groups using formal group-discussion protocols. P_{7A}: The introduction of irrelevant information leads to cognitive overload and causes a greater proportion of incompetent decisions (for individual participants as well as in group interactive decisions). P_{7B}: The introduction of irrelevant information through complex decision aids leads to lower confidence in the decision (for individual participants as well as group interactive decisions).

P_8: An individual with more experience in managerial judgement and decision-making (JDM) makes more competent decisions compared to decision-making by individuals with lower levels of management (JDM) experience. P_9: Groups with higher levels of management experience make more competent decisions compared to decision-making groups with less management experience. P_{10}: Individual decision-makers with higher versus lower levels of experience in JDM make more competent decisions and are more confident in their decision competency than individual decision-makers with lower levels of experience in JDM.

P_{11}: Individuals with high versus low levels of education and JDM experience are more competent and more confident in their decision outcomes. P_{12}: Groups of participants with high levels of management experience and high levels of formal

education are less competent than individual decision-makers with high levels of management and education experience but the first condition does not associate with higher levels of confidence. P_{13}: Participants exposed to a combination of treatment conditions outperform participants who receive only one of the treatments, resulting in higher levels of decision confidence and higher levels of decision competence.

To ensure valid substantiation of propositions, a rigorous experimental research design is imperative (Anderson & Lawton, 2009), and the next section outlines the research design of this study. Chapter 4 discusses the validation procedures.

3.2.2 Research Design

True laboratory experiments investigates decision competency, using a total of 150 participants who receive four in-basket problems to investigate, analyse, and complete four case-based scenarios. In surveying the effectiveness (or not) of a predetermined selection of andragogical methods, this study exposes participants to a series of a configuration conditions likely to affect decision-makers' competency and/or the decision outcome. To implement the andragogies, configurations of conditions are designed in the form of in-basket simulations, supported by printed decision aids that have been pre-tested in several studies or as a pre-test to this study, but to the best of my knowledge, there are no studies that are either investigating this particular combination of conditions, or studying the effect on this specific target audience of MBA and graduate management students.

Participants are given four in-basket simulations covering four managerial decision-making scenarios, with one decision required for each scenario. All participants receive the same limited selection of possible answers. It is hypothesised that different combinations of andragogical methods result in different levels of competence or success in the decision outcomes. Contextual conditions are thus varied through the application of decision-aids in the form of typewritten competency and incompetency training aids as well as extraneous information. Competent decisions are predefined by a panel of experts (described in detail in Chap. 4). Participants complete the four decision exercises in a single two-hour laboratory and the configuration of conditions each participant experiences remain unchanged throughout the two hours (e.g. if they are in a group, they do not change groups during this period; if they receive a competency training aids, they do not also receive incompetency training aids). The exercises range from low cognitive decisions to high level cognitive decisions and cover a wide range of managerial topics. Implementing the study involves testing the 13 propositions with 20 groups (a total of 150 participants) in pre-test and post-test scenarios with a control-group design. The proposal requires a total of 20 groups to achieve reasonable statistical power through the application of fuzzy set quantitative content analysis (fsQCA).

This research design has four major benefits. First, the design substantially extends the research of (Gigerenzer & Brighton, 2009; Green, 2002, 2005, 2010;

Green & Armstrong, 2009; Weick, Sutcliffe, & Obstfeld, 2005) relating to training methodologies and alternative management development pedagogies that affect managerial competency or incompetency. Second, the study contributes to the body of knowledge and responds to the call for rigorous, objective and compelling research in of the field of simulations and gaming (Anderson & Lawton, 2009; Feinstein & Cannon, 2002; Feldman & Lankau, 2005; Gosen & Washbush, 2004). Gosen and Washbush (2004) report that, based on Bloom's (1956) taxonomy of learning and rigorous research design standards, "There have not been enough high quality studies to allow us to conclude players learn by participation in simulations or experiential exercises." Third, the high level of control over the experimental environment and the treatment variables (Campbell & Stanley, 1963a, b) via experimental laboratory research. Fourth, managerial development is a continual series of experiential learning interventions and this study mirrors the way managers' progress in real business life, thus ensuring high face validity (Hsu, 1989; Schippmann, Prien, & Katz, 1990). The ability to hold all other variables constant whilst administering the treatment is of extreme value to this study, hence the choice of laboratory experiments within the MBA context (Burns & Burns, 2008; Campbell & Stanley, 1963a, b).

3.3 Justification of the Paradigm and Methods

3.3.1 Selecting Appropriate Tools

Gigerenzer (1991, p. 19) informs, "Scientists' tools are not neutral". His studies shows how methods and instruments affect the way researchers analyse data, as well as how they develop theory. Woodside (2011a, b, 2013) echoes this general perspective and comments on the limitations of traditional multiple regression analysis (MRA) and structural equation modelling (SEM) to investigate and theorise about cognitive processes. Unambiguous advice from McClelland (1998), Gigerenzer and Brighton (2009), Armstrong (1991) and Woodside (2013) encourages researchers to move beyond the dominant logic of thinking of outcomes as net effects and using matrix algebra and traditional statistical methods to investigate outcome. Instead they need to think in terms of which of several factors are crucial to an outcome using Boolean algebra, set theory and algorithms for asymmetrical data analysis. To identify and analyse possible conditions necessary to improve decision competence and decision confidence, a combination of causal factors needs to be considered.

McClelland (1998) highlights the non-linear relationships between dependent and independent variables. He stresses that studies on success and competencies show that relationships are not well described by correlation coefficients. Gladwell (2001), meanwhile, describes observation by social scientists as "tipping points". He offers several examples from the social sciences (such as the decline of inner-

city crime, pedagogy and TV watching behavior) to support this tenet. He explains tipping points by referring to the impact of variances in societal factors (poverty, red tape, corruption, hours practised) make little difference to the outcome (such as epidemics; corruption; excellence in sport; executive success), until a certain critical level is achieved. McClelland (1998) executed 13 studies on causation and competency algorithms associated with managerial success. He concludes that a number of different competencies can substitute one another. This is labelled "multiple conjunctive paths" and indicates that many recipes or combinations of factors may lead to the same outcome. Outcomes are the desired results or dependent variable in traditional statistical methods. For McClelland's studies the outcome under investigation is executive success. For this study the outcomes are decision competence and decision confidence.

Mauro (1995, pp. 685–686) examines GDP growth per capita for different countries considering nine institutional factors (such as corruption, red tape, bureaucratic procedures) and concludes that "A number of mechanisms may contribute to explaining positive correlations among all categories of institutional efficiency... As a consequence, it may be desirable to combine groups of variables into composite indices". In commenting on Mauro's study, Woodside (2013) offers the following advice: "The difficulty is overcome if the researcher moves beyond thinking in terms of which of the several institutional factors are crucial; none are crucial but a few combinations of these variable are likely to associate with high levels of growth. Rather than developing theory and thinking in terms of relative impacts of independent variables, thinking in terms of alternative mechanisms (i.e. algorithms) indicates that several causal recipes relate to high economic growth". These studies add further support for the use of algorithms rather than linear relationships between variables. Some high scores in the outcome (for example GDP annual growth in Mauro's study), a low score in one antecedent condition (in his study judicial inefficiency) in combination with another antecedent (of high or low score; treatment or measured antecedent, example low corruption) may result in a high score in the outcome condition.

According to Wagemann and Schneider (2007, p. 380), "The general goal of a QCA is to support the researcher in the attempt to arrive at a meaningful interpretation of the (causal) patterns displayed by the cases under examination". QCA resembles qualitative case research in that it is inductive, considers case-based data and explanatory variables, and compares configurations of variables, called conditions or antecedents, and the outcome or lack of outcome to review, update or dictate theory. At the same time it is deductive in approach in that theory informs the criteria and calibration of both the conditions and the outcome(s), as discussed below. The next section considers the strengths and weaknesses of QCA as methodology.

3.3.2 *Justification of the Use of QCA at Epistemological and Methodological Levels*

Some difficulties occur though, in the use of qualitative comparative analysis (QCA) versus MRA. Ragin (2006a, pp. 7–8) captures these in the statement, "The search of patterns of multiple conjunctural causation[s], a common concern of case-orientated research, pose serious practical problems for variable-oriented research". He adds that sophisticated techniques such as QCA are "very rarely used by variable-oriented researchers. When they are, they require at least two essential ingredients: (1) a very large number of diverse cases and (2) an investigator willing to contend with a difficult mass of multi-collinearity. These [statistical] techniques are simply not feasible in investigations with small or even moderate Ns, the usual situation in comparative social science." (N = number of cases.)

Several key principles necessary to bridge the gap between management decision practice and research are listed in the literature. Woodside, Ko, & Huan (2012, pp. 775–776) present six methodological pillars designed to bridge the gap between management decision practice and research, and these are (in no particular order): "(1) do case-based, not variable-based analysis, thus enable the maintenance of each individual case's integrity, while enabling generalization and prediction to multiple or 'new' cases; (2) consider multiple paths associated with high outcome (s) and that paths may lead to alternative outcomes; (3) report on key paths or configurational models, rather than one key success factor that is sufficient or necessary for success or failure to occur; (4) allow participants to revisit research reports to add missing data and correct mistakes; (5) do theory-driven sampling to study prolific and rare cases, thus recognizing that averages mislead; (6) 'get out' and do the research in real-life contexts where chance observations and real-life context provides the complexity and rare insights not always possible in self-completed surveys or quasi experiments." "In QCA a cause (such as a specific conjunctive path) is sufficient if the path associates invariable (or almost invariably) with a given outcome condition" (Woodside, 2012c, p. 279). In surveying the effectiveness (or not) of a predetermined selection of andragogical methods, this study exposes participants to a series of a configuration conditions likely to affect decision-makers' competency and/or the decision outcome. To implement the andragogies, configurations of conditions are designed in the form of in-basket, supported by printed decision aids that have been pre-tested in several studies or as a pre-test to this study.

3.3.3 *Justification of Case-Based Methods*

Several scholars (Byrne & Ragin, 2009; Cooper, 2005; Kent, 2009; Schrodt, 2006; Woodside, 2011a, b) challenge traditional assumptions that case-centred methods are limited to small-N research and synonymous with qualitative research, and that

"frequentist" (Kent, 2009, p. 184) statistical methods (such as analysis of variance [ANOVA]; MRA and SEM) should be used to analyse causal relationships and offer alternative overlapping methods to replace the misconception that "linear frequentist orthodoxy [is the] sole legitimate form of social science". These dominant analytical methods "deconstruct individual case data into variables using matrix-algebra calculations" (Woodside et al., 2012, p. 766). Other social researchers and scholars (Ragin, 2008c; Woodside et al., 2012) promote the use of case-centred approaches such as cluster analysis, ethnographic decision tree modelling (EDTM) and QCA and its variants (csQCA, mvQCA and fsQCA) when frequentist approaches are counterintuitive; seem inappropriate to the task of finding patterns; when many sets of possible solutions are likely; or when the researcher expects the asymmetric relationships between low scores in antecedent conditions might be associated with low or high scores in the outcome condition (s) (Woodside et al., 2012, p. 770).

Yin (2003, p. 1) states, "In general, case studies are the preferred strategy when 'how' and 'why' questions are being posed, when the investigator has little control over events, and when the focus is on a contemporary phenomenon within some real-life context". The researcher opted for a multiple case-study research design as this is aligned with the recent resurgence of interest in case-based research (Braumoeller & Goertz, 2000; Jordan, Gross, Javernick-Will, & Garvin, 2011; Miethe & Drass, 1999; Woodside, 2011a, b) as well as the procedural requirements of QCA as method and set of techniques (Ragin, 1987; Ragin, 2006a, b, c). Ragin (1987, pp. 51–52) points out that the case study approach has a number of benefits: "First they are designed to uncover patterns of invariance and constant association [;] . . . second . . .the method is relatively insensitive to the frequency distribution of types of cases [;] . . .third, case orientated methods force investigators to consider their cases as whole entities . . . [and] fourth, case-oriented method stimulate rich dialogue between ideas and evidence". Thus, the main reason for this choice of methodology is our need to look at a combination of causation factors in developing MBA graduates' decision competencies, rather than the net effect of a set of independent variables.

A key objective of this study is to examine how various teaching methods and competency and incompetency training aid or impede the development of decision competency and confidence. This research thus takes up the challenges highlighted in this section by considering several combinations of antecedents (variables) likely to associate with high levels of decision competence and high levels of decision confidence and by selecting a methodology that expects and supports asymmetric relationships between treatment conditions and the outcome(s).

3.3.4 QCA as Method and Set of Tools

QCA is a method based on the premise of configurational causation in that it combines qualitative and quantitative methods to study the relation between

multiple factors and a specific outcome. According to Rihoux and Grimm (2006, p. 1), this research strategy is more likely to result in "in-depth insight in the complexity of the cases, while still attempting to produce some level of generalization". In contrast to net effect thinking, where each variable is considered to be able to affect the outcome or the level or probability of the outcome in isolation and regardless of the other variables, QCA considers how combinations of conditions and case aspects affect the specified outcome condition, in this study the decision competencies of the participants.

In addition, QCA techniques allow for different factors or causal paths to lead to the same outcome, termed "conjunctural causation" (Rihoux & Ragin, 2009). "Unlike more quantitative methods that are based on correlation, QCA seeks to establish logical connections between combinations of causal conditions and an outcome, the result being rules that summarize the sufficiency between subsets of all of the possible combinations of the causal conditions (or their complements) and the outcome. Each rule is a possible path from the causal conditions to the outcome" (Lambert & Fairweather, 2010, p. 1). According to Grimm and Rihoux (2006, p. 18), "By studying combinations of conditions, it is possible to unravel the conditions or contexts that enable or disable specific connections (e.g. between education and the avoidance of poverty)".

QCA is both a research strategy and a set of research tools (Jordan et al., 2011; Rihoux, 2006) and was developed by Ragin (1987) to bridge the divide between qualitative and quantitative approaches (Woodside & Zhang, 2012). Although originally designed for application in politics and historical sociology, QCA principles and the accompanying set of analytical techniques have been gaining acceptance and are now applied in a large variety of disciplines An increasing proportion of social scientists, for example, are selecting QCA for its ability to generalise findings over a relatively limited number of cases (Braumoeller & Goertz, 2000; Chan, Levitt, & Garvin, 2010; Jordan et al., 2011; Lambert & Fairweather, 2010; Miethe & Drass, 1999; Moses, Rihoux, & Kittel, 2005). Rihoux (2006, p. 680) notes that this "increasing momentum ... coincides with a renewed interest in case-oriented research".

As a research strategy, QCA's goal is to "integrate the best features of the case-orientated approach with the best features of the variable-orientated approach" (Ragin, 1987, p. 84). In essence the technique involves understanding the interplay between variables or conditions; configurations of variables and a specific outcome or absence of a specific outcome (Ragin, 1987, 2000).

QCA differs from traditional qualitative research in viewing the causal relationships as complex, asymmetric and equifinal (Wagemann & Schneider, 2007). The term equifinality refers to multiple routes to certain outcomes (Rihoux, 2006); different causal paths—distinct and relevant in a unique way—may lead to the same outcome (De Meur, Rihoux & Yamasaki, 2008). In other words, it allows for the possibility that the phenomenon can be explained by or result from several causal recipes, with several combinations of antecedent conditions generating the same outcome. Rihoux (2006) refers to this as "multiple conjunctural causation". It differs from standard statistical analysis in that sets, subsets, unions and

intersections of sets are not seen as correlated or co-variables to result into quantifiable net effects, but as sufficient conditions to develop causal claims (Ragin, 2000, 2008b). "This implies that (1) most often, it is a combination of conditions (independent variables) that eventually produces a phenomenon—the outcome (dependent variable); (2) several different combinations of conditions may produce the same outcome; and (3) depending on the context, on the con juncture, a given condition may very well have a different impact on the outcome" (Rihoux, 2006, p. 682). QCA rejects permanent causality, but views causality as context- and conjuncture-sensitive (Ragin, 1987) and "allows different configurations of cases conceived as combinations of qualitative attributes" (Ragin, 2000, p. 181).

According to Jordan et al. (2011, p. 1160), QCA is an appropriate family of configurational comparative methods to use when "the underlying question is which combination of conditions trigger a given outcome". The phenomenon that is studied, in this case the decision competencies of managers and graduate students, is conceptualised as an observable change or discontinuity and the causal antecedent conditions are considered as sets. "While an MRA model might report the 'total effect' via summing the direct and indirect net effects on an outcome variable" QCA, using Boolean-algebraic calculations "recognize the necessity of maintaining the integrity of individual cases in analyzing management decision data" (Woodside et al., 2012, p. 767). QCA and its published benefits are therefore deemed as particularly relevant to this study.

QCA also has some of the key strengths of statistical quantitative research methods. In QCA both antecedents and outcomes involve explicit criteria and are calibrated and therefore "researchers should use external, substantive criteria to define the phenomenon of interest and to evaluate its degree of expression" (Ragin, 2004, p. 14). Using Boolean algebra, membership to either the antecedent sets or the outcome sets can be quantified and can vary from full membership (1.0) to cross-over point or indifference point (0.5), to full non-membership (0.0). There are three main variants of QCA, which Table 3.1 summarizes.

As a later iteration of QCA, fsQCA uses fuzzy-set logic to allow variables between the two qualitative states (full and non-membership) at varying degrees of membership, forming a continuous "fuzzy set" (Seawright, 2005). Thus, information about antecedent conditions and outcomes are transformed into sets of

Table 3.1 Variants of QCA

Variant of QCA	Name	Variable range	Useful
csQCA	Crisp-set	Dichotomous	When variables can be defined and approximated into binary categories of present (1) and absent (0)
mvQCA	Multi-value	Multi-chotomous	When attribute values under study can reasonably be summarised into a small number of discrete options
fsQCA	Fuzzy-set	Continuous	When finer graduations in the dataset are significant and each variable can be assigned a value along a continuous range

Adapted from Jordan et al. (2011, p. 1162)

variables by creating a calibrated set ranging between the two thresholds of (0.0) non-membership and full membership (1.0). QCA researchers use theoretical information and arguments to create the calibrated set of membership and use intensive theoretical and collected knowledge of the cases to determine which empirical evidence to consider (Wagemann & Schneider, 2010).

The advantage of using Boolean algebra for scholars of management science is its ability to turn cases (conditions and outcomes) into algebraic variables and expressions, without compromising the integrity of each case. "Each individual case is considered as a complex entity, as a whole that needs to be comprehended and which should not be forgotten in the course of the analysis" (Rihoux, 2006, p. 682). Two key conditions for scientific research are (1) the ability to generalise and (2) the ability to replicate the study and its results (Campbell & Stanley, 1963a; Popper, 1963; Ragin, 1987; Rihoux, 2006). Since QCA and fsQCA rely on Boolean algebra for its key operations (where aspects and cases are essentially reduced to a series of numbers—an analytic approach), prior research results can be easily replicated, collaborated or falsified (Rihoux, 2006).

In addition, the use of Boolean minimisation algebra allows for generalisation to parsimonious causal regularities and prime implicants. "Boolean minimization; that is, reducing the long Boolean expression, which consists in the long description of the truth table, to the shortest possible expression (the minimal formula, which is the list of the prime implicants) that unveils the regularities in the data" (Rihoux & Lobe, 2008, p. 225). According to Kent (2009, p. 205), "A major advance accomplished by the configurational approach and in particular the work of Ragin is that the study of necessary and sufficient causation is moved away from temporal implication (if X then Y) to one of set theoretic inclusion (which, in set theoretic terms, can be seen as the Xs are a subset of the Ys). Only this approach can cope with situations where relationships between the variables are asymmetrical".

A key advantage of fsQCA is "its ability to corroborate or refute assumptions and theories. QCA is hence a particularly powerful tool for theory-testing . . . QCA slows one to elaborate new assumptions or theories: the minimal formula ultimately obtained can be interpreted . . . and lead the researcher to formulate new segments of theory" (Rihoux, 2006, p. 684). This is of particular importance to this study, whose main aim is to extend the theoretical proposals of Schank (1994, 1993, 1999), Armstrong and Green (2007), Gigerenzer (2004), Gilovich (1991) and Gladwell (2005) (Fig. 3.1).

As a research strategy, QCA, more recently called *crisp-set* QCA (csQCA) and its subsequent variants *fuzzy-set* QCA (fsQCA) and *multi-value* QCA (mvQCA), provides a middle-ground method between statistical analysis methods based on large-N studies (typically quantitative), which may lose the ability to examine causal links, and small-N case-oriented (typically qualitative) methods (Gross, 2010; Jordan et al., 2011; Rihoux, 2006), with their limited generalisability. Each of these approaches is best suited to a particular situation, relative to the number of cases and need to preserve the richness of the information in the data set under investigation, as illustrated in Fig. 3.2.

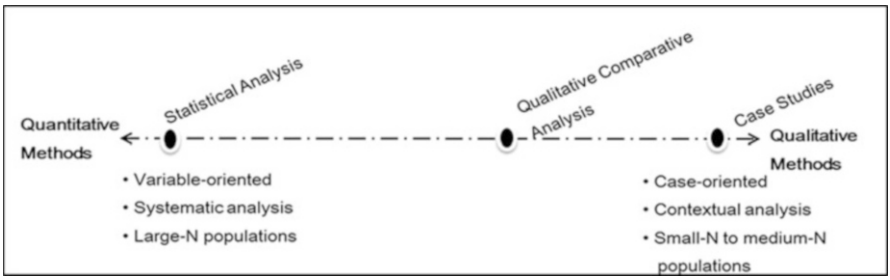

Fig. 3.1 Spectrum of research methodology (Adapted from Jordan et al., 2011, p. 1161)

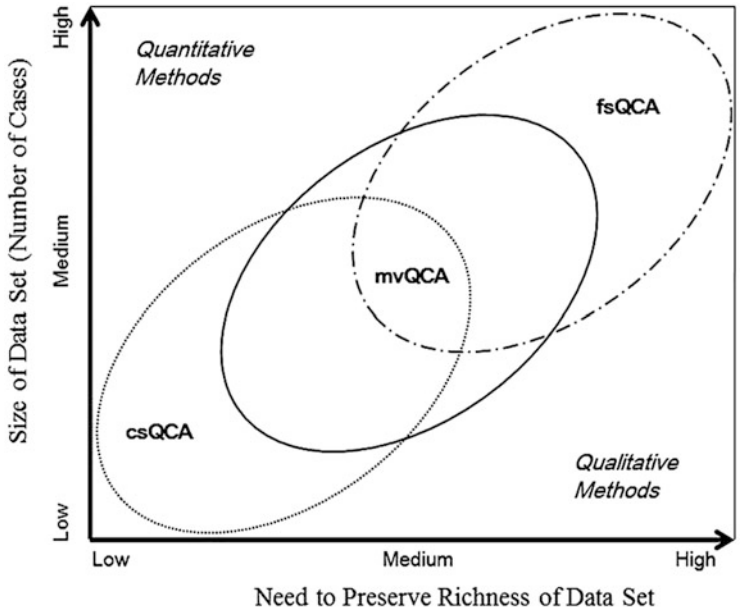

Fig. 3.2 Best use of QCA, MVQCA and fsQCA (Adapted from Rihoux, 2006)

In this experimental study, minimal loss of contextual information is likely to result from using the binary structure (1 = present; 0 = absent) of crisp sets for several of the proposed condition variables—such as group versus individual decision-making; the presence of absence of DA dissent; and the introduction of competency or incompetency training materials to the participants, making crisp-set QCA the preferred option. Other variables such as educational level and age are more complex and the anticipated complexity of the outcome (mere success = 1 or failure = 0 is not rich enough in data) of the investigation compels the use of fsQCA as the most suitable approach.

3.3.5 *Justification of the Use of Laboratory Experiments*

A series of laboratory experiments compares the relative effectiveness of alternative pedagogies on participants' decision-making and managerial competencies.

This study assesses educational value—rather than attitudes—and for this purpose a large number of assessment tools, including case-based exams, multiple choice exams, computer-based games, role-plays, card and board games, short-answer questions, essay questions, oral exams, progress tests and free recall can be selected from (Anderson & Lawton, 2009). Scholars and academic examiners require postgraduate students to display higher order skills (Easterby-Smith et al., 1991), where lower order skills (levels 1–3) are knowledge, comprehension and application, and higher order skills (levels 4–6) are analysis, synthesis and evaluation. Since our study focuses on higher order learning outcomes in Bloom's (1956) taxonomy of learning (Bloom, Englehart, First, Hill, & Krathwohl, 1956), such as analysis, synthesis and evaluation, instruments better suited and sensitive enough to assessing higher levels of learning need to be used.

3.3.6 *Justification of the Application of Simulated Interaction (SI)*

Scores of articles and conference papers laud the benefits of business simulations and offer a wide range of diverse reasons why simulations should be used by educationalists and why they are used in universities and private enterprise (Anderson & Lawton, 2009; Faria, 2001; Gosen & Washbush, 2004; Keys & Wolfe, 1988; Wolfe, 1985). In-basket assessment exercises mimic the bounded rationality (Gigerenzer & Selten, 2001; Simon, 1976) and the required levels of productivity and efficiency in real-life business environments, which call for quick decisions with limited information.

Gooding and Zimmerer (1980) point to the importance of the time aspect of simulations and although not directly tested on role-plays and in-basket simulations, experience has taught the researcher that this is an important factor to take into consideration when designing, implementing and assessing outcomes. Developing executives' decision-making and thinking competencies through role-plays and in-basket simulations allow pedagogues and HR practitioners to bring reality into the training in terms of content and time factors, whilst minimising the risk factors of expensive mistakes in business enterprises (Gooding & Zimmerer, 1980).

Armstrong and Green (2005) use experiments to investigate the accuracy and validity of simulated interaction (SI) to achieve and improve marketing graduates' competency in sales forecasting. They report on the usefulness of SI in predicting decisions in conflict situations such as negotiations. A quote from Green's (2010) website provides some insight into this method: "The group forecasting method of

simulated interaction ... allows realistic representations of group interactions and does provide accurate forecasts."

Although empirical studies in management education are few, studies concur that role-play and SIs have andragogical merit (Beaver, 1999; Brennan & Pearce, 2008; Knowles, 1998; Torbet, 1989). The early work of Meier, Newell, & Pazer (1969, p. 15) records the self-instructional benefits of SIs, whose "valuable contribution to the development of decision-making skills ... is not dependent upon practice in a realistic environment." Moreover, there is an increase in the uptake and implementation of ED and role-play to enhance management education (Brennan & Pearce, 2008; Schibrowsky & Peltier, 1995), "Role play is most prevalent amongst the learning techniques" in active learning in higher education (Lean, Moizer, Towler, & Abbey, 2006, p. 234). Lean et al. conclude that teachers use role-play in their pedagogy across a diverse range of disciplines. Gosen and Washbush (2004, p. 286) report that "there is a mild preference for simulations over other experiential modes, and there are positive learning effects—and I cannot even say this for sure because there are too few studies that used comprehensive research designs. It is the intention of this study to expand the body of knowledge through rigorous research to allow for objective, verified and generalisable results.

Educational drama (ED) in management education dates back to 1960s, with Lewin's well-known T-group teaching method for training group dynamics (Kolb & Kolb, 2008). The literature indicates the popularity, acceptance, effectiveness and widespread use of experiential learning in education in general (Andrew, 2010; Bosse, Nickel, Huwendiek, Jünger, Schulz et al., 2010; Druckman & Ebner, 2007; Evans, McGuire, & Thanyi, 2010). Compared to more conventional lecturer-centred teaching approaches (such as lectures, group-based research, reading and question-and-answer driven seminars), experience-based learning (such as video-recordings of student interactions with business professionals; in-class dramas and role-plays, simulations and other forms of educational dramas) engage the whole person—intellect (logos), feelings and senses (pathos) (see Chap. 2). The central theme which emerges from a thorough literature review as it relates to business education is that ED is not only diverse in its application across content fields and curricula, but is also, on the whole, popular with students as a learning method (Bosse et al., 2010; Brennan & Pearce, 2008; Druckman & Ebner, 2007; Pearce & Jackson, 2006). Qualitative studies on the nature and benefits of ED (Pearce, 2004; Pearce & Jackson, 2006) and quantitative studies on comparative student attitudes reveal ED's value to teachers and the role it can play in achieving soft skills acquisition and transfer (Brennan & Pearce, 2008). As mentioned before, the key objective of role-play and SI is to achieve holistic learning outcomes. Additional advantages can be directly linked to the advantages of experience-based learning (Anderson, Boud, & Cohen, 2000; Bloom, 1956; Dewey, 1963; Kolb, 1984), specifically (a) whole person engagement—cognitive, affective and senses (Beirne & Knight, 2007; Elm & Taylor, 2010; Taylor, 2003; Yanow, 2001), (b) prior learning experiences and learners' personal meaning and the relevance to the learning, and (c) self-reflection and expert-assisted reflection to improve understanding and deepen learning (Pearce, 2004). The work of Gooding and Zimmerer (1980) stresses

important secondary benefits such as enhancing the participant's self-confidence as a decision-maker.

According to the empirical work of Brennan and Pearce (2008, p. 8), students find role-play drama "an excellent method of acquiring knowledge and skills". Of the 11 teaching methods they surveyed (including assignment-based research; discussions with co-students; self-guided research; group and self-analysis of case studies; question-and-answer seminars; private reading of textbooks and articles; watching videos; lectures; and computer-based learning), students clearly scored ED the highest in terms of "how much they learn when each method is used" (Brennan & Pearce, 2008, p. 8). The authors conclude that "educational drama is a potentially valuable tool in marketing education, particularly where educational goals pertain to presentation skills, team-working skills, and confidence building" (p. 9).

3.3.7 In-baskets as an Andragogical Method

"An in-basket game presents the participant with a hypothetical work situation in which he [sic] must make a decision on a series of letters, memos and other documents deposited as incoming mail in his [sic] in-basket" (Kesselman, Lopez, & Lopez, 1982). In Keys and Wolfe's (1988) review of the literature, a number of definitions for in-basket simulations are mentioned. The following abbreviated definition is most applicable to this study: "A simulation experiential environment is a simplified and contrived situation that contains enough verisimilitude, or illusion of reality, to induce real world-like response by those participating in the exercise... [stripping away extraneous details], thereby producing an accelerated from of action so that they can be more efficient than their real-world operating environments". In more informal terms, in-basket simulations consist of a set of materials upon which participants much make rapid decisions—condensing experiences normally encountered over a far longer period in the real workplace to an hour or so.

The uses of in-basket simulations include selection tests in recruitment drives (Kesselman et al., 1982; Lopez, 1966; Randall, Cooke, & Smith, 1985; Shimko, 1992); teaching and training methods—a military technique since 1930 (Schippmann et al., 1990); and in business and educational institutions and as research instruments (Fredericksen, Saunders, & Wand, 1957; Kibbee, 1961). In-basket simulations are widely used as teaching and assessment tools for a large variety of reality-based business competencies, including sales skills and sales management competencies, skills in business communication, managerial and personality assessment, and information systems management (Castleberry, 1990; Craik, Ware, Kamp, O'Reilly, Staw et al., 2002; Pearson, Barnes, & Onken, 2006; Stearns, Ronald, Greenlee, & Crespy, 2003; Wagner, 2004). Hackney (1971) identifies a variety of decision and interpersonal skills that can be learned in simulations based on contracted time-frames including prioritising; inter-related nature of decisions; and team cooperation and coordination. Randall et al., (1985)

report on the use of in-basket simulations to assess soft skills competencies such as self-reliance, time management, and the processing abilities of sales professionals in the life insurance industry.

In-basket simulations have been used specifically in studies of managerial decision-making and other management topics (MacCrimmon & Wehrung, 1984; Tse, Lee, Vertinsky, & Wehrung, 1988). A study by Kesselman et al., (1982) reports on the use of simulations and games to predict managerial performance. The authors conclude that management games are promising tools to assist firms to assist organisations in their management and selection efforts (Kesselman, et al., 1982). In contrast to some management games—which largely focus on team and group situations—the authors place premium on the ability of in-basket cases to act as training method, selection test and research instrument for solitary management tasks and functions as opposed to other manager games which are aimed mainly at group situations and team interactions.

In the seminal work of Bloom (1956), six levels of cognitive teaching objectives are set out (see p. 15). It is often very difficult to achieve higher order learning outcomes with standard teaching practices such as lectures, questioning techniques and text reading (Pearson et al., 2006) and there is evidence in the literature that in-basket simulations assist teachers to achieve higher order learning objectives such as synthesis and evaluation (Day, 2003; Pearson et al., 2006).

Lopez (1966) identifies several advantages of the in-basket exercise and these are re-iterated by other authors: it measures insight rather than recall; the assessees (those assessed) use higher order thinking skills such as reasoning, critical thinking, problem-solving and higher order mental processes; participants can demonstrate creativity and originality; it allows participants to demonstrate social subtleties, judgement and appreciation for complexities and ambiguities; and it measures the assessors' willingness to make decisions.

Although the study includes a rigorous attempt to find literature from as wide a range of sources as possible, very little empirical work substantiates the use of in-basket simulations as an assessment and teaching tool (Kesselman, et al., 1982). However, an empirical study using four hypothetical scenarios in in-basket format cited the main benefit of this method as "its realism and its rich context, [which] in comparison with conventional tools for studying executives' decisions . . . provides more relevant decision variables to the respondents" (Tse et al., 1988). Hence, in-basket assessments are well suited to this study. Having established the validity of in-baskets as an assessment and development tool, the discussion now turns to the advantages and disadvantages of using in-basket simulations to conduct research.

3.3.8 In-baskets as Research Method

According to McGrath (1982), the research method should ideally maximise three dimensions: (1) the ability to generalise from the sample to the population; (2) the

control and precision with which to evaluate the behaviors; and (3) the realism of the setting in which the actors behave. This laboratory study uses in-basket simulations (simulated problem solving and decision-making) to allow greater control over the experimental arrangements and provide a rich contextual narrative (Tse et al., 1988). Since no single laboratory method maximises all three of the above dimensions, the experimental design was selected to ensure robustness and trustworthiness of the research findings (Campbell, 1957; Cook & Campbell, 1979); to allay doubts about validity; and because it places considerable emphasis on causality. Further, as highlighted a number of studies (Burns & Burns, 2008; Keys & Wolfe, 1988; Lant, 1989; McGrath, 1982; Schippmann et al., 1990), simulations and experiential methods allow precise measurement as the environment is a closed system and decision responses are made repeatedly over time by both the treatment and the control groups.

Darley (1999) reports two distinct advantages of using in-basket simulations that are relevant to our study: time compression and "to the degree to which a participant feels genuinely evaluated as an organizational member, it both creates involvement on the part of the participant and casts the respondent into an organizational milieu". For this study, the ability to condense a work week or perhaps even decisions normally made over an extended period of time into a two-hour time-frame will not only assist with the research process in terms of convenience and do-ability, it will also enable intensive learning opportunities with minimal impact on the normally over-full MBA programme. The second advantage relates to the verisimilitude and realism of the study and the usefulness of the research environment thus created. Unfortunately, this is simultaneously a limitation of the study, since participants are aware that the simulation is merely a role-play and may therefore react differently within the social environments and informational structures of the ecological environment of real-world organisations.

3.3.8.1 Validity and Reliability of In-basket Simulations

In-basket simulations and tests are the result of more than 60 years of research and application. The first in-basket simulation was designed by Fredericksen et al. (1957) in response to a need for assessing managers' competencies when working in solitude. Over the years in-basket simulations have gained wide acceptance and the technique is seen as useful in a variety of research, assessment and training applications (Kesselman et al., 1982; Lopez, 1966; Schippmann et al., 1990). A number of studies report on the reliability and validity of situational methods which include in-basket methods, but with mixed findings (Bray & Grant, 1966; Kesselman et al., 1982; Wollowick & McNamara, 1969).

"Evidence from several studies indicates that in-baskets could be reliably scored, although reliability values obtained were modest" (Spangenberg & Theron, 2003). Procedures for scoring the tests can be taken from the earliest work by Fredericksen et al. (1957) and Hemphill (1961) and the reviewed tests by Meyer (1970). Meyer (1970) suggests three approaches to score in-basket tests. Raters and

scorers should consider: (a) the content of the behavior; (b) the style of the behavior; and (c) the overall performance as rated by an expert. In line with Meyer (1970), split-half checks on reliability could be achieved by using two or (multiples of two) scores or raters. By dividing the completed test in half, with one half of the raters marking only odd-numbered in-basket items and the other half rating only even-numbered items, the half-tests could be correlated to obtain reliability estimates.

Inter-rater reliability was first studied in 1957 by the United States Air Force. Studies reporting on inter-rater reliability coefficients cover a wide range of values indicating a need to consider the causes of these variances. From the literature review compiled by Schippmann et al. (1990), covering 30 years of studies on in-basket performance measures, scorer/rater training and ensuring rater reliability emerges as a serious consideration for this (or any other in-basket simulation) study, hence the scoring, capturing and encoding in this study was done by a single scorer and double-checked by an independent research specialist for accuracy and any anticipated bias.

In terms of validity, most prior relevant studies provide superficial descriptions of assessment centre (AC) programmes and they are often based on perception and anecdotal evidence rather than empirical analysis and evaluative data. Jeanneret and Silzer (1998) define the method as "a process of measuring a person's knowledge, skills, abilities, and personal style to evaluate characteristics and behavior that are relevant to (predictive of) successful job performance" (p. 3). ACs are relevant to this study, as methods used in ACs often include: measures of personality, values, interests, and motives, cognitive aptitude testing instruments, work simulations, such as case analyses, in-baskets, and role-play exercises, which simulate real world scenarios, situational judgment tests, which consist of questions about relevant on-the-job situations and group interaction exercises with assessment observers (Gaugler, Rosenthal, Thornton, & Bentson, 1987). Schippmann et al.'s (1990) review concludes that "evidence of validity is at best marginal and generally higher in settings where the in-basket was specifically constructed for a defined target job. Unfortunately it appears that specifically constructed in-baskets are not very common—shelf products being used with greater frequency". This study specifically constructed four in-basket simulations. In the label "in-basket "simulation", the word simulation can be used interchangeably with "assessments" for this study, since decisions are assessed in response to the in-basket case-based simulations.

Campbell (1957) and Cook and Campbell (1979) warn against the threats of rival explanations of causal findings resulting from testing sensitivity of respondents; historic changes and natural maturation of the respondents; selection differences between groups; and causal direction ambiguities. These threats can be easily eliminated by assigning control groups and using random assignment of activities. This study followed these procedures and confidence in the findings is thus greatly enhanced.

According to Burns and Burns (2008, p. 427), "Content validity reflects the degree to which the content of a measurement reflects the intended content to be measured" The content is a sample of the universe of the content. Chapter 4

discusses the steps taken to achieve content validity in detail. Burns and Burns (2008, p. 428) define face validity as "how a measure or procedure appears . . . and reassures lay participants. . . of a test's validity simply on its design and on how professional it looks." The high realism and face validity of in-basket simulations are important advantages of the method (Keys & Wolfe, 1988; Lopez, 1966; Meyer, 1970; Schippmann et al., 1990). But face validity is insufficient for making inferences about job performance and competency development through this method. A review of 30 years of studies reporting on in-basket and assessment centre (AC) validity, claim content validity but in most cases the supporting data is lacking (Schippmann et al., 1990). Several authors (Schippmann et al., 1990; Schippmann, Hughes, & Prien, 1987) advise that systematic procedures be used to unsure that content-orientated test development procedures, including a thorough job analysis, should be followed and care should be taken to ensure that the resulting information is built into the research study. For this study, as for most, it will be especially important to determine which aspects of the test correlate with which aspects of management competency or performance. Meyer (1970) observes that "Experience in construction tests of this kind in the past had shown that the use of real a life managerial job as the position to be simulated, and the use of actual materials that had appears in the in-baskets of managers of such a job, was advisable".

In terms of the external validity of in-basket simulations, Spangenberg and Theron (2003) note that "Criterion-related validity of assessment centres is well established" (p. 29). According to Schippmann et al.'s (1990, p. 853) review, "The studies of criterion-related validity did reveal a large number of significant correlations between in-basket measures and various criteria. Thus the evidence of criterion-related validity of certain in-baskets is sufficient to support the development and use of the procedure for various decision-making purposes". It is clear from the review that construct validity will need serious consideration for a study employing in-basket simulations in its design. The authors qualify their by conclusion by noting the "differences in in-basket content, performance measure schemes and criteria across situations". Chapter 4 treats this issue in greater detail.

Reports on the predictive validity of in-basket experiments are scarce. Only two research studies (Schippmann et al., 1990; Spangenberg & Theron, 2003) report on the correlation between job performance ratings and measures and in-basket measures using predictive designs. Satisfactory predictive construct validity is reported and Spangenberg and Theron (2003, p. 31) contend that "the earlier conclusions about the usefulness of in-basket measures of performance remain valid to some degree."

Poor generalisability is one of the main weaknesses of in-basket simulations (Keys & Wolfe, 1988; McGrath, 1982), resulting from the fact that business simulations often provide realistic group decision-making contexts but not realistic organisational context. The organisational context of this study however is the educational context and therefore this limitation is negated. Another weakness highlighted in the literature is poor generalisability due to poor sample selection. In management studies, convenient samples of business students are selected rather than using more demanding sampling from real managers or multi-level hierarchies

(Cook & Campbell, 1979; Gooding & Zimmerer, 1980). In this study, however, a random sample of MBA students and executive course participants is highly matched to the overall population. To further enhance the selection, maturation and history validity, this experiment is repeated with four groups in four different tertiary education institutions.

3.4 Thought Experiments

In order to assist the researcher (and readers of this dissertation) to visualize the anticipated outcomes of this study and to develop new insights, in line with the advice of Tufte (2000) and Cohen (2005), a thought experiment is executed. Tufte (2000, p. 9) declares in his book, *Visual Explanations: Images and quantities, evidence and narrative*, "clarity and excellence in thinking is very much like clarity and excellence in the display of data. When principles of design replicate principles of thought, the act of arranging information becomes an act of insight."

Figure 3.3 shows a thought experiment on the expected hypothetical findings for this study. According to Woodside (2012a, p. 460), "A thought experiment includes a 'property space analysis' (Lazarsfeld, 1937) of possible influences in a given context and predicts likely outcomes of specific configurations (i.e., causal recipes) of antecedent conditions".

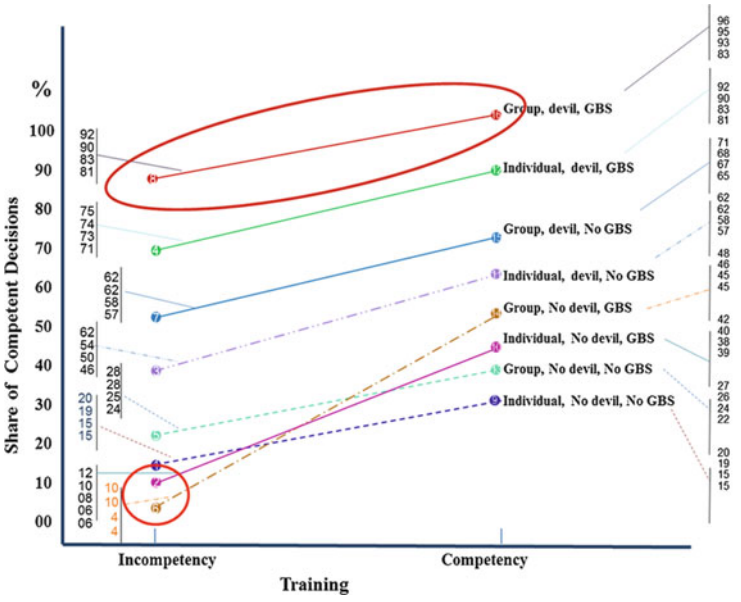

Fig. 3.3 Thought experiment on findings of sense-making and decision-making training influences on decision competency

Figure 3.3 indicates that high membership of the configuration of all four treatment antecedents (combinations of the four treatments: group interaction; GBS simulations; DA dissent; and (in)competency training) associates with high membership of the outcome antecedent (decision success). The rationale is as follows: high exposure to all four treatment antecedents simultaneously will result in high decision success since participants (1) benefit from the insight and experience of their colleagues in the group interactions (Group); (2) are exposed to the alternative and contradicting views of the DA and will thus reconsider incorrect or faulty assumption (devil); (3) benefit from GBS simulations (GBS) to become aware of the impact of decisions on other strategic business units (SBUs) which are likely to affect their decisions in a positive way; and (4) competency training (Competency) will remind participants of important heuristics and will guide students to "drop their tools" when necessary in order to improve decision outcomes. The thought experiment in Fig. 3.3 also indicates that the absence of any one of the treatment antecedents will reduce the success rate of participants. For example, participants who make decisions as individuals (and who are not exposed to group interaction) are likely to be less successful in their decisions. Further, the presence of DA dissent will compensate for the absence of GBS, since some of the considerations that might have been raised by the different role-players are likely to be raised by either group members or by the DA. In addition, it is expected that participants exposed to group interaction will show a higher share of competent decision outcomes than those participants who work as individuals only. On the whole, the upward slant of all graphs indicates that this study accepts the rationale of Armstrong and Woodside that incompetency training will result in a lower share of decision competence compared to participants who receive competency training treatments such as heuristic training (e.g. "take the best" and "drop your tools"). The slant of the graphs upwards and to the right indicates that incompetency training is expected to reduce decision success, or conversely, that competency training will, in general, result in more competent decision outcomes.

3.5 Summary

This chapter provides a general overview of the methodology and justified the decision to use case studies and experiments involving in-basket simulations. Given the nature of this study, the complexity of the outcome under investigation, and the benefits espoused in the literature, QCA, based on case-based analysis through a set of tools, is clearly indicated as the best research methodology for this study.

References

Anderson, L., Boud, D., & Cohen, R. (2000). Experience-based learning. In G. Foley (Ed.), *Understanding adult education and training* (2nd ed., pp. 225–239). St. Leonards, NSW: Allen and Unwin.

Anderson, P. H., & Lawton, L. (2009). Business simulations and cognitive learning: Developments, desires and future directions. *Simulation and Gaming, 40*(2), 193–216. doi:10.1177/1046878108321624.

Andrew, T. (2010). *Importance of role play learning activities in technology classes*. http://www.suite101.com/content/importance-of-role-play-learning-activities-in-technology

Armstrong, J. S. (1991). Prediction of consumer behavior by experts and novices. *Journal of Consumer Research, 18*(2), 251–256.

Armstrong, E. K. (2003). Applications of role playing in tourism management teaching: Evaluation of a learning method. *Journal of Hospitality, Leisure, Sport and Tourism Education, 2*(1), 5–16. doi:10.3794/johlste.21.24.

Armstrong, J. S., & Green, K. C. (2005). Demand forecasting: Evidence-based method. In L. Moutinho & G. Southern (Eds.), *Strategic marketing management: A business process approach*. Hampshire: Cengage Learning.

Armstrong, J. S., & Green, K. C. (2007). Competitor-oriented objectives: Myth of market share. *International Journal of Business, 12*(1), 116–136.

Beaver, D. (1999). *NLP for lazy learning*. Shaftesbury, England: Element Books.

Beirne, M., & Knight, S. (2007). From community theatre to critical management studies. *Management Learning, 38*(5), 591–611. doi:10.1177/1350507607083209.

Bloom, B. S. (1956). *Taxonomy of educational objectives: The cognitive domain*. New York: David McKay.

Bloom, B. S., Englehart, M. D., First, E. D., Hill, W. H., & Krathwohl, D. R. (1956). *Taxonomy of educational objectives: The classification of educational goals* (Handbook 1: The cognitive domain). New York: David McKay.

Bosse, H. M., Nickel, M., Huwendiek, S., Jünger, J., Schulz, J. H., & Nikendei, C. (2010). Peer role-play and standardised patients in communication training: A comparative study on the student perspective on acceptability, realism, and perceived effect. *BMC Medical Education, 10*(1), 27. doi:10.1186/1472-6920-10-27.

Braumoeller, B. F., & Goertz, G. (2000). The methodology of necessary conditions. *American Journal of Political Science, 44*(4), 844–858.

Bray, D. W., & Grant, D. L. (1966). The assessment center in the measurement of potential. *Psychological Monographs, 80*(17). doi:10.1037/h0093895.

Brennan, R., & Pearce, G. (2008). Educational drama: A tool for promoting marketing learning? *International Journal of Management, 8*(1), 1–9. doi:10.3794/ijme.81.237.

Burns, R. B., & Burns, R. A. (2008). *Business research methods and statistics using SSPS*. London: Sage.

Byrne, D., & Ragin, C. C. (2009). *The Sage handbook of case-based methods*. London: Sage.

Campbell, D. T. (1957). Factors relevant to the validity of experiments in social settings. *Psychological Bulletin, 54*(4), 297–312. doi:10.1037/h0040950.

Campbell, D. T., & Stanley, J. C. (1963a). *Experimental and quasi-experimental designs for research*. Boston: Houghton Mifflin.

Campbell, D. T., & Stanley, J. C. (1963b). Experimental and quasi-experimental designs for research on teaching. In N. L. Gage (Ed.), *Handbook on research on teaching* (pp. 171–246). Chicago: Rand McNally.

Castleberry, S. B. (1990). An in-basket exercise for sales courses. *Marketing Education Review, 1*, 51–56.

Chan, H., Levitt, R. L., & Garvin, M. J. (2010, November 4–6). *Collective effect of strategic, cultural and institutional factors on concession renegotiations*. Paper presented at the meeting of the Engineering Project Organization Conference, South Lake Tahoe, CA.

Cohen, M. (2005). *Wittgenstein's beetle and other classic thought experiments*. Oxford: Blackwell.

Cook, T. D., & Campbell, D. T. (1979). *Quasi-experimentation: Design and analysis for field settings*. Boston: Houghton Mifflin.

Cooper, B. (2005). Applying Ragin's crisp and fuzzy-set QCA to large datasets: Social class and educational achievement in the National Child Development Study. *Social Research Online*, *10*(2). www.socresonline.org.uk/10/2/cooper.html

Craik, K. H., Ware, A. P., Kamp, J., O'Reilly, C., Staw, B., & Zedeck, S. (2002). Explorations of construct validity in a combined managerial and personality assessment programme. *Journal of Occupational and Organizational Psychology, 75*(2), 171–193. doi:10.1348/09631790260098758.

Darley, J. M. (1999). Methods for the study of evil-doing actions. *Personality and Social Psychology Review, 3*(3), 269–275. doi:10.1207/s15327957pspr0303_9.

Day, N. E. (2003). Can performance raters be more accurate? Investigating the benefits of prior knowledge on performance dimensions. *Journal of Managerial Issues, 7*, 323–343.

de Bono, E. (1985). The CoRT thinking program. In J. W. Segal, S. F. Chipman, & F. Glaser (Eds.), *Thinking and learning skills volume 1: Relating instruction to research*. New York, NY: Routledge.

De Bono, E. (1999). *Six thinking hats*. New York: Little, Brown and Company.

De Meur, G., Rihoux, B., & Yamasaki, S. (2008). Addressing the critiques of CQA. In B. Rihoux & C. Ragin (Eds.), *Configural comparative methods, qualitative comparative analysis (CQA) and related techniques*. Thousand Oaks, CA: Sage.

Dewey, J. (1963). *Experience and education*. New York: Collier.

Druckman, D., & Ebner, N. (2007). Onstage or behind the scenes? Relative learning benefits of simulation role-play and design. *Simulation and Gaming, 39*(4), 465–479. doi:10.1177/10468787311377.

Easterby-Smith, M., Thorpe, R., & Lowe, A. (1991). *Management research: An introduction 1*. London: Sage.

Elm, D. R., & Taylor, S. S. (2010). Representing wholeness: Learning via theatrical productions. *Journal of Management Inquiry, 19*(2), 127–136. doi:10.1177/1056492609360407.

Evans, G. J., McGuire, M., & Thanyi, D. (2010). *Using environmental consulting as a team design project: Role play to reality*. http://library.queensu.ca/ojs/index.php/PCEEA/article/view/3099/3037

Faria, A. J. (2001). The changing nature of business simulation/gaming research. *Simulation and Gaming, 32*(1), 97–110. doi:10.1177/104687810103200108.

Feinstein, A. H., & Cannon, H. M. (2002). Constructs of simulation evaluation. *Simulation and Gaming, 33*(4), 425–440. doi:10.1177/1046878102238606.

Feldman, D. C., & Lankau, M. J. (2005). Executive coaching: A review and agenda for future research. *Journal of Management, 31*(6), 829–848. doi:10.1177/0149206305279599.

Frederiksen, N., Saunders, D. R., & Wand, B. (1957). The in-basket test. *Psychological Monographs: General and Applied, 71*(9), 1–28. Mail Scanner has detected a possible fraud attempt from "psycnet.apa.org.ezproxy.aut.ac.nz" claiming to be http://dx.doi.org/10.1037/h0093706.

Gaugler, B. B., Rosenthal, D. B., Thornton, G. C., III, & Bentson, C. (1987). Meta-analysis of assessment center validity. *Journal of Applied Psychology, 72*, 493–551.

Gigerenzer, G. (1991). From tools to theories: A heuristic of discovery in cognitive psychology. *Psychological Review, 98*(2), 254–267. doi:10.1037//0033-295X.98.2.254.

Gigerenzer, G. (2004). Fast and frugal heuristics: The tools of bounded rationality. In D. Koehler & N. Harvey (Eds.), *Blackwell handbook of judgment and decision making* (pp. 62–88). Oxford: Blackwell.

Gigerenzer, G. (2008). Why heuristics work. *Perspectives on Psychological Science, 3*(1), 20–29. doi:10.1111/j.1745-6916.2008.0058.x.

Gigerenzer, G., & Brighton, H. (2009). Homo Heuristicus: Why biased minds make better inferences. *Topics in Cognitive Science, 1*, 107–143. doi:10.1111/j.1756-8765.2008.01006.x.

Gigerenzer, G., & Selten, R. (2001). *Bounded rationality—the adaptive toolbox*. Massachusetts, MA: MIT Press.

Gilovich, T. (1991). *How we know what isn't so*. New York: Free Press.

Gladwell, M. (2001). *The tipping point: How little things can make a big difference*. London: Little, Brown Book Group.

Gladwell, M. (2005). *Blink: The power of thinking without thinking*. New York: Little Brown Company.

Gooding, C., & Zimmerer, T. (1980). The use of specific industry games in the selection, orientation and training of managers. *Human Resource Management, 20*(3), 300–318. doi:10.1002/hrm.3930190105.

Gosen, J., & Washbush, J. (2004). A review of the scholarship on assessing experiential learning effectiveness. *Simulation and Gaming, 35*(2), 270–293. doi:10.1177/1046878104263544.

Green, K. C. (2002). Forecasting decisions in conflict situations: A comparison of game theory, role-playing and unaided judgment. *International Journal of Forecasting, 18*, 321–344.

Green, K. C. (2005). Game theory, simulated interaction, and unaided judgment for forecasting decisions in conflicts: Further evidence. *International Journal of Forecasting, 21*(3), 463–472. doi:10.1016/j.ijforecast.2005.02.006.

Green, K. C. (2010). *Forecasting methods*. Retrieved November 19, 2012, from http://www.forecastingprinciples.com/index.php?option=com_content&task=view&id=16&Itemid=16

Green, K. C., & Armstrong, J. S. (2009). Role-thinking: Standing in other people's shoes to forecast decisions in conflicts. *MPRA Paper*, *16422* (July), 1–8.

Gross, M. E. (2010). *Aligning public-private partnership contracts with public objectives for transportation infrastructure*. PhD thesis. Virginia Technicon, Virginia, VA. http://scholar.lib.vt.edu.ezproxy.aut.ac.nz/theses/available/etd-08242010-173605/unrestricted/Gross_ME_D_2010.pdf

Hackney, N. (1971). The fine art of management make-belief. *Management Review, 60*(11), 44–47.

Hemphill, J. K. (1961). Why people attempt to lead. In L. Petrulo & B. Bass (Eds.), *Leadership and interpersonal behavior* (pp. 201–215). New York, NY: Holt Rhinehart & Wilson.

Hsu, E. (1989). Role-event gaming simulation in management education. *Simulation and Games, 20*(4), 409–438. doi:10.1177/104687818902000402.

Jeanneret, R., & Silzer, R. (Eds.). (1998). *Individual psychological assessment: Predicting behavior in organizational settings*. San Francisco: Jossey-Bass.

Jordan, E., Gross, M. E., Javernick-Will, A. M., & Garvin, M. J. (2011). Use and misuse of qualitative comparative analysis. *Construction Management and Economics, 29*(11), 1159–1173. doi:10.1080/01446193.2011.640339.

Kent, R. (2009). Case-centred methods and quantitative analysis. In D. Bryne & C. C. Ragin (Eds.), *The Sage handbook of case-based methods*. London: Sage.

Kesselman, G. A., Lopez, F. M., & Lopez, F. E. (1982). The development and validation of a self-report scored in-basket test in an assessment center setting. *Public Personnel Management Journal, 11*, 228–238.

Keys, B., & Wolfe, J. (1988). Management education and development: Current issues and emerging trends. *Journal of Management, 14*(2), 205–229. doi:10.1177/-14920638801400205.

Kibbee, J. M. (1961). *Model building for management games*. Paper presented at the meeting of the Simulation and gaming: A symposium, New York.

Knowles, M. (1998). *The adult learner: The definitive classic in adult education and human resource development*. Houston, TX: Gulf Publishing.

Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. Englewood Cliffs, NJ: Prentice Hall.

Kolb, D. A., & Kolb, A. (2008). Experiential learning theory: A dynamic holistic approach to management learning, education and development. In S. J. Armstrong & C. Fukami (Eds.), *Handbook of management learning, education and development*. London: Sage.

Lambert, S. J., & Fairweather, J. R. (2010). *The socio-technical networks of technology users' innovation in New Zealand: A fuzzy-set qualitative comparative analysis*. Canterbury, New Zealand: Lincoln University. http://hdl.handle.net/10182/3339.

Lant, T. K. (1989). *Simulation games: A research method for studying organizational behavior*. Unpublished manuscript, New York University.

Lazarsfeld, P. F. (1937). Some remarks on the typological procedures in social research. *Festschrift fur Sozialforschung, 6*, 119–139.

Lean, J., Moizer, J., Towler, M., & Abbey, C. (2006). Simulations and games: Use and barriers in higher education. *Active Learning in Higher Education, 7*(3), 227–242. doi:10.1177/1469787406069056.

Lopez, F. M. (1966). *Evaluating executive decision-making: The in-basket technique* (AMA Research Study, Vol. 75). New York: American Management Association.

MacCrimmon, K., & Wehrung, D. A. (1984). The risk in-basket. *Journal of Business, 57*(July), 367–387.

Mauro, P. (1995). Corruption and growth. *Quarterly Journal of Economics, 110*(3), 681–712. doi:10.2307/2946696.

McClelland, D. C. (1998). Identifying competencies with behavioral-event interviews. *Psychological Science, 9*(5), 331–339. doi:10.1111/1467-9280.00065.

McGrath, J. E. (1982). Dilemmatics: The study of research choices and dilemmas. In J. E. McGrath, J. Martin, & R. A. Kulka (Eds.), *Judgment calls in research*. Beverly Hills, CA: Sage.

Meier, F. C., Newell, W. T., & Pazer, H. L. (1969). *Simulation in business and economics*. Englewood Cliffs, NJ: Prentice-Hall.

Meyer, H. (1970). The validity of the in-basket test as a measure of managerial performance. *Personnel Psychology, 23*(3), 297–307. doi:10.1111/j.1744-6570.1970.tb01657.x.

Miethe, T. D., & Drass, K. A. (1999). Exploring the social context of instrumental and expressive homicides: An application of qualitative comparative analysis. *Journal of Quantitative Criminology, 15*(1), 1–21. doi:10.1023/A:1007550704282.

Moses, J., Rihoux, B., & Kittel, B. (2005). Mapping political methodology: Reflections on an European perspective. *European Political Science-EPS, 4*(1), 55–68. doi:10.1057/palgrave.eps.2210006.

Pearce, G. (2004). The advantages (benefits) and disadvantages (weaknesses) of educational drama. *International Journal of Management Education, 4*(2), 29–45.

Pearce, G., & Jackson, J. (2006). Today's educational drama: Planning for tomorrow's marketers. *Marketing Intelligence and Planning, 24*(3), 218–232. doi:10.1108/02634500610665691.

Pearson, M. M., Barnes, J. W., & Onken, M. H. (2006). Development of a computerized in-basket exercise for the classroom: A sales management example. *Journal of Marketing Education, 28*(3), 227–236. doi:10.1177/0273475306291467.

Popper, K. (1963). *Conjectures and refutations: The growth of scientific knowledge*. London: Routledge.

Ragin, C. C. (1987). *The comparative method: Moving beyond qualitative and quantitative Strategies*. Berkeley, CA: University of California Press.

Ragin, C. C. (2000). *Fuzzy-set social science*. Chicago: University of Chicago Press.

Ragin, C. C. (2004). *Redesigning social inquiry [Slide-show PPT]*. http://eprints.ncm.ac.uk/379/1/RSDI-RMF.pdf

Ragin, C. C. (2006a). How case-orientated research challenges variable-orientated research. *Comparative Social Research, 16*, 27–42.

Ragin, C. C. (2006b). The limitations of net-effect thinking. In B. Rihoux & H. Grimm (Eds.), *Innovative comparative methods for policy analysis. Beyond the quantitative-qualitative divide* (pp. 13–41). New York: Springer.

Ragin, C. C. (2006c). Set relations in social research: Evaluating their consistency and coverage. *Political Analysis, 14*(3), 291–310. doi:10.1093/pan/mpj019.

Ragin, C. C. (2008b). *Redesigning social inquiry*. London: University of Chicago Press.

Ragin, C. C. (2008c). *Redesigning social inquiry: Fuzzy sets and beyond*. Chicago: University of Chicago Press.
Randall, E. J., Cooke, E. F., & Smith, L. (1985). A successful application of the assessment center concept to the salesperson selection process. *Journal of Personal Selling and Sales Management, 5*, 53–62.
Rihoux, B. (2006). Qualitative comparative analysis (QCA) and related systematic comparative methods: Recent advances and remaining challenges for social science research. *International Sociology, 21*(5), 679–706. doi:10.1177/0268580906067836.
Rihoux, B., & Grimm, H. (2006). *Innovative comparative methods for policy analysis*. New York: Springer.
Rihoux, B., & Lobe, B. (2008). The case for qualitative comparative analysis (QCA): Adding leverage for thick cross-case comparison. In D. Byrne & C. C. Ragin (Eds.), *The Sage handbook of case-based methods* (pp. 222–242). Thousand Oaks, CA: Sage.
Rihoux, B., & Ragin, C. C. (2009). *Configurational comparative methods*. London: Sage.
Schank, R. C. (1994). *What we learn when we learn by doing*. Evanston, IL: Northwestern University Press.
Schank, R. C. (1995). *What we learn when we learn by doing*. Evanston, IL: Institute for the Learning Sciences Northwestern University. http://cogprintes.org/637/1/LearnbyDoing_Schank.html.
Schank, R. C., Berhman, T. R., & Macpherson, K. A. (1999). Learning by doing. In C. M. Reigeluth (Ed.), *Instructional-design theories and models: A new paradigm of instructional theory*. Mahwah, NJ: Erlbaum.
Schank, R. C., Fano, A., Jona, M., & Bell, B. (1993). *The design of goal-based scenarios*. Evanston, IL: Northwestern University Press.
Schibrowsky, J. A., & Peltier, J. W. (1995). The dark side of experiential learning activities. *Journal of Marketing Education, 17*(1), 13–24. doi:10.1177/027347539501700103.
Schippmann, J. S., Hughes, G. L., & Prien, E. P. (1987). The use of structured multi-domain job analysis for the construction of assessment center methods and procedures. *Journal of Business and Psychology, 1*(1), 353–366. doi:10.1007/BF01018144.
Schippmann, J. S., Prien, E. P., & Katz, J. A. (1990). Reliability and validity of in-basket performance measures. *Personnel Psychology, 43*(4), 837–859. doi:10.1111/j.1744-6570.1990.tb00685.x.
Schrodt, P. (2006). Beyond the linear frequentist orthodoxy. *Political Analysis, 14*(3), 335–339. doi:10.1093/pan/mpj013.
Seawright, J. (2005). Qualitative comparative analysis vis-à-vis regression. *Studies in Comparative International Development, 40*(1), 3–26. doi:10.1007/BF02686284.
Shimko, B. W. (1992). Pre-hire assessment of the new work force: Finding wheat (and work ethic) among the chaff. *Business Horizons, 35*(3), 60–66.
Simon, H. A. (1976). *Administrative behavior* (3rd ed.). New York: Free Press.
Spangenberg, H. H., & Theron, C. C. (2003). Validation of the high performance leadership competencies as measure by an assessment centre in-basket. *SA Journal of Industrial Psychology, 29*(2), 29–38. doi:10.4102/sajip.v29i2.106.
Spanier, N. (2011). *Competence and incompetence training, impact on executive decision-making capability: Advancing theory and testing*. Doctoral thesis. Auckland University of Technology, Auckland, New Zealand.
Stearns, J. M., Ronald, K., Greenlee, T. B., & Crespy, C. T. (2003). Contexts for communication: Teaching expertise through case-based in-basket exercises. *Journal of Education for Business, 78*(4), 213–219. doi:10.1080/08832320309598603.
Taylor, S. S. (2003). Knowing in your gut and in your head: Doing theatre and my underlying epistemology of communication. *Management Communication Quarterly, 17*(2), 272–279. doi:10.1177/0893318903256239.

Torbet, W. R. (1989). Leading organizational transformation. In R. Woodman & W. Pasmore (Eds.), *Research in organizational change and development* (Vol. 3, pp. 83–116). Greenwich, CT: JAI.

Tse, D. K., Lee, K., Vertinsky, I., & Wehrung, D. A. (1988). Does culture matter? A cross-cultural study of executives' choice, decisiveness, and risk adjustment in international marketing. *Journal of Marketing, 52*(4), 81–95. doi:10.2307/1251635.

Tufte, E. R. (2000). *Visual explanations: Images and quantities, evidence and narrative*. Cheshire, CT: Graphics Press.

Wagemann, C., & Schneider, C. Q. (2007). *Standards of good practice in qualitative comparative analysis (QCA) and fuzzy sets*. Compasss working paper, WP2007-51.

Wagemann, C., & Schneider, C. Q. (2010). Qualitative comparative analysis (QCA) and Fuzzy-Sets: Agenda for a research approach and a data analysis technique. *Comparative Sociology, 9* (3), 376–396. doi:10.1163/156913210X12493538729838.

Wagner, C. (2004). Teaching information systems via action memos. *Journal of Information Systems Education, 15*(1), 5–7.

Weick, K. E., Sutcliffe, K. M., & Obstfeld, D. (2005). Organizing and the process of sensemaking. *Organizational Science, 16*(4), 409–421. doi:10.1287/orsc.1050.0133.

Wolfe, J. (1985). The teaching effectiveness of games in collegiate business schools. *Simulation and Games, 16*, 251–288.

Wollowick, H. B., & McNamara, W. J. (1969). Relationship of the components of an assessment center to management success. *Journal of Applied Psychology, 53*, 348–352.

Woodside, A. G. (2011a). *Case study research: Theory, methods, practice*. Bingley, England: Emerald Group.

Woodside, A. G. (2011b). Responding to the severe limitations of cross-sectional surveys: Commenting on Rong and Wilkinson's perspectives. *Australasian Marketing Journal, 19*(3), 153–156. doi:10.1016/j.ausmj.2011.04.004.

Woodside, A. G. (2012a). Consumer evaluations of competing brands: Perceptual versus predictive validity. *Psychology & Marketing, 29*(6), 458–466.

Woodside, A. G. (2012c). Proposing a new logic for data analysis in marketing and consumer behavior: Case study research of large-N survey data for estimating algorithms that accurately profile X (extremely high-use) consumers. *Journal of Global Scholars of Marketing Science: Bridging Asia and the World, 22*(4), 277–289. doi:10.1080/21639159.2012.717369.

Woodside, A. G. (2013). Moving beyond multiple regression analysis to algorithms: Calling of adoption of a paradigm shift from symmetric to asymmetric thinking in data analysis and crafting theory. *Journal of Business Research*, 10. doi:10.1016/j.jbusres.2012.12.02

Woodside, A. G., Ko, E., & Huan, T. C. (2012). The new logic in building isomorphic theory of management decision realities. *Management Decision, 50*(5), 765–777. doi:10.1108/00251741211227429.

Woodside, A. G., & Zhang, M. (2012). Identifying X-consumers using causal recipes: "Whales" and "Jumbo Shrimps" Casino Gamblers. *Journal of Gambling Studies, 28*(1), 13–26. doi:10.1007/s10899-011-9241-5.

Yanow, D. (2001). Learning in and from improvising. *Reflections on Society for Organizational Learning and MIT, 2*, 58–62.

Yin, R. (2003). *Case study research: Design and methods* (3rd ed.). Thousand Oaks, CA: Sage.

Chapter 4
Laboratory Experiments of Configural Modeling

This chapter provides an overview of the laboratory experiments in this study and outlines the numerous methodological considerations for the application of fsQCA, a modification the QCA method. A description of the in-basket simulations and decision aids used in the laboratory experiments is provided, followed by a, step-by-step description of the research procedure.

4.1 Design of the Laboratory Experiments

The study was originally designed as a laboratory experiment involving 96 participants in 12 sessions with (see numbers 1–12 in the columns labelled "Cell #" in Table 4.1.). This would have resulted in a total of 384 decisions, since each respondent would have completed decisions for each of the four in-basket simulations.

A total of 153 MBA students responded to the invitation and attended the decision-making laboratories, but due to incomplete responses three completed in-baskets simulation cases were rejected, resulting in 150 cases in the study (see Table 4.2). The experiments consisted of either groups with four members per group making interactive decisions or groups comprising four individuals making individual decisions. The study was executed 10 times to allow the opportunity to test and retest, replicate and adjust. The number of participants in each group and the number of individual participants is shown in Table 5.1 below.

The study utilised a series of four in-basket simulations and role-plays simulating decision-making scenarios. Three decision categories (Human Resource Management, Marketing, and General Management) were tested in four in-basket simulations, combining simulated interactions (SIs) as well as independent thought. Each participant received four in-basket problems to investigate, analyse and resolve.

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Table 4.1 Initial research design: 12 configurations of conditions (384 units/96 participants)

Competency/ Incompetency decision aids (1 ≡ Competency 2 ≡ Incompetency)	Individual (I) or Group (G)	Devil's Advocate (Yes ≡ D) (No ≡ F)	Cell.# No GBS Units/ Decisions (Code N)	Code to indicate configuration of conditions	Cell.# GBS Units/ Decisions (Code B)	Total Units/ Decisions	Total cases
Incompetency ≡ 2	I	No ≡ F	**1.** n = 8/32	↲INF2 IBF2↲	**2.** n = 8/32	16/64	16
Incompetency ≡ 2	G	No ≡ F	**3.** n = 8/32	↲GNF2 GBF2↲	**4.** n = 8/32	16/64	16
Incompetency ≡ 2	G	Yes ≡ D	**5.** n = 8/32	↲GND2 GBD2↲	**6.** n = 8/32	16/64	16
Competency ≡ 1	I	No ≡ F	**7.** n = 8/32	↲INF1 IBF1↲	**8.** n = 8/32	16/64	16
Competency ≡ 1	G	No ≡ F	**9.** n = 8/32	↲GNF1 GBF1↲	**10.** n = 8/32	16/64	16
Competency ≡ 1	G	Yes ≡ D	≡ n = 8/32	↲GND1 GBD1↲	**12.** n = 8/32	16/64	16
Units			N = 48/192		N = 48/192	N = 96/384	n/a
Total participants			48		48	n/a	96

Note: Although $2^4 = 16$ combinations can logically be expected with four conditions; the four treatments (IND1, IND2, IBD1, IBD2) Individuals in role-plays employing devil's advocate dissent as decision aid were excluded from this study
The ≡ symbol indicates the code that signifies a specific condition

Table 4.2 Research design: configurations of conditions & number of units

Combination of conditions	# of Units number of decisions	Cell CODE	Cell CODE	# of Units number of decisions	Combination of conditions
~group • ~ gbs • ~ devil • comp	22 / 88	**INF1**	**GNF1**	9 / 36	group • ~ gbs • ~ devil • comp
~group • ~ gbs • ~ devil • ~ comp	25 / 100	**INF2**	**GBF2**	12 / 48	group • ~ gbs • ~ devil • ~ comp
~group • gbs• ~ devil • ~ comp	21 / 84	**IBF1**	**GBF1**	12 / 48	group • gbs • ~ devil • comp
~group • gbs • ~ devil • ~ comp	19 / 76	**IBF2**	**GBF2**	13 / 32	group • gbs • ~ devil • ~ comp
group • ~ gbs • devil • comp	8 / 32	**GND1**	**GND2**	9 / 36	group • ~ gbs • devil • ~ comp
Actual number of students = 95			*Actual number of students = 55*		
Actual number of decisions = 380			*Actual number of decisions = 220*		
comp ≡ Competency training **Code 1** devil ≡ Devil's advocate **Code D** group ≡ Group **Code G** gbs ≡ Goal-based scenarios **Code B**			~comp ≡ Incompetency training **Code 2** ~devil ≡ No devil's advocate dissent **Code F** ~group ≡ Individuals; **Code I** ~gbs ≡ No goal-based scenarios Code N		

Note: Combinations are recorded as coded strings and as Boolean algebraic equations in this table. Interpreting Boolean algebraic equations is discussed later in this chapter

Participants were asked for decisions on business issues such as the selection of marketing media exposure, pricing, key account management, key talent development, and event venue selection. The problems ranged from low cognitive difficulty to high cognitive difficulty as per Bloom's (1956) taxonomy of learning objectives. All four simulations were pre-tested with two groups, involving six senior faculty in the marketing and management disciplines and three to four senior business executives in private enterprise. A post-test only design was used to confirm or contradict the asymmetrical relationships between the antecedents of competencies and incompetencies in executive decision-making.

As Table 5.1 displays, the original plan for the study was to test the impact of four conditions, resulting in $2^k = 2^4 = 16$ (k = number of conditions) configurations. Only 12 configurations could logically be considered, since treatments of individual participants would not practically allow for the inclusion of a devil's advocate (DA) role-player in the decision-making process. Each of the 12 configurations of conditions investigates the impact on a minimum of 8 participating MBA students or units. The Boolean algorithms and numbers are displayed in Table 4.2 below.

The implemented laboratory experiment involved 150 MBA alumni and current MBA students at four universities in New Zealand. Each participant completed the two-hour simulation in the laboratory. Each of the participants received an information sheet and was briefed about the procedures and prepared for the group, or

individual, decision process. Every participant completed a post-test questionnaire to collect demographic and attitudinal data and was debriefed after completion. In alignment with ethics requirements, all participants are given the opportunity to opt out and attend a further debriefing meeting after all experiments were completed. Not a single participant took up the invitation to attend the second debriefing meeting, but all participants indicated the wish to receive the research results. The briefing sheet, information sheet and debriefing sheet can be found in Appendix B.

4.1.1 Administration of the Experimental Treatments

Potential participants were invited to participate in different laboratories at the different campuses at different points in time, exposing between 8 and 64 participants to the treatments any one point in time. The laboratories were held at 10 different times between January 2012 and April 2012, starting at Auckland University of Technology in Auckland, and ending with Victoria University MBA students in Wellington, New Zealand. The researcher took meticulous care to ensure that the instructor, support material, instruments and physical context remain almost exactly the same during the course of the experiments. Conditions were meticulously recorded before, during and after each of the experimental laboratories.

As participants arrived for the experiment, they received a set of materials (in-basket simulations and decision aids and support materials, collated into pre-packaged sets) encoded by treatment code (see Table 4.2 above). Note that the cells in this study alternate between individual (~group/I) and group treatments, where a cell is a group of people who received exactly the same set of materials, with the same configuration of treatment conditions, and is represented by a treatment code, e.g. INF1. . The tilde ~ sign indicates "not" in Boolean algebra and is explained in more depth in paragraph 4.2.6 on page 131). In not-group (**~group**) cells, participants worked on their own, without assistance from or interaction with other participants.) All participants received printed (competency or incompetency) training matter and four in-basket simulations (and additional support material) for consideration (see Appendix C for examples of the decision aids and written training materials). All decision sheets and demographic sheets were coded with the treatment code, but participants were not made aware of the meaning or position of these codes (this code/terminology is not used in any of the instructions for the participants).

Every participant received a set of the same four in-basket simulations with the same four business scenarios and problems to solve. The problems under consideration ranged from low cognitive difficulty to high cognitive difficulty (Bloom, 1956). Decision-makers were provided with printed (competency or incompetency) training matter as decision aids for the four in-basket simulations (and additional support material) for consideration. During each 2-h laboratory experiment, four

training methods were probed: goal-based scenario (GBS) including simulated interaction (SI); group interactive decision-making (G) (Schank, Berhman, & Macpherson, 1999); devil's advocates (DA) black hat thinking (De Bono, 1976); decision-matrix training through the Boston Consulting Group matrix (BCG) and knowledge-based teaching aids. Each in-basket had one main cased-based decision to be made. Participants received a finite range of possible answers from which they could select their preferred choice—the one they would recommend to their prospective clients.

In the groups (indicated with the code "G" in Tables 4.1 and 4.2 above), problem solving was done via group interaction (instructions provided in Appendix B). Where SI was part of the treatment, four role-players were identified and participants' roles were pre-allocated (for detailed descriptions of the roles, see Appendix C for instructions and descriptions of the roles of Vice President (VP): Marketing, VP: Sales & Advertising, VP Operations and VP: Talent & Development). The pre-allocated roles were initially hidden from all prospective participants when they entered the laboratory and only become known once they opened the packs and found the props (i.e. a sash and a button indicating their role). For those groups where DA dissent was indicated (coded "D" in Table 4.2), all participants were provided with an instruction sheet (see Appendix B) and one member of the group received a black hat, a coat button, and a red sash to wear as visible reminders of his/her role to provide caution and highlight potential issues and difficulties with group suggestions. Participants exposed to the GBS treatment condition (indicated with B; those participants who were not exposed to GBS are coded with N) received instructions (see Appendix B) based on the work of Schank, Fano, Jona, and Bell (1993). The research propositions were tested in SI, a form of role-playing (Armstrong, 2006) for all groups where GBS (coded B in Tables 4.1 and 4.2) was indicated. Green (2002, 2005) reports 57 % less forecast errors relative to expert judgement forecasts when participants use SI. According to Armstrong, "simulated interaction is particularly useful in conflicts such as . . . buyer/seller negotiations, union management relations [and] legal cases" (Armstrong, 2006, p. 9). Since the focus of this study is the development of soft skill competencies such as reasoning and other sense-making heuristics, this forecasting method will be a useful teaching method and decision aid from which it is reasonable to expect a high level of accuracy (See the detailed discussion of internal and external validity Sect. 4.3 below).

Since configurations of the conditions are investigated, not all participants were exposed to the same four training methods. Some learners/participants were only exposed to KBT materials. The KBT competency and incompetency training aids deserve special attention and are discussed in Sect. 4.1.2 below.

Where simulated interaction is part of the treatment, four role-players (Vice President (VP): Marketing & Sales, VP: Accounting, VP: Talent & Development, and VP: Operations) are identified and participants were pre-allocated (at random) to the roles. In some cases the role of Operations Manager was replaced by an alternative fourth role, i.e. the DA. Clear briefs were provided to prepare participants for these roles (see Appendix B). Problem solving was done in isolation for

cells with individual participants (~group). In this case, individual participants were be instructed to "wear different hats" when considering alternative decisions. Physical props (such as hats and buttons) were provided to identify the role-players. Groups resolved problems employing SI or role-play, but where no GBS or SI was in the configuration of conditions, groups were left to their devices and natural instincts for interaction. All groups received brief instructions to facilitate group interaction, whether they were exposed to GBS and SI or not (see Appendix B).

4.1.2 Competency and Incompetency Teaching Aids

Decision-makers are often unconsciously incompetent and use ineffective heuristics. Teaching tools or developmental aids that aid in overcoming conscious and unconscious debilitating habits and tools are keen interest in the present study. In a bid to overcome decision-makers' unconscious incompetence; unconscious childhood biases; implicit cultural training; "leaps to conclusion"; and other competency reducing or debilitating factors, KBT competency training aids were provided to some participants. The laboratory experiments include competency aids which highlighted the context and relevant information and advised against groupthink, consensus and unnecessary complexity (i.e., suggested "dropping tools") but did not provide additional facts or improved information to support the decision-makers' decision processes or procedures (the competency and incompetency teaching aids can be found in Appendix C, and differ substantially for each of the in-basket simulations). Some participants (unbeknownst to them) received deliberate incompetency training and decision aids, to act as a placebo. Incompetency aids covered content traditionally taught in business school courses such as the BCG matrix, priority weighting matrices, market share, and customer and profit orientation. For further discussion of the use of incompetency training in organisations and in formal instruction see Woodside (2012).

4.2 Application of Qualitative Comparative Analysis (QCA) as Method

QCA identifies and studies a specific outcome, along with the combinations of causally relevant antecedents affecting that outcome (Ragin, 2008c; Rihoux, 2006; Woodside & Zhang, 2012). Defining the outcome(s) of interest to a study is the most important aspect, more important than either selecting cases or configuring the conditions (variables) that distinguish one case from another (Jordan, Gross, Javernick-Will, & Garvin, 2011). The application of QCA as a research

methodology involves numerous procedures which are addressed in this section. Figure 4.1 outlines the terms and abbreviations used in the following discussion.

For a detailed guide of the 15 dialogues the researcher has to follow along the QCA approach, See Rihoux and Lobe's (2008, pp. 221–242) detailed guide and 15 steps as Fig. 4.2 illustrates.

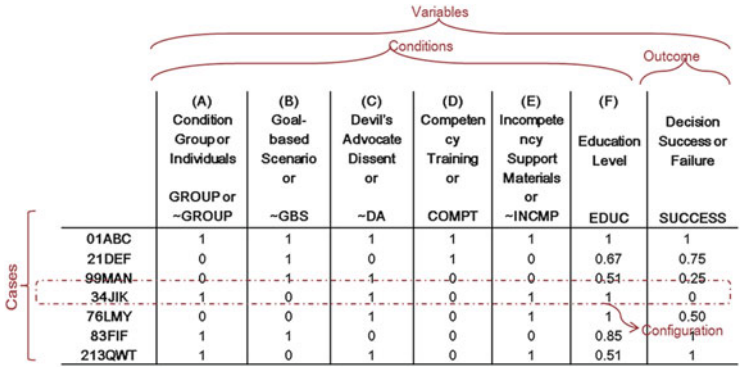

Fig. 4.1 QCA nomenclature (Adapted from Gross, 2010)

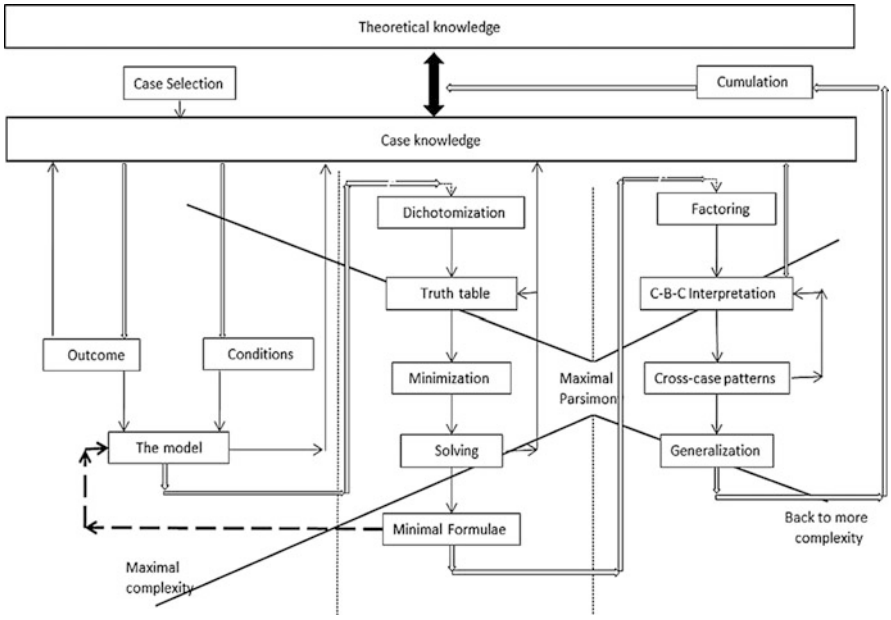

Fig. 4.2 QCA and the concrete steps and feedback loops (Adapted from Rihoux & Lobe, 2008, p. 238)

4.2.1 Definition of the Outcome of Interest

The first step, culminating from the literature review during which likely variables are identified, is the definition of the outcome. This critical first step assists in the identification of cases with sufficient representation of the each of the sought outcome(s). The characterisation of outcome is specifically limited to decision- and sense-making competencies and decision confidence. Decision competence for the four in-basket simulations was theoretically grounded, as set out in Chapter 2. In addition, the validity of this selection was reviewed by senior management executives and senior scholars with extensive experience and theoretical knowledge in the disciplines of general, human resource (HR), key account, and events management. They concurred that the simulations had verisimilitude and that the outcomes accurately reflected decision competency, noting that decision competency is complex and challenging and is likely to differ substantially by age, education level, managerial experience level, and decision strategy and/or the exposure to a range of andragogical treatments. Since participants were all MBA students or recent MBA alumni (who had graduated less than 3 years prior to the study), careful deliberation by the experts and deliberate analysis of participants' age, education level and experience resulted in unanimous agreement that the conditions of age, education level and managerial experience can be combined as a single condition. Further, scholars involved in the pre-tests questioned the ability of any instrument to be sensitive enough to "detect the impact of a single learning experience such as a simulation" on a student's ability, given a lifetime spent as learner (Anderson & Lawton, 2009, p. 206). Since QCA is not studying net effect but the impact of several causal conditions on a well-defined outcome within a specific context, this concern is realistic but not relevant to the nature and intent of this particular study.

4.2.2 Selecting Cases

The definition of outcome(s) is followed by an iterative process of selecting cases and conditions to ensure that the selected set of cases exposed to the configuration of causal conditions exhibit the range of outcomes (Fig. 4.3).

4.2.2.1 A. Type of Cases

A case is effectively the unit of analysis of this research and according to Kent (2009, p. 194), "each case [can be seen] as a particular combination of characteristics—as a configuration. Only cases with identical configurations can be seen as the 'same type of case'". For the purposes of this research, the proposed case unit of analysis is an MBA student with a specific level of managerial experience who is exposed (in controlled laboratory studies) to a specific combination of andragogical

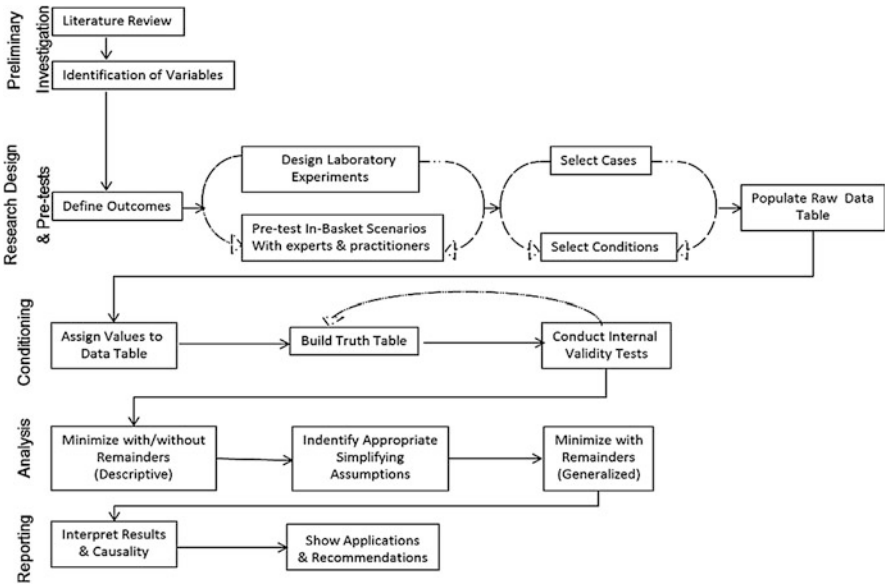

Fig. 4.3 Research design and process (Adapted from Gross, 2010; Jordan et al., 2011)

conditions. Each case is selected to represent a variety of ages, genders, educational levels, experience levels. In addition each case had, due to their participation in the laboratory, been recently exposed to a finite selection of decision support aids, including theoretical frameworks and extracts from peer-reviewed journal articles. The "Truth Table" (see Table 4.14) shows the number of cases (frequency) that possess the logically possible combination of "causal" conditions likely to affect the outcome of interest, in this case the participants' decision competency or incompetency.

According to Byrne and Ragin (2009), it is desirable in selecting cases for inclusion to achieve sufficient variety in both conditions and outcome in order to ensure robust analysis. Although this may appear to be improper manipulation of the data set, the resulting heterogeneity of condition and outcome is appropriate for QCA methods, since the method's logic is not probabilistic. QCA considers causality—it does not consider whether more or fewer cases exhibit certain characteristics—which "contributes to the richest possible explanation of relationships among the widest array of data" (Gross, 2010, p. 40). The real interest of this study is in the existence of a specific combination of implicants and the resulting outcomes within the context, hence the pursuit of maximum heterogeneity in types of cases selected, where implicants are those conditions which remain after all superfluous conditions are removed and only the most parsimonious solutions, which leads to the outcome, remains (Rihoux & Lobe, 2008).

4.2.2.2 B. Number of Cases

Different variants of QCA are more suited to certain data set sizes (see Fig. 3.1). QCA literature avoids rigid data set size requirements, since data set size is closely linked to the studied outcome and the number of conditions considered likely to affect the outcome (see the next section). A further important consideration when determining data set size is the researcher's ability to gain sufficiently rich and empirically intimate knowledge about each individual case (Berg-Schlosser & De Meur, 2009). In a workshop on practical considerations for QCA, Fiss (2011) offers valuable advice regarding the ratio of cases to variables to ensure that "real data" can be distinguished from "random data" and warns against situations where the ratio of cases drops below tested thresholds. Fiss's (2009) suggested ratios are shown in Table 4.3.

Set size and resulting data space grow exponentially with each additional independent condition and thus the number of possible combinations of conditions quickly exceeds the number of empirically observed combinations (Ragin, 1987; Rihoux, 2006). In addition, authors point out that cases that display all logically possible combinations "might be unlikely to occur in practice or be hard to detect or measure" because "size decreases the chance that very logically possible combination will have an empirical referent" (Fielding & Warnes, 2009, p. 281). Berg-Schlosser and De Meur (2009, p. 27) point out the QCA algorithm can produce robust results "even with large amounts of empty data space", thus non-observed cases, called "logical remainders", are not objectionable and have been justified (Ragin & Rihoux, 2004; Rihoux, 2006). Authors suggest small-N data sets require between 1 and 4 cases, intermediate-N sets in the range between 5–10 or 6–100, and large-N sets to exceed 100 cases (Ragin & Rihoux, 2004; Rihoux & De Meur, 2009). When applying csQCA—where variables can only assume binary values (0 or 1)—a total of 2^n (n = number of conditions) data sets are required for analysis. For the mvQCA method, the number of possible configurations is calculated by considering the number of values possible for each condition, and multiplying said number with the value for each of the variables (Ragin & Rihoux, 2004). This study involves ten conditions: one 7-value condition (**age_c**), one 6-value condition (**educ_c**), three 4-value conditions (**age, man_exp, conf_c** and **chng_c**) and five 2-value conditions (**gender, group, devil, gbs** and **comp**) resulting in $7 \times 6 \times 4 \times 4 \times 4 \times 2 \times 2 \times 2 \times 2 \times 2 = 86{,}016$ possible

Table 4.3 Ratio of causal conditions to cases

Number of causal conditions	Suggested number of cases (Marx, 2006)
4	10–12+ cases
5	13–15+ cases
6	16–25+ cases
7	27–29+ cases
8	36–45+ cases

Source: Fiss (2009)

Table 4.4 Crisp set and fuzzy set variables

Crisp set	Three-value fuzzy set	Four-value fuzzy set	Six-value fuzzy set	"Continuous" fuzzy set
1 = Fully in	1 = Fully in	1 = Fully in	1 = Fully in	1 = Fully in
			0.8 = Mostly but not fully in	Degree of member is more "in" than "out":
		0.75 = More in than out	0.6 = More or less in	$0.5 < x_i < 1$
	0.5 = Neither fully in nor fully out	0.5 = Neither fully in nor fully out	0.5 = Cross-over: neither fully in nor fully out	0.5 = Cross-over: neither fully in nor fully out
		0.25 = More out than in	0.4 = More or less out	Degree of membership is "out" than "in":
			0.2 = Mostly but not fully out	$0 < x_i < 0.5$
0 = Fully out	0 = Fully out	0 = Fully out	0 = Fully out	0 = Fully out

Source: Ragin (2000, p. 156)

configurations of conditions. For this study, the five of the eight variables have binary values, thus assisting in keeping the data space manageable and the number of cases for this study well within the range for either mvQCA or fsQCA, and the case size suggested by Fiss. (2-Value conditions are also called crisp sets and for a more detailed explanation of 4-value and 6-value conditions see Table 4.4. For the calibrated values of conditions in this study, see Tables 4.5, 4.6 and 4.7.)

4.2.3 Selecting Causal Conditions

"The key philosophy of QCA as a technique is to (start) by assuming causal complexity and then (mount) an assault on that complexity" (Ragin, 1987, x). As a third step in the research design process, the researcher populates the raw data table, in which each case displays a combination of conditions and an outcome or outcomes.

4.2.3.1 A. Identifying Conditions

"Conditions are the variables that distinguish one case from another . . . and may influence the outcome under analysis" (Jordan et al., 2011, p. 1162). The selection process is an important part of the QCA methodology; it is generally grounded in

Table 4.5 Crisp set scoring (values) for dichotomous conditions

Condition variable name	Degree of membership	CS Score
Group Inter-active Decision-making or **group**	Participated in inter-active group decision-making events	1
	Participated in the decision laboratory as an individual with NO group interaction	0
Goal-Based Scenario Simulated Interactions **gbs**	Exposed to Goal-based Scenario briefing with instructions to play specific role in the simulated interaction	1
	Did receive Goal-based Scenario briefing and did not receive any instructions to participate in role-play	0
Devil's Advocate Dissent Role-play **devil**	Instructions to consider the perspective of a devil's advocate and a briefing document and the concomitant badge, hat and sash was present during the deliberations	1
	No instructions regarding any specific dissent, caution or possible down-sides were included	0
Competency Training & Decision Support Aids **comp**	Decision Support Aids included specific aids developed by scholars and theorists to assist in conscious deliberation were included with the in-basket information	1
	Decision Support Aids included specific aids highlighted by scholars and theorists are leading to increased incompetency in decision-making were included with the in-basket information (1-comp = −comp = incmp)	0

Table 4.6 Statistics: Calibration of fuzzy sets for antecedents (demographics and experimental treatments)

	Measured antecedents			Treatment antecedent	
	Age	Education	Management experience	Overall confidence	Overall success
Code	age_c	educ_c	man_exp_c	conf_tot_c	success_tot_c
Median	4	3	0.5	3	4
Minimum	1	1	1	1	1
Maximum	7	5	4	4	7
Calibration values at					
95 %	6	5	4	4	6
50 %	4	3	3	3	4
5 %	2	1	2	1.5	2

Note: Refer to Table 4.7 for the spread of values in the original demographic sets
See Truth Table in Appendix E for full details of calibrated values for all cases and all antecedents

theory and is likely to be an iterative process. To select initial causal conditions for consideration and analysis, Amenta and Poulsen (1994) and Yamasaki and Rihoux (2009) recommend five alternative strategies. (1) The comprehensive approach

Table 4.7 Fuzzy set scoring (values) for the measured antecedents: age, education and experience

Indicators	Codes used in data table ≡ Standard/Category specified by the participant	Frequency	%	Fuzzy score
Age (age_c)	1 ≡ 21–25 years old	0	0.00	0.01
	2 ≡ 26–30 years old	29	19.3	0.12
	3 ≡ 31–35 years old	27	18.0	0.27
	4 ≡ 36–40 years old	31	20.8	0.27
	5 ≡ 41–45 years old	23	15.3	0.82
	6 ≡ 46–50 years old	23	15.3	0.95
	7 ≡ 50+ years old	17	11.3	0.99
Education (edu_c)	1 ≡ No formal management education	31	20.7	0.05
	2 ≡ Bachelor's degree	23	15.3	0.33
	6 ≡ Diploma in Business	14	9.3	0.11
	3 ≡ Post-graduate education	28	18.7	0.5
	4 ≡ Post Masters' Degree	5	3.3	0.82
	5 ≡ Master's Degree	49	32.7	0.95
Management experience: in Decision-Making (man_exp_c)	1 ≡ No management decision-making experience	2	1.3	0
	2 ≡ One to five years experience: 1–5 years	57	38.0	0.05
	3 ≡ Six to ten years experience: 6–10 years	45	30.0	0.5
	4 ≡ More than 10 years experience: > 10 years	46	30.7	0.95

where the full array of possible factors is considered in an iterative process. (2) The perspective approach, where a set of conditions representing two theories are tested in the same model. (3) The significance approach, where the conditions are selected on the basis of statistical significance criteria. (4) The second look approach, where the researcher adds one or several conditions that are considered as important although dismissed or overlooked in a previous analysis. (5) The conjunctural approach, where conditions are selected based on joint interactions among theories which predict multiple causal combinations for a certain outcome. This study applied the second strategy, where theories are tested in the same experimental model. The preliminary list of conditions posited at the outset of the study was:

- Age (age)
- Gender (gender)
- Education level (educ)
- Experience in management (man_exp)
- Confidence (conf)
- Group interaction (group)
- Simulated interaction in goal-based scenarios (gbs or GBS)
- Inclusion or absence of the devil's advocate (devil)

- Competency training materials (comp)
- Incompetency decision aids (incmp or ~ comp).

All conditions have been previously identified by scholars and tested with practitioners as significant influences on competency or incompetency. The first three conditions (age, educ, man_exp) as well as the inclusion of a DA role-player (devil) merit further explanation (see Sect. 4.2.3.3).

4.2.3.2 B. Number of Conditions

Researchers advise against too large a number of conditions, as it adds complexity to the logic space, thus making it difficult to interpret the results. Berg-Schlosser and De Meur (2009, p. 28) recommend keeping the ratio between number of conditions and number of cases balanced and offer the following guidance: "The ideal balance is not a purely numerical one and will most of the time be found by trial and error. A common practice in an intermediate-N analysis (say 10–40 cases) would be to select from 4 to 6–7 conditions". Given the moderate to large number cases (N = 150 for this study), having ten conditions specific to each in-basket simulation (group, gbs, devil, comp, age, gender, man-exp; bask*i*, conf*i* and chng*i*) is considered acceptable.

Berg-Schlosser and De Meur (2009) suggest various procedures such as discriminant analysis to identify strong bivariate relationships, and factor analysis to create composite conditions, where multiple conditions contribute to the same dimension. This study implements QCA procedures and Boolean algebra to determine the least number of factors that account for the common variance of the three variables of age, education level and level of managerial experience. These composite calibrated factors are indicated with the labels age_c; educ_c and man_exp_c. The set theoretic methods on which the fsQCA procedures are based enable researchers to investigate configurations of causal conditions with causal paths represented in Boolean algebraic form, thus enabling redundant variables to be identified and deleted (Ragin, 1987, 1994, 2000), resulting in parsimonious equations.

4.2.3.3 C. Alternative Conditions for Future Consideration

As with the list of outcomes, the QCA conditions were reviewed by experienced educationalists and management practitioners. The experts suggest additional or alternative conditions to expand the study: unconscious deliberation (and/or delayed decision-making); providing learners with checklists composed by experts; the impact of a decision-coach providing situational feedback and additional training as a complement to the heuristics (e.g. take-the-best [Gigerenzer & Goldstein, 1996]). Such investigations would require additional data fields and more detailed case data to accommodate all possible configurations of conditions and

should be repeated with pre- and post-test results (temporal data sets required to detect the influence of time lapsed on the deliberation and decision-making outcomes); they clearly reasonable and worthwhile directions for future research but were beyond the scope of this investigation. Also, since this study is interested in a selection of causal paths, and QCA investigates causal conditions on a pre-defined outcome—in contrast to net effect investigation by statistical methods—investigation of the suggested causal conditions can be taken up by further studies at a later stage.

An obvious variable for consideration in management decision competency is ethnicity. Although ethnicity data has been gathered for each case, this study is purely interested in the efficacy of particular andragogical methods on decision competency or incompetency for MBA students in general. The possible effect of cultural conditions on decision (competency or incompetency) outcomes as well as their impact on decision confidence could be analysed in future research projects.

4.2.4 Scoring Cases: Conditions and Outcomes

Once the outcomes, conditions and cases are determined, the researcher collects raw data and assigns values for each QCA variable (see Appendix D for the raw data). The allocated scores designate the degree of membership to a predetermined set, in contrast to a variable approach which attempts to place each case on a continuum of relative values. A score of 1 indicates full membership of the set, and a score of 0 indicates non-membership or exclusion of a variable. If only 0 and 1 is indicated (as in the presence of absence of a treatment condition such as the DA, this set of values is called a crisp set. FsQCA and mvQCA permit both binary values (0,1) and multiple threshold values (see Table 4.4). The researcher must be able to clearly and transparently justify all threshold values on theoretical or empirical grounds to ensure reliability of the study and its results (Rihoux & De Meur, 2009).

Table 4.4 captures two aspects of diversity: difference in condition and difference in degree to which the condition is present or not present, and illustrates the general idea behind fuzzy sets. In the three-value fuzzy set an extra value is added to the crisp set, namely 0.5. This value indicates membership of cases that are neither fully in nor fully out of the set in question (e.g. payment of an invoice may be neither quick—less than 30 days, nor long—more than 60 days, so in this example 45 days may be given the mid-level value of 0.5). The table sets out different levels (four-, six-, and continuous) of fuzzy sets, each respectively more finely tuned to the level of membership than the one before. All fuzzy sets of three values or more utilise levels above and below the "crossover point" of 0.5 and the two qualitative states of "fully in" and "fully out". The researcher calibrates data using substantive knowledge of each case, as well as theoretical knowledge (Ragin, 2009) to determine the number of values in the fuzzy set. The researcher purposefully calibrates each condition to indicate "the degree of membership to a well-defined and specified set" (Ragin, 2008a, b, c, d, p. 30).

For this study some conditions are clearly dichotomised, such as group (participants were either in a group or not); gbs, devil, comp (incmp = ~comp). Participants either received this type of decision support aid or received the incompetency training aids. No participant received neither and thus a simple crisp set membership of 1 = full inclusion and 0 = full exclusion (Ragin, 2007a) will suffice. Crisp scores for the four treatment antecedents (used inter-changeably with the term conditions) are set out in Table 4.5. Note that according to fsQCA methods the absence of a condition is labelled with a tilde (~) and its value is 1- (value of the present condition). Thus ~ group = 1-group. So if the score for a particular case is (say) 0.99 for its group condition, then the ~ group value for that case is 1−0.99 = 0.01. Note that for this study ~ comp = incmp; cases that did not receive competency training decision aids in all cases received incompetency decision aids. Thus **1-comp = incmp = ~comp.** For the condition **gender**, males received the crisp score of 1, whilst female participants **(~male)** = 1-male = 1−1 = 0 = female.

In contrast to the crisp sets above, the antecedent conditions age (age), education (educ) and managerial experience (man-exp) can be characterised in terms of differences in degree. It is important to note that calibration of fuzzy sets is not merely positions of each case relative to another; it is a calibration relative to a standard. The standard is either a generally agreed upon or conventional standard (e.g. poverty standards set by the United Nations); or a standard based on "accumulated substantive knowledge . . . that resonates appropriately with existing theory" and is thus set by the researcher (Ragin, 2007a, p. 7). According to Ragin (2007a, p. 17), these groupings can be "preliminary and open to revision" based on increased understanding and dialogue between the cases and the findings. In this case the target set is defined as students with a postgraduate qualification (note that some participants were still in the process of acquiring a MBA degree) with more than 5 years' management experience.

Each of the variables in the raw data is calibrated using the fsQCA programme and the sub-routine of the "indirect method of variable calibration" (Ragin, 2008a, b, c, d, p. 84). The researcher specifies three values for calibrating the scale: the original value covering 95 % of the data, 50 % of the data values and 5 % of the data values. Table 4.6 provides the original statistics and the calibrated values of the treatment and measured antecedents of this study. Table 4.7 provides an overview of the calibrated values as performed by the fsQCA software. Full details for each case can be found in the Truth Table in Appendix D.

4.2.5 Calibrating the Outcome: Decision Competency or Incompetency

The central focus of this study is that decision-making competencies improve substantially when participants receive support by using SI to extract directive feedback from peers in groups; overcome deference when prompted to dissent by peer-enacted role-playing (e.g. DA); and place themselves mentally within the

context either in action learning-by-doing through experiential learning, through role-play, or by envisaging the context of the enactment of the decision. The study investigates previous research findings (e.g. Armstrong & Brodie, 1994; Spanier, 2011) suggesting that incompetency training is effective in increasing incompetency in executive decision-making and outcomes, and attempts to confirm and extend these prior findings through the analysis of empirical data.

The definition and understanding of decision competency or incompetency (broadly termed decision success and coded as **success_c** in the data and truth tables) has been vastly aided by scholars such as Gigerenzer, Boyatzis and Mintzberg. The standard educational measure of success and commonly acceptable level of pedagogical success is a pass mark—a student needs to achieve above 50 % in a test or examination to be seen as "having successfully completed the assessment event." Unfortunately real-life business decisions are not so easily assessed as "right" or "wrong." Therefore, decision competency/incompetency as an outcome for cases in this study is remarkably fuzzy and not merely dichotomous as in "yes, successful" or "no, not successful." Tables 4.8 and 4.9 illustrate the fuzzy set score for two different calibrations of overall decision success. Reflecting the traditional view of educators that a pass mark is at least 50 % of the total marks possible, this study ascribes success according to the degree to which participants have supplied "best/correct" answers for each of questions in the four in-baskets simulations, as identified by the experts.

Table 4.8 Fuzzy scoring for outcome condition: Overall decision competence (success-tot)

Outcome	Standard of competency	Frequency	%	Fuzzy score
Achieved decision-competency (success-tot)	1 out of 4 correct	20	13.3	0.01
	2 out of 4 correct	61	40.7	0.33
	3 out of 4 correct	54	36.0	0.67
	4 out of 4 correct	15	10.0	0.99

Note: Calibrated by defining threshold values for full membership (0.99), full non-membership (0.01) and degree of membership

Table 4.9 Fuzzy scoring for outcome condition: overall decision competence (bool_success)

Outcome	Standard of competency	Frequency	%	Fuzzy score
Achieved decision-competency (success_tot)	1 out of 4 correct	20	13.3	0.01
	2 out of 4 correct	61	40.7	0.33
	3 out of 4 correct	54	36.0	0.67
	4 out of 4 correct	15	10.0	0.99
Achieved decision-competency calculated using Boolean Algebra (bool_success)	Some answers incorrect	135	90.0	0.01
	All answers correct	15	10.0	0.99

Note: bool_success is calibrated Boolean Algebra and the fsQCA software, thus only cases will all four answers correct will receive the full membership score of 0.99

In the in-basket simulations, therefore, participants had to have selected the best/correct answer for two of the four simulations. The first outcome (**success_tot**) is aggregated over all four simulations using the median and the scale is calibrated using the QCA sub-routine to calibrate fuzzy scores. Overall decision success is calculated in the second outcome **(bool_success)** by applying Boolean algebra, which delivers the minimum value over the four decision outcomes for four in-baskets or minimum (X_i), where X is the crisp score for each separate in-basket and is each of the 4 in-basket answers.

Two additional implicants are considered for decision success/failure, namely (1) the participants' confidence in their decisions and (2) their likelihood to change their decision "should you be asked to review them in two weeks' time". Participants are asked to indicate their confidence in the recorded decision on a Likert scale of 1–4, with 1 = "not very confident" and 4 = "very confident; and the likelihood of changing their mind on another Likert scale of 1–4, with 1 = "very likely to change" and 4 = "I will not change my decision at all. I will stick to my current decision". These confidence (conf*i*) and likelihood to change (chng*i*) outcomes were recorded and captured separately by each participant for each of the in-basket simulations (Tables 4.10, 4.11, 4.12, 4.13).

4.2.6 Constructing the Truth Table

The next step after calibrating the conditions and outcome(s) is to construct a "truth table" (Ragin, 2007b). In a truth table (see Table 4.14) variables are no longer

Table 4.10 Fuzzy scoring for outcome antecedents for in-basket simulation 1

Outcomes	Standard of competency	Frequency	%	Fuzzy score
Achieved decision-competency (bask 1)	Incorrect answer	33	22	0.01
	Correct answer	117	78	0.99
Decision confidence (conf1_c)	1 ≡ Not very confident	3	2	0.01
	2 ≡ Somewhat confident	9	6	0.33
	3 ≡ Confident	71	47.3	0.67
	4 ≡ Very confident	67	44.7	0.99
Likelihood of changing the decision after deliberation (chng1_c)	1 ≡ Very likely to change my decision	0	0	0.01
	2 ≡ Somewhat likely to change my decision	17	11.3	0.33
	3 ≡ I am unlikely to change my decision. I will stick with my decision.	84	56.0	0.67
	4 ≡ I will not change my decision, I will stick with my current decision.	49	32.7	0.99

Table 4.11 Fuzzy scoring for outcome antecedents for in-basket simulation 2

Outcomes	Standard of competency	Frequency	%	Fuzzy score
Achieved decision-competency (bask 2)	Incorrect answer	29	19.3	0.01
	Correct answer	121	80.7	0.99
Decision confidence (conf2_c)	1 ≡ Not very confident	2	1.3	0.01
	2 ≡ Somewhat confident	16	10.7	0.33
	3 ≡ Confident	76	50.7	0.67
	4 ≡ Very confident	56	37.3	0.99
Likelihood of changing the decision after deliberation (chng2_c)	1 ≡ Very likely to change my decision	1	0.7	0.01
	2 ≡ Somewhat likely to change my decision	23	15.3	0.33
	3 ≡ I am unlikely to change my decision. I will stick with my decision.	87	58	0.67
	4 ≡ I will not change my decision. I will stick with my current decision.	39	26	0.99

Table 4.12 Fuzzy scoring for outcome antecedents for in-basket simulation 3

Outcomes	Standard of competency	Frequency	%	Fuzzy score
Achieved decision-competency (bask 4)	Incorrect answer	101	67.3	0.01
	Correct answer	49	32.7	0.99
Decision confidence (conf4_c)	1 ≡ Not very confident	1	0.7	0.01
	2 ≡ Somewhat confident	14	9.3	0.33
	3 ≡ Confident	70	46.7	0.67
	4 ≡ Very confident	65	43.3	0.99
Likelihood of changing the decision after deliberation (chng1_c)	1 ≡ Very likely to change my decision	1	1.3	0.01
	2 ≡ Somewhat likely to change my decision	16	10.7	0.33
	3 ≡ I am unlikely to change my decision. I will stick with my decision.	85	56.7	0.67
	4 ≡ I will not change my decision. I will stick with my current decision.	47	31.3	0.99

isolated or distinct aspects of cases, but are treated as components of configurations that still allow for the retention of the uniqueness of each case.

Each row in the truth table represents a unique configuration of conditions with a single threshold value for each condition and each outcome for that case. The truth table lists all logically possible combinations of conditions and the outcomes displayed by each case (in this case each participating MBA student). It sorts the

Table 4.13 Fuzzy scoring for outcome antecedents for in-basket simulation 4

Outcomes	Standard of competency	Frequency	%	Fuzzy score
Achieved decision-competency (bask 4)	Incorrect answer	72	48.0	0.01
	Correct answer	78	52.0	0.99
Decision confidence (conf4_c)	1 ≡ Not very confident	0	0.0	0.01
	2 ≡ Somewhat confident	9	6.0	0.33
	3 ≡ Confident	72	48.0	0.67
	4 ≡ Very confident	69	46.0	0.99
Likelihood of changing the decision after deliberation (chng4_c)	1 ≡ Very likely to change my decision	1	0.7	0.01
	2 ≡ Somewhat likely to change my decision	15	10.0	0.33
	3 ≡ I am unlikely to change my decision. I will stick with my decision.	70	46.6	0.67
	4 ≡ I will not change my decision. I will stick with my current decision.	64	42.7	0.99

cases by the combinations of causal conditions they exhibit, using reasonable subsets of these conditions, from "recipes that seem especially promising" (Ragin, 2008a). As described earlier, all possible logical combinations of causal conditions are considered, even when no empirical instances are present in the study (Ragin, 2008a). The number of configurations is 2^k where k is the number of causal conditions; $k = 10$ for this study, resulting in 1024 configurations. When no observed empirical case is present it is termed logical remainders. There are three basic operations the software performs: negation; logical OR, and logical AND (Ragin, 2009, p. 94).

Negation

The tilde sign (~) indicates negation and is calculated as follows:

$$(\text{Membership in set } \textit{not-A}) = 1 - (\text{membership in } \textit{set A}), \text{ also } :\sim \mathbf{A} = \mathbf{1} - \mathbf{A}.$$

In this study, for example, negating the set of participants with high age transforms the set to not-high age (i.e. younger participants). For crisp set membership the scores thus change from 1 to 0 and from 0 to 1. For fuzzy set membership, full membership of 0.99 will be negated to 0.01. The only score that does not change is that of maximum ambiguity, 0.5. The tilde (~) indicates either the absence of the treatment (for **group**, **comp**, **devil** and **gbs**) or, for measured antecedents (age, experience and education), lower levels.

Logical AND

The intersection of two or more sets is calculated by *logical AND* (Ragin, 2009, p. 96). The QCA software determines the minimum membership score for each case

Table 4.14 Extract of calibrated data in the Truth Table

Case	case	group	gbs	devil	comp	bask1	conf1_c	chg1_c	bask2	conf2_c	chg2_c	bask3	conf3_c	chg3_c	bask4	conf4_c	chg4_c
9	9	0.99	0.99	0.01	0.01	0.99	0.67	0.67	0.01	0.67	0.33	0.99	0.99	0.99	0.01	0.67	0.67
10	10	0.99	0.99	0.01	0.01	0.99	0.67	0.33	0.99	0.99	0.99	0.01	0.99	0.67	0.99	0.99	0.99
11	11	0.99	0.99	0.01	0.01	0.99	0.67	0.67	0.99	0.67	0.67	0.01	0.67	0.67	0.99	0.67	0.67
12	12	0.99	0.99	0.01	0.01	0.99	0.67	0.67	0.99	0.33	0.33	0.01	0.67	0.67	0.99	0.99	0.99
13	13	0.99	0.99	0.01	0.01	0.99	0.67	0.67	0.99	0.67	0.99	0.01	0.67	0.67	0.99	0.67	0.67
14	14	0.99	0.01	0.01	0.99	0.01	0.67	0.67	0.99	0.99	0.99	0.01	0.67	0.67	0.99	0.99	0.99
15	15	0.99	0.01	0.01	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.01	0.67	0.99	0.99	0.67	0.67
16	16	0.99	0.01	0.01	0.99	0.01	0.99	0.99	0.99	0.99	0.99	0.01	0.99	0.99	0.99	0.99	0.99
17	17	0.99	0.01	0.01	0.99	0.01	0.67	0.67	0.99	0.99	0.99	0.99	0.67	0.67	0.99	0.99	0.99
18	18	0.99	0.01	0.01	0.99	0.99	0.99	0.67	0.99	0.99	0.99	0.01	0.67	0.67	0.99	0.67	0.67
19	19	0.99	0.01	0.01	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.01	0.99	0.99	0.99	0.99	0.99
20	20	0.99	0.01	0.01	0.99	0.99	0.99	0.99	0.99	0.67	0.67	0.01	0.99	0.67	0.99	0.99	0.99
21	21	0.99	0.01	0.01	0.99	0.99	0.67	0.99	0.99	0.99	0.99	0.01	0.67	0.67	0.99	0.99	0.67
22	22	0.99	0.01	0.01	0.99	0.01	0.67	0.99	0.01	0.67	0.67	0.01	0.67	0.67	0.99	0.33	0.33
23	23	0.99	0.01	0.01	0.01	0.99	0.99	0.67	0.99	0.99	0.67	0.99	0.67	0.67	0.01	0.99	0.99
24	24	0.99	0.01	0.01	0.01	0.99	0.67	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.01	0.99	0.99

Note: This extract represents cases 9–24 (of the 150 cases) and 18 antecedents. The full Truth Table covers more than 50 pages and is available in soft copy upon request from the author

in the sets that are combined. *Logical AND* statements of all possible combinations determine a new fuzzy score by finding the lowest value of the antecedents in the model (statement) when a statement combines two or more antecedent conditions. For case 14 in Table 4.14, for example, the score for group AND devil AND comp AND gbs is equal to the min{0.99; 0.01; 0.01; 0.33} = 0.01. In Boolean algebra, the mid-level dot (•) indicates logical AND. The model group • gbs • comp • devil → success would thus indicate the presence all four treatment conditions. It would read: the treatment conditions group AND gbs AND competency training AND devil's advocate dissent leads to success.

Logical OR
The union of two or more sets is calculated by *logical OR*, which is determined by calculating the maximum score in each of the component sets and reflects the degree of membership of each case in the union of sets. For case 14 in Table 4.14, for example, the score for group *OR* devil *OR* chg1_c would be = 0.99.

4.3 Validity of the Method, Procedures and Treatments

Scientific researchers demand rigor and verisimilitude in experimental methods (Campbell & Stanley, 1963; Salmon, 2003). Validity tests for research methods give an indication of how well the experiment and the instruments used in the experiment measure a given characteristic, given a certain set of circumstances and a certain set of research participants. From this definition, one measurement or "assessment technique may have many types of validity and a unique validity for each circumstance and group or items assessed" (Burns & Burns, 2008, p. 425). Cook and Campbell (1979) observe that two main types of validity are taken into account for research studies: internal and external. "Internal validity refers to the approximate validity with which I infer that a relationship between two variables is causal or that the absence of a relationship implies the absence of cause. External validity refers to the approximate validity with which I can infer that the presumed causal relationship can be generalized to and across alternate measures of the cause and effect and across different types of persons, settings and times" (p. 37).

The focus of this study is on experimental educational simulation in the form of GBS, role-plays or SI and in-basket simulations and a plethora of literature covers the validity of these techniques. A comprehensive list of 21 validation concepts can be found in the work of Feinstein and Cannon (2002), ranging from algorithmic validity to plausibility, representational validity, and verification. The authors conclude that the lexicon of simulation validation research "can be roughly understood in terms of two basic dimensions: game development versus application and internal versus external validity" (p. 430). They then define the following terms: "the *developmental system* represents issues regarding the actual development of a simulation game, drawing on principles of *representational validity*. The *educational system* represents issues involving the learning process, as the game is

actually applied in a teaching environment, drawing on principles of *educational validity*. *Internal validity*, roughly speaking, addresses the extent to which a simulation functions in the intended manner. *External validity* asks whether the internal functioning corresponds to relevant phenomena outside the simulation" (p. 430).

4.3.1 Internal Validity

4.3.1.1 A. Conceptual Validity and Fidelity

Feinstein and Cannon (2002), representational validity relates to the level of realism presented to the learner, or *fidelity*. Hays and Singer (1989, p. 50) define fidelity as: "the degree of similarity between the training situation and the operational situation which is simulated. Is a two dimensional measurement of this similarity in terms of (1) the physical characteristics, for example visual, spatial, kinaesthetic, etc.; and (2) the functional characteristics, for example the informational, stimulus, and response options of the training situation".

There are opposing views in the literature on the need for a high level of fidelity. Some earlier studies found that higher levels of fidelity ensure effective training or enhanced learning (Feinstein & Cannon, 2002; Kibbee, 1961), whilst others found that higher levels of fidelity hinder learning in novice trainees due to overstimulation, and that lower levels of fidelity assist in focusing on the generalisable principles of the training (Alessi, 1988; Cannon, 1995).

Feinstein and Cannon (2002) argue for construct validity rather than fidelity, empirical validity or realism. They maintain that conceptual validity is essentially a level of theoretical accuracy between the system it models and the simulation and is commensurate with a set of objectives: "Construct validity implies that the relationship between variables is correct, but they can be more subjective and modelled by any number of heuristic devices" (p. 433). This incorporates face validity, plausibility or verisimilitude—the degree to which the evaluator or user perceives the simulation to "ring true".

"The second form of internal validity, addresses the degree to which game participants understand the game and play it with insight . . . referred to as *educational validity*" (Feinstein & Cannon, 2002, p. 435). Parasuraman (1981) questions the extent to which student decisions are influenced in the intended manner by the simulation design. To be internally valid, the educational simulation needs to provide students with a simulation modelling the real business phenomenon in order to develop managerial insights and decision-making skills. According to Norris (1986, p. 447), the internal validity of simulation modelling represents "the educational value of simulations in teaching specific material to participants. Many other researchers equate internal validity with the educational effectiveness of the simulation (Bredemeier & Greenblat, 1981; Norris, 1986; Pierfy, 1977; Wolfe, 1985). Cannon and Burns (1999) suggest using the three taxonomies of educational objectives as cognitive (thinking), affective (feeling) and psychomotor

(acting) patterns to evaluate the design and performance of the simulation for testing conceptual validity. The extent to which the three educational taxonomies can be observed determines the conceptual validity of the simulation. According to Feinstein and Cannon (2002, p. 435), "to achieve internal educational validity, game participants would have to discern the phenomena of being modeled".

But, as Feinstein and Cannon (2002) point out, internal validity does not necessarily equate to educational effectiveness. They provide an example where students are taught via a simulation with high verisimilitude. The game simulates a set of desirable responses, but the overall principle derived by the students is not educationally sound: "For instance, in the interest of teaching the effect of advertising in consumer markets, a game might emphasize the advertising function and end up teaching students that advertising is always the primary key to marketing success. The game would be internally valid but externally disastrous!" (Feinstein & Cannon, 2002, p. 426) (Fig. 4.4).

Several steps were taken during the development of the four experimental treatments to test and confirm that participants would perceive the in-basket simulations as (a) realistic and (b) likely to be encountered during real workplace experiences by real-world executives. A series of steps was followed: (1) an extensive literature review to find validated and cases used in prior studies/extant literature; (2) in-basket simulations were designed based on the researcher's and supervisors' personal experiences as practitioners in marketing and as managers; (3) experts reviewed the simulations for realism and confirmed both the likelihood

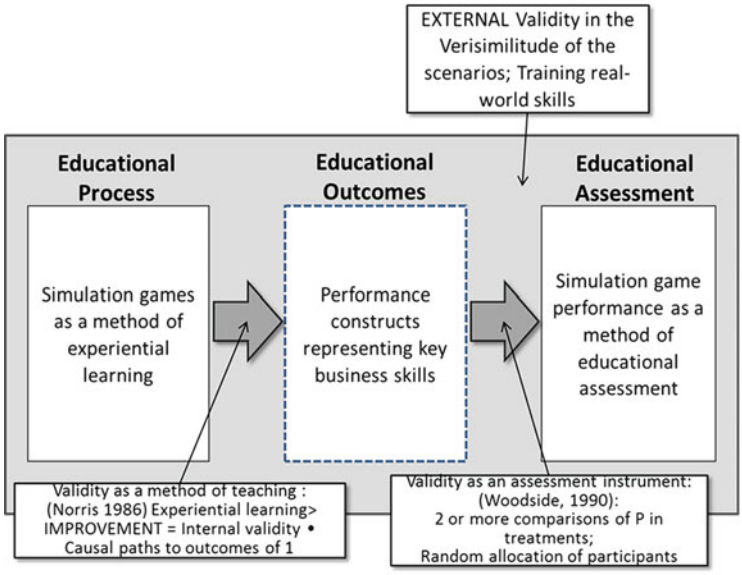

Fig. 4.4 The faces of simulation game validation (Adapted from Anderson, Cannon, Malik, & Thavikulwat, 1988)

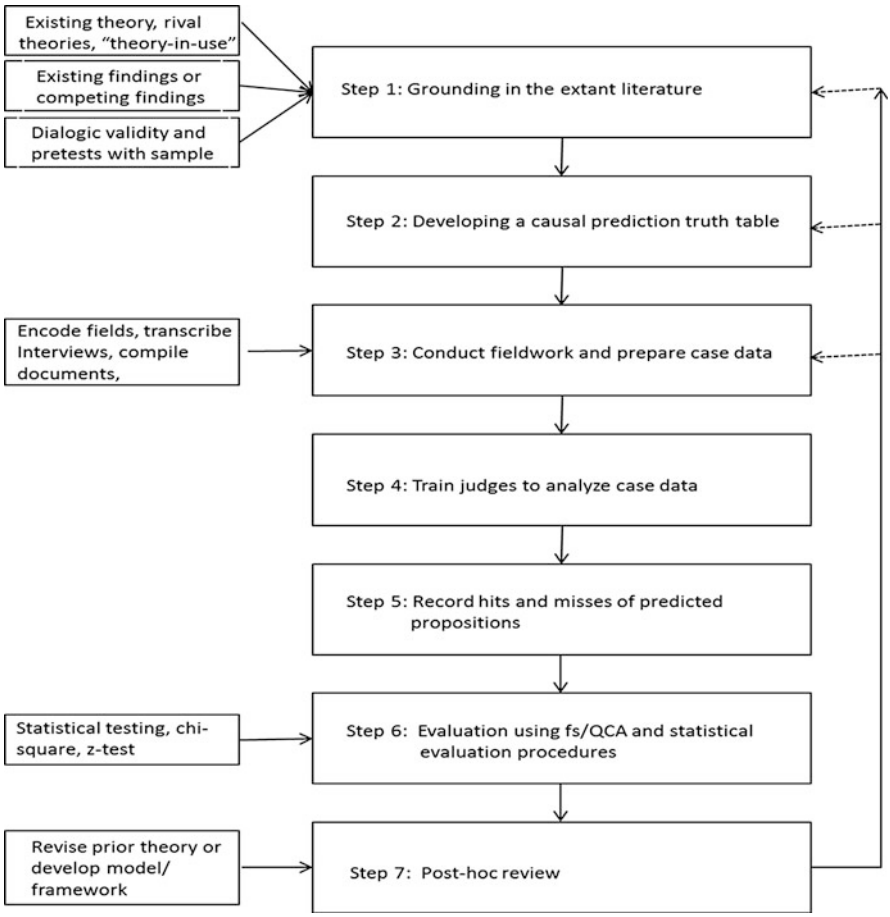

Fig. 4.5 Step-by-step research process for group decision-making in organisational behavior (OB) (Adapted from Woodside, 2010, p. 245)

of encountering such decision scenarios in real-life situations; (4) the simulations were pre-tested with MBA students and experienced practitioners to ensure verisimilitude and that instructions were read and interpreted as intended; (5) all highlighted procedural issues were addressed; and (6) the training support materials were revised. Further details of these six steps are set out in paragraph B on page 138. Figure 3.7 shows a model for the research process of this study adapted from the "Degrees of Freedom Analysis" (DFA) model described by Woodside (2011a, b, p. 245) for considering group decision-making in organisational behavior (OB) (Fig. 4.5).

4.3.1.2 B. Procedures to Ensure Realism, Fidelity and Construct Validity

Procedures to ensure validity for the laboratory experiments consisted of three distinct and consecutive phases: (a) development and design; (b) pre-testing and pilot; and (c) main field test.

Development and Design
An extensive literature review delivered useful guidance in terms of the design of games, simulations, and GBS creation. In addition, the researcher pursued "dialogic validity" (Anderson & Herr, 1999, p. 16; Newton & Burgess, 2008, p. 26) by supplementing theoretical guidelines with informal conversations and open-ended interviews with scholars and practising management development consultants. These practitioners are actively using role-plays, simulations and in-basket simulations as training and development tools in their own business practices as well as in their own action research within their training institutions. Dialogic validity was thus achieved.

Construct Validity
Construct validity refers to the vertical inter-relationship between an unobservable construct (conceptual combination of concepts) and an ostensible measure of it, which is at an operational level. Peter (1981, p. 133) refers to the development of constructs in marketing research and states: "Although marketing has little in the way of fully developed, formally stated scientific theories, such theories cannot develop unless there is a high degree of correspondence between abstract constructs and the procedures used to operationalize them. Because construct validity pertains to the degree of correspondence between constructs and their measures, construct validity is a necessary condition for theory development and testing."

This study pursues construct validity by building pre-determined and pre-validated constructs from the seminal and conceptual work of scholars such as Simon, Armstrong, Gigerenzer, Schank and Schwenk to explain the behavior of students and practitioners involved in the managerial decision activities. It is common practice by marketing scholars to seek constructs and nomenclature from other disciplines and to borrow "constructs and theoretical propositions relating to them" (Peter, 1981, p. 133).

In addition, constructs have two recognised types of meaning. The first type, namely systemic meaning (Kaplan, 1967), refers to the fact that interpretation of the construct is determined by the theory in which it is grounded. Thus, to understand incompetency training as a construct, readers will have to understand training theory (andragogy and pedagogy), in which the concept is embedded. Construct validity and systemic meaning was tested with marketing scholars, management practitioners and educationalists and validity established to the satisfaction of the researcher and the main beneficiaries of the study. The second type of meaning, namely observational meaning, refers to the ability of the construct to be operationalised. Again this validity was tested with three members of each of the

beneficiaries, that is, MBA teachers, MBA graduates and MBA students. Once again, expert scholars and the researcher were satisfied that operational meaning was achieved to a very high degree.

Pre-test

To enhance ecological validity and verisimilitude, the in-basket simulations were pre-tested with MBA students and marketing and management practitioners currently employed in the roles and functions portrayed in the in-basket simulations. (Note: these MBA students did not participant in the laboratory experiments.) Two types of pre-tests were done: (1) a time-controlled pre-test with current MBA students and (2) an off-site, self-timed, uncontrolled, self-administered test completed by practitioners. After the time-controlled pre-test, participating MBA students completed the demographic section of the survey and the participants were debriefed. The debriefing focused particularly on: (1) the simplicity and comprehensibility of the instructions; (2) realistic time allowance (to complete the reading, study the decision aids, consider an opinion and complete the decision forms); (3) verisimilitude or realism of the simulations; (4) complexity and relative comprehensiveness of the provided information; (5) the presence of escalating decisions from lower order to higher order decision-making activities; and (6) motivation and enthusiasm to complete all sections of the written questions and (7) practicality of procedural issues.

To deliberately avoid favouring one of the contending alternative theories (Woodside, 2011a, b) contained in the multiple choice answers, all data collection forms, in particular the sections with alternative answers, were designed and tested with research experts. In line with the suggestion by Woodside (2011a, b, p. 247) "to achieve bias reduction of questioning" . . .independent experts checked the decision alternatives (multiple-choice answers) as well as the sequence of answers in the questionnaire. In addition, "to allow for objectivity and verifiability in the data collection and analysis, the actual survey forms used to collect data is available for independent examination" (Woodside, 2011a, b, p. 247).

The initial in-basket simulations were subjected to a series of pre-tests with practitioners and scholars in the field and revised. The pre-tests revealed that changes were required to word-choice in order to clarify instructions, The question sequence was changed and formatting issues such as structure and lay-out of multiple choice answers and the 4-point Likert scales were resolved (Cox, 1980; Likert, 1932. A few minor changes were made to the actual simulation descriptions. The time allocated for self-study and case reading (both the competency and incompetency training materials); analysis; group discussions; and recording of decisions were tested and adapted. For example, the time allowed for self-study was lengthened from 15 min to 20 min; the time allowed to record decisions was reduced from 7 min to 5 min. Pre-tests established that individuals responding to the four in-basket simulations took less than an hour and thus half the time of configurations of conditions where group interactive decisions are required. It was determined that all participants in the pre-test interventions could quite comfortably complete the full experiment within the allotted time of 2 h.

4.3.1.3 Conducting Fieldwork: Main Test

Instructors

An experienced administrator is necessary to manage the implementation phase of the experiments. "One of the largest potentially confounding factors is the instructor" (Anderson & Lawton, 2009, p. 206). The literature suggests two ways to control for the impact of the instructor (Anderson & Lawton, 2009; Gosen & Washbush, 2004). One way is to keep the instructor constant throughout the study; an alternative method is to use a large group of instructors and to randomly allocate them to the test and control groups. Since instructors were to be selected from faculty members with already heavy service and teaching responsibilities, and the selection was further complicated by our inability to offer enticing rewards, the second option was discarded in favour of having a single instructor.

The administrator commits substantial amounts of time to prepare to deal with the 10 laboratory experiments and deal with the 150 participants and the complications related to the 12 different configurations of conditions. In addition to the requirement of a substantial amount of time, Anderson and Lawton (2009) identified two further considerations when nominating the instructor: (1) bias and (2) the competence of the instructor. The researcher ultimately selected a single professional consultant, well-versed in role-play and in-basket simulations and well-regarded as a facilitator by past students and current colleagues. This selection ensured time-commitment and competence. The study relied on the professional calibre of the nominated instructor and thorough briefings and debriefing to monitor and control for bias were implemented. As additional preparation, the facilitator was involved in all of the pre-tests. She followed carefully written and pre-tested instructions (see Appendix B) to the letter for every one of the ten laboratories to ensure consistency for all three phases: Introduction, Experiment, and Debriefing (also see the AUTEC-approved forms in Appendices A and B). The researcher's supervisor acted as observer with the special responsibility to monitor behavioral and attitudinal biases in the instructor.

A single administrator implemented the study and briefed and debriefed all participants. Ten separate experiment laboratories were held to accommodate the demanding schedules of the MBA students and alumni and to administer the experiment at business schools further afield. Participants could self-select which of the experimental laboratories to attend within their local university or they could travel to a nearby campus, if the particular date of the laboratory suited them better.

In order to minimise instructor bias, the instructor read the brief and debrief from prepared documents. All instructions to the participants were in writing and all competency and incompetency training support material were only provided in printed document format. The facilitator had clear instructions not to interact with the participants, provide feedback, or any additional training or insights, other than to indicate the elapsed time. The time was kept with the aid of an alarm clock which was used in every lab. The experiment is highly structured into five clear sections.

The first is a self-study period of 20 min where participants got the opportunity to study the full set of four in-basket simulations as well as the decision aids. Thereafter the facilitator structured the remaining time into four sections of 25 min to allow a 15-min group interaction phase, a 5-min decision recording phase, and an additional 5-min phase to prepare the next simulation. These phases were announced verbally as well as by ringing a small bell. In all but one laboratory, individuals and groups worked in the same room and individuals were briefed to follow their own time-frame. In all cases individuals completed the full experiment well before the groups. In approximately 15 % of the group cases, the groups completed their discussions and decision recording before the chiming of the bell. All individual participants completed the full experiment well within the two hours allocated.

Additional Considerations Regarding Internal Validity

With regard to internal invalidity factors, the researcher considers the degree to which the experimental treatment causes change(s) in specific experimental settings. Prior research (Campbell, 1957; Dimitrov & Rumrill, 2003) identifies eight categories of variable which need to be controlled, namely: history, maturation, mortality, instrument decay, testing and pretesting effects, statistical regression towards the mean, selection of participants, and interactions of factors (e.g. selection and maturation). This study followed a post-test only design with control groups as set out in Figs. 4.1 and 4.2 above. In basic post-test only experimental designs, one or more experimental groups are exposed to a treatment or research intervention and the resulting change is compared to one or more control groups who did not receive the treatment.

Woodside (1990, p. 230) highlights two requirements to control sources of invalidity in true experiments: (1) two or more comparisons of subjects (individuals or groups) either exposed or not exposed to the interventions; and (2) "randomized assignment of participants to treatment exposure and to no treatment exposure (i.e. control) groups." Woodside expands on the issue of amount and allocation of participants' assignment by pointing out that enough subjects must be randomly assigned to ensure that treatment and control groups are very similar in all aspects (including demographics and psychographics) before the treatment conditions are administered. To respond to requirement (1), the experiment was repeated 10 times with more than eight participants in each of the cells. Further, each of the treatments is contrasted by a group or individuals who do not receive the treatment, also consisting of eight or more participants. To respond to requirement (2), randomisation was carefully managed to ensure that participants self-assigned to the treatments, without prior knowledge of which treatment they were about to receive. Further randomisation was achieved by ensuring that each laboratory at the different campuses covered a random selection of the treatments, thus enabling randomisation across the different university campuses (see the section below for additional clarification of random sampling for this study).

Sampling and Randomised Allocation

Subject pools of MBA students, MBA alumni, advanced postgraduate management students and executives-in-training (on executive management or HR short courses) studying in the Faculty of Business and Law at Auckland University of Technology (AUT), the University of Waikato in Hamilton, Victoria University in Wellington and Massey University in Palmerston North served as participants in these experiments. A total of 153 learners participated in the study. Participants assigned themselves randomly to the alternative treatments. Since our interest is in the efficacy of education methodologies on managerial decision-making competencies, the choice of sample group was based on two factors. The most important factor was the likelihood that participants would exhibit a need for and therefore interest in managerial decision-making competencies to ensure commitment and a good level of interest, as well as active, enthusiastic (even dedicated) participation. A second sampling consideration was that learners need a comparable, basic level of understanding and experience in managerial decision-making through prior training. (Self-assessed levels of experience were recorded prior to the experiment as part of the demographic data to be collected and the selection criteria of MBA programmes presupposes a certain level of business knowledge and experience). A concerted effort was made to select MBA students who had completed the compulsory papers, but random allocation to all 12 treatment cells negated the need to be overly concerned with the participants' prior level of knowledge. In addition, prior knowledge was captured as two measured antecedents (i.e. **educ and man_exp)** and was thus given full consideration during the analysis and interpretation of the findings.

Random Allocation to Cells

The following procedures were followed. Encoded sealed envelopes containing the instructions, in-basket simulations, decision aids, and simulation props such as buttons, badges and sashes were placed on round tables with four sets per table. As students entered the laboratory, they self-selected which table to sit at. At this point of the experiment there were no visible signs as to which treatment participants would be exposed to. Students participating on an individual basis, although seated in groups of four, worked on their own with no interaction with the other students at the table. Students whose self-selection allotted them to the group treatment all received the same treatment at the same table (one group). In cases where participants were exposed to the GBS treatment, each participant received a unique briefing document and set of props over and above the general instructions, in-basket simulations and decision aids. Each pack in every envelope for both groups and individuals was encoded with a unique identifier code to ensure that the data capturer and data analyst could accurately determine which configuration of conditions the participants were exposed to. At no point were the codes disclosed to or discussed with any of the participants. Codes remained secret and hidden throughout the experiment and only the data capturer linked case codes with the unique code of each participant.

To assist with generalisability and comparative groups, subjects were randomly allocated to one of 12 different cells. In line with fsQCA, the four dichotomies (i.e. groups •~groups; competence training •~competency training; DA •~DA; GBS cases •~GBS cases) presented 81 groupings or initial configurations.

Fit Validity

An important test for the validity of a research instrument or theoretical model is "fit validity or performance validity" (Wright, 1999). This study of causal complexities as they relate to decision competence and decision confidence relies on QCA modelling, which is based on set theoretic relations and subset relations. Two quantitative measures to assess the level of correspondence between the theoretically assigned conditions, and the anticipated outcomes, as posited by Ragin (2006a, b, c), are consistency and coverage. These metrics rate the "goodness of fit".

Cases are precisely assessed by their degree of consistency with the subset relation. This allows the researcher to "establish and assess individual case's degree of consistency with the outcome" (Ragin, 2009, p. 120). The following formula determines the degree of consistency (Ragin, 2008c, p. 99): Consistency $(X_i \leq Y_i) = \sum[\min(X_i, Y_i)]/\sum(X_i)$, where X_i is the degree of membership in set X; Y_i is the degree of membership in outcome set Y; $(X_i \leq Y_i)$ is the subset relation under consideration and indicates the lower of the two values. If all the values of condition X_i are equal or less than the corresponding values of the outcome Y_i, the consistency is 1, signifying full consistency. A further measure of consistency comes from the work of Rihoux and De Meur (2009):

$$\text{Consistency} = \frac{\text{Number of cases for which both a given condition and outcome are present}}{\text{Number of cases for which only the outcome is present}}$$

Ragin (2004, 2006c) suggests that substantive grounds are limited for observed consistency scores below 0.70. Values for consistency should ideally be at least 0.75 (Ragin, 2006c; Wagemann & Schneider, 2007) to indicate useful models (also called paths or solutions). In contrast, coverage is a gauge of the empirical relevance or importance of configurations of conditions (Ragin, 2006c, p. 301; Woodside & Zhang, 2012) and is expressed as:

$$\text{Coverage}(X_i \leq Y_i) = \sum(\min(X_i Y_i))/\sum(Y_i) \text{ OR}$$

$$\text{Coverage} = \frac{\text{For a given outcome, number of cases containing a given solution term}}{\text{Total number of cases with the given outcome}}$$

When coverage is too small (below 0.2) then there are numerous ways to achieve the outcome and the studied configuration of conditions does not do a useful ("good") job of explaining the link between high membership of the configuration of conditions (X_i) and high membership of the outcome (high Y_i) (Ragin, 2006c).

A "good fit" in QCA is indicated by the coverage and consistency of the multiple configuration models. Only models that are useful—those where high configuration set membership is associated with high outcome membership, where the consistency is above 0.70, and the coverage scores are between 0.2 and 0.6—are useful and thus covered in the findings of this research. Thus, fit validity can be accurately assessed and achieved. In some cases the fit may be limited and the models thus only marginally useful. Coverage metrics indicate the relative explanatory strength of each configural model (Wagemann & Schneider, 2007) and are thus useful to compare the relative explanatory ability of paths or models. Woodside, Hsu, and Marshall (2010, p. 794) note that "fsQCA coverage values are analogous to effect size estimates in statistical hypothesis testing." Coverage and consistency for each configuration of conditions and suggested predictive model is assessed and recorded in Chaps. 5, 6, and 7. Woodside (2010, 2013) prompts marketing scholars not to consider fit validity in isolation; it needs to be considered alongside the predictive validity of tested models, and this is covered in the next section.

4.3.2 External Validity: Equifinality and Predictive Validity

A basic goal of scientific study is to provide credible, reliable and generalisable theoretical explanations for real-life behavior. In contrast to internal validity, external validity is the extent to which the treatment effect is generalizable across populations or transferred to other populations and other contexts beyond the specific research settings, treatment variables and measurement instruments (Burns & Burns, 2008). Research studies list several threats to external validity: selection biases and its interaction with treatment effects; the effect of pretesting on participants' reaction; reactive effect of experimental procedures; and multiple-treatment interference (For a thorough discussion and examples of threats to internal and external validity, see Campbell, 1957; Campbell & Stanley, 1966).

In the early literature on simulations, external validity was related to realism (Kibbee, 1961). Later the concept of verisimilitude (the perception of reality by evaluators and participants) was heralded as more important. But since verisimilitude will differ for each unique participant, and in order to move away from the perceptions of individuals, researchers looked for a more testable hypothesis of external validity. Some authors offer suggestions and prescriptions for designing and implementing valid simulation research. Cannon and Burns (1999) propose linking career success or performance measurement to the simulation experience. The key question for external educational validation according to these authors is: "how well does the educational process actually work in teaching real-world skills?" (p. 43). Wolfe (1976, p. 412) refers to external validity as the transferability of "academic insights into useful and effective real-world orientations, perceptions and business career practices".

Gosen and Washbush (2004, p. 273) term the ability to generalise the learning effects to students' careers as "transfer-internalization validity". However, Norris

(1986) argues that career success is individual-based and that the success measures in the simulation and in real business will be differentially affected. Using career success as validation is further compromised by the variables associated with career success such as personal motivation, career opportunities, praise, job satisfaction, and other subjective criteria identified by Wolfe and Roberts (1986). The authors highlight the difficulty in testing for significant variations in success when these subjective criteria are employed. According to Wolfe and Roberts (1986) salary increases and promotions—although complicated by inter- and intra-company transfers, organisational differences, external economic and political factors, confidentiality of information, and other industry factors—are considerably better indices. The validity of the research is further complicated by the need to rely on self-reports, with the concomitant risk of bias.

Feinstein and Cannon (2002) return to the importance of the perception of reality—verisimilitude, believability and plausibility. Although these terms do not directly represent scientific validity, but only the perception of it, they "tend to increase the level of external validity" (p. 437) as indicators of motivation and insight, which are directly related to both internal validity and stimulating students to learn. This in turn increases productive learning of managerial and decision-making skills and therefore increases external validity.

This study employs fsQCA using Boolean algebra as its research method and analysis technique. Techniques in fsQCA deal with cases in a configurational, comparative way, where the integrity of each case is retained and cases are considered a complex combination of properties. QCA conveys a particular conception of causality using Boolean algebra as well as visual tools in the form of Venn diagrams for a "dialogue between the theory and the data" (Ragin, 1987) in order to understand and interpret results. "Multiple conjunctural causation rejects any form of permanent causality and stresses equifinality (many paths can lead to the same outcome $AB \rightarrow Y$; $AB + CD \rightarrow Y$)" (Rihoux & Ragin, 2009, p. 8). FsQCA recognises asymmetrical relationships, where low values for X associate with low and high values for Y (Woodside, 2011a, b). In addition, this study considers a combination of antecedents and causal conditions, where no one factor is likely to be sufficient for the ideal outcome. For fsQCA as a set of techniques, "modest generalization" can be achieved but "permanent causality is not assumed" (Rihoux, 2006, p. 9). In order for the models resulting from QCA to be valid, they need to be able to go beyond description and predict additional cases and achieve modest generalisation (Armstrong, 1991; Berg-Schlosser & De Meur, 2009; McClelland, 1998). As tools of scientific inquiry, theory and constructs are deemed adequate when they can be used to make observable predictions of untested cases or events.

McClelland's (1998) advice to researchers is to consider the critical question: Does a model predict an outcome or dependent variable in additional samples—samples not included in the original data sets used to test the theory or models? In other words, does a model have "predictive validity". Gigerenzer and Brighton's (2009b) study finds multiple regression analysis (MRA) models to be of extremely good fit, but these models perform relatively poorly when predictive validity is considered. In other words, when models resulting from MRA and traditional

methods are tested for accuracy on a separate set of data not analysed as part of the original data, the models generally perform less well. The dominant practice in management and marketing literature is to present only best-fit models "but doing so is bad practice" (Woodside, 2010, p. 9). "Testing for predictive validity with hold out samples is always possible and doing so substantially increases the added value for both empirical positivistic and interpretative case studies" (p. 9). Although Ragin (2008c) does not consider predictive validity, it is considered critical by Armstrong (1991) and Gigerenzer and Gaissmaier (2011). This study recognises the importance of predictive validity but due to its exploratory nature, it includes only fit validity. That is, this study is the first application the researcher is aware of applying Boolean algebra to a laboratory experiment testing various ways to achieve high decision competence and high decision confidence.

4.4 Constructing Conjunctive Recipes

Now that the fsQCA method and the logical procedures have been outlined, closer links between the research propositions (as set out in Sect. 3.2.1) and the possible models are set out in Table 4.15. Refer to Sect. 4.1 for interpretation of the Boolean algorithms.

4.5 Ethical Considerations

4.5.1 Principles of Partnership, Participation and Protection

According to Cohen, Manion, and Morrison (2000), it is critical to protect the identity of all participants. To achieve this principle of anonymity, certain protocols were followed throughout the research process.

All prospects' and participants' rights were respected by adhering to four key principles: competence, voluntarism, comprehension, and full information (Cohen & Manion, 1994). To adhere to the principle of competence, information was provided to assist participants in making informed decisions during all stages (before, during and after) committing to participate (see the advertisement, information sheets and final step sheet in Appendices B and C). Students who agreed to participate, completed AUT Ethics Committee-approved consent forms. Participants' privacy and confidentiality was and will be kept secure and will not be made available to any third party.

Table 4.15 Propositions and related configural causation models

#	Context-related propositions	Configurations for possible parsimonious models in fsQCA
P_1	In groups, training via goal-based scenarios results in more competent decision-making than inactive knowledge learning.	gbs · group → high success ~gbs · group → ~ success
P_2	Competency increases by adding formal assignment of a devil's advocate role-player versus natural, unguided group interactive decision-making (a placebo condition) to group discussions in making decisions.	group · devil → high success group · ~devil → ~high success
P_3	The introduction of incompetency training and decision aids such as BCG and Priority Matrices result in less competent decision-making, but increases high decision confidence.	~comp · devil → high conf_c ~comp · group → ~ success ~comp · ~group → ~success ~comp · devil → high conf_c
P_4	Role-playing introduced through the role of case-based scenarios/GBS, increases decision competency versus group inter-active decision-making alone.	gbs · group → high success group → ~ success
P_{5a}	Decision-making by an individual is more effective than group decision-making when the group uses no formal group-discussion protocols (e.g. formal role- playing as introduced through GBS).	gbs · ~group → high $success_1$ ~gbs · group → ~high $success_2$
P_{5b}	Group interactive decision-making is more effective than individual decision-making when the group uses formal group-discussion protocols (e.g. formal role-playing as introduced through GBS.)	gbs · group → high $success_3$ high $success_3$ > high $success_1$
P_6	Individuals trained in contextual influences on decision-making (e.g., drop-your-tools contexts) and the use of implicit thinking (e.g., "intuitive first choice/gut feeling") make for more competent decisions compared to groups using formal group-discussion protocols.	comp · ~group → high $success_4$ comp · group → high $success_5$ high $success_4$ > high $success_5$
P_{7A}	The introduction of irrelevant information leads to cognitive overload and causes a greater proportion of incompetent decisions (for individual participants as well as in group interactive decisions).	~comp · ~group → ~high success ~comp · group → ~ high success
P_{7b}	The introduction of irrelevant information through complex decision aids leads to lower confidence in the decision that (for individual participants as well as group interactive decisions).	~comp · ~group → ~high conf_c ~comp · group → ~ high conf_c
#	Cognitive-related propositions	
P_8	Decision-making by an individual with more experience in managerial judgement and decision-making (JDM) make more competent decisions compared to decision-making by individuals with lower levels of management (JDM) experience.	man_exp • ~group → high success ~man_exp• ~group → ~high success

(continued)

Table 4.15 (continued)

#	Context-related propositions	Configurations for possible parsimonious models in fsQCA
P_9	Groups with higher levels of management experience, make more competent decision compared to decision-making groups with a lesser management experience.	man_exp •group → high success ~ man_exp •group → ~high success
P_{10}	Individuals participating decision-makers with higher versus lower levels of experience in JDM make more competent decisions and are more confident in their decision competency than individual decision-makers with lower levels of experience in JDM.	man_exp • ~ group → high conf_c ~ man_exp • ~ group → ~high conf_c
P_{11}	Individuals with high versus low levels of education and JDM experience are more competent and more confident in their decision outcomes.	edu • ~ group → high conf_c ~ edu • ~ group → ~high conf_c ~ edu • ~ group → high success ~ edu • ~ group → ~high success
	Propositions with a combination of contextual and cognitive conditions	
P_{12}	Groups of participants with high levels of management experience and high levels of formal education are less competent individual decision-makers with high levels of management and education experience but the first recipe does not associate with higher levels of confidence.	man_exp•edu•~group → high success man_exp•edu•group → ~high success man_exp•edu• ~ group → ~ high conf_c
P_{13}	Participants exposed to a combination of treatment conditions outperform participants who receive only one of the treatments, resulting in higher levels of decision confidence and higher levels of decision competence.	See the results presented in Chaps. 5, 6, and 7.

4.6 Summary

The rest of the study book has the following structure. Chapter 5 presents the analysis of the data and configural models for overall decision competence and decision confidence. Chapter 6 presents the QCA procedures, data analysis and interpretation of the findings for the four separate in-basket simulations. Chapter 7 then investigates decision incompetence and doubt, and Chap. 8 covers implications for practitioners and scholars, limitations of this study, and suggestions for future research.

References

Alessi, S. M. (1988). Fidelity in the design of instructional simulations. *Journal of Computer Based Instruction, 15*(2), 40–47.

Amenta, E., & Poulsen, J. D. (1994). Where to begin: A survey of five approaches to selecting independent measures for qualitative comparative analysis. *Sociological Methods and Research, 23*(1), 22–53. doi:10.1177/1525822X03257689.

Anderson, P. H., Cannon, H. M., Malik, D., & Thavikulwat, P. (1988). Games as instuments of assessment: A framework for evaluation. *Development in Business Simulation and Experiential Learning, 25*, 31–37.

Anderson, G. L., & Herr, K. (1999). The new paradigm wars: Is there room for rigorous practitioner knowledge in schools and universities? *Educational Researcher, 28*(5), 12–21.

Anderson, P. H., & Lawton, L. (2009). Business simulations and cognitive learning: Developments, desires and future directions. *Simulation and Gaming, 40*(2), 193–216. doi:10.1177/1046878108321624.

Armstrong, J. S. (1991). Prediction of consumer behavior by experts and novices. *Journal of Consumer Research, 18*(2), 251–256.

Armstrong, J. S. (2006). Findings from evidence-based forecasting: methods for reducing forecast error. *International Journal of Forecasting, 22*, 583–598.

Armstrong, J. S., & Brodie, R. J. (1994). Effects of portfolio planning methods on decision-making: Experimental results. *International Journal of Research in Marketing, 11*(1), 73–84.

Berg-Schlosser, D., & De Meur, G. (2009). Comparative research design: Case and variable selection. In B. Rihoux & C. C. Ragin (Eds.), *Configurational comparative methods: Qualitative comparative analysis (QCA) and related techniques* (pp. 19–32). Thousand Oaks, CA: Sage.

Bloom, B. S. (1956). *Taxonomy of educational objectives: The cognitive domain*. New York: David McKay.

Bredemeier, M. E., & Greenblat, C. S. (1981). The educational effectiveness of simulation games. *Simulation and Games, 12*(3), 307–332. doi:10.1177/104687818101200304.

Burns, R. B., & Burns, R. A. (2008). *Business research methods and statistics using SSPS*. London: Sage.

Byrne, D., & Ragin, C. C. (2009). *The Sage handbook of case-based methods*. London: Sage.

Campbell, D. T. (1957). Factors relevant to the validity of experiments in social settings. *Psychological Bulletin, 54*(4), 297–312. doi:10.1037/h0040950.

Campbell, D. T., & Stanley, J. C. (1963). Experimental and quasi-experimental designs for research on teaching. In N. L. Gage (Ed.), *Handbook on research on teaching* (pp. 171–246). Chicago: Rand McNally.

Campbell, D. T., & Stanley, J. C. (1966). *Experimental and quasi-experimental design for research*. Chicago: Rand McNally.

Cannon, H. M. (1995). Dealing with the complexity paradox in business simulation games. *Developments in Business Simulation & Experiential Exercises, 22*, 97–103.

Cannon, H. M., & Burns, A. C. (1999). A framework for assessing the competencies reflected in simulation performance. *Developments in Business Simulation & Experiential Exercises, 26*, 40–44.

Cohen, L., & Manion, L. (1994). *Research methods in education*. London: Routledge.

Cohen, L., Manion, L., & Morrison, K. (2000). *Research methods in education*. New York: Routledge Falmer.

Cook, T. D., & Campbell, D. T. (1979). *Quasi-experimentation: Design and analysis for field settings*. Boston: Houghton Mifflin.

Cox, E. P. (1980). The optimal number of response alternatives for a scale: A review. *Journal of Marketing Research, 17*(4), 407–422. doi:10.2307/3150495.

de Bono, E. (1976). *Teaching thinking*. England: Penguin Books.

Dimitrov, D. M., & Rumrill, P. D. (2003). Pretest-posttest designs and measurement of change. *Work, 20*, 159–165. Speaking of research. IOS Press.

Feinstein, A. H., & Cannon, H. M. (2002). Constructs of simulation evaluation. *Simulation and Gaming, 33*(4), 425–440. doi:10.1177/1046878102238606.

Fielding, N., & Warnes, R. (2009). Computer-based qualitative methods in case study research. In D. Byrne & C. C. Ragin (Eds.), *Sage handbook of case-based methods* (pp. 271–288). London: Sage.

Fiss, P. C. (2009). *Practical issues in QCA*. Professional development workshop on Qualitative Comparative Analysis (QCA) conducted at the meeting of the Academy of Management. http://www-bcf.usc.edu/~fiss/QCA_PDW_2009_Fiss_Practical_Issues.pdf

Fiss, P. C. (2011). Building better causal theories: A fuzzy set approach to typologies in organization research. *Academy of Management Journal, 54*(2), 393–420.

Gigerenzer, G., & Brighton, H. (2009). Homo Heuristicus: Why biased minds make better inferences. *Topics in Cognitive Science, 1*, 107–143. doi:10.1111/j.1756-8765.2008.01006.x.

Gigerenzer, G., & Gaissmaier, W. (2011). Heuristic decision making. *Annual Review of Psychology, 62*(1), 451–482. doi:10.1146/annurev-psych-120709-145346.

Gigerenzer, G., & Goldstein, D. G. (1996). Reasoning the fast and frugal way: Models of bounded rationality. *Psychological Review, 103*(4), 650–669. doi:10.1037/0033-295x.103.4.650.

Gosen, J., & Washbush, J. (2004). A review of the scholarship on assessing experiential learning effectiveness. *Simulation and Gaming, 35*(2), 270–293. doi:10.1177/1046878104263544.

Green, K. C. (2002). Forecasting decisions in conflict situations: A comparison of game theory, role-playing and unaided judgment. *International Journal of Forecasting, 18*, 321–344.

Green, K. C. (2005). Game theory, simulated interaction, and unaided judgment for forecasting decisions in conflicts: Further evidence. *International Journal of Forecasting, 21*(3), 463–472. doi:10.1016/j.ijforecast.2005.02.006.

Gross, M. E. (2010). *Aligning public-private partnership contracts with public objectives for transportation infrastructure*. PhD thesis. Virginia Technicon, Virginia, VA. http://scholar.lib.vt.edu.ezproxy.aut.ac.nz/theses/available/etd-08242010-173605/unrestricted/Gross_ME_D_2010.pdf

Hays, R. T., & Singer, M. J. (1989). *Simulation fidelity in training systems design: Bridging the gap between reality and training*. New York: Springer.

Jordan, E., Gross, M. E., Javernick-Will, A. M., & Garvin, M. J. (2011). Use and misuse of qualitative comparative analysis. *Construction Management and Economics, 29*(11), 1159–1173. doi:10.1080/01446193.2011.640339.

Kaplan, A. (1967). A philosophical discussion of normality. *Archives of General Psychiatry, 17*(3), 325–330.

Kent, R. (2009). Case-centred methods and quantitative analysis. In D. Bryne & C. C. Ragin (Eds.), *The Sage handbook of case-based methods*. London: Sage.

Kibbee, J. M. (1961). *Model building for management games*. Paper presented at the meeting of the Simulation and gaming: A symposium, New York.

Likert, R. (1932). A technique for the measurement of attitude. *Archives of Psychology, 140*, 1–55.

Marx, A. (2006). *Toward more robust model specification in QCA. Results from a methodological experiment* (Compasss Working Paper, WP2006-43).

McClelland, D. C. (1998). Identifying competencies with behavioral-event interviews. *Psychological Science, 9*(5), 331–339. doi:10.1111/1467-9280.00065.

Newton, P., & Burgess, D. (2008). Exploring types of educational action research: Implication for research validity. *International Journal of Qualitative Methods, 7*(4), 18–30.

Norris, D. R. (1986). External validity of business games. *Simulation and Games, 17*(4), 447–459.

Parasuraman, A. (1981). Assesing the worth of business simulation games: Problems and Prospects. *Simulation and Games, 12*(2), 189–200.

Peter, P. J. (1981). Construct validity: A review of basic issues and marketing practices. *Journal of Marketing Research, 18*(2), 133–145.

Pierfy, D. (1977). Comparative simulation game research: Stumbling blocks and stepping stones. *Simulation and Games, 8*(2), 255–268. doi:10.1177/003755007782006.

Ragin, C. C. (1987). *The comparative method: Moving beyond qualitative and quantitative Strategies*. Berkeley, CA: University of California Press.

Ragin, C. C. (1994). *Constructing social research*. Thousand Oaks, CA: Pine Forge Press.

Ragin, C. C. (2000). *Fuzzy-set social science*. Chicago: University of Chicago Press.

Ragin, C. C. (2004). *Redesigning social inquiry [Slide-show PPT]*. http://eprints.ncm.ac.uk/379/1/RSDI-RMF.pdf

Ragin, C. C. (2006a). How case-orientated research challenges variable-orientated research. *Comparative Social Research, 16*, 27–42.
Ragin, C. C. (2006b). The limitations of net-effect thinking. In B. Rihoux & H. Grimm (Eds.), *Innovative comparative methods for policy analysis. Beyond the quantitative-qualitative divide* (pp. 13–41). New York: Springer.
Ragin, C. C. (2006c). Set relations in social research: Evaluating their consistency and coverage. *Political Analysis, 14*(3), 291–310. doi:10.1093/pan/mpj019.
Ragin, C. C. (2007a). Fuzzy sets: Calibration versus measurement. In J. M. Box-Steffensmeier, H. E. Brady, & D. Collier (Eds.), *The Oxford handbook of political methodology*. http://toktok.persiangig.com/other/Calibration%20fuzzy%20measurement.pdf
Ragin, C. C. (2007b). Qualitative comparative analysis using fuzzy-sets (fsQCA). In B. Rihoux & C. C. Ragin (Eds.), *Configurational comparative analysis*. Thousand Oaks, CA: Sage.
Ragin, C. C. (2008a). *Online tutorial: Qualitative comparative analysis and fuzzy sets*. http://www.fsqca.com
Ragin, C. C. (2008b). *Redesigning social inquiry*. London: University of Chicago Press.
Ragin, C. C. (2008c). *Redesigning social inquiry: Fuzzy sets and beyond*. Chicago: University of Chicago Press.
Ragin, C. C. (2008d). *What is qualitative comparative analysis (QCA)?* Symposium conducted at the meeting of the 3rd ESRC Research Methods Festival. Retrieved May 5, 2010, from http://eprints.ncrm.ac.uk/250/1/What_is_QCA.pdf
Ragin, C. C. (2009). Qualitative comparative analysis using fuzzy sets (fsQCA). In B. Rihoux & C. Ragin (Eds.), *Configurational comparative methods: Qualitative comparative analysis (QCA) and related techniques*. Thousand Oaks, CA: Sage.
Ragin, C. C., & Rihoux, B. (2004). Qualitative comparative analysis (QCA): State of the art and prospects. *Qualitative Methods Newsletter of the American Political Science Association Organized Section on Qualitative Methods, 2*(2), 3–13.
Rihoux, B. (2006). Qualitative comparative analysis (QCA) and related systematic comparative methods: Recent advances and remaining challenges for social science research. *International Sociology, 21*(5), 679–706. doi:10.1177/0268580906067836.
Rihoux, B., & De Meur, G. (2009). Crisp-set qualitative comparative analysis (csQCA). In B. Rihoux & C. C. Ragin (Eds.), *Configurational comparative methods: Qualitative comparative analysis (QCA) and related techniques* (pp. 33–68). Thousand Oaks, CA: Sage.
Rihoux, B., & Lobe, B. (2008). The case for qualitative comparative analysis (QCA): Adding leverage for thick cross-case comparison. In D. Byrne & C. C. Ragin (Eds.), *The Sage handbook of case-based methods* (pp. 222–242). Thousand Oaks, CA: Sage.
Rihoux, B., & Ragin, C. C. (2009). *Configurational comparative methods*. London: Sage.
Salmon, P. (2003). How do we recognize good research? *The Psychologist, 16*(1), 24–27.
Schank, R. C., Berhman, T. R., & Macpherson, K. A. (1999). Learning by doing. In C. M. Reigeluth (Ed.), *Instructional-design theories and models: A new paradigm of instructional theory*. Mahwah, NJ: Erlbaum.
Schank, R. C., Fano, A., Jona, M., & Bell, B. (1993). *The design of goal-based scenarios*. Evanston, IL: Northwestern University Press.
Spanier, N. (2011). *Competence and incompetence training, impact on executive decision-making capability: Advancing theory and testing*. Doctoral thesis. Auckland University of Technology, Auckland, New Zealand.
Wagemann, C., & Schneider, C. Q. (2007). *Standards of good practice in qualitative comparative analysis (QCA) and fuzzy sets*. Compasss working paper, WP2007-51.
Wolfe, J. (1976). Correlates and measures of the external validity of computer-based business policy decision-making environments. *Simulation and Games, 7*, 411–438. doi:10.1177/003755007674003.
Wolfe, J. (1985). The teaching effectiveness of games in collegiate business schools. *Simulation and Games, 16*, 251–288.

Wolfe, J., & Roberts, C. R. (1986). The external validity of a business management game: A five-year longitudinal study. *Simulation and Games, 17*, 45–59. doi:10.1177/0037550086171004.

Woodside, A. G. (1990). Outdoor advertising as experiments. *Journal of the Academy of Marketing Science, 18*(3), 229–237. doi:10.1177/009207039001800305.

Woodside, A. G. (2010). *Principles of case study research*. Boston: Boston College, Carroll School of Business. http://gfa2010.univie.ac.at/fileadmin/user_upload/GFKconference/GFA2010/documents/jbr/JBR-example.pdf.

Woodside, A. G. (2011a). *Case study research: Theory, methods, practice*. Bingley, England: Emerald Group.

Woodside, A. G. (2011b). Responding to the severe limitations of cross-sectional surveys: Commenting on Rong and Wilkinson's perspectives. *Australasian Marketing Journal, 19*(3), 153–156. doi:10.1016/j.ausmj.2011.04.004.

Woodside, A. G. (2012). Incompetency training: Theory, practice and remedies. *Journal of Business Research, 65*, 279–293. doi:10.1016/j.jbusres.2011.10.025.

Woodside, A. G. (2013). Moving beyond multiple regression analysis to algorithms: Calling of adoption of a paradigm shift from symmetric to asymmetric thinking in data analysis and crafting theory. *Journal of Business Research*, 10. doi:10.1016/j.jbusres.2012.12.02

Woodside, A. G., Hsu, S., & Marshall, R. (2010). General theory of cultures' consequences on international tourism behavior. *Journal of Business Research, 64*(8), 785–799.

Woodside, A. G., & Zhang, M. (2012). Identifying X-consumers using causal recipes: "Whales" and "Jumbo Shrimps" Casino Gamblers. *Journal of Gambling Studies, 28*(1), 13–26. doi:10.1007/s10899-011-9241-5.

Wright, B. D. (1999). Fundamental measurement for psychology. In S. Embretson & S. Hershberger (Eds.), *The new rules of measurement*. NJ: Lawrence Erlbaum.

Yamasaki, S., & Rihoux, B. (2009). A commented review of applications. In B. Rihoux & C. C. Ragin (Eds.), *Configurational comparative methods: Qualitative Comparative Analysis (QCA) and related techniques* (pp. 123–146). Thousand Oaks, CA: Sage.

Chapter 5
Analytics and Findings for Overall Competency

5.1 QCA Approach to Investigate Configurations of Conditions for Overall Decision Competence

As Chap. 4 describes, QCA uses Boolean algebra and set relationships, rather than correlations between dependent and independent variables. This research investigates the presence or absence of four treatment conditions associated with high decision competence and or decision confidence. The treatment antecedents include (1) group interaction, (2) GBS simulations, (3) DA dissent and (4) competency/incompetency training. The calibration of all antecedent conditions and the outcomes (occurrence of the two phenomena of decision competence OR decision confidence) are defined and calibrated as fuzzy sets, with the resulting membership scores reflecting the level of membership to the set, using theoretical and substantive knowledge of the cases (Ragin, 2008c) as set out in Chaps. 3 and 4. Both presence and absence of antecedent conditions are considered in the configurations of causal conditions. For this study there are two types of antecedent conditions: (2) treatment antecedents and (2) measured antecedents, and these are set out in Table 5.1 below.

QCA is widely recognised and applied as a method of causal analysis (Mahoney, 2000; Ragin, 1987, 2000; Rihoux, 2006). In contrast to traditional statistical methods, QCA is not concerned with net effect, but rather causes are understood as combinations of conditions that are non-linear (Ragin, 2000) with theoretic connections that are asymmetrical rather than symmetrical. Unique configurations of conditions are studied which are sufficient to predict the outcome: high values of configurational conditions (X_i) associate with high values of the outcome. In this study decision competence (Y_1) OR decision confidence (Y_2) are the outcome conditions. QCA recognises that the phenomenon (here decision competence or decision confidence), may be caused by different combinations of conditions, also called "multiple conjunctural causation" (Ragin, 2007a). Next, the study applies the QCA method to explore causal models (configurations of conditions) for these

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Table 5.1 A comprehensive list of treatment and measured antecedents

Treatment antecedents	Code	Measured antecedents	Code
Group interaction Individual interaction	group ~group[a]	Age Low age	age ~age
Goal-based scenario simulations	gbs ~gbs	Formal education level Low formal education level	educ ~educ_c
Devil's advocate dissent	devil ~devil	Management experience (also abbreviated exp)	man_exp man_exp_c
Competency training Incompetency training	comp incmp or ~comp	Gender (male) Gender (female)	Gender ~gender
		Confidence Not confidence Confidence for all 4 in-baskets (calibrated)	conf ~conf conf_tot_c
		Likelihood to make future changes	chng or chg*i* *i is the number of the in-basket*

[a]*Note*: Absence of the condition is indicated by the tilde (~). The tilde (~) indicates absence of a condition, or "low age" for "~age" and female for "~gender" Antecedents with the extension "_c", indicate that scores are calibrated from the raw data; the extensions educ_c; man_edu_c; conf_tot_c; and chg_tot_c indicate overall measures calibrated, and the extension "tot" indicates aggregated scores over all four in-basket simulations

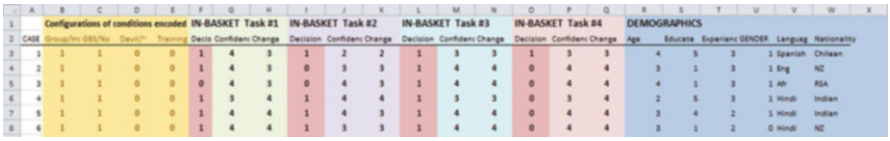
outcomes decision competence and decision confidence over all in-basket assessments (as defined in Chap. 3 and calibrated in Chap. 4).

5.2 Data and Truth Table

5.2.1 Cases and Fuzzy Scores

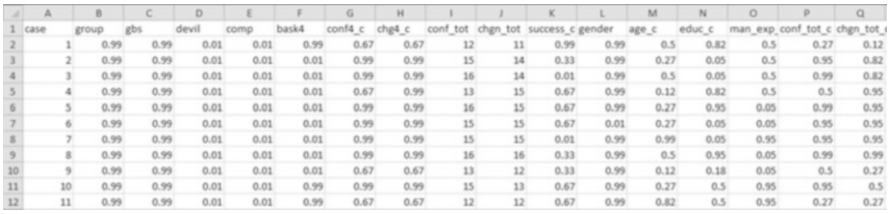
This study examines data for 150 cases (MBA participants completing four in-basket simulations over a period of 2 h). A full overview of the 150 cases appears in Appendix D. While recognising that not all managers have MBA qualifications or some form of formal decision-making training, for practical reasons and reasonable sampling only cases that recorded all measured antecedents in full were analysed. Thus, the original 153 respondents were reduced to 150 cases due to incomplete fields on the decision sheets and/or demographic records. Figure 5.1 provides an example of an extract from the raw data for six cases (data files appear in Appendix D).

A fuzzy set scale transforms the variables into membership, either crisp sets as in the case of gender (males = 1.0, females = 0.0) or continuous variables into membership values ranging between 0 and 1 (see age_c in column M in Fig. 5.2 below).



		Configurations of conditions encoded				IN-BASKET Task #1			IN-BASKET Task #2			IN-BASKET Task #3			IN-BASKET Task #4			DEMOGRAPHICS					
	CASE	Group/Inc GBS/No		Devil/*	Training	Decis	Confidenc	Change	Decision	Confidenc	Change	Decision	Confidenc	Change	Decision	Confidenc	Change	Age	Educate	Experienc	GENDER	Languag	Nationality
3	1	1	1	0	0	1	4	3	1	2	2	1	3	3	1	3	3	4	5	3	1	Spanish	Chilean
4	2	1	1	0	0	1	4	3	0	3	3	1	4	4	0	4	4	3	1	3	1	Eng	NZ
5	3	1	1	0	0	0	4	3	0	4	3	1	4	4	0	4	4	4	1	3	1	Afr	RSA
6	4	1	1	0	0	1	3	4	1	4	4	1	3	3	0	3	4	2	5	3	1	Hindi	Indian
7	5	1	1	0	0	1	4	4	1	4	3	1	4	4	0	4	4	3	4	2	1	Hindi	Indian
8	6	1	1	0	0	1	4	4	1	3	3	1	4	4	0	4	4	3	1	2	0	Hindi	NZ

Fig. 5.1 Example of cases in the raw data file



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	case	group	gbs	devil	comp	bask4	conf4_c	chg4_c	conf_tot	chgn_tot	success_c	gender	age_c	educ_c	man_exp	conf_tot_c	chgn_tot_c
2	1	0.99	0.99	0.01	0.01	0.99	0.67	0.67	12	11	0.99	0.99	0.5	0.82	0.5	0.27	0.12
3	2	0.99	0.99	0.01	0.01	0.01	0.99	0.99	15	14	0.33	0.99	0.27	0.05	0.5	0.95	0.82
4	3	0.99	0.99	0.01	0.01	0.01	0.99	0.99	16	14	0.01	0.99	0.5	0.05	0.5	0.99	0.82
5	4	0.99	0.99	0.01	0.01	0.01	0.67	0.99	13	15	0.67	0.99	0.12	0.82	0.5	0.5	0.95
6	5	0.99	0.99	0.01	0.01	0.01	0.99	0.99	16	15	0.67	0.99	0.27	0.95	0.05	0.99	0.95
7	6	0.99	0.99	0.01	0.01	0.01	0.99	0.99	15	15	0.67	0.01	0.27	0.05	0.05	0.95	0.95
8	7	0.99	0.99	0.01	0.01	0.01	0.99	0.99	15	15	0.01	0.99	0.99	0.05	0.95	0.95	0.95
9	8	0.99	0.99	0.01	0.01	0.01	0.99	0.99	16	16	0.33	0.99	0.5	0.95	0.05	0.99	0.99
10	9	0.99	0.99	0.01	0.01	0.01	0.67	0.67	13	12	0.33	0.99	0.12	0.18	0.05	0.5	0.27
11	10	0.99	0.99	0.01	0.01	0.99	0.99	0.99	15	13	0.67	0.99	0.27	0.5	0.95	0.95	0.5
12	11	0.99	0.99	0.01	0.01	0.99	0.67	0.67	12	12	0.67	0.99	0.82	0.5	0.95	0.27	0.27

Fig. 5.2 Extract of the truth table to illustrate fuzzy set calibration (A soft copy of the full truth table is available upon request)

To avoid losing cases, this study used threshold values of 0.01 and 0.99, rather than 0 and 1, as recommended by Fiss (2009). To calibrate fuzzy values from original "raw" values, the study uses median values to calibrate 0.5 associated with 50 % of the data, 0.05 values associated with the cumulative 5 % of the data and the 0.95 value associated with 95 % of the data (This procedure can be calibrated using the fuzzy set QCA software available from fsQCA.com or COMPASSS.net). An illustrative example is provided in Fig. 5.2.

The difference between the raw data and the final configuration table is the calibration of membership as well as composed conditions such as conf_tot (see column I in Fig. 5.2) and chg4_c, that is, a variable reflecting the level of membership of cases when all four measured antecedents of decision confidence over all four in-basket simulations is aggregated into a single membership value. These aggregated values (age_c; man_exp_c) are statistically calculated using distribution of scores as stated earlier. The calibration of education and decision success (educ_c and success_c) relies on theoretical knowledge and substantive knowledge of each case (Ragin, 2008c). For the antecedent representing formal education (educ_c), students selected from the six levels provided in the demographic section of the survey and compared to known standards such as the entry requirements for the MBA programme.

The antecedent of success (success_c) was calibrated by determining the proportion of correct answers for each of the in-basket simulations and comparing it to achievement standards. Thus, participants with correct answers for all four simulations received a fuzzy score of 1 (or 0.99 as indicated above); those with 3 out of 4 correct answers received 0.67; those with 2 out of 4 correct answers received 0.5; and those with a single correct answer received 0.33. Participants who did not have any correct answers received a fuzzy score of 0.01. Boolean algebra was used to compute decision success (bool_success in the truth table). For this computation,

the QCA software compares success over all four simulations and determines the calibrated value for each case. In addition, the final configuration table also reflects the success for each in-basket simulation as bask*i* (where $i =$ the simulation number). For example, bask4 = the success or failure in answering the question for in-basket simulation 4).

This study develops complex causal conditions from the four simple treatment antecedents and the six measured antecedents. For practical and scope reasons, the present study does not include the two measured antecedents of language or nationality.

5.2.2 *Fuzzy Truth Table: Evaluating Consistency and Coverage*

The truth table is the next step after calibration (Ragin, 2007b). The fuzzy set membership scores are transformed into a truth table using the QCA algorithm to display all 2^k (k = number of causal conditions) logically possible combinations of conditions as well as the empirical outcome(s) (Ragin, 2008a). This study has four causal conditions (treatment antecedents), resulting in $2^4 = 16$ theoretically possible combinations. When measured antecedents are included in this calculation, the number is 2^{10} or 1024 possible configurations. Relevant and useful configurations must have a frequency threshold based on the number of cases greater than 0.5 membership in each configuration (Ragin, 2004), a consistency threshold above the minimum level of 0.75, and coverage of between 0.2 and 0.6. Cases that do not meet these criteria should be deleted since they are irrelevant to the study of the outcome phenomenon. Researchers Rihoux and Ragin (2009, p. 109) define set-theoretic "consistency" as "the degree to which the empirical evidence is consistent with the set theoretic relation question". The formula is: Consistency $(X_i \leq Y_i) = \sum(\min(X_i, Y_i))/\sum(X_i)$, where "min" indicates the lower of two values for X_i and Y_i represents membership scores in the outcome. For example, if 107 cases of the 150 cases displaying a causal combination (for example, competency training AND gbs AND group) also display the outcome condition (decision competence) then the proportion consistent is 0.71. Ragin (2004, 2006c) suggests that substantive grounds are limited for observed consistency scores below 0.7. See Figs. 5.3 and 5.4 for graphs reflecting coverage and consistency.

The next step after establishing that a set relation is consistent is to calculate coverage. According to Ragin (2006c, p. 300), "It is pointless to compute the coverage of a cause or combination of causes that is not a consistent subset of the outcome". Coverage is a gauge of the empirical relevance or importance of configurations of conditions (Ragin, 2006c, p. 301; Woodside & Zhang, 2012) and is expressable as:

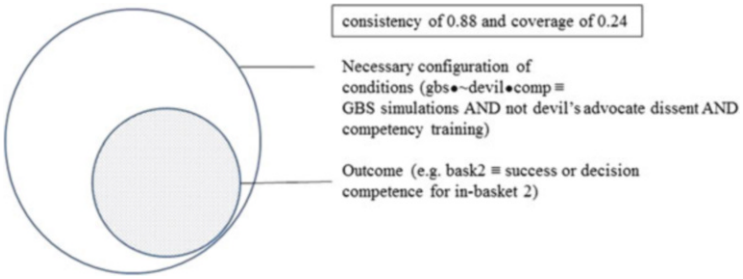


Fig. 5.3 Empirically relevant necessary configurations of conditions

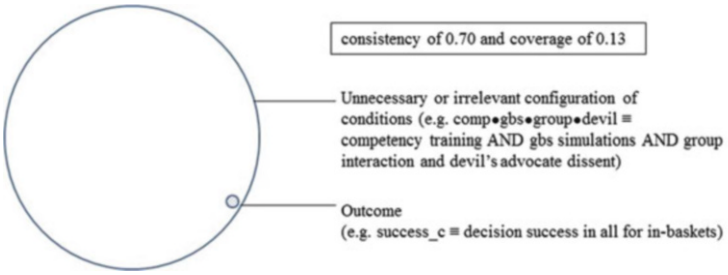


Fig. 5.4 Empirically trivial necessary configurations of conditions

$$\text{Coverage } (X_i \leq Y_i) = \sum \left(\min(X_i Y_i)\right) / \sum (Y_i)$$

The concepts and calculated values of consistency and coverage for each in-basket simulation as well as the overall decision competence are discussed in detail in Sect. 5.3. Only configurations with coverage of between 0.2 and 0.6 were considered relevant in this study. Configurations above 0.7 were considered irrelevant and discarded. When coverage is too small (below 0.2) then there are numerous ways to achieve the outcome and the studied configuration of conditions does not do a useful ("good") job of explaining the link between high membership of the configuration of conditions (X_i) and high membership of the outcome (high Y_i) (Ragin, 2006c). For example, a rather disappointing finding of the study is, given consistency of 0.70 and coverage of 0.13, that a combination of the treatment antecedents (comp ● gbs ● group ● devil) indicates the irrelevance of this configuration of conditions, meaning that the high decision competence does not associate with a high outcome condition. Following Ragin (2006c), irrelevant configurations of conditions were rejected on empirical grounds by the researcher. Figures 5.3 and 5.4 show relevant and irrelevant (also called trivialised) configurations in this study.

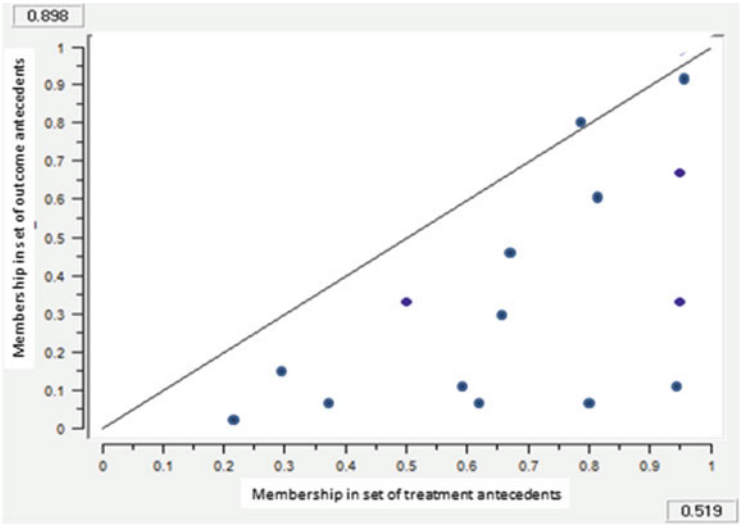


Fig. 5.5 XY plot of necessity (outcome is subset of cause)

5.2.3 Necessary and Sufficient Conditions

Ragin (1987, p. 99) explains "A cause is defined as necessary if it must be present for a certain outcome to occur. A cause is defined as sufficient if it by itself can produce a certain outcome." If there are several antecedents, the word "cause" may refer to either single values or combined values of several antecedents (variables). In Boolean algebra, sufficient conditions are conceptually equivalent to prime implicants, thus a single prime implicant is a necessary cause. In other words, the necessity rule is: "When a causal combination is necessary for an outcome, all instances of the outcome should exhibit the same combination of causal conditions . . . Naturally, if a combination of conditions is necessary for a particular outcome, the each single causal condition is also necessary for the outcome" (Ragin, 2000, p. 100). Using set theory to understand the arithmetical relationship for fuzzy sets, if the fuzzy membership scores in the outcome are less than or equal to fuzzy membership in the cause, then the outcome is a subset of the cause. This arithmetical relationship ($Yi \leq X_i$) is depicted as an XY plot in Fig. 5.5.

"To support the argument of sufficiency, the researcher must demonstrate that the cause is a subset of the outcome" (Ragin & Drass, 2008). In terms of set theory, sufficiency is the evaluation of whether the cases displaying the causal conditions form a subset of the cases displaying the outcome: $Y_i \geq X_i$ (Fig. 5.6).

Ragin (2000, p. 91) suggests that the researcher must "work backward from instance of the outcome to the identification of relevant causes . . . A necessary cause must be present for the outcome in question to occur. Thus, an instance of the outcome should be preceded by the cause of exhibit the cause in some way". None of the four treatment antecedents is necessary for a high membership of the

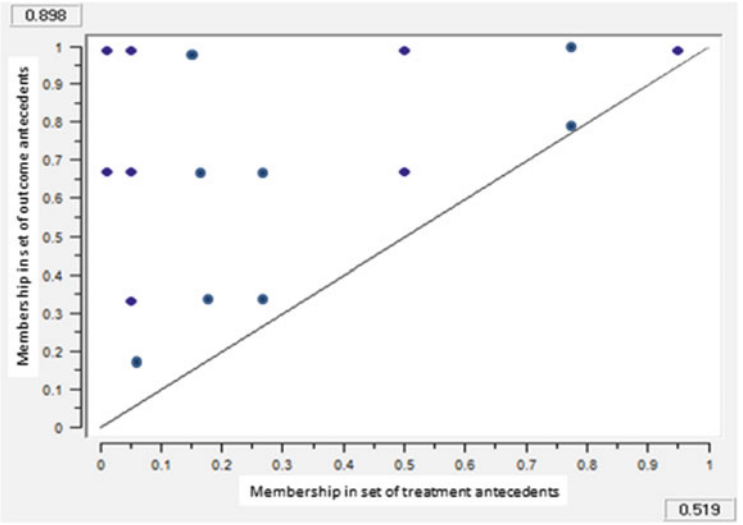


Fig. 5.6 XY plot of sufficiency (cause is a subset of outcome)

outcome of "decision competence" (success_c) for all in-basket simulations. After conducting this test for configurations of conditions for the simulations separately (bask1, bask2, bask3 and bask4) sufficient causal conditions were identified and these are discussed in the next section.

5.3 Findings and Interpretations of Overall Decision Competence and Decision Confidence

Ragin (2008d, p. 13) states that "fsQCA presents three solutions to each truth table analysis: (1) a 'complex' solution that avoids using any counterfactual cases (rows without cases—'remainders'); (2) a 'parsimonious' solution, which permits the use of any remainder that will yield simpler (or fewer) recipes; and (3) an 'intermediate' solution, which uses only the remainders that survive counterfactual analysis based on theoretical and substantive knowledge (which is input by the user). Generally, intermediate solutions are best."

The intermediate and parsimonious recipes for the individual in-basket simulations (bask*i*, where $i \in \{1;2;3;4\}$) are now discussed, as well as the overall decision success and decision confidence (conf*i*_c where $i \in \{1;2;3;4\}$, i is the same as the indicator for number of simulation; the "c" indicates calibration using the median [as 0.5] recipes). The findings of the QCA minimisation procedure produced several sufficient configurations of conditions for the experiments' "high decision success" outcome, but these configurations differ substantially over the four in-basket simulations and are therefore discussed individually. Ragin (2000, p. 87) warns

against over-reliance on the QCA methodology alone, where the researcher views cases as configurations by "adopting the laser beam-like focus of the case-oriented approach" and adds that "Viewing cases as configurations is not a panacea". To overcome this caveat the discussion of findings will refer back to the extant literature on predictions and forecasts; simulations; in-basket simulations; GBS; DA dissent, group interaction for decision-making; competency training and incompetency training and experiential learning.

5.3.1 *Aggregate of All In-basket Simulations: Decision Success*

The intermediate solutions offered by the QCA procedure result in causal recipes that are not useful. The first causal recipe in Table 5.2 combines the four treatment conditions (group, gbs, devil and competency training). Unfortunately the consistency is very low and coverage is below the acceptable minimum level of 0.2 (0.13). Ragin and Rihoux (2004) indicate that a minimum consistency of 0.75 is required to consider a model of configurations of antecedents as "useful" and robust, with 0.70 considered the absolute minimum. These numbers indicate that the set theoretic relationships with this combination of causal conditions (treatment antecedents) explain too few of the cases of useful outcomes.

Table 5.2 Parsimonious solutions for decision success over all four in-basket simulations

```
**********************
*TRUTH TABLE ANALYSIS*
**********************

File:  G:/DeVilliers/20 Jan 13.csv
Model: success_c = f(group, gbs, devil, comp)

 Rows:      10



 Algorithm: Quine-McCluskey
      True: 1-L

--- PARSIMONIOUS SOLUTION ---
frequency cutoff: 8.000000
consistency cutoff: 0.707391

                     raw        unique
                   coverage    coverage   consistency
                  ----------  ----------  ----------
group*gbs*comp     0.131446    0.131446    0.707391  See graph below
solution coverage: 0.131446
solution consistency: 0.707391
```

Table 5.3 Models for overall high decision competence (all four in-baskets simulations)

```
**********
*TRUTH TABLE ANALYSIS*
**********

File:  F:/PhD from D9_2011/DATA for PHD/ARCH IN BOSTON Jan 2013/AAARCH_De Villiers 17 Jan PLUSss22.csv
Model: success_c = f(conf_tot_c, comp, devil, gbs, group)

 Rows:       8

 Algorithm: Quine-McCluskey
      True: 1
   0 Matrix: 0L
Don't Care: -

--- INTERMEDIATE SOLUTION ---
frequency cutoff: 1.000000
consistency cutoff: 0.753590
Assumptions:

                                raw       unique
                           coverage    coverage   consistency
                          ----------  ----------  ----------
*  conf_tot_c*~comp*~devil*~gbs  0.235847  0.214825  0.773793
   ~comp*devil*~gbs*group     0.084922  0.063900  0.587210
   ~conf_tot_c*~devil*gbs*group  0.120656  0.050868  0.895942
** comp*~devil*gbs*group       0.131446  0.061658  0.707391
   solution coverage: 0.461042
   solution consistency: 0.709817

--- PARSIMONIOUS SOLUTION ---
frequency cutoff: 1.000000
consistency cutoff: 0.753590

                                raw       unique
                           coverage    coverage   consistency
                          ----------  ----------  ----------
devil*~comp                0.084922  0.010229  0.587210
~gbs*~comp*conf_tot_c      0.289518  0.214825  0.759559
group*gbs*~conf_tot_c      0.120656  0.050868  0.895942
group*gbs*comp             0.131446  0.061658  0.707391
solution coverage: 0.461042
solution consistency: 0.709817

See graph below
```

* Example: The causal path for decision competency for which participants report high levels of competence; combined purposely absence of the treatment antecedents of competency training, devils' advocate and GBS.

** Example: Participants in the high competence treatment, with GBS simulations, working in groups, but with no devil's advocate dissent experience, display high levels of decision competence.

The model therefore has limited coverage in the number of cases. In other words, there are others models (configurations X) that will work equally well in predicting high decision competence (Y_1). This is not the only model that will give researchers a reasonably accurate assessment of high decision competence.

When a single measured antecedent (**conf_tot_c** ≡ calibrated total confidence reported by the respondents) is combined with the four treatment antecedents, however, a useful model for high decision success does result (Table 5.3).

The only parsimonius solution (~gbs ● ~comp● conf_c) that is of some use is the one displayed in Fig. 5.7. Intermediate solutions are displayed in Table 5.4. The causal path which configures the conditions "not competency training", "not DA dissent", "not GBS" and the measured antecedent of high confidence indecisions is useful to achieve decision competence in the participants. The overall solution consistency is 77 % and the solution coverage is 23 %. These numbers indicate that the set theoretic relationship between high outcome and the causal conditions is moderately useful in predicting decision competence.

Figure 5.8 depicts the XY-plot of one of the causal recipes (conf_c ● ~comp ● ~devil ● ~gbs) and the outcome of overall decision competence for all four in-basket simulations. In this case decision competence is a fuzzy set determined by the number of correct answers for all four simulations. Figure 5.8 shows the vast majority of cases in the upper left triangle, indicating a moderate consistency score (0.24) for sufficiency. Note that the configural statement does not reflect decision competence for all participants (cases): while a student with high scores is

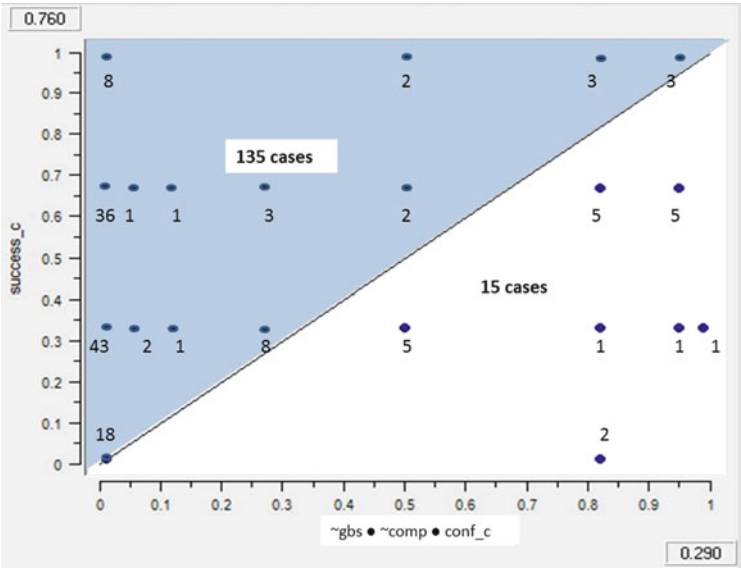


Fig. 5.7 Scatter plot of decision success for all four in-basket simulations. *Note*: The number of cases is indicated by the numbers below the dots

Table 5.4 Models for overall high decision competence (all in-basket simulations): Measured antecedents of confidence and competency training. DA; GBS and group treatment antecedents

```
File:  F:/PhD from D9_2011/DATA for PHD/ARCH IN BOSTON Jan 2013/AAARCH_De Villiers 17 Jan PLUSss22.csv
Model: success_c = f(conf_tot_c, comp, devil, gbs, group)

 Rows:      14



 Algorithm: Quine-McCluskey
      True: 1
   0 Matrix: 0L
Don't Care: -

--- INTERMEDIATE SOLUTION ---
frequency cutoff: 1.000000
consistency cutoff: 0.720001
Assumptions:

                                 raw        unique
                              coverage    coverage   consistency
                             ----------  ----------  ----------
~comp*~gbs*group              0.181334    0.066284    0.586051
~conf_tot_c*~devil*group      0.173347    0.012472    0.782416
conf_tot_c*~comp*~devil*~gbs  0.235847    0.133267    0.773793      See graph below
~conf_tot_c*~comp*~devil*gbs  0.129064    0.057175    0.782498
comp*~devil*gbs*group         0.131446    0.061659    0.707391
solution coverage: 0.545542
solution consistency: 0.662074
```

**Example: Participants with high levels of confidence and deliberately not exposed to the competency treatment, and not devil's advocate dissent and not involved in the GBS simulations, display decision competency overall in all four the in-baskets.

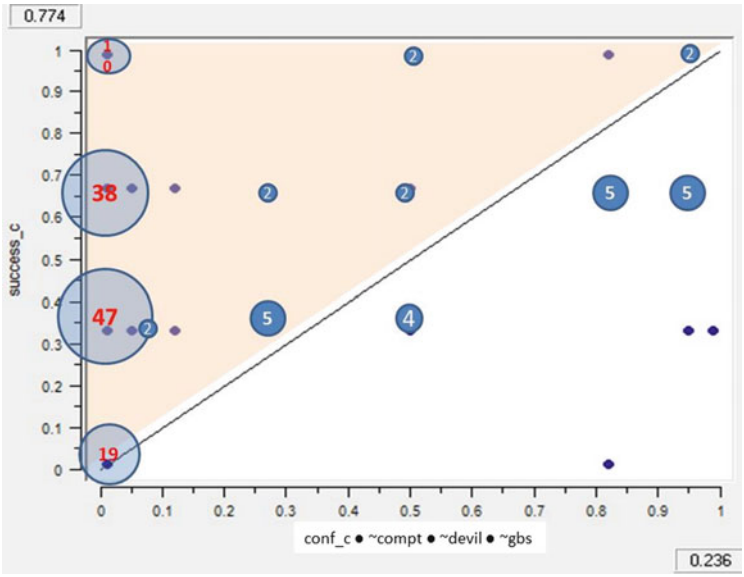


Fig. 5.8 Models for overall decision competence: measured antecedent of overall confidence AND treatment antecedents of incompetency training AND not DA AND not GBS

Table 5.5 The effect of each treatment antecedent individually on overall decision competence

	Coverage	Consistency
Group interaction	0.47	0.53
GBS simulations	0.45	0.49
DA dissent	0.11	0.44
Competency training	0.46	0.46

consistently a member of the set of competent decision-makers, the configural statement is not necessary for indicating decision competence. Cases with low scores in the configural statements (X) include both low and high scores in decision confidence. The configural statement is thus sufficient, but not necessary for identifying decision competence.

This study analyses the impact of the treatment antecedent on decision competency separately. Disappointingly, all four treatment antecedents have minimal predictive value (see Table 5.5, Fig. 5.9).

Table 5.6 below reveals possible models for decision success (in all four in-basket simulations) as a function of the six measured antecedents: likelihood-to-change_total (chgn_tot_c), overall confidence (conf_tot_c), managerial experience (man_exp_c), level of formal education (edu_tot_c), gender (gender) and age (age_c). Figure 4.9 shows the plot of one of the useful models (*), gender● ~ age_c● ~ man_exp_c●conf_tot_c, which indicates that young (~age), male (gender) participants with low levels of management experience

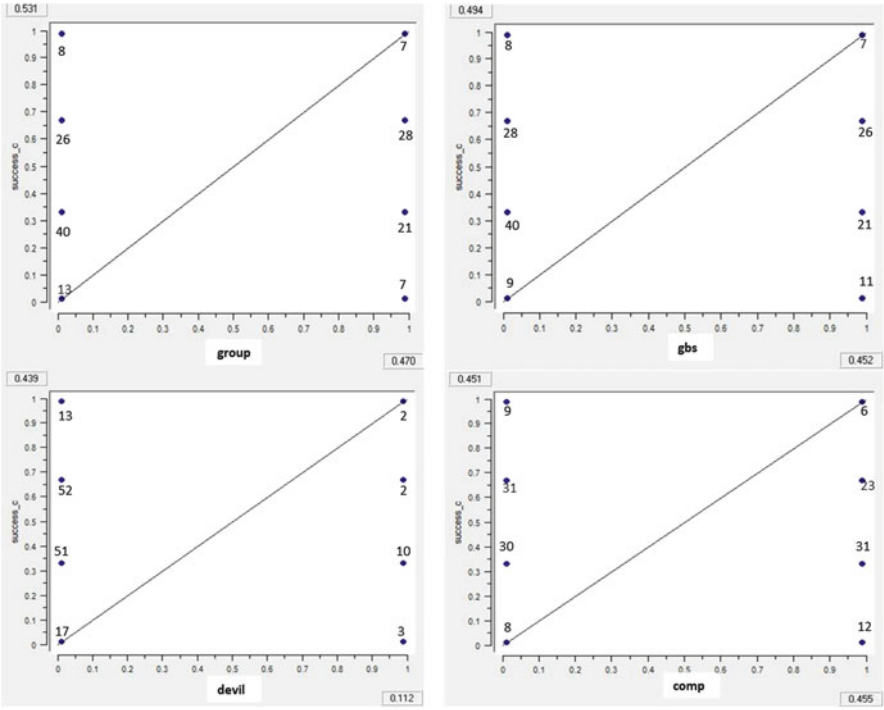


Fig. 5.9 XY plots of invalid models of overall decision competence

(notme ≡ ~man_exp_c) and high levels of total confidence (conf) displayed high decision competency overall in all four simulations.

Figures 5.10, 5.11, 5.12 show the plots of three of the five marginally useful models to predict decision competence that are related to gender-related configurations.

The analysis of the impact of measured antecedent of gender on decision confidence was retested in isolation. A not-useful (trivial) model or correlation was found with a consistency well below the minimum level of 0.75 at 0.49. The coverage was measured at 0.72 (see Fig. 5.13).

Taking heed of Ragin's (2000, p. 88) caution to avoid myopia when using QCA and over-reliance on the solutions offered by the software, analyses of tenths of configurations of treatment and measured conditions in order to find additional causal recipes were completed. Considering experience, age and education as antecedents (calibrated by using the median, 0.05 and 0.95 values determine fuzzy values, as explained earlier), the models were not useful (see Table 5.7).

But when Boolean algebra is used to calculate the fuzzy set values for a combination of the measured antecedents of age, experience and education (see Table 5.8 and Fig. 5.14 below), the resulting model is moderately useful. This

Table 5.6 Findings for measured antecedents' impact on overall decision competence

```
--- COMPLEX SOLUTION ---
frequency cutoff: 1.000000
consistency cutoff: 0.724466
```

	raw coverage	unique coverage	consistency	
gender*~age_c*~man_exp_c*~chgn_tot_c	0.277747	0.012612	0.776646	See graph below
age_c*man_exp_c*~conf_tot_c*~chgn_tot_c	0.298066	0.046384	0.736241	
* gender*~age_c*~man_exp_c*conf_tot_c	0.314742	0.035874	0.793921	
~educ_c*~man_exp_c*conf_tot_c*chgn_tot_c	0.350056	0.038397	0.803991	
age_c*man_exp_c*conf_tot_c*chgn_tot_c	0.345852	0.035454	0.687849	
gender*~educ_c*~man_exp_c*~conf_tot_c*~chgn_tot_c	0.219731	-0.000000	0.805756	
~gender*educ_c*~man_exp_c*~conf_tot_c*~chgn_tot_c	0.110006	0.022702	0.717550	See graph below
~gender*~age_c*educ_c*conf_tot_c*chgn_tot_c	0.120376	0.029008	0.760850	
gender*age_c*~educ_c*man_exp_c*~chgn_tot_c	0.224356	-0.000000	0.679542	
gender*age_c*~educ_c*man_exp_c*conf_tot_c	0.254484	-0.000000	0.711599	

```
solution coverage: 0.824131
solution consistency: 0.651851
```

*Example: Young, male participants with low levels of management experience and high levels of total confidence display high decision competency overall in all four the in-baskets.

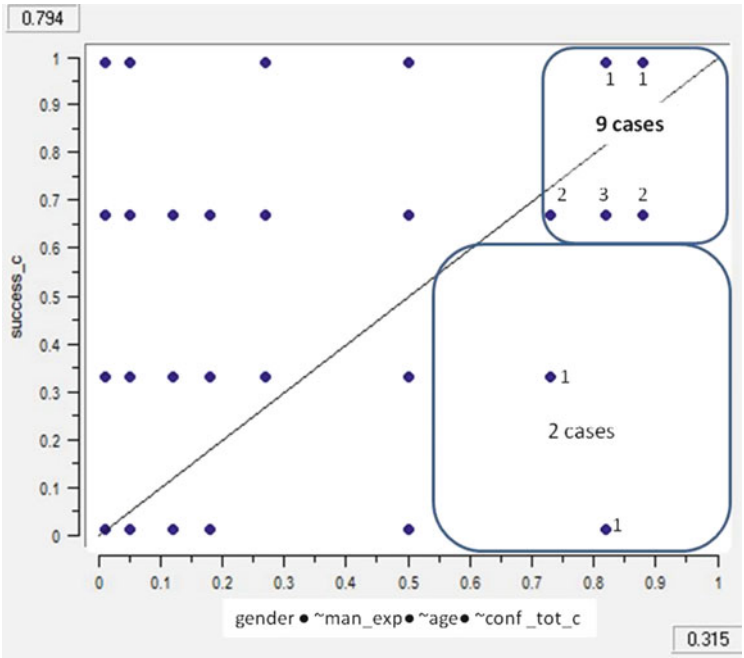


Fig. 5.10 Useful model for the measured antecedents' impact on overall high decision competency

means that high age (**age**) AND education (**edu**) level AND high levels of management experience (**exp**) predict high decision success for a significant number of the cases. This can be interpreted as older participants who report high levels of

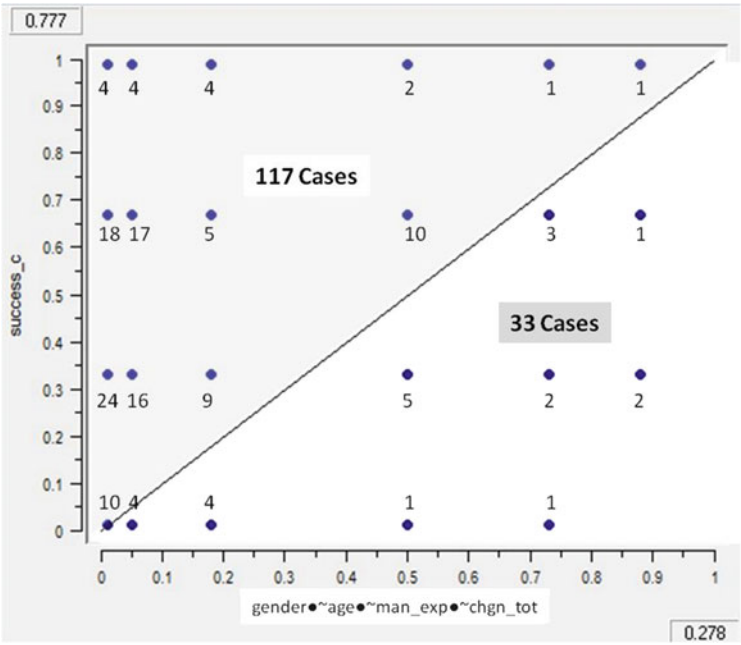


Fig. 5.11 Moderately useful model for decision competence of male participants

formal education AND high levels of management experience demonstrating high levels of decision competence.

This model is somewhat useful to predict decision competence in other cases, since the consistency is marginally acceptable (0.73) and the coverage is 0.30, as guided by Rihoux and Ragin (2009). Figure 5.14 shows that the majority of cases are in the upper left triangle ($Y_i > X_i$), with only 42 of the 150 cases in the lower right triangle, indicating moderate consistency in the fuzzy set.

Unfortunately all additional or new propositions related to overall decision competence (/success) were falsified by contrary cases or associate with very low outcome levels. The next section investigates decision confidence as an outcome of the treatments.

5.3.1.1 Not-Decision Competence of Decision Failure (~Success)

The possible logical configurations of conditions total to 2046 combinations. The fsQCA procedure was executed hundreds of times, with careful consideration, analysis and interpretation of large number of models. Many were disregarded due to consistency or coverage scores not meeting the required levels. In pursuit of thoroughness "not-decision competence" (~success) was investigated and two useful models resulted from the fsQCA procedures (Table 5.9).

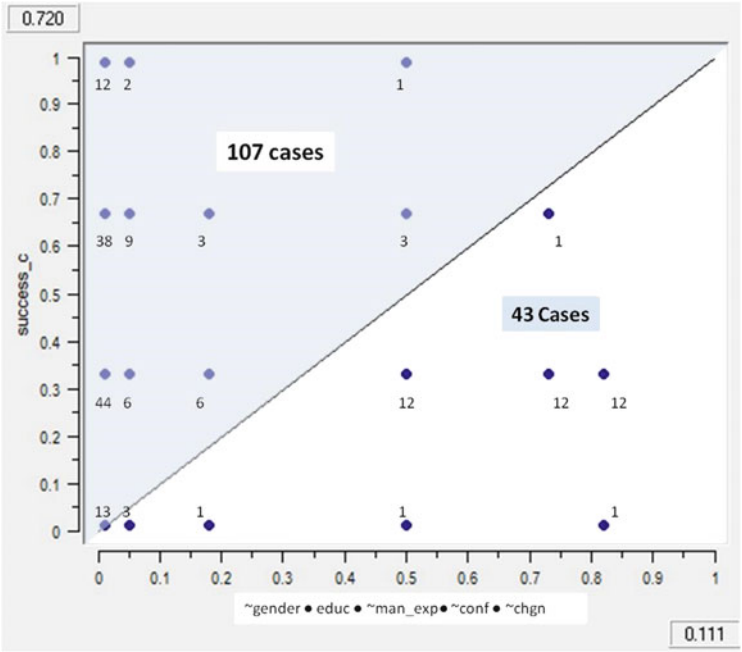


Fig. 5.12 Model for path association with high decision success (/competence) for female participants

Experimental treatments for which participants make decisions in groups, but are not given GBS training (no specified roles and or any highlighted goals), results in high failure membership OR participants who make decisions in group interactive decision-making treatment AND not give the benefit of GBS simulated interaction associated with high decision failure. A useful recipe (consistency > 0.75 and coverage > 0.2) for decision incompetence is a combination of the treatment antecedents of groups and not GBS simulations. In other words, if participants are placed in groups but not given training in GBS, they have high membership in the set of incompetent decision-makers. This result guides educators and practitioners to use GBS simulations (which include clear goal specification and SI or role-play) to assist groups making decisions and avoid failure. Figure 5.15 illustrates the impact of group● ~ gbs on decision failure. Note that **not_bool_success** indicates **1-success** calibrated by using Boolean algebra (i.e. overall success $= 0$ for all for in-basket simulations).

In summary, group AND not gbs OR not devil associates with high decision failure (group● ~ gbs + ~devil → ~success).

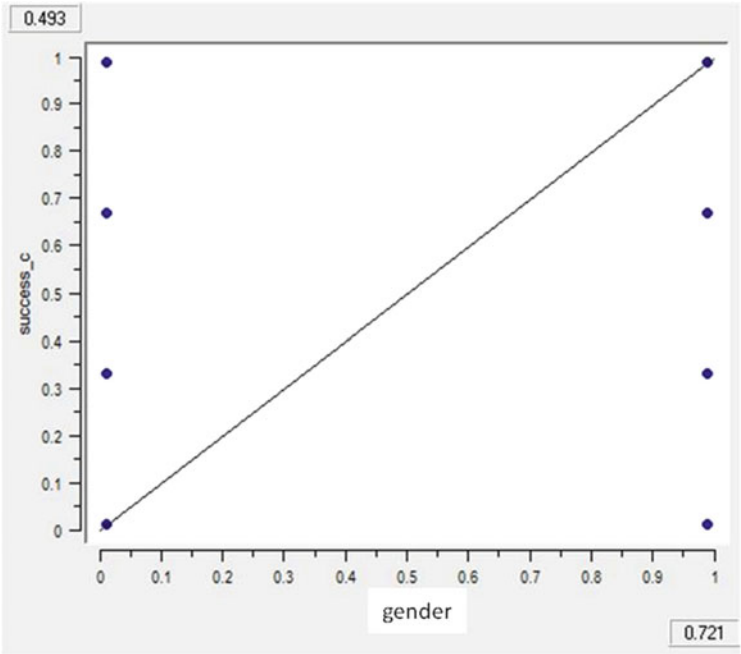


Fig. 5.13 fsQCA output for impact of gender on overall decision competence

Table 5.7 Overall decision competence by measured antecedents

```
File:  F:/PhD from D9_2011/DATA for PHD/ARCH IN BOSTON Jan 2013/AAARCH_De Villiers 17 Jan PLUSss22.csv
Model: success_c = f(educ_c, age_c, man_exp_c)

 Rows:       8



 Algorithm: Quine-McCluskey
      True: 1
   0 Matrix: 0L
Don't Care: -

--- INTERMEDIATE SOLUTION ---
frequency cutoff: 2.000000
consistency cutoff: 0.730345
Assumptions:

                  raw        unique
                 coverage    coverage   consistency
                ----------  ----------  ----------
~man_exp_c      0.678251    0.228700    0.598048
educ_c          0.612668    0.163117    0.660822
solution coverage: 0.841368
solution consistency: 0.587763
```

Table 5.8 Overall decision success (success) when antecedents are calibrated using Boolean algebra (exp●age●edu)

```
Algorithm: Quine-McCluskey
     True: 1-L

--- PARSIMONIOUS SOLUTION ---
frequency cutoff: 11.000000
consistency cutoff: 0.730345

                   raw         unique
                  coverage    coverage   consistency
                 ----------  ----------  ----------
exp_age_edu      0.296804    0.296804    0.730345
solution coverage: 0.296804
solution consistency: 0.730345
```

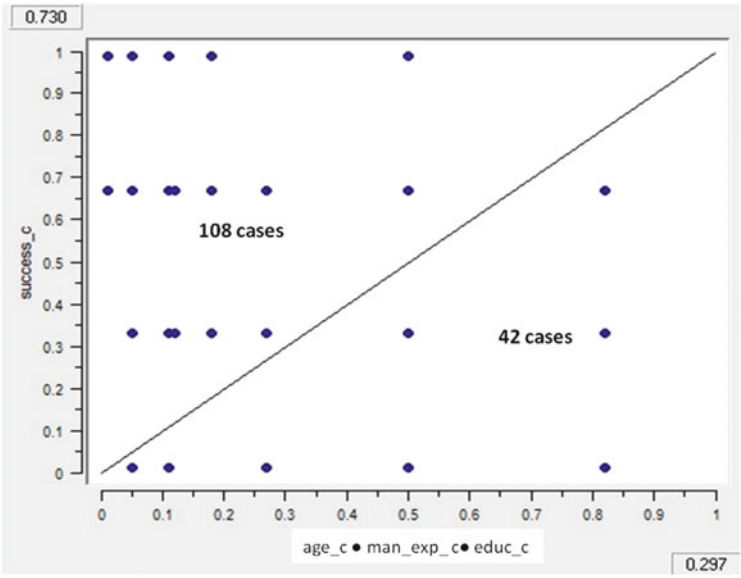


Fig. 5.14 Age AND education AND management experience association with high overall decision competence

Table 5.9 Decision failure (~success) by treatment antecedents

```
File:  F:/PhD from D9_2011/DATA for PHD/ARCH IN BOSTON Jan 2013/AAARCH_De Villiers 17 Jan PLUSss22.csv
Model: not_bool_succ = f(group, gbs, devil, comp)

 Rows:      10



 Algorithm: Quine-McCluskey
      True: 1

--- COMPLEX SOLUTION ---
frequency cutoff: 8.000000
consistency cutoff: 0.778281

                   raw         unique
                coverage    coverage    consistency
-------------------------------------------------
~devil          0.890134    0.732437    0.903368
group*~gbs      0.267563    0.109866    0.924109      See graph below
-------------------------------------------------
solution coverage: 1.000000
solution consistency: 0.901010
```

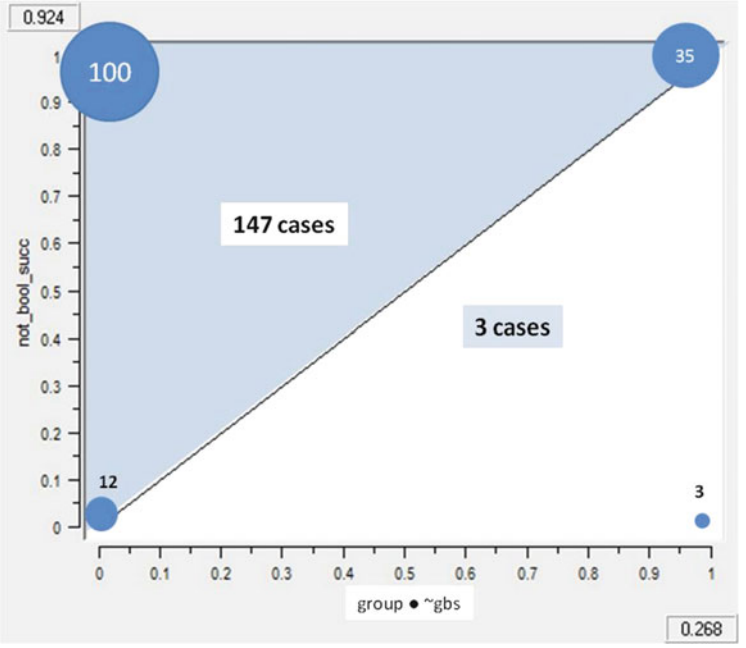


Fig. 5.15 Plot of decision failure by configuration (group ● ~ gbs)

5.3.2 *Aggregate of All In-baskets Assessments: Decision Confidence*

Careful implementation of the fsQCA procedures and analysis of the truth table algorithms relating to the four treatment conditions (group, gbs, devil, comp), delivered disappointing results. When the impact of the four treatment antecedents on decision confidence was analysed, the resulting models were not affirmed. Although the consistency was within the acceptable range, the coverage was below the minimum acceptable level of 0.2, indicating that other models could equally well (or poorly in this case) predict high decision confidence (Rihoux & Ragin 2009). Table 5.10 shows the intermediate solutions for decision *confidence* when configurations of treatment antecedent conditions are considered.

When paths (configurations of conditions) associated with high decision confidence combine measured antecedents (age_c; man_exp_c and educ_c; excluding gender) and only one treatment antecedent group, useful models are indicated when consistency is > 0.7 and coverage between 0.2 and 0.6 (Table 5.11, Fig. 5.16).

This study also investigates the following issue. How is overall decision confidence affected by a combination of (only) the measured antecedents?

The model of management experience AND formal education (man_exp_c ● educ_c) is highly useful in predicting decision confidence for this study (see Table 5.12 above and description of the plot in Fig. 5.17 below). In other words, as would be commonly accepted, researchers can with a high level of certainty predict that MBA graduate managers will have high levels of formal education

Table 5.10 Intermediate solutions for overall decision confidence

```
File:  E:/PhD from D9_2011/DATA for PHD/ARCH IN BOSTON Jan 2013/AAARCH_De Villiers 17 Jan PLUSss22.csv
Model: conf_tot_c = f(comp, devil, gbs, group)

 Rows:       3



 Algorithm: Quine-McCluskey
      True: 1
  0 Matrix: 0L
Don't Care: -

--- INTERMEDIATE SOLUTION ---
frequency cutoff: 8.000000
consistency cutoff: 0.717697
Assumptions:

                            raw        unique
                           coverage    coverage   consistency
                          ----------  ----------  ----------
comp*~gbs*group           0.151536    0.135028    0.758260
~comp*~devil*gbs*group    0.112469    0.095961    0.717697
solution coverage: 0.247497
solution consistency: 0.727832
```

Table 5.11 Decision confidence by the configuration of conditions (group ● age_c ● educ_c ● man_exp_c)

```
File:  C:/Users/rouxelle/Desktop/ARCH IN BOSTON Jan 2013/AAARCH_De Villiers 17 Jan PLUSss22.csv
Model: conf_tot_c = f(group, age_c, educ_c, man_exp_c)

 Rows:      12



 Algorithm: Quine-McCluskey
      True: 1

--- COMPLEX SOLUTION ---
frequency cutoff: 1.000000
consistency cutoff: 0.715043

                          raw         unique
                        coverage    coverage    consistency
                        ----------  ----------  ----------
~age_c*~man_exp_c       0.434357    0.041598    0.734189
group*educ_c            0.326841    0.063387    0.794121
age_c*man_exp_c         0.462969    0.044349    0.742761
~group*~man_exp_c       0.328051    0.019808    0.642180
~group*age_c            0.427094    0.015957    0.715392
solution coverage: 0.916144
solution consistency: 0.681595
```

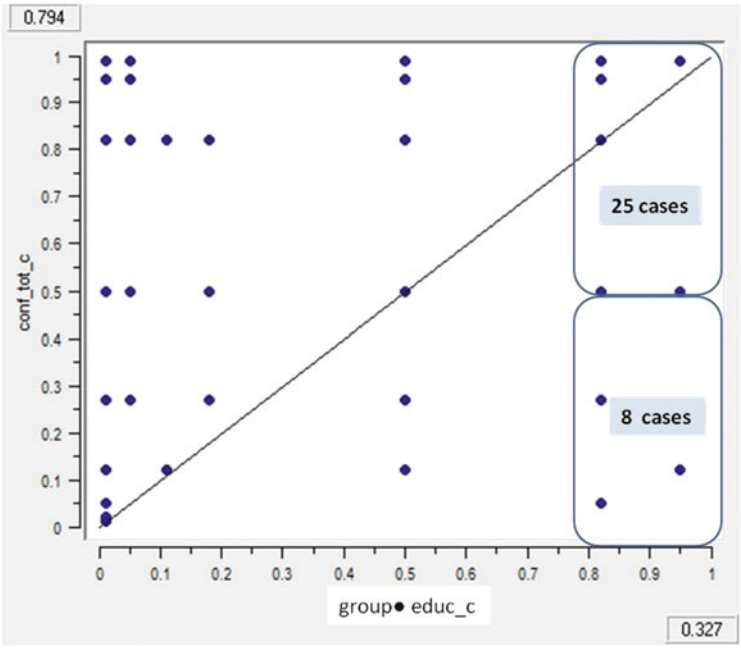


Fig. 5.16 Impact on overall decision confidence by path (group ● educ_c)

Table 5.12 Overall decision confidence

```
Model: conf_tot_c = f(man_exp_c, educ_c, age_c, gender)

 Rows:      16



 Algorithm: Quine-McCluskey
      True: 1
  0 Matrix: 0L
Don't Care: -

--- INTERMEDIATE SOLUTION ---
frequency cutoff: 1.000000
consistency cutoff: 0.762843
Assumptions:

                          raw        unique
                       coverage    coverage   consistency
                      ----------  ----------  ----------
age_c                 0.665346    0.243205    0.721394
~man_exp_c*gender     0.429294    0.129856    0.724420
man_exp_c*educ_c      0.322438    0.036756    0.836904
solution coverage: 0.858809
solution consistency: 0.697409
```

(postgraduate qualifications) and high levels of managerial experience (more than 5 years judgement and decision-making [JDM] experience).

A number of authors indicate that MBA graduates can be arrogant, which implies they are confident without being necessarily able to back their attitude up with performance. When compared to the models produced for decision competence, the man_exp●age_c●educ_c model is only repeated for exceptional cases—those cases where full success (i.e. four out of four correct decisions) has been achieved as displayed by a Boolean algebraic score of 1—AND only when combined with the measured antecedent of age. As expected, the intermediate solution in Table 5.12 above and illustrated in Fig. 5.18 below indicates that age (age_c) is a predictor of decision confidence (with a consistency of 0.72, coverage 0.67). Thus age is a marginally useful model to predict decision confidence.

The marginally useful (consistency 0.72) configuration of measured conditions ~ man_exp_c ● gender is not unexpected. High decision confidence for males (gender) with low levels of management experience (~man_exp_c ≡ JDM 5 years and less) associates with high levels of decision confidence (see Fig. 5.19 below). This result is expected in line with assertions in the literature that MBAs lack

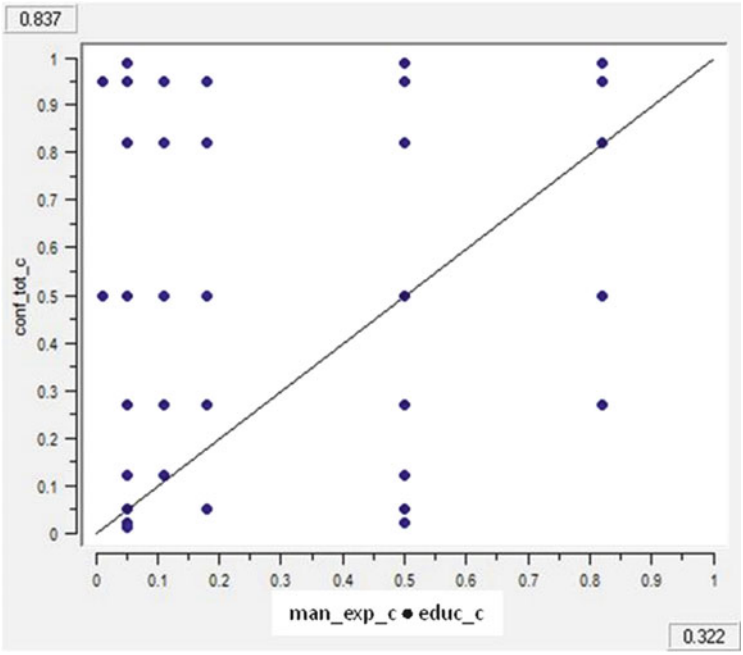


Fig. 5.17 Plot for path (man_exp_c ● educ_c) impact on decision confidence

relevance in the real world (Bennis & O'Toole, 2005; Clinebell & Clinebell, 2008; Kedrovsky, 2005; Pfeffer & Fong, 2002) and critics' complaints that MBA programmes focus mainly on technical skills, often ignoring critical soft skills such as teamwork and inter-personal and cultural skills (Porter & McKibbin, 1988). Other criticisms about MBA graduates are that they are arrogant; overly confident; demand inordinately high starting salaries; and that their expectations exceed their abilities. They have almost no loyalty towards their employers and are largely focused on rising through ranks as fast as possible, with no regard for the "collateral damage" they leave behind (Cheit, 1985; Mintzberg & Lampel, 2001; Neelankavil, 1994). It seems that these assertions have some merit, but only for the male participants in this study. Analyses of paths of decision confidence for female participants did not result in any useful models for accurately predicting female participants' decision confidence within the context of this study.

5.3.3 Summary of Core Findings

Table 5.13 sets out the core findings of this study. Note that these are not "key success factors" as the dominant discourse seems to follow in traditional statistical methods of marketing research. This research finds that no single treatment or

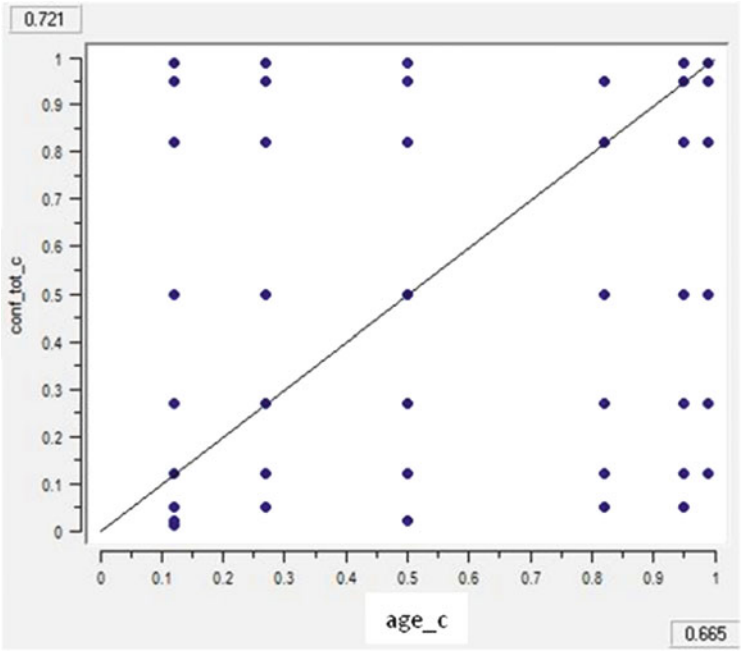


Fig. 5.18 fsQCA plot of the association between age and overall decision confidence

measured antecedent is necessary for high decision competence, but that the single measured antecedent of age is marginally sufficient to impact decision confidence. Also, the single treatment antecedent of **~ devil** was found to be sufficient to impact high decision incompetence (failure).

It is clear from these configural recipes that none of the treatments are singularly necessary and sufficient to associate with high decision competence. We can also deduce that educationalists need to be cognisant of the impact of measured conditions on participants' decision competence and decision confidence. The presence of all six measured antecedents in the configuration of conditions set out in Table 5.13 indicates that none of these are negligible when designing development interventions. The only treatment that is not necessary AND not sufficient in impacting decision competence is group. One certain statement is that high decision *incompetence* is associated with group interactive decision-making and not receiving a GBS treatment (group ● ~ gbs). The implication for educationalists is that group work with the absence of clear goals AND combined with clear task objectives as used in SIs AND training group members to consider the impact of the decision on different functions/objectives (normally represented by the role-players) is highly likely to result in poor decision outcomes.

Chapter 5 investigates the decision competency and decision confidence performance of all participants over all in-basket simulations. It thus reflects overall performance and does not analyse or demonstrate how participants performed in

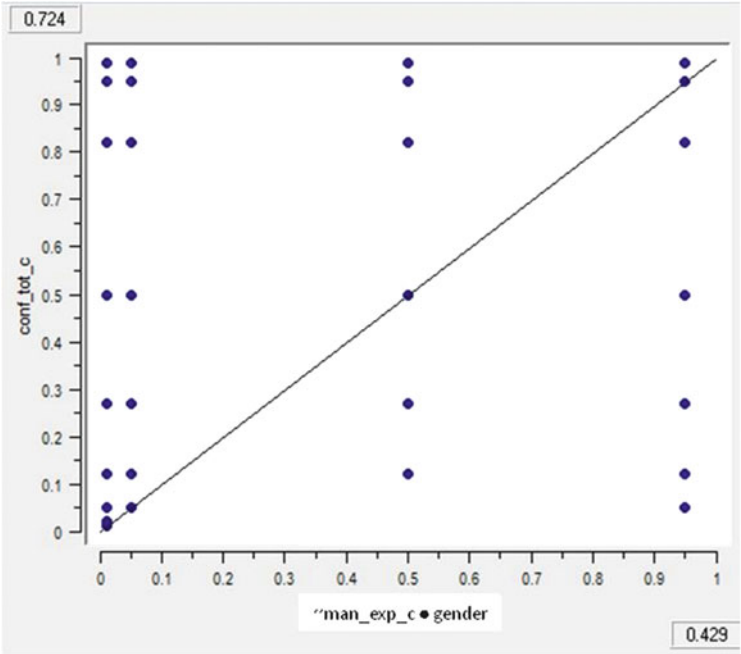


Fig. 5.19 Decision confidence by configured conditions (~man_exp_c●gender)

Table 5.13 All solutions for overall decision competence & decision confidence

All models of overall decision competence and overall decision confidence (all four in-basket simulations)	Consistency	Coverage
Decision competence		
~gbs● ~ comp●conf_tot_c	0.76	0.29
conf_tot_c●comp● ~ devil● ~ gbs	0.77	0.24
gender● ~ age_c● ~ man_exp_c● ~ change_tot_c	0.78	0.28
age_c●man_exp_c● ~ conf_c● ~ chgn_tot_c	0.74	0.30
gender● ~ age_c● ~ man_exp_c●conf_tot_c	0.80	0.31
~educ_c●man_exp_c●conf_tot_c●chgn_tot_c	0.80	0.35
gender●educ_c● ~ man_exp_c● ~ conf_tot_c●chgn_tot_c	0.81	0.22
man_exp●age●edu_c (using Boolean Algebra)	0.73	0.30
NOT-Decision Competence (using Boolean Algebra)		
~devil	0.90	0.89
group● ~ gbs	0.92	0.27
Decision confidence		
age_c	0.72	0.67
~man_exp●gender	0.72	0.43
man_exp_c●edu_c (using Boolean Algebra)	0.83	0.32

each of the separate in-basket simulations, which differed substantially in cognitive complexity. Chapter 6 discusses findings for the fsQCA analysis for each of the in-basket simulations separately, and will investigate decision competence and decision confidence as outcomes. Chapter 7 discusses the investigation of the outcomes: decision incompetence and decision doubt for the aggregate results of all four simulations as well as the results for the individual in-basket assessments.

References

Bennis, W. G., & O'Toole, J. (2005). How business schools lost their way. *Harvard Business Review, 83*(5), 96–104.

Cheit, E. F. (1985). Business schools and their critics. *California Management Review, 27*(3), 43–62.

Clinebell, S. K., & Clinebell, J. M. (2008). The tension in business education between academic rigor and real-world relevance: The role of executive professors. *Academy of Management Learning & Education, 7*(1), 99–107.

Fiss, P. C. (2009). *Practical issues in QCA*. Professional development workshop on Qualitative Comparative Analysis (QCA) conducted at the meeting of the Academy of Management. http://www-bcf.usc.edu/~fiss/QCA_PDW_2009_Fiss_Practical_Issues.pdf

Kedrovsky, P. (2005). The problem with b-schools. *Canadian Business, 78*(14/15), 19.

Mahoney, J. (2000). Strategies of causal inference in small-N analysis. *Sociological Methods & Research, 28*(4), 387–424. doi:10.1177/0049124100028004001.

Mintzberg, H., & Lampel, J. (2001). Matter of degrees: Do MBAs make better CEOs? *Fortune, 19* (February), 244.

Neelankavil, J. P. (1994). Corporate America's quest for the ideal MBA. *Journal of Management Development, 13*(5), 38–52.

Pfeffer, J., & Fong, C. T. (2002). The end of business schools? Less success than meets the eye. *Academy of Management & Education, 1*(1), 78–95. doi:10.5465/AMLE.2002.7373679.

Porter, L., & McKibbin, I. (1988). *Management education and development: Drift into the 21st century*. New York: McGraw-Hill.

Ragin, C. C. (1987). *The comparative method: Moving beyond qualitative and quantitative Strategies*. Berkeley, CA: University of California Press.

Ragin, C. C. (2000). *Fuzzy-set social science*. Chicago: University of Chicago Press.

Ragin, C. C. (2004). *Redesigning social inquiry [Slide-show PPT]*. http://eprints.ncm.ac.uk/379/1/RSDI-RMF.pdf

Ragin, C. C. (2006c). Set relations in social research: Evaluating their consistency and coverage. *Political Analysis, 14*(3), 291–310. doi:10.1093/pan/mpj019.

Ragin, C. C. (2007a). Fuzzy sets: Calibration versus measurement. In J. M. Box-Steffensmeier, H. E. Brady, & D. Collier (Eds.), *The Oxford handbook of political methodology*. http://toktok.persiangig.com/other/Calibration%20fuzzy%20measurement.pdf

Ragin, C. C. (2007b). Qualitative comparative analysis using fuzzy-sets (fsQCA). In B. Rihoux & C. C. Ragin (Eds.), *Configurational comparative analysis*. Thousand Oaks, CA: Sage.

Ragin, C. C. (2008a). *Online tutorial: Qualitative comparative analysis and fuzzy sets*. http://www.fsqca.com

Ragin, C. C. (2008c). *Redesigning social inquiry: Fuzzy sets and beyond*. Chicago: University of Chicago Press.

Ragin, C. C. (2008d). *What is qualitative comparative analysis (QCA)?* Symposium conducted at the meeting of the 3rd ESRC Research Methods Festival. Retrieved May 5, 2010, from http://eprints.ncrm.ac.uk/250/1/What_is_QCA.pdf

Ragin, C. C., & Drass, K. (2008). *User's guide to fuzzy set/qualitative comparative analysis*. http://www.u.arizona.edu/~cragin/fsQCA/software.shtml

Ragin, C. C., & Rihoux, B. (2004). Qualitative comparative analysis (QCA): State of the art and prospects. Qualitative methods. *Newsletter of the American Political Science Association Organized Section on Qualitative Methods, 2*(2), 3–13.

Rihoux, B. (2006). Qualitative comparative analysis (QCA) and related systematic comparative methods: Recent advances and remaining challenges for social science research. *International Sociology, 21*(5), 679–706. doi:10.1177/0268580906067836.

Rihoux, B., & Ragin, C. C. (2009). *Configurational comparative methods*. London: Sage.

Woodside, A. G., & Zhang, M. (2012). Identifying X-consumers using causal recipes: "Whales" and "Jumbo Shrimps" Casino Gamblers. *Journal of Gambling Studies, 28*(1), 13–26. doi:10.1007/s10899-011-9241-5.

Chapter 6
Analytics and Findings for Competency and Confidence

This chapter covers the QCA analysis of memberships of outcome conditions, decision confidence and decision competence for each of the individual in-basket simulations. The treatment and measured antecedents are re-explored during the same 2-h experiment and results were recorded for the same participants, in the same physical contexts and all other variables were controlled to remain unaltered. In a way, each of these in-baskets simulations acts as a re-test and repeat of the study. It is important to note that the discipline and level of complexity of the decisions varied substantially for each of the in-basket simulations. The next four sections analyse the raw data gathered from each of the participants, for each of the separate in-baskets and interpret the fsQCA analysis of the truth table and combinations of treatment and measured conditions for each simulation, hereafter referred to as In-basket 1, In-basket 2, In-basket 3 and In-basket 4 respectively.

6.1 Findings and Interpretations of Decision Competence and Decision Confidence: In-basket 1

Since QCA assumes equifinality (multiple causal paths may lead to an outcome) the tool/theory recognizes that different combinations of conditions may be sufficient for the occurrence of the phenomenon (decision competence OR decision confidence). The next sub-section investigates conjunctural causation (combinations of conditions) for the decisions make in In-basket 1. In-basket 1 probes decision success for Mr Pizza's Advertising; where well-supported advertising decisions are contrasted with low-evidence sponsorship decisions. Competency training highlighted the need for evidence-based decisions. In contrast, incompetency training (a form of placebo) highlighted relevant (and irrelevant) issues such as integrated promotional activities, clear direction and customer benefits (see Appendix for full details).

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6.1.1 *In-basket 1: Assessments of Decision Success Causal Paths*

Table 6.1 illustrates the intermediate solutions of causal models for high decision confidence for In-basket 1 assessments for which consistency registers above 0.75. There are three causal models with acceptable consistency scores, but the third model is useless due to the low coverage score. The first two models in Table 6.1 separately and individually account for more than half of the sum of the memberships of the outcome and are both thus useful causal models. Model 1 is explained in the example of the table and therefore findings for model 2 are described here.

The causal path: ~devil • gbs• ~group explains that participants receiving the goal-based scenario (GBS) treatment AND non-exposure to devil's advocate (DA) dissent AND not working in groups (making the decisions as individuals) display high decision competence. This recipe explains approximately 30 % of sum of the memberships in the outcome.

Additional analysis of the causal paths uncovered the impact of the measured antecedent of confidence on the outcome of decision competence. Table 6.2 sets out the four useful models which resulted from the QCA procedure. These are encircled with a dotted box and the plot for the fourth useful path is depicted in Fig. 6.1. Note: The contribution of the discretely measured antecedent "confidence" (stated confidence in the decision for In-basket 1 ≡ conf1_c; c indicates calibrated confidence

Table 6.1 Decision competence by treatment conditions for In-basket 1

```
File:  F:/PhD from D9_2011/DATA for PHD/ARCH IN BOSTON Jan 2013/AAARCH_De Villiers 17 Jan PLUSss22.csv
Model: bask1 = f(comp, devil, gbs, group)

 Rows:       8



 Algorithm: Quine-McCluskey
      True: 1
   0 Matrix: 0L
Don't Care: -

--- INTERMEDIATE SOLUTION ---
frequency cutoff: 8.000000
consistency cutoff: 0.810078
Assumptions:

                          raw        unique
                       coverage    coverage   consistency
                      ----------  ----------  ----------
* ~comp*~devil        0.527548    0.278410    0.886572
  ~devil*gbs*~group   0.299759    0.151859    0.855528
  ~comp*~gbs*group    0.173210    0.059056    0.911232
solution coverage: 0.738465
solution consistency: 0.870687
```

* Example: the model of not competency training and not devil's advocate is useful to explain high membership of high decision competence; with a consistency assessed at 0.89 and coverage of 0.53.
The dotted line encircles useful models.

Table 6.2 Analyses of models for success for In-basket 1: Causal paths for improved decision competence using all four treatment antecedents and the measured antecedent of decision confidence

```
**********************
*TRUTH TABLE ANALYSIS*
**********************

File:  F:/PhD from D9_2011/DATA for PHD/ARCH IN BOSTON Jan 2013/CALIBRATED DATA_20 Jan 13.csv
Model: bask1 = f(group, gbs, devil, comp, conf1_c)

 Rows:      15



 Algorithm: Quine-McCluskey
      True: 1

--- COMPLEX SOLUTION ---
frequency cutoff: 1.000000
consistency cutoff: 0.763285

                              raw         unique
                           coverage    coverage    consistency
                          ----------  ----------  ----------
~gbs*~devil*~comp         0.291322    0.060951    0.896186
~group*gbs*~devil         0.299759    0.066804    0.855528
~devil*~comp*conf1_c      0.419421    0.084711    0.897568
~group*~devil*conf1_c     0.478650    0.110020    0.845756
**group*~gbs*~comp*conf1_c  0.150999    0.056302    0.930011
solution coverage: 0.829201
solution consistency: 0.857397
```

See graph below

**Example: Participants not exposed to group interaction (working as individuals) AND not exposed to the devil's advocate dissent AND very confident in their decision for in-basket one. display high decision competence.

levels resulting from the direct method calibration of median to determine fuzzy set degree of membership) results in five models of which only four are useful.

When comparing the four predictive causal models set out in Table 6.2, ~devil (not DA dissent) is a necessary condition to achieve high membership in the set of decision success for In-basket 1 (bask1). For all other causal recipes the causal conditions are sufficient to deliver decision competence; consistency is well above 0.75 and the coverage range between 0.29 and 0.47, which indicates that the models are useful in predicting decision competence. The causal recipe of ~group • ~devil• ~conf1_c is explained in Table 6.2 and the XY plot appears in Fig. 6.1.

The plot in Fig. 6.1 registers a high consistency score (0.83) and coverage of 0.44, indicating that the fsQCA algebraic evidence supports the claim that membership in the three-condition model of decision competence results in high decision competence (Table 6.3).

Note that the addition of the one confidence-related antecedent, namely **chg1_c**, affects the models for decision competence. For this analysis, high membership in the decision competence set is predicted by the configuration:

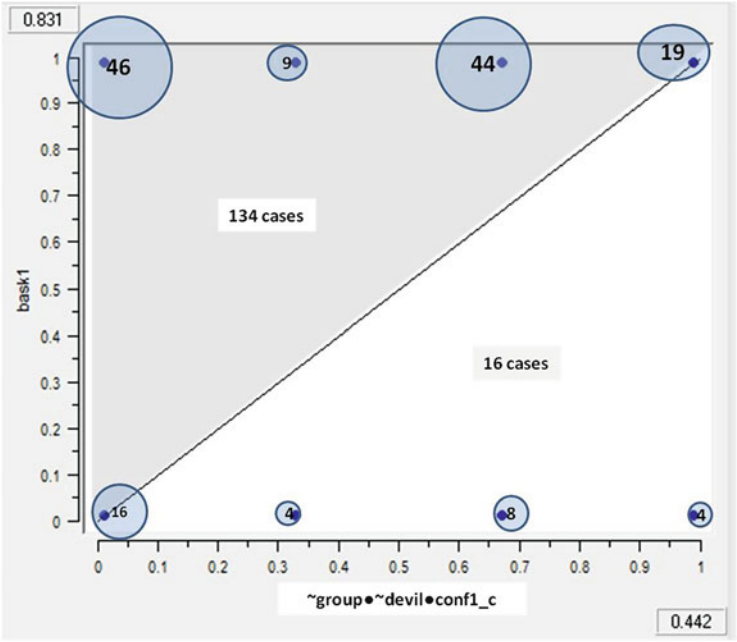


Fig. 6.1 Plot of membership in decision competence for In-basket 1 assessment against membership of the three-condition causal recipe

conf1_c • ~comp + chg1_c • ~comp + gbs • ~comp + ~group •comp ≤ high bask1

(bask1 indicates decision success for assessments in In-basket 1 = success1). The consistency for this configuration of solutions is 0.85 and the coverage 0.82. This finding points to the need for educationalists and practitioners to consider the cognitive and affective development of managers when placing them in groups or within simulated interactions (e.g. GBS). In addition, the impact of incompetency training tools (such as BCG matrix and overload of information) may be negated and even turned into a positive when combined with high levels of confidence or when decision-makers are place in GBS simulations. The model ~group •comp is in line with the research propositions since individuals (~group) who are guided by competency training aids are likely to make more competent decisions that individuals who do not receive the competency training aids.

Additional exploration of possible solutions of high decision outcome against antecedent conditions appears in Table 6.4. In this QCA procedure, configurations of all six measured antecedents are analysed. Those recipes which merit further investigation (consistency above 0.75 and coverage between 0.2 and 0.6) and are thus useful models are demarcated by dotted boxes. Four confirmed models achieved high set membership.

Figure 6.2 shows the XY plot of the four-condition recipe, marked ♠, against the outcome (high decision competence) along with relevant consistency (0.75) and

Table 6.3 Decision competence by treatment antecedents AND two measured antecedents related to participants' level of personal confidence

```
**********************
*TRUTH TABLE ANALYSIS*
**********************

File:  F:/PhD from D9_2011/DATA for PHD/ARCH IN BOSTON Jan 2013/CALIBRATED DATA_20 Jan 13.csv
Model: bask1 = f(conf1_c, chg1_c, group, gbs, devil, comp)

 Rows:      24



 Algorithm: Quine-McCluskey
      True: 1-L

--- PARSIMONIOUS SOLUTION ---
frequency cutoff: 1.000000
consistency cutoff: 0.757463

                     raw        unique
                   coverage    coverage   consistency
                  ----------  ----------  ----------
conf1_c*~comp     0.475723    0.044938    0.889282
chg1_c*~comp      0.436639    0.011364    0.890449
* gbs*~comp       0.249139    0.038740    0.880710
~group*comp       0.299759    0.286846    0.797892
solution coverage: 0.821109
solution consistency: 0.856194
```

* Example: The model of not competency training AND gbs simulation is useful to explain high membership of high decision competence for In-basket 1 decisions with a consistency assessed at 0.88 and coverage of 0.25.
The dotted line encircles useful models with consistency >0.7 and coverage >0.2.

coverage scores (0.21). The recipe is only marginally useful since the model registers the barely acceptable low level of consistency of 0.75, indicating that the evidence supports the claim that membership in the four condition recipe is a subset of membership of the outcome of decision competency, but the relatively low coverage score indicates that the model is NOT a very important pathway to decision competence. In contrast the three-condition pathway marked with the symbol ♦ in Table 6.4 is an important pathway to decision competence, with a consistency score of 0.83 and a coverage score of 0.45 (Fig. 6.3).

Table 6.4 Analyses of models for success for In-basket 1: Causal paths for improved decision competence using all four treatment antecedents and the measured antecedents decision confidence and likelihood to change

```
**********************
*TRUTH TABLE ANALYSIS*
**********************

File:  F:/PhD from D9_2011/DATA for PHD/ARCH IN BOSTON Jan 2013/CALIBRATED DATA_20 Jan 13.csv
Model: bask1 = f(gender, age_c, educ_c, man_exp_c, conf1_c, chg1_c)

 Rows:      23



 Algorithm: Quine-McCluskey
      True: 1

--- COMPLEX SOLUTION ---
frequency cutoff: 1.000000
consistency cutoff: 0.707547

                                                  raw         unique
                                                 coverage    coverage    consistency
                                                 ----------  ----------  ----------
~man_exp_c*conf1_c*chg1_c                        0.454459    0.067407    0.830292
educ_c*conf1_c*chg1_c                            0.401687    0.041581    0.808665
gender*age_c*educ_c*man_exp_c                    0.208506    0.022727    0.754517
age_c*~educ_c*man_exp_c*conf1_c                  0.246298    0.019370    0.742924
gender*age_c*man_exp_c*conf1_c                   0.248967    0.011622    0.757663
gender*~age_c*~educ_c*~man_exp_c*conf1_c         0.173210    0.008781    0.850740
gender*~age_c*educ_c*~man_exp_c*chg1_c           0.150999    0.006801    0.837632
~gender*~age_c*educ_c*~man_exp_c*~conf1_c*~chg1_c 0.043905   0.002927    0.757800
solution coverage: 0.706353
solution consistency: 0.798774
```

6.1.2 *In-basket 1: Assessment of Decision Confidence Models*

In the next QCA procedure, all treatments and the four measured antecedents were considered, and the two confidence antecedents directly related to In-basket 1 (conf 1_c and chgn1_c) were analysed as outcome, rather than measured antecedents. Although the consistency scores of a number of models permit interpretation, the coverage scores of all but one causal model are too low. The model highlighted in Table 6.5 is plotted in Fig. 6.4.

High decision confidence is recorded for male (gender) participants working as individuals (~group) AND not exposed to DA treatment (~devil) AND older (age) and with high levels of management experience (man_exp_c), as shown in Chap. 5. Thus, the only useful model for this configuration of conditions (consistency > 0.7 and coverage > 0.2) indicates that older, male participants, with high levels of management (JDM) experience who make decisions as individuals (~group) AND do not receive DA dissent treatment associate with high decision confidence. A number of authors report on gender differences in decision-making habits and decision confidence (Bandura, 1986; Bussey & Bandura, 1999; Crow, Fok, Hartman, & Payne, 1991). Bandura (1986) notes the impact of personal factors, especially personal experiences, beliefs and judgements on decision behaviour. Readers who are experienced educators or managers are likely to intuitively

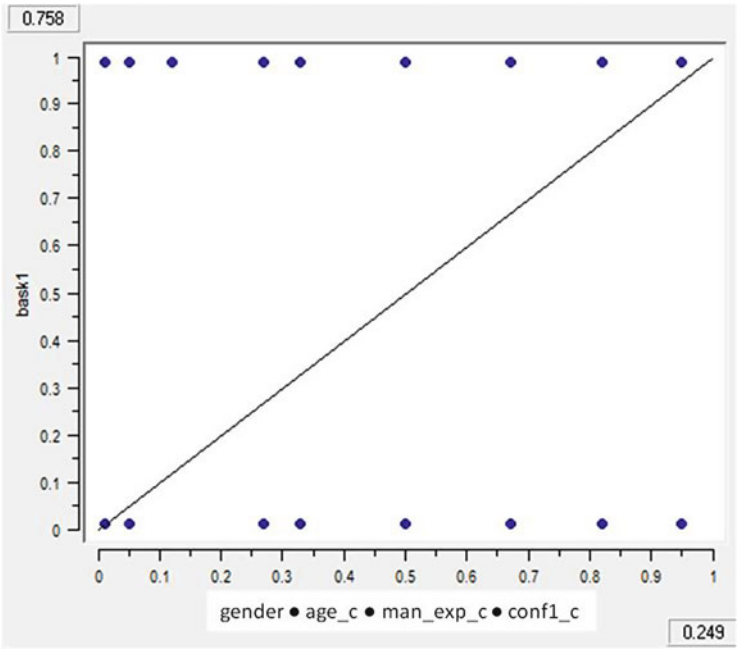


Fig. 6.2 Plot of membership in decision competence against membership in the four-condition causal recipe ♠

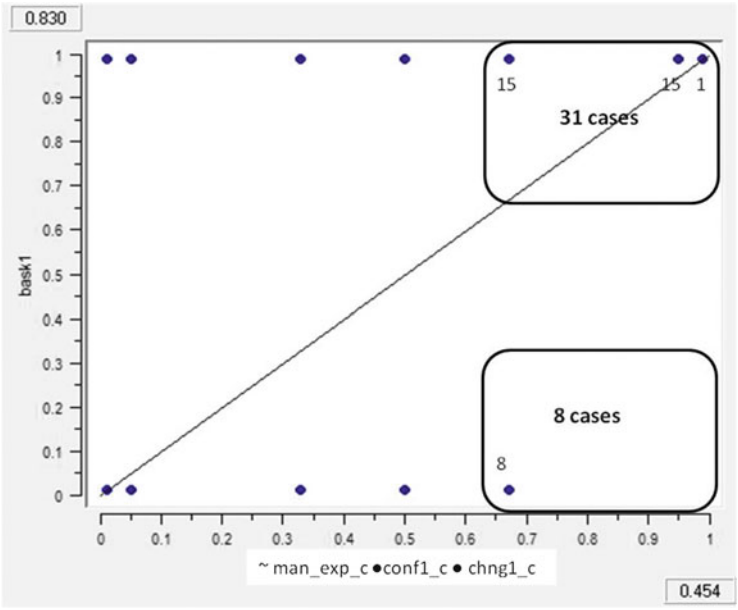


Fig. 6.3 Plot of decision competence by configural model: ~man_exp_c● conf1_c ●chg1_c

Table 6.5 Models for decision confidence for In-basket 1: Causal paths for improved decision confidence with all four treatment antecedents and all measured antecedents

```
File:  F:/PhD from D9_2011/DATA for PHD/ARCH IN BOSTON Jan 2013/CALIBRATED DATA_20 Jan 13.csv
Model: conf1_c = f(group, gbs, devil, comp, gender, age_c, educ_c, man_exp_c)

 Rows:      50



 Algorithm: Quine-McCluskey
      True: 1

--- COMPLEX SOLUTION ---
frequency cutoff: 1.000000
consistency cutoff: 0.803279
```

		raw coverage	unique coverage	consistency	
**	~group*~devil*gender*age_c*man_exp_c	0.212233	0.033790	0.849658	See graph below
	~group*~gbs*~devil*~gender*~age_c*~man_exp_c	0.059709	0.010949	0.764513	
	~group*~gbs*~devil*~comp*~age_c*~man_exp_c	0.082036	0.031223	0.853963	
	group*gbs*~devil*~comp*~age_c*~man_exp_c	0.063730	0.040034	0.957584	
	~group*gbs*~devil*comp*~educ_c*~man_exp_c	0.078871	0.013687	0.861682	
	group*~gbs*~devil*gender*~age_c*~man_exp_c	0.071600	0.044055	0.876440	
	~group*gbs*~devil*gender*~educ_c*~man_exp_c	0.103679	0.012746	0.878898	
	~group*~gbs*~devil*age_c*~educ_c*man_exp_c	0.132763	0.030197	0.955077	
	~group*~gbs*~devil*comp*gender*age_c	0.090590	0.024893	0.972452	
	gbs*~devil*gender*age_c*~educ_c*man_exp_c	0.132763	0.013772	0.846238	
	group*~gbs*devil*age_c*educ_c*man_exp_c	0.064158	0.037382	0.961539	
	group*~gbs*comp*~gender*~age_c*educ_c*~man_exp_c	0.033362	0.017622	0.962963	
	~group*gbs*~devil*~comp*age_c*educ_c*~man_exp_c	0.047904	0.020445	0.967185	
	group*gbs*~devil*comp*~gender*~age_c*educ_c	0.039008	0.022241	0.938270	
	group*~gbs*devil*~comp*gender*educ_c*~man_exp_c	0.044312	0.020445	0.945256	
	group*~gbs*~devil*comp*gender*~age_c*educ_c	0.036869	0.009324	1.000000	
	gbs*~devil*comp*gender*~age_c*educ_c*~man_exp_c	0.046450	0.014371	0.917230	
	group*gbs*~devil*comp*age_c*~educ_c*man_exp_c	0.040975	0.009495	0.928294	

```
solution coverage: 0.722755
solution consistency: 0.870313
```

** Example : Higher levels of decision confidence are demonstrated by older (age_c) individual (`~group) male (gender) participants with non-exposure to devils' advocate treatment, (~devil) and high levels of managerial experience (man_exp_c).

agree that experience and age (which relates to life and business experience and JDM experience) might aid decision confidence, and a number of authors concur that the more often one engages in a type of behaviour, the stronger one's self-confidence is about that particular behaviour and vice versa (Bandura & Schunk, 1981; de Acedo Lizárraga, de Acedo Baquedano, & Elawar, 2007). The absence of any cautionary advice or dissent—as is likely to be experienced in group interactive decisions or where DA role-players are present—reduces the possibility of self-doubt affecting participants' decision confidence. Bandura (1982, p. 123) observes that "In applying existing skills strong self-efficaciousness intensifies and sustains the effort needed for optimal performance, which is difficult to realize if one is beleaguered by self-doubts . . . High self-percept of efficacy may affect preparatory and performance effort differently, in that some self-doubt bestirs learning but hinders adept execution of acquired capabilities. In applying existing skills strong self-efficaciousness intensifies and sustains the effort needed for optimal performance, which is difficult to realize if one is beleaguered by self-doubts." Most of the gender differences identified in empirical studies are minimal (Crow et al., 1991; de Acedo Lizárraga et al., 2007; Hatala & Case, 2000).

Some studies however elucidate gender differences in decision-making and point to issues such as norms and values (Tannen, 1990), social status and power

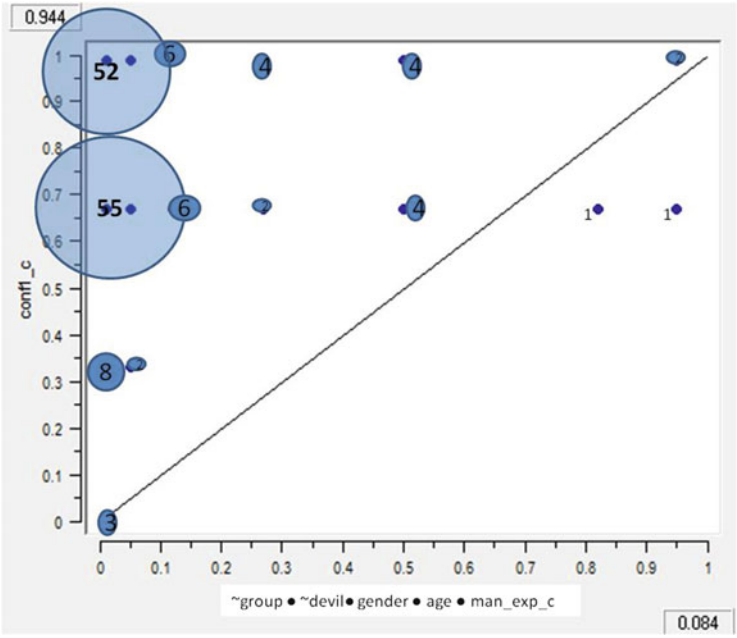


Fig. 6.4 Plot of membership for decision confidence for in-basket 1 against members in the causal recipes including all four treatment and three measured antecedents

(West & Zimmerman, 1991). In addition, men were found to be more assertive, realistic, more dominant and more objective by one study (Wood, 1990). Further, women are more concerned with the impact of decisions on the community: "Women are more aware of the constraints that the setting and close persons put on them. Conversely, men assign more importance to the analysis of the information required to carry out the decision and to the definition of the goals or purposes of the decision" (de Acedo Lizárraga et al., 2007, p. 387). For In-basket 1, the case scenario describes a decision which affects resource allocation and gives a choice between two parties' recommendations. The conclusion offered in the study by de Acedo Lizárraga et al. (2007) is thus a possible explanation for the singular useful path in this analysis.

Additional investigation into decision confidence as an outcome of the four treatments delivered the results set out in Table 6.6.

The conclusion is that participants in In-basket 1 who worked in groups (group) AND who did not receive the GBS simulated interaction (~gbs) OR who did not receive the treatment of DA role-play (~devil) associate with high decision confidence (conf1_c): group • ~gbs + ~devil → conf1_c. This could result from the "self-efficacy mechanisms governing the motivational effects" of participants, as discussed in the work of Bandura (1982, 1986; Bandura & Cervone, 1983). Participants are likely to benefit from the combined effort and exposure to alternative views, but might feel less confident when their views are challenged by the

Table 6.6 Findings from fsQCA for decision confidence as an outcome for configurations of the four treatment conditions

```
File:  E:/PhD from D9_2011/DATA for PHD/ARCH IN BOSTON Jan 2013/AARRCH_De Villiers 17 Jan PLUSss22.csv
Model: conf1_c = f(group, gbs, devil, comp)

 Rows:       10



 Algorithm: Quine-McCluskey
      True: 1

--- COMPLEX SOLUTION ---
frequency cutoff: 8.000000
consistency cutoff: 0.739231

                   raw         unique
                coverage    coverage   consistency
-----------  ----------  ----------  -----------
~devil       0.879384    0.720788    0.779733
group*~gbs   0.279212    0.120616    0.842540
solution coverage: 1.000000
solution consistency: 0.787205
```

cautionary views expressed by the DA. This finding is less immediately apparent, and the research would benefit from in-depth qualitative interviews with the cases in this cell (students exposed to the treatments). Unfortunately such case knowledge was not available at the time of this analysis.

The next section investigates conjunctural causation (combinations of conditions) for the decisions made in the In-basket 2 assessment scenario.

6.2 Findings and Interpretations of Decision Competence and Decision Confidence: In-basket 2

In-basket 2 probed decision success for L-Guys and T-Guys; where profit and market share decisions are contrasted. The competency training provided highlighted the need to achieve high levels of profit. In contrast, incompetency training provided the BCG matrix and the Experience Curve (see Appendix for details and extracts).

6.2.1 In-basket 2: Assessments of Decision Success Causal Paths

Considering causal models which only included the four treatment antecedents resulted in the useful results set out in Table 6.7.

Table 6.7 Decision competence in In-basket 2 assessments by four treatment conditions

```
**********************
*TRUTH TABLE ANALYSIS*
**********************

File:  G:/DeVilliers/20 Jan 13.csv
Model: bask2 = f(comp, devil, gbs, group)

 Rows:       12



 Algorithm: Quine-McCluskey
      True: 1
   0 Matrix: 0L
Don't Care: -

--- INTERMEDIATE SOLUTION ---
frequency cutoff: 8.000000
consistency cutoff: 0.745013
Assumptions:

                      raw         unique
                     coverage    coverage    consistency
---------------------------------------------------------
~devil*~group        0.575617    0.285643    0.796681
♦ comp*~devil        0.445037    0.089773    0.832139   See graph below
~gbs*group           0.281811    0.204030    0.873515
solution coverage: 0.934710
solution consistency: 0.826753
```

An example of the resulting model (indicated with ♦) reads: participants exposed to the competency training treatment AND not exposed to DA dissent measured high in their level of decision competence with a measured consistency of approximately 83 % and this model explains ≈ 45 % of cases. All three models are highly useful, with consistency scores well above 0.75 and coverage scores between 0.2 and 0.6 as directed by scholar Ragin (2008a, b, c, d). Analyses of models for success for In-basket 2 of configurations and causal paths for improved decision competence by all four treatment antecedents resulted in the following complex solution:

~devil • ~group + ~devil • comp + comp • group → bask2

Individual participants who did not receive instructions to consider the cautionary view of a DA associate with high decision competence for the In-basket 2 assessments. Although this could result from the limited diversity in the data set, it also stands to reason that individuals working on their own, not distracted by alternatives and competing viewpoints, could focus energy and rely on their own knowledge and skills to determine effective answers. The causal path ~devil • comp could reasonably be explained by similar reasoning, that is, a keen focus on key issues highlighted in the competency training decision aids (e.g. "drop your tools" such as the BCG matrix and use simple heuristics such as profit orientation).

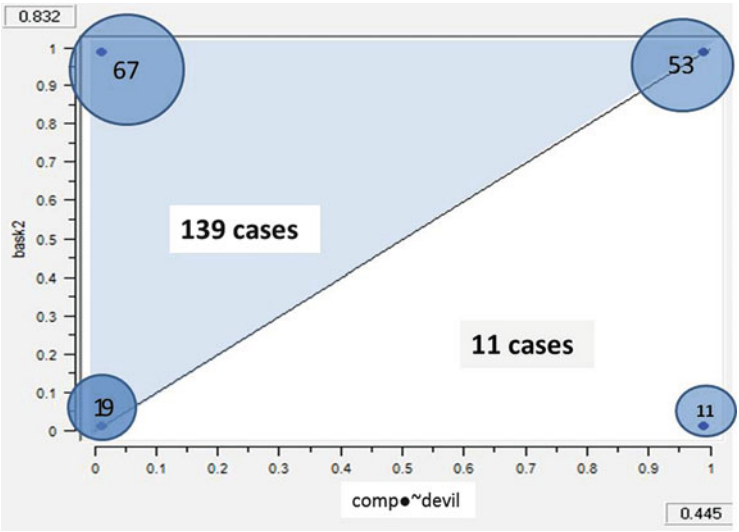


Fig. 6.5 Plot of decision competence for In-basket 2 by conjunctive condition: comp● ~devil (♦)

The plot of this useful model for decision competence (bask2) appears in Fig. 6.5, which shows that by far the largest number of cases are in the upper triangle and the ratio of high decision competence (high Y) to high membership of the two-condition configuration (comp● ~devil; high X) is approximately 5:1 (53:11), making this a highly predictive model with very high proportional representation of success (bask2). See the visual scatter plot of the two-condition model marked ♦ in Fig. 6.5.

The third component of the model group ●comp highlights the strength of QCA and delivers a logically expected result. Participants working as members of a four- or five-person group and who received the competency training aids were likely to display high levels of decision competence. Unfortunately this does not translate into decision confidence, as evidenced by the results detailed below.

When configurations of conditions which include the measured antecedent of decision confidence (conf2_c) are analysed, a number of useful models result. These models appear in Table 6.8. Once consistency has been established as above 0.70, useful models are established when consistency for the models is calculated between 0.2 and 0.6. The resulting useful models are enclosed in the dotted boxes.

The four paths to decision success for In-basket 2 are:

(1) group ● ~gbs ● conf2_c OR (2) ~group ● ~devil ● ~comp OR

(3) ~group ● ~devil ● ~conf2_c + (4) gbs ● ~devil ● comp. See Fig. 6.6 for the XY plot of success membership against the three-condition causal recipe (3). As for overall decision success, decision competence for In-basket 2 decisions is not clearly related to a configuration of treatment antecedents. This confirms the findings of Gigerenzer (2004, 2008) and Schank (1994; Schank, Fano, Jona, &

Table 6.8 Analysis of causal models for decision success for In-basket 2: Configurations and causal paths for improved decision competence

```
**********************
*TRUTH TABLE ANALYSIS*
**********************

File:  F:/PhD from D9_2011/DATA for PHD/ARCH IN BOSTON Jan 2013/CALIBRATED DATA_20 Jan 13.csv
Model: bask2 = f(group, gbs, devil, comp, conf2_c)

 Rows:      18



 Algorithm: Quine-McCluskey
      True: 1

--- COMPLEX SOLUTION ---
frequency cutoff: 1.000000
consistency cutoff: 0.756025

                            raw         unique
                          coverage    coverage   consistency
                         ----------  ----------  ----------
group*~gbs*~comp         0.151233    0.026815    0.822464
group*~gbs*conf2_c       0.236176    0.051965    0.886804
~devil*~comp*~conf2_c    0.130746    -0.000000   0.801839
~group*~devil*~comp      0.298134    0.074617    0.802330
gbs*~devil*~conf2_c      0.128415    -0.000000   0.813291
~group*~devil*conf2_c    0.419720    -0.000000   0.818979      See graph below
** gbs*~devil*comp        0.249167    0.045303    0.884162
~devil*comp*conf2_c      0.356096    -0.000000   0.872653
solution coverage: 0.919054
solution consistency: 0.840774
```

** Example: Participants receiving the goal-based scenario treatment AND non-exposure to devil's advocate dissent AND includes competency training, display high decision competence

Bell 1993) that different teaching methods must be used to achieve decision competence and these methods should be reviewed and revised for different decision contexts/contents. In addition, it prompts educators and practitioners to consider self-efficacy and group efficacy (Bandura, 1982) and the impact thereof on decision-making behaviour. Figure 6.6 depicts the scatter plot of the three-condition configural model (~group • ~devil • conf_2) and demonstrates its fit.

Next, configural paths including all treatments and all measured antecedents were analysed and only one reasonably useful recipe resulted (see Table 6.9).

The only useful model for high decision competence against membership in the four-condition causal recipe: ~group • ~devil • gender • age_c • man_ex_c is plotted in Fig. 6.7. This notable path indicates that older males (above 40 years) with high levels of management experience (above 6 years), who made the decisions as individuals (did not work in groups = ~groups) and were not trained to use DA dissent (~devil) demonstrate high levels of decision competence (bask2). Since configurations including the measured antecedent (~gender ≡ female) display low consistency and low coverage it is not reasonable to develop gender-related comparisons. In other words, propositions regarding female participants were

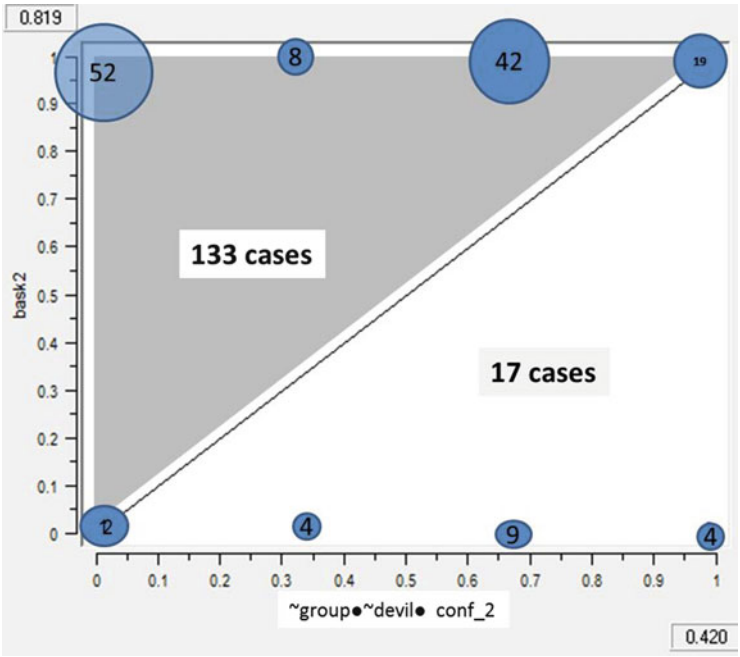


Fig. 6.6 Model for high decision competence against membership in the 3-condition causal recipe: ~group ● ~devil ● conf_2

empirically trivialised by the QCA analysis, so the only useful model is related to older, experienced male participants.

Note that the findings for decision competency in the In-basket 1 and In-basket 2 simulations differ noticeably and that mere comparison of the results confirms Bandura's (1982, 1986) position that the researcher should not look for a single, specific cause of behaviour. Human behaviour is affected by personal judgements, experiences, norms and values, but is simultaneously affected by cognitive, behavioural, and environmental factors in conjunction and differentiates between them. Bandura states that outcomes will be affected in different ways depending on each situation and on the individual.

The research propositions concerning the impact of measured antecedents were investigated using QCA procedures and the resulting models are shown in Table 6.10. Useful models are demarcated by the dotted box.

Three useful models result from the analysis. The first useful two-condition model (conf2_c ● educ_c) registers a consistency score of 0.85 and a coverage score of 0.40. This is a moderately useful two-condition model indicating that participants with high confidence in their decisions for In-basket 2 AND high education levels exhibit decision competence. As the second model in Table 5.9 indicates, participants with high confidence AND high age (older than 40) exhibit high decision competence. The second model conf2_c ● age_c has a consistency score

Table 6.9 Analysis of causal models for decision competence for In-basket 2: Configurations and causal paths considering all measured and treatment antecedents

```
Model: bask2 = f(group, gbs, devil, comp, gender, age_c, educ_c, man_exp_c)

 Rows:      50



 Algorithm: Quine-McCluskey
      True: 1

--- COMPLEX SOLUTION ---
frequency cutoff: 1.000000
consistency cutoff: 0.707943
```

	raw coverage	unique coverage	consistency
~group*~devil*gender*age_c*man_exp_c	0.205780	0.089857	0.846233
~group*~gbs*~devil*~comp*~age_c*~man_exp_c	0.073951	0.023318	0.790739
~group*gbs*~devil*comp*~educ_c*~man_exp_c	0.081696	0.021319	0.916822
group*~gbs*~devil*gender*~age_c*~man_exp_c	0.063625	0.019071	0.800001
~group*~gbs*~devil*comp*gender*age_c	0.086609	0.021735	0.955005
group*~gbs*devil*age_c*educ_c*man_exp_c	0.063708	0.028731	0.980769
group*gbs*~devil*~comp*~gender*~age_c*~man_exp_c	0.024484	0.005663	1.000000
~group*~gbs*~devil*~comp*age_c*~educ_c*man_exp_c	0.058544	0.013908	0.875467
group*~gbs*comp*~gender*~age_c*educ_c*~man_exp_c	0.033728	0.018404	1.000000
~group*gbs*~devil*~comp*age_c*educ_c*~man_exp_c	0.043888	0.025067	0.910190
group*gbs*~devil*comp*~gender*~age_c*educ_c	0.033728	0.004580	0.833330
group*~gbs*~devil*comp*gender*~age_c*educ_c	0.034477	0.009077	0.960556
group*~gbs*devil*~comp*gender*age_c*educ_c	0.044970	0.012825	0.960854
group*gbs*~devil*comp*age_c*~educ_c*man_exp_c	0.042638	0.024983	0.992248
group*gbs*~devil*~age_c*educ_c*~man_exp_c	0.064374	0.000000	0.832974
group*~devil*gender*~age_c*educ_c*~man_exp_c	0.074534	0.000000	0.835668
~group*~devil*~comp*gender*~age_c*~educ_c*~man_exp_c	0.064041	0.000000	0.842278
~group*gbs*~devil*gender*~age_c*~educ_c*~man_exp_c	0.076366	0.000000	0.906126
~group*gbs*~devil*comp*gender*~age_c*~man_exp_c	0.065623	0.003664	0.974042
gbs*~devil*comp*gender*~age_c*educ_c*~man_exp_c	0.047552	0.000000	0.964527

```
solution coverage: 0.621669
solution consistency: 0.862308
```

of 0.84 and covers approximately 50 % of all cases and is thus highly useful. The 3-condition model ~man_exp_c • ~educ_c • ~age_c is useful and has a coverage score of 0.24. The model is interpreted as: participants with low levels of management experience, low education levels and low age recorded, associates with high decision success for In-basket 2 assessments. The borderline consistency of 0.77 is recorded for the three-condition model (man_exp_c• ~edu_c• gender). The fourth causal model is, according to Ragin (2008c, p. 118), "hazardous to interpret", with the coverage measure reported below 0.2. It is rejected due to the low coverage score (0.18).

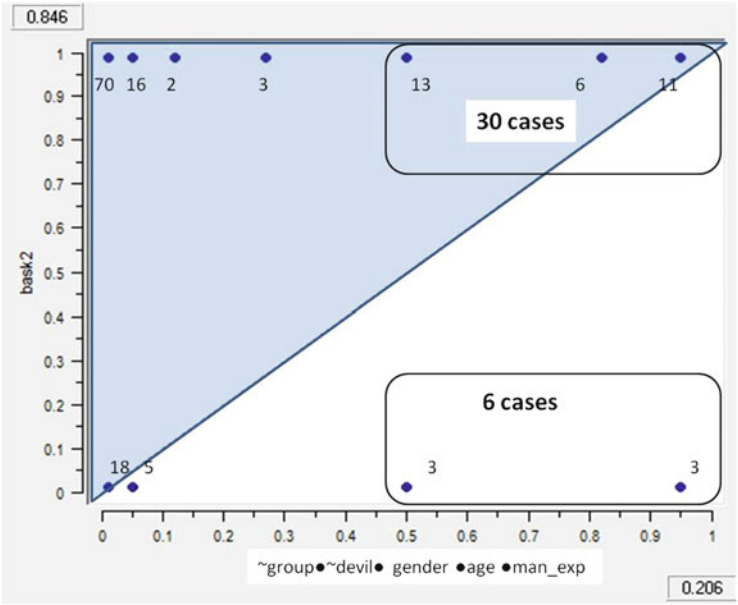


Fig. 6.7 Decision competence (bask2) by configural model: ~group • ~devil • gender • age_c • man_exp_c

6.2.2 In-basket 2: Assessment of Decision Confidence Models

Following Rihoux and Ragin (2009), decision confidence is considered an outcome as well as a measured antecedent. When considered an outcome (for In-basket 2 assessments), the possible recipes combining the four treatment conditions of group, gbs, devil and comp were analysed and the possible recipes assessed. Useful models (consistency >0.75; 0.2 < coverage <0.8) appear in Table 6.11 and are demarcated by a dotted box. The table below investigates only treatment conditions.

Using fuzzy set QCA methods, the degree of membership of cases in each of the logically possible recipes was assessed and all four models were considered for further analysis. The treatment antecedent **~devil** (not exposed to DA dissent) is a necessary condition for three models, but is not sufficient for high decision confidence. ~devil explains high membership of the outcome high decision confidence when combined with other treatments such as group interactive decision-making (group) OR combined with incompetency training (~comp) OR combined with (~gbs). Therefore, MBA graduates records high confident in their decisions for In-basket 2 when exposed to low or no involvement in DA dissent(~devil) and the placebo GBS treatment (~gbs). The causal recipe ~gbs • group is a useful model to explain high membership in the outcome decision confidence. The model indicates

Table 6.10 Analysis of causal models for decision success for In-basket 2: Configurations and causal paths for improved decision competence involving only measured antecedents (excl. likelihood to change)

```
File:  F:/PhD from D9_2011/DATA for PHD/ARCH IN BOSTON Jan 2013/CALIBRATED DATA_20 Jan 13.csv
Model: bask2 = f(conf2_c, man_exp_c, educ_c, age_c, gender)

 Rows:      24



 Algorithm: Quine-McCluskey
      True: 1
   0 Matrix: 0L
Don't Care: -

--- INTERMEDIATE SOLUTION ---
frequency cutoff: 1.000000
consistency cutoff: 0.700341
Assumptions:

                                raw        unique
                              coverage   coverage   consistency
                              ----------  ----------  ----------
conf2_c*educ_c                0.404147   0.067039    0.845176
conf2_c*age_c                 0.501166   0.173218    0.836414
~man_exp_c*~educ_c*~age_c     0.237508   0.063708    0.780301
~man_exp_c*educ_c*gender      0.184794   0.019570    0.770219
solution coverage: 0.704780
solution consistency: 0.809934
```

Note: Useful models are demarcated by the dotted-line box. Only three of the four intermediate solutions are reasonable and display satisfactory levels of consistency and coverage.

that participants who make decisions aided by group interaction AND who do not receive the goals and SI of GBS treatments report high levels of confidence. It is interesting to note that incompetency training (in this case use of the BCG matrix) improved confidence. This observation seems easy to explain since most students are familiar with the BCG model and educationalists agree that prior knowledge or familiarity with the training matter is likely to improve confidence, which in turn results in higher levels of engagement and commitment (Linnenbrink & Pintrich, 2003; Tobias, 2010).

If consistency scores of $\geq$0.75 are considered, then the analysis yields only two useful parsimonious solutions: ~gbs and group. Ragin (2008c, p. 120) warns against "infatuat[ion] with parsimony". He adds that "when using it as a guide for understanding cases, the three- or four-condition recipe might offer a more complete account, connect better with the observed causal process and offer a better basis for understanding the causal mechanisms at work ... The more complex explanation might be preferred to the more parsimonious explanation on substantive and theoretical grounds". Using substantive knowledge and QCA analyses, it is clear that the parsimonious solutions are too restrictive and scholars will be guided better by the intermediate and more complex solutions. The findings from additional

Table 6.11 Analysis of causal models for decision confidence for In-basket 2: Configurations and causal paths for improved decision confidence involving all four treatment antecedents

```
Model: conf2_c = f(comp, devil, gbs, group)

 Rows:      20



 Algorithm: Quine-McCluskey
      True: 1
  0 Matrix: 0L
Don't Care: -

--- INTERMEDIATE SOLUTION ---
frequency cutoff: 8.000000
consistency cutoff: 0.713846
Assumptions:

                    raw        unique
                 coverage    coverage   consistency
 ----------------------------------------------------
 ~devil*~gbs     0.468386    0.146695    0.767537
 ~comp*~devil    0.457102    0.120724    0.738423
 ~gbs*group      0.286406    0.117500    0.825507
 ~devil*group    0.344795    0.087946    0.826534
 ----------------------------------------------------
solution coverage: 0.882501
solution consistency: 0.770325
```

analysis of the impact of measured antecedents on decision confidence appear in Table 6.12.

All three of the above models are useful. The complex configuration for high decision confidence is: educ_c + age_c + ~man_exp_c → conf2_c. In other words, the findings provide very good support for all three antecedents that high fuzzy-set membership in educ_c OR high age OR low levels of management experience associates with high confidence for In-basket 2 assessments. Thus participants with postgraduate qualifications associate with high membership in decision confidence. Or, participants that are older than 40, or high age_c, associate with high decision confidence. A rather surprising finding is that low levels of management experience (~man_exp_c) associate with high decision confidence for participants in assessment In-basket 2. Some explanation may be found in the nature of the case (the context) since the dilemma is a choice between profit and market share, but once again we should defer to Bandura's (1986) insight that cognitive, behavioural, and environmental factors affect behaviour in conjunction, but differs for context and for individuals. These recipes indicate that the measured conditions are sufficient, but not necessary, to impact decision confidence (Fig. 6.8).

As for the overall study (all four In-basket simulations aggregated) and for the In-basket 1 assessments, no single solution for In-basket 2 was found (even if consisting of a configuration of multiple causal conditions) for decision competence. Although frustrating for the researcher (for whom a nice, simple, clear

Table 6.12 Decision confidence as outcome by measured antecedents

```
File:  C:/Users/rouxelle/Desktop/ARCH IN BOSTON Jan 2013/AAARCH_De Villiers 17 Jan PLUSss22.csv
Model: conf2_c = f(age_c, educ_c, man_exp_c, gender)

 Rows:      14



 Algorithm: Quine-McCluskey
      True: 1

--- COMPLEX SOLUTION ---
frequency cutoff: 1.000000
consistency cutoff: 0.838710

                  raw       unique
                 coverage    coverage   consistency
                ----------  ----------  ----------
~man_exp_c      0.572273    0.101917    0.789571
age_c           0.644367    0.179383    0.858489
educ_c          0.514240    0.039405    0.867896
solution coverage: 0.913129
solution consistency: 0.796687
```

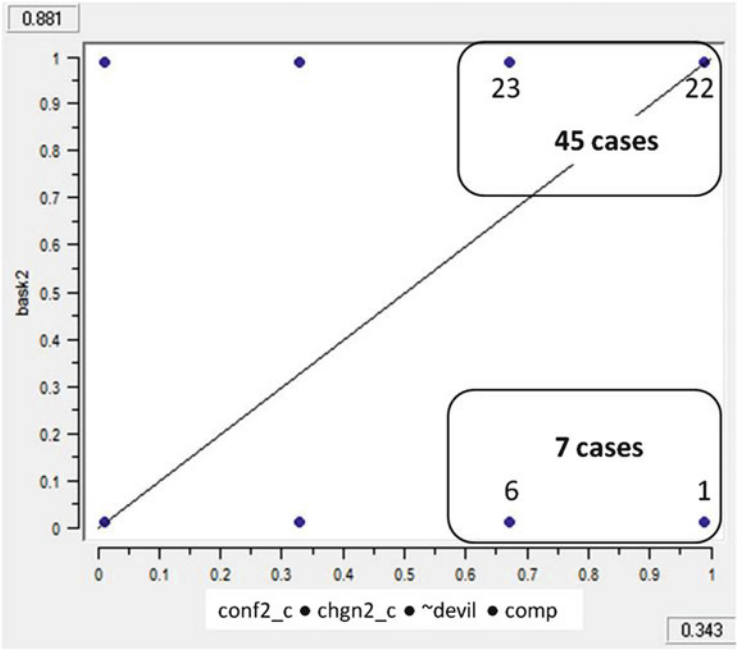


Fig. 6.8 Decision confidence (conf2_c) by measured condition educ_c

pathway would be a cause for celebration), this finding confirms the work of scholars like Simon, Armstrong and Bandura that contextual changes are important and that no single educational method or training methodology will suffice to achieve generalisable statements about "what works best". There is still no single answer to the question "how" educationalists develop decision competence through combinations of training methods. To investigate patterns and inter-relationships between conditions (variables) further, the next section explores decision competence and decision confidence for the In-basket 3 assessments.

6.3 Findings and Interpretations of Decision Competence and Decision Confidence: In-basket 3

In-basket 3 probes decision success for the RED annual RISC sales conference. Decision-makers had to select from nine alternative hotels to recommend as preferred conference facility to a prospective client. The decision demands students to be mindful of client goals and pre-set requirements, as well as the use of "take the best" and other decision heuristics. Competency training highlighted decision heuristics and sense-making tools, whilst incompetency training focused on the weighted priority matrix (see Appendix for the full set of decision aids).

6.3.1 In-basket 3: Assessments of Decision Success Causal Paths

Upon examination of the evidence that supports high membership in decision competence and the conjunctive causal recipes impacting **bask3**, the only useful intermediate solution, is summarized in Table 6.13.

Figure 6.9 shows the plot for the four-condition recipe (**comp • ~devil • gbs • group**). Note that most points (cases) are consistently above the diagonal; the few stray cases are well below the diagonal ($X_i < Y_i$). Interestingly, the parsimonious solution offers one less condition in the configuration, but is still 81 % consistent over all cases and covers ±21 % of all cases (Table 6.14).

The difference between the four-condition recipe and the three-condition recipe is thus ignorable. Ragin (2008c, p. 120) informs, "The scientifically based impulse is to favour the more parsimonious three-condition recipe." The scatter plot in Fig. 6.9 could thus equally well represent the XY plot for the parsimonious solution.

The degree of membership in the outcome of decision success (bask3) registers an acceptable consistency of just above the minimum (0.78) but the coverage is barely acceptable (0.20). It is interesting to note that this is the first in-basket simulation where the four treatment antecedents are all present in the useful causal recipe for high decision competence. In the three preceding analyses, (overall

Table 6.13 Analysis of causal models for decision confidence for In-basket 3: Configurations and causal paths for improved decision confidence involving all four treatment antecedents

```
File:  F:/PhD from D9_2011/DATA for PHD/ARCH IN BOSTON Jan 2013/CALIBRATED DATA_20 Jan 13.csv
Model: bask3 = f(comp, devil, gbs, group)

 Rows:       1



 Algorithm: Quine-McCluskey
      True: 1
   0 Matrix: 0L
Don't Care: -

--- INTERMEDIATE SOLUTION ---
frequency cutoff: 8.000000
consistency cutoff: 0.778281
Assumptions:

                            raw       unique
                          coverage    coverage   consistency
                         ----------  ----------  ----------
** comp*~devil*gbs*group   0.208401    0.208401    0.778281
solution coverage: 0.208401
solution consistency: 0.778281
```

** Example: QCA analysis result in one useful configuration of treatment conditions: high membership of the configuration: competency training AND no presence of devil's advocate dissent AND gbs simulated interaction AND group decision-making will result in high levels of decision competency. This configuration of conditions has a consistency of ± 78% and covers± 21% of cases.

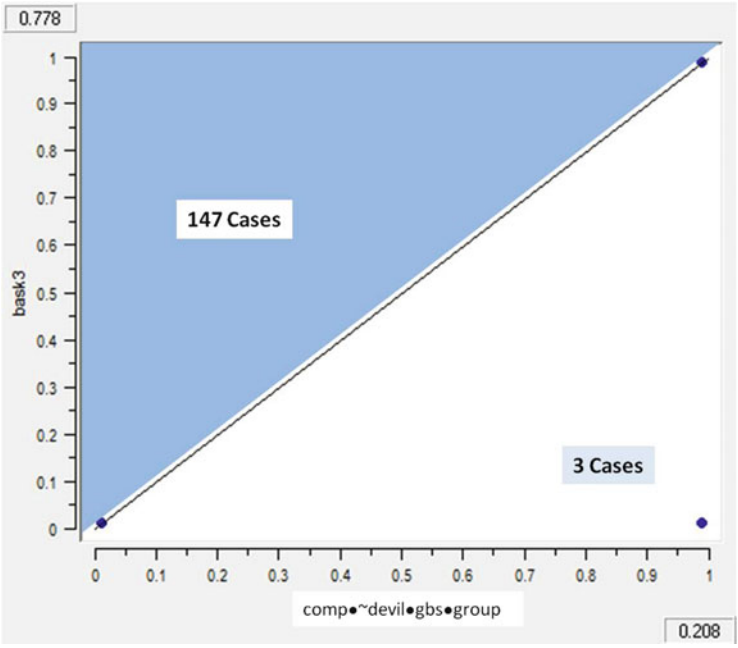


Fig. 6.9 Decision competency for In-basket 3 by a configuration of treatment conditions

Table 6.14 Parsimonious solution for bask3 (decision competence)

```
--- PARSIMONIOUS SOLUTION ---
frequency cutoff: 8.000000
consistency cutoff: 0.778281

                     raw         unique
                    coverage    coverage    consistency
  ------------------ ----------  ----------  ----------
  group*gbs*comp     0.208401    0.208401    0.778281
solution coverage: 0.208401
solution consistency: 0.778281
```

success, bask1 and bask2) assessments, some measured antecedents had to be part of the configuration to generate useful causal models, or configurations of conditions included a maximum of two of the treatment antecedents. Table 6.15 shows the results when an additional antecedent is configured into the possible solutions, namely the measured antecedent confidence (conf3_c).

Both causal models are useful (consistency above 0.75 and coverage >0.2). The degree of membership score supports the claim that the four-condition recipes indicate a subset of membership in the outcome of decision competence. The model marked ** provides evidence for the claim that high membership in the desired outcome of high decision competence results from high membership in the configuration of antecedents: competency training AND not DA AND GBS and group interactive decision-making procedures. The plot for the useful model (comp • ~devil • gbs • group) is depicted in Fig. 6.10 shows that most cases are in the upper triangle or near to it. According to Mendel and Korjani (2012), the most important and desirable region is the upper right-hand corner of the plot and needs to be compared with the lower right-hand corner of the plot. The upper right-hand corner and the number of cases with high decision competence and high membership in the causal conditions are indicated by the shaded triangle (A).

Further investigation into the 1024 logically possible configurations of antecedent resulted in no useful models for high membership in decision competence outcome. The QCA procedure trivialised all possible models of decision competence (bask3). Consistency scores are below the minimum level of 0.7, trivialising possible configurations and rendering the models useless. For illustrative purposes, Table 6.16 shows some of the hundreds of unsuccessful QCA procedures for the outcome antecedent decision competence (bask3).

6.3.2 In-basket 3: Assessment of Decision Confidence Models

For in-baskets 1 and 2, decision confidence (conf3_c) can be considered an outcome antecedent and causal recipes are developed and QCA procedure executed to learn

Table 6.15 Analysis of causal models for decision competence for In-basket 3: Configurations and causal paths for improved decision competences involving all four treatment antecedents and the measured antecedent conf3_c

```
File:  F:/PhD from D9_2011/DATA for PHD/ARCH IN BOSTON Jan 2013/CALIBRATED DATA_20 Jan 13.csv
Model: bask3 = f(conf3_c, comp, devil, gbs, group)

 Rows:       4



 Algorithm: Quine-McCluskey
      True: 1
  0 Matrix: 0L
Don't Care: -

--- INTERMEDIATE SOLUTION ---
frequency cutoff: 1.000000
consistency cutoff: 0.706170
Assumptions:

                              raw         unique
                             coverage    coverage   consistency
                            ----------  ----------  ----------
conf3_c*~devil*gbs*group     0.314621    0.145396    0.724652
** comp*~devil*gbs*group     0.208401    0.039176    0.778281    See graph below
solution coverage: 0.353798
solution consistency: 0.727575
```

** Example: Participants who report high levels of decision confidence for the decisions of in-basket 3 AND work in groups AND who receive the goal-based scenario treatment AND not exposed to devil's advocate dissent; record higher level of decision competence.
Useful models appear in the dotted-line box.

useful configurations of conditions resulting in high membership in decision confidence. Exploration efforts resulted in the marginally useful model (group• ~gbs) with the borderline consistency score of 0.75 and a very useful model (~devil) with consistency score of 0.78 and coverage of 0.89. As in previous tables, the dotted box demarcates useful models (if only marginally useful), which in the case of confidence as an outcome antecedent, includes both models (~devil) OR (group• ~gbs): thus ~devil + group• ~gbs → high conf3_c (Table 6.17).

The single-condition model ~devil is highly useful in predicting high decision confidence for In-basket 3. Figure 6.11 shows the scatter plot of membership in decision confidence against membership in the single-condition causal recipe (**~devil**).

Figure 6.12 shows that participants display high decision confidence when they receive the group interactive decision-making treatment (group) AND no exposure to GBS simulation (~gbs). The recipe (group • ~gbs) offers a model for understanding the causal conditions sufficient to result in high decision confidence for In-basket 3 assessments. Once again we see that non-exposure to the cautionary voice or deliberate dissent offered by the DA role-player has a positive impact on confidence. In discussing group efficacy, Bandura (1982, p. 143) proposes, "The strength of groups, organizations, and even nations lies partly in people's sense of

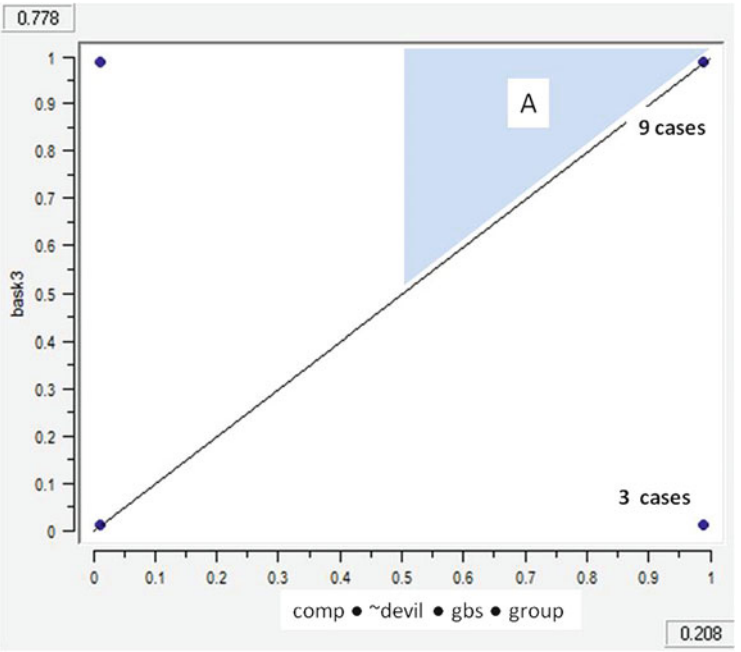


Fig. 6.10 Useful model for decision success for In-basket 3

Table 6.16 Trivialised causal models for decision competence for In-basket 3

```
File:  F:/PhD from D9_2011/DATA for PHD/ARCH IN BOSTON Jan 2013/CALIBRATED DATA_20 Jan 13.csv
Model: bask3 = f(gender, age_c, educ_c, man_exp_c, conf3_c, chg3_c, group, gbs, devil, comp)

 Rows:      55



 Algorithm: Quine-McCluskey
      True: 1

--- COMPLEX SOLUTION ---
frequency cutoff: 1.000000
consistency cutoff: 0.721961
```

	raw coverage	unique coverage	consistency
gender*~age_c*~educ_c*~man_exp_c*conf3_c*chg3_c*group*~devil*~comp	0.109250	0.021002	0.772858
~age_c*~educ_c*~man_exp_c*conf3_c*chg3_c*group*gbs*~devil*~comp	0.089459	0.014540	0.856864
~gender*~age_c*educ_c*~man_exp_c*conf3_c*group*gbs*~devil*comp	0.060784	0.028877	0.746898
gender*~age_c*educ_c*~man_exp_c*conf3_c*chg3_c*group*gbs*~devil	0.106422	0.058562	0.902398
gender*~age_c*educ_c*~man_exp_c*~conf3_c*~chg3_c*group*~gbs*~devil*~comp	0.059572	0.015953	0.817174
gender*~age_c*educ_c*~man_exp_c*conf3_c*chg3_c*~group*~gbs*~devil*~comp	0.062399	0.032108	0.721961
gender*age_c*~educ_c*man_exp_c*~conf3_c*~chg3_c*~group*gbs*~devil*~comp	0.045840	0.015549	0.799296
gender*~age_c*educ_c*~man_exp_c*conf3_c*~chg3_c*group*~gbs*devil*~comp	0.063005	0.015347	0.936937
~gender*age_c*~educ_c*man_exp_c*~conf3_c*~chg3_c*group*gbs*~devil*comp	0.044427	0.012520	0.866142
gender*age_c*educ_c*~man_exp_c*conf3_c*chg3_c*group*~gbs*devil*~comp	0.064418	0.016761	0.811705
gender*age_c*~educ_c*man_exp_c*conf3_c*chg3_c*group*gbs*~devil*comp	0.065024	0.030695	1.000000

```
solution coverage: 0.373184
solution consistency: 0.757999
```

Table 6.17 Analysis of causal models for decision confidence for In-basket 3: Configurations and causal paths for improved decision confidence which includes all four treatment antecedents and the measured antecedents confidence and likelihood to change (conf3_c)

```
File:  F:/PhD from D9_2011/DATA for PHD/ARCH IN BOSTON Jan 2013/CALIBRATED DATA_20 Jan 13.csv
Model: conf3_c = f(group, gbs, devil, comp)

 Rows:      10



 Algorithm: Quine-McCluskey
      True: 1

--- COMPLEX SOLUTION ---
frequency cutoff: 8.000000
consistency cutoff: 0.705883

                   raw         unique
                coverage     coverage   consistency
                ----------   ----------  ----------
~devil          0.889541     0.749223    0.781857   See graph below
** group*~gbs    0.250777     0.110459    0.750132
solution coverage: 1.000000
solution consistency: 0.780336
```

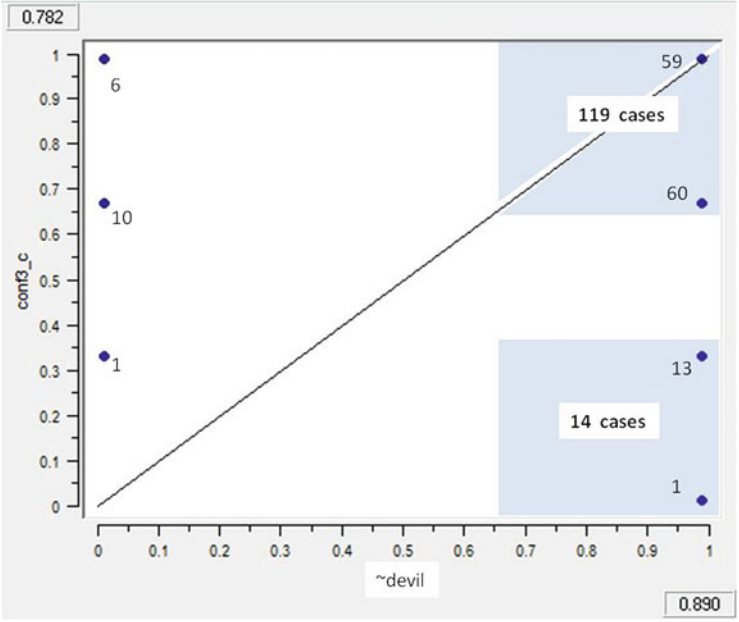


Fig. 6.11 Model for decision confidence for In-basket 3 by antecedent condition ~devil

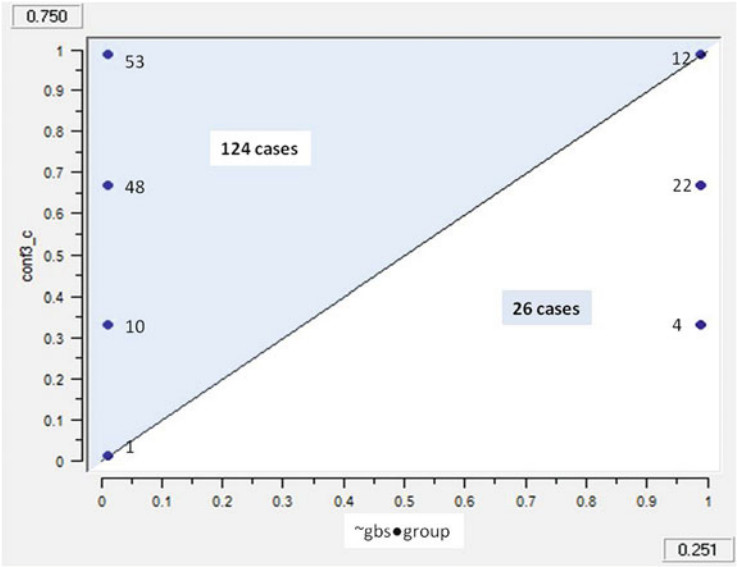
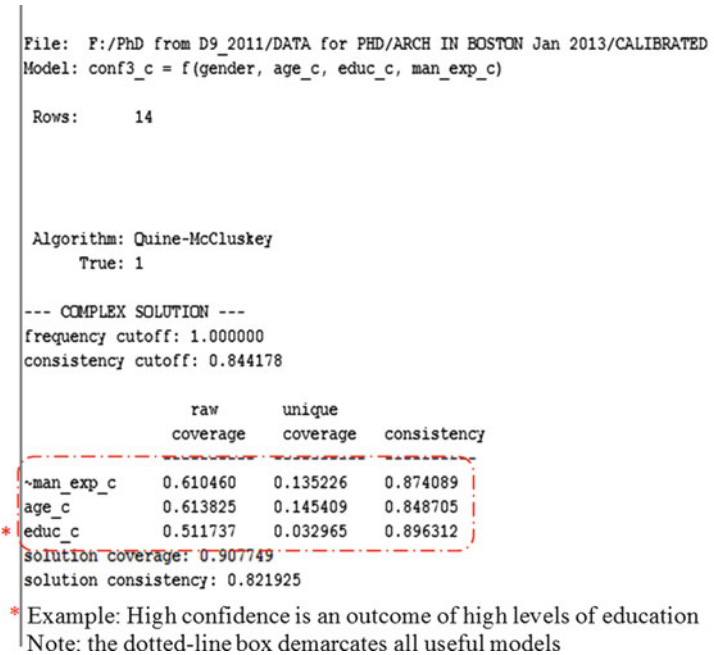


Fig. 6.12 Model for decision confidence for In-basket 3: The influence of treatment antecedents on decision confidence

collective efficacy that they can solve their problems and improve their lives through concerted effort . . . It should be noted that knowledge of personal efficacy is not unrelated to perceived group efficacy". A logical explanation might be that participants who perceive their fellow MBAs to be competent and intelligent might benefit from this perception and report high levels of confidence when placed in groups. Unfortunately the treatment antecedent group is not necessary for decision confidence, although it is sufficient when configured with the condition ~gbs (Table 6.18).

Interestingly, low membership in management experience (**~man_exp**) associates with high levels of decision confidence. Another useful model to predict high membership of decision confidence for In-basket 3 is high age. Further, high education, that is, participants with graduate qualifications, associates with high levels of decision confidence (conf3_c). This is almost an exact replication of the results for In-basket 2, even in terms of the order of magnitude of the scores, as appearing in Table 6.19.

Table 6.18 Analysis of causal models for decision confidence for In-basket 3: Configurations and causal paths for improved decision confidence which includes only the four measured antecedents



```
File:  F:/PhD from D9_2011/DATA for PHD/ARCH IN BOSTON Jan 2013/CALIBRATED DATA_20 Jan 13.csv
Model: conf3_c = f(gender, age_c, educ_c, man_exp_c)

 Rows:      14



 Algorithm: Quine-McCluskey
      True: 1

--- COMPLEX SOLUTION ---
frequency cutoff: 1.000000
consistency cutoff: 0.844178

                  raw       unique
                coverage    coverage   consistency
              ----------  ----------  ----------
~man_exp_c      0.610460    0.135226    0.874089
age_c           0.613825    0.145409    0.848705
* educ_c        0.511737    0.032965    0.896312
solution coverage: 0.907749
solution consistency: 0.821925
```

* Example: High confidence is an outcome of high levels of education
Note: the dotted-line box demarcates all useful models

Table 6.19 Comparative analysis of decision confidence for In-baskets 2 and 3

Decision confidence (In-basket 2) = conf2_c		
~devil • ~gbs	0.77	0.47
~comp • devil	0.74	0.46
~gbs • group	0.83	0.29
~devil • group	0.83	0.35
~man_exp_c	0.79	0.57
age_c	0.86	0.64
educ_c	0.87	0.51
Decision confidence (In-basket 3) = conf3_c		
~devil	0.78	0.89
~gbs • group	0.75	0.25
~man_exp_c	0.87	0.61
age_c	0.85	0.61
educ_c	0.90	0.51

6.4 Findings and Interpretations of Decision Competence and Decision Confidence: In-basket 4

In-basket 4 explores decision success for the scenario of Mary, a highly competent and long-term key staff member, who offends a key client. Decision-makers had to select from five not-so-ideal solutions, a single, preferred course of action. The decision demands insight into key talent development as well as key client retention and service recovery theories. According to the consulting experts involved in developing the In-basket simulation and alternative choices, soft skills such as empathy and mindfulness would be beneficial to the decision-maker (see Appendix for the full set of decision aids).

6.4.1 In-basket 4: Assessments of Decision Success Causal Paths

A thorough analysis of logical pathways to decision competence (**bask4** success) resulted in numerous useful models. Table 6.20 shows the intermediate solution for membership in the outcome of decision competence (bask4). Results displayed in Table 6.20 indicate that a useful causal recipe for decision competence is the three-condition model: comp • ~devil • group → bask4. For decisions in In-basket 4, the combination of competency training (comp) AND exposure to group interaction (group) AND no presence of DA dissent (~devil) associates with high decision competence. This configuration of treatment antecedents has a coverage score of 0.23 of cases with a consistency score of 0.82. The XY plot is depicted in Fig. 6.13.

The plot in Fig. 6.13 has substantially more cases in the upper triangle than below the diagonal, and a correspondingly high consistency score of 0.82. The graph plots high membership in the outcome condition against membership of the configuration of treatment conditions. Note the difference between number of cases with high Y_i value and the number with high X_i value (a ratio of approximately 4.5:1). This signifies a useful model with high consistency and coverage of 0.23, indicating that model is useful to forecast high membership in the outcome to a reasonable degree. Table 6.21 shows the useful results of careful analysis of multiple possible causation configurations of all combinations of the four treatment antecedents and the measured antecedents of decision confidence (conf4_c). For In-basket 4, participants high in the combination of confidence AND who participate in the GBS treatments AND given the opportunity to discuss the simulations with co-participants AND exposed to competency training display high levels of decision competence (outcome bask4). When measured antecedents related to decision confidence (conf4_c and chg4_c) are included in the configuration model, only one new causal path is useful, with a consistency level above 0.75 and coverage score between 0.2 and 0.6: ~gbs • ~devil • comp • conf4_c + group • ~devil • comp → high bask 4. In the case of In-basket 4 ~devil is a necessary

Table 6.20 Analysis of causal models for decision competence for In-basket 4: Configurations and causal paths for improved decision competence which includes all four treatment antecedents

```
--- INTERMEDIATE SOLUTION ---
frequency cutoff: 8.000000
consistency cutoff: 0.778281
Assumptions:

                          raw         unique
                        coverage    coverage   consistency
                       ----------  ----------  ----------
comp*~devil*group      0.233000    0.233000    0.822464
solution coverage: 0.233000
solution consistency: 0.822464
```

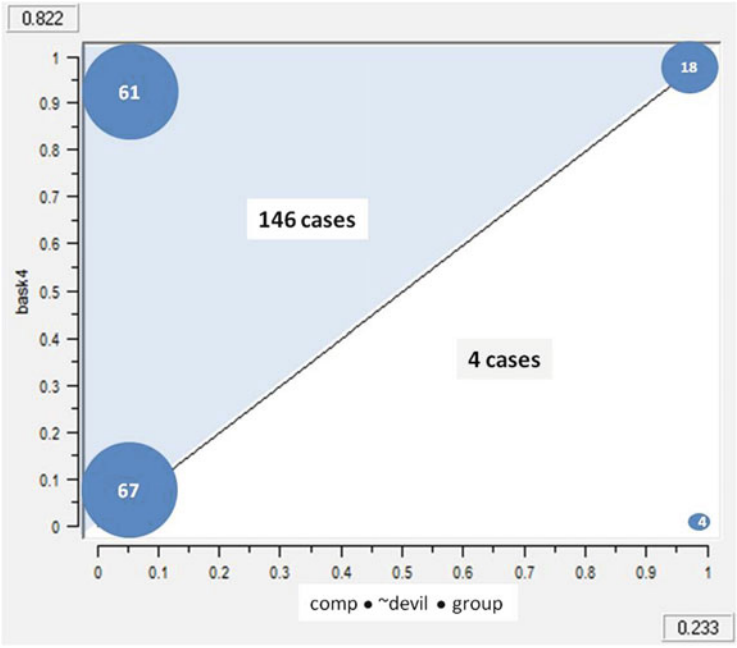


Fig. 6.13 Model for decision competence for In-basket 4: Causal path for improved decision competency considering the four treatment antecedents

condition, but not sufficient for high decision competence (bask 4). Only in combination with other treatment antecedents AND the measured antecedent of confidence (conf4_c) are some useful and sufficient models uncovered.

Additional analysis attempts at finding useful models by combining all measured antecedents were not successful (see Table 6.22). None of the logically possible configurations of measured antecedents are useful for In-basket 4. Low consistency

Table 6.21 Analysis of causal models for decision competence for In-basket 4: Configurations for treatment antecedents (age; group: comp; devil) in combination with the measured antecedent (conf4_c)

```
File:  F:/PhD from D9_2011/DATA for PHD/ARCH IN BOSTON Jan 2013/CALIBRATED DATA_20 Jan 13.csv
Model: bask4 = f(group, gbs, devil, comp, conf4_c)

 Rows:      16



 Algorithm: Quine-McCluskey
      True: 1

--- COMPLEX SOLUTION ---
frequency cutoff: 1.000000
consistency cutoff: 0.700576

                                 raw        unique
                              coverage    coverage   consistency
                             ----------  ----------  ----------
** group*~devil*comp          0.233000    0.121375    0.822464
   ~group*~gbs*~devil*~comp   0.233000    0.045676    0.698462
   group*~gbs*comp*~conf4_c   0.040287    0.008468    0.830688
   ~group*~gbs*~devil*conf4_c 0.330511   -0.000000    0.691729
   ~gbs*~devil*comp*conf4_c   0.250449   -0.000000    0.767900
solution coverage: 0.598409
solution consistency: 0.729205

** Example: For in-basket 4, participants given the opportunity to discuss the simulations with co-participants (group)
            AND not devil's advocate dissent AND who receive competency training, associates high levels
            of decision competence.
Note: The dotted-line box demarcates useful models.
```

scores indicate that the evidence does not support the claim that membership in any model is a subset of the membership of decision competence, which in turn indicates that it is not reasonable to attempt an interpretation of causal sufficiency for any recipes. Where consistency is above 0.75, the coverage is too low (0.05) and thus the investigated model (~chg4 • ~conf4 • ~man_exp • educ_c • ~age_c • ~gender) is trivialised. The same is true for all configured models combining measured and treatment antecedents, as illustrated in Table 6.23.

No intermediate or parsimonious solutions are valid or indicate high set-theoretic membership in the outcome high decision competence for In-basket 4.

6.4.2 In-basket 4: Assessment of Decision Confidence Models

Analysis of the possible outcome antecedent high decision confidence investigated causal path propositions involving all four treatment antecedents of **group, gbs, devil and comp** (Table 6.24).

Table 6.22 Analysis of causal models for decision competence for In-basket 4: Configurations of measured antecedents only

```
File:  F:/PhD from D9_2011/DATA for PHD/ARCH IN BOSTON Jan 2013/CALIBRATED DATA_20 Jan 13.csv
Model: bask4 = f(chg4_c, conf4_c, man_exp_c, educ_c, age_c, gender)

 Rows:       3


 Algorithm: Quine-McCluskey
      True: 1
  0 Matrix: 0L
Don't Care: -

--- INTERMEDIATE SOLUTION ---
frequency cutoff: 1.000000
consistency cutoff: 0.700656
Assumptions:
```

	raw coverage	unique coverage	consistency
~chg4_c*~conf4_c*~man_exp_c*educ_c*~age_c*~gender	0.057737	0.004362	0.789473
chg4_c*conf4_c*~man_exp_c*educ_c*~age_c*~gender	0.123429	0.070054	0.700656
~chg4_c*conf4_c*~man_exp_c*educ_c*age_c*~gender	0.048627	0.001026	0.737353

```
solution coverage: 0.128817
solution consistency: 0.662707
```

Two fuzzy subset relations consistent with sufficiency are associated with the scrutinised outcome ~devil OR group• ~gbs. The relatively high consistency scores permit interpretation of the causal sufficiency of these two recipes and interpretation of the coverage scores, indicating the usefulness of the models (Figs. 6.14 and 6.15).

In this case ~devil is sufficient to cause decision confidence, but not necessary (since it does not appear in every case of the configuration of conditions) (Ragin, 2004). This seems to align with the argument that exposure to cautionary comments by respected peers or contradictory statements by other members in the group might lead to self-doubt or lower levels of confidence in the decision, thus not having such a role-player present might associate with high decision confidence (conf4_c). Further analysis into decision confidence for In-basket 4 (conf4_c) investigated causal paths combining measured antecedents. The complex solutions resulting from the QCA analysis appear in Table 6.25. The conjunctive solution edu_c + age + ~man _exp → conf4_c leads to high decision confidence in 90 % of the studied cases and the context determined by the study.

For in-basket 4, participants' high formal education (educ_c) OR high age (age_c) OR low level management experience (~man_exp_c) associated with high decision confidence (conf4_c). The graph in Fig. 6.16 plots membership of decision confidence in In-basket4 against the membership in the single-condition causal recipe: educ_c. The plot has a large number of cases above the diagonal

Table 6.23 Trivialised models for decision competence for In-basket 4: Models considering configurations of measured antecedents and all treatment antecedents

```
File:  F:/PhD from D9_2011/DATA for PHD/ARCH IN BOSTON Jan 2013/CALIBRATED DATA_20 Jan 13.csv
Model: bask4 = f(group, gbs, devil, comp, conf4_c, chg4_c, age_c, educ_c, man_exp_c, gender)

 Rows:      57



 Algorithm: Quine-McCluskey
      True: 1

--- COMPLEX SOLUTION ---
frequency cutoff: 1.000000
consistency cutoff: 0.719864
```

	raw coverage	unique coverage	consistency
~group*~gbs*~devil*~comp*conf4_c*chg4_c*~age_c*~man_exp_c	0.112138	0.051065	0.844445
group*~devil*comp*conf4_c*chg4_c*~age_c*educ_c*~man_exp_c	0.084039	0.023480	0.830165
~group*~gbs*~devil*comp*conf4_c*chg4_c*age_c*gender	0.087375	0.049397	0.791861
~group*~gbs*~devil*~conf4_c*~chg4_c*~age_c*educ_c*~man_exp_c*~gender	0.042725	0.004362	0.818182
~group*~gbs*~devil*conf4_c*chg4_c*~age_c*~educ_c*~man_exp_c*~gender	0.075956	0.015781	0.922118
~group*gbs*~devil*comp*conf4_c*~age_c*~educ_c*~man_exp_c*gender	0.060944	0.006543	0.742188
~group*gbs*~devil*comp*chg4_c*~age_c*~educ_c*~man_exp_c*gender	0.058763	0.004362	0.735153
group*gbs*~devil*conf4_c*chg4_c*~age_c*educ_c*~man_exp_c*~gender	0.051193	0.008468	0.817619
group*~gbs*~devil*comp*conf4_c*chg4_c*~age_c*~man_exp_c*gender	0.050552	0.015525	0.889389
group*gbs*~devil*comp*conf4_c*chg4_c*~age_c*educ_c*~gender	0.042725	-0.000000	0.693747
group*~gbs*~devil*comp*conf4_c*chg4_c*~age_c*educ_c*gender	0.042982	0.007955	0.835411
~group*~gbs*~devil*conf4_c*chg4_c*age_c*educ_c*man_exp_c*gender	0.057480	0.005132	0.742952
group*gbs*~devil*comp*conf4_c*chg4_c*age_c*~educ_c*man_exp_c	0.060175	0.035668	0.957142
group*~gbs*~devil*~comp*conf4_c*~chg4_c*~age_c*~educ_c*~man_exp_c*gender	0.029895	0.010649	0.784512
~group*~gbs*~devil*~comp*~conf4_c*~chg4_c*age_c*educ_c*man_exp_c*gender	0.035925	0.004362	0.918033
~group*gbs*~devil*comp*conf4_c*chg4_c*age_c*~educ_c*~man_exp_c*~gender	0.031306	0.012061	0.903704
group*~gbs*devil*~comp*conf4_c*chg4_c*age_c*educ_c*man_exp_c*~gender	0.027714	0.008468	1.000000
group*~gbs*devil*comp*conf4_c*chg4_c*age_c*educ_c*man_exp_c*gender	0.030151	0.010906	0.827465

```
solution coverage: 0.445856
solution consistency: 0.774633
```

Note: All hypothetical models are falsified - coverage scores below 0.2

(X = Y) and a correspondingly high consistency score of 0.9. The coverage of ± 0.5 indicates that the model is useful and covers 50 % of all cases in the study.

Other conditions to consider when probing high membership for high decision confidence are, as expected, high age_c OR low management experience (~man_exp_c). Once again, the analysis for high decision confidence in In-basket 4 replicates the results for the other three in-baskets assessments: age_c + ~man_exp_c + educ_c → high conf4_c.

6.5 Discussion, Conclusions and Implications

6.5.1 Discussion

The main purpose of this study is to examine decision competence and how different treatments (development interventions or teaching methods) can improve decision competency and/or reduce incompetency. A fresh approach, namely

Table 6.24 Analysis of causal models for decision confidence for In-basket 4: Models considering configurations of all four treatment antecedents

```
File:  F:/PhD from D9_2011/DATA for PHD/ARCH IN BOSTON Jan 2013/CALIBRATED DATA_20 Jan 13.csv
Model: conf4_c = f(group, gbs, devil, comp)

 Rows:      10



 Algorithm: Quine-McCluskey
      True: 1

--- COMPLEX SOLUTION ---
frequency cutoff: 8.000000
consistency cutoff: 0.766305

                    raw         unique
                  coverage    coverage    consistency
                 ----------  ----------  ----------
~devil           0.887550    0.729752    0.804611  See graph 5.19 A below
** group*~gbs     0.270248    0.112450    0.833766  See graph 5.18 below
solution coverage: 1.000000
solution consistency: 0.804848
```

** Example: The treatment antecedent of group interactive decision-making, in combination with limited or low exposure to *gbs* simulations, associates with high levels of decision confidence for participants in in-basket 4.

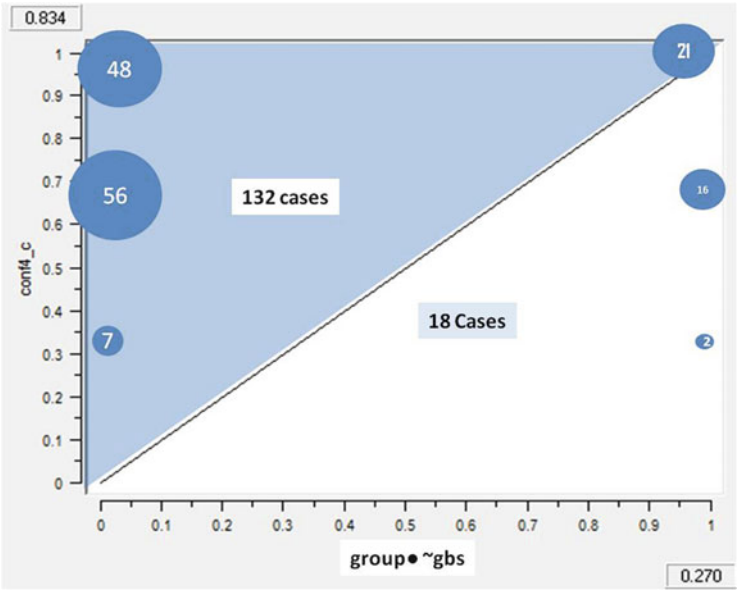


Fig. 6.14 Model for decision confidence for In-basket 4

fsQCA, is used as a methodology to conceptualise and discover causation models associated with performance outcomes. One of the key benefits of QCA is that it allows for equifinality, or multiple paths to the same outcome (Mahoney, 2007; Wagemann & Schneider, 2010) and it also allows for "the possibility to produce

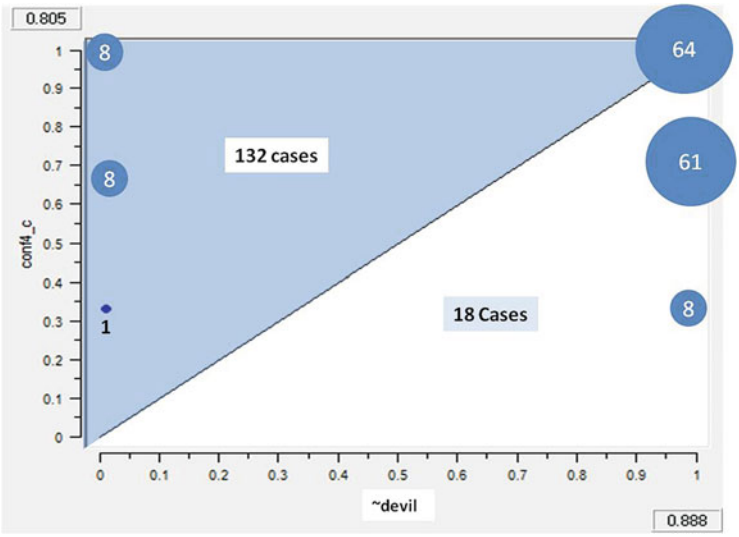


Fig. 6.15 Decision confidence for In-basket 4 by condition ~devil

Table 6.25 Analysis of causal models for decision confidence for In-basket 4: Configurations of measured antecedents: age; gender_c; man_exp; educ_c

```
File:  F:/PhD from D9_2011/DATA for PHD/ARCH IN BOSTON Jan 2013/CALIBRATED DATA_20 Jan 13.csv
Model: conf4_c = f(gender, age_c, educ_c, man_exp_c)

 Rows:      14


 Algorithm: Quine-McCluskey
      True: 1

--- COMPLEX SOLUTION ---
frequency cutoff: 1.000000
consistency cutoff: 0.929587

                   raw         unique
                  coverage    coverage    consistency
                  ----------  ----------  ----------
*~man_exp_c       0.586178    0.121402    0.865686
*age_c            0.618642    0.168842    0.882234
*educ_c           0.498411    0.037149    0.900393  See graph below
solution coverage: 0.904786
solution consistency: 0.844976
```

Note: All three single-condition recipes are useful, consistency >0.75 and coverage scores between 0.2 and 0.6. Useful models are demarcated by the dotted-line box.

generalizations" (Rihoux & Lobe, 2008, p. 224). This means that causal effects of one variable may depend on the causal combinations (both the presence and absence of that condition) and simultaneously different configurations of conditions may produce similar outcomes. For this study, several different combinations of

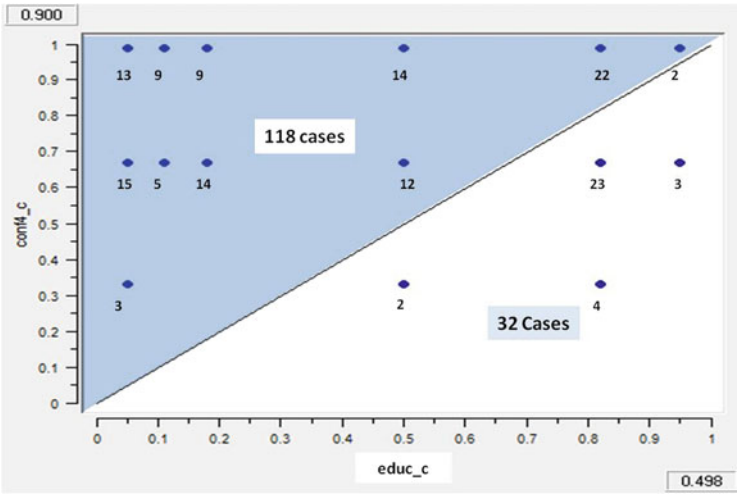


Fig. 6.16 Model for decision confidence for In-basket 4 as affected by the measured antecedent of education (edu_c). *Note*: The number of cases is indicated by the number below each *dot*

conditions are causally sufficient to cause the outcomes under investigation, that is decision competence (success_c; bask1; bask2; bask3 and bask 4 for the overall and individual In-basket assessments). The second outcome under investigation is that of decision confidence. Not only is confidence an important measure of the feasibility of a decision, but the QCA analysis indicates that it is a key contributor to overall decision success. The analysis and interpretation in this section also considers decision confidence (conf_tot_c; conf1_c;conf2_c; conf3_c and conf4_c).

6.5.2 Comparative Analysis

Rihoux and Lobe (2008, p. 236) instruct the researcher to "strive to identify similarities across the 'thick' case narratives ... building on the terms of the minimal formula; typically those cases that are clustered in connection with a given parsimonious term are examined in parallel ... By engaging in the cross-case, focused comparative interpretations, [one] not only discover common (bits of) narratives across cases, but also some other, unsuspected elements that were not comprised in the QCA model". In this study of multiple conjectural causation for decision competence, no single cause (treatment) is necessary (must appear in every case of decision confidence) OR sufficient to cause high membership in decision confidence when configurations of measured antecedents are analysed (see Table 6.26 for plausible consequential configurations). These are called "insufficient but necessary part of a condition which is itself unnecessary but sufficient for the result" (Goertz, 2003, p. 68), which is abbreviated to "INUS". Wagemann and

Table 6.26 All models of decision competence and decision confidence

	Consistency	Coverage
Decision competence (Overall—all four in-baskets)		
~gbs • ~comp • conf_tot_c	0.76	0.29
conf_tot_c • comp • ~devil • ~gbs	0.77	0.24
gender • ~age_c • ~man_exp_c • ~change_tot_c	0.78	0.28
age_c • man_exp_c • ~conf_c • ~chgn_tot_c	0.74	0.30
Gender • ~age_c • ~man_exp_c • conf_tot_c	0.80	0.31
~educ_c • man_exp_c • conf_tot_c • chgn_tot_c	0.80	0.35
gender • educ_c • ~man_exp_c • ~conf_tot_c • chgn_tot_c	0.81	0.22
man_exp • age •edu_c (using Boolean algebra)	0.73	0.30
NOT-decision competence (Overall) (using Boolean Algebra)		
~devil	0.90	0.89
group • ~gbs	0.92	0.27
Decision confidence (Overall) = conf_tot_c		
age_c	0.72	0.67
~man_exp • gender	0.72	0.43
man_exp_c • edu_c (using Boolean algebra)	0.83	0.32
Decision competence (In-basket 1) = bask1		
~comp • devil	0.89	0.53
~devil • gbs • ~group	0.86	0.30
~gbs • ~devil • ~comp	0.90	0.29
~devil • ~comp • conf1_c	0.90	0.42
~group • ~devil • conf1_c	0.85	0.49
chg1_c • ~group • ~devil	0.83	0.44
~man_exp • conf1_c • chgn1_c	0.83	0.45
educ_c • conf1_c • chg1_c	0.81	0.40
age • ~educ • man_exp_c • conf1_c	0.74	0.25
gender • age • man_exp_c • conf1_c	0.76	0.25
conf1_c • ~comp	0.89	0.48
chg1_c • ~comp	0.89	0.44
gbs • ~comp	0.88	0.25
~group • comp	0.80	0.30
Decision confidence (In-basket 1) = conf1_c		
~group • ~devil • gender • age_c • man_exp_c	0.85	0.21
group • ~gbs	0.84	0.28
~devil	0.78	0.88
Decision competence (In-basket 2) = bask2		
comp • ~devil	0.83	0.45
~devil • ~group	0.80	0.58
~gbs • group	0.87	0.28
~gbs • group • conf2_c	0.89	0.24
~group • ~devil • comp	0.80	0.30
~group • ~devil • conf2_c	0.82	0.42

(continued)

Table 6.26 (continued)

	Consistency	Coverage
Gbs • ~devil • comp	0.88	0.25
~group • ~devil • gender • age_c • man_exp_c	0.85	0.21
~educ_c • ~age_c • ~man_exp_c	0.78	0.24
conf2_c • age_c	0.84	0.50
conf2_c • educ_c	0.85	0.40
group • ~devil • conf2_c • chg2_c • gender • age_c • man_exp_c	0.84	0.18
conf2_c• ~group • ~devil	0.82	0.42
conf2_c • chg2_c • ~devil • comp	0.88	0.34
Decision confidence (In-basket 2) = conf2_c		
~devil • ~gbs	0.77	0.47
~comp • devil	0.74	0.46
~gbs • group	0.83	0.29
~devil • group	0.83	0.35
~man_exp_c	0.79	0.57
age_c	0.86	0.64
educ_c	0.87	0.51
Decision competence (In-basket 3) = bask3		
comp • ~devil • gbs • group	0.78	0.21
conf3_c • ~devil • gbs • group	0.72	0.31
Decision confidence (In-basket 3) = conf3_c		
~devil	0.78	0.89
~gbs • group	0.75	0.25
~man_exp_c	0.87	0.61
age_c	0.85	0.61
educ_c	0.90	0.51
Decision competence (In-basket 4) = bask4		
comp • ~devil • group	0.82	0.23
~gbs • ~devil • comp • conf4_c	0.77	0.25
Decision confidence (In-basket 4) = conf4_c		
~devil	0.80	0.89
~gbs • group	0.83	0.27
~man_exp_c	0.87	0.57
age_c	0.88	0.62
educ_c	0.90	0.50

Schneider (2010, p. 382) highlight that "In the process of analyzing data with QCA, it is the rule rather than the exception that a single condition is neither necessary nor sufficient, yet plays a crucial causal role." For the outcome decision confidence, a number of single-condition paths are valuable these are shown in Table 6.26.

Wagemann and Schneider (2010, p. 386) point out two ways in which QCA overcomes shortcomings of commonly applied frameworks and statistical methods, which are also true for this study: (1) "hardly ever is a singly condition found to be sufficient for all cases under examination. Instead, empirical and research reality most of the time reveals that conditions are only sufficient in combination with other conditions ('conjectural causation')"; (2) QCA can take equifinality of comparative case studies idiosyncratic explanation into account, but has limited generalisability of the results beyond the cases under examination. Although these are clearly set out as benefits for studying complex trends in social sciences, these benefits simultaneously complicate the analysis and interpretation of this study. Equifinality, which has causal equivalence as central idea (different conditions or combinations of conditions may satisfy the causal requirement), for instance, points to a number of paths to high decision competence. If only those solutions (or configurations of conditions, i.e. paths) with consistency above 0.70 (that is 70 % of all membership scores lie above the main diagonal in the XY plot) are considered, 42 possible paths emerge for decision competence (or ~decision competence) and 23 equivalent paths for decision confidence result.

The logical equivalence of causation models towards the outcome decision confidence (and separately decision confidence) does not exclude the possibility of assessing their different degrees of empirical importance (Ragin, 2006; Wagemann & Schneider, 2010), which is "usually achieved through the coverage measure" (Wagemann & Schneider, 2010, p. 383). Pathways (solution models) with a consistency score of 1 and coverage of 0.5 or above are regarded as very useful, since consistency measures the degree to which cases with a given set of causal conditions exhibit the outcome and coverage measures the degree to which a given path explains the cases analysed and determines the relevance of each causal recipe (Ragin, 2008c). Table 6.27 shows all models in this study with a consistency above 0.75 AND coverage above 0.50.

6.5.3 Finding, Interpretations and Implications

The main finding of this study is that simply combining all treatments in pursuit of high competence is not an effective strategy. There is no single (either complex or parsimonious) recipe which results in high decision competence. Sadly, there is also no catch-all, single training solution to aid in the development of managerial decision confidence. Different recipes relate to decision competence and to decision confidence, not only in the four different In-basket simulations, but also when measured antecedent (the self-recorded knowledge and skill levels as reflected by the measures management experience and education level as well as the demographic age) are considered. One certain statement is that high decision incompetence is associated with group interactive decision-making and not receiving a GBS

Table 6.27 Important models of decision competence and decision confidence

	Consistency ≥0.75	Coverage ≥0.50
NOT-decision competence (overall) (using Boolean Algebra)		
~devil	0.90	0.89
Decision confidence (In-basket 1) = conf1_c		
~devil	0.78	0.88
Decision competence (In-basket 2) = bask2		
~devil • ~group	0.80	0.58
conf2_c • age_c	0.84	0.50
Decision confidence (In-basket 2) = conf2_c		
~man_exp_c	0.79	0.57
age_c	0.86	0.64
educ_c	0.87	0.51
Decision confidence (In-basket 3) = conf3_c		
~devil	0.78	0.89
~man_exp_c	0.87	0.61
age_c	0.85	0.61
educ_c	0.90	0.51
Decision confidence (In-basket 4) = conf4_c		
~devil	0.80	0.89
~man_exp_c	0.87	0.57
age_c	0.88	0.62
educ_c	0.90	0.50

treatment (**group• ~gbs**). The implication for educationalists is that group work in the absence of clear goals AND combined with clear task objectives as used in SIs AND training group members to consider the impact of the decision on different functions or objectives (normally represented by the role-players) is highly likely to result in poor decision outcomes.

Practitioners often express a generally held belief that managerial experience alone is a sufficient condition to achieve high decision competence. This belief could NOT be confirmed. In contrast, a marginally useful model (due to low consistency of 0.71; coverage 0.45) for not-decision success (~success_c interchangeable with decision incompetence) affirmed by the study is that if participants self-report both low levels of management experience (~man_exp_c) AND low levels of education (~educ_c), then high membership in the outcome not decision competence (~success_c) results. In other words, participants who report both low levels of education and low levels of managerial experience are less competent in making effective decisions.

When high membership to decision confidence is carefully analysed in configured models, only one useful model relates to high decision confidence: group •

educ_c and one marginally useful model (due to low consistency of 0.74; coverage 0.46): age_c •man_exp_c. The measured antecedents in these models indicate sufficiency, but not necessity. It is important to note that no single antecedent could predict decision confidence to a high level. From these two moderately useful models educationalists can infer that high decision confidence associates with decision-makers who receive group interactive decision-making AND record high levels of education. Also, high decision confidence is associated with decision-makers who report both high levels of management experience (above 5 years) AND who are above 35 years old.

This study confirms and extends the findings of Simon and colleagues (1982, 1989, 1992) that cognitive ability alone, experience alone or prior knowledge of decision makers alone will not lead to decision competency. Managerial decision-makers should be concerned with and cognisant of the context. Similarly, educationalists developing managerial decision competency need to raise awareness among future decision-makers of the context. This reaffirms the work by Boyatzis (1982), Boyatzis, Baker, Leonard, Rhee, and Thompson (1995) and Boyatzis and McKee (2005) that stresses the importance of "mindful" leadership.

In summary, different recipes are related to high performance and differ from decision scenario to decision scenario (as reflected by the different results for the four In-basket simulations). All four treatments (antecedents) together do not deliver the desired or expected results. From this it can be deduced that all treatments in combination do not necessarily result in either improved competence or in improved confidence. This finding is isomorphic with real life, where there is often not one single, clear-cut catch-all recipe to success. In the words of my wise, but not so famous mother: "too much of a good thing is a bad thing" or in the words of my learned friend Arch Woodside: "too much of a muchness results in garbage".

In addition, observations throughout the experiments indicated that merely having the tool(s) and decision aids in writing is not sufficient to affect the outcome(s). Based on the work of experiential learning theorists (Schank, 1994; Schweiger, Sandberg, & Ragan 1986; Schwenk, 1984; Senge, 1990; Shaw & Linnecar, 2007) and own experience, having access to the decision aids and competency training tools is not sufficient. Participants need time to practise how to use the tools. Future researchers should allow ample time for practical, interactive training of the participating students and allow students time to practice using the decision aids before implementing the experiment. Alternatively pre-test and post-test methods could be employed. The Chap. 8 presents additional suggestions for future studies. Table 6.28 summarizes the findings and relates the causation models back to the original propositions.

Table 6.28 Propositions and causation models

#	*Context-related propositions*	*Configurations for possible parsimonious models in fsQCA*	*Evidence in support?*
P_1	In groups, training via goal-based scenarios results in more competent decision-making than inactive knowledge learning	gbs•group → high success ~gbs•group → ~success	No Yes
P_2	Competency increases by adding formal assignment of a devil's advocate role-player versus natural, unaided group interactive decision-making (a placebo condition) to group discussions in making decisions.	group •devil → high success group• ~devil → ~high success	No Partial (some contexts)
P_3	The introduction of incompetency training and decision aids such as BCG and Priority Matrices result in less competent decision-making, but result in high decision confidence	~comp •devil → high conf_c ~comp •group → ~success ~comp • ~group → ~success ~comp • devil → high conf_c	Confidence related to measured antecedents not treatments
P_4	Role-playing introduced through the role of GBS, increases decision competency versus group inter-active decision-making alone	gbs • group → high success group → ~success	No
P_{5a}	Decision-making by an individual is more effective than group decision-making when the group uses no formal group-discussion protocols (e.g. formal role-playing as introduced through GBS)	gbs • ~group → high $success_1$ ~gbs • group → ~high $success_2$	No Yes
P_{5b}	Group interactive decision-making is more effective than individual decision-making when the group uses formal group-discussion protocols (e.g. formal role-playing as introduced through GBS)	gbs•group → high $success_3$ high success $_3$ > high $success_1$	See Chap. 5 for different combinations of causal conditions
P_6	Individuals trained in contextual influences on decision-making (e.g., drop-your-tools contexts) and the use of implicit thinking (e.g., "intuitive first choice/gut feeling") make for more competent decisions compared to groups using formal group-discussion protocols	comp • ~group → high $success_4$ comp • · group → high $success_5$ high success $_4$ > high $success_5$	No No

(continued)

Table 6.28 (continued)

P_{7a}	The introduction of irrelevant information leads to cognitive overload and causes a greater proportion of incompetent decisions (for individual participants as well as in group interactive decisions)	~comp • ~group → ~high success ~comp •group → ~high success	No No
P_{7b}	The introduction of irrelevant information through complex decision aids leads to lower confidence in the decision that (for individual participants as well as group interactive decisions)	~comp •~group → ~high conf_c comp •group → ~high conf_c	No No
#	*Cognitive ability-related propositions*	*Configurations for possible parsimonious models in fsQCA*	*Evidence in support?*
P_8	Decision-making by an individual with more experience in managerial judgement and decision-making (JDM) make more competent decisions compared to decision-making by individuals with lower levels of management (JDM) experience	man_exp • ~group → high success ~man_exp • ~group → ~high success	No No
P_9	Groups with higher levels of management experience, make more competent decision compared to decision-making groups with lesser management experience	man_exp •group → high success ~man_exp · group → ~high success	No No
P_{10}	Individuals participating decision-makers with higher versus lower levels of experience in JDM make more competent decisions and are more confident in their decision competency than individual decision-makers with lower levels of experience in JDM	man_exp •~group → high conf_c ~man_exp• · ~group → ~high conf_c	No No
P_{11}	Individuals with high versus low levels of education and JDM experience are more competent and more confident in their decision outcomes	edu • ~group → high conf_c ~edu • ~group → ~high conf_c ~edu • ~group → high success ~edu • ~group → ~high success	No No No No

(continued)

Table 6.28 (continued)

	Propositions with a combination of contextual and cognitive conditions	*Configurations for possible parsimonious models in fsQCA*	
P_{12}	Groups of participants with high levels of management experience and high levels of formal education are less competent than individual decision-makers with high levels of management and education experience but the first recipe does not associate with higher levels of confidence	man_exp•educ• ~group → high success man_exp•educ•group → ~high success man_exp•educ• ~group → ~high conf_c	No No No
P_{13}	Participants exposed to a combination of treatment conditions outperform participants who receive only one of the treatments, resulting in higher levels of decision confidence and higher levels of decision competence	A vast number of configurations of conditions tested by the fsQCA software are discarded due to too low consistency and unacceptable coverage scores	

References

Bandura, A. (1982). Self efficacy mechanism in human agency. *American Psychologist, 32*(7), 122–147.

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall.

Bandura, A., & Cervone, D. (1983). Self-evaluative and self-efficacy mechanisms governing the motivational effects of goal systems. *Journal of Personality and Social Psychology, 45*(5), 1017–1028.

Bandura, A., & Schunk, D. A. (1981). Cultivating competence, self-efficacy and intrinsic interest through proximal self-motivation. *Journal of Personality and Social Psychology, 41*(3), 586–598.

Boyatzis, R. E. (1982). *The competent manager: A model for effective performance*. Newbury Park, CA: Sage.

Boyatzis, R. E., Baker, A., Leonard, D., Rhee, K., & Thompson, L. (1995). Will it make a difference? Assessing a value-based, outcome oriented, competency-based professional program. In R. E. Boyatzis, S. S. Cowen, & D. A. Kolb (Eds.), *Innovating in professional education: Steps on a journey from teaching to learning* (pp. 167–202). San Francisco, CA: Jossey-Bass.

Boyatzis, R. E., & McKee, A. (2005). *Resonant leadership*. Boston, MA: Harvard Business School Press.

Bussey, K., & Bandura, A. (1999). Social cognitive theory of gender development and differentiation. *Psychological Review, 106*, 676–713.

Crow, S. M., Fok, L. Y., Hartman, S. J., & Payne, D. M. (1991). Gender and values: What is the impact on decision making? *Sex Roles, 25*, 255–268.

de Acedo Lizárraga, M. L. S., de Acedo Baquedano, M. T. S., & Elawar, M. C. (2007). Factors that affect decision making: Gender and age differences. *International Journal of Psychology and Psychological Therapy, 7*(3), 381–391.

Gigerenzer, G. (2004). Fast and frugal heuristics: The tools of bounded rationality. In D. Koehler & N. Harvey (Eds.), *Blackwell handbook of judgment and decision making* (pp. 62–88). Oxford: Blackwell.

Gigerenzer, G. (2008). Why heuristics work. *Perspectives on Psychological Science, 3*(1), 20–29. doi:10.1111/j.1745-6916.2008.0058.x.

Goertz, G. (2003). The substantive importance of necessary condition hypotheses. In G. Goertz & H. Starr (Eds.), *Necessary Conditions* (pp. 65–94). Lanham, MD: Rowman & Littlefield Publishers.

Hatala, R., & Case, S. M. (2000). Examining the influence of gender on medical students' decision making. *Journal of Women's Health and Gender Based Medicine, 9*, 617–623.

Linnenbrink, E. A., & Pintrich, P. R. (2003). The role of self-efficacy beliefs in student engagement and learning in the classroom. *Reading & Writing Quarterly: Overcoming Learning Difficulties, 19*(2), 119–137. doi:10.1080/10573560308223.

Mahoney, J. (2007). Qualitative methodology and comparative politics. *Comparative Political Studies, 40*, 122–144. doi:10.1177/0010414006296345.

Mendel, J. M., & Korjani, M. M. (2012). Charles Ragin's fuzzy set qualitative comparative analysis (fsQCA) used for linguistic summarizations. *Information Sciences, 202*, 1–23.

Ragin, C. C. (2004). Redesigning social inquiry [Slide-show PPT]. Retrieved from http://eprints.ncm.ac.uk/379/1/RSDI-RMF.pdf

Ragin, C. C. (2006). Set relations in social research: Evaluating their consistency and coverage. *Political Analysis, 14*(3), 291–310. doi:10.1093/pan/mpj019.

Ragin, C. C. (2008a). Online tutorial: Qualitative comparative analysis and fuzzy sets. Retrieved from http://www.fsqca.com

Ragin, C. C. (2008b). *Redesigning social inquiry*. London: University of Chicago Press Ltd.

Ragin, C. C. (2008c). *Redesigning social inquiry: Fuzzy sets and beyond*. Chicago, IL: University of Chicago Press.

Ragin, C. C. (2008d, May 5, 2010). What is qualitative comparative analysis (QCA)? In *Symposium conducted at the meeting of the 3rd ESRC Research Methods Festival*. Retrieved from http://eprints.ncrm.ac.uk/250/1/What_is_QCA.pdf

Rihoux, B., & Lobe, B. (2008). The case for qualitative comparative analysis (QCA): Adding leverage for thick cross-case comparison. In D. Byrne & C. C. Ragin (Eds.), *The Sage handbook of case-based methods* (pp. 222–242). Thousand Oaks, CA: Sage.

Rihoux, B., & Ragin, C. C. (2009). *Configurational comparative methods*. London: Sage.

Schank, R. C. (1994). *What we learn when we learn by doing*. Evanston, IL: Northwestern University Press.

Schank, R. C., Fano, A., Jona, M., & Bell, B. (1993). *The design of goal-based scenarios*. Evanston, IL: Northwestern University Press.

Schweiger, D. M., Sandberg, W. R., & Ragan, J. R. (1986). Group approaches for improving strategic decision making: A comparative analysis of dialectical inquiry, devil's advocacy, and consensus. *Academic Management Journal, 29*(1), 51–71. doi:10.2307/255859.

Schwenk, C. R. (1984). Devil's advocacy in managerial decision-making. *Journal of Management Studies, 21*(2), 153–168. doi:10.1111/j.1467-6486.1984.tb00229.x.

Senge, P. (1990). *The fifth discipline: The art and practice of the learning organization*. New York, NY: Doubleday/Currency.

Shaw, P., & Linnecar, R. (2007). *Business coaching: Achieving practical results through effective engagement*. San Francisco, CA: Jossey-Bass.

Simon, H. A. (1982). *Models of bounded rationality*. Cambridge, MA: MIT Press.

Simon, H. A. (1992). *Economics, bounded rationality and the cognitive revolution*. Aldershot Hants: Elgar.

Simon, H. A., & Kaplan, C. A. (1989). *Foundations of cognitive science*. Cambridge, MA: MIT Press.

Tannen, D. (1990). Gender differences in topical coherence: Creating involvement in best friends' talk. *Discourse Processes, 13*(1), 73–90.

Tobias, S. (2010). The expertise reversal effect and aptitude treatment interaction research (commentary). *Instructional Science, 38*(3), 309–314. doi:10.1007/s11251-009-9103-z.

Wagemann, C., & Schneider, C. Q. (2010). Qualitative comparative analysis (QCA) and Fuzzy-Sets: Agenda for a research approach and a data analysis technique. *Comparative Sociology, 9* (3), 376–396. doi:10.1163/156913210X12493538729838.

West, C., & Zimmerman, D. H. (1991). Doing gender. In J. Lorber & S. A. Farrell (Eds.), *The social construction of gender* (pp. 13–37). Newbury Park, CA: Sage.

Wood, J. T. (1990). *Gendered lives: Communication, gender, and culture*. Belmont, CA: Wadsworth.

Chapter 7
Delimiting Performance Outcomes

7.1 Rationalising Investigating Decision Incompetence and Decision Doubt

Conventional correlational analysis and conventional null hypothesis statistical testing (NHST) (e.g., multiple regression analysis including structural equation modeling) assume symmetrical relationships between the independent variables and a dependent variable (Fiss, 2011; Ragin, 2006b, 2008a; Woodside, 2013). The conventional methods represent a "net effects" estimation approach to research (Ragin, 2006b). This means that if the researcher using traditional statistical analysis models a high performance outcome (e.g. the ability to develop product innovations) then the inverse (namely the inability for inventors to successfully develop innovations) results from the same causes, except that the sign of the coefficients change (Fiss, 2011). Net-effects thinking is problematic since significant correlations among the independent variables almost always occur in studies with high numbers of variables (e.g. 10 or more).

In addition, the net effects approach focuses on "analytically separable independent variables and their degree of inter-correlation" (Ragin, 2006b, p. 21), while qualitative comparative analysis (and specifically fsQCA) focuses on individual cases that retain their unique characteristics and are defined by the configurations of "causally relevant conditions they display." Ragin (2006b, p. 17) present four advantages of fsQCA over MRA: (1) the algorithm focus of QCA overcomes problems in multi-collinearity and examining complex interaction effects; (2) a key strength of algorithm analysis is the investigation of configurations of causally relevant conditions, whereas logistic regression results are silent on the issue of causal combinations; (3) "the algorithm focus retains explanation details at the case level that variable level findings do not report while still providing sample or population-level generalizations" (Prado & Woodside, 2013, p. 5); and (4) net effect statistics attempts to estimate context-independent net effects, whilst

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fsQCA considers context-dependent outcomes related to multiple possible "paths" or "models".

Woodside (2013, p. 464) calls for a paradigm shift from symmetric to asymmetric thinking with reference to real-life business scenarios and stresses that "reality usually includes more than one combination of conditions that may lead to high values in outcome condition (i.e. high values in a dependent variable; thus, reality usually indicates that any insightful combination of conditions has an asymmetrical relationship with an outcome condition and not a symmetrical relationship." Reality is more complex than for the mere negation of the signs of the "antecedent conditions in an adoption causal recipe with high consistency to provide high consistency in non-adoption" (Prado & Woodside, 2013, p. 36). Crafting theory from an algorithm-building methodology such as fsQCA offers important advantages over statistical tools such as MRA (McClelland, 1998; Ragin, 2008c; Woodside, 2013). Goldstein and Gigerenzer (2009) and Woodside (2013) warn against investigating relationships for more than three variables using regression analysis only. They recommend as alternative or complementary strategy reporting regression findings in parallel with findings from using algorithms. Woodside (2013, p. 464) states that "A symmetric relationship indicates that high values in X are both necessary and sufficient for high values of Y to occur and that low values of Y occur with low values of X" and this appears in Fig. 7.1.

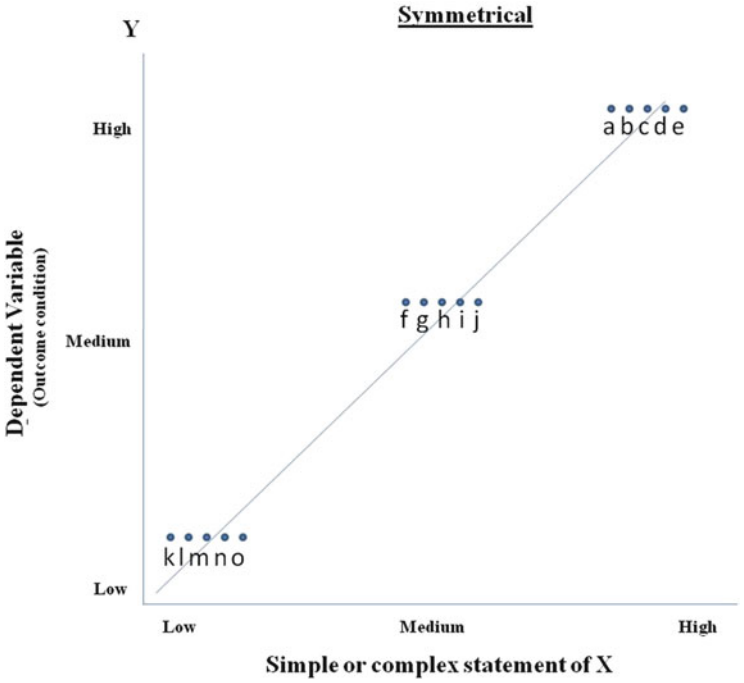

Fig. 7.1 Symmetrical relationship between X and Y for 15 cases of synthetic data (*Source*: Woodside, 2013, p. 464)

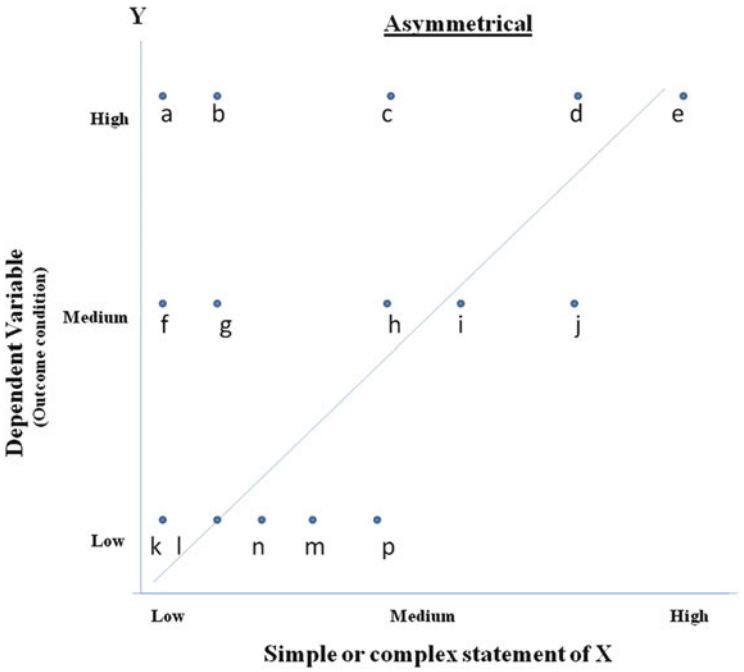

Fig. 7.2 Asymmetrical relationship between X and Y for 15 cases of synthetic data (*Source*: Woodside, 2013, p. 464)

The contrasting view of proponents of fsQCA is that "the set of causal conditions leading to the presence of the outcome may frequently be different from the set of conditions leading to the absence of the outcome. Shifting to a causal, core-periphery view of typologies allows for such differing sets of causal conditions to exist across the range of an outcome, with one set leading, for instance, to average performance; a different set, to high performance; and yet another set, to very high performance" (Fiss, 2011, p. 395). Figure 7.2 illustrates an asymmetric relationship between high values of X and high values of Y, where low values of X—single or combined combinations of causal factors—may also result in high values of Y, indicating that additional causal recipes may associate with high outcome conditions.

Lambert and Fairweather (2010, p. 50) investigate successful and unsuccessful product innovations and find four useful models for innovation success and three, very different (not merely negated) configurations of conditions for unsuccessful innovation. They conclude that "there is no single pathway to success . . . Successful innovation is the product of both individual inventive ability and the ability to manage the factors—the innovation network—within which the invention is developed into an innovation. It would seem that innovation success is more likely when more of the key factors are given attention. The pathways to failure show that invention by itself is not enough." A study into acceptance versus rejection of

international product certification standards by Prado and Woodside (2013) states that "Causal asymmetry occurs for adoption versus non-adoption of product certification, that is, the causal recipes leading to adoption are often quite different from non-adoption than the negation of terms in these recipes.

From these and other studies it is clear that "the set of causal conditions leading to the presence of the outcome may differ frequently from the set of conditions leading to the absence of the outcome" (Fiss, 2011, p. 395). Not only may different configurations of conditions lead to the presence or absence of an outcome, but from the perspective of asymmetrical relationships, one simple condition (independent variable in MRA) can have both a positive and a negative impact on the outcome, depending on the context. The context refers to the presence or absence of other treatment and measured antecedent conditions (Prado & Woodside, 2013).

The primary outcomes for this fsQCA study are decision competence (success + bask*i*) and decision confidence (conf*i*). Building on the insights and recommendations of Ragin, Goldstein and Gigerenzer, Armstrong and Woodside, the analysis now turns to examine what simple or complex configurations of conditions lead to the absence of high decision performance, labelled decision incompetence (DI) (~success + ~bask*i*) and the absence of decision confidence, labelled decision doubt (DD) (~conf_tot_c + ~conf*i*).

The next section uses fsQCA analysis procedures to re-examine the 150 cases in this study as configurations to investigate context-specific configurations of conditions associated with non-performance or DI, and DD. It seeks answers to the following questions: What conditions either enable or disable specific connections between causes and outcomes? Under what conditions does group-interactive decision-making matter and under what conditions does management experience or education level matter? Do these conditions differ for males and females (gender and ~gender)? Which treatment conditions combined with which measured antecedents predict high DI? Do some measured antecedents alone predict high DI or DD? If so, are they necessary and sufficient to cause DI or DD? Ragin (2006b, p. 17) reports on similar analyses and notes that "These kinds of questions are outside the scope of conventional net-effects analyses, for they are cantered on the task of estimating context-independent net effects". Section 7.2 presents the findings when aggregated results over all four in-baskets are analysed. Sections 7.3–7.6 respectively present the results for the four in-basket assessments.

7.2 Examining Decision Incompetence (DI) and Decision Doubt (DD) Aggregated Over All In-baskets

7.2.1 DI of All In-basket Assessments

The first task is to consider consistency of the subset relation in order to assess sufficiency, having previously selected, scored and calibrated the causal conditions

Table 7.1 Treatment conditions linked to DI

```
Model: ~success_c = f(comp, devil, gbs, group)

 Rows:       1



 Algorithm: Quine-McCluskey
      True: 1
  0 Matrix: 0L
Don't Care: -

--- INTERMEDIATE SOLUTION ---
frequency cutoff: 8.000000
consistency cutoff: 0.794433
Assumptions:

                            raw       unique
                         coverage    coverage   consistency
                        ----------  ----------  ----------
comp*devil*~gbs*group   0.094354    0.094354    0.794433
solution coverage: 0.094354
solution consistency: 0.794433
```

and outcome conditions. As Ragin (2000, 2006b) explains, the subset relationship between the combination of causal conditions and the outcome(s) under investigation is an estimate of causal sufficiency. The strength of evidence threshold for this study is 0.75 since "generally, scores on this measure that are lower than 0.75 indicate conspicuous departure from the set-theoretic relation in question ($X_i \leq Y_i$)" (Ragin, 2006b, p. 32).

Table 7.1 shows the results of the fsQCA analysis to estimate membership in the outcome DI over all four in-basket assessments. The outcome ~success_c indicates DI. The study first considers the impact of the four treatment conditions group interactive decision-making (group), devil's advocate (DA) dissent (devil), goal-based scenario (GBS) simulations (gbs) and competency training aids (comp) on DI.

Further investigation is necessary since none of the models are very useful, due to the low coverage of less than 0.2. When configurations of all four treatment antecedents (group; devil; gbs and comp) are combined with the three measured antecedents (gender; age_c; educ_c and man_exp_c), consistency levels indicate a large number of possible models for consideration, but for most solutions (models) the coverage is well below 0.2, thus trivialising them (see Table 7.2). A single marginally useful model: ~group • ~devil • gender • age_c • man_exp_c has a consistency score of 0.74 and coverage above the threshold of 0.27.

As Ragin (2006a, b, c, p. 37) indicates, "The calibration of fuzzy sets is central of fuzzy-set analysis". In rigorously investigating DI, this study recalibrates the outcome DI using Boolean algebra. DI or ~bool_success (not_bool_success) is defined as not achieving correct answers for all four in-basket assessments. Here

Table 7.2 Treatment and measured antecedents linked to DI

```
Model: ~success_c = f(man_exp_c, educ_c, age_c, gender, comp, devil, gbs, group)

 Rows:      86



 Algorithm: Quine-McCluskey
      True: 1
   0 Matrix: 0L
Don't Care: -

--- INTERMEDIATE SOLUTION ---
frequency cutoff: 1.000000
consistency cutoff: 0.711250
Assumptions:
```

	raw coverage	unique coverage	consistency
man_exp_c*age_c*gender*~devil*~group	0.273016	0.076424	0.735274
~man_exp_c*~age_c*~comp*~devil*~gbs*~group	0.094736	0.026958	0.663402
~man_exp_c*~age_c*~gender*~devil*~gbs*~group	0.095244	0.031155	0.820372
man_exp_c*~educ_c*age_c*~devil*~gbs*~group	0.170015	0.041073	0.822769
~man_exp_c*~age_c*gender*~devil*~gbs*group	0.075407	0.040692	0.620943
~man_exp_c*~age_c*~comp*~devil*gbs*group	0.067523	0.034461	0.682520
age_c*gender*comp*~devil*~gbs*~group	0.098550	0.021236	0.711662
man_exp_c*educ_c*age_c*devil*~gbs*group	0.076679	0.049339	0.773077
~man_exp_c*~educ_c*gender*~comp*~devil*gbs*~group	0.071719	0.014369	0.871716
~man_exp_c*~educ_c*~gender*comp*~devil*gbs*~group	0.035097	0.008647	0.816568
~man_exp_c*educ_c*age_c*~comp*~devil*gbs*~group	0.057604	0.016785	0.782383
~man_exp_c*~educ_c*age_c*comp*~devil*gbs*~group	0.071083	0.013988	0.849544
~man_exp_c*educ_c*~age_c*~gender*comp*~gbs*group	0.044507	0.021109	0.864197
man_exp_c*~educ_c*age_c*gender*~comp*~devil*gbs	0.104654	0.018311	0.861780
~man_exp_c*educ_c*~age_c*gender*comp*~devil*gbs	0.058113	0.017167	0.771960
educ_c*~age_c*gender*comp*~devil*~gbs*group	0.040437	0.005722	0.737818
~man_exp_c*educ_c*gender*~comp*devil*~gbs*group	0.051246	0.028230	0.735399
man_exp_c*educ_c*~age_c*~gender*comp*~devil*gbs*group	0.033825	0.014751	0.939929

```
solution coverage: 0.785351
solution consistency: 0.691757
```

Boolean algebra determines the minimum value of ~success_c over all cases and all configurations. The results in Table 7.3 indicate cases of decision-makers who did not achieve decision competence (**~bool_success** or **not_bool_success**) when analysing all configurations of all treatment conditions.

Experimental treatments for which participants make decisions in groups but are not given GBS training (no specified roles and highlighted goals) resulted in high failure membership OR participants who make decisions in group interactive decision-making treatment AND are not given the benefit of GBS simulations associate with high DI. A useful recipe (consistency > 0.75 and coverage > 0.2) for DI is a combination of the treatment antecedents of groups and not GBS scenario simulations. In other words, if participants are placed in groups AND not given training in GBS, they have high membership in the set of incompetent decision-makers. This result guides educators and practitioners to use GBS simulations (which include clear goal specification and SI or role-play) to assist groups making decisions in order to avoid failure. Figure 7.3 illustrates the impact of group

Table 7.3 Configurations of conditions associating with DI (using Boolean algebraic recalibration)

```
File:  F:/PhD from D9_2011/DATA for PHD/ARCH IN BOSTON Jan 2013/AAARCH_De Villiers 17 Jan PLUSss22.csv
Model: not_bool_succ = f(group, gbs, devil, comp)

 Rows:      10



 Algorithm: Quine-McCluskey
      True: 1

--- COMPLEX SOLUTION ---
frequency cutoff: 8.000000
consistency cutoff: 0.778281

                  raw         unique
                 coverage    coverage   consistency
                 ----------  ---------- ----------
~devil           0.890134    0.732437   0.903368
group*~gbs       0.267563    0.109866   0.924109
solution coverage: 1.000000
solution consistency: 0.901010
```

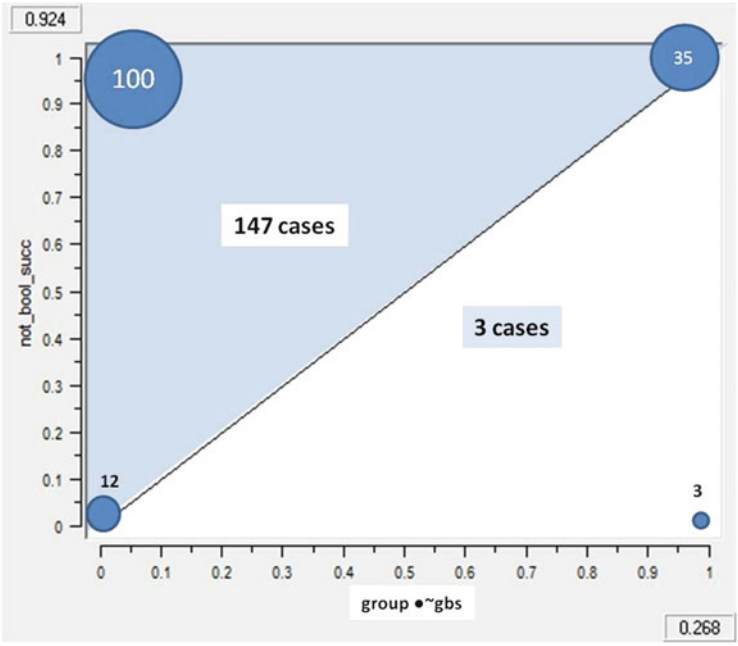

Fig. 7.3 Plot of DI (failure) by configuration (group ● ~ gbs)

Table 7.4 Configurations of conditions associating with DI (using Boolean algebraic recalibration)

```
File:  C:/Users/rouxelle/Desktop/DATA for PHD/ARCH IN BOSTON Jan 2013/AAARCH_De Villiers 17 Jan PLUSss22.csv
Model: not_bool_succ = f(group, gbs, devil, comp, gender, age_c, educ_c, man_exp_c)

 Rows:      50



 Algorithm: Quine-McCluskey
      True: 1

--- COMPLEX SOLUTION ---
frequency cutoff: 1.000000
consistency cutoff: 0.731449
```

	raw coverage	unique coverage	consistency
~group*~devil*gender*age_c*man_exp_c	0.206353	0.038341	0.945548
~group*~gbs*~devil*~gender*~age_c*~man_exp_c	0.062556	0.019208	0.916758
~group*~gbs*~devil*~comp*~age_c*~man_exp_c	0.071450	0.025934	0.851291
group*gbs*~devil*~comp*~age_c*~man_exp_c	0.054485	0.035052	0.937018
~group*gbs*~devil*comp*~educ_c*~man_exp_c	0.069283	0.014051	0.866355
group*~gbs*~devil*gender*~age_c*~man_exp_c	0.064873	0.040807	0.908901
~group*gbs*~devil*gender*~educ_c*~man_exp_c	0.092078	0.014350	0.893401
~group*~gbs*~devil*age_c*~educ_c*man_exp_c	0.109193	0.027653	0.899077
~group*~gbs*~devil*comp*gender*age_c	0.074365	0.022870	0.913682
gbs*~devil*gender*age_c*~educ_c*man_exp_c	0.130942	0.012033	0.955289
group*~gbs*devil*age_c*educ_c*man_exp_c	0.050972	0.034903	0.874359
group*~gbs*comp*~gender*~age_c*educ_c*~man_exp_c	0.030269	0.016517	1.000000
~group*gbs*~devil*~comp*age_c*educ_c*~man_exp_c	0.036248	0.012257	0.837651
group*gbs*~devil*comp*~gender*~age_c*educ_c	0.036323	0.021674	1.000000
group*~gbs*devil*~comp*gender*educ_c*~man_exp_c	0.033632	0.020105	0.821167
group*~gbs*~devil*comp*gender*~age_c*educ_c	0.032212	0.008146	1.000000
gbs*~devil*comp*gender*~age_c*educ_c*~man_exp_c	0.034604	0.007474	0.782095
group*gbs*~devil*comp*age_c*~educ_c*man_exp_c	0.030942	0.006278	0.802322

```
solution coverage: 0.653812
solution consistency: 0.901113
```

• ~gbs on decision failure. Note that not_bool_success indicates 1-success calibrated by using Boolean algebra (i.e. overall success = 0 for all for In-baskets).

In summary, group AND not gbs OR not DA dissent associates with high DI (group • ~gbs + ~devil → ~success).

Table 7.4 reveals the findings for DI of the configurations of the eight treatment and measured conditions considered for ~success earlier in this chapter. In Table 7.4 the consistency is higher than the threshold value of 0.75 for all solutions. Coverage scores are below the threshold of 0.2, except in the case of the configuration: ~group• ~devil• gender • age_c • man_exp_c. Although recalibration using Boolean algebra results in the same useful solution, this result is important and confirms that the causal conditions linked to DI are combinatorial in nature. This result confirms the proposition of Ragin and Fiss (2008) regarding causal asymmetry. In this study, causes leading to overall decision competence in all four In-baskets are quite different from those leading to the absence of the outcome, DI (compare Tables 7.4 and 5.13, for example). Merely negating all signs of antecedent conditions in the models for decision competence does not result in the models for DI.

7.2.2 DD of all In-basket Assessments

The fsQCA analyses reveal multiple paths to high levels of decision doubt (~conf_tot_c or DD). None of the models are empirically relevant, however, since the coverage scores do not meet the minimum requirement of 0.2. Table 7.5 shows these trivialised models.

Although the consistency for the configuration: ~group • ~gbs • ~devil • ~gender • ~age_c • ~man_exp_c is well above the threshold value of 0.75 at 0.85, the consistency for this complex antecedent condition is below 0.2 (0.13). The model may thus be considered marginally useful. Substantive knowledge of the theory and dialogue between the cases and theory is required to determine the model's value (Ragin, 2006a, b, c). The plot in Fig. 7.4 provides additional insights.

This marginally substantive model indicates that DD is associated with not group interactive decisions, not DA dissent, female, young, and with low levels of management experience. The results confirm that the complex configuration of treatment and measured conditions generates the relevant outcome. No single simple condition in isolation indicates the outcome of DD. For example, it is not evidenced that young participants (~age_c) are less confident in their decisions than older ones (age_c), nor that participants in group interactive decision interventions (group) are more confident in their decisions than their individual counterparts

Table 7.5 Trivialised models for overall DD

```
File:  E:/PhD_some stuff in final run to complete/AAARCH_De Villiers 17 Jan PLUSss22.csv
Model: ~conf_tot_c = f(group, gbs, devil, comp, gender, age_c, educ_c, man_exp_c)

 Rows:      50



 Algorithm: Quine-McCluskey
      True: 1

--- COMPLEX SOLUTION ---
frequency cutoff: 1.000000
consistency cutoff: 0.705736
```

	raw coverage	unique coverage	consistency	
~group*~gbs*~devil*~gender*~age_c*~man_exp_c	0.131067	0.058684	0.848850	See graph
~group*gbs*~devil*comp*~educ_c*~man_exp_c	0.125994	0.026890	0.696262	
~group*~gbs*~devil*~comp*~age_c*educ_c*~man_exp_c	0.101302	0.016066	0.821674	
group*gbs*~devil*~comp*~gender*~age_c*~man_exp_c	0.038221	0.012853	0.768707	
~group*gbs*~devil*gender*~age_c*~educ_c*~man_exp_c	0.135803	0.038052	0.793478	
~group*~gbs*~devil*comp*gender*age_c*~man_exp_c	0.064434	0.025030	0.667250	
group*gbs*~devil*gender*~age_c*educ_c*~man_exp_c	0.077626	0.029765	0.785958	
gbs*~devil*comp*gender*~age_c*educ_c*~man_exp_c	0.088618	0.000000	0.885135	
~group*~gbs*~devil*gender*age_c*educ_c*man_exp_c	0.088111	0.033655	0.729691	
group*~gbs*devil*~comp*gender*age_c*educ_c	0.064265	0.038897	0.676154	
~group*gbs*~devil*comp*gender*age_c*man_exp_c	0.115847	0.060376	0.687751	
group*~gbs*devil*~gender*age_c*educ_c*man_exp_c	0.052258	0.021140	0.782278	
~group*~gbs*~devil*~comp*~gender*age_c*~educ_c*man_exp_c	0.063420	0.026044	0.966495	
~group*gbs*~devil*~comp*~gender*age_c*educ_c*~man_exp_c	0.043971	0.018603	0.828025	
group*~gbs*devil*comp*~gender*~age_c*educ_c*~man_exp_c	0.037206	0.006088	0.774648	
group*gbs*~devil*comp*~gender*age_c*~educ_c*man_exp_c	0.047861	0.014713	0.860182	
group*gbs*~devil*comp*~gender*~age_c*educ_c*man_exp_c	0.038559	0.005412	0.805654	

```
solution coverage: 0.643497
solution consistency: 0.654567
```

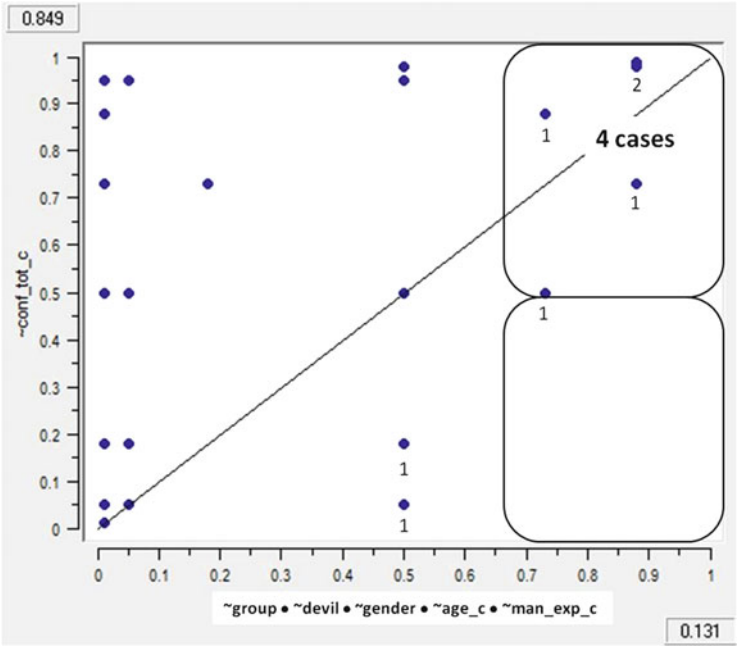

Fig. 7.4 Plot of marginally useful model for DD (~conf_tot_c)—female. *Note*: The number below each *filled circle* in the graph, indicates the number of cases represented by the *filled circle*

(~group), nor any other simple indication of a single condition resulting in DD for any participants.

For males the causal link between DD and the conditions is annotated by the following expression:

~group • gbs • ~devil • gender• ~age_c• ~man_exp_c • ~educ_c ≤ high DD

where the tilde (~) indicates either the absence of the treatment (for group, comp, devil and gbs) or, for measured antecedents (age, experience and education), lower levels (see Tables 4.6 and 4.7). Note that this expression has very similar levels of coverage (0.13 and 0.14 respectively) for the models for female and male participants. Conditions in the same order will assist to compare and contrast the two gender-specific models, thus the re-arranged conditions reveal the difference between DD for male and female participants:

$$\sim \text{group}\bullet \sim \text{devil}\bullet \sim \text{agec}\bullet \sim \text{manexpc} \bullet \text{gender} \bullet \text{gbs}\bullet \sim \text{educc}(\text{maleparticipants}) \quad (7.1)$$

$$\sim \text{group}\bullet \sim \text{devil}\bullet \sim \text{agec}\bullet \sim \text{manexpc}\bullet \sim \text{gender}\bullet \sim \text{gbs}(\text{femaleparticipants}) \quad (7.2)$$

Note that the first four antecedent conditions are the same for both male and female expressions, but their confidence outcome is differently affected by the GBS treatment (gbs). For female participants the absence of the GBS treatment (~gbs) contributes to DD, whilst for men the presence of the GBS treatment contributes to high DD. In addition, male participants' education levels (edu_c) play a role in their DD in that education levels below postgraduate qualifications (~edu_c) link to high DD.

The DI and DD for each of the four In-baskets are investigated in the following sections.

7.3 Examining Decision Incompetence (DI) and Decision Doubt (DD) for In-basket 1

7.3.1 DI (In-basket 1)

Configurations of conditions do not associate with high DI for In-basket 1 assessments. Table 7.6 reveals that no model meets either the requirement of a minimum consistency score of 0.75, or the minimum consistency score of 0.2.

Table 7.6 Trivialised models for DI in In-basket 1 assessments

```
Model: ~bask1 = f(group, gbs, devil, comp, gender, age_c, educ_c, man_exp_c, conf1_c)

 Rows:      53



 Algorithm: Quine-McCluskey
      True: 1

--- COMPLEX SOLUTION ---
frequency cutoff: 1.000000
consistency cutoff: 0.723127
```

	raw coverage	unique coverage	consistency
group*~gbs*comp*~gender*~age_c*educ_c*~man_exp_c*conf1_c	0.074468	0.021277	0.646154
group*gbs*~devil*comp*age_c*~educ_c*man_exp_c*conf1_c	0.104019	0.049941	0.734861
group*~gbs*devil*comp*age_c*educ_c*man_exp_c*conf1_c	0.097813	0.044622	0.764433
~group*~gbs*~devil*comp*~gender*~age_c*~educ_c*~man_exp_c*~conf1_c	0.065603	0.021277	0.723127
~group*~gbs*~devil*~comp*~gender*~age_c*educ_c*~man_exp_c*~conf1_c	0.074468	0.030142	0.747774
~group*gbs*~devil*comp*~gender*~age_c*~educ_c*~man_exp_c*conf1_c	0.063830	0.019504	1.000000
group*~gbs*~devil*comp*gender*~age_c*~educ_c*~man_exp_c*conf1_c	0.068853	0.024527	0.728125
group*gbs*~devil*comp*gender*~age_c*educ_c*~man_exp_c*conf1_c	0.061170	0.013298	0.731449
group*gbs*~devil*comp*~gender*~age_c*educ_c*man_exp_c*conf1_c	0.066785	0.016253	0.798586
~group*~gbs*~devil*comp*gender*age_c*educ_c*man_exp_c*conf1_c	0.079492	0.035166	0.741047

```
solution coverage: 0.338949
solution consistency: 0.584906
```

7.3.2 DD (In-basket 1)

Table 7.7 reports the findings for DD of the cases participating in the In-basket 1 assessments and shows that no solution supports high DD for any configuration of conditions. Ragin (2006b, p. 34) states that "parsimonious solution[s] . . . incorporate many combinations, without regard for their empirical plausibility . . . instead, the researcher evaluates the plausibility of the counterfactual combinations, a less parsimonious solution is derived. This intermediate solution is obtained by first deriving the most complex solution (not shown here) and then using only 'easy' counterfactuals to produce an intermediate solution. The intermediate solution is a superset of the most complex solution and a subset of the most parsimonious", hence no useful intermediate solutions are indicated.

Table 7.7 Trivialised models for DD for In-basket 1

```
Model: ~conf1_c = f(group, gbs, devil, comp, gender, age_c, educ_c, man_exp_c)

 Rows:       50



 Algorithm: Quine-McCluskey
      True: 1-L

--- PARSIMONIOUS SOLUTION ---
frequency cutoff: 1.000000
consistency cutoff: 0.739558

                                        raw        unique
                                      coverage   coverage   consistency
                                     ----------  ----------  ----------
devil*~gender                        0.103323    0.058006    0.463413
~group*comp*~gender*~age_c           0.121148    0.075831    0.653094
~comp*~gender*~age_c*educ_c          0.130212    0.084894    0.556847
group*gbs*comp*gender*~educ_c        0.083988    0.006344    0.640552
group*comp*gender*age_c*~educ_c      0.103625    0.000000    0.462886
group*~devil*comp*gender*age_c       0.103625    0.000000    0.497100
group*comp*gender*~educ_c*man_exp_c  0.105740    0.006344    0.540121
group*gbs*comp*gender*age_c          0.077643    0.000000    0.563595
group*gbs*comp*gender*man_exp_c      0.075529    0.000000    0.632911
solution coverage: 0.335046
solution consistency: 0.422155
```

7.4 Examining DI and DD for In-basket 2

7.4.1 DI (In-basket 2)

For the outcome decision confidence for In-basket 2, cases are negated (**~bask2**), meaning that the outcome of DI is investigated for all 150 participants. Investigation of the truth table shows only 29 cases with high membership in DI. For these cases, no model indicating high association with **~bask 2** is useful, due to the low consistency (<0.75) and coverage (<0.2). Additional analyses of tenths of alternative iterations of the truth table and alternative combinations of conditions resulted in no useful models, since the proportion of cases that are explained by the model (solution coverage) is so low that these models are useless in fit (Table 7.8).

7.4.2 DD (In-basket 2)

The raw data for decision confidence (recorded as conf2), as well as the calibrated fuzzy sets (conf2_c), are the lowest compared to all other declarations of confidence in the four In-baskets. Thus, results for DD (~conf2_c) for In-basket 2 decisions are of great interest to the researcher. Unfortunately neither parsimonious solutions nor

Table 7.8 Trivialised models for DI for In-basket 2

```
Model: ~bask2 = f(man_exp_c, educ_c, age_c, gender, comp, devil, gbs, group)

 Rows:       8



 Algorithm: Quine-McCluskey
      True: 1
  0 Matrix: 0L
Don't Care: -

--- INTERMEDIATE SOLUTION ---
frequency cutoff: 1.000000
consistency cutoff: 0.701754
Assumptions:
```

	raw coverage	unique coverage	consistency
~man_exp_c*~age_c*~gender*comp*~devil*~gbs*~group	0.137366	0.087233	0.837067
~man_exp_c*~educ_c*~age_c*gender*~comp*~devil*gbs*group	0.111297	0.033423	0.778036
~man_exp_c*educ_c*~age_c*gender*~comp*devil*~gbs*group	0.093583	0.043450	0.701754
man_exp_c*~educ_c*age_c*gender*~comp*~devil*gbs*group	0.109291	0.031417	0.746574

```
solution coverage: 0.273396
solution consistency: 0.693808
```

Table 7.9 Trivialised models for DD for In-basket 2

```
Model: ~conf3_c = f(man_exp_c, educ_c, age_c, gender, comp, devil, gbs, group)

 Rows:      28



 Algorithm: Quine-McCluskey
      True: 1
  0 Matrix: 0L
Don't Care: -

--- INTERMEDIATE SOLUTION ---
frequency cutoff: 1.000000
consistency cutoff: 0.729970
Assumptions:
```

	raw coverage	unique coverage	consistency
~man_exp_c*educ_c*~age_c*~gender*~devil*~gbs*~group	0.143025	0.086753	0.689265
~man_exp_c*~educ_c*~gender*comp*~devil*gbs*~group	0.062720	0.018757	0.633136
man_exp_c*educ_c*age_c*~comp*devil*~gbs*group	0.103165	0.059203	0.730287
man_exp_c*~educ_c*age_c*comp*~devil*gbs*group	0.102579	0.046307	0.678291
man_exp_c*~educ_c*age_c*~gender*~comp*~devil*~gbs*~group	0.087046	0.030774	0.765464
~man_exp_c*educ_c*~age_c*gender*~comp*~devil*~gbs*group	0.110785	0.066823	0.812900
~man_exp_c*~educ_c*~age_c*gender*comp*~devil*~gbs*group	0.073857	0.016413	0.752239
~man_exp_c*educ_c*~age_c*~gender*~comp*~devil*gbs*group	0.053341	0.009379	0.805310
man_exp_c*educ_c*~age_c*gender*comp*~devil*~gbs*group	0.070047	0.012603	0.773463
man_exp_c*educ_c*~age_c*~gender*comp*~devil*gbs*group	0.065064	0.008793	0.784452

```
solution coverage: 0.437867
solution consistency: 0.586803
```

intermediate solutions offered any new insights (not provided by the overall results), since the alternative configurations did not achieve the minimum threshold score of 0.75. In addition, the resulting parsimonious solutions explain such a low proportion of membership (coverage <0.2) that additional case information (not available at the time) would be necessary to interpret their usefulness (Table 7.9).

7.5 Examining DI and DD for In-basket 3

7.5.1 DI (In-basket 3)

DI for in-basket 3 (~bask3) considers high membership in the set not-decision competence. The intermediate solutions following fsQCA analysis considering all four treatment antecedents are highly useful with consistency well above 0.75. The solution ~devil • ~group scores 0.80 for consistency and 0.69 for coverage.

Table 7.10 shows the algorithm: ~devil • ~group + comp • ~gbs • group → ~bask3, with a solution consistency of 0.81 and coverage of 0.83. The high levels of consistency and coverage reveal that the solution terms play a crucial role in the treatment procedures leading to DI. Figure 7.5 displays the scatter plot

Table 7.10 Highly useful models for DI for In-basket 3 (treatment conditions)

```
Model: ~bask3 = f(comp, devil, gbs, group)

 Rows:        6



 Algorithm: Quine-McCluskey
      True: 1
   0 Matrix: 0L
Don't Care: -

--- INTERMEDIATE SOLUTION ---
frequency cutoff: 8.000000
consistency cutoff: 0.707754
Assumptions:

                      raw          unique
                     coverage     coverage     consistency
                    ----------   ----------   ----------
~devil*~group       0.687899     0.672970     0.796681      See graph
comp*~gbs*group     0.161226     0.146297     0.892071
solution coverage: 0.834196
solution consistency: 0.810482
```

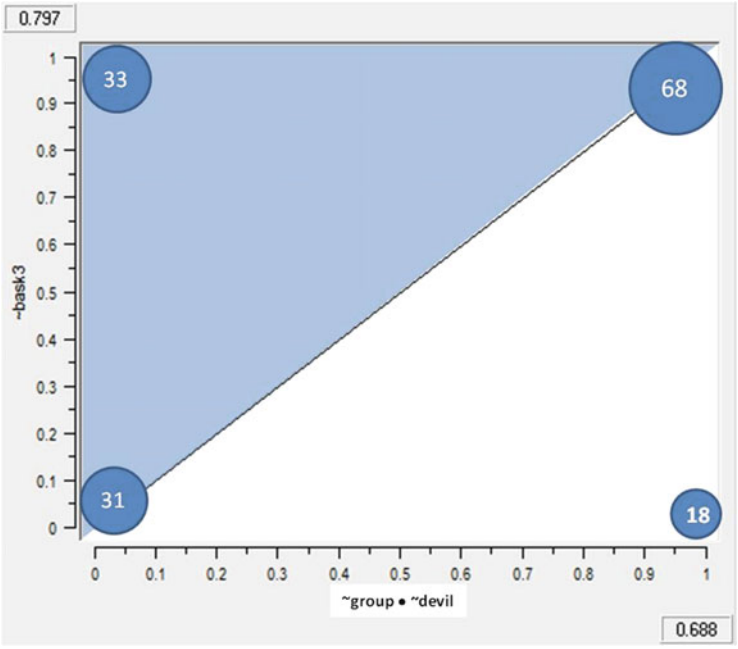

Fig. 7.5 Plot of highly useful model for DI (~bask3). *Note*: The *numbers* in each *circle* represents the number of cases

Table 7.11 Highly useful models for DI for In-basket 3 (measured conditions)

```
Model: ~bask3 = f(conf3_c, man_exp_c, educ_c, age_c, gender)

 Rows:      18



 Algorithm: Quine-McCluskey
      True: 1
  0 Matrix: 0L
Don't Care: -

--- INTERMEDIATE SOLUTION ---
frequency cutoff: 1.000000
consistency cutoff: 0.711520
Assumptions:

                                    raw        unique
                                 coverage    coverage   consistency
                                ----------  ----------  ----------
conf3_c*~man_exp_c*~gender      0.185808    0.059116    0.770533
conf3_c*educ_c*~gender          0.152568    0.012042    0.757411
conf3_c*man_exp_c*age_c         0.366939    0.131668    0.750000   See graph
~man_exp_c*educ_c*~age_c*~gender 0.110669   0.012042    0.752877
man_exp_c*~educ_c*age_c*~gender 0.087878    0.010450    0.755993
man_exp_c*educ_c*age_c*gender   0.168889    0.009355    0.777371
solution coverage: 0.546875
solution consistency: 0.757513
```

for the configuration encased by the dotted box, clearly indicating the high score for coverage and thus the high degree of membership in the outcome DI for In-basket 3.

Additional analysis of the associations between high DI (~bask3) and the measured antecedents (age, gender, management experience and education level) resulted in only one useful solution: conf3_c • man_exp_c • age_c (indicated by the dotted box in Table 7.11), with consistency and coverage scores above the threshold values. The absence of the DA treatment and the group inter-active decision procedures predicts high DI for In-basket 3 assessments (Fig. 7.6).

This means that high DI (~bask3) associates with high confidence in the decision for In-basket 3 AND high levels of management experience (>5 years) AND high age (>40 years). In other words, older participants with high levels of management experience who also self-report high levels of confidence in this particular simulation associate with high DI. The levels of solution consistency and coverage (0.75 and 0.37 respectively) reveal that this solution is important and sufficient to result in high DI.

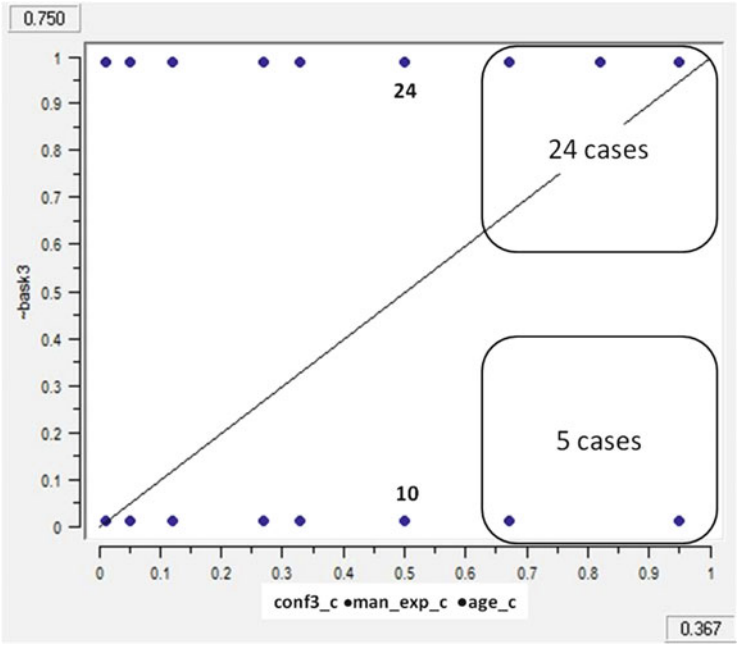

Fig. 7.6 Scatter plot of DI for In-basket 3 (~bask3)

7.5.2 DD (In-basket 3)

The dotted box in Table 7.12 captures all configurations with a consistency above the minimum threshold of 0.75, meaning that each solution term is a subset of the outcome. According to Ragin (2006c, p. 293), "Set-theoretic consistency assesses the degree to which the cases sharing a given condition or combination of conditions agree in displaying the outcome in question" (e.g. DD) and coverage "assesses the degree to which a cause or causal combination "accounts for" the empirical relevance." Thus the models in the dotted box may associate with high DD, but because the coverage score is low the models are empirically irrelevant.

7.6 Examining DI and DD for In-basket 4

7.6.1 DI (In-basket 4)

When considering only treatment antecedents, fsQCA analysis resulted in no useful models for DI for In-basket 4 (see Table 7.13). When the analysis is expanded to include all treatment and measured antecedents, the consistency scores of some

Table 7.12 Not useful models for DD for In-basket 3

```
Model: ~conf3_c = f(man_exp_c, educ_c, age_c, gender, comp, devil, gbs, group)

 Rows:      28



 Algorithm: Quine-McCluskey
      True: 1
   0 Matrix: 0L
Don't Care: -

--- INTERMEDIATE SOLUTION ---
frequency cutoff: 1.000000
consistency cutoff: 0.729970
Assumptions:

                                                          raw         unique
                                                         coverage    coverage   consistency
                                                         ----------  ----------  ----------
~man_exp_c*educ_c*~age_c*~gender*~devil*~gbs*~group      0.143025    0.086753    0.689265
~man_exp_c*~educ_c*~gender*comp*~devil*gbs*~group        0.062720    0.018757    0.633136
man_exp_c*educ_c*age_c*~comp*devil*~gbs*group            0.103165    0.059203    0.730287
man_exp_c*~educ_c*age_c*comp*~devil*gbs*group            0.102579    0.046307    0.678291
man_exp_c*~educ_c*age_c*~gender*~comp*~devil*~gbs*~group 0.087046    0.030774    0.765464
~man_exp_c*educ_c*~age_c*gender*~comp*~devil*~gbs*group  0.110785    0.066823    0.812900
~man_exp_c*~educ_c*~age_c*gender*comp*~devil*~gbs*group  0.073857    0.016413    0.752239
~man_exp_c*educ_c*~age_c*~gender*~comp*~devil*gbs*group  0.053341    0.009379    0.805310
man_exp_c*educ_c*~age_c*gender*comp*~devil*~gbs*group    0.070047    0.012603    0.773463
man_exp_c*educ_c*~age_c*~gender*comp*~devil*gbs*group    0.065064    0.008793    0.784452
solution coverage: 0.437867
solution consistency: 0.586803
```

models are well above the minimum prescribed score of 0.75, but the consistency is still too low (<0.2) for the models to be considered useful and thus in need of interpretation. All models are empirically irrelevant and thus trivialised by the fsQCA analysis. Multiple additional analyses resulted in empirically trivial information, as demonstrated by the example in Table 7.14.

7.6.2 DD (In-basket 4)

As for the investigation of configurations of conditions associating with high DI for In-basket 4, the fsQCA analysis of algorithms for DD resulted in no useful models, as illustrated by a sample of some of the results in Table 7.15.

Table 7.13 Trivialized models for DI for In-basket 4 (all conditions)

```
Model: ~bask4 = f(group, gbs, devil, comp, gender, age_c, educ_c, man_exp_c)

 Rows:      50



 Algorithm: Quine-McCluskey
      True: 1

--- COMPLEX SOLUTION ---
frequency cutoff: 1.000000
consistency cutoff: 0.700704
```

	raw coverage	unique coverage	consistency
~group*gbs*~devil*gender*age_c*~educ_c	0.197197	0.023175	0.793855
~group*gbs*~devil*gender*age_c*man_exp_c	0.178463	0.032057	0.786545
group*gbs*~devil*~comp*~age_c*~educ_c*~man_exp_c	0.059117	0.009992	0.823981
~group*~gbs*~devil*~gender*age_c*~educ_c*man_exp_c	0.064252	0.025396	0.672965
~group*gbs*~devil*~comp*age_c*educ_c*~man_exp_c	0.056481	0.013600	0.702934
group*~gbs*devil*~comp*gender*educ_c*~man_exp_c	0.055648	0.014155	0.731749
gbs*~devil*comp*gender*~age_c*educ_c*~man_exp_c	0.051762	0.007633	0.630067
gbs*~devil*~comp*gender*age_c*~educ_c*man_exp_c	0.104496	0.013045	0.788482
group*~gbs*devil*comp*age_c*educ_c*man_exp_c	0.050375	0.018040	0.810266
~group*gbs*~devil*comp*~gender*~age_c*~educ_c*~man_exp_c	0.030808	0.009992	1.000000
group*~gbs*devil*comp*~gender*~age_c*educ_c*~man_exp_c	0.039412	0.013877	1.000000
group*gbs*~devil*comp*~gender*~age_c*educ_c*man_exp_c	0.031363	0.010547	0.798586
gbs*~devil*~comp*gender*~age_c*~educ_c*~man_exp_c	0.079378	0.000000	0.783562
~group*gbs*~devil*~comp*gender*~educ_c*~man_exp_c	0.075077	0.000000	0.836167
~group*~gbs*~devil*~comp*age_c*~educ_c*man_exp_c	0.074383	0.000000	0.667497
group*gbs*~devil*~comp*gender*~age_c*~man_exp_c	0.070081	0.000833	0.796530
~group*~devil*~comp*gender*age_c*~educ_c*man_exp_c	0.113378	0.000000	0.755083
group*gbs*~devil*gender*~age_c*educ_c*~man_exp_c	0.054677	0.000000	0.674655
group*~gbs*devil*~comp*gender*age_c*educ_c	0.058424	0.000000	0.749108
group*~gbs*devil*gender*age_c*educ_c*man_exp_c	0.047322	0.000000	0.637381

```
solution coverage: 0.529558
solution consistency: 0.690929
```

7.7 Summary

Table 7.16 shows the aggregated findings from the four In-basket simulations for DI—the same set of 150 cases analysed to produce the findings for decision competence in Chap. 4. DI causal recipes are not the negated opposite of causal recipes for decision competence. The models are complex and more often than not contain three or four terms for both DC and DI outcomes. The asterisk (*) in Table 7.16 indicates a marginally useful model.

Similarly, Table 7.17 shows the aggregated findings from the four In-basket simulations for DD (no useful models for DD occur for any of the individual in-basket assessments). One certain statement is that high DI associates with group interactive decision-making AND not receiving a GBS treatment (group • ~gbs). Not only is the consistency very high (0.92), but the model is empirically highly relevant and covers 72 % of all cases. The implication for educationalists is

Table 7.14 Trivialised models for DI for In-basket 4 (treatment conditions)

```
Model: ~bask4 = f(comp, devil, gbs, group)

 Rows:        3



 Algorithm: Quine-McCluskey
      True: 1
   0 Matrix: 0L
Don't Care: -

--- INTERMEDIATE SOLUTION ---
frequency cutoff: 8.000000
consistency cutoff: 0.704375
Assumptions:

                                raw        unique
                           coverage     coverage    consistency
                          ----------   ----------   ----------
~comp*~devil*gbs*~group     0.197613     0.176797     0.707754
~comp*~devil*~gbs*group     0.129615     0.108798     0.704375
comp*devil*~gbs*group       0.102415     0.081599     0.790150
solution coverage: 0.388010
solution consistency: 0.703930
```

Table 7.15 Trivialised models for DD for In-basket 4

```
Model: ~conf4_c = f(man_exp_c, educ_c, age_c, comp, devil, gbs, group)

 Rows:       2



 Algorithm: Quine-McCluskey
      True: 1
   0 Matrix: 0L
Don't Care: -

--- INTERMEDIATE SOLUTION ---
frequency cutoff: 1.000000
consistency cutoff: 0.731391
Assumptions:

                                                    raw        unique
                                               coverage     coverage    consistency
                                              ----------   ----------   ----------
man_exp_c*educ_c*~age_c*comp*~devil*gbs*group     0.074147     0.074147     0.731391
solution coverage: 0.074147
solution consistency: 0.731391
```

that group-work in the absence of clear goals as in case-based scenarios AND not training group members to consider the impact of the decision on different functions/objectives (normally represented by the role-players) is highly likely to result in poor decision outcomes.

Table 7.16 All models of overall DI

	Assessment context	Consistency	Coverage
Decision incompetence (~success)			
~group • ~devil • gender •man_exp_c • age_c	→ ~success (overall)	0.74	0.27
~devil	→ ~success (overall)	0.90	0.89
group • ~ gbs	→ ~success (overall)	0.92	0.72
~devil + group • ~ gbs	→ ~success (overall)	0.90	1.00
~devil • ~ group + comp • ~ gbs • group	→ ~bask3	0.83	0.81
conf3_c • man_exp_c • age_c	→ ~bask3	0.75	0.37
Decision incompetence (not_bool_success)			
~devil • ~group • ~gender • age_c • man_exp_c	→ ~bool_success	0.95	0.21*

Table 7.17 All models of overall DD (~conf_tot_c)

	Assessment context (Overall)	Consistency	Coverage
~devil • ~group• ~gbs • ~gender • ~age_c • ~man_exp_c	→ ~conf_tot_c	0.85	0.13*
~group • gbs• ~devil • gender • ~age_c • ~man_exp_c • ~educ_c	→ ~conf_tot_c	0.80	0.14*

The most striking feature of Table 7.17 is that ~success is the only outcome which associates with a single node solution (~devil) over the entire study (consistency is 0.9). This is a highly useful and empirically important model since the coverage score is 0.89. The condition ~devil is present in all but two of the configurations of conditions that associate with high membership in the outcome set DI. It is thus not a necessary but a sufficient condition for DI in the context of this laboratory experiment. The condition (~devil) also appears in the causal model for high DD. Not-devil (~devil) is thus sufficient to cause DI or DD, but is not necessary for either outcome.

The utility of exploring complex causal combinations in an effort to explain outcomes is clear. The results may also account for conflicting conclusions regarding the role of different andragogical methods and measured antecedents when scholars attempt to explain decision competency and decision incompetency. Learning about these complex causal models will aid educationalists' and practitioners' understanding of some of the factors (antecedent conditions) useful to consider when designing and re-engineering curricula.

Due to the complexity of the models and the diversity of conditions for different contexts, educationalists might have to refer to guides or checklists, rather than have a set of simple causal models to memorise, as this study aimed to produce. In

the words on the cover of Gawande's book, *The Checklist Manifesto* (2009), "We live in a world of great and increasing complexity, where even the most expert professionals struggle to master the tasks they face. Longer training, ever more advanced technologies—neither seems to prevent grievous errors. But in a hopeful turn... Gawande finds a remedy in the humblest and simplest of techniques: the checklist." In an article by the same title, Zipple and Gawande (2010) laude the benefits of checklists and state, "Checklist reduce the risk of being trapped by own flaws and limitations. Done well, a checklist can be a powerful way to reduce the risk that essential steps are overlooked in completing a task" (Gawande, 2009, p. 77). As Gladwell (2010) proclaims in his review of Gawande's book, "Experts need checklists—literally—written guides that walk them through the key steps in any complex procedure." A next step to follow this study could (and perhaps should be) the development of checklists to aid scholars and practitioners in selecting teaching methods and tools to build management competencies in nurturing their opposable minds.

References

Fiss, P. C. (2011). Building better causal theories: A fuzzy set approach to typologies in organization research. *Academy of Management Journal, 54*(2), 393–420.

Gawande, A. (2009). *The checklist manifesto*. New York, NY: Metropolitan Books.

Gladwell, M. (2010). Amazon exclusive: Malcolm Gladwell reviews The Checklist Manifesto. Retrieved from http://www.amazon.com/Checklist-Manifesto-How-Things-Right/dp/0805091742/ref=sr_1_1?s=books&ie=UTF8&qid=1362928191&sr=11&keywords=Checklist+Manifesto

Goldstein, D. G., & Gigerenzer, G. (2009). Fast and frugal forecasting. *International Journal of Forecasting, 25*(4), 760–772. doi:10.1016/j.ijforecast.2009.05.01.

Lambert, S. J., & Fairweather, J. R. (2010). *The socio-technical networks of technology users' innovation in New Zealand: A fuzzy-set qualitative comparative analysis*. Canterbury: Lincoln University. Retrieved from http://hdl.handle.net/10182/3339.

McClelland, D. C. (1998). Identifying competencies with behavioral-event interviews. *Psychological Science, 9*(5), 331–339. doi:10.1111/1467-9280.00065.

Prado, A. M., & Woodside, A. G. (2013). *Causal recipes of firm self-regulation via adoption of international produce certification standards*. Alajuela: INCAE Business School.

Ragin, C. C. (2000). *Fuzzy-set social science*. Chicago, IL: University of Chicago Press.

Ragin, C. C. (2006a). How case-orientated research challenges variable-orientated research. *Comparative Social Research, 16*, 27–42.

Ragin, C. C. (2006b). The limitations of net-effect thinking. In B. Rihoux & H. Grimm (Eds.), *Innovative comparative methods for policy analysis. Beyond the quantitative-qualitative divide* (pp. 13–41). New York, NY: Springer.

Ragin, C. C. (2006c). Set relations in social research: Evaluating their consistency and coverage. *Political Analysis, 14*(3), 291–310. doi:10.1093/pan/mpj019.

Ragin, C. C. (2008a). Online tutorial: Qualitative comparative analysis and fuzzy sets. Retrieved from http://www.fsqca.com

Ragin, C. C. (2008c). *Redesigning social inquiry: Fuzzy sets and beyond*. Chicago, IL: University of Chicago Press.

Ragin, C. C., & Fiss, P. C. (2008). Net effects analysis versus configurational analysis: An empirical demonstration. In C. C. Ragin (Ed.), *Redesigning social inquiry: Fuzzy sets and beyond* (pp. 190–212). Chicago, IL: University of Chicago Press.

Woodside, A. G. (2013). Moving beyond multiple regression analysis to algorithms: Calling of adoption of a paradigm shift from symmetric to asymmetric thinking in data analysis and crafting theory. *Journal of Business Research, 66*, 463–472. doi:10.1016/j.jbusres.2012.12.02.

Zipple, A., & Gawande, A. (2010). The checklist manifesto: How to get things right. *Psychiatric Rehabilitation Journal, 34*(1), 76–77. doi:10.2975/34.1.2010.74-7.

Chapter 8
Contributions to Theory, Method, and Practice

8.1 Core Principles

The core principle on which this study is based is that what often appears as "common sense" or "known truths", and what sometimes appears in the literature as truth without evidence and without formal testing of its validity, needs to be formally and scientifically studied. An example of such truths can be found in the book *Redirect* by Timothy Wilson (2011), which challenges the "known truth" that victims of trauma or abuse will benefit from immediate psychological counselling or crucial incident stress debriefing (CSID). Wilson provides evidence that offering grief counselling immediately after a tragedy or traumatic incident is not helpful as a strategy. The recommended and "better" strategy is to allow victims/survivors to deal with the trauma by using story-telling and journal writing a few weeks after the critical event.

Propositions on how to develop decision competence and what training methods affect management decision competency often appear in the literature as truth without evidence. The core purpose of this research is to formally test the validity of combinations of training methods for business schools to improve decision competency. Scientific assessment of methods is common practice in psychology and applied business, both in laboratory and field contexts, and it somewhat surprising that business schools have not made much progress in testing useful configurations of teaching methods to improve decision competence. Using treatment and control groups as a method of finding tested and valid interventions is well established (Campbell & Stanley, 1963) both in laboratory and field contexts, but the majority of research papers still seems to use self-administered surveys and focus on net outcomes.

Armstrong and Green (2007) writes of hostility towards such testing and cites the resistance of academics and the long battle to get a paper about a widely used decision aid—the Boston Consulting Group (BCG) matrix—published in recognized academic literature. He advises researchers to pursue scientific research,

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concomitant with resistance, in the pursuit of excellence. Another cornerstone to this study is the belief that "method shapes thinking and theory crafting" (Gigerenzer, 1991 cited in Woodside, 2013, p. 1). Woodside (2011a, b) warns against the limitations of the dominant methods of MRA and SEM and suggests that scholars use algorithms and fiscal as tools to develop theory in social science and management. Rong and Wilkinson (2011) expose many shortcomings in use of cross-sectional self-report surveys to collect data on decision-making executives. They lament that most studies do not include attempts to create and test alternative causal sequences in managerial research. In response to the warnings and advice offered by these celebrated authors, this study takes up the challenge to look beyond "net effects" and the reliance on self-report surveys in order to find necessary and/or sufficient "key success factors" for decision competence.

This study relates to the above quests and the view that method drives theory, which runs counter to the dominant logic that method naturally follows theory. The study here examines configural recipes combining treatment and measures antecedents for their impact on high decision competence outcomes, rather than adopting the dominant logic of proposing to study the "net effects" of the individual treatment conditions (variables) and the relative size of the net impact by comparing standardised betas. This study adopts the view that no single treatment or measured antecedent is sufficient or necessary for high decision competence.

Following Armstrong and Brodie (1994), a true experimental design with administration of treatment and control (placebo) conditions for proper or scientific testing of the real value of propositions was implemented. This research takes a meaningful step towards examining combinations of tools for conscious thinking and contextual elements by studying different thinking tools as well as characteristics of the participants such as age, gender, education and management experience. The study of such combinations is a core recommendation of Simon (1992), in which the author presents a dual-blade (scissors) analogy that combines cognitive intelligence (here decision competence) with the context of the problem. A valuable advantage of the design and analysis methodology adopted in this study is that the researcher can study the potential configural causes of high competence outcomes and simultaneously, with the same rigour, the configural causes of making poor choices of incompetent decisions. This study therefore extends the work of Armstrong, Weick, Gigerenzer, and Simon and build on the study by Spanier (2011) on sacrosanct announcements in managerial education as to successful competency training methods.

This study's laboratory experiment examines four decisions in four separate marketing management realms and is to the best of the researcher's knowledge the first to experiment on a large scale with tools for thinking well and for improving training in marketing decision-making by using true experiments and configural analysis (QCA) to test propositions and useful recipes for competence and incompetence. Using fsQCA allows robust research despite small-N cases. Often experiments cannot be designed to have sufficient statistical power (of at least 30 cases per cell) to test models and propositions. Configural analysis in contrast permits

testing for few cases (5–10) per cell and is thus isomorphic with what happens in real life.

The study replicates four decision points in the separate domains, thus generating multiple decisions and contexts but keeping the measured antecedents related to the decision-makers (participants) constant. Four sacred pronouncements challenged by scholars in the literature and by this study are: (1) facts and evidence-based decisions versus peer opinions and overconfidence in one's incompetence; (2) the use of fast and frugal heuristics versus analytical hierarchical processes (AHP) such as the use of weight prioritisation matrix; (3) market share and competitor orientation versus profit maximisation; (4) media overage versus cash-flow and return on investment (ROI). As stated earlier, none of these models are necessarily associated with high incompetence, but both goals and context impact their effectiveness as decision aids. An example quoted earlier is the proposal by Weick, Sutcliffe, and Obstfeld (1999) of highly reliable organisation theory (HRO) as a counterpoint to profit maximisation. Such theories run counter to the dominant logic and frequently shock because they contain recommendations that are likely to change preconceived beliefs and firmly held misconceptions – in direct opposition to the dominant logic of the time.

8.2 Contribution of This Study

This present book extends the theories relating to management competency development and education in decision- and sense-making and adds to the seminal works of Boyatzis, Armstrong, Schank, Brodie, Gigerenzer and other management and marketing experts. The propositions are rigorously tested with regards to the managerial training methods best suited to aid in decision competency and decision confidence. The study makes nominal advances in guidelines regarding new or improved tools to prevent graduate managers from making incompetent choices or decisions, and reductions in their inability to drop their tools and previously acquired knowledge—should the circumstances favour doing so. Although there is evidence to support the statement by Spanier (2011, p. 94) that "good decision-making can be taught", the QCA procedures and additional analysis of data sets did not always succeed in identifying clear-cut causal conditions or "solutions" to indicate unambiguously "how". Unfortunately there are no simple answers to this, as demonstrated in Chaps. 4–6. The many different configurations of causal conditions (equifinality) send a clear message to educators and talent developers: Simon's (1992) scissors analogy and Bandura's three-factor human efficacy theory need to be constantly borne in mind when considering teaching methods. That is, educators need to be constantly aware that cognitive, behavioural, and environmental factors impact competency development. Context, conduct and cognition are important considerations for any and all managerial development interventions. No catch-all method (e.g. placing students in groups, using role-play or providing competency training in isolation) will work for all contexts, all problems and/or all

students. Educators and managers need to assist students and protégés with a tool kit of decision-making aids, but students need to practise how to use them and when to not use ("drop") them.

This study contributes to the body of knowledge regarding organisational knowledge, organisational learning, management development and experiential learning. A further contribution of particular use to management practitioners and HR specialists is the four tested in-basket simulations for use in assessment and selection centres. Experientialists (Feldman & Lankau, 2005; Gosen & Washbush, 2004) ask for high quality exercises and this study contributes four laboratory and field-tested in-basket simulations. Faculty responsible for re-engineering the MBA curricula (or other management education and development interventions) now have access to empirically supported knowledge regarding the four laboratory tested teaching methodologies.

This study applies QCA as method and set of techniques to the study of managerial decision competency and incompetency, as well as to the study of MBA andragogy. This study is, to the best of the author's knowledge, the first to apply the fsQCA approach to these disciplines. Given the limitations and complications experienced with traditional statistical and quantitative methods, the existence of a well-documented example of the application of this tool in managerial development could be of great value.

QCA demands transparency from the researcher and this means that it is possible for other researchers to take this study as a starting point and to "re-visit the analysis, for instance taking a few cases out or bringing a few cases in, adding one or two conditions, changing the way some conditions have been dichotomized, etc. . . . Because QCA is a case-sensitive technique (De Meur, Rihoux, & Yamasaki, 2008), the result of these other analyses will most probably yield some different formulae . . . which in turn will further enrich cross-case interpretation" (Rihoux & Lobe, 2008, p. 237). In this way, the conceptual work and detailed experimental tools (e.g. in-basket simulations, competency and incompetency training aids) will greatly reduce the preparatory time and labour-intensity of an experiment of this nature by providing pre-tested materials to use as launch-pad into further research. But, there are many unanswered questions and thus the research journey has only just begun. The next section sets out some suggestions and warnings for future research projects to assist in extending the work done thus far even further.

Oral feedback immediately after concluding the laboratories, and more recently written feedback from participating MBA students, indicated enhanced self-confidence in completing in-basket assessments during job interviews, plus the additional benefit of experimenting with the "new" decision aids used in the laboratory. The author is both a lecturer and business consultant so feedback of this nature is very rewarding. Evidence of said feedback is available upon request.

8.3 Limitations and Insights Useful for Designing Repeat Studies

What we know now that we did not know before and what we would have done differently

The following limitations may have affected the results of the study. First, although the researcher made every attempt to control all variables in the experiment, a large number of variables may affect the causal conditions as well as the final outcome of the experiment. Such variables may include factors impacting on participants' cognitive abilities and cause varying levels of interest and motivational distractions or "noise", such as fatigue; personal debilitating emotional factors; existing dislikes or likes between group members resulting in bias towards expressed options (even if randomly allocated students are in a relatively small corps within the university); unpleasant previous experience in events similar to those described in the scenarios; and physical discomfort due to circumstances outside of the control of the researcher such as ailments and other such inter- and intra-personal factors. The experimental studies were timed to (1) accommodate pressures of examinations, so studies were performed in weeks 2–5 of the 8-week terms, and (2) participants could select from four different times of the day and four different days of the week.

Secondly, competency and incompetency training was provided in the form of written instructions. Learner styles differ, and some learners, classified as "auditory" in the literature, absorb information better when presented verbally, whilst others, classified as "kinaesthetic", learn better through demonstrations and touch. Accordingly, the use of written competency and incompetency training matter is a likely impact factor that was not controlled for in this experiment. Whilst random assignment of participants might have reduced or even negated this impact, the study cannot report on the effect of learner style with any authority. In addition, with the wisdom of 20–20 vision after completing the study and the analysis if the data, the researcher would implement the in-basket training quite differently. Students should be able to verbalise their interpretation of the written training support material and at least have one practice session, focused solely on the teaching method (not the decisions, but the process of getting to the decisions). Although the role-play, the goals, the use of the devil's advocate dissent and the need to extract insights from the group members were actively and thoroughly stressed in the briefing leading up to the 2-h experiment, future research should allow participants to practise these inter-active, simulated roles before the experiment. Although the study does not provide evidence for the following claim, it is the researcher's perception that there was so much focus on getting to the decision that procedural instructions took a back seat and the front seat belonged to "getting the answer right".

Third, a large proportion (39.3 %) of the participating student sample indicated fewer than 5 years management decision-making experience. While it would be highly desirable to use currently employed managers to improve the

generalisability to business executives, of primary importance to this study is the improvement of andragogy for MBA students, thus negating this limitation for this study. Further, the skill set and demographics of the participating students are compatible with the larger population of practising managers. Age, gender, race and experience levels vary greatly within organisations and demographics gathered from NZTE correspond well with the demographics provided by the participants. These demographic indicators may differ substantially in other countries and in other universities.

8.3.1 Pre-existing Experience and Skills

Without a pre-test it was not possible to identify pre-existing skills or decision competencies. A pre-test though might have (1) prepared the students to anticipate contextual factors and (2) allowed discussion amongst the very small MBA consort and thus contaminated the results. In hindsight, it is desirable to have a more quantitative measure of pre-test decision competence than the self-recorded measure of experience as captured in the demographic section of the study. The assumption that all MBA students have comparable levels of decision competency might not be sound and further evidence and a quantifiable, assessable measure of pre-test decision competency is required. Prior knowledge could (and perhaps should) be ascertained by pre-tests. Another way to examine this problem is to selectively pre-familiarise some participants with the issues related to the decisions and determine the impact of this prior exposure to the results achieved by participants not exposed to the materials and competency training aids. Random allocation to the control group should have countered this, which means that the outcome is compared to a control group, rather than improved performance of an individual against his/her own prior performance.

Repeating the study with currently employed managers and compare those results with the results achieved for MBA students would be desirable. The value of such a repeated study might contribute to the predictive validity as well as the generalisability of the study. The importance of predictive validity needs to be recognized, however this study does not include estimating predictive validity, only fit validity due to its exploratory nature.

8.3.2 Time and Timing

Although the pre-test indicated that the 2-h time allocated for the four in-basket decisions was (1) realistic (as managers might allocate for the for decision-tasks or be the relative time allowed for these activities because of other pressures encountered in the real world) and (2) sufficient, some non-verbal indicators (such as surprise or upset when the instructor indicated time was up) flagged the limited time

allotment as a possible impact factor. This is especially relevant for the eight cells for which one of the causal factors included interactive group decision-making and discussion. No concerns were raised in experimental groups where decisions were made as individuals and all participants handed their decision sheets in well before the 2 h expired. It might thus be useful to add an additional causal condition in future experiments where the time allotment is much more generous (say 3–4 h) to measure and record the impact of additional time for more in-depth group discussions and more time to consider the options available. An additional indicator that the time allocated for this study might have been too short is the very cryptic sentences used in the open-ended questions. Again, the recommended remedy is a series of qualitative questions to be conducted immediately upon conclusion of the simulated group decision intervention and after participants have completed the decision and demographic sheets. This might have assisted the researcher to have better understanding of the factors impacting participants' final decisions and allowed for richer insight into each of the cases in a cell. However, in the words of Gigerenzer and Brighton (2009, p. 116),"more information, computation and time is not always better", so allowing for different conditions in future experiments (including additional discussion or decision time) and allowing different heuristics and their application by the participants need further examination.

8.3.3 Bounded Rationality

Participants were provided with limited information and although typical of MBA cases, this is not reflective of real-life marketing and management decisions. One of the complaints about MBA training is the inability of students to determine relevant and irrelevant information. This lack of information and availability of an abundance of irrelevant information (as in real life) was addressed in a small way through the provision of some facts to be ignored, but very minimally. Further, incompetency training tested participants' competency in determining relevant facts in different contexts and "drop tools" strategies to make the most effective decisions. In future in-basket simulations should perhaps be reduced in number to keep the time realistic, but the number of information sheets and decision support aids should be increased to reflect real-life more closely.

8.3.4 Consensus

Groups were not required to reach consensus. The researcher deliberately chose not to ask participants to reach consensus and instructed the instructor to stress this point carefully during the pre-experiment briefing. Reasons for this were: (1) more time is needed; (2) one decision per cell might not indicate participants' own choice despite the interaction; (3) group dynamics are quite different when groups attempt

to reach consensus; and (4) demanding consensus implies a group facilitator or leader will need to lead people to that point. The researcher did not want to complicate the decision-making process by either appointing a group leader or investing the additional time required for newly formed groups to decide on or allow a natural leader to appear. Although this can be seen as a key strength, future studies could consider a comparison between consensus decision-making outcomes and group interactive decision-making results.

8.3.5 Group Dynamics

Consensus associates closely to team work and group dynamics. In real-world scenarios managers often make group decisions during or after interaction with teams they are familiar with. (This may vary substantially from circumstance to circumstance.) Decision-makers may have spent many hours developing team norms and team goals and thus the dynamics may be very different from those displayed during the experiment. The issue of team formation status (i.e. where they are in the process of forming, storming, norming, performing, mourning) has not been accommodated (Firestien & McCowan, 1988; Osborn, 1963; Putman & Paulus, 2009; Todd, 2005), nor its impact tested in this study. Participants were given very brief instructions about group interaction in order to optimise the 20 min provided for group interaction during the experiment. These instructions were brief and pointed, but there is no evidence that these instructions (1) were adopted/accepted or (2) implemented during the group discussions. In addition, the 20 min groups were allowed for interactive role-play and decision-making for each separate in-basket did not allow much time to build cohesive groups (or enter into the five-phase group development process) and see the impact of group dynamics. Some groups may know each other better than others; again random allocation should overcome this, but no specific controls were in place to have similar levels of personal experience in the same team.

In addition, future experiments replicating or extending this study could ask participants to assess the impact to some level by using the suggested additional feedback sheet in Fig. 8.1. Although this is a self-report survey, this additional case knowledge could provide additional insight(s) of value to educators and practitioners.

8.3.6 Range of Topics

The decision topics were deliberately selected to be mostly marketing related (market share, key clients, service recovery, pricing, advertising, selling and sales training). To ensure verisimilitude and generalisability a broader range of management decisions might be necessary. In addition, the in-basket simulations were only

A) Please indicate how much of your decisions were affected by the group discussion. Please tick ☑ your option:

1	I did not change any of my decisions or reasons during or after the group discussions.	2	I considered the group's opinions, but changed only the reasons, not the decisions.	3	I changed a few decisions and/or reasons based on the group discussions.	4	I changed the majority of my answers and/or reasons based on the group discussions.

B) Please indicate how much your decisions were affected by the devil's advocate in the group. Please tick ☑ your option:

1	I did not change any of my decisions or reasons because of the caution expressed by the devil's advocate.	2	I considered the devil's advocate's caution and reconsidered my decisions in the fewer than half of cases.	3	I changed more than half of my decisions and/or reasons based on the caution expressed by the devil's advocate.	4	I changed the majority of my answers and/or reasons based on the caution expressed by the devil's advocate.

Fig. 8.1 Suggested self-report mechanism on final feedback sheet

a few pages of details, whereas in real-life business scenarios an information overload, as well as the inter-linked nature of decisions, are likely to be part of the decision dilemma. To be a better copy of reality, future research regarding decision competence could include more complex scenarios, with more useful and more useless information in the scenario material. In addition, decisions impacting more than one strategic business unit should be included with more than one or two aspects to compare. In addition, the decisions in the four in-basket simulations were mostly tactical in nature. Little to no incentive was provided for participants to consider the wider context within neither the firm nor the long-term impact of the decision. Agency theory (Eisenhardt, 1989) also suggests that decision-makers are likely to consider their own gain and this factor was not built into the decision-making activities. The extant literature indicates that this plays a significant role in the decisions managers make.

8.3.7 Multiple Choice

Participants were provided with a limited range of answers to each of the in-basket assessments. In addition, qualitative studies would allow gaining additional insights into the reasoning process by following the decisions with in-depth interviews. Participants were not given the opportunity to rationalise or qualify their decisions due to the very limited time-frame. Pre-tests indicated that busy executives and MBA students were not likely to spend more than two hours in the laboratory. The additional time required to interview participants will thus remain a challenge for future research. A suggestion to consider is the use of open-ended questions that might improve participants' ability to indicate an unlimited range of choices and

decisions, considering a variety of factors. The multiple-choice style decision sheets might have provided answers that do not represent participants' decisions fully. Students were not given the alternative of another option, beyond those provided in the multiple-choice, nor the opportunity to indicate their level of satisfaction with the answers provided or choices made.

8.3.8 Confidence and Likelihood to Change Decisions

Participants' self-confidence in their decisions was only tested with a single question. Future researchers should not merely rely on self-recorded measures but should test this confidence. In addition, the question about likelihood to change the decision (after 2 weeks) relied on a selection from four Likert scale indicators. Although the nature and scope of this study did not allow the researcher to repeat the experiment after 2 weeks to validate/disprove the participants' choice, it would be advisable to do so in future research of this nature. Following the experiment up with an additional chance to reconsider the decision would allow testing hypotheses about the power of "unconscious deliberation" but may counter the "take the best" heuristic. This needs to be tested fully.

Although fsQCA is designed for small-sample experiments, some scholars may find it desirable to replicate the study with a larger and more diverse study sample, thus improving the generalisability. The study considered only students from four universities in New Zealand and although the recorded demographics indicated a very diverse group of participants (age, gender, ethnicity and nationality) it is highly desirable to replicate this experiment with large student groups in other business faculties within New Zealand and in other countries.

8.4 A Final Thought

Finally, the need for accurate assessment of the value of tools to increase decision competence via controlled experimentation will continue beyond any single study. Similar to real-world decision-makers, researchers need to avoid the fallacy that the tools presently being used cannot be improved upon. This study makes a real and measurable contribution to the refinement of research instruments designed to investigate and assess the impact of competency and incompetency training on nurturing executives' opposable minds through decision competency and incompetency development. Research in this field will continue, and the findings of some of this research will encourage other researchers in the field to further refine understanding of both effective and ineffective decision-making processes.

References

Armstrong, J. S., & Brodie, R. (1994). Effects of portfolio planning methods on decision making: Experimental results. *International Journal of Marketing Research, 11*(1), 73–84.

Armstrong, J. S., & Green, K. C. (2007). Competitor-oriented objectives: Myth of market share. *International Journal of Business, 12*(1), 116–136.

Campbell, D. T., & Stanley, J. C. (1963). Experimental and quasi-experimental designs for research on teaching. In N. L. Gage (Ed.), *Handbook on research on teaching* (pp. 171–246). Chicago, IL: Rand McNally.

De Meur, G., Rihoux, B., & Yamasaki, S. (2008). Addressing the critiques of QCA. In B. Rihoux & C. Ragin (Eds.), *Configural comparative methods. Qualitative comparative analysis (QCA) and related techniques*. Thousand Oaks, CA: Sage.

Eisenhardt, K. M. (1989). Agency theory: An assessment and review. *The Academy of Management Review, 14*(1), 57–74. doi:10.2307/258191.

Feldman, D. C., & Lankau, M. J. (2005). Executive coaching: A review and agenda for future research. *Journal of Management, 31*(6), 829–848. doi:10.1177/0149206305279599.

Firestien, R. L., & McCowan, R. J. (1988). Creative problem solving and communication behavior in small groups. *Creativity Research Journal, 1*(1), 106–114. doi:10.1080/10400418809534292.

Gigerenzer, G. (1991). From tools to theories: A heuristic of discovery in cognitive psychology. *Psychological Review, 98*(2), 254–267. doi:10.1037//0033-295X.98.2.254.

Gigerenzer, G., & Brighton, H. (2009). *Homo Heuristicus*: Why biased minds make better inferences. *Topics in Cognitive Science, 1*, 107–143. doi:10.1111/j.1756-8765.2008.01006.x.

Gosen, J., & Washbush, J. (2004). A review of the scholarship on assessing experiential learning effectiveness. *Simulation and Gaming, 35*(2), 270–293. doi:10.1177/1046878104263544.

Osborn, A. F. (1963). *Applied imagination* (3rd ed.). New York, NY: Scribner.

Putman, V. L., & Paulus, P. B. (2009). Brainstorming, brainstorming rules and decision making. *Journal of Creative Behavior, 43*(1), 23–40. doi:10.1002/j.2162-6057.2009.tb01304.x.

Rihoux, B., & Lobe, B. (2008). The case for qualitative comparative analysis (QCA): Adding leverage for thick cross-case comparison. In D. Byrne & C. C. Ragin (Eds.), *The Sage handbook of case-based methods* (pp. 222–242). Thousand Oaks, CA: Sage.

Rong, B., & Wilkinson, I. (2011). What do managers' survey responses mean and what affects them? The case of marketing orientation and firm performance. *Australasian Journal of Marketing*, *19*(3). doi:10.1016/j.ausmj.2011.04.001.

Simon, H. A. (1992). *Economics, bounded rationality and the cognitive revolution*. Aldershot Hants: Elgar.

Spanier, N. (2011). *Competence and incompetence training, impact on executive decision-making capability: Advancing theory and testing*. Doctoral thesis. Auckland University of Technology, Auckland.

Todd, D. W. (2005). *The impact of motivation and conflict escalation on the five zone model for preferred conflict handling and managerial decision making*. PhD dissertation, Georgia State University, Atlanta, GA. Retrieved from http://digitalarchive.gsu.edu/managerialsci_diss/10Paper10

Weick, K. E., Sutcliffe, K. M., & Obstfeld, D. (1999). Organizing for high reliability: Processes of collective mindfulness. *Research in Organizational Behavior, 21*, 2381. doi:10.1177/0020764009106599.

Wilson, T. D. (2011). *Redirect: The surprising new science of psychological change*. London: Little Brown and Company.

Woodside, A. G. (2011a). *Case study research: Theory, methods, practice*. Bingley: Emerald Group Publishing, Ltd.

Woodside, A. G. (2011b). Responding to the severe limitations of cross-sectional surveys: Commenting on Rong and Wilkinson's perspectives. *Australasian Marketing Journal, 19*(3), 153–156. doi:10.1016/j.ausmj.2011.04.004.

Woodside, A. G. (2013). Moving beyond multiple regression analysis to algorithms: Calling of adoption of a paradigm shift from symmetric to asymmetric thinking in data analysis and crafting theory. *Journal of Business Research, 66*, 463–472. doi:10.1016/j.jbusres.2012.12.02.

Appendices

In-Basket Task #1: Advertising Media Decision @ Mr. Pizza

GND2 [Group, No GBS, Devil's Advocate Present, and Placebo Information (PI)]

President Pete Smith is going to increase advertising for the firm's brand, **Mr. Pizza** that consists of franchises of 27 pizza restaurants in St. Louis. President Smith is going to double promotion expenditures.

Fran Jones, the firm's advertising manager, favors placing 80 % of the additional funds in television and Facebook advertising because of the sales jump experienced in the firm's restaurants when the brand's TV commercials appear—sales increase 20–30 % among the stores and profits jump as well.

Tom Hendricks, head of marketing, points out that the firm's pizza restaurant locations only cover 30 % of the metro area—a lot of television advertising will be wasted. Tom favors using sponsoring events (rock bands and concerts) with the additional promotional funds as a way of increasing brand awareness and acceptance of the firm's brand. Fran disagrees; she views sponsorships as delivering little direct impact on sales.

President Smith is going to decide this week on spending the additional advertising funds.

GND2

Your consulting report to President Smith:

Your personal secret code:

Number;	Number;	Letter;	Letter;	Letter

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(1) Based on the information available in the case, select **oneof the two options** in the case to recommend to President Smith, Fran, and Tom. Your choice: Please tick **ONLY ONE** preferred option here below:

Option	Place your ✓ in this column
Option A: Place 80 % of the additional funds in television and Facebook advertising	
Option B: Use sponsoring events (rock bands and concerts)	

(2) Provide between one and three reasons to support your recommendation to this firm on deciding on spending the additional advertising funds. (Use the back of this sheet if you require more space.) Your reasons:

Reason 1:
Reason 2:
Reason 3:

(3) Please indicate how confident you are that your answer is the correct answer. Please tick your level of confidence.

1	Not very confident	2	Somewhat confident	3	Confident	4	Very confident

(4) Please indicate how likely you are to stick with your decisions, should you be asked to review them in 2 weeks time. Please tick your option

1	Very likely to change my decision	2	Somewhat likely to change my decision	3	I am unlikely to change my decision. I will stick with my current decision	4	I will not change my decision at all. I will definitely stick with my current decision.

Exhibit 1(i): Advertising Media Selection

GBF2

Please think for a minute or two to yourself on how you might apply the information appearing on this page in making the decision. Also ask yourself: should you apply the information on making a decision that appears on this page?

Advertising media selection is the process of choosing the most cost-effective media for advertising, to achieve the required coverage and number of exposures in a target audience.

5 Steps for Better Advertising Return

If you think that, because your business is small, you can advertise without having a defined marketing strategy, Ed Yeaker disagrees with you. "In the acting business, there are no small parts, only small actors, and there is no small advertising plan, either," says Yeaker, president of Ed Yeaker Associates, Inc. Advertising and Marketing Services in White Plains, N.Y. "No matter the size of the business, ad budget or extent of activity, the advertising investment is always huge."

Yeaker, a former adjunct marketing instructor at Pace University, offers five tips for businesses that want to get more *ka-ching* out of their advertising.

1. **Have a Clear Marketing Direction—and Stick to It.** "Advertising helter skelter just because of aggressive media sales reps, friends' suggestions, status and emotional appeals usually has little or no value, or even hurts the business," Yeaker says. "Every business, no matter the size, needs a planned approach to marketing-directed advertising that supports the company's goals and allows it to prosper." The key elements of a solid plan should include:

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- **Situation analysis,** including market data, consumer profiles and attitudes, plus competitive appraisal;
- **Assessment of problems and weaknesses** along with opportunities and strengths;
- Review of the overall business and its financial goals; and
- **Objectives**, strategies and rationale for the money you're spending on advertising.

2. **Distinctive Positioning.** You must separate your business from competitors selling the same thing in a way that is meaningful, memorable and believable. Then you have to apply that identity consistently and visibly in every facet of your business and operation. Strong positioning is at the heart of effective creative strategy for advertising, but only if it is meaningful and memorable. Being believable is at the heart of advertising success. "The stronger the assertion, the greater the disbelief," Yeaker notes.
3. **It's All About Customer Benefits.** It's not what you have to sell, but what customers need that's important, even if the customer doesn't know (yet) that she needs it. And your advertising's focus doesn't end when you produce the commercial, print ad or Internet campaign. That's just the beginning. Understanding how customers use and experience your product should drive your ongoing promotion. Yeaker notes, for example, that some bedroom furniture manufacturers advertise the benefit of their materials and construction, emphasizing durability. But when he designed a campaign for a client in this space, the consumer promise was "sweet dreams," because research showed a good night's sleep was the key emotional benefit of the product. "Sure, they want a good product and a fair price, but first things first when you're trying to get their attention," he says.
4. **Integrate All Promotional Activity.** Yeaker suggests you take a top-down approach to your advertising strategy so you get results greater than the sum of the parts. Rather than initially focusing on the individual components of an ad campaign—the media where the ad will run, the creative content, the price you'll pay, the number of customers you will convert, and fitting together all the different types of ads and promotions—think first about the problem you are solving for your business. This is a typical "forest and trees" issue: if you center your attention on the mechanics of advertising and promotion and how well they look and sound individually, you may miss the opportunity (which is really a necessity) of making sure they all add up to a well-integrated whole that delivers new profits for your business. Taking a top-down approach assures "a cohesive look and attitude so that each of your ads is instantly recognized as being uniquely yours in every application, from print media advertising to TV and radio, from mailings to telemarketing, plus sales literature and especially, Internet marketing," Yeaker says.

5. **Accountable Performance.** At its heart, advertising is an experiment. You can't have perfect knowledge of what will work, so it's critical to test your assumptions. There are a couple of key ways to measure and analyze advertising to make it accountable:

   - Creative development, with some preliminary research to confirm viable appeals and offers, followed by testing of different messages and executions;
   - Testing different messages within each media you use;
   - Testing the demographics and psychographics of the lists you use for direct mail and telemarketing; and
   - Testing media in print and broadcast—each with virtually infinite variations and combinations.

While all this testing and preparation may sound complex and expensive to do, it's actually much cheaper than doing what most small businesses do: winging it!

Source:
5 Steps to a Better Return on Your Advertising Investment.
By Mitchell York, About.com Guide.
http://entrepreneurs.about.com/od/salesmarketing/a/AdvertisingTips.htm;
Retrieved 13 October 2011

Exhibit 1(ii): A Guide to Managing Media and Public Relations

GBF2

Please think for a minute or two to yourself on how you might apply the information appearing on this page in making the decision. Also ask yourself: should you apply the information on making a decision that appears on this page?

1. *Have a strategy*.
   Tailor your strategy for each public relations opportunity. Think about the audience you want to reach and how to create excitement. An effective part of your strategy should be to enforce your organization's core messages in all news releases.
2. *Have a good story*.
   A news story must have a compelling beginning, middle, and end. Journalists recognize a strong story within seconds, so tell your story quickly and succinctly.
3. *Know your audience*.
   You wouldn't follow up on a potential business opportunity without knowing something about their business, so don't call the news media blindly. Before you pitch to any media outlet, study their work. Read the publication, watch the show, and listen to the radio broadcast. Get familiar with the characteristics of the media outlet you are targeting. Find out about their main audience and their likes and dislikes. (Internet message boards are good for this.)
4. *Invest in relationships*.
   The more you know about the media organization and your target editor, the better and more confidently you can pitch to them. Building relationships *now* means editors will be more likely to take your call when you've got an important story to tell. Best of all, even if they can't offer you coverage on this particular story, they may refer you to another reporter who can. As with any relationship, building trust is critical. Keep your promises, and be on time. Be upfront about what you can and can't do. You might not be able to do everything, but reporters will appreciate your honesty.

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5. *Think before you speak*.
   A word of caution: *everything* you say to a reporter is on the record, regardless of disclaimers. You are representing your organization at all times. The impression that you give has a definite impact on how the media views your organization.
6. *Monitor your media coverage*.
   Media coverage shows your success. As a media relations expert, the end goal is always positive media coverage for your organization. When your organization is spotlighted in major media outlets, you bring attention and respect to your business

Source:
http://tldp.org/LDP/Linux-Media-Guide/html/howto_maximize.html; Retrieved 13 October 2011

Exhibit 1(iii): Advertising that Expands Consumption

GBF2

Please think for a minute or two to yourself on how you might apply the information appearing on this page in making the decision. Also ask yourself: should you apply the information on making a decision that appears on this page?

Advertising Adstock is a term coined by Simon Broadbent [1] to describe the prolonged or lagged effect of advertising on consumer purchase behavior. It is also known as 'advertising carry-over'. Adstock is an important component of marketing-mix models. Adstock is a model of how response to advertising builds and decays in consumer markets.

Advertising tries to expand consumption in two ways; it both reminds and teaches. It reminds in-the-market consumers in order to influence their immediate brand choice and teaches to increase brand awareness and salience, which makes it easier for future advertising to influence brand choice. Adstock is the mathematical manifestation of this behavioral process.

The Adstock theory hinges on the assumption that exposure to television advertising builds awareness in the minds of the consumers, influencing their purchase decision. Each new exposure to advertising builds awareness and this awareness will be higher if there have been recent exposures and lower if there have not been. In the absence of further exposures adstock eventually decays to negligible levels. Measuring and determining adstock, especially when developing a marketing-mix model, is a key component of determining marketing effectiveness.

The lagged or decay component of Advertising Adstock can be mathematically modelled and is usually expressed in terms of the 'half-life' of the ad copy, modeled using TV Gross Rating Point (GRP). A 'two-week half-life' means that it takes 2 weeks for the awareness of a copy to decay to half its present level. Every Ad copy is assumed to have a unique half-life. Some academic studies have suggested half-life range around 7–12 weeks,.[2] Other academic studies find shorter half-lives of approximately 4 weeks,[3] and industry practitioners typically report half-lives

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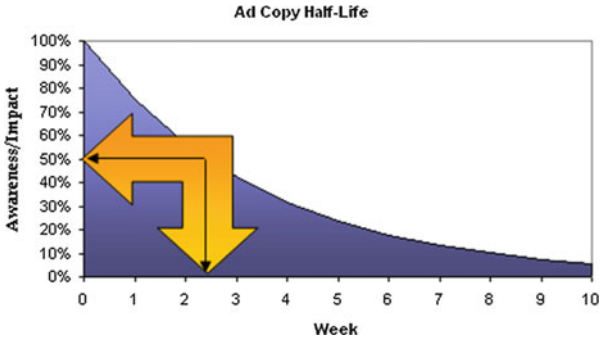
between 2 and 5 weeks, with the average for Fast Moving Consumer Goods (FMCG) Brands at 2.5 weeks.[4]



The copy in the above graph has a half-life of 2.5 weeks

References

Broadbent, S. (1979) "One Way TV Advertisements Work", Journal of the Market Research Society Vol. 23 no.3.

Leone, R.P. (1995) "Generalizing what is known about temporal aggregation and advertising carry-over", Marketing Science, 14, G141–G150.

Newstead, K., Taylor, J., Kennedy, R. and Sharp, B., 2009. Single source data: how do findings from individual-level analysis converge with aggregate level advertising experiments? Journal of Advertising Research 49 (2).

Exhibit 1A: Evidence on the Relationship Between a ROI and GNF1 Effectiveness of Advertising Campaigns

Please think for a minute or two to yourself on how you might apply the information appearing on this page in making the decision. Also ask yourself: should you apply the information on making a decision that appears on this page?

Return on Investment (ROI) is used to measure the effectiveness of advertising campaigns. ROI is determined by comparing the cost of advertising to either sales or inquiries generated from the advertising effort.

The worst ROI occurs for situations where costs are high and response is low. Television and to some extent radio are the worst ROI advertising options. These are high cost with usually low response. You are reaching a large number of people that are not qualified prospects—in other words, they probably do not want your product or service. It is difficult to provide a clear and effective call for action. This is largely because of the short time you have the prospects' attention. The best advertising ROI is when the cost of the advertising is low and the sales or inquires are high.

One of the cheapest advertising activities, and therefore likely to be one of the best advertising ROI efforts, for any business is networking. The key for successful networking is to follow up with prospects. Networking efforts likely to result in a high ROI would be a vendor or business booth at a networking event you would be attending anyway. Inexpensive advertising efforts can have good ROI. Being creative when it comes to handing out information and tracking the response from any given effort will show you what works best for your market. You do not have to invest many dollars in advertising to be effective.

http://www.essortment.com/small-business-tips-worst-roi-advertising-opportunities-23656.html

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Exhibit 2A: Evidence on the Relationship Between Market Share and Profitability, Market Share and Firm Survival

GBF1

Please think for a minute or two to yourself on how you might apply the information appearing on this page in making the Pricing Decision for L-Guys. Also ask yourself: should you apply the information on making a decision that appears on this page?

- 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."

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- 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 ($p = 0.07$ by the Fisher Exact Test).

Reference List:

Anterasian, C., & Graham, J. L. (1989). When it is 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.

Exhibit 2B: Information on Setting Price

GBF2

- 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 are positioning your product as an exclusive luxury product, a price that is 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 are going to have to do some good basic market research to find this out, even if it's informal. Get ten people to answer a simple questionnaire, asking them, "Would you buy this product/service at X price? Y price?" For a larger venture, you will 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.

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- **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

In-Basket Task #2: Pricing Decision

GND2

You are the 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 10 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
L-Guys:	$10.2 million profits 56.7% market share	$20.4 million profits 48.6% market share
T-Guys:	Profits? 43.3% market share	Profits? 51.4% market share

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

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Your consulting report to L-Guys:
GND2

Your personal secret code:

Number;	Number;	Letter;	Letter;	Letter

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

Option	Place your ✓ in this column:
Option A: The low price strategy	
Option B: The high price strategy	

2. Please provide between one and three reasons for your choice:

Reason 1:
Reason 2:
Reason 3:

3. Please indicate how confident you are that your answer is the correct answer. Please tick ✓ your level of confidence:

1	Not very confident	2	Somewhat confident	3	Confident	4	Very confident

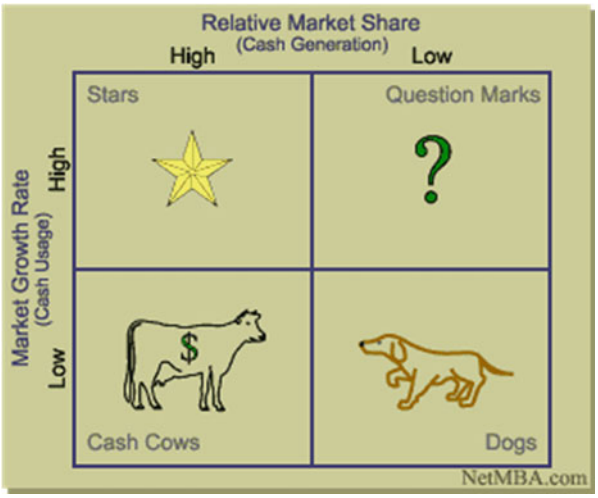
4. Please indicate how likely you are to stick with your decisions, should you be asked to review them in 2 weeks time. Please tick ✓ your option below:

1	Very likely to change my decision	2	Somewhat likely to change my decision	3	I am unlikely to change my decision. I will stick with my current decision	4	I will not change my decision at all. I will definitely stick with my current decision.

Exhibit 2(i): Boston Consulting Group (BCG) Growth Share Matrix

GBD2

Please think for a minute or two to yourself on how you might apply the information appearing on this page in making the L-Guys Pricing Decision. Also ask yourself: should you apply the information on making a decision that appears on this page?



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

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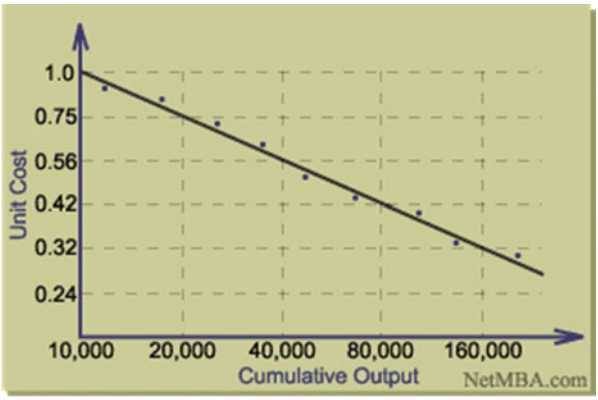
industry attractiveness, and relative market share serves as a proxy for competitive advantage. The growth-share matrix thus maps the business unit positions within these two important determinants of profitability. This framework assumes that an increase in relative market share will result in an increase in the generation of cash. (http://www.netmba.com/strategy/matrix/bcg/)

Exhibit 2(ii): The Experience Curve

GBD2



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.

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- 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/).

Task #3: Hotel Selection

Attributes ranked by past participants of RISC Conferences
GBD2

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	Rated	Hotel A	Arturo	Hotel B	Bianca	Hotel C	Clover	Hotel D	Domino	Hotel E	Enterprise	Hotel F	Fargo	Hotel G	Gladiator	Hotel H	Hilltop	Hotel I	Imperial
Atribute	Out of 10	Yes/No	Weighted	Yes/No	Weighted	Yes/No	Weighted	Yes/No	Weighted	Yes/No	Weighted	Yes/No	Weighted	Yes/No	Weighted	Yes/No	Weighted	Yes/No	Weighted
Good food, great entertainment and break-away areas	**9**	−1	**−9**	1	**9**	−1	**−9**	1	**9**	−1	**−9**	1	**9**	−1	**−9**	1	**9**	1	**9**
Interesting sights and entertainment in close proximity to the hotel	**7**	−1	**−7**	1	**7**	−1	**−7**	−1	**−7**	−1	**−7**	1	**7**	−1	**−9**	−1	**−7**	−1	**−7**
Excellent, secure conference facilities	**10**	1	**10**	−1	**−10**	1	**10**	−1	**−10**	−1	**−10**	1	**10**	1	**10**	1	**10**	1	**10**
Easy access to trains, busses, parking and transport	**6**	1	**6**	1	**6**	1	**6**	−1	**−6**	1	**6**	1	**6**	−1	**−6**	1	**6**	−1	**−6**
Free, fast internet and business support services to access messages and e-mail(s)	**5**	−1	**−5**	−1	**−5**	1	**5**	1	**5**	1	**5**	1	**5**	−1	**−5**	1	**5**	1	**5**
Friendly concierge service with good knowledge of local sites and events; friendly local services and vendors.	**3**	−1	**3**	−1	**−3**	1	**3**	1	**3**	1	**3**	−1	**−3**	−1	**−3**	1	**3**	−1	**−3**

Good IT support for the conference facilities	**2**	1	**2**	1	**2**	1	**2**	1	**2**	−1	**−2**	−1	**−2**	1	**2**	−1	**−2**	1	**2**
Comfortable rooms with *en suite* bathrooms and television.	**8**	1	**8**	1	**8**	1	**8**	−1	**8**	1	**8**	1	**8**	1	**8**	−1	**−8**	−1	**−8**
Speedy, friendly front desk and good overall service quality	**4**	−1	**−4**	1	**4**	1	**4**	1	**4**	−1	**−4**	−1	**−4**	1	**4**	−1	**−4**	−1	**−4**
Overall affordability of food and lodging	**1**	−1	−1	1	1	1	1	1	1	1	1	−1	−1	−1	−1	1	1	1	1
Total weighted score	**55**		**3**		**19**		**23**		**9**		**−9**		**35**		**−9**		**13**		**−1**

Yes = 1
No = −1

Exhibit 3B: Satisficing as Decision Strategy Useful Rules for Evaluating Hotel Scenarios

GBF1

Please think for a minute or two to yourself on how you might apply the information appearing on this page in making the hotel decision.

Also ask yourself: should you apply the information on making a decision that appears on this page?

This information sheet is about fast and frugal heuristics for making decisions—how they work, and when they succeed. Humans and animals make inferences about their world with limited time, knowledge, and computational power. Gigerezer and Todd argue that models of much of human reasoning and decision making involve the use of fast and frugal heuristics that make inferences with limited time and knowledge. These heuristics do not involve much computation, and do not compute probabilities and utilities; using such heuristics results in more accurate decisions than fully rational models.

Fast and Frugal Heuristics: Example from the Medical Industry

A man is rushed to a hospital in the throes of a heart attack. The doctor needs to decide quickly whether the victim should be treated as a low risk or a high risk patient. He is at highrisk if his life is truly threatened, and should receive the most expensive and detailed care. The doctor does not have the luxury of extensive deliberation: She must decide under time pressure using only the available cues, each of which is, at best, merely an uncertain predictor of the patient's risk level. At the University of California, San Diego Medical Center, as many as 19 such cues, including blood pressure and age, are measured as soon as a heart attack patient is admitted. Common sense dictates that the best way to make the decision is to look at the results of each of those measurements, rank them according to their importance, and combine them somehow into a final conclusion. Consider in contrast the

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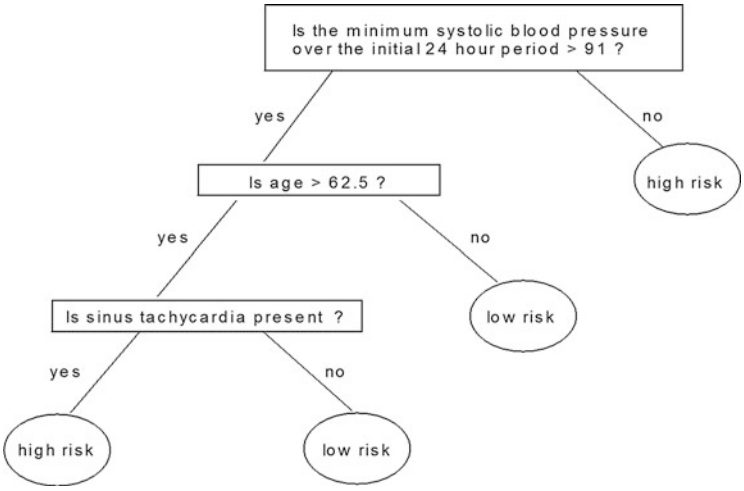
simple decision tree in Fig. 1.1, which was designed by Breiman and colleagues (Breiman et al., 1993) to classify heart attack patients according to risk using only three variables. If a patient has a systolic blood pressure of less than 91, he is immediately classified as high risk—no further information is gathered. If not, then the decision is left to the second cue, age. If the patient is under 62.5 years old, he is classified as low risk; if he is older, then one more cue (sinus tachycardia) is considered to classify him as high or low risk. The tree requires the doctor to answer a maximum of three yes-no questions to reach a decision rather than to measure and consider 19 predictors, letting her proceed to life-saving treatment all the sooner. And it works!

Figure 1.1 A simple decision tree for classifying incoming heart attack patients into high risk and low risk patients (adapted from Breiman et al., 1993).



This decision strategy is simple in several respects. First, the heuristic ignores the great majority of possible measured predictors. Second, the heuristic ignores quantitative information by using only yes/no answers to the three questions.

Deciding Under Constraints

Satisficing is a method for making a choice from a set of alternatives encountered sequentially when one does not know much about the possibilities ahead of time. Satisficing takes the shortcut of setting an aspiration level and ending the search for alternatives as soon as one is encountered that exceeds the aspiration level (Simon, 1956a, 1990). Satisficing is a way of making a decision about a set of alternatives that respects the limitations of human time and knowledge: it does not require finding out or guessing about all the options and consequences the future may hold,

as constrained optimization does. However, some forms of satisficing can still require a large amount of deliberation on the part of the decision maker, for instance to set an appropriate aspiration level in the first place, or to calculate how a current option compares to the aspiration level (Simon, 1956b). Satisficing limit the search of objects or information using easily-computable stopping rules, and they make their choices with easily-computable decision rules.

Heuristic principles for guiding search. Decisions must be made between alternatives, and based on information about those alternatives. In different situations, may need to be found through active search. The heuristic principles for guiding search for those alternatives are what give search its direction (if it has one). For instance, search for cues can be simply random, or in order of some precomputed criterion related to their usefulness; or based on a recollection about which cues worked previously when making the same decision. The search for alternatives can similarly be random or ordered.

Heuristic principles for stopping search. In our conception of bounded rationality, the temporal limitations of the human mind (or that of any realistic decision-making agent) must be respected as much as any other constraints. This implies in particular that search for alternatives or information must be terminated at some point.

Heuristic principles for decision making. Once search has been guided to find the appropriate alternatives or information and then been stopped, a final set of heuristic principles can be called upon to make the decision or inference based on the results of the search. These principles can also be very simple and computationally bounded. For instance, a decision or inference can be based on only one or two cues or reasons, whatever the total number of cues found during search. A one-reason decision making does not need to weight or combine cues, and so no common currency between cues need be determined. Decisions can also be made through a simple elimination process, in which alternatives are thrown out by successive cues until only one final choice remains.

One of the surprising results reported in empirical studies by Gigerenzer and Todd (1999), is that simple heuristics need not always make tradeoffs in accuracy or quality. These studies show that, when compared to some standard benchmark strategies, fast and frugal heuristics can be faster, more frugal, and more accurate at the same time.

Reference

Gigerenzer, G., & Todd, P. M. (1999). Fast and Frugal Heuristics. In ABC Research Group (Ed.), *Simple Heuristics that Make Us Smart*. New York: Oxford University Press.

Exhibit 3A: GBF1 Decision About Conference Facility Attributes: Studies over a Decade

Please think for a minute or two to yourself on how you might apply the information appearing on this page in making the hotel decision. Also ask yourself: should you apply the information on making a decision that appears on this page?

The event industry is experiencing impressive growth. To facilitate the destination selection process, the planner and host organization should first establish the goals and objectives for the event. With that knowledge, destination selection criteria are easier to establish (Rompf, Breiter, & Severt, 2008). Upchurch, Jeong, Clements, and Jung (1999) note that the organization should create a short list of two or three priorities for site selection. Furthermore, the selection of location also depends significantly on the size and budget of the organization producing the event (Crouch & Ritchie, 1998). According to Churchill (1993, p. 56), "During a recession companies cannot afford to waste time and resources, therefore companies are giving more emphasis to setting clear objectives and high quality standards for their conferences", he later adds that "valued-added is increasingly the name of the game for management conferences".

Crouch and Louviere (2004) interviewed 500 meeting planners from the Meetings Industry Association of Australia. Each respondent was asked to make discrete choices on a number of designed scenarios recounting hypothetical convention sites described by site selection attributes. The study reports that participant proximity to the convention site, quality of conference and exhibition space, plenary rooms, break-out rooms, and perceived food quality were important antecedents to site selection. In terms of the convention destination setting, opportunities for entertainment, shopping, sightseeing, recreation and organized tours were found as significant advantages for destinations.

An Australian study by Comas and Moscardo (2005) collect data on the attributes or selection criteria that association planners look for when choosing a host destination for association conferences and meetings. They discovered six key themes among a variety of destination attributes: meeting venue (including size, location, and access), accommodation venue (size of the property, location, and

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cost of room nights), convenience (preference of one venue covering a range of facilities including meeting space, accommodations, and conference dinners), quality of technology, price of meeting and accommodation facilities, and overall city atmosphere, including the hospitality of the local residents, safety, and the availability of additional activities, Crouch and Ritchie (1998) identify four major site selection factors to consider when choosing a site: accessibility, local support, extra-conference opportunities, and accommodation facilities, keeping in mind that variations in these dimensions are dependent upon the size and budget of the particular group.

Accessibility refers to the expense of transportation and access, the duration/distance of travel involved, the frequency of connections to the site, the convenience of these connections, and any existing barriers, such as passports or customs procedures, that may hinder the travel experience.

Local support refers to the amount of assistance or backing offered by any local chapters or branches of the group, the amount of CVB/convention center support, and the availability of any subsidies or rebates offered by the destination. *Extra-conference opportunities* refer to activities event participants can take advantage of while visiting the destination, such as entertainment, shopping, sightseeing, recreation, and professional opportunities. *Accommodation* facilities are of particular importance to meeting planners in that they need to know the capacity of facilities, the cost of the accommodations, the perceptions towards standards of service at particular lodging establishments, the assurance of a safe and secure environment, and the availability of the facilities when required (Crouch & Ritchie, 1998).

Both the competitive environment and external forces appear to drive new factors in conference facilities and destination selection, referred to as "Key Event Success Factors." Those factors/criteria are "overall cost," "perceived value for money," "reputation for hosting events," "image as a desirable place to visit," "support services for events," "safety and security," and "accessibility."

References

Churchill, D. (1993). Hangovers are out and cost effectiveness is in. *Management Today, 00251925*, 56–56.

Crouch, G. I., & Louviere, J. J. (2004). The Determinants of Convention Site Selection: A Logistic Choice Model from Experimental Data. *Journal of Travel Research, 43*(2), 118–130. doi:10.1177/0047287504268233

Rompf, P. D., Breiter, D., & Severt, K. (2008). Destination Selection Criteria: Key success factors evolve and dominate. *Event Management, 12*, 27–38.

Upchurch, R. S., Jeong, G. H., Clements, C., & Jung, I. (1999). Meeting planners' perceptions of site selection characteristics: The case of Seoul, Korea. . *Journal of Convention & Exhibition Management, 2*(1), 15.

Exhibit 3(i) Steps in Rational Decision-Making/Weighted Priority Matrix

GBD2

- 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.)

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- 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).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.

Cue	Cue weight	Evaluation of Linda	Evaluation of Tom
German language ability	2	0.3 [0.06]	1.0 [2.0]
University quality	1	1.0 [1.0]	0.3 [0.3]
Relevancy of training to job	3	0.5 [1.5]	0.7 [2.1]
Job experience	4	0.8 [3.2]	0.4 [1.6]
Gender	0	0.2 [0.0]	0.8 [0.0]
Σ Total		[6.3]	[6.0]

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

In-Basket Task #3: RISC Selection of a Hotel

Sam, a highly successful International Sales Manager for RED, a chain of hair dressing stores in New Zealand and Australia, has approached you for advice. The firm RED has its annual international sales conference in 3 months' time. At this international sales conference which normally runs over 3 days, the Australasian top achieving sales representatives are rewarded and new products are launched. The annual RED International Sales Conference (RISC) is highly prestigious and there is already much excitement amongst the sales representatives to see who will make it through to RISC this year. This year it is planned for a venue in the Pacific Islands. RED's international sales management team organizes many functions every year. Several members of Sam's event planning team have taken business trips to assess a large number of possible hotels. The enclosed list of nine hotels are those pre-screened hotels that meet the minimum requirements to host a conference of this caliber for this number of people.

RED's president, Joe White always takes personal interest in the RISC function. Since the key focus of the coming sales year is on customer care and nurturing existing clients, she has asked Sam's team to find a venue that will demonstrate these qualities. The team has done some preliminary research and has found nine possible hotels RED have used in the past, to host the upcoming RISC function.

Sam needs to make the final decision today since many of the hotels have a minimum lead time and RED's president wishes to announce the venue and key speakers at the director meeting which is tomorrow. Once you have made your recommendation, Sam will have full authority and control over the all-inclusive budget of $1.7 m to make the decision. His decision will be final.

Sam's event planning team has, over the years of organizing the RISC function, developed a checklist of key attributes to consider. This ranked attribute list was compiled from past top achievers and RISC conference attendees' feedback forms. The factors, issues and attributes of the event and the priority weighting of each factor appear in the second column, labeled *Importance (scored out of 10 by sales staff who attended conferences in the past)* in Table 1.

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Your Consulting Report to the RED International Sales Manager

You wish to develop a short-list of one or two hotels to consider. Second, you wish to generate one strength and one weakness for each alternative action. Finally, you want to select one of the alternatives to recommend to Sam and tell why this action is the best one for RED to take.

Your Consulting Report to the RED international sales manager of RISC
GBF1

Your personal secret code:

Number;	Number;	Letter;	Letter;	Letter

1. One to two hotels to consider on the final short-list?

Hotel 1:	Hotel 2:

2. One strength and one weakness for each course of action?

Hotel 1:	Hotel 2:
Strength Hotel 1:	Strength Hotel 2:
Weakness Hotel 1:	Weakness Hotel 2:

3. Final choice of action and why it's best for RED and the RISC function?

Final choice of Hotel: (Write name of Hotel here):
Why it is the best for RED:

4. Please indicate how confident you are that your answer is the best venue for the event. Please tick ✓ your level of confidence:

1	Not very confident	2	Somewhat confident	3	Confident	4	Very confident

5. Please indicate how likely you are to stick with your decisions, should you be asked to review them in 2 weeks time. Please tick ✓ your option

1	**I am very likely to change**	**2**	**Somewhat likely to change my decision**	**3**	**I am unlikely to change my decision. I will stick with my current decision**	**4**	**I will not change my decision at all. I will definitely stick with my current decision.**

(continued)

Instructions (Cont.) Group Rules for Effective Idea Generation

GBF1

Start:

Let the group interaction begin with whomever starts it. No specific "leader" is required.

Stay Focused on the Task:

Concentrate on the problem at hand and avoid engaging in irrelevant thought processes or discussions. When it is necessary to interrupt a group member,

say something like:

"Remember that we need to stay focused on our task."

Ask:

Please think for a couple of minutes:

How might we apply the information on making a decision appearing in the decision aids in making the decision?

Also ask:

Should we apply the information on making a decision that appears on the decision aid(s)?

Do not tell stories or digress into long explanations by one group member:

The group is interested in your ideas and explanations. The group wants logical arguments or evidence to support the choice, suggestion or idea. Allow expansion on why suggestions or ideas are good or bad, but DO NOT allow group members to digress into long-winded stories about their experiences or highly descriptive examples. Say something like:

"**We understand your point of view. Can we give someone else a chance to contribute**?"

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Keep the group interaction going:

During a lapse (of more than 4–5 s) when no one is talking, someone in the group should say something like:

"Let's see what other ideas we can come up with for (restate the problem). If there is still no further comment, someone should say something like:

"**We have not fully discussed option . . .X. . . Any ideas about . . .XYZ?**

Return to Previous Categories:

When the group members are not talking very much, go back to options or suggestions that have already been considered and try to build on these previous ideas. For example, say "Does anyone have any more ideas related to (restate an idea already suggested)?"

If there are no further ideas, ask something like:

"**Do you have the necessary information to make the decision? Is everyone ready to complete the decision form?**"

If all members agree, disperse to complete the decision form relating to the specific in-basket scenario. If you cannot agree, keep on deliberating until the facilitator indicates the end of the discussion (after 15 min).

There is NO need to achieve CONSENSUS neither is MAJORITY VOTING required.

Select one of the provided options, even if there is no a perfect match to your ideal answer.

Briefing Document (Groups & GBS Only): Objectives & Your Role as Vice-President: XXX

The Objectives
The objective of the in-basket exercise is to assist students to learn how to:

1. analyze available information in order to assess the impact of the context on the business decision.
2. appraise the available information and determine which information to use and which to omit in making an effective business decision.
3. conclude by advising the client of the preferred course of action within the complex business environment.
4. justify or explain why the suggested course of action is the preferred or most effective option.

Your Brief
You are a team of three full-time, independent, strategic management consultants. A new client (Mr Right) is considering hiring your services full-time for 6 months to train the firm's executives in increasing their effectiveness in strategic and tactical decision-making.

Before the final decision on whether or not to hire your team, this new client asks you to complete four executive-decision tasks. The tasks take the form of in-basket simulated problems that need solving today.

The senior executives of the new client firm plans on reviewing your answers tomorrow and you will receive a formal review of your answers and their decision on hiring you before 5 pm tomorrow. Should your firm get this contract, it could be worth $1.2 m over the next 2 years.

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The decisions in your in-basket are the type of decisions you will come across in your future career and will therefore give you excellent insight into general management decision-making scenarios or will assist in preparing you as a professional management consultant.

Your Role in This Team: (EACH STUDENT ONLY GETS ONE OF THESE) Please wear the hat and button provided with your pack.

HR Consultant: Your excellent track record, long-standing experience in management and highly-regarded formal qualifications make you the ideal candidate to be the Human Resource (HR) consultant on the team. You are often referred to as *Vice-President: Talent Development* or Vice-President in charge of human resource acquisition, development and retention. You are known for your outspoken opinions on the importance of hiring and warnings against wrongful firings. Your belief is that all employees have great potential, given the right job, the right training and the right motivation, appropriate for the specific individual.

Marketing Consultant: Your excellent track record, long-standing experience in marketing management and highly-regarded formal qualifications make you the ideal candidate to be the Marketing and Sales consultant on the team. You are often referred to as *Vice-President: Marketing & Sales* or Vice-President in charge of client acquisition, development and retention. You are known for your outspoken opinions on the importance of getting and keeping key clients and building customer life-time value.

Financial Consultant: Your excellent track record, long-standing experience as chief financial officer and highly-regarded formal qualifications make you the ideal candidate to be the Financial Consultant on the team. You are often referred to as *Vice-President: Accounting and Finance* or Vice-President in charge of cash-flow, profit and budgets. You are known for your outspoken opinion that "the business of business is to stay in business"; directly translated that the first goal of any business must be to make profit.

Customer Services Consultant: Your excellent track record, long-standing experience in customer services and your highly-regarded formal qualifications make you the ideal candidate to be the Customer Service Excellence consultant on the team. You are often referred to as *Vice-President: Customer Care* or Vice-President in charge of client care, customer relationships and customer service. You are known for your outspoken opinions on the importance of providing excellent services and recovering from any form of poor service delivery in order to keep clients happy and building long-term customer equity.

Replace with DA if in the Configuration: OTHERWISE Use OPS Below

Operations Manager: Your excellent track record, long-standing experience in business management and highly-regarded formal qualifications make you the ideal candidate to be the Operations Consultant on the team. You are often referred to as *Vice-President: Operations and Processes* or Vice-President in charge of performance and processes. You are known for your outspoken opinions on the importance of effective and efficient processes, quality control and your high performance orientation.

The Objectives: (INDIVIDUALS * ~GBS)

IND1

The objective of the in-basket exercise is to assist students to learn how to:

1. Analyze available information to make a sound business decision.
2. Appraise the available information and determine which information to use and which to omit in making an effective business decision
3. Conclude by advising the client of the preferred course of action within the complex business environment.
4. Justify or explain why the suggested course of action is the preferred or most effective option.

The decisions in your in-basket are the type of decisions you will come across in your future career and will therefore give you excellent insight into general management decision-making scenarios or will assist in preparing you as a professional management consultant.

Process & Procedures
You have 2-h to complete all four in-basket scenarios. Please provide complete answers to each problem in the in-basket. Please take the time that you find the exercises require in answering. After selecting your preferred option, please complete the two questions to justify your decision and to indicate your confidence in

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the decision. After completing the **last** Decision Form, please complete the section on Demographic Information and thereafter the final sheet. All answers and personal information is anonymous and will treated as such throughout the data gathering, data analysis and data reporting stages of this study.

In-Basket Task #4: Performance Management at ABConsulting

You client is **Abe Connor, CEO of ABConsulting**, a business consulting service with 57 consultants and 135 support and administrative staff. **Mary Smith**, National Promotions & Events Manager is normally a star performer in Abe's team at ABConsulting. She is highly competent at running multiple promotional campaigns and projects and although she is not very well liked, is well regarded by her twelve subordinates as a hard-working and strict manager. She is seen by her colleagues as a perfectionist with a keen focus on task and delivering high quality output within tight deadlines. She is responsible for the national promotions and sponsorships of ABConsulting services business, which amounts to approximately 24 projects with a total budget of $850,000.

Mary was recently asked to not only organize the National Awards for Media Innovation function which is part of her normal function, but in addition present a cheque on the gala evening of the Awards function, of which the firm is the main sponsor. This presentation and executive liaison role would normally be allocated to someone more senior than Mary in ABConsulting. Abe wanted to give her a chance to shine in the limelight and offer her a chance to demonstrate her ability to move up the ranks—one she often expresses a desire for. (In two of her previous bi-annual performance review meetings, the most recent of which was last month, she expressed a need to be promoted into higher paying and more responsible positions).

The Awards function ran smoothly and impressively as per all the promotional campaigns her team executes, but her interface with the top achievers, prize winners, and executives left much to be desired. Abe has first-hand information from a trusted friend that she was rude to the president of Media Inc., the owners and organizers of the event—and one of your most important and most valuable clients—on more than one occasion on the day of the function. She was sulking throughout the evening event function, made harsh, inappropriate remarks to clients and colleagues and was inappropriately dressed for such a glamorous function. In the words of Abe's trusted friend, "She looked like she came straight off the ladder where she was hanging the 'congratulations banner' to present the award, rather

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than dressed in smart evening attire, as was specified on the invitations she wrote and printed herself". Even one of her team members said, "I don't think I have ever seen her in such a foul and unaccommodating mood."

It has previously come to Abe's attention that she is first in the office in the mornings and that she never leaves the office before 7 pm and is very often the last person to leave the building. Although she has gained quite a bit of weight, she makes no time for tea or lunch and a senior colleague still sees her running at 6 am every morning on his daily jogs. During her performance review she stated that she is having some personal problems at home and that a promotion "would be just the thing to make me feel valued and appreciated." Abe is concerned about the impact Mary's behavior might have on the reputation and image of ABConsulting. There is some rumor that Media Inc. is considering taking their substantial business to your main competitor. Which of the following actions should Abe take?

A. Call Mary and her team in immediately to express his discontent with Mary's type of behavior and warn them all that a repeat performance will lead to a reduction in status or bonus/pay or both and that such behavior at corporate events will not be tolerated. Express the importance of key clients such as Media Inc. to the survival of ABConsulting and how one event like this might cost you years of good work and hundreds of dollars in real consulting work.
B. Wait for the next performance review, which is only 2 months away, to address the matter on a formal basis. Ensure that Abe build new criteria into the performance review document for all members of the national promotions business unit. Suggest that Abe phone the president of Media Inc. immediately to apologize and to smooth over any feathers that may have been ruffled. Advise Abe to go out of his way to rebuild the relationship and retain this key client.
C. Suggest to Abe to find Mary immediately and ask her for her version of the story so that Abe can give her a warning about future non-conformance actions he will take. Give her a formal warning so that he has followed procedure in case there is a repeat performance and he wishes to fire her after the next infringement. Advise Abe to call Media Inc. to resolve any residual unhappiness.
D. Suggest that Abe call his Media Inc. client to gather more information and to select one of two options. If the president of Media Inc. is seriously considering taking their consulting business away from ABConsulting, offer to fire Mary in order to retain the business of this key client. If the Media Inc. client is not too mad, suggest that Abe offers his personal apologies and let the issue rest. Suggest that Abe does nothing further after dealing with Media Inc.
E. You advise Abe to use positive reinforcement. You suggest to Abe to call Mary into his office, congratulate her on another successful event, but explain why she needs to call your Media Inc. to apologize for her behavior. Abe should explain that he relies on her and trust her to follow up with Media Inc.'s president and smooth over any problems. Give her a few pointers on how to deal with irate clients and difficult staff. Ask for feedback after the call.

Your consulting report to Abe at ABConsulting:
GBF1

Your personal secret code:

Number;	Number;	Letter;	Letter;	Letter

GBF1

1. Which course of action to you suggest do Abe take, please tick (✓) one choice:

Option	Suggestion to Abe of ABConsulting	Tick your selection
A	Take immediate action and express your discontent to the whole team.	
B	Wait to address the issue with the team. Call the client immediately and rebuild the relationship with the key client	
C	Call Mary in to address the non-conformance immediately. Call the client immediately and rebuild the relationship with the key client.	
D	Call Media Inc and either fire Mary or let the issue rest if the client is not all that upset.	
E	Congratulate Mary on a successful function. Direct her to call Media Inc. Give her some pointers. Ask for feedback	

2. Please provide one to three reasons for your choice here: (Use the back of the sheet if necessary)

Reason 1:
Reason 2:
Reason 3:

3. Please indicate how confident you are that your answer is the correct answer. Please tick ✓ your level of confidence:

1	Not very confident	2	Somewhat confident	3	Confident	4	Very confident

4. Please indicate how likely you are to stick with your decisions, should you be asked to review them in 2 weeks time. Please tick ✓ your option:

1	Very likely to change my decision	2	Somewhat likely to change my decision	3	I am unlikely to change my decision. I will stick with my current decision	4	I will not change my decision at all. I will definitely stick with my current decision.

Exhibit 4A: Decision Aid: Information on Retaining Key Clients & Key Staff

GBF1

Please think for a minute or two to yourself on how you might apply the information appearing on this page in making the ABConsulting decision.

Also ask yourself: should you apply the information on making a decision that appears on this page?

- In the service industry, an average of 95 % of business comes from 15 % of clients. Retaining key clients should be the focus of every manager in the business. Most industries quote the Pareto principle, i.e. 80 % of business comes from 20 % of clients. This 20 % of clients are called key clients.
- Key clients of service organizations periodically review and change their advertising; marketing and corporate communications services business models and supplier relationships. If service organizations are unable to remain competitive or retain key clients, their business and financial results may be materially adversely affected.
- The success of acquiring and retaining clients depends largely on organizations' ability to manage client relationships and retention of key personnel to manage those relationships.
- Organizations' ability to attract and retain key personnel is an important aspect of their competitiveness since employees and key clients are the two most important assets of any business. If unable to attract and retain key personnel, the organization's ability to provide services in the manner customers expect may be adversely affected, which could harm their reputation and result in a loss of clients, which could have a material adverse effect on results of operations and the overall financial condition.
- To develop strong business relationships, key service personnel need to have the interpersonal and relationship-building skills to attract and retain key clients. This is an example of a valuable relational asset as well as a potential source of competitive advantage. Organizations should invest time and money to develop these competencies.

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- In many organizations, the most prominent and expensive resource is their employees. As a result, a lot of time is spent on (a) creating processes and conditions that drive and motivate employees; and (b) developing employee competencies and skills to perform effectively and productively in the workplace.
- Starting with the issue of motivation, it is fair to say that this is not an easy task since different drivers motivate different people. The reason: motivation develops internally from a personal desire to achieve goals that are important both to the individual and to the organization. Motivation is the force that prompts them to take action. If a leader or manager is having trouble getting someone to achieve the organization's goals, they are probably failing to understand what the employee's personal goals are.
- Frederick Herzberg, research psychologist and author of "One More Time, How Do You Motivate Employees?" found that rather than working purely for external rewards such as money, people are motivated by challenges, stimulating work and increasing responsibility. In other words, people become frustrated when their work offers little or no opportunity for growth and achievement. While pay, fringe benefits, and working conditions are important, research has shown that absence of these factors produces a lack of motivation, but their presence has no long-range motivational effects. Long-range motivational factors are recognition of a job well done, sense of achievement, growth, participation, challenge, and identification with the company's goals and vision.
- Compassion is caring and empathy in action. It is the ability and willingness to act on feelings of care and empathy for others' feelings and experiences. According to leadership guru Richard Boyatzis, leading with compassion can favorably affect the bottom line. Important organizational results are achieved through compassion: "development of more people as leaders' higher commitment, responsiveness to customers, and a sense of share community and social responsibility" (Resonant Leadership, p. 185)
- They also argue that CRM is particularly concerned with singling out customers who are of strategic importance to the company, having the greatest customer lifetime value. It is with these customers that the company should build strong, interactive and collaborative relationships in order to be able to provide them with personalized offerings, thus enhancing company profitability (p. 14).
- Just as in literature concerning CRM, people are seen as a key success factor in Key Account Management (KAM). In Zupancic's (2008) framework on the operational KAM level, it is of importance to determine the competencies needed to best serve each key account and to nominate the people in the key account team, as well as analyze the individual needs of the people already involved in a particular relationship. Meanwhile, on the corporate KAM level it is crucial to acknowledge the pivotal role of outstanding staff in the success of KAM and continuously analyze their competencies, as well as provide the staff involved in KAM with training and development programmes. It is also within

the realm of corporate KAM to appoint key account managers from within the organization (Zupancic, 2008, p. 31).

- The findings of Brady (2004) and Nätti et al. (2006) highlight the importance of capable staff as a key success factor in KAM.

Exhibit References

Bianchi, Constanza C. (2009) How service companies from emerging markets overcome internationalization barriers: evidence from Chilean services firms. In: 2009 *Strategic Management in Latin America Conference,* January 5–7, 2009, Sao Paulo, Brazil.

Salojärvi, H. Sainio, L.M., Tarkiainen, A. (2010). Organizational factors enhancing customer knowledge utilization in the management of key account relationships. *Industrial Marketing Management*, 39(8), p. 1398

Key account acquisition and retention in the United Kingdom private medical insurance market: case study: AXA PPP healthcare Sini Nordberg. Retrieved on September 29, 2011 https://publications.theseus.fi/bitstream/handle/10024/28683/Thesis%20S.Nordberg.pdf?sequence=1.

Exhibit 4(i): Information on Retaining Key Clients

GND2

Please think for a minute or two to yourself on how you might apply the information appearing on this page in making the ABConsulting decision.

Also ask yourself: should you apply the information on making a decision that appears on this page?

- In the service industry, an average of 95 % of business comes from 15 % of clients. Retaining key clients should be the focus of every manager in the business. Most industries quote the Pareto principle, i.e. 80 % of business comes from 20 % of clients. These 20 % of clients are called key clients.
- Key clients of service organizations periodically review and change their advertising; marketing and corporate communications services business models and supplier relationships. If service organizations are unable to remain competitive or retain key clients, their business and financial results may be materially adversely affected.
- The market place for service businesses is highly competitive. Key competitive considerations for retaining existing clients and winning new business include the ability to develop creative solutions that meet clients' needs, the quality and effectiveness of the services offered the ability to efficiently serve clients, particularly large key clients, on a broad geographic basis.
- While client relationships may be long-standing, companies put their advertising, marketing and corporate communications services business up for competitive review from time to time. The competitive landscape changes often because of these reviews.
- To the extent that organizations are not able to remain competitive, their revenue may be adversely affected, which could then affect their results of operations and financial condition.
- "To develop strong business to business relationships, key service personnel need to have the interpersonal and relationship building skills to attract and retain key clients. This is an example of a valuable relational asset as well as a potential source of competitive advantage."

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Exhibit References

Bianchi, Constanza C. (2009) How service companies from emerging markets overcome internationalization barriers: evidence from Chilean services firms. In: 2009 *Strategic Management in Latin America Conference,* January 5–7, 2009, Sao Paulo, Brazil.

Salojärvi, H. Sainio, L.M., Tarkiainen, A. (2010). Organizational factors enhancing customer knowledge utilization in the management of key account relationships. *Industrial Marketing Management*, 39(8), p. 1398.

The Objectives (GROUP * ~GBS)

GND1
The objective of the in-basket exercise is to assist students to learn how to:

1. Analyze available information in order to make a sound business decision.
2. Appraise the available information and determine which information to use and which to omit in making an effective business decision.
3. Conclude by advising the client of the preferred course of action within the complex business environment.
4. Justify or explain why the suggested course of action is the preferred or most effective option.

The decisions in your in-basket are the type of decisions you will come across in your future career and will therefore give you excellent insight into general management decision-making scenarios or will assist in preparing you as a professional management consultant.

Process & Procedures
You have 2-h to complete all four in-basket scenarios. Please use eighteen (*18) minutes* to discuss a scenario and seven (7) minutes after each discussion to complete the Decision Form for each scenario. Please complete the relevant Decision Form before moving to the next in-basket scenario. After the group discussion, each group member completes his/her own Decision Form by providing/indicating the group decision. After selecting the group option, please complete the two questions to justify the decision and to indicate your confidence in the decision. After completing the **last** Decision Form, please complete the section on Demographic Information and thereafter the final sheet. All answers

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and information provided is anonymous and will treated as such throughout the data gathering, data analysis and data reporting stages of this study. The researchers will not attempt to link answers with individual respondents at any point throughout the study.

The Devil's Advocate's Perspective (GROUP)

GND2

An excellent track record and long-standing experiences in a variety of management roles and highly-regarded formal qualifications make a manager the ideal candidate to be the devil's advocate on any team.

Colleagues often refer to this type of person as The Devil's Advocate or *Vice-President: Caution*. According to creative thinking guru Edward de Bono, **Black Hat Thinking** explores ways that an idea may not fit the situation, problems we may need to overcome, faults, or why something or a line of thinking may not work. During *Black Hat Thinking* we consider obstacles, existing or potential downsides, and concerns. The single word that best describes the nature of the Black Hat is "caution." If we are not cautious, we risk damage, danger, and disaster both for ourselves, our organization and for others. The *Black Thinking Hat* protects us from harm. Black Hat Thinking can discover potential problems that might arise. The Black Hat helps us improve on an idea by drawing attention to the faults in the idea.

	**Black Hat** Difficulties, potential issues. Why a solution may not work

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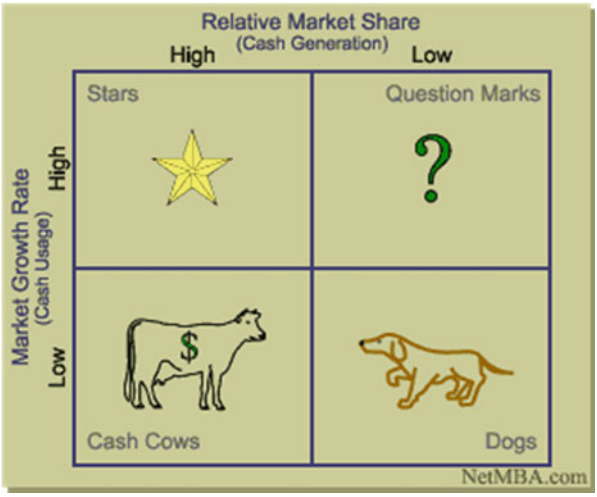
During your deliberations and decision-making processes, please consider the role and perspectives of a devil's advocate. Please wear the black hat provided by the facilitator when considering the black hat perspective.

Source: http://www.debonoonline.com/black-hat-thinking.asp

Briefing Document: Objectives & Hats You Need to Wear (INDIVIDUALS *GBS)



IBD1

The Objectives:
The objective of the in-basket exercise is to assist students to learn how to:

1. Analyze available information in order to assess the impact of the context on the business decision.
2. Appraise the available information and determine which information to use and which to omit in making an effective business decision.
3. Conclude by advising the client of the preferred course of action within the complex business environment.
4. Justify or explain why the suggested course of action is the preferred or most effective option.

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The decisions in your in-basket are the type of decisions you will come across in your future career and will therefore give you excellent insight into general management decision-making scenarios or will assist in preparing you as a professional management consultant.

Your Brief

You are a member of a team of four full-time, independent, strategic management consultants. A new client (Mr Right) is considering hiring your services full-time for 6 months to train the firm's executives in increasing their effectiveness in strategic and tactical decision-making.

Before the final decision on whether or not to hire your team, this new client asks you to complete four executive-decision tasks. The tasks take the form of in-basket simulated problems that need solving today.

The senior executives of the new client firm plans on reviewing your answers tomorrow and you will receive a formal review of your answers and their decision on hiring you before 5 pm tomorrow. Should your firm get this contract, it could be worth $1.2 m over the next 2 years.

Your other five team members are not available today. The report is due before they will be back in office, so it is important to consider the perspectives they might have had on the decision. Also remember the perspective of the devil's advocate.

You Need to Consider Your Answers, but Reviewing the Information from Four Different Perspectives

HR Consultants' perspective: Their excellent track records, long-standing experience in management and highly-regarded formal qualifications make HR consultant's perspectives valuable as Human Resource (HR) consultant on the team. This type of executive is often referred to as *Vice-President: Talent Development* or Vice-President in charge of human resource acquisition, development and retention. They are known for your outspoken opinions on the importance of hiring and warnings against wrongful firings. HR consultants believe that all employees have great potential, given the right job, the right training and the right motivation, appropriate for the specific individual.

Marketing Consultant's perspective: Their excellent track record, long-standing experience in marketing management and highly-regarded formal qualifications make marketing consultant's perspectives valuable as the Marketing and Sales consultant on the team. This type of executive is often referred to as *Vice-President: Marketing & Sales* or Vice-President in charge of client acquisition, development and retention. They are known for your outspoken opinions on the importance of getting and keeping key clients and building customer life-time value.

Financial Consultant's perspective: Their excellent track record, long-standing experience as chief financial officer and highly-regarded formal qualifications make financial consultant's perspectives valuable as the Financial Consultant on the team. They are often referred to as *Vice-President: Accounting and Finance* or Vice-President in charge of cash-flow, profit and budgets. They are known for

your outspoken opinion that "the business of business is to stay in business"; directly translated that the first goal of any business must be to make profit.

Customer Services Consultant's perspective: Their excellent track record, long-standing experience in customer services and your highly-regarded formal qualifications make them valuable as the Customer Service Excellence consultant on the team. This type of executive is often referred to as *Vice-President: Customer Care* or Vice-President in charge of client care, customer relationships and customer service. They are known for your outspoken opinions on the importance of providing excellent services and recovering from any form of poor service delivery in order to keep clients happy and building long-term customer equity.