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AARES 44<sup>th</sup> Annual Conference,  
Adelaide, 23-25 January 2001

**The Influence of Personality and The Financial Risk Management Competency of Dairy Farmers in Preparing for Industry Deregulation in SE Queensland.**

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***Introduction***

I am a veterinarian, and have been in practice for over 25 years. During that time, as I visited many farms, and spoke to many farmers, a number of things started to intrigue me. For example, farmers had different qualities of problems - some were quite simple technical problems, while others sought answers to more complicated conceptual questions. Some farmers were able to make more of limited resources than others were, who perhaps had better quality land or stock or improvements. Why were some farmers in comparable circumstances making a good livelihood from their farms, while others were clearly struggling? Why would some farmers block any discussion of the costs/benefits of specific farm practices, while others entertained such discussion? Why would some farmers not know, or want to know their costs of production, while others demonstrated an accurate idea of their costs of production? These questions assumed some urgency as deregulation of the dairy industry approached.

What were the differences in the personalities of the farmers involved? What is a competent farmer? What constitutes “managerial ability”? Peter Nuthall posed a similar question at the AARES Conference in Christchurch in 1999 (Nuthall 1999). A quest to find the answers to some of these questions prompted this investigation.

The deregulation of the dairy industry in Australia, in one action on 1<sup>st</sup> July 2000, placed the Australian dairy industry in a precarious position, because farmers were not ready for their new entrepreneurial roles. Because of the past education and training practices of dairy farmers, a large number of them are ill-equipped to deal with the wider conceptual issues involved in trading in an unregulated market. If current speculation that 30%-40% of dairy farmers dairying at 1<sup>st</sup> July 2000 will leave the industry as a result of deregulation, is true, then the remarks by Archer and Catt (Archer 1998), as late as 1998 seem to portray little cognizance of the changing business environment foreshadowed by Carmichael in 1993 (Carmichael 1993). In the context of the Australian dairy industry, Carmichael’s vision meant an expanded education outlook and the need for new competencies in management and conceptual skills for farmers.

The Australian Dairy Farmers Federation Report of June 1999, “Taking Responsibility for the Future, Advancing Dairy Australia” (ADFF 1999) stated that “the farm sector in this industry must undergo a quantum leap in attitude” and “farm management skills are

critical to success in building wealth in the farm enterprise...” and “that intelligence should be made available for farmers who want it – they must become ‘seekers’ (no longer passive recipients) of intelligence they need to act on” and specific attention is recommended in relation to the management of capital, farm business management, and the quality of information (ADFF 1999). These recommendations are quintessentially pertinent, and from the above discussion infer an active reflective role for farmers, rather than a passive role in training. However, publishing this report only one year before the implementation of deregulation made the task of having dairy farmers ready for deregulation, an impossible one.

While the United States dairy industry will probably never deregulate, mostly because of political factors, there are a number of easily-accessed programs in place now available from the United States Department of Agriculture (USDA), namely, USDA Risk Management Education Agency, USDA sponsored Dairy Options Pilot Program, National Program for Dairy Risk Management & Research and various University Extension Departments, e.g., University of Wisconsin – Madison, Center for Dairy Research and Department of Agricultural and Applied Economics, to teach and coach dairy farmers about wider conceptual issues with respect to managing their dairy enterprises in a deregulated business environment.

In Australia, the market has been deregulated ahead of the readiness of the farmers in the production sector of the industry. For example, the Dairy Regional Assistance Program funded by the Australian Department of Agriculture, Fisheries and Forestry is now being funded to overcome the impact of industry deregulation. Financial and social counseling services have also been funded in Queensland, New South Wales and South Australia (Truss 2001). Learning from this experience and observing others, there is a strong case that timely Competency-Based Education for the individual producers rather than Training is a necessary precursor to industry reconstruction programs.

### *Hypotheses*

There are differences among the personalities of dairy farmers.

These differences can be measured.

There are certain competencies required for financial risk management.

The possession of, or ability to acquire the required competencies for financial risk management will depend on the personality traits and characteristics of the individual.

### *Competence*

#### *Introduction*

In the United States, many universities, for example, the Land Grant Universities, researched “practical” regional and local problems and taught curricula that suited a developing nation. In Europe, people gained an “education” by reading the Classics and

the Arts. They learned about philosophy, politics and government from the Ancients, and of the triumphs and frailties of humanity by reading history.

In general, Australia, as a member of the British Empire, was strongly influenced by the British tradition in education and training during the nineteenth and first half of the Twentieth Century. Consequently, in Australian Universities, there was an emphasis on the Arts and Humanities, the basic Sciences, and the professions of Medicine and Law. Higher education was an elitist activity, and apprenticeships were designed for vocational training.

It was not until the 1980s that Institutes of Technology and Colleges of Advanced Education were elevated to University status. For example, in Brisbane, Queensland, the Central Technical College became the Queensland Institute of Technology (QIT), which then became the Queensland University of Technology (QUT). These institutions grew out of establishments that provided trade training and apprenticeships, signaling a wider concept of higher education in other diverse disciplines, for example, Hospitality and Tourism Studies, crucial to the changing economy of Australia. This transition occurred in Australia later than in the United States and Canada; the Australian attitude reflecting the European influence of an elitist higher education system and a separate vocational or technical training stream. The difference between training and education will be pointed out below, but the tardiness of education policy in Australia to appreciate the differences is starting to expose the shortcomings of Australian farmers in a more sophisticated world of industry deregulation and global market forces.

Trade education in Australia was primarily by apprenticeship training, where a young person, usually a male, was indentured to a master “to serve his time”. Some of the more practical professions, for example, Surveying and Journalism, had similar “articles” systems where “cadets” were assigned to practicing professionals for a specified time of training. The “cadets” were given their professional qualifications after passing examinations set by the relevant professional organization, for example, The Institute of Surveyors. This process had some of the attributes of competency-based education, in that the practicing professionals had some influence over what was taught, and examined.

The training of farmers in Australia was primarily through “experience” on the family farm. An apprenticeship of sorts was served by jackaroos and jillaroos who served time under different working conditions from other farm or station hands, and learned by practical experience and guidance from “the boss”.

As will be outlined, competency-based training and education, although started in the US during the First World War, did not achieve a mainstream status in Australian post-secondary education until the early 1990s. This seems to have been due to a divergence of opinion between Educationists expressing a more humanist approach on the one hand, and Industry expressing behaviourist approaches on the other. There appears to have been little will on either side to compromise.

One wonders why the early impetus for “practical” training and education subsided in Australia. In many Australian country towns there are halls and buildings, relics of the Nineteenth Century, which bear the names of “Mechanics Institute” or “School of Arts”. Similarly, Agricultural Societies have changed their focus from vehicles for the education of farmers, to entertainment and social institutions and places for the annual exhibition of technical excellence.

#### *Background to Competency-based Education*

John Dewey’s book of 1916, “Democracy and Education” set the tone for much of the philosophical discussion at the beginning of the twentieth century. Dewey saw students as members of a society, and thus learning took place both within and outside the classroom. He thought that the community should be involved in education, that education should be as realistic as possible and that education should be designed to prepare students for life roles. Democracy, for Dewey, was more than a form of government; it was primarily a mode of associated living, of conjoint communicated experience (Dewey 1916, 1966 p.87).

Competency-based education programs arose in the United States towards the end of the First World War, as a response to the demands of that country’s entry into the war in Europe. Antecedents of the competency-based education movement were various influences calling for efficiency in education, vocational education, progress in education and instructional technology. The emphasis in these programs was on cost and time efficiency (Grant 1979). In times of crisis in American history at the beginning of the twentieth century, the effects of utility and democracy triumphed over elitist and “nonpractical” concepts of liberal culture and research for research’s sake (Veysey 1965).

Neumann, in an essay among a collection of essays edited by Grant, outlined the development of job analysis and competency-based assessment programs (Neumann 1979). He stated that Frederick Taylor developed the concept of job analysis, which was a systematic analysis and dissection of occupations (mainly trade occupations) into a number of component steps and processes. This concept had important implication for the training of employees. It enabled the demonstration of the most efficient way to carry out a task, as well as the most efficient manner in which to train someone to fill a specific role.

Developing Taylor’s concept further, Charles Allen proposed that a number of blocks could be identified which would each comprise specified skills. The blocks were ranked according to difficulty, and the specification of the blocks allowed students to enter the training process at any level that he or she was prepared for. This process shifted the emphasis from timed learning to individually paced learning regimes. The measure for completion of the learning blocks was mastery of the specified tasks. James Chapman produced a variation of Allen’s ideas in allowing for a predetermined percentage of competence to be incorporated into the assessment of students, in order to allow them to pass onto the next learning task (Neumann 1979).

The emphasis in the training programs to equip the U.S. Army for its entry into the First World War was on jobs as units of achievement, rather than units of time spent at various tasks. This methodology was deemed very successful at the time, and promoted transference of military education approaches into civilian programs. Indeed, Kornhauser who served on committees overseeing the war effort with Chapman, was convinced of the value of trade tests, which he called performance job tests. Kornhauser, in rearranging apprenticeship training, enabled the transfer of military training programs to peacetime industrial education (Neumann 1979).

Franklin Bobbitt promoted the idea of the curriculum, by scientifically defining what was to be learnt. He required the articulation of objectives in terms of real situations related to the workplace. W.W.Charters, one of Bobbitt's contemporaries expanded on Bobbitt's curriculum ideas. Charters considered that personality trait analysis should always accompany an activity or job analysis. He considered that personality traits had as much to do with the performance of a vocation as information or technical skills (Charters 1924), i.e., fitting the person to the needs of the job. Although the emphasis was on industrial and vocational training in the 1920s, inroads were made to adapt competency-based education principles into the education of professionals and other traditional academic areas (Neumann 1979).

Following the Second World War, Miller and Gagne further developed military training systems for civilian use, with an emphasis on arriving at statements of behavioural objectives, or statements of job performance which contained the job description and the degree of mastery expected of the individual completing the job. These were considered critically important in the design of effective instruction. Task analysis, as outlined by Taylor during the First World War training programs, was again used to serve as an instructional goal. Gagne considered that task analysis was the most effective means of instructing individuals to develop motor skills, sequencing skills and problem solving (Gagne 1962).

### *Definitions*

Elliott (1989) quotes the simplest definition of competence from an article by Doll. Doll argued that competence "refers essentially to a state of being or a capacity..." He distinguished between competency and performance, and alluded to personality, when he stated that performance "is the outward and public manifestation of underlying and internal powers" (Elliott 1989).

An amalgam of the ideas of Doll, Elliott and Butler (see later) gives an interpretation of competence, as a capacity to perform specified tasks. The capacity comprises technical elements peculiar to the specified task, and a cognitive contribution from the individual. As the task becomes more developed and complex, a learning component and a function of the individual's personality, reflection, is activated to a greater or lesser extent between the self and the outside world.

Grant (1979) defined competence-based education (CBE) as education that derives a curriculum from an analysis of a prospective or actual role in modern society and that attempts to certify student progress on the basis of demonstrated performance in some or all aspects of that role. Theoretically, such demonstrations of competence are independent of time served in formal educational settings (Grant 1979).

As a specific example in the agriculture area, Sturgess (1993) cited the ( Australian) National Training Board's view of competence as 'the ability to perform the activities within an occupation or function to the standard expected in employment'. He stated that the Australian Institute of Agricultural Scientists (AIAS) was a body "wishing to embrace competency standards" (Sturgess 1993). Such a narrow view of competency would fall foul of the current ideas on competency in that it failed to mention any personal attributes an individual might bring to the profession and the tasks in hand. Sturgess went on to point out the multidiscipline approach to the area of agricultural economics, and the impossibility of regulation for such a complex group, who have contributed proficiently to agriculture in Australia. He also made the point that the proponents of 'competency standards' have not proven the case that the present system of operation, without bureaucratic regulation of competencies, is lacking (Sturgess 1993). Following the publication of Sturgess's comments, the AIAS policy was changed to reflect the sentiments outlined by him.

Deer drew a distinction between "competence" and "competency". She accepted a definition of "competence" given by Walker (cited in Deer) as the attributes (knowledge, skills, attitudes) which enable an individual or group to perform a role or set of tasks to an appropriate level or grade of quality or achievement (i.e., an appropriate standard) and thus make the individual competent in that role. However, "competency" is defined as the ability to perform the activities within an occupation or function to the standard expected in employment (Deer 1993). These hairline distinctions and poor "auto-definitions" were used in referring to teacher competencies in New South Wales. The very narrow difference seems to be whether or not there is any reference to employment- an unfortunate intrusion of politics into the debate that trivialized a serious question.

It is unfortunate that some of the more relevant differences (outlined below) between education and training were not seized upon by educators in Australia, and inculcated into a regime of more reflective industrial progress. Grant's definition seems to have stood the test of time as it kept the door open to all philosophical points of view in referring to the "performance of a role"- performance being more than just the technical outcome.

### *Training and Education*

In the early 1960s, Glaser was the first to make a distinction between "training" and "education". The process of "training" inferred the idea of a tightly specified process, while the process of "education" inferred an idea of a more-complex process in which the end-product was harder to specify. The student is educated by the provision of

approximations to the eventual behaviour it is hoped that he or she will be able to perform (Glaser 1962). Butler and Elliott developed these ideas further.

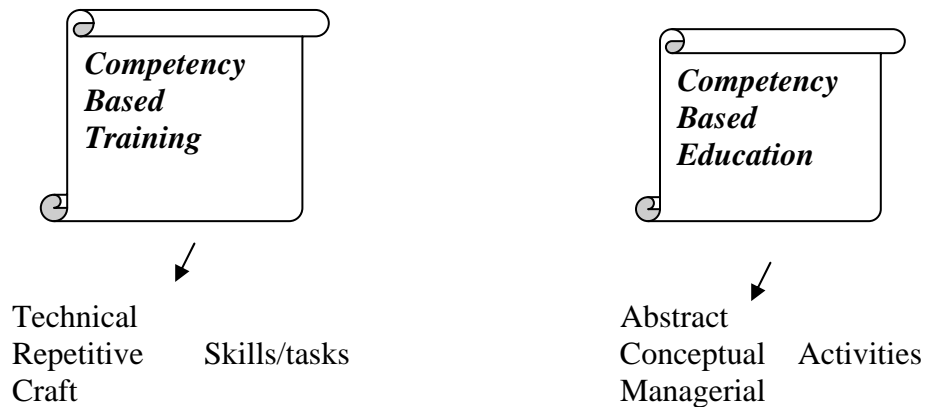


Fig 1. The difference between **CBT** and associated tasks and **CBE** and associated activities

Butler proposed the view that learning is a self-directed process. Training, on the other hand, is a prescribed course of improvement in specific performance skills. He quoted Watkins and Marsick, (1992, p.228) ‘organizations have found that training is not enough to meet the demands of continuous learning’, because the learning process is facilitated by reflection. Butler defined reflection as the “open, active communication channel between the outside social context and the inner self”. Butler gave the example that educators, in order to perform more effectively, needed to learn continually, rather than be trained (Butler 1996).

The acquisition of competencies in general, is a cognitive activity. It requires a positive frame of mind, goal-orientated effort and input (reflection) from the individual, the self (Boud 1988). In so doing, it allows the individual to assume an active responsibility for the learning process, rather than being a passive recipient of training (Butler 1996). Educators might point out to their students the value of taking the responsibility for their own continual learning process, so that students become active in their own endeavours rather than passive recipients of information.

Dewey, as far back as 1916, considered that reflection involved an integration of attitudes and skills in methods of inquiry, and that neither attitudes nor skills alone will suffice (cited in(Boud 1988 p.21)).

Butler has put forward a model of human agency or interaction to demonstrate the links between reflection, knowledge, action and the self. Reflection, the learning process in the realm of performance, stands between the known and the unknown, the self and the social surrounds. In the learning (reflective) activity, on a continuum from novice to expert, we review processes to see if desired goals have been achieved; we endeavour to make learning visible to bring it into consciousness; to connect and complete learning cycles in

our lives; to give more considered responses to events; to give meaning to actions; to improve performances and self, and to improve our competence along the path from novice to expert (Butler 1996).

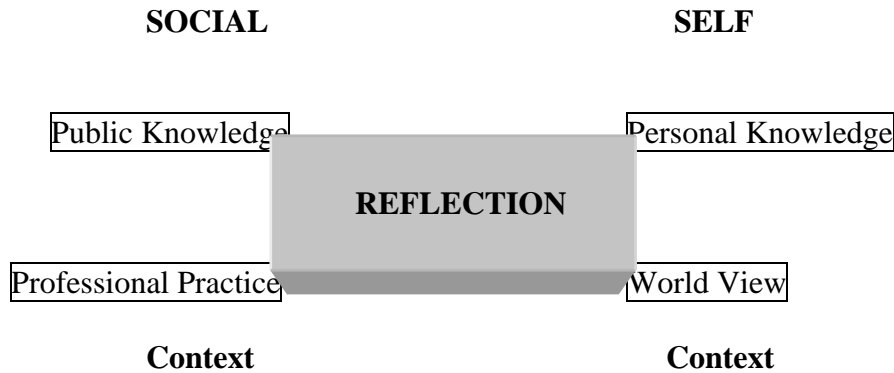


Fig 2. The components of the model of human interaction (after (Butler 1996))

Elliott, like Butler, argued that different levels of competency reflect different kinds of powers and capacities. In respect of teacher education, for example, Elliott stated “that ... ‘reflective practice’ competence resides in a teacher’s capacity to control his or her performance through self-monitoring”. Despite lesson plans and conscious performance-related decisions, all may not go according to plan in the classroom. For example, teaching performance may be affected by motivational and emotional states. A teacher may, or may not be aware of these. In this environment, personal qualities (personality) of the teacher (not to mention the students) will affect the performance outcome (Elliott 1989 p.81). In this classroom example, personality is an integral part of the competence involved in teaching.

Extending this argument, personality is an integral part of the competence involved in any occupation that requires ‘reflective practice’ and self-monitoring. For example, a dairy farmer, working autonomously on the farm would need to reflect on his or her practices in the managing of milk quality, the cropping and feed management aspects of the farm, as well as financial risk management for the whole farm enterprise. This reflection and self-monitoring is necessary because of the continually changing circumstances of weather and climate, farm input prices, government policies, milk markets etc. The reflection and self-monitoring undertaken by the farmer will mirror his or her personality, and be represented in his or her competence in managing the dairy farm.

At another level, that of craft or repetitive skills, the source of competence resides in the capacity for processing contextual and situational information as a basis for performance, a different capacity from self-monitoring in conceptual thinking (Elliott 1989).

According to trait theory, personality traits are genotypically determined, and stable. Dewey, Charters, Butler and Elliott, all argue that as well as technical ability, personal

inputs are important contributors to performance. It is an hypothesis of this project that a dairy farmer's competence in the financial risk management of his or her dairy farm is a function of the acquisition of the required technical skills and his or her personality. Any professional development by any farmer with respect to financial risk management, or any other group of tasks would involve not only improving his or her technical expertise, but also the expression of appropriate motivations (conscientiousness) and attitudes to acquire the required technical knowledge. As Dewey indicated (above) one does not go without the other.

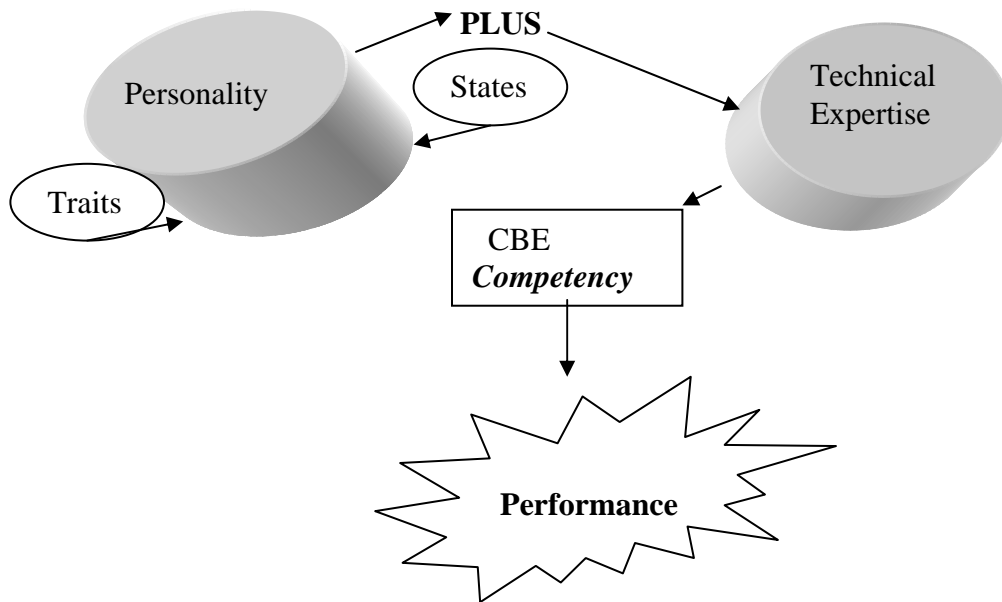


Fig 3. The relationship between Personality, Technical Expertise, Competency and Performance.

### *Generic Competencies*

Taylor's concept of job analysis referred primarily to more simple, repetitive tasks that an infantryman or Army tradesperson might perform. For example, stripping a rifle. In more complex situations, the detailed description of all of the parts of a job analysis is an onerous task, if not impossible in some circumstances. For example, to describe all of the steps needed by a veterinarian in an obstetrical intervention to calve a cow, for all possible eventualities, would be a never-ending task, making the practicality of such an analysis useless in the field.

Elliott has described one way to overcome the difficulties of complexity and description of intricate tasks - the development of generic competencies for occupations and professions (Elliott 1989). Generic competencies are broad clusters of abilities, (including personal qualities) which are conceptually linked, and few in number. This methodology has several advantages.

- It avoids bias, which accompanies intuitive assessment of personal qualities.
- It avoids the compilation of checklists of dozens of specific skills.
- It avoids or minimizes personal prejudices, which operate in intuitive selection of criteria for assessment of the competency involved.

The use of generic competencies accomplishes the above advantages by having a number of people involved in the appraisal process and crosschecking the assessments of the assessment team.

In the situation of the newly deregulated dairy industry in Australia, many farmers certainly have the technical expertise to operate their farms efficiently, in a technical sense, but lack the managerial skills required to administer the whole farm enterprise, which would include more abstract tasks such as financial risk management. This situation has arisen from the emphasis placed on farmer training (technical expertise accomplished through CBT), rather than farmer education (expertise accomplished through CBE). Education seeks to encourage the acquisition of more abstract conceptual skills requiring reflection, commensurate with a much broader understanding of the issues involved, as in the dairy industry, at the farm level (non-systemic risk) and at the industry level (systemic risk). One of the hypotheses of this project is that only dairy farmers with particular personality traits, values and attitudes can make the transition from technical competency to managerial competency.

The major problem with the use of generic competencies is in assembling a sufficiently large qualitative database from which it is possible to make valid conclusions.

#### *Competency-Based Education in Australia*

While the principles of competency-based education had been outlined and thoroughly developed by the Americans early in the Twentieth Century, many educators in Australia were reluctant to embrace the Australian notion of CBT because of the narrow, behaviourist, outcomes-focused approach of CBT to vocational training (Chappell 2000). The educators' attitudes were parallel to the ideas of Glaser, Butler and Elliott, which were espoused later in this debate, and cited above.

Following the Deveson Report, more inquiries and committees were convened to address the issue of Vocational Education and Training (VET) and CBT. The Mayer Report of 1993 developed a set of seven key competencies at three performance levels (broad clusters of abilities). It was recommended that these competencies should be embodied in all education and training credentials for all candidates for employment at specified levels. (Mayer 1992). While for the educators this was a step in the right direction towards a more humanist approach, it still did not go far enough. Further work by Gonczi, Hager and Oliver proposed that competency description should place outcomes on an equal footing with the underpinning attributes of individuals performing the specified tasks (Chappell 2000).

In response to students being encouraged to stay at school longer over the past twenty years in Australia, Carmichael, (1993) in a paper published by the Australian College of

Education, outlined the challenges that longer school participation produced for the provision of post-secondary vocational and higher education. These challenges were in the form of the computer-based technology revolution, globalization of world markets, awareness, understanding and legal accountability about the environmental and social effects of industry, and the emergence of new ways of working in teams with interactive participation and greater accountability for performance (Carmichael 1993). In making these observations, Carmichael (from a trade union background) seemed more aware of the realistic challenges of educating young school-leavers. He demonstrated more insight into the education requirements that Australians would need than many of his contemporaries in positions to influence education policy and reform in Australia. It seems that he foresaw that competitiveness was moving into the Australian economy from the influences that he outlined, and thus there was a need to change the way Australians were being educated, to take a turn towards education, rather than continue on with the existing training agendas.

In the 1990s, CBT was discussed primarily in relation to trade and industry training, traineeships and apprenticeships within industry, in areas where motor skills were being assessed with respect to a prescribed knowledge base. Competencies in the workplace, or benchmarking in the workplace, were starting to be used to determine industrial awards, workplace agreements, wage rates and selection for promotion (Dawkins 1989). Competencies or benchmarks were seen as the standards for the workplace, which the education process had to meet. The other areas of discussion about CBT were in relation to the assessment of immigrant professionals' qualifications for registration of those qualifications in Australia, and in learning English as a second language.

Later in the 1990s, CBT was starting to be used in professional continuing education, for example in nursing and medicine. In these areas, individual's motor skills, which could be objectively observed, were important as well as the body of knowledge and other attributes (including personal inputs), which were implicit in applying those skills (Masters 1990). This situation illustrates the merging of Competency Based Training and Competency Based Education.

#### *Criticisms of CBT and CBE in Australia*

The criticism of CBT in Australia focused on the narrowness of the behaviourist approach, in that training (as opposed to education) would be "responsive to the needs of individual existing industries"(Martin 1992). These criticisms were not new. Dewey wrote of the "philosophic dualisms" surrounding leisure and culture, theory and practice and mind and body (Dewey 1916, 1966 p.307). For Dewey, the opposite of a career was "aimlessness, capriciousness, and the absence of cumulative achievement in experience", whereas a vocation indicated a "direction of life activities as renders them perceptively significant to a person, because of the consequences they accomplish and also useful to his associates" (Dewey 1916, 1966). The debate in Australia centred on the behaviourist and humanistic schools of thought – a debate that had been active for most of the Twentieth Century. However, the critics seemed unable to cast off the shackles of the behaviourists and broaden their view of CBT to Competency-Based Education.

The behaviourist approach centered on a highly controlled learning environment. It ignored the non-technical aspects of performing a workplace task, such as being able to communicate effectively with fellow workers, working in a team, and decision-making abilities – activities crucial for effective management. All competencies needed to be defined so that they could be measured. More complex tasks that involved the worker to use different, interacting knowledge bases limited the behaviourist approach. These were very difficult to describe in such a way that they contained all of the necessary elements.

Other criticisms were that, in defining the competency, there was little or no margin for individual variation in the performance of that task. In this way, CBT became very objective, or outcome-only oriented, leaving very little room for subjective expression by the individual worker. Further, in being able to modularize the training process, the individual became more important than the group, in which he or she worked – a concept being superceded by group working practices in contemporary workplaces (Foley 2000).

In retrospect, it seems that much was lost in Australia over the past twenty years, in not building on the earlier American and Australian literature on Competency-Based Education and Training. The topic of CBT was complicated by political issues about the possible transference of power from teachers to employers and managers (Jackson 1993). While the American competency-based education systems of the early Twentieth Century may not have been perfect, Australian bureaucrats, theorists and some researchers lost valuable time with their protest reaction, rather than taking a lead in the development of education and training as outlined by Laurie Carmichael.

#### *Competency-Based Education for Farmers in Australia*

The Report of the Review of Agricultural and Related Education (McColl 1990), does not specifically discuss Competency-Based Education or CBT. However, the opening paragraph of Chapter 4, p.31, states that “Agricultural and related education services employer and community needs, and it is important that such needs be identified if the education provided is to be relevant”. In view of previous discussion, this statement identifies one of the main objectives of Competency-Based Education and Training.

This Report also indicated that participation by the agricultural sector in post-secondary education was low, despite the fact that agriculture requires an increasingly skilled, innovative and entrepreneurial workforce. This was partly due to small, fragmented teaching faculties. Such circumstances were not conducive to meeting emerging challenges. The report recommended a consolidation of agricultural education providers that would, among other things, have greater flexibility in responding to changing community requirements (McColl 1990 p.111-12).

The Agrimark Survey, a supporting document to the above Report identified a number of deficiencies in graduates from their survey of private and public sector employers (Agrimark 1990). This again implies a competency-based methodology of assessment.

These sentiments were echoed by Reeve et al, in calling for a change in agricultural education from a production-oriented core (to which other pieces of content were added

when it seemed that there was a need from industry) to a more innovative approach cognizant of the environmental impact of new products and processes, business management, and new technology (Reeve 1990). Again, these statements infer the principles of Competency-Based Education and Training.

Archer and Catt (1998) have clarified the data illustrating the age and educational status of Australian farmers. The two main sources of figures for statements made in these areas are the Australian Bureau of Agricultural and Resource Economics (ABARE) and the Australian Bureau of Statistics (ABS). The two sets of data are derived from different samples, which are compiled from different questions and categories in each sample. These authors stated that the average age of farmers hovered around 46-48 years from 1961 – 91 from one set of figures, and around 50-54 from the other set of figures for the same time interval (Archer 1998).

While acknowledging that the formal education level of Australian farmers is not high (15% in 1991), Archer and Catt stated that taking into account ‘recognition of prior learning’ as outlined by the National Training Agenda, the human capital assets of Australian farming are considerable. They also stated that “it is misleading to interpret lower levels of formal education as indicating that the Australian rural workforce is less capable than in other countries” (Archer 1998). These emotive remarks were reactive to the political agenda at the time (a Federal Election) making an objective assessment of the human capital assets of Australian farming difficult, and showed little understanding of the challenges facing farmers, which were mainly in the managerial arena, not in technical expertise.

## *Personality*

### **Introduction**

A suitable metaphor for understanding personality is the art and science of weather forecasting. We know that the weather in Cairns is different from the weather in Sydney. However, from year to year, the weather pattern in Sydney is fairly consistent, such that the hottest time of the year is January-February, and the coldest time is July-August. Similarly, there is a fairly consistent yearly weather pattern in Cairns. The difficulty for the Weather Bureau is in trying to predict any variation in the overall established weather pattern. And the bigger challenge is in trying to specify and predict the timing of those variations.

Personality traits of individuals can be likened to the yearly weather patterns of regions – fairly stable from year to year. The situational effects on the variability of personality can be likened to the variation that occurs in the weather of a particular region on a daily basis, but is within the bounds of the expected yearly pattern. Like a weather forecaster, this project will be looking at both the stable and the more variable aspects of the

behaviour of dairy farmers to determine the indicators for competency in the financial risk management of their dairy enterprises.

There is a range of characteristics from the stable traits of personality to the other unobservable, more variable mental states such as values, needs or attitudes, which influence behaviour. The term “disposition” expands as we move on a scale away from more consistent traits towards more variable states, e.g., situational influences, at the other end of the scale. (House 1996). See Fig 1 below.

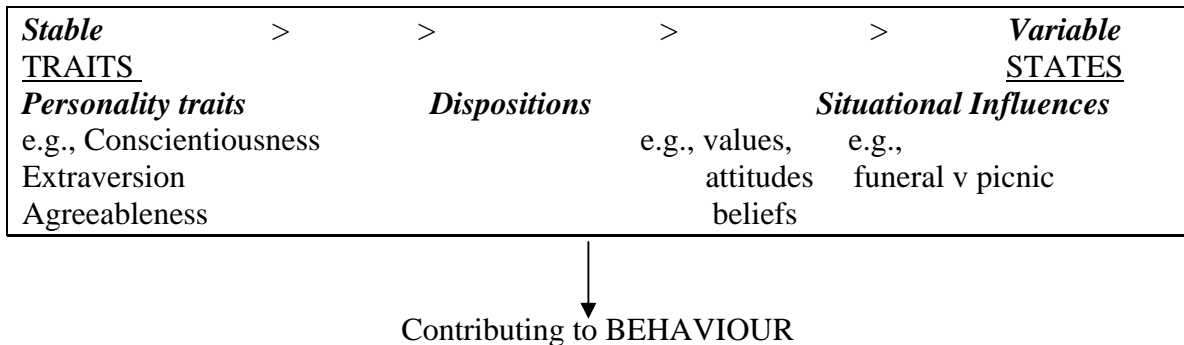


Fig.4 Stability/Variability Scale showing the relative influence of stable traits, and the more variable dispositions and situational influences on behaviour.

Trait theorists hold that traits are genetically influenced and stable over time. However, no normal person exhibits totally rigid, absolutely repeatable behaviour. This paper also describes the more variable personality states that influence people’s behaviour, from which we can make inferences about the contribution of attitudes, beliefs, values and other variable factors to their personalities.

These two positions are not contradictory. Rather, they are complementary and interactive, filling out the full spectrum of personality.

Situationists claim that a person’s behaviour or intentions is governed mainly by stimuli present in the environment at the time (Endler 1976). Trait Theorists, and Dispositionists hold that traits and dispositions, innate in the person, affect behaviour, responses and intentions across situations. Traits, dispositions and situations all contribute to behaviour. The difficulty lies in attribution. How much of an observed behaviour is influenced by a person’s personality traits and disposition, and how much by the situation operating at the time? The contributions of each are interactional and relative rather than exclusive of the other (House 1996).

Malloy and Kenny (1986) stated that the correct methodological approach to the study of personality must recognize that behaviour is a simultaneous function of the person, the situation and their interaction (Malloy 1986). The examination of these ideas is not new – it is the old problem of reconciling the more stable part of personality (traits) with the variable aspect of personality (states), both of which we intuitively know exist concurrently.

### *The Language of Personality*

Personality is a term used in the vernacular to express the group of intangible positive characteristics, such as temperament, sense of humour, social grace, manner of speaking, and approachability perceived by others as belonging to a particular individual, but, by implication, not necessarily to all individuals, in the same measure. The terminology is ubiquitous and familiar to all in the community.

Saucier and Goldberg talk of the wisdom embedded in natural languages, and the subset of terms referring to individual differences, in the common stock of words. They pointed out that the language of personality, in describing attributes, provided a framework for description, not explanation, referring to phenotypes, not genotypes (Saucier 1996). Allport and John noted approximately 4500 trait descriptors for personality in the English language. This is evidence for the social importance of the discussion of personality traits among the community. (Cited p.84 in (McCrae 1992).

### *Rationality*

Rationality implies that people generally understand themselves and those around them and act in ways that are consistent with their conscious beliefs and desires. Personality discussions are rational in that subjects are asked directly to describe themselves (in natural language) and interpret the responses more or less literally. There is cumulating evidence for the accuracy of self-reports of personality attributes and their convergence with lay-observer ratings and expert ratings (McCrae 1996).

### *Definitions*

There is no clear, universally accepted definition of “personality”.

McClelland observed that personality is the most adequate conceptualization of a person’s behaviour in all its detail (McClelland 1951). Guilford described personality as a person’s unique pattern of traits, while Allport defined personality as the dynamic organization within the individual of those psychological systems that determine his/her characteristic behaviour and thought (Guilford 1959 p.5), (Allport 1961 p.28). It was not until Zuckerman’s definition of personality in 1991, that the concept of personality implying some degree of consistency of behaviour over time and some degree of consistency of response across situations, became established among psychologists. (Zuckerman 1991).

Maddi defined personality more formally as a stable set of tendencies and characteristics that determine those commonalities and differences in people’s psychological behaviour (thoughts, feelings and actions) that have continuity in time and that cannot easily be understood as a product of the biological and social pressures of the moment (Maddi 1996).

Pervin defined personality as the complex organization of cognitions, affects, (evaluations) and behaviours that gives direction and pattern (coherence) to the person’s

life. Like the body, personality consists of both structures and processes and reflects both nature (genes) and nurture (experience, situations). In addition, personality includes the effects of the past, including memories of the past, as well as constructions of the present and future (Pervin 1996).

Matthews and Deary (1998), when writing about personality traits indicated that everyday conceptions of personality traits assume that traits are stable over time and that traits directly influence behaviour(Matthews 1998).

The ideas defining personality have stabilized over the past decade indicating stability of traits over time and in different situations.

### *Theories of Personality*

A discussion of the numerous theories of personality that have been proposed over the past Century is beyond the scope of this project. However, there are a few points, which should be considered.

Students of personality tend to study groups of people to examine not only their similarities, but also their individual distinctions. The study of individual distinctions can be observed, measured, and considered in an objective way in a group of subjects, because differences are more easily observed. Similarities are not as obvious, so their interpretation is more abstract and interpretive (Maddi 1996).

The pre-eminence of Freudian psychoanalysis was essentially over by the end of the 1970's. The study of personality since then has progressed with the adoption of scientific methodology, based on conceptual insights of the past and contemporary empirical research. (McHugh 2000). For example, in the 1970s, Beck developed a program that he called Cognitive Behaviour Therapy that systematically attempted to correct the self-defeating attitudes and assumptions that provoke demoralization (McHugh 2000).

Nuthall has proposed that Cognitive Behaviour Therapy could be used to modify farmers' thinking and actions with respect to improving managerial ability. The process would involve improving the existing general competencies of farmers, rather than simply adding to their list of skills through additional time-based education and refresher courses.(Nuthall 1999). Competency in any particular area of expertise implies an analysis of a prospective or actual role in society as the basis for learning a skill, a certification based on demonstrated performance, and a lack of a time limit for achieving required skill levels(Lees 1991). Competency will be discussed in more detail below.

### *Personality Traits*

Ajzen defined a personality trait (rather circuitously) as a characteristic of an individual that exerts pervasive influence on a broad range of trait-relevant responses. Assumed to be behavioural manifestations of an underlying trait, people's responses are taken as indications of their standing on the trait in question (Ajzen 1988 p.2). Brody went further: "I assume that personality traits are causal. They are genotypically influenced latent characteristics of persons that determine the way in which individuals respond to the

social world they encounter.”(Brody 1994) In other words, behaviour is influenced by traits, which are stable and consistent over time. That traits directly influence behaviour and are stable over time, is the central focus of trait theory. “... If there is a specialty called personality, its unique and defining characteristic is traits” (Buss 1989).

Traits also contain genotypic inferences that invoke some explanation of behaviour. Thus trait theory explains the consistency in individual differences. It is a commonsense observation that different people react differently to the same stimulus, but that the individual response to that stimulus will be consistent for that individual over time. “The same fire that melts the butter hardens the egg” (Allport 1937). This simple observation is of paramount importance in framing legislation, social planning, and education (McCrae 1996).

Bearing this in mind, resolution of industry problems where the industry constituents are individuals (often the case in agriculture) with blanket solutions is undesirable, since such action produces as many different outcomes as there are individuals for whom the solution is sought. One of the conclusions of this project is that, in order to make the best use of resources, it is important to understand the personalities and competencies of the stakeholders to ascertain their capabilities, (since both personality and theoretical knowledge contribute to competency) as well as the intricacies of the allocation of resources.

In allowing for individual differences with a range of solutions, the desired outcome is more likely to be achieved. For example, in the newly deregulated dairy industry, if 30-40% of dairy farmers are predicted to leave the industry as a result of deregulation, then the problem for a large proportion of the industry constituents is one of the Dairy Industry’s and policy maker’s not understanding the competence or capacity (= technical ability + personality) of the dairy farmers in the industry before embarking on deregulation.

### *Consistency of Personality Traits*

Early in the twentieth century, psychologists were of the opinion that personality was consistent throughout life. This assumption flowed from the idea that traits were the constituents of personality. The concept was guided by an essentially 19<sup>th</sup> Century view of science, in which it was considered that personality traits could be measured, in much the same way that a physical object could be measured or weighed (Mischel 1999).

However, the idea of consistency of personality over time was challenged and has been debated over much of the past century. In 1968, Mischel (Mischel 1968) concluded from earlier studies by Hartsthorne and May, and Newcombe (cited in Mischel p.428 (Mischel 1999)) that situations had a greater bearing on the individual’s behaviour than did an inherent personality.

Trait theorists countered by seeking indicators that were agreed-on basic units of personality description, and by undertaking longitudinal studies that might provide

empirical evidence for stability over time. This resulted in the emergence of the Big Five traits (neuroticism, extroversion, openness to experience, agreeableness and conscientiousness) (Wrightsman 1994 p.160).

Following the research of Tupes and Christal in the 1960s, which Costa and McCrae developed further in the 1990s, trait theory matured towards the end of the 20<sup>th</sup> Century. The development of the Five-Factor Model of Personality by Costa and McCrae in the 1990s has seen a common theme and purpose develop in personality research which was absent until then.

#### *Background to the Five-Factor Model*

In 1959, Fiske identified five factors from three sets of previously collected data. Fiske's five factors were social adaptability, conformity, emotional control, inquiring intellect, and confident self-expression. His five factors were consistent across three different sources: self-ratings, peer-ratings and supervisor's ratings. Although reported in a well-regarded journal, his findings were largely ignored (Matthews 1998).

"Recurrent Personality Factors Based on Trait Ratings" was the title of a paper produced by Tupes and Christal in 1961 in a relatively obscure United States Air Force technical publication. It was republished in the Journal of Personality in 1992 (Tupes 1992) and was described by McCrae in the editor's introduction as ... "undoubtedly the pivotal work that summarized and crystallized previous research and laid the foundations for future elaboration on the five-factor model (McCrae 1992).

Tupes and Christal's study was initiated after a conference sponsored by the Directorate of Personnel Research of the US Air Force, where participants indicated that the existing interest and personality inventories had little, if any, validity for the prediction of success of officer candidates, either in officer training, or after graduation from the officer training course (Christal 1992). Tupes and Christal investigated the factorial structure of personality trait ratings in six samples, which varied with respect to raters, length of acquaintanceship of the subjects, and rating situations. Five, clearly defined personality factors were found in each analysis. They concluded that the factor structure of personality trait ratings is sufficiently invariant that such trait ratings might be regarded as adequate criteria for the study of personality differences and for test development purposes (Tupes 1958) cited in (Christal 1992).

In 1959, Tupes conducted a study demonstrating that the factor structure of peer ratings of personality traits of senior officers closely resembled that of junior officers. He also reported high similarity in the relationships of the personality traits to Officer Effectiveness Reports collected on junior and senior officers. He concluded that any officer selection program, which screened on personality variables applicable to junior officer success, would also select for traits characteristic of senior officer success (Tupes 1959) cited in (Christal 1992).

In this study, it is hypothesized that the FFM can be used to assess the personality traits of dairy farmers, that these traits can be related to financial risk management

competencies and to the objective financial standard of gross margins per cow from existing Q-DAS data, in much the same way that Tupes' 1959 study related personality traits of junior and senior officers to an objective statement of officer effectiveness.

By the early 1960s, it was clear to Tupes and Christal that the five-factor model was a stable representation of the personality domain (Christal 1992). However, this understanding was to stay outside the mainstream of personality studies for the next thirty years.

### *The Five-Factor Model of Personality*

The Five-Factor Model (FFM) is a version of trait theory. It defines the essence of human nature in individual differences (McCrae 1992). It is a consensus of five fundamental and recurring factors, and has assumed a dominant place in the field of personality assessment because similar five-factor solutions to the problem of personality have been arrived at from disparate sources - the lexical approach, the studies based on questionnaires and from psychometric and theoretical issues (Matthews 1998).

Nearly all the constructs measured by personality scales and inventories can be interpreted as aspects of one or more of the five factors.

The factors of the FFM are Neuroticism (N), Extraversion (E), Openness to Experience (O), Agreeableness (A), and Conscientiousness (C). By selecting scales to measure each of these factors, a full portrait of an individual may be obtained at a global level (Costa 1991).

Just as the compass points give some reference markers to the information contained on a map, given standard orientation of the map, so too does the FFM give orientation to personality structures in natural languages and personality inventory questionnaires. Costa and McCrae's justification for this analogy was that the FFM demonstrates its psychological reality through stability over time and cross-observer validity. It pervades the trait systems of laypersons and personality theorists, recurs in many different cultures, and has a biological basis (Costa 1992).

The FFM carries an explanatory, as well as a descriptive implication, since Costa and McCrae include traits in their list of Basic Tendencies which ... "may be inherited, imprinted by early experience or modified by disease or psychological intervention, but at any given period in the individual's life, they define the individual's potential and direction" (McCrae 1996 p.67-68).

### *Personality States*

When speaking of personality as a whole, however, there is a range of characteristics from the stable traits of personality, discussed above, to the other unobservable, more variable mental states such as values, needs or attitudes, which influence behaviour.

Mischel and Shoda (1995) established that a personality state refers to the pattern of activation among thoughts and affects (evaluations) at a given time. A personality state depends on the context and the psychological situations experienced by the individual at

that time. The whole personality system of the individual may remain stable across situations, but the personality state changes when the situational features that affect that individual change.

These situational factors may be presented in a different manner, or may have some emotional factors attached (Mischel 1995). For example, Farmer A may be quite at ease when talking over the finances of the farm with her bank manager, but very agitated when having the same discussion with her accountant. This variance in behaviour illustrates the effect that different situations have on this individual when she is engaged in essentially the same process.

As noted above, there is debate over the importance of traits and dispositions, on the one hand, and the importance of situations, on the other hand. The contributions of each are interactional and relative rather than exclusive of the other (House 1996). How much each contributes to a specific behaviour is very difficult to determine. Malloy and Kenny (1986) stated that the correct methodological approach to the study of personality must recognize that behaviour is a simultaneous function of the person, the situation and their interaction (Malloy 1986).

Shoda et al. (1994) reported the finding of meaningful, stable situation – behaviour profiles. These profiles are characteristic intraindividual patterns consistent with the way a particular person relates to different psychological conditions. These patterns form a sort of behavioural signature that reflects personality coherence (cited in (Mischel 1995)). In the above example, it could be that the farmer's behaviour is different, but uneasy on every occasion she meets her accountant. This difference in behaviour in the same situation will be coherent behaviour for that individual.

As discussed earlier, and from the studies of Bouchard et al. (1990) comparing identical and fraternal twins, there is ample evidence that personality traits have genetic origins (Bouchard 1990). These authors showed that genetic inheritance repeatedly accounted for an average of 50% of variance of personality traits of identical twins reared apart. People learn through life experiences, and what is learned is guided by genetic predisposition to a considerable degree (House 1996).

The evidence stated above supports the hypothesis outlined earlier, that some dairy farmers will have an innate competency for financial risk management or will have the capacity to acquire financial risk management competency, and that the possession or acquisition of this competency will be substantially dependent on the personality of the individual.

Psychologists refer to “strong” and “weak” situations. For example a person's behaviour at a funeral would differ from the same person's behaviour at a picnic. The funeral would be classed as a strong situation, and the picnic as a weak situation. The strong situation of the funeral imposes behavioural bounds on attendees because of the constraining circumstances of the formality of the proceedings, the grief of friends and relatives etc. The weak situation of the picnic has no similar constraints.

Monson, Henley and Chernick (1982) and Lee, Ashford and Bobko (1990) cited in (House 1996) have demonstrated that behavioural expression of personality traits is most predictive in weak psychological situations. Again, in the above example, a person is more likely to express his or her personality traits at the picnic rather than at the funeral because of the constraints imposed by the solemn situation of the funeral. As stated above, different people behave in different ways in different situations, and as demonstrated by the example of the funeral and the picnic, the manifestation of a particular disposition may be activated by situational circumstances. These links should be identified and dispositions examined in different situations (House 1996).

No normal person exhibits totally rigid, absolutely repeatable behaviour. States describe the more variable factors that influence people's behaviours. From a person's behaviour we can make inferences about these states, i.e., their attitudes, beliefs, and values. Combining this knowledge with knowledge of their personality traits, we can then form a "global" picture of their personality.

Further work in this area will involve assessing the personalities of dairy farmers and their competencies in financial risk management, then relating these assessments to objective financial data that has been collected for their dairies, and either specifying their suitability as financial risk managers, or recommending either education or out-sourcing beyond a certain level of competence.

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