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THE DEVELOPMENT OF TALENT IN ADULTS

A THESIS PRESENTED IN PARTIAL FULFILLMENT OF THE
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ABSTRACT

Giftedness and talent in children has been a significant area of research and endeavour in education over nearly a century and there is a large body of literature on the subject available to researchers. However this is not the case for adult talent and the actual process of talent development in adults has not been explored in any depth, indeed it has been ignored to a certain extent in academic research. Additionally it seems to be assumed that the process of talent development in adults is the same or very similar to that in children. One of the central foci of this study is the proposition that talent development in adults does not follow the same process as that in children, indeed in many aspects it is quite different. Adults are not merely older children who perceive, judge and act in the same ways that children do and so why would they develop talent in the same way or for the same reasons that children do? The question is also asked as to whether an adult would have to be gifted in order to develop talent? In this study the life paths of a small group of talented individuals were investigated and major causal and a-causal influences identified in their histories. A form of enquiry was developed that focused on synthesising the various influences so as to interpret the process of talent development. This was termed *Critical Life Path* analysis and by using quantum and systems notions a description of life path processes was attempted. The *Critical Life Path* is viewed as a holistic, interconnected process in which the outcomes are determined by the combinative effects of critical influences identified by the participants and genetically based patterns of preference that resulted in timely and efficacious patterns of behaviour. These patterns of thinking and action enabled the individuals to increasingly construct supportive and special environments that were synchronous with their proposed inherited patterns of preference and to progress rapidly and effectively along unique paths of talent development.

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CHAPTER 1

INTRODUCTION

The concept of talent development is increasingly being established in education as a legitimate area of research and endeavour, both practical and theoretical. The development of talent in adults however is not a process that could be considered a mainstream area of educational research. Within the internationally published literature to date, very few studies have been carried out that specifically deal with the process of the development of talents by adults.

In late 1995-96 a small number of articles and studies that have some relevance and which indicate a changing orientation in the field from giftedness and the possession of gifts, to a talent development approach, were published. In one such study, Reis (1995) examined the lives of 12 older women, who after the age of 50 achieved eminence in their particular fields and from the data a model of talent realisation was developed. This situation of a developing paradigm, a lack of research on adult talent development and some indications that there could be a developing focus, provides a platform for study of the adult talent development process and poses some questions regarding the phenomena.

What is Talent Development?

In this study of adult talent development there are a number of issues and foci. The primary issue concerns the two questions of what is talent development in adults and how can it be described. Secondary questions concern what talent actually is and is the process the same in adults as in children. Other issues concern the use of terminology, the roles of nature, nurture, intelligence and personal characteristics. Add to this environmental contexts, learning, practice effects, people, events and processes and the mix

becomes quite complex. The problem was to identify and establish the relative importance of factors in the talent development process, from this to establish the critical influences and then to place these in a framework which could provide both description and some degree of explanation.

One of these issues was the distinction between the terms gift and talent which will be a theme developed in subsequent chapters. For the interim it is necessary to point out that the terms are often used synonymously in literature and discussion. The orientation to talent as a construct in the initial part of this study, is that it will be viewed as a dynamic, developmental process, not necessarily with any indications of precocious possession of aptitude. Giftedness on the other hand will be viewed as a static construct - a set of possessed characteristics that are evidenced as precocious behaviours, not necessarily with any indications of developmental processes of any significant kind. The use and conceptualisation of the two main terms in the area, 'gift' and 'talent', and their derivations, have served to maintain a confusion in the area of study and endeavour. Since 1985, Gagne in particular has investigated the problem of inconsistent use of terminology in this field and makes a strong case for some clarification and consistency as a precursor to further development and research in the field. Gagne's ideas will be discussed in terms of application to this study in subsequent chapters.

What talent is and how it can be, or is developed by adults, could become a significant area of endeavour, practically, theoretically, and by way of substantive research in education. A primary concern of any society must be the development of expertise, the generation of knowledge and ideas, and the achievement of excellence, and the most able individuals in that society provide a significant portion of the impetus in these areas. In science, technology, the arts, education, sport, industry, culture, business and commerce there is ample evidence of talent and talented individuals who are older adults, with a case in point being the Nobel Prize and its many older adult winners. In many instances these individuals may not have previously manifested well developed talents in

any particular field or in any particular way at a younger age but have become recognised as high level performers in their fields later in life. What these talents are is perhaps easier to ascertain than actually finding out why or how the developmental path of the eminent performer differs from the ordinary individual, or indeed from the precociously talented individual who does not proceed further. This same problem is recognised in studies related to the gifted and talented child, such as the study by Tomlinson-Keasey and Little (1990). In this study a number of points are raised:

The fact that many children who have been identified as gifted are not realising their intellectual potential has become a matter of public concern (DeLeon and VandenBos, 1985). In 1972, the U.S. Office of Education noted that ' We are increasingly being stripped of the comfortable notion that a bright mind will make its own way' (p.1.) A decade later, Gardner (1983) headed a commission to evaluate the nation's schools. In a report titled ' A Nation at Risk', the commission proclaimed 'Over half the population of gifted students do not match their tested ability with comparable achievement in school.' (p.8.) (p442)

The focus in this case is on intellectual giftedness and the expectation is that early evidence of giftedness should make for later success. Tomlinson-Keasey and Little (1990) however, argue that this is not necessarily the case and that:

One might reasonably argue that finding any significant paths over a 40 - year period is surprising. Despite the significance of these paths, the results certainly indicate that adult Intellectual Skill, Educational Attainment, Occupational Achievement, and Personal Adjustment are not highly canalised and that a variety of other variables and experiences at different points during development may well have a significant impact on the adult's development. (p454)

The observation that "...other variables and experiences at different points during development may well have a significant impact on the adult's development." (Tomlinson-Keasey and Little, 1990, p454) is a theme that is a central focus in this study.

The title of an article by Marjoram (1995) "Growing up Gifted: To Everything There is a Season" indicates a very relevant avenue for research

into the development of talent in adults and provides some directions for the problems outlined by Tomlinson-Keasey and Little (1990). Marjoram actively campaigns for educational opportunities for late developing talent within the United Kingdom's educational system and points out an often disregarded view relating to gifted and talented development that "...not all flowers bloom in spring" (p58). It is further stated that:

We must all follow our biological clocks, but when the wake up alarm goes it would be comforting to know that there were opportunities and resources waiting and available. This is why all my life I have actively campaigned for adult education, open universities, distance learning and deferred university grants. (Marjoram, 1995, p57)

Indeed it would seem reasonable to assume that great benefit would accrue to any society and individuals within it that set about supporting and studying their most excellent performers with the idea that the qualities, attributes and circumstances of the talented individual could be transferable in some manner or form in order to elevate the performances and faculties of others. In sport and music for example this practice is commonplace. However, in many other areas we admire our artists and writers, musicians and mountain climbers, scientists and leaders in various fields but infrequently study them to find out exactly how and why they are so good at what they do, our egalitarian orientations often being in conflict with the celebration or illumination of excellence.

There seems to be however, a growing orientation amongst those in the field of gifted and talented education towards looking at the phenomena from an adult perspective. The writings and studies of such people as Simonton (1991), Main (1993), Piirto (1995), Feldhusen (1995), Treffinger and Feldhusen (1996) and Gagne (1995) show a gradual movement away from the "cradle gifted" approach (Marjoram, 1995) to a view which encompasses a talent development approach over a longer term basis and is more open to the variables proposed by Tomlinson-Keasey and Little (1990).

The New Zealand context.

In the New Zealand setting there is a body of knowledge focused in the domain of gifted and talented children. A number of individuals have contributed in a variety of ways to the area and a number of significant issues have been explored. Amongst these are the related cognitive, social and affective areas of children's development, educational aspects, and political and social issues. The work of Richardson, McAlpine, Hill, Parkyn, Reid and others has been included in a bibliography of research on gifted and talented children (Pickens, Reid, McAlpine, Marland, 1992). Richardson's 1993 book "Provisions for Creative, Gifted and Talented Children" covers a practitioner's endeavours in the area of creative writing in the primary school and is a reference for teachers in the field. Richardson was evolving the integrated learning approach decades before its recent popularisation and his views and practices are echoed by the call of many experienced people in education and vocational endeavours to bring children and adults back into learning in an integrated and contextual way.

This contextual approach to learning is important for the talent development approach in that talent development in adults necessarily takes place in real life circumstances and over an extended period as opposed to giftedness, which in this author's view is more often seen to be within the person and is very often associated with children in educational settings. This raises an interesting point - giftedness is very evident and often recognised in children, however with adults there seems to be less recognition of giftedness as though the moment in time is passed and the potential has not been fulfilled, or the giftedness is latent and unused. Is this due to the disappearance of the attributes in adults, of the sublimation, substitution or replacement with other more immediate and imperative attributes and actions? The importance of context in eliciting, supporting and enabling giftedness, or as is preferred in this study talent to be developed, is a focus of this study and will be discussed in subsequent chapters.

Recently McAlpine and Moltzen (1996) have published a comprehensive collection of writings on gifted education titled Gifted and Talented: New Zealand Perspectives. Much of this and other work has and is generating new developments in education and in the study of the expert performances of juveniles in New Zealand. Giftedness and the development of talent in children have been the focus of investigation and discussion, and valiant attempts at establishing and promoting recognition of gifted education and the establishment of a national educational policy that can cater for and provide some substantive resource for the gifted and talented school age child have been made. However the history of this movement is patchy in most instances and only spasmodic success as far as resourcing and policy is concerned has taken place. Moltzen's (1996) chapter on the history of the movement in New Zealand details the beginnings with Parkyn and the subsequent uneven and disjointed history and the involvement of the Department of Education. The general approach amongst educators and decision makers in the period from the 1950's through to the early 1970's had an egalitarian focus and attempts to establish a national policy or action in the field of what was then gifted education never came to much. The torch of talent development was carried for the most part by dedicated educators, parents and small groups of interested people in a few organisations who offered either support or programmes for development.

In the 1970's associations for gifted and talented children were established and from these a national association was formed. School programmes focused on curriculum enrichment and acceleration and the procedures for identification of candidates for intervention focused largely on scholastic performance. Moltzen (1996) makes the point that the New Zealand record is hardly one to be proud of and apart from sports people the attitude to giftedness and talent is generally one of indifference. However with a gradual shift in focus towards a talent development approach recently this situation may change dramatically over the next decade as the stigma of the elitist nature of

gifted education becomes less of an issue. In the book by McAlpine and Moltzen (1996) there is no chapter or part that deals with the adult gifted and talented and it would seem that the area in New Zealand suffers from the same lack of scrutiny that is evident elsewhere.

While there is a focus of research and discussion on gifted and talented children in the New Zealand educational setting there has been little if any study of talent development in adults particularly within the diverse contexts that adults are engaged in. What study there has been is of a more journalistic and biographical nature (eg Earl, 1998; Courtney, 1996) or falls within the realm of commerce and business with much of this focus on gaining specific business oriented benefit. (eg Laurent, 1998; Newland, 1996) With changing vocational structures, lifestyles, demographics of workforce, populations and economic considerations there are a number of significant issues which should be explored outside education and business. Amongst these are the optimisation of human abilities and faculties that have to do with the changing and often new developmental paths that women, immigrants, older adults and different ethnic groups, in particular, will set out on, especially those who change vocational focus and re-skill more than once in their lifetimes. The skills and experiences of older adults have been at times overlooked in our new age society and the study of talent development in adults and the diverse contexts within which they operate, for reasons possibly based on traditional resourcing, has been overlooked in favour of the study of giftedness and talent in children within the more narrow educational setting.

If education is to be a life-long process then the study of adult learning and performance, must continue to be a growing area of investigation, especially as adult education and retraining is now a mainstream educational function and it is the tertiary sector which relies increasingly on adult students for its continued existence and prosperity. There appear at present to be no

studies specifically looking at how adults develop talent to the point of expert or eminent performance in New Zealand in either educational or other settings.

In the publication "Education for the 21st Century - A Discussion Document" (Ministry of Education, 1993) which purports to set the scene for education in New Zealand for the next few decades, there are a number of references made to issues that have some bearing on this study:

Change will continue to accelerate. Schools can no longer provide people with the specific skills they will need in adulthood because we cannot predict what those skills will be. People are going to have to retrain several times through their working lives. (p.1)

It is unclear as to what "the specific skills of adulthood" are but the view seems to be that adults will have to retrain possibly several times in a 'working life'. The orientation is fairly heavily weighted to training with specific end use in paid vocations rather than the development of generic skills and qualities that would fit a person for life, but the statement indicates a perceived requirement for providing tertiary opportunities to significant groups of adults in later life and it is in this area that the study of talent development could have particular relevance.

In order to identify specific skills of adulthood, to look at the circumstances of adult development, or as Tomlinson-Keasey and Little (1990) state "the other variables and experiences", adult life paths need to be investigated and analysed. In the case of expert and eminent performers common and critical features and patterns of experience and personal characteristics would be useful to identify so that these patterns and characteristics may be repeatable for or practiced by others. The population demographics of New Zealand society, particularly in the urban areas are changing rapidly and full economic, social, cultural and educational development of individual talents would be of great benefit to the country. With women increasingly coming into paid vocations after child rearing, with changing economic and market structures forcing shifts in vocational paths, with

an influx of immigrants from many different cultures, and with significant lifestyle changes in our lives, the exceptional abilities of the expert and eminent performers should be the subject of serious scrutiny. Marjoram (1995) points out:

My own study of Open University graduates and doctoral students revealed many cases of women who left school early to marry and rear a family and turned to study only after the children became independent. (p57), and

We only have to look at the life stories of a few great achievers to realise that (a) not all at first excelled at their eventual sphere of mastery, and (b) many did not excel until late in life. Growth is a curious thing and we all have our own quite different development programmes. Galileo, Mendel, Swift, Trollope, Delius, Rontgen and Marconi were not first trained for the fields in which they ultimately gained fame. (p57)

Agassi (1985) quotes many examples of people who would fall into the category of genius at a time in their lives well past maturity - Moses, Muhammad, Freud, Van Gogh, Gauguin, Rousseau, Pestalozzi, Faraday, Planck and others. "as far as I know, none of them were seen early in mature life, either by their teachers, their peers, or by themselves, as the exceptional individuals that they were later judged to be" (p52). There are many examples of well known adults who developed their talents later in life or in different areas from their initial foci. This recognition of later talent development is long overdue and a new avenue additional to the focus on precocious talent development.

The discussion document "Education for the 21st Century" (Ministry of Education, 1993) goes on to state:

We live in a global marketplace. If we seek to improve our economic standing relative to that of our competitors, our commitment to education and training must be greater than that of other countries. We must adapt more quickly to change than our competitors, and the skills of our workplace must improve faster than the skills of other workforces. We must invest in people, our greatest economic resource. (p1)

Although the statement is weighted towards economic benefit, nevertheless the major points in the statement indicate that there should be a significant commitment to education and training, to adapting to change, and to skills enhancement. This echoes Torrance's (1992) appeal for a "national climate for creativity and invention" in the United States and his proposition that:

"There has been recognition of the connection between creativity and invention, and national economic prosperity" (p10). The contention is that certain personal qualities and actions in individuals are directly linked to benefits that are amongst other things, economic and also have a societal effect. To develop these, it is to people that investment in resource and investigation must be directed, inventiveness and creativity being but two of the attributes commonly associated with talented people. If a demonstrable payoff can be indicated or produced from the study of adult talent then no doubt greater resource could become available and further investigation could take place. As a result, the situation for the education of gifted and talented children and indeed all children could also improve, especially if the characteristics of adult talent development can be shown to have application at younger ages. At present the orientation is to study gifted and talented children and take the lessons from this in order to assist them as they develop so that they may become gifted and talented adults. However the experiences that affect the developmental paths of adults are not identified and used to assist children in the same manner. The focus in this area is in need of further change from the possession of gifts by the special individual to the development of many talents, by many people in many contexts that support the process.

"Society is deprived when any person does not reach their full potential."(Ministry of Education, 1993, p 34). This sentiment regarding the larger societal effect of human development has a direct bearing on this study in that if people wish to develop their potential then there must be opportunity and method to do so, and studying the contingencies that affect the developmental paths of adults would seem to be one way in which individual

potential and high level contribution to the group can be fostered and opportunities made available. Promoting excellence and enabling individuals to optimise their interests and aptitudes provides an opportunity to enrich and benefit our society and individual and community lives as well as our economic prosperity. New Zealand's pioneering spirit of creativity and inventiveness, and the "No 8 wire" approach to making do may be seen as part of the reason why, relative to the size of population, New Zealanders can be so successful in many areas of endeavour even on a world stage. This inventiveness, commitment to task and striving to build a new nation and a better life would seem to be part of the base for developing exceptional talent.

The International Context.

Outside New Zealand, in larger nations such as the United States, where because of greater populations and resourcing and the existence of large, well established educational institutions, the study of giftedness and talent in children is often an area of considerable endeavour and there are many examples of structured programmes and research that provide a wealth of information.

However even in the United States, the United Kingdom and Australia there is still little evidence of any comprehensive move to expand the focus of talent development to include adults and adult learning in any organised or systematic way despite the gradual shift spasmodically evident in 1995-96. The need to study the life paths of talented people is recognised by Subotnik and Arnold (1995) who point out that longitudinal investigations of exceptional people are rare and that the ultimate responsibility in education lies in translating childhood potential to adult attainment. Any student investigating the process of talent development has little adult related information to refer to and so inevitably the evidence available that relates to children must provide a backdrop to any discussion, but with the caution that what applies for children may not apply for adults. The question here is - are adults viewed merely as

larger children and do they develop their talents in the same way? This question needs to be answered and the study of adult talent development may illuminate possible differences which may have benefits for both child and adult education.

The Study

The approach taken to the development of adult talent was that it was viewed by the author as a phenomena in itself which might have its own peculiar characteristics. A study of talented adults might indicate what these characteristics were and if there were any significant differences from the process of talent development in children. In addition the research orientation was to develop a model of the process along with an attempt to provide a theoretical interpretation and to see if this model might have application to adult life paths.

In the next chapter the terms and definitions used, the nature/nurture question, the role of intelligence and the relevant aspects of the study of gifted and talented children will be discussed as they relate to the development of talent in adults.

CHAPTER 2

LITERATURE REVIEW

The early origins in the modern era of the investigation of the gifted and talented concentrated on eminence and then on intelligence. Since then there has been a widening of the area of focus, the development of new theoretical approaches and in the 1990's there are further significant changes becoming apparent. The relative roles of nature, nurture, intelligence and creativity and the substantial effects of practice, are areas of discussion as they relate to

adults. The scarcity of research and comment on the process of adult talent development means that inevitably much of the discussion becomes a matter of conjecture and some reference has to be made to literature on child talent development. It is with caution that this is done as there is not necessarily any automatic connection between the two areas and it cannot be assumed that adults are just larger, older children whose manner of development is the same or even similar. A study by Reis (1995) on talented adults and four models of giftedness/talent illustrates a change in the approach to the subject area and is indicative of the growing talent development paradigm.

Historical Background

Galton's propositions regarding genius (1892) are a significant marker from which to start any discussion relating to talent in the modern era. Galton talked of "great ability", "zeal" and the "power to work", which have their counterparts in today's research with children. Galton focused on eminence and drew the conclusion that an individual achieving eminence also possessed intelligence. He took the Gaussian (bell shaped curve) which demonstrated distribution of physiological characteristics in a population and applied it to psychological characteristics in order to support propositions that eminence, as it was in the society of his day, implied intelligence and that this was controlled by hereditary means rather than environmental factors. This view in the modern era has been investigated and discussed at length and evidence for and against presented in what seems to be regular cycles according to the orientation of the day. At the crux of any investigation in the early stages of the developing field was the argument of nature versus nurture and initially the orientation was that genius was genetically controlled, a philosophy very much in sympathy with the class distinctions of the era.

Since Galton's day the field has changed with a significant broadening of issues investigated and many new and stimulating theoretical and practical directions being taken. The initial focus following Galton and the Darwinians

was on the individual considered to be special rather than or including the conditions that surrounded them. The criteria most often utilised to identify or distinguish the special individual was the construct of intelligence and this was viewed as a distinguishing characteristic of talented individuals until recent years when it has become less of a focus. However with the advent of universal education the focus has shifted to academic and scholastic ability in educational settings as evidence of the desired interpretation of intelligence. A further shift from the focus on intelligence, towards other interpretations, is also taking place. The general intelligence factor "g" was evolved and subsequently split by Thurstone (1938), Guilford (1967) and recently by today's well known figures in this area, Sternberg (1985) and Gardner (1983). Developmental psychologists added their interpretations (e.g. Vygotsky, 1978) and the literature today reveals a range of additional approaches such as Tannenbaum's (1983) theory. Each of these has useful points for consideration but as yet a unified approach is still very much distant and further study, discourse and argument is required in order to bring the various approaches closer to unity.

The splitting of intelligence into multiple facets has allowed the construct of talent with its diversity of performance to come into common use and almost bypass the construct of giftedness which has been a primary focus in the field for a number of decades. Ericsson, Krampe and Tesch-Romer's (1993) "deliberate practice", for example, is a construct that describes a substantive way of developing talent and is closely linked with the idea that a kind of intelligence has much to do with talent development. Gardner's (1983) development of multiple intelligences being closely linked with talent areas illustrates this point.

Initially talent was obscured beneath the umbrella of giftedness but the focus has changed from Galton's person of privileged position that separated people in a class distinguishable way. The multi-faceted individual, acting in and upon any number of circumstances is increasingly a developing orientation. It is becoming evident that talent is not just a characteristic of a selected

individual in a particular privileged setting, but can be applied to a vast number of individuals in a large number of circumstances.

The historical change in focus from genius, to giftedness, to the talented individual and now to talent development reflects the shift from the class distinction bias of 19th century society with its privileged few, to an egalitarian view in which more people can share. The early descriptions of genius and intelligence were typified by their class elitism but as more and more investigation and discussion was carried out it became apparent that this narrow view limited the scope of endeavour. At present the area of scrutiny is still widening and this is a continuing trend as more and more fields of human activity and influence are included in the world view.

The individual per se is no longer considered in a - once gifted, always gifted, either you have it or you don't - kind of sense and the focus is shifting to the behaviour or performance itself as talent. Renzulli and Reis's (1985) approach for example, centered around the cultural-experiential context and the fields of activity in which the individual performs, encourages the perception of talent as active and applied, and is concerned with the developing of 'gifted behaviours'. The effect then is not to label a person gifted or talented but to allow any individual to be able to show or develop talent. This view however seemingly recent is not in fact new. This is the approach of the Jungian learning style theorists who see gift/talent as being applicable to everyone, but developed to a greater or lesser extent depending on circumstance. The 1980 book by Isabel Briggs-Myers, Gifts Differing, gives indications of a view that is only recently becoming accepted - that everyone has different strengths and weaknesses and that if a capability is sufficiently developed in the best fitting circumstances it can essentially be a case of talent development.

Nature and Nurture

The essence of any argument in the context of talent development is the relative contribution of nature and nurture. It would seem almost unnecessary to

say that the contribution of either may not be constant, but that they may be subject to considerable change over time, place, process and product and that they may differ according to parameters not normally considered relevant, such as age, sex or culture.

Evidence for the role of nature in human development is to be found throughout the literature dealing with the biology of the human species. The colour of hair, skin and eyes, stature, body type, muscle fibre composition, response rates to stimuli, strength tests and so on are all relevant and numerous. In the field of human psychology the perceived genetic bases for behaviour are illuminated by numerous testing programmes (e.g. IQ testing, psychomotor response tests, hand-eye co-ordination tasks). Limits are deemed to have been placed on human performance by such factors as neural efficiency, aerobic and anaerobic capacity, the length of bones acting as levers and the proportion of fast-twitch muscle fibres in an individual's biological makeup. In the area of giftedness the historical view was that performance was predetermined by genetic endowments (Galton, 1892) and it is still common to hear this view expressed in the field of education and in life in general.

Central to the argument for the role of nature has been the construct of intelligence as a genetic potential. Developing a comprehensive theory and context to intelligence has meant that many avenues have been explored and complex theories attempted, ranging from Guilford's (1967) numerous factors of intelligence to current theories in which intelligence is divided into a few comprehensive subsets that are more closely related to application in real life terms (Sternberg, 1985; Gardner, 1983).

In an educational context, intelligence and the measure of IQ have been an often used reference point for decision making in the area of the gifted/talented, on who is selected as gifted/talented, the interventions and their focus to be applied to the selected individuals and the means of assessing the efficacy of the interventions. The intelligence test in its various forms is still in common use for streaming students in academic subjects within schools but the

manner of use is changing. The tests themselves are now used more as one of a wider selection of measures to ascertain precocity and for ranking children or selecting them for special intervention. The situation is extensively debated and the question of the relationship of IQ score to the biological base of intelligence is contentious, racially, politically and ideologically. Jensen's (1969) article on how much can IQ and scholastic achievement be accelerated, Eysenck's (1975) approach to the biological underpinnings of intelligence and the recurring example of Burt's manipulated data exposed by Kamin (1974) are examples of this kind of debate.

The Role Of Intelligence In The Development Of Talent

Intelligence is not seen as a critical factor in talent development, in creativity or in giftedness, given that a minimum baseline capacity is necessary in order for the individual to operate effectively in an environment. More correctly it might be said that high level, psychometrically assessed intelligence is not seen as being essential. A difficulty with the term intelligence is that it is too often taken as referring to assessed intelligence rather than practiced intelligence. That intelligence is not seen as critical has more to do with the historical focus of investigation in intelligence and the classical view deriving from the psychometric approach that intelligence is concerned with scholastic ability more than anything else. What may have much greater relevance and application to the field of talent are the modern theories that postulate multiple intelligences, typified in the work of Guilford, Thurstone, Gardner, and Sternberg. Much of the early work on intelligence reflected the preoccupation with school-based achievement and the later work of the multiple intelligence theorists goes a considerable way towards real-world application and the exercise of intelligence required in adult life.

However, the way in which intelligence is exercised must be a central issue in talent development, the important consideration being that any approach in the area must reflect the real-world application of talent and be a

long way removed from the narrow psychometric approach. The talented individual must, of necessity, utilise the full array of perceptual, information processing, and responsive and generative capabilities which can be brought to bear on any endeavour. Intelligence then becomes a case of focusing all relevant functions on a process as and when required and this process itself can be seen to be part of the exercise of intelligence. The view that intelligence is fixed, is static and finitely measurable at any stage must be questioned particularly when many authorities (e.g. Bloom, 1982; Ericsson et al, 1993) find that expert and eminent performance in any field requires up to ten years experience, immersion and practice.

Intelligence itself cannot be legitimately separated from its function. An individual cannot just possess intelligence, it must be evident. Intelligence therefore is a process of the application of a quality of mind - people think intelligently; and activity - people do things intelligently. Intelligence therefore is not a possessed quality or characteristic but a quality of behaviour. Sternberg (1996) has developed the view that IQ counts, but what really counts is successful intelligence. He points out that to be successful one must know what works in specific environments. The Piagetian view also supports to an extent, the idea that intelligence is developmental and dynamic, although this approach stops at the formal-operational stage, around 12 years of age. This is possibly a most unlikely situation, given that many adults develop their most effective life strategies in some cases quite late in life and seem to exercise a variety of intelligences that do not necessarily fit well with the ultimate stage of Piaget's theory.

Intelligence could be viewed as a continuum, a parameter upon which an interpretation can be constructed, not a static result confined to what is tested by pencil and paper means. At its developmental limits intelligence could include creativity and wisdom - that elusive combination of experience, insight and cognisance of a higher morality. Wisdom may also contain the much mis-used construct - common sense. Sternberg (1995,1996) associates common

sense with practical intelligence and tacit knowledge, and with using this to find out how to succeed in particular environments. In the case of the talented individual, are they more able to profit from the contingencies and experiences of life, and are therefore more intelligent in a worldly sense? The traditional view of intelligence that derives from the psychometric approach with its school and academic bias, is too narrow to accommodate the enormous variety of successful human endeavour that indicates intelligence is being used effectively in diverse contexts.

What are the aspects of intelligence and the research in the field that particularly relate to the focus of this study? Nash's (1990) view that intelligence is a behavioural trait not a capacity and Anastasi's (1976) view that "intelligence should be regarded as a description rather than an explanatory concept ... and no intelligence test can indicate the reasons for his performance." (p349) fit with the proposition that intelligence might be viewed as a process not a possession or a product. Maybe intelligence could be best described as a quality of action, both internal action as thought and external as activity. It seems rather odd to view intelligence as static, measurable and constant, fixed at birth or conception by unknown genetic influences, when virtually every other faculty that humans possess is considered to be subject to some modification and variation during life. The recurring notion of the mystical underlying capacity, Spearman's "g", clouds the issue, at least as far as talent development goes as it implies a fixed quantity rather than a flexible quality. A more useful approach to intelligence and talent development may lie with the work of the multiple intelligence theorists, Sternberg (1985) and Gardner (1983). Their greater focus on making rational and constructive sense that enables action in the world, is seen to be a more relevant construct to apply.

There are important considerations that affect the role of intelligence in talent development and one of these is speed of response, which in the classical view is seen as being a primary requirement of intelligence and is an essential requirement in achieving high scores in many IQ tests. Hunt (1978),

Hunt et al (1975) identify speed of access to lexical information as important and Jensen (1981) has shown significant correlations between reaction time and psychometrically measured intelligence with the magnitude of correlation going up as the complexity increased. Does this then mean that all decision making should be performed at speed in order for greater intelligence to be attributed? A number of questions are raised by this issue amongst them being the question of the trade off between speed and accuracy and between speed and specialist function. Sternberg (cited in Trotter, 1986) points out, that intelligent individuals should know when to go fast and when to go slow, that this capability may be more important than sheer speed of information processing, indicates advanced levels of awareness and an ability to plan. In other words they have an awareness of how a process can best be developed or fitted to an outcome. In view of this consideration, speed of information processing is not seen as being critical in the developmental requirements of talented adults. Walberg and Wynn (1993) concur pointing out that:

Eminent adults not only work hard but they also attain their goals. In effect, they learn not only how to choose difficult goals they can attain, but they also learn to manage activities so they succeed. (p31)

The distinction here is that it is not speed of response that is critical, it is how efficient the process of learning about the task or tasks is. It is evident that speed of responding to one or a small set of isolated task requirement/s is totally different from learning and applying a range of task requirements. The two phenomena are not equivalent. In talent development it is evident that individuals who are at the forefront of their fields have learned well the practices, habits, understanding and culture in which they operate so effectively. They may not be the fastest at a task, they may not be able to respond as quickly as others, but the perceptions they have, the decisions they make and the activities they engage in seem to give the best returns. Do they have an intelligence which best fits the task requirements?

Another issue is determining what constitutes a particular degree of intelligence. As far as this study is concerned the psychometric approach is seen as being of little use as it falls well short of being able to measure, by the use of pencil and paper tests, any degree of effective application and in particular the huge variety of endeavour that the participants in this study for instance, are engaged in. Renzulli and Reis (1985) warn against the tendency to associate measured intelligence scores with actual intelligence "There is no ideal way to measure intelligence and therefore we must avoid the typical practice of believing that if we know a person's IQ score we also know his or her intelligence" (p20).

The proposition that is put forward in this study is, as Nash, Anastasi, Sternberg, Gardener and others point out, that intelligence is to do with application not possession. The only real test of intelligence, with the group in this study as an example, is that excellent, expert and eminent performance is in itself the measure that must indicate the relative effectiveness of the exercise of intelligence and perhaps by inference, the capacity or measure of 'native intelligence' that the individual possesses. The logic of differentiating this group from the ordinary is that they are exceptional and the evidence comes from their performance. In this instance the measurement is qualitative by description and quantitative by comparison with others.

All the various theoretical approaches rely on identifying and measuring underlying mental processes that guide overt responding. It seems it is impossible to determine intelligence without testing or assessing by way of overt responding and this begs the question of what is being tested. (i.e. is what is being found a function of the test itself, and is this an indication of underlying capacity?) This characteristic makes virtually every test culture bound and situation specific. Thurstone's and Guilford's intelligences reflect this orientation in part. Gardner moved away from the focus on linguistic symbolisation, logical-mathematical symbolisation and the scholastic bias, towards intelligences that are not often easily measurable by short answer tests and this orientation

further questions the belief that intelligence is measurable by 'pencil and paper' tests. Gardner's and Sternberg's orientation are to assess intelligence in terms of context and application. The idea that the talented have exercised their capacity in order to accrue relatively greater benefit to themselves and maybe others, than the lesser talented, fits well with this approach. The role of intelligence in talent development, as it is represented by traditional approaches is unclear. What is becoming clearer is that the modern view of intelligence, as being applied in a wide variety of circumstances, is allowing talent development to assume a place alongside well established constructs of human development. Talent areas are able to be associated directly with differentiated applications of intelligence. This means that the talented are (the most) intelligent within their field of activity.

The Role of Nurture.

The role of nature in talent development, apart from considerations of cognitive efficacy, would seem to depend largely on the area of endeavour. In the area of physical endeavours such characteristics as body type, stature, composition of muscle type, aerobic and anaerobic efficiency, hand-eye co-ordination, sense of balance, metabolic suitability and many other physiological and biological characteristics would all contribute or detract from the endeavour depending on the closeness of characteristics to the requirements of performance. Nature then suits some more to certain endeavours but not to others. At this point it becomes apparent that if there is not an optimal fit between the natural physical characteristics and the demands of circumstance then some other mechanism is needed to provide a closer fit and it is to nurture that attention must then be focused.

If a major factor in talent development is nurture then it must be decided how nurture plays a significant role. As talent development is viewed in this study as a dynamic progression then there must be mechanisms that allow for this. One such mechanism could be considered as the longitudinal effect of

exposure and practice. Exposure and practice effects on performance are investigated in a study "The Role Of Deliberate Practice In The Acquisition Of Expert Performance" by Ericsson, Krampe and Tesch-Romer (1993),

Most contemporary domains of expertise have evolved over centuries from activities originally centered around playful interaction with learning through active participation. As the levels of performance in the domain increased in skill and complexity, methods to explicitly instruct and train individuals were developed. (P369)

These methods Ericsson et al (1993) call "deliberate practice" and they distinguish these from other activities, such as "playful interaction, paid work, and observation of others." (p369) This approach could provide insight into the process of late development of talent recognised by a few in the field such as Majoram (1986, 1995) in the United Kingdom, as a legitimate area in which enquiry and effort needs to be directed. Ericsson et al's (1993) study has a particular relevance to the development of talent in adults in that they strongly suggest that exposure and practice are the vital ingredients in achieving expertise.

The study by Ericsson et al (1993) illustrates the relative role of nurture in the development of talented musicians. One of the significant factors identified in the development of talent is the length of time in the field and they identify a decade as the critical time. This critical factor is supported by many others. Bloom (1982) notes in his 3 year study of the development of talent of people under 35 years of age in six different fields of endeavour,

Whatever the individuals original "gifts" or special early abilities, skills and achievements, without extremely favourable supporting and teaching circumstances over more than a decade they would not have been likely to reach the levels of attainment for which they were selected for this study. (p511)

It seems that this decade of intense involvement in an area of activity, and favourable circumstances, at least in the case of children and young adults, are prerequisites to expert performance in many activities. The question regarding Bloom's "extremely favourable supporting and teaching circumstances." (p511)

in adult talent development is a major consideration. If the environmental contingencies for children developing talents are different from the contingencies that operate in the adult context, then the process for adults could be quite different and the current research and discussion relating to children may be irrelevant to the adult process.

With older adults, who have had possibly decades of experience in many a varieties of activity, some of this exposure and practice might have taken place in incidental ways and an older adult might already have many of the characteristics that more formalised deliberate practice engenders in younger people. This then might allow these individuals to enter a field of endeavour at an elevated level of competence. Ericsson and Smith (cited in Ericsson et al, 1993) suggest this is a strong possibility when they state that:

Untrained adults can overcome limits on speed and processing capacity by acquiring new cognitive skills that circumvent these limits by qualitatively different processes. Further research on the capacities and characteristics of expert performance will give us a much deeper understanding of the full range of possible adaptations and methods for circumventing limits. (p400)

Adults then, when entering new fields of endeavour or redeveloping latent areas of activity, may find a much shorter path to a level of expertise along their talent development track. However mitigating against this is the likelihood that as societies develop, the role, requirement and effect of deliberate practice will have to increase. Even a century ago athletes for example were unlikely to spend anything like the time involved in their sport, particularly in practice to enhance performance, that they would do so in today's sports endeavours.

Simonton (1992), provides an interesting interpretation of age related development with a mathematical model that identifies an ideation rate (the rate at which ideas are produced) and an elaboration rate (the rate at which these ideas can be transformed into complete projects). He proposes that these rates differ according to discipline and that a person who starts late in a discipline

should suffer no disadvantage other than a time based restriction on total productivity given that some disciplines require a longer learning time than others. To extrapolate Simonton's model it could be applied to any area of activity not just an academic discipline and for any person at any age who starts an activity, or, takes up again an activity they may have started many years before. In addition Simonton's model is useful in describing what may happen when a related activity is commenced at a later stage of life. This is indeed good news for those people who may be beginning new endeavours at an older age. Accommodation of this view would require a major shift in emphasis in education from the concentration on educating and resourcing the young in a society, to a much broader focus of offering opportunity. This process is being worked through in many countries at present with varying success as more and more adults take advantage of further learning opportunities.

The relative contribution of nature can be measured to a certain extent by the administration of tests and assessments of many sorts (e.g. aptitude tests) which purport to measure in a quantifiable manner the existence of a baseline potential which remains invariant throughout life. However it would appear that many human attributes and characteristics can be subject to considerable change over life spans or even very short durations (Flynn, 1987; Ericsson et al, 1993) and there is every reason now to assume that many supposedly invariant characteristics such as short term memory could not also be subject to some modification given critical conditions for optimisation (or detracting). Ericsson, Chase and Faloon (1980) for example showed that "an undergraduate of average intelligence, given 230 hours of instruction and practice (based on such notions) raised his memory for numbers from 7 to 79 digits." (cited in Colangelo and Davis, 1991, p247)

The evidence is that large practice effects play a significant part in performance even in IQ testing (Gibson, 1969) and that pretesting ability gives an indication of success only for initial performance and not for final performance, a situation which would seem to make intelligence testing highly

suspect as a selection procedure. Sternberg's and Gardner's multiple intelligences approach may be indicating that intelligence is better viewed as fixed at birth or conception only in so far as the range of actual biological-neurophysiological efficiency allows and developmental within certain constrictions in application to life's activities .

The questions regarding core stability of responses, of measurable IQ, of specific ability, all centre around the performance of the individual, and it is this performance that is now, with the developing paradigm of talent development, being seen as amenable to change rather than fixed and immutable. Even the most seemingly gifted young performers of today's world increasingly need to practice intensively over a long period of time in order to remain at the forefront of their field. It would seem that given this outcome, the top performers of yesteryear would compare poorly with their modern counterparts.

The research of Ericsson et al (1993) suggests strongly that in either physical or mental activity it is exposure and practice that have a most significant effect. This further fits the picture of talent development being able to take place at any stage and in any circumstance by anybody, given that circumstance and *baseline capability* is necessary. The acquisition and development of expert performance, certainly in adults, is determined by factors which are as yet unclear in their entirety. The fit of the individual and their necessary minimal biological attributes (Ericsson et al, 1993) that enable the acquisition of expert performance, and the context and modality of activity must be a central theme in any understanding of the process of talent development. It has to be assumed that there is a best fit between the two and is hardly likely that any amount of practice will have much positive effect when there is a mismatch between the individual's baseline characteristics and the contextual task. However there is a view that the performance of experts is in many ways specific to the task, or constellation of tasks that are similar in modality. As the characteristics of the task requirements become more specialised the

transferability of skills becomes less and less. Ericsson et al (1993) elaborate citing Starkes, (1987); Starkes and Deakin, (1984)

However, experts superior speed in their domain of expertise does not transfer to general tests of speed, such as simple RT (response time), or to general tests of perception. (P365).

This then, places the role of nurture in a symbiosis with nature in that first of all no matter how close the fit of nature to the task requirements, exposure and practice (ie. the more evident part of the talent development process) are required for exceptional outcomes to become apparent. Secondly, If there is a great divergence between the fit of nature to the task requirements then a great deal of exposure and practice must take place and a close fit may never eventuate. Additionally as exposure and practice take place in an increasingly focused area of endeavour it is likely that the broader range of talent opportunities and capabilities will decline until expertise in other areas is lost, declines or atrophies. In other words - if you don't use it, you lose it. If there is a very close fit between task requirements and nature then precocious behaviour (giftedness) is evident, but will remain at that level unless developed through exposure and practice.

The problem is to place all the substantial findings in context and establish sound relationships between them of a qualitative and/or quantitative nature. A further problem is to ascertain if there are strategic changes in human behaviour that may result as assumed genetically imposed limits of performance on the human species are approached. The use of technology to enhance and enable extreme performance is an obvious strategy, but what of the more hidden functions of perception and cognition? Are the "possible adaptations and methods for circumventing limits", (Ericsson and Smith, cited in Ericsson et al, 1993, p400) evident or do they need to be investigated as strategies for further development that circumvent the structurally imposed limits of genetics? Another strategy is the intense involvement in a narrow activity zone for an extended period of time (a decade) which essentially has to be at

an optimum stage of maturation. The peaking of performance at certain age bands in specific sports is an example.

A further strategy is to develop the ability to form connections (intuition/insight) that are not readily apparent given a level of information. Ericsson et al (1993) recognise this, "in virtually all domains, insight and knowledge are steadily accumulating and the criteria for eminent as well as expert performance undergo continuous change" (p366). This characteristic is evident in the lives of famous scientists, Darwin, Einstein, Rutherford, Kekule and Fleming as examples where they formed connections between disparate events and concepts that reshaped knowledge in their fields. Sternberg and Davidson (1984) carried out a study in which they taught the skills of insight to children in a 5 week training programme and greatly improved the children's scores compared to children who had not received the training. Again the "other variables and experiences at different points during development" that Tomlinson-Keasey and Little (1990) identified become an avenue for investigation with adults.

A focus on adults.

What then is the situation for adults? The critical conditions for adults are not so clear cut as they seem to be for children. The contributing nature of the vast variety of activity undertaken as an adult, may in some instances, have a greater effect than years of practice in a single domain of endeavour. The decade of development that is a common factor in talent development with young people may not always be necessary with adults due to factors such as the large number of automatic behaviours that adults have. These automatic patterns of habits may free them from the menial and that means that they may go on to the exceptional and the specialised much quicker than children. The optimisation of performance may be powerfully influenced and aided by an adult's exposure to the field, even when it is passive or remote from the task requirements. The accumulation of knowledge and understanding at substantial

levels may enable development in more efficacious ways, (not necessarily faster ways). Ericsson et al (1993) identify processes, including the observation of others, and these may serve to shorten the decade of involvement that is indicated in studies of the young talent. These processes result in accumulated experience which enables efficient skill and knowledge transfer and is a central and powerful focus in any kind of apprenticeship. This "tacit" knowledge has been studied in the context of business practice and academic psychology (Wagner and Sternberg, 1986) and found to be influential in predicting real world criteria of success such as merit rises and performance ratings. An example in our western societies in the present day is the growing trend for women to move from childcare in the home to paid vocational endeavour outside the home. The decade of involvement in an area of expertise that is common with children may be compressed considerably for adults as the requirements of prior learning in aspects of the (new) activities may have already taken place, in their day to day activity, to a level well past the minimum competency required for the task/s. The adult in this case has acquired generic contextual skills (flexible and efficient patterns of habits) which constitute 'ways of doing' and are transferable to the new context in which the major activity focus is taking place. Walberg and Wynne (1993) elaborate

'Eminent adults are well informed' (Hirsch, 1987). In our complex and ever-changing times, we can't foresee what knowledge will be of most use. Therefore it makes sense to amass a large body of knowledge and skills (in youth) that can be applied to diverse problems in later unforeseen circumstances. People with such knowledge moreover, can apply insights from one field to another; they are less prone to the 'trained incapacity' of the narrow, obsolescing specialist. (p29)
and,

Acquiring personal knowledge requires thinking about information, tying it to old knowledge, and making associations readily retrievable. (p29)

Walberg and Wynne include skills as an essential element although it is only assumed that they mean physical as well as mental skills. Sternberg and Davidson (1984) concur:

Precocious children form connections at a much more rapid rate than do ordinary children and exceptional adults have formed exceptionally large numbers of variegated stimulus-response connections. (p44)

What other processes and strategies are there that may contribute to later adult talent development? Torrance (1992) looking at the Japanese "NM" method of teaching inventive skills for technology with adults, identifies an important function of cognition, "... deliberate dreaming as part of the process." (p12) This activity is often recognised as an important aspect of expert and eminent performance. Indeed it is quoted and utilised in folk histories - Archimedes's "eureka" in the bath tub and Paul's "blinding light" on the road to Damascus are probably our most engaging and illuminating examples of this process at work. Many great minds when having been asked why and what sets their performance above others often say that it is because they just quite simply "think " about the problem or situation more than their contemporaries do and this enables them to arrive at understanding and develop explanation before or in superior manner to their contemporaries. Newton when asked how he did so well in evolving his theories said it was because he was always thinking about them. Darwin's habit of walking in his garden every day enabled him to dwell in isolation on the formulation of his ideas about evolution. Without doubt a similar percolation or incubation effect takes place with all knowledge and practice in which we engage ourselves. Indeed it would seem logical that to compliment deliberate practice an external and physical activity, there is an internal counterpart and that is internal practice - the critical role of deliberate or incidental cognition by way of such methods as daydreaming, dreams themselves or quite simply thinking about the subject either in terms of abstract deliberation, such as arguing with oneself, letting the mind dwell on the subject and sleeping on it.

In such a process there would seem to be two separate ways to arrive at a solution or to take action, one being the 'blinding light' of insight, a process similar to that which that Powell (1987) aptly describes as:

“Skip thinking” or a more rapid form of curvilinear reasoning, involving a rapid shift from one level of thinking about things to another, reflecting a quick integration of several steps of a single chain of reasoning into a single step. (p87)

The “rapid shift” in this instance is perhaps being intuitive - more automatic, even primitive and perhaps to a large extent uncontrolled, (i.e. not deliberate).

The second way is a more structured and more deliberately learned method, of step by step process, where cause and effect is established in a painstaking manner, until the outcome is reached after considerable delay as compared to the intuitive manner, but possibly with sometimes greater accuracy. This is the academic process of argument that has as its basis the causal linking and verification of ideas.

What does all this mean for the development of talent? It could mean that talent development is not so much a function of inherent skill level or giftedness, but more a function of preference for engaging in certain modalities or patterns of activity both internal and external. It could mean that talent, rather than being only a product of genetically based giftedness as Gagne (1985) proposes, can also be a product of environmental influence - deliberate practice sustained over a long period of time in a form which may modify even seemingly preset organic features of the individual such as the proportion of specific muscle fibre types and “patterns of mental habits” (Lawrence, 1993). The implication here is that an individual can learn to be talented.

It appears if this is the case that anyone may become expert, at a task or activity, given sufficient exposure and practice, as long as they possess requisite minimal physiological and biological capacities. It also means that expertise may be much more specific to type of activity than is generally accepted. It may also mean that preference for type of activity is more powerful than environmental influences in the selection of activity.

In summary the proposition is that the individual may enter an existing context of activity, then begins a process of developing underlying potentials to create a context in which their talents are firstly developed to the point of

expertise and then perhaps to eminence - a situation in which they may become the foremost experts or practitioners in their fields. Tannenbaum (1983) recognises this aspect of talent development in proposing that exceptional individuals seek out, develop and create their own appropriate learning environments that are dispositionally congruent with their basic abilities.

Scarr and McCartney (1983), propose a Theory of Genotype --> Environment Effects to explain development which relates to the process of talent development. Three processes are proposed. The first process in development is a passive kind of environment provided through childhood by biologically related parents. The second process is an evocative kind elicited by others. The third kind is an active kind in which the individuals select environments in an idiosyncratic manner. In this theory they emphasise the role of genotype in determining the responsiveness of the person to the environmental opportunities and which environments are experienced, but more importantly which environments are selected. They state that:

We propose that development is indeed the result of nature and nurture but that genes drive experience. Genes are components in a system that organises the organism to experience its world. (p425)

They further argue that some genotypes are more likely to receive and select certain environments than others, that there is a developmental progression from the passive, to the evocative to the active kind, and that the selection of compatible and stimulating environments is correlated with motivational, personality and intellectual aspects of genotype. Scarr and McCartney's theory they propose, predicts that children select and build niches that are correlated with their talents, interests, and personality characteristics. This approach is compatible with Myers-Brigg's learning preferences, Lawrence's patterns of mental habits, Sternberg and Gardner's preferential applications of intelligence and Gagne's motivational construct in the Differentiated Model of Talent Development (1985).

Terminology

A significant focus of any review of the literature in the field of talent must be on the construct of talent, the way the term is used and applied and other constructs and terms that are relevant. There seem to be many definitions of talent and the allied term giftedness, and until recently no real direction could be ascertained as to what applied in which situation, the two terms often being used interchangeably. Talent and the related concept of giftedness seem to be undergoing a change of orientation as researchers, commentators and scholars in the field review and redefine their positions and findings. In the public arena it seems to be commonly accepted that firstly there are "gifted " and "talented " individuals and secondly that there is a subtle but often unclarified distinction between the two terms and this situation is also evident in the academic literature. Examples of the synonymous use are found in the work of authors such as Ericsson et al (1993). In addition differences and changes in the use of definitions of the terms "giftedness" and "talent" can be found in official definitions. In the New Zealand education system the term "Children with Special Abilities" (CWSA) was used as the preferred expression and eight areas of performance were identified in 1986 by the Department of Education (McAlpine, 1994). In Australia the preferred term was talent and four areas of focus were identified by the Department of Education, New South Wales in 1983 (McAlpine, 1994). In the United States the terms gifted and talented were used and six areas of focus were identified in 1972 and redefined in 1978 to five areas of focus by the United States Office of Education (McAlpine, 1994).

Since the education of the gifted and talented has a relatively high public and educational profile it would be useful to detail the commonly used everyday terms as referents for definitions and usage then and see if there are any significant differences between the concepts before discussing them further in terms of the views of educators and researchers. To illustrate the conceptualisation in the public arena a selection of dictionary definitions are as follows:

Chamber's Encyclopaedic English Dictionary (1994) describes gift as - 'a natural ability.' Merriam Webster's Collegiate Dictionary (1994) describes gift as a - 'notable capacity, talent or endowment' and further that 'gift often implies special favour by God or nature'. Oxford Advanced Learner's Dictionary (1992) defines gift as - 'natural ability or talent'. All the definitions have an element of the natural possession of a particular quality of action.

Chamber's dictionary describes talent as - '1 a special or innate skill, aptitude or ability, especially for art, music etc. 2 high general or mental ability'. Merriam Webster's describes talent as - '2 archaic : a characteristic feature, aptitude, or disposition of a person or animal 3 : the natural endowments of a person 4 a : a special often creative or artistic aptitude b : general intelligence or mental power; the Oxford describes talent as ' instance of special or very great ability, and talented as - having talent, gifted.

Although dictionary definitions have limited utility in academic study, nevertheless they indicate common perceptions and use and in this case mirror the confusion amongst terms. It is evident that there are shades of meaning but little clear and concise distinction between the dictionary terms. The mention of natural endowment, innateness and specialness are common to both gift and talent. If these dictionary definitions are representative of common use then it is not surprising that there is confusion about the terms in discussion and literature in the educational field.

The critical distinction is in the use of the performance element (i.e. that talent is more evident in terms of use or application whereas for gift the evidence is attributed as a quality of possession). This interpretation is echoed strongly by Gagne (1985) who more than any other researcher in the domain has investigated the issue of terms. Gagne (1985) examines the definitions and proposes clear distinctions between the two terms. In essence he differentiates on the basis of performance. i.e. that a gift is:

Associated with domains of abilities which foster and explain exceptional performance in varied fields of activities, that is, talents. Thus one can be

gifted without being talented (as with the case of underachievers), but not vice versa. (p103).

In 1993, Gagne, Belanger and Motard examined the public perceptions of giftedness and found that there was an "extreme diversity of the estimates" (p97) of the prevalence of giftedness and talent and, "giftedness was perceived to be much less common than talent" (p97)

Further common arguments for the perceived differences are identified by Gagne et al (1993):

- *giftedness is reserved for exceptional, rare or extraordinary behaviour
- *the gifted excel at many things while the talented perform in a single area
- *giftedness is restricted to intellectual abilities while talent extends to all other fields of performance
- *giftedness is hereditary, while talent is attainable through effort and perseverance, even in the absence of any special natural gifts. (p97)

Again the distinction rests with talent being performance oriented and gift being implied as an attribute which may or may not end up as a performance.

Gagne's claim that a person can be gifted and talented but not vice versa needs to be examined. In the quotes above it can be seen that there is a contradiction between his 1985 statement and the 1991 study. If a person had to be gifted in order to be talented then deliberate practice (Ericsson et al, 1993) would have little effect if the individual did not possess a-priori gifts. Gagne's view that an individual needs to be gifted in order to be talented is difficult to support from an adult talent perspective and indeed Reis's (1995) study of older women who have developed high level talent indicates that talent development does not necessarily mean giftedness is essential at a young age.

In Gagne's "Differentiated Model of Giftedness and Talent" (1985) there is a linear path from giftedness to talent. The model relies on the presence of a critical factor, motivation, to transform the possessed gift into the performed talent. The causes of the motivation are not explored, but are seen to be subsumed within the process of the individual interacting with the environment. The critical role of motivation is also supported by others. Renzulli's "task

commitment" component in the Three Ring Model of Giftedness is described as a "refined or focused form of motivation" (Renzulli and Reis, 1985, p25); and Csikszentmihalyi (1990) states:

I have become convinced that an essential ingredient for sustaining creative effort is intrinsic motivation, or *the ability to derive rewards from the activity itself* rather than from external incentives like power money and fame. (p196). (italics added).

The key phrase above, identified by italics, is a major focus of this study. It seems to be generally recognised within the field that intrinsic motivation is a key element in any path of talent development. However there are a number of questions relating to the issue, amongst these being the question of changing motivations i.e. with adults perhaps more than children the motivations may change dramatically from the initial to the final stages of a persons path - the need to make a living may strongly influence a decision initially but may give way to more intrinsic motivations ultimately or vice versa. (Reis, 1995) An adult may find interest eventually because they are so heavily involved. These are questions that could be asked of adults proceeding on a developmental path. Gagne's model seems plausible as it stands, however the assumption that a gift precedes a talent in all cases is questionable in the light of findings by other investigators as well. Firstly the 'gift' inherited can be questioned:

The belief that the striking differences between expert performers and less accomplished performers reflect innate abilities (talent) is so strong that the failure to identify the specific talents necessary for expert performance in a given domain is viewed, at most, as a temporary problem until the relevant talents are discovered. The conviction in the importance of talent appears to be based on the insufficiency of alternative hypothesis to explain the exceptional nature of expert performance" (Ericsson et al, 1993, p365), and "If genetic factors rigidly determine maximal performance, it is reasonable to assume that these genetic factors cannot be influenced by practice and training and hence remain stable across time. (Ericsson et al, 1993, p365)

The term "talent" is used here as Gagne has used "gift" - further illustration of the need to define the terms for use in research and discussion. Gagne (1995)

elaborates further on the subject and concludes that the appropriate labels should be applied as follows:

The term giftedness appears quite appropriate as a label for the possession of high natural, partly inborn, abilities that can be seen as gifts from nature, and which develop quite naturally through maturational processes, as well as daily use and/or informal practice. On the other hand, the term talent can be applied to a high performance in the systematically developed skills of a particular field of human activity, skills developed through a long and sometimes arduous, program of learning, training, and practice. (p106)

The terminology that Gagne explores and which he proposes should be applied to the field will be useful in this study and the distinction made between the terms gifted and talented will be utilised in this investigation of adult talent development. Gagne (1999) elaborates on his interpretation of the terms differentiating between giftedness and talent on the basis that although both have a common source in the concept of ability, giftedness occupies the starting position as the raw material which is manifested in at least one ability domain. Talent is differentiated as the systematically developed outcome of natural ability. In this sense giftedness then, is readily apparent without systematic development and talent seen more as a latent aptitude there to be developed systematically and is an end point of the process. In both cases the point is made by Gagne that talent is a relative concept and singles out a small percentage of the population, the upper 15 percent as being able to be described as talented.

The question of what is gift and what is talent can be further illustrated by reference to Bloom (1982) who points out that it is very often the perception of the parents that their child has some exceptional ability that sets the path upon which the child treads and that this path is very often determined by the "values and interests of the parents which determine which qualities they will or will not note and mark as special and worthy of further attention and cultivation." (p520) Put in this way it would seem that the whole question of "giftedness" is ill defined and unspecified in its actuality and may only in the extreme be a vehicle

by which parents and others direct children's development in what they see as important or worthy directions. If gifts are "possessed" then they must be inherited as part of the genetic code. If they are not, then they must be learned. Either way there is as yet no concrete evidence that either view is more or less correct.

However talent is more dynamic and usable by virtue of its performance orientation and at least in this study a more useful definition to work with. This however does not deny the existence of genetically based abilities, gifts, only that since these cannot be identified, measured or adequately described at least within this study then the term giftedness is of limited use and its function is a label rather than a description or indeed an explanation. Sternberg and Zhang (1995) concur on this view of giftedness when they point out that "in the case of giftedness, however, we appear to be dealing in part with a labelling phenomenon. In one culture, the gifted individual might be a hunter; another a gatherer; and in a third a student" (p88). This means that the areas of competency are essentially culturally, and to a certain extent technologically, dependant according to the evolutionary standing of the group under scrutiny.

With a performance based orientation the concept of talent development may be investigated. It would seem that minimum *baseline capability* would be required to start the process. As this became more complex and activity requirements changed, more subtle responses with their genesis in unseen, implied events and processes (cognition, affect, style, culture) would be added to a set of behaviours and *baseline capability* would be well surpassed. At this level the initial performance would not necessarily predict the final performance a point made by Ericsson et al (1993) that "this implies that ability tests can predict early performance on a job whereas final performance is poorly predicted. Clearly there are other significant factors to be considered." (p364). Once again the other variables and experiences in development identified by Tomlinson-Keasey and Little (1990) appear again. To return to the issue of definitions. Davis and Rimm (1993) note that: "There is no one definition of

"gifted", "talented", or "giftedness" that is universally accepted. Common usage of the term is ambiguous and inconsistent." (p16).

Gagne et al (1993) view gifts and talents as two quite distinct constructs, the former of possession and the latter of development, essentially a difference between innate and acquired abilities, and between capacity and performance. Giftedness is seen as being possessed but not necessarily being developed, that it is much less common than talent, applicable only to intellectual areas and is hereditary. Talent is seen as applicable only via performance, only within a narrow field and is developed through "deliberate practice" (Ericsson et al, 1993).

The view that talent is applicable only to a narrow field is both supported and denied by commentators. Gagne and Bloom see talent as a development of expertise in one general field but it is common amongst teachers to hear talk of multi-talented children who seem to be able to do many things well. Perhaps what should be defined here has more to do with the ability to learn quickly and effectively any set of task requirements that the individual chooses to engage in, or is directed to engage in. Bloom (1982) refers to the ease with which some individuals learned new ideas and skills in the specific talent field. In the case of the young the choice of activities may be more guided by what the parents and teachers see as being suitable or better reflects their values. In this case the children are directed by others. Bloom (1982) describes a process in which the activities of the child are clearly directed by parents and teachers. With adults the situation may be completely different, in some cases almost entirely self directed and the choice of activities may be influenced by other variables outside the immediate context (Reis, 1995) This choice may derive from some bias within inherited capabilities and a preference for certain kinds of activity, certain kinds of motivations (Reis, 1995) and certain kinds of experiences which accumulate to develop patterns of mental habits. (Lawrence, 1993).

Amabile's (1983) labour of love, Csikszentmihalyi's (1990) state of flow and Simon's (1967) assertion that control of attention is the most important

function of motivation are all complimentary interpretations of the intense focus on an area of activity that results in a process of learning that may take place at any stage of life, a process which is typified by its efficacy, intensity and pace. This *accelerated learning process* is by its very nature specific to the area of focus although often the individuals seem to be able to learn totally new untried tasks at similar rates which may be a function of their ability to narrow the stimulus field down rather than an ability to transfer previously learned skills. Bloom (1982) points out that this phenomena in children at least, is restricted to the specific talent field and that:

As far as these general characteristics or qualities are concerned, the weight of evidence is that they are developable abilities and skills. Whether or not they were present - even in small measure - before the beginning of informal and formal training in the specific talent fields cannot be determined by the evidence collected. (p514)

This view is contrary to the view which seems most common in the public arena, namely that it is those with a-priori gifts, aptitudes, capabilities and the like who ultimately succeed in the particular field of endeavour. Are they recognising Ericsson et al's (1993) "Minimum biological attributes" and attributing greater import to them than to the likelihood of exposure and practice being of greater effect. A further possible difference in the development of adult talent is that adults may have a much greater ability to transfer learned skills to new contexts and tasks than children. This difference may be an attribute of the development of tacit knowledge, of accumulated experience both applied and vicarious, of automaticity and of a state of readiness.

The concept of readiness is common in educational literature regarding children but does not seem to be applied much to adults and it is noticeable that many theories of human development tend to treat the attainment of adulthood as a final stage in development. Some theorists (eg. Shaugnessy, 1983, 1987; Main, 1993) see distinct, successive and important developmental stages in moral, social and cognitive development throughout adulthood and there may also be recognisable physical and certainly habitual stages throughout

adulthood. These stages may be particularly noticeable in artisan, craft and trade areas of endeavour and could follow developmental stages of skill and knowledge acquisition. If there are recognisable stages in adulthood then the concept of readiness is applicable across a wide range of activities.

Talent development in adults

Talent development in adults is centered around activity. The activities of adults cover a vast range but the individual developing talent seems to concentrate on major areas in which immerse themselves and become exceptional performers. The way in which they choose and develop their foci of activity must be a major feature of the talent development paradigm. There are many views and interpretations of this amongst them being behaviourist views which emphasises reinforcements gained from activity, developmental views which emphasise particular activities engaged in at stages of readiness, sociological views that emphasise the influence of political, social and familial contexts and economic type views which emphasise competition and resource factors. The person centered views of learning psychology and in particular of learning styles theory are the most applicable to a study of talent development.

Scarr and McCartney's (1983) theoretical approach emphasises the interaction of genetics and environment and how this influences choice of environment. The patterns of mental habits construct (Lawrence, 1993), provides a link between genetics and environment. In a process of talent development there must be some reason why individuals concentrate their energy in particular ways rather than spreading it around. This focus of energy and activity must provide some kind of reward in order for the individual to keep on doing the activity. Lawrence's (1993) construct of habits gives a clue as to what is rewarding about this. The reinforcement may be implicit in the activity. In other words the individual who is concentrating upon an area of development may be receiving a kind of reinforcement that has little to do with identifiable real-world rewards, such as money, fame or attention, but may be more to do with the kind of intrinsic personal stimulation that comes from engaging in an

activity of choice. As such this intrinsic reward must have some kind of effect within the individual's persona both psychologically and physiologically.

The extrapolation of this brings the possibility that choice of activity as an adult may have its genesis in the physiology of the nervous system with what could be interpreted as a preference for certain modalities or patterns of stimulation. Wasserman (1992) recognises this when she says about children that "experiential learning, or serious play, builds habits of thinking" (p136) and it may be that these habits of thinking (and acting) result in an individual selecting areas of focus that increasingly provide the rewards for certain kinds of mental and physical stimulation which form recognisable patterns of action upon the world. These patterns might reflect innate preferences acted out within the constraints of opportunities offered up by the context within which the individual lives. The point to be made is that the way in which people move towards some kinds of activities and away from others, over an adult life span, may have strong links with inherited preferences for thought and action in the world.

If this is so then these patterns may be critical to subsequent adult development and be evidenced as preferences for specific kinds of stimulation related to specific areas of activity, in this study the focus of which is the talent area, an area in which due to a close match of circumstance and inheritance, an individual may find their performance becomes more closely related to task requirement.

With adults the possibility that talent is developed by vicarious means - exposure, observing people, thinking about the subject, the percolation and incubation effects, lessons learned distant in time and type from the original stimulus situation, what adults place under the catch-all description of "experience", is not an issue which at least in the literature to date, is either well acknowledged or researched. This issue is relevant particularly to women beginning a new developmental path later in life, to different ethnic groups (e.g. Maori, Asian) who bring quite different histories to bear on their subsequent

progress in cultures which may be foreign to them and indeed to any individual who does not follow mainstream paradigms. This view also brings into question the very important issues of who decides who is talented and what are these talents. Again it is those who best fit the mainstream paradigms operating in that society who establish the general criteria. In our western culture what is seen as a talent may have no application whatsoever in say Maori or Asian cultures - they may have their own very clear ideas about who is talented and what talent is within their situation.

This situation then affects the terms themselves and it must be acknowledged that the concept of talent held in the west is culture specific and to a certain extent is owned by vested interest groups within the sub-culture in society who establish in part the criteria by which they judge each other and agree as to who is expert. e.g. art and artists, music and musicians, science and scientists, research and academics, business and business-people and so on. If as some authors prefer, talent is seen as specific and performed, then a variety of areas of endeavour, culturally specific can be proposed and subjected to scrutiny. Cultural areas of talent could be subject to investigation but this area shows little evidence of this happening even though culture, especially indigenous and threatened cultures have an increasingly high profile in the world today. The talented individuals in these areas who serve a dual role of both preserving and developing the individuality of their culture are not the subject of much serious scrutiny.

A paradigm development

In general there are still very diverse views within the field about what is talent and what is giftedness. There is a slow but significant change in orientation from a focus on giftedness to the construct of talent development. Giftedness is not being set aside, rather, talent development as a recognisable process is becoming more acceptable and is being discussed. Performance rather than possession is encouraging a more equitable orientation in which the view is increasingly that any individual may develop their own characteristics to

high levels as compared to their background group. A study by Reis (1995) illustrates this change. In this research 12 older women who had achieved eminence in an area of endeavour after the age of 50 were questioned about their lives. Data on their abilities, personality characteristics, environmental influences, the perceived social importance of and the desire to develop their talent were utilised to develop a model of the process. Reis notes that there is meagre research on why some women become eminent and others do not and this observation is applicable generally across the gender and age range after child and early adulthood. In the study questionnaires were used to frame interview questions, initial interviews were conducted followed by semi-structured interviews and primary information sources (diaries, chapters, recordings, writings and publications) were consulted. Open, axial and selective procedures were used to analyse the data. Open coding, a way of comparing data, was used to develop conceptual labels such as common personality traits. Axial coding focused on identifying and connecting categories so that causal and contributing factors can be ascertained in order to generate theory. Selective coding was used to select a core category and relate major categories to each other. Four major factors emerged as important in enabling these women to develop their talents: above average intelligence and/or special talents, personality traits, environmental factors and the perceived social importance of the manifested talent. "These factors merge with a belief in self, and a desire to develop one's talent into a product, experience or pursuit of an area deemed personally important" (p71). Reis points out that none of the participants showed superior academic achievement when young and only one displayed any special abilities at a young age. Reis notes also that the women in the study saw the development of their talents as a way of improving the human condition. A further feature is that the women did not "acknowledge the importance of luck and timing, but rather the results of their own hard work and active efforts to be successful" (p71).

The model Reis (1995) proposes can be compared with three other models that relate to talent development and the differences illustrated. The first, Renzulli's Three Ring Model (1985), identifies components of creativity, task commitment and above average intelligence and can be associated with Reis's above average intelligence and/or special abilities, personality traits and desire to develop one's talent. The fundamental differences between Renzulli's child centered approach and Reis's adult centered approach lie in two areas. The first is the importance of environmental factors in Reis's findings and the model developed. Renzulli's view is very much within the person and is very applicable to children. Reis's findings are that the wider environmental and social context play a significant part. The second is in the type of motivating factors. With Renzulli's theory the motivating factors are subsumed within the component of task commitment and creativity but in Reis's model the motivating factors are separately evident and include the belief in one's self coupled with the desire to develop perceived talent/s for the common good. Adults have a wider world view than children and it may be less likely that children would see a social, philosophical or moral reason for developing their talents as they may not have reached a stage of appreciating or understanding the wider social context. These differences illustrate the caution required when extrapolating the findings on children to the process of talent development in adults. In this instance it is evident that the process in adults has more contributing factors and therefore is more complex. A related question must also be asked - is the process in this case more gender specific? Do older men develop their talents for similar reasons to the women in Reis's study?

In Gagne's Differentiated Model (1985, 1995) a different approach is taken and the motivations of the individual are encapsulated within an intrapersonal context and then an environmental context. Gagne sees the environment as having a greater influence on talent development and his model is more inclusive than Renzulli's. Gagne (1995) identifies the developmental process - learning, training and practice as the core of talent development with

context, personality and motivation as contributing to the process. This approach is also compatible with Reis's findings and subsequent model. Gagne specifically differentiates between giftedness as aptitude domains, and talent as fields of talent. Gagne also include chance factors as a significant contributor to the developmental process and considers that the majority of people are gifted and talented in something. Tannenbaum (1983) and Simonton (1989) note that people can place themselves in proximate positions so that chance or luck can be enhanced and therefore developmental potential can be promoted. This view is representative of what can be seen as a major paradigm change in the field - the change from inherited ability of the few to the development of the potential of many through exposure, learning and practice.

Sternberg and Zhang (1995) have put forward a model. "The Pentagonal Theory of Giftedness", that focuses on identifying who can be judged as gifted. Five criteria are used: excellence - being superior in some way from peers; rarity - having a high level attribute that is rare amongst peers; productivity - being able to produce something of value; demonstrability - being superior according to valid assessments; and value - the outstanding feature/s of the individual must be valued by society. Each of these criteria interact to define the individual's giftedness. The theory is seen as implicit at present until validation may be achieved empirically. Again there are similarities and disparities between this and the other models but the inclusion of a performance criteria - productivity, brings the model closer to the model that Reis proposes. The confusion in terminology is again apparent with the inclusion of this performance criteria in Gagne's terms more associated with talent than giftedness. To produce something an individual must exercise a large repertoire of learned behaviours - skills and understanding and this aspect of the model essentially fits well with the talent development paradigm.

There are common factors in the four differing models but the important difference that is relevant to adults is in the emphasis by Reis on environmental contexts and the kind of motivation that influences talent development by older

people. It is reasonable to assume that it is the accumulation of prior experiences that is at the core of the differences between the models and between the process in children and that in adults. Reis (1995) observes when discussing the participants of the study that "talent development is a life long process, that for them, culminated later in life" (p72). There is no indication from Reis that the process had to necessarily start when the individual was young.

The paradigm shift from gifted education to talent development has been promoted by experts in the field such as Gagne (1985), Feldhusen and Treffinger (1996). They argue that there is a strong shift away from singular, global "g" type giftedness to multiple talent, from limited academic-intellectual orientation to interest in competence and expertise across a broad range of human endeavour at all levels. Treffinger and Feldhusen (1996) stress that "New paradigms will compel us to involve our entire community more widely and effectively in searching for talent (in students and in adults) and in creating talent development opportunities in and out of schools" (p191). They recognise background features to talent development - conative factors such as self-discipline, locus of control, beliefs and stylistic variables and the influence of social, cultural and circumstantial factors outside the person's internal, testable and cognitive abilities.

A distinction that is relevant in the talent development approach is between the concepts of expert and eminence. Ericsson et al (1993) differentiate, "to reach the status of an expert in a domain it is sufficient to master the existing knowledge and techniques. To make an eminent achievement one must first achieve the level of an expert and then in addition surpass the achievements of already recognised eminent people and make innovative contributions to the domain." (P366). VanTassel-Baska and Olszewski-Kubilius (1989) differentiate between eminence and fame and say that "eminence is related to the furthering of knowledge and, as such, possesses substantiation beyond the phenomenon of name recognition" (p147). It is evident that this view is rather unidimensional and could be further

enhanced by the inclusion of practice as well as knowledge but nevertheless the passage illustrates a concept of eminence as distinct from fame and also expertise.

It is evident that there are questions regarding the context within which these labels are given. In a local or regional sense there is little justification for the label of eminence but every reason for a skilled practitioner to be called expert. However in a larger regional, national or international application there is more opportunity for comparison of performance against well known experts and to be called eminent an expert individual must be at the forefront of others who are the most competent in the domain.

Walberg and Wynne (1993) in a summary of research on eminence detail a number of features that are found in adults who were remarkable achievers in their fields. They identified five childhood activities associated with adult eminence. They were hard work, personal knowledge, support and criticism, making and keeping commitments, and successfully completing difficult tasks. All these aspects of development can be found in varying emphasis in the writings of Bloom, Gagne and many others. Walberg and Wynne point out in summary that the eminent achievers were usually competent but not necessarily spectacular achievers and had a diversity of experience. Their opinion is that the education system should emphasise and provide opportunity for the " Complimentary, educational activities that make for long term adult success." (p32)

Piirto (1994) in a book that summarises the knowledge and research in the gifted/talented field, briefly details the paradigm shift beginning with Feldman's (1992) interpretation of what is happening and closing with a personal view of what is required for talent development to take place, namely that an individual should have certain aspects of personality already present or able to be cultivated; a minimum IQ threshold; and specific talent in a domain that is manifested in physical as well as mental ways. Piirto's recognition of the necessity of physical manifestation of talents provides further impetus for a

context based theory. The question of aspects of personality should include style, affect and the subtle qualities of an individual's psyche that will give rise to a complex pattern of individuality that are expressed in activities carried out in the built world.

Summary

The dearth of study, discussion and literature on the development of talents in adults is a cause for concern and as yet there are no clear indications from researchers that this area of study will grow to the proportions it warrants. Examples of the current emphasis/bias in the field of gifted and talented education can be found in publications that purport to represent a comprehensive view of the field. In "The Handbook of Gifted Education" (Colangelo and Davis, 1997) there is no chapter or part that deals with adult talent either as a process in itself or as an educational process worthy of study.

However Piirto's (1994) publication "Talented Children and Adults" contains many references to and a chapter specifically on talented adults. This situation however is not a reflection of the general culture within the field of gifted and talented education. It seems as though the age bias of educational resourcing has created a mind set within the field that embraces the attitude that giftedness/talent relates primarily to precocity. That early signs of giftedness/talent may lead to further expert and eminent endeavour is not disputed but to focus almost exclusively on this as the criteria of identification and study is indicative of narrow and rigid thinking and it is time for a change. The literature must begin to reflect a wider and inclusive view of the development of talent at all ages at many levels and in a greater diversity of activity especially outside the educational domain.

The Research Focus

1. The literature shows a large gap in the area of adult talent and particularly in adult talent development. The range of age related phenomena in the field of

optimal human performance is not reflected in the literature and the thrust of academic research shows a bias to the young, the educational setting and to academic and some related fields. Areas of human endeavour such as technology are poorly served as far as research goes and familial, community and cultural settings show little evidence of investigation in the talent field.

2. There are very few researchers looking at whole life paths and even fewer approaching life paths as a means of investigating adult talent. The constituents of life path dynamics are obscure, ill defined or partial and the question of how an adult progresses through a process of talent development is as yet a relatively unexplored phenomena. Many theories of human development define stages and processes in the young but neglect the range of life changes in adults. Developmental stages in adults tend to be less obvious as they are less physical in a maturational sense and so are perhaps less identifiable. Life path theorists propose useful interpretations of developmental processes and these may become more useful if the critical indicators can be identified. A method of identifying the significant elements of a talent development process might provide some insight.
3. There is little evidence of researchers depicting life paths as connected patterns of development, rather than developments of singular characteristics and the genesis of developmental processes in adults is still within the realms of proposition and conjecture. Areas of investigation such as personal characteristics, intelligence, learning preferences and environmental considerations provide snapshot means of investigating aspects of adult development but do not by themselves enable dynamic progression and connection to be illuminated.

In this study the intention is to :-

- Use case studies to investigate the life paths of a small number of talented adults and the longitudinal process of adult talent development
- Investigate life path influences
- Develop methods of analysis of life path processes
- Explore ways of showing developmental patterns, connections and processes

CHAPTER 3

METHODOLOGY

In this investigation the case study is the research method chosen to gather data. Robert Yin (1994) states that it is essential to develop a theoretical approach to case study and with this in mind the method is discussed. It was intended that the data gained by this method might enable a method of analysis to be developed that would give a unique view of the adult talent development process and from which a theoretical framework could emerge. With the exception of Reis's (1995) model of talent realisation in women there appears to be no specific theory or model of talent development in adults. This development process is termed by the author as a *critical life path*. The case study method is examined and the *critical life path* perspective is introduced. The way in which it was used is explained in the procedure, data collection and analysis sections which follow.

THE CASE STUDY APPROACH

A well tried and proven approach, the case study has long been utilised by social scientists. Piaget, Freud, Jung and many others gained much of their information from case studies and the early work in psychology on case studies gave much of the impetus to consequent research. The case study is a useful

tool to set the scene for further investigation. This "step to action" (Adelman, Jenkins and Kemmis, 1976, p7) and the consequent development from the case studies is a major focus in this study of adult talent development. The outcome is one well recognised as Atkinson and Delamonte (1985) point out:

If studies are not explicitly developed into more general frameworks, then they will be doomed to remain isolated one-off affairs, with no sense of cumulative knowledge or theoretical insights. Regrettably this failing of "illuminators" renders their worth a rather pale version of qualitative research. (p39)

In this study the procedure is one of replication. (ie multiple case investigation). The intention is to achieve either contrary or similar results (or combination of these) for reasons that may be predictable. These reasons may support the initial propositions or indicate a need to revisit these and/or the subjects themselves. If the evidence from multi-case studies is clear then it carries more weight than the evidence gained from single case study investigations.

The strengths of case study lie in a number of areas. In order to extract the relevant information pertaining to life histories and to identify cause and effect relationships over a long period of time there were no other methods considered to give a detailed description that was "strong in reality", and recognised the "complexity and embeddedness of social truths" Adelman et al (1976, p7) that was required in this study. In addition as part of the outcomes the case study provides data that:

May form an archive of descriptive material that was sufficiently rich to admit subsequent reinterpretation and serve a multiple audience, in a form more publicly accessible than other kinds of research.
(Adelman et al, 1976, p7)

Generalisation about an instance, or from an instance to a class, attention to detail, the opportunity to relate to and develop practice, the opportunity to illuminate contextual and individual influences, the use of real life and time language, the opportunity to describe process (Adelman et al, 1976),

and an holistic view of the individual rather than reducing their behaviour to constituent parts (Foster, 1986, p35), are all strengths of the case study approach and important orientations to the outcomes of this study. Allport (1942) suggests that: "Psychology needs to concern itself with life as it is lived, with significant total processes of the sort revealed in consecutive and complete life dimension." (cited in Foster, 1986, p33)

In this study of adult talent, the focus is on placing the various significant events that affect the developmental path of the respondents into a structured format which may enable further investigation and ultimately useful interventions.

The interview procedure was chosen as best fitting the structure and focus of the study for a number of reasons. These reasons primarily revolved around these aspects:- the number of participants - less than 30, the minimum required for reliable quantitative data analysis; the kind of information required from them - spoken data recorded as narrative; the consequent analysis of the data - to produce life history paths (Time Series Analysis); to ascertain any patterns within and between subjects (Pattern Matching); to evolve consequent procedures if possible for further use (Step to action); and to identify areas which could be investigated further including the opportunity to build explanations (Explanation Building).

This process of building explanations from collected data, in this instance from real-life sources, avoids the artificiality of experimental procedures which at least in the initial stages of investigation in this area would seem to have little benefit as the focus of investigation would be too narrow. With a qualitative procedure the situation is open ended, cause and effect relationships may be explored and described, the chain of evidence can be constructed and interpretation is encouraged. To explore a new field or approach a broad view that is representative and indicative of underlying as well as evident processes is required. The argument between the quantitative/positivist and the qualitative

approaches and the use of the case study approach, particularly as it applies to this study of adult talent development, is encapsulated by Foster (1986):

When we do research on giftedness we intend to accomplish two things: 1) To better describe the phenomenon, and, 2) By locating cause/effect relationships connected to that phenomenon, more adequately explain its nature and our effect upon its overall character and development. (p33)

Foster goes on to point out that it is usual in research in the area of giftedness and talent to use large samples and statistical analysis which gives the normal bell shaped curve of distribution, and generalisations are then made to larger populations. However Foster states that this should not always be the case as nomothetic samples may not give an understanding of the particular circumstances of an individual and idiographic investigation is important for two reasons:- "1. the very nature of this exceptionality means that we are attempting to describe and explain the unusual, the atypical, the unique; and, 2. Our ultimate concern must extend beyond knowledge generation to the educational and psychosocial well-being of the individuals with whom we work." (Foster, 1986, p33).

Foster points out that the qualitative approach has particular application for the study of the unique individual and instance. This method allows the informing of theory and practice through 'grounded' insight (Denzin, 1970). The procedure also avoids the constriction of the development of a-priori theories to explain talent and allows description instead to lead to theory development. ie it informs theory. The large scale nomothetic studies that have great status in the field eg Terman et al's study "Terman Life -cycle Study of Children with High Ability 1922-1986; Subotnik and Arnold's study, 'Longitudinal Study of Giftedness and Talent' ; and Lubinski and Benbow's planned fifty year study 'The Study of Mathematically Precocious Youth', provide little insight into individual adult development and how and why talent has been or could be developed.

Drawbacks and cautions to the case study approach.

The case study with all its on-site relativity has a number of weaknesses which have been identified by Cohen and Mannion (1994). Some of these relate to the requirements of academic rigour and concern the key aspects of reliability and validity. They are: - The Hawthorne Effect - the influence or effect the investigator has on the respondent or the context may skew or act to change the data. In participant observation there is also a potential for bias especially in recording data and the observer may lose their detachment and not record or report evidence contrary to a theoretical or practical orientation. External checks are weak and caution should be exercised. One way to limit these effects is to clearly define question, data recording methods and the categories themselves. With single case studies there is the drawback of having insufficient data to generalise accurately, however with multiple sources the case for generalisation is stronger. Insufficiently trained observers, and the unavailability of baseline data are additional considerations. To make the process more valid and reliable, case studies must have a clearly defined set of procedures, ideally use multiple sources of evidence and firmly establish the chain of evidence. As each case is considered as unique and a bounded system, the requirement for external validity is not of primary importance but the question must be asked - is this a valid example given the stated objectives of the study and are the explanations valid?

Other considerations relate to the process itself and basically are logistical:- The time element especially in cases involving a number of respondents, multiple sources of information, and long term observational cases is a critical consideration. With long term studies there is always the danger of data becoming outdated and irrelevant, or attitudes and opinions changing during the procedure. In addition the sheer volume of data may mean difficulty in processing and analysing and if the researcher cannot delegate tasks, has insufficient consideration for consequences or cannot control or account for

perverse effects then the case for the approach can be weakened, which may mean ultimately it could be discounted.

Summary

The case study approach in this instance focuses on a life history approach in an attempt to describe significant features of a unique developmental path that individuals proceed upon. The essence of the enquiry is to see if there are unique phenomena, either personal or circumstantial, that have significant effect upon their trajectory, and what relationships there are between these phenomena. In order to find out there appears to be one way in which this could be carried out most effectively and this is summed up by Allport (1942). "If you wanted to know something about people's activities the best way of finding out was to ask them."

THEORY DEVELOPMENT

In developing a theoretical approach to case study and how it was used in this investigation the following development was largely carried through without a great deal of reference to experts in the domain of gifted and talented education. The intention was to formulate a set of ideas and principles that might describe a process of development, in this case an adult's path through life which had certain characteristics, most noticeably the development of talents to a high degree of efficacy. Reis's (1995) study confirms that there are major differences in the process of talent development in children and adults, enough difference that if the process focused on children is overused as authoritative evidence, a unique view of the adult circumstance may not emerge, much less be able to be compared with that in children. In addition there is no evidence in the literature that a *critical life path* methodology or anything like it has ever been attempted in the field of talent development and so there is no precedence or reference for comparison or support in this area either.

Concepts and constructs

One of the central issues in the study is the construct of talent development. The talent development paradigm is a relatively recent and growing focus in the field of education and is considered by the author to be most appropriate to a study of adult talent development. The major difference between the construct of giftedness and the construct of talent development as viewed within this study is considered as follows: Giftedness is considered as a possessed, static set of characteristics which may or may not be developed but are unusual in that they are evident in individuals at ages well in advance of their peers. The evidence is the almost immediate appearance of precocious high level performance in children in proximate stimulus situations that takes place without any discernible practice or exposure effect. Talent development on the other hand is considered as a process of developing baseline characteristics to a point well in advance of peers. The evidence is a rapidly increasing gap between the individual and the comparison group. With giftedness the difference is immediately noticeable. With talent development the difference is increasingly noticeable. It is this developmental approach to adult talent that will be a primary focus in this study.

This author makes a functional distinction between the terms gifted and talented that may be useful to others. If the term 'gift' is taken as referring to inborn, genetically evolved abilities then it can be said to be natural and not contrived. The English term that approximates this concept is the term 'organic' meaning 'of the body'. The term "organic" can then be paired with the term talent to give an accurate description of a readily recognisable ability that is evident at a young age that has little if any learned or contrived modification to it - *Organic talent*. Obversely the developed, learned and contrived performance can be given the label of 'inorganic' - not of the body, and when paired with the term talent becomes *Inorganic talent*. The central idea is that one fades into the other along a continuum in which the catalyst is life experience - exposure and practice. As one moves from one end of the

continuum to the other, organic talents assume a greater proportion of inorganic influence - they are changed by exposure and practice. However the organic talents do not disappear, they are overlaid by modified versions of the modal behaviour in order to be a better fit to the requirements of the context, but remain as the basis for action. The context on the other hand is seen as being inorganic initially (even if natural) because it is not 'of the body' and the development of talents serves to bring the inorganic context more into synchronicity with the original organic characteristics (ie it becomes more 'organic' itself). In the final analysis the individual developing talent achieves a best fit by working on both their original organic characteristics and the inorganic context in which they find themselves, to approximate a state of supportive equilibrium in which the evolutionary drive to master the circumstances of intra and extrapersonal circumstances are evident. In this state there is energy and opportunity to enhance and increase stimulation in the manner of preference - the expression of phenotype - 'the real me.'

When an individual is beginning the process of talent development they will enter an area of endeavour which increasingly assumes specialist characteristics, termed in this study the *zone of competence*. At the point at which they enter this zone they can be conceived of as having a novice status and entry at a level of competence relative to others. This level may be as a result of inherited characteristics usually termed gifts, at a level as a result of developed characteristics or as a result of the combination of both. This author's preference is to set aside the concept of giftedness and replace it with a performance criteria - *baseline capability giving entry level to a zone of competence*. This entry level would illustrate a significant difference in comparative standard of performance between the ordinary and the excellent performer and would indicate either genetic or learned expertise, or both, in application at the point of entry, depending on age. At an early age this entry level would be more a genetically inherited capability (giftedness - *organic talent*) and at a mature age (eg. as a teenager or adult) could increasingly and

more accurately describe practiced performance (*talent- Inorganic talent*). The concept is then measurable to a certain extent as evaluation of a comparative nature can then be carried out.

The developmental process

Talent development in this study is considered to be a process, either deliberate, incidental or accidental by which excellent, expert and eminent performance is produced. The process itself is considered to be a series of changes or events, recognisable, specific and interconnected much like an organised procedure or series of operations, which begin to form a recognisable and complex pattern and result in an accelerated linear progression - a life path.

The primary indicator of talent in this study is considered to be performance, because performance provides ready evidence of something happening, in this case evidence of expertise being developed. This process may involve many factors, functions, critical points and related phenomena that contribute or affect the resultant developmental path. The developmental path was called the *critical life path* - a pattern of critical events and connections which act in a cumulative and combinatory manner to enable or produce exceptional developmental outcomes. The most significant events and connections in these life paths were called *critical elements*. These *critical elements* were to be the major components from which the *critical life path* approach could be developed.

The intention was to construct a composite, interrelated view of the process and analyse this as opposed to deconstructing the process and analysing the pieces. The talent development process was seen to be dependant upon exposure, practice and experience combining in unique ways over time with the individual's personal characteristics to form patterns of behaviour that resulted in a best fit to the demands of an increasingly specialised environment that surrounded the individual. This special

environment was termed the *ecological context* and describes that special part of the larger environment that gives personal meaning, circumstance and connection with and to the individual. It is considered that this context is just as important as the individual's personal characteristics and the events that take place around them. The *ecological context* may take the form of a vocational area, an area of special endeavour such as an intense interest or hobby or a combination of related areas that form a focus of attention. As talent development proceeds this context will begin to faithfully reflect the individual's characteristics, to the point where the activities he/she engages in optimally fit the contingencies that operate within this special context. Without this special context it is proposed that the talent development process would not take place in the same manner or possibly not take place at all.

Looking at this it becomes clear that talent development is considered in this approach as context dependant (ie if this supportive and synchronistic context was not there then the individual would be unable to progress along an accelerated developmental path). However it must be made clear that the individual is also considered to have a formative influence on the developing characteristics of the context. In other words the individual developing talent effectively is also constructing a supportive environment within which their individual characteristics can be optimally expressed.

Within this the individual engages in preferential activities which will be described by the term *major world activity*. The term describes the area of focus and action in an individual's life into which they put the greatest effort and ultimately in which they become known. It is from this *major world activity* that the individual is considered as gaining greatest rewards and these are interpreted as essentially intrinsic. (ie the reward is gained from the activity as such as it reflects and matches the personal preferences of the individual).

Within this *ecological context* the individual selects from a broad range of activities and environments which, as accelerated learning proceeds, becomes narrowed and focused and in the case of talent development becomes the *zone*

of competence within which the individual is at the forefront of activity and expertise. The individual's *major world activity* becomes increasingly narrowed until they are engaged for a major part of their active lives in a specialised area of endeavour.

The broad process of selection follows this course: - the individual developing talent operates in a larger environmental circumstance. As they begin to fit their learning patterns to the broad environment, they begin to select patterns of available activity that fit more and more with their own preferences for thought and action. This process of achieving best fit brings intrinsic rewards of various kinds - affective, physical, intellectual or whatever. As they move through this process they begin to experience and select more specialised environments, contexts that support and enable further development until in the end at very highly developed levels they have mastered these specialised contexts and are now extending the boundaries.

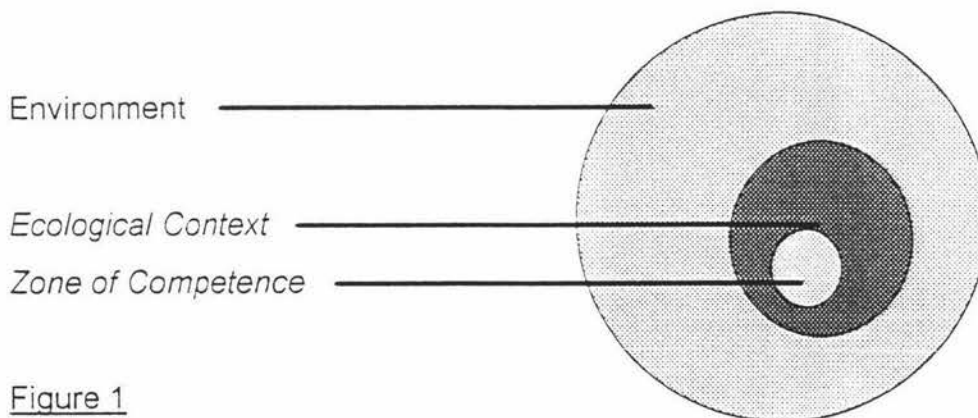


Figure 1

Schematic of Relationships of World Activities

Contrary to behaviourist interpretations that emphasise reinforcement gained from activities according to primary and secondary needs, it is considered in this interpretation that the reinforcement gained in developing talent effectively is from the nature of the activity itself. Taken a step further, the activity undertaken is considered to give reward in the form of patterns of mental and physical stimulation that are synchronistic with inherited patterns of

preference. It must be stressed that in this theoretical approach the operative term is patterns of stimulation, not singular or even multiple stimulation. The overall process in talent development is considered to be one of pattern matching - of environmental patterns with genetically inherited patterns and vice-versa and these may be literally related to inherited brain centered patterns of preference for stimulation. Why these kinds of activities may be preferential will be subsequently discussed in relation to the Myers-Briggs Type Indicator instrument and the theoretical approach that goes with this.

During this process individuals are considered as progressing through a series of stages in which they achieve a certain status related to their level of expertise. They can be seen to begin as a novices and progress through to able, to competent, to excellence, to expert status and sometimes finally to eminence, much as an apprentice in a trade, craft or profession may. They are considered as doing this in an individual context which increasingly bears their mark and fits more and more with their characteristics. The context is viewed in the initial stages as an activity area in the general environment (eg some form of endeavour that others are also involved in such as a vocational group in industry) and within which the characteristics change so that the surroundings become an increasingly specialised environment. Within this context the individual performs in a manner that indicates the development of expertise.

At the developed end of the process the stages are differentiated as excellent, expert and eminent and it is in these stages that it is considered that the talent is recognised and attributed as being fulfilled and performed, whereas at earlier stages recognition may be less forthcoming. The terms excellent, expert and eminent are differentiated as follows: Excellent performance is at a level that in a local context is qualitatively at the very upper end of the scale of comparison with the local peer group engaged in a special field of activity (eg school mathematics). At this point the individual has proven high level competence in advance of peers. Expert performance is at a level that in larger contexts is qualitatively at the very upper end of a scale comparative with the

appropriate peer group in an increasingly specialised field of activity in which competent performance is the norm (eg university level mathematics). At this point the expert performer has proven superior competence and is referred to or acknowledged by other experts or by virtue of performance, usually indicators such as examination results, successful projects, work outputs and so on. Eminent performance is at a level that in national and international contexts places the individual at the forefront of their specialised field of activity and indicates unique and durable contribution to this specialist expert field (eg research and development work involving high level mathematics). At this point the individual is referred to by other experts as an authority and an eminent practitioner. At the developed end of the context the individual is in control of major contingencies and is also referred to by others, passes on knowledge and skills and extends the boundaries of the context.

Below is a simple diagrammatic depiction of the interrelationships between these terms that places them in perspective for use:

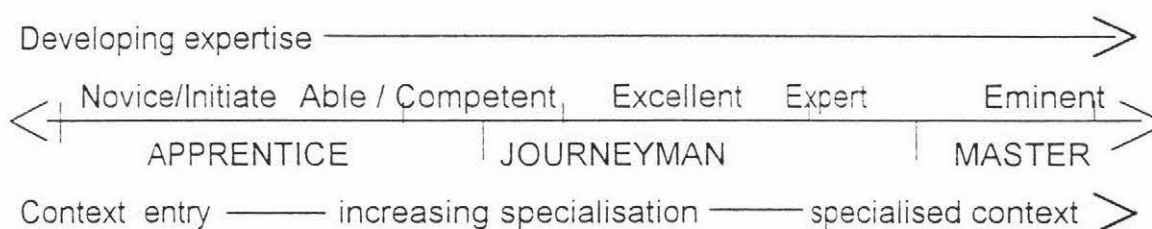


Figure 2 (Not to scale) A simple Model of the Transitional Path from novice to eminent practitioner.

The difference between novice and able practitioner is larger than all the others and takes into account a long maturational/developmental process such as formal education and training. This gap can be compared with the decade of immersion that Bloom and others find in the development of talent. The gap between excellent and expert practitioner is also relatively large as is the gap between expert and eminent practitioner. The reason for this is that there are

fewer and fewer individuals who reach the developed end of the continuum and the time span increases as the demands of expertise increases. It is considered that as talent is developed it is increasingly dependant on a specialised context for developmental progress and expression.

Causality

Within a life path, events will be encountered by the individual that are comprehensible in the sense that they are within the normal frame of reference as part of the individual's everyday world. These events are considered as causal and rational reasons for connection may be made in explaining why and what they are. The usual explanation is that they have a character of determinism about them (eg if I do x , y will usually happen). However events that are outside the frame of reference and comprehension of the everyday world are a problem for explanation and do not always fit into a determinist interpretation. Some of these events are to be considered as a-causal in this theory development and a rational 1:1 match cannot be made between any action, status or presence of the individual and the a-causal event that follows.

These events fit into the category of what is possible and it is proposed they have probabilistic characteristics that range from the likely to the unimaginable. The individual's path may be changed by these events just as much as by causal events. The connection between the a-causal event, its occurrence in the *ecological context* and the path of the individual may give critical possibilities to changing the developmental path. In the case of the individual developing talent, it is the outcome of the event being perceived and acted upon which is critical. In an ordinary path there may be no outcome of significance, but within a *critical life path* the outcome may be critical due to the synchronicity of the various contributing factors. In any life path, critical elements that are causal (ie are able to be comprehended and are active in altering the life path) also may have an element of synchronicity about them. However in this interpretation these elements might be better described as

events that have resonant characteristics rather than synchronistic characteristics. The distinction is to do with degree of timeliness and remoteness of connection.

Within social sciences the predominating approach is to adhere to determinist principles. Establishing temporal cause and effect is important in validating findings and establishing arguments. However the determinist approach to is view all a-causal events as chance happenings and is considered by this author as a contradiction within the approach. To take this view one step further is not to assign the events the attribute of chance - 'they might happen' - but to view them as having a probability of happening which may be statistically calculated. So any a-causal critical element on a developmental path is not within the frame of reference for attributing a direct 1:1 connection with the individual's path and must be described from a different perspective. The only scientifically based approach for this is that evolved from quantum science. Quantum notions reveal a rational distribution of events (both causal and a-causal) and within this author's theoretical approach is the proposition that by utilising quantum notions a better explanation of coincidence, chance and luck may be able to be applied to the appearance of *critical elements* that affect the life paths of the individuals in this study. Essentially the difference in the two disparate approaches of mechanistic science and quantum theory is that in mechanistic science all events are viewed as causally connected and if so are certain. If the connection between cause and effect cannot be made then the instance is written of as chance, coincidence or luck. (the ghost in the machine). From a quantum view however all events without exception are viewed as possible, may have a statistical character of probability but are never certain. That means that in the extreme, some causes may have very unlikely effects and vice-versa. This may mean that some events may have strong characteristics of synchronicity to them but no apparent certain connection with any other event. They are most unlikely and therefore are viewed as a-causal.

In a *critical life path* the view is that chance has probabilistic characteristics rather than random characteristics. The proposition is that synchronicity will take place in some life paths in some instances, that the outcomes will at times be critical to the developmental path, and that the observer/participant may in some way have some effect on the likelihood of some critical events taking place. To extend this is the notion that individuals on a *critical life path* of talent development have a greater locus of control over events and circumstances - some of which may lie outside determinist explanations, but within quantum possibility. By building into this theory of talent development the probability of quantum effects the notion of determinism is preserved but with qualification that deterministic connection is not objective but subjective. In this approach the focus is on talking about what is or could be happening, not saying what it is. Quantum reality is mathematical, not certain.

This is perhaps a radical view regarding causality in a social science context but within the quantum approach, actions in the future may have some effect on the past. This notion is difficult to apply to the behaviour of the physical world but may have greater application in the non-physical world and perhaps particularly so in the life path of the talented individual. A simple demonstration of this can be made when considering that individuals take action in pursuit of the effect with the cause goals. The goals are possibilities in the future and action is taken in the present to match. In the physical world cause and effect are temporally bound. In the non-physical world this may not be necessarily so and the life paths of the individuals in this study may show evidence of this notion.

The contention is that in all lives it is probable that a-causal events and influences will appear, that is in the nature of our existence. Further that in a life path they may offer rare opportunity. These a-causal elements will most likely not be spread evenly, be influential at all or even be influential at any particular stage, unless the individual is ready to take advantage or act upon these 'chance' appearances.

If the question of what they are is considered then this can only lead to speculation as the events are many and may be meaningless outside the context of the individual's lives. They engage meaning by the effect they create within a life path. The central question is - why do these particular influences appear when they do? Are they the workings of happenstance, of chance, coincidence and luck, entirely unconnected with the individual's path? How can they be unconnected when they have such critical effect? Can a rational explanation be attempted that indicates some reasonable connection between the path of the individual and the 'appearance' of these phenomena?

If there is to be a rational explanation then the actions of the individual must become a focus. Can the individual have an influence on the appearance of these events and if so, how? There are a number of considerations here. The first is, what is the likelihood of these events occurring? The second is, what is the likelihood of these events happening at crucial times? The third is, why did these events have critical effect. Would some other event, or the absence of an event, have had the same effect?

The first consideration can be answered only by a comprehensive statistical study on the occurrence of a-causal influences that a) happen in people's lives; and b) have a critical effect on their lives. Unfortunately this kind of study is neither common, nor is it possible in the context of this study of adult talent development. However it must be said that there is a possibility, or better still a probability that these kinds of influences will occur in any individual's life path and maybe in the case of the developing talent a likelihood that more of these kinds of events may occur in the life path. The point to be made is - do they have greater import in the life path of the developing talent than in an ordinary path? Whether or not the individual can influence the occurrence of these can be approached from the point of view that they may be able to increase the likelihood of certain kinds of a-causal events happening by taking an active role and manipulating the contingencies of the environment, or by

taking a more passive role and being more perceptive and responsive so that when the event occurs they are ready for it.

The second consideration concerns the event happening at a critical time. Again the explanation must revolve around the question of - why now? A possible answer to that lies in considering a number of contributing factors. The first involves the proposition that the individual is being driven by some influence that enables them to become more perceptive to the subtle cues of their environment that means that they may respond in the best possible way to the appearance of an a-causal event that will enable progression along the developmental path. This influence it is proposed, is the drive by genotype to experience the environment in compatible ways as Scarr and McCartney propose in their theory of Genotype ---> Environment Effects (1983). Scarr and McCartney say that the genes are part of a system that organises how the individual experiences their world and that the genotype selects environments in which the individual may be highly responsive.

A factor which may be influential is that the appearance of a-causal events that are critical rather than incidental is a payoff of a system in which the individual begins to construct in an active way, a new supportive context (termed in this study the *ecological context*) that is synchronous with the drive for genotypic expression. Scarr and McCartney (1983) propose that this "active" selection process results in stimulating environments and that these correlate with motivational, personality and intellectual aspects of genotype. In this *critical life path* approach it is proposed that the individual may select the active environment which best fits, but that they go much further by actually creating by various means within this broader environment a specific *ecological context* which maximally supports their opportunity to express their own personal characteristics. If this is the case then the probability of the environment throwing up critical a-causal influences that are selectively fortuitous must be considerably higher in an "active" environment than a "passive" or "evocative" kind. (Scarr and McCartney, 1983). This means that the individual has managed

to dramatically increase the likelihood of fortuitous events taking place, at fortuitous times and is maximally ready to benefit from these. The *critical life paths* of the participants may show instances of these. However it must not be assumed that this phenomena is a prerequisite to progression along the *critical life path*. Some paths may not show this aspect of development at all - there may be no need, because things may be happening anyway in a determinist sense to enable progression along the developmental path. Some paths may show a large number, some of greater benefit, some of lesser benefit and some that may be negative but still fortuitous as they provide impetus to further development. The essence of the second contributing factor is that the individual may become highly responsive to contextual clues and remote events that enable critical aspects of development to take place.

Further it is proposed that these *critical elements* must happen at crucial times - they must be synchronous with the requirements of context and person to allow progression along the path. If they, or a causal influences do not take place, then underlying genotypic pressure for maximal expression may be stalled. The individual developing talent to a high degree may be more aware and able to synchronise their actions in the world than the ordinary person. This readiness may be evident within the life paths of the participants in the study. The individuals seem to be able to make the best use of what in a modern idiom may be called a "window of opportunity."

The third consideration concerns the nature of the a-causal influence. For progression to take place, the a-causal influences must occur in time with the pattern and direction of development. This once again raises the notion of synchronicity. Why this event had critical effect may best be approached from the point of view of where this event lay in the developmental path and what are the connections with events in proximity to it. Scrutiny of the *critical life path* might provide some clues. The question regarding would some other event (or its absence) have had the same effect is unanswerable as the only basis for judgement is what the individual reports has happened in the past.

The considerations that affect a-causal influences in a developmental progression are that they have critical effect because they happen, they happen at crucial times, and they are certain kinds of happenings. That they may happen in any life is not disputed and that the individual is able to respond in a most efficacious manner is also not disputed, but a question which was asked at the beginning of this study is - why do some succeed, but not others, given equal opportunity and capability? Part of the answer may lie in the proposition that the individuals typified by the participants in this study might actually be able to increase the likelihood of fortuitous influences taking place, at the right time, and in the best manner to achieve the most beneficial results, whereas others in the same position may not have been able to combine all the elements that were required in a recipe for success to the same degree. A determinist interpretation would be that there would be a 1:1 match between an aspect of the individual's circumstance and the individual's happenstance, but this simplistic explanation explains virtually nothing as the 1:1 match does not seem to occur in the case of the a-causal influence. A quantum explanation in which combinations of factors that contribute to a critical state and in which there is a 1: many possibilities of action and outcomes, better serves the concept of an accelerated development interpreted as a *critical life path* trajectory.

At the base of this attempt at theory development are these key notions as below. In order for talent development to proceed at pace these factors are considered essential:- that there must be three essential constituents to the talent development process and that each has certain characteristics:-

1. the person – with a personal readiness inclusive of *baseline capability*
2. the context – with environmental opportunity, support and resource
3. critical elements – with a synchronicity of occurrence of *critical elements* and contextual demands

These factors combine to actualise the process of talent development through an acceleration of the efficiency of learning. This progression can be described by the methodology of *critical life path analysis*. In addition the

occurrence of a-causal elements is considered as having critical effect on the path and may actually be essential in some instances to progression along the path.

The method will be to evolve a developmental path and place upon it the critical influences - termed *critical elements*, causal or a-causal that the individual encounters or engages in, in progressing along this path. If the model is established, appears valid and reliable as a descriptive measure, it may be then adjusted and developed and elements of the process isolated and subjected to scrutiny. The data depiction will be graphical. The reasons for this are primarily the opportunity for a picture of holistic, interconnected process to be visible but at the same time for the observer to see that there are constituent parts to the process. Another reason is that the data display lends itself to a mathematical interpretation without becoming too statistical and remote from the substance of qualitative interpretation and appreciation of background effects.

It is to be emphasised that just like any theoretical construct it is in the end a best fit interpretation, not an absolute truth.

THE CRITICAL LIFE PATH

The concept of a Critical Path is borrowed from the domain of Project Management and Planning (Armstrong-Wright, 1969). In this approach a project is planned using a variety of network diagrams of specific kinds to manage all the contingencies that are required and might be encountered in carrying out a major project. The procedure is one of forward planning. However in this study of adult talent development the procedure will be used to analyse individual life paths in a retrospective manner and will be termed the *critical life path*. The idea is that any individual developing his or her talents sets out on a developmental path and along this path there are critical influences that alter the trajectory. These critical influences will be termed *critical elements* as they are elemental to progression along the path.

critical elements

The *critical elements* can be separated into two kinds. The first, causal influences that can be directly connected to the circumstances of the individual's progression along the life path trajectory. In this case a determinist, 1:1 match can be made between the individual's development and the *critical element* and the *critical life paths* may show many of these. However the second kind of *critical element*, the a-causal influence does not fit into a determinist, 1:1 match. The second kind of *critical element* has to be interpreted rather than explained, as the appearance of this kind of influence in a life path is coincidental in determinist terms. These a-causal elements are not planned for, seemingly have no or at most a remote connection with what the individual is doing and may or may not be significant depending on what stage of development the individual is at. The problem is one of interpretation.

The *critical life path*

An individual developing talent makes a transition along a path from novice to expert and perhaps to eminence. This path is considered to have a number of distinctive features. Initially, as the individual proceeds his or her progress may conform to a standard rate of progression, a rate which is in step more or less with their peer group, their *baseline capability* and the resource base which is available to them. At certain, critical points their rate of progression accelerates. This will be termed the *accelerated learning process*. The reasoning behind the construct of the *accelerated learning process* is that any individual who has or is developing talent to an expert or eminent degree, must have been able to efficiently and effectively learned the constellation of task requirements that enable them to become expert and eminent in their respective fields of endeavour. Others whose performance is ordinary or not at the same level of excellence are considered not to have learned these requirements at the same rate, as effectively, or to the same level and therefore their rate and efficacy of learning is not accelerated in comparison.

This *accelerated learning process* is likely to be a result of either extrinsic environmental factors such as chance events, planned outcomes, new opportunities, changes in resourcing or environment; or, intrinsic factors such as frustration, the gaining of intrinsic reward from tasks undertaken, a change of focus enabling intense interest in a task or the acquisition of a new set of skills or knowledge; or a combination of these extrinsic and intrinsic factors. In all of this it is the fit and synchronicity of the individual's ways of thinking and doing, to the requirements of an existing or new set of tasks that means that the individual is able to progress on this *accelerated learning process* and begins to develop significant specific and related talents.

Obversely the developmental path may be stalled, in recession, discontinued or in decline. In these instances the individual is not following a process of talent development in an activity area which will result in a successful outcome as compared to the peer group and the rate of learning is not accelerated.

Related Constructs and Terms

In a *critical life path* progression the individual will at some stage engage in a set of activities which will become a primary area of focus and in which they will become known and acknowledged as expert and perhaps achieve eminence. The *zone of competence* encompasses this set of activities and will be conceptualised as a specific field of endeavour which will have distinctive characteristics such as type of activity or occupation, frequency and modality of activity, task requirements, context, specialised resources, significant others and special outcomes that define success and failure. A point can be designated as the starting point and an entry level, relative to the group cohort can be assigned. The entry point to the *zone of competence* is shown by a horizontal, dotted line in Figure 4 (p105) and is considered to be the point at which the individual begins the progression within the specific area of expertise. This is within the *ecological context*. Examples of the specific *zones of*

competence may be found in the paths of the participants. These zones may change as the participant develops. Zones may also be plural (eg academic endeavour and politics.) The idea of a descriptive name - the *zone of competence*, is that it is a way of describing the specialised context within which the individual operates and within which there are both tacit and actual rules, methodologies, conventions, and special areas of skill, knowledge and action. In these zones, competencies are expected according to the requirements of the activities being undertaken.

In summary the individual developing talent is moving along a path that is not ordinary, indeed may become quite extraordinary, from novice to expert - the *critical life path*. They are engaged in a specific field of endeavour, a *zone of competence* which they have entered after progressing from the general environment to an *ecological context*, and attempting to achieve or succeeding in achieving very high level performance based competencies, talent. As they proceed along this path their rate of learning is typified by becoming asynchronous with their peers. (ie. they begin to learn task requirements at an accelerated and more efficacious rate and pull ahead of their peer group - the *accelerated learning process*.) Along this path they encounter *critical elements* that have particular effect - people, events and processes that significantly alter the trajectory. These events may have positive or negative valency. If they have positive effect they facilitate upward progression. If they have a negative effect they block or stall the developmental process or cause it to decline. The individual may enter a zone at a particular stage of life (eg. when entering a vocation or when developing a new field or sub-field of endeavour.) They may enter as a novice or as partially competent. The reason they may be a novice or partly competent is that they may have made a choice to enter a specific zone but may be in an apprenticeship type of relationship, have some of the skills required but not yet have an optimal range of qualities that will take them through to the point of expertise, they may learn many of these qualities from other experts and masters of the field of endeavour.

The *critical elements* can be given a temporal position, a relationship with other critical or contributing events, a valency and a magnitude. These elements combine synchronously with the individual's personal characteristics and the *ecological context* in which they operate to enable the *accelerated learning process* and it is this acceleration of learning that is described by the trajectory of the *critical life path*. The Path does not become different from the norm unless the critical conditions are met, namely: - personal readiness inclusive of characteristics which best fit the preferential activity; environmental opportunity and resource; and the synchronicity of the various elements.

PARTICIPANTS

Six adults from a wide range of endeavours were selected as being suitable subjects for the study. They were initially contacted by telephone. A follow up letter and information sheet were then sent and consent obtained. Five of those approached agreed to be included in the study. The participants were required to fulfil a number of criteria as to their suitability for selection and evidence was provided by them or by reference to common sources of information eg. print media, publications and so on.

The criteria were as follows:- The participants had to be over 40 years of age, involved in an area of endeavour in which they had to have made a unique contribution, were recognised by others as experts and referred to as authorities in their fields. They were to have developed over at least ten years talents which set them at the highest level on a national and international scale of acknowledgment and productivity and could be said to be eminent practitioners in the specific area of endeavour. These areas of endeavour included the following:- politics, a range of academic activities, education, literature, construction, management, botany and horticulture.

The sample selected had to be restricted as to geographic location (the study had no financial assistance). None of the participants had ever been previously identified by any researcher as gifted or talented and none has participated

previously in any intervention, research study or programme in the field of Gifted and Talented Education.

The participants represent a diverse cross-section of endeavours. Each of these individuals has carved out a niche for themselves in which they are or have been recognised leaders in their fields. They have all made unique contributions and extended the boundaries of knowledge and practice, and have had an extended period of influence within these specific contexts.

1) Elwyn Richardson - Author, educator, palaeontologist. Elwyn established an experimental school in the Far North of New Zealand in the 1950's and developed a radical approach to education departing from what was then a very old fashioned mainstream culture and approach. His development of integrated learning approach in education was innovative and is still being quoted in recent times. He has published a number of books the most well known being "In the Early World" (1964) a book which was used for two decades as the major reference in the field of creative learning in education. The book was used extensively in teacher training and by teachers in the 1960's and 1970's. His most recent publication in education "Provisions for Gifted and Talented Children" was published in 1993 and is a practitioners reference for the development of creativity in literature. He has been involved for many years in the field of Gifted and Talented Education, has lectured and studied overseas and in New Zealand, published a number of papers on the subject and has been awarded the Queens Service Medal, QSM, for his work in education. He is now retired and has returned to his original area of qualification, palaeontology, researching and publishing new finds in his field work. He can be considered to be one of the foremost educators since the Second World War in New Zealand and his ideas are still reappearing and influencing educators today.

2) Marilyn Waring - past Member of Parliament, farmer, lecturer, author. Marilyn became the youngest female Member of Parliament elected to office in New Zealand. Her forthright philosophies and determination had a major

influence on New Zealand international anti-nuclear policies in the 1970's and she has been and still is a major influence on social policy particularly related to women's issues. She has published a number of books and papers amongst these most notable in recent years being her work on the economic practices and theory relating particularly to women and the third world status and situation of women around the world. She has had extensive international experience including working for the United Nations and a number of governments and is still very active in national and international women's issues. Her ideas and teachings on economics have resulted in her achieving a very high profile in economic and social policy circles and she is referred to as an eminent authority in the field.

3) Lino Nelisi - author, teacher, educational adviser. Lino was born on Nuie a small island nation in the South Pacific. She grew up on the island in difficult circumstances in her early years and trained as a teacher, working in schools on Nuie until she came to New Zealand. In New Zealand once again circumstances were difficult. She gained employment as a teacher in New Zealand and her desire to contribute in a unique and significant way to the education of Pacific Island children resulted in her beginning to write children's stories. She achieved great recognition in this field and is now a very successful author. Her stories are the stories of her youth and her approach to this area of writing is creating an incentive to others. She works at present in the Education Advisory Service and is often asked by organisations including various governments to contribute to endeavours and projects involving Pacific Island affairs.

4) Graeme Platt - nurseryman/botanist, horticulturalist, environmentalist, writer, lecturer. Graeme is an innovative individual of strong opinions who has developed a unique niche of expertise within a number of related fields. He travelled extensively in his early years and returned to New Zealand to further diverse adventures and ventures one of which established him as the foremost expert in the field of native plant propagation in New Zealand. This venture has

lead him down a number of paths and he has diversified his endeavours so that he is now internationally recognised as a botanist and nurseryman of considerable eminence. He undertakes work for a number of international organisations, including governments, writes papers and publishes in New Zealand and overseas and is in demand as an authoritative speaker in the field of botany and related areas. He presently runs the New Zealand Botanical Research Institute and is working on a number of diverse projects.

5) Warren Hollings - carpenter, construction/project manager. Warren is recognised as one of the foremost construction managers in the world of construction both in New Zealand and internationally. He began his career at the basic levels of construction work and has succeeded in making his way to the very top. He has developed strong innovative and effective practices and has a long list of very successful projects, the most recent being the completion of a project that was considered unachievable and too risky by all the current experts in the field of construction in New Zealand - Sky City Casino. While undertaking this project his team developed construction methods that are at the forefront of endeavour nationally and internationally and are now in use throughout the world. He is in demand as a speaker on the subject of both construction, management and leadership and as is considered to be one of the most eminent practitioners in his field.

PROCEDURE

In this case study approach the aim was to select participants who would be willing to talk about their lives so that the significant influences on their progress could be identified and described and the data analysis methodology worked through to achieve final outcomes.

A short list of participants representative of a diverse range of adult endeavours was made and from this list approaches were made to ten people. Four were unable to participate and two were unwilling to participate. Six

agreed to be involved. Due to logistical considerations one participant was not interviewed and the study was conducted with 5 people.

The participants were contacted by letter and a follow up telephone call made within ten days to introduce the researcher and discuss the study and participation. The purpose of the study was discussed, the credentials of the researcher, the institution through which the study was being conducted, procedures, expectations, research questions, ethics and the end use of the research were talked about. All the prospective subjects contacted by phone were interested and willing to discuss the study. These same individuals also all agreed to participate. If the subjects expressed interest in participating the following were sent to them: - a covering letter (refer appendix *A*); an Information Sheet which detailed the study aims and procedures (refer appendix *B*); a background information questionnaire which asked them to provide details of personal contact, family circumstances, work and qualification history, and personal tastes (refer appendix *E*); and, consent forms which asked for participation in the study, permission to use their names and agreement to complete the Myers-Briggs Type Indicator (refer appendix *C, D*) The subjects completed the appropriate portions and mailed these back to the researcher.

Following this the first interviews were scheduled, conducted and recorded on audio tape with a focus on gaining as much information in narrative form as possible that detailed the participant's life paths. The participants were asked to complete the Myers-Briggs Type Indicator questionnaire. The first interviews took place over a period of two months in the middle of 1997 and were carried out as below.

Following this the data was transcribed, a list of significant elements made and the second interview was arranged. The data was checked with the participant for accuracy, the list of significant elements discussed and adjusted and then the critical elements identified from this list. The draft list of elements was then constructed into the format Table 1a (between pp.105-106). The draft of Table 2a (between pp.105-106) was then constructed. In each case the participant

decided on the identification, longitudinal effect and valency of each critical element. Four of these interviews were completed in late 1997 and the last one in mid 1998

Data processing

The draft data from Tables 1^a and 2^b (between pp.105-106) was taken away and the initial *critical life path* diagram was drawn up on a computer data base (Excel 5.0) as a graphical display in three forms. The data display was shown as Table 1^a (between pp.105-106), a bar chart detailing each *critical element* identified in the participant's life path in terms of its temporal effect and sequence. Table 2^b (between pp.105-106), detailed the valency and relative magnitude of each *critical element* in sequence, and Table 3^c (between pp.105-106) showed the cumulative effect of the scores from Table 2^b (between pp.105-106) - the relative valency and magnitude in sequence, to give a *critical life path* depiction. By following the high points in each element a trajectory can be drawn and this describes the *critical life path*.

The completed tables were then analysed with the following points in mind. The major orientation was to look for evidence of patterning within and between subjects on the *critical life path*.

Evidence of the similarity of longitudinal effect, sequence, valency, magnitude and kinds of *critical elements* within and between subjects and of influences of preference of type, intelligence and kind of activity were looked for. Synchronicity and a-causality, the development of specialised contexts, involvement in *zones of competency* and *accelerated learning processes* taking place were also considered.

The data provided some interesting outcomes, a number of which only became apparent after some lengthy consideration on what the data display actually showed. Some of the results are quite evident and some are perhaps inferred rather than immediately evident.

The participant's life paths were summarised and presented to them for comment. These life path summaries are detailed in Chapter 4, Results: Part 1- Case Studies. The completed data was analysed and is detailed in Chapter 5, Results: Part 2 - *critical life path analysis*. The results from both Chapter 4 and 5 are discussed in Chapter 6, Discussion and Conclusions.

Ethical Considerations

In any study involving human subjects it is important that the participants feel comfortable about sharing their personal information. In this study the participants were very open and frank about their lives and their own philosophies and ways of doing things. Each participant was quite happy to have their name and information given used within the study and in reference to each other. Initially, verbal agreement was reached regarding participation and then both written and verbal consent was given. For reasons of confidentiality the names of people within the study that the participants mentioned have been denoted by title and/or letter eg Scoutmaster. It was not considered that names of businesses, institutions and organisations need to be treated in the same way unless there was a negative connotation which might reflect badly on the present day operation of the organisation. Although this question was raised with the participants it was not considered by them to be important enough to warrant using a non-de-plume or code in the study.

THE MYERS-BRIGGS TYPE INDICATOR (MBTI)

The Myers-Briggs Type Indicator (MBTI) is the instrument used in this study of adult talent development to investigate the personal characteristics of adults progressing on the developmental path. The MBTI is considered by the researcher as having sufficient utility relating to a number of critical factors to indicate why certain processes take place. The idea was to associate personal characteristics shown by the MBTI profile to the choice of activities that the individual engages in along the developmental path. It is considered that the

type profile will give useful indications as to why the respondents made certain choices and took certain directions in their endeavours, and also in the manner in which they themselves constructed or adapted their own contexts to support and develop their talents.

The Myers-Briggs Type Indicator was chosen due to the instrument's structure reflecting the underlying theory that the range of people in a population, their orientations, perceptions, decisions and lifestyles may be broadly separated into a series of characteristic preferences reflecting underlying genotype.

Preferred focus of interest in life -

E _____ / _____ I
extraverted introverted
(the external world of people, actions things) (the internal world of ideas and concepts)

Preferred perceptual style -

P _____ / _____ N
perceptive intuitive
(looking for the immediate and practical, - the facts, as they are here and now) (looking for meanings, possibilities, connections and relationships)

Preferred decision making style -

T _____ / _____ F
thinking feeling
(making decisions based on cause and effects objective, impersonal) (making decisions on the basis of feelings, subjective, weighs choices and values)

Preferred lifestyle orientation -

J _____ / _____ P
judging perceptive
(organised, planned orderly, regulated, controls events) (spontaneous, relatively unplanned, flexible, adaptive, understands events)

Figure 3. The MBTI parameters (Adapted from Lawrence, 1993)

The individuals place themselves at a point along each of the bi-polar parameters via a comprehensive set of questions they answer and this results in a type indicated by a letter combination taken from the complimentary types

E / I; S / N; T / F; J / P which corresponds to a profile which details the common characteristics of that particular type. This type profile indicates a preference for operating and dealing with the world in certain broad ways that are considered as a development of genotype interacting with the environment and evolving the phenotype. The parameters are set out as below to indicate preferences:

A fuller description of the four parameters as they are seen to relate to the development of talent and the *critical life path* methodology is as follows:- The E/I parameter is important to the developmental path as it is considered that a preference for ideas will influence the individual to seek out opportunities and engage in activities that are ideas based such as becoming involved in technology or research involving the development or analysis of ideas. Similarly a preference for people will influence the individual to become involved in activities in which they can interact substantially with people such as early childhood education and in the health and social services areas.

The S/N parameter is important in that the way in which events in the world are perceived affect the way in which information is processed and this affects the choice of activity - the T/F parameter. If the individual orientation is to perceiving events with a preference for intuition - N, then the possibilities and connections seen create a preference for acting which develops these connections - the individual predicts the outcome in terms of future possibilities. If the preference is to perceive events in terms of what is immediately evident and directly linked then actions will be taken that predict the outcomes in terms of the past - what is already known.

The T / F parameter illuminates how the preference for making decisions affects the resultant action taken. If the preference is to take action on the basis of logic and analysis -T, then the individual developmental path should reflect the choice of activities undertaken (ie. the main developmental focus will be concentrated on activities that indicate the preference - such as working with logical systems such as computer technology). If the preference is for action

based on feelings then the developmental focus will be on activities that indicate the preference - such as working with systems that are based on non-parametrical constructs such as health care and social work.

This preference for perceiving and deciding should then have an effect on the participants actions in the following manner: - showing development in areas which support the major orientation of ideas or people. (E/I); indicating the preferential modes of stimulation, (S/N); influencing the choice of modal activity, (T/F); and resulting in the development of a context in which the individual operates that reflects a preference for general choice of lifestyle - organisation or the opportunity to react to imperatives. J/P. In an overall sense the general approach of the individual on the developmental path is considered to be reflected in the E/I and J/P parameters and the specific instances of perception and choice of immediate stimulus and activity are reflected in the S/N and T/F parameters.

Reviews of the MBTI

Two reviews from *Buros Mental Measurement Yearbook*, (1989, 1990) on the Myers-Briggs Type Indicator were considered. The review by Wiggins (p537) points out an important feature of this procedure and that is that in order to utilise the assessment for the purposes of validating investigation the user must accept the underlying theory of Jung's psychological types. Wiggins goes on to say that there is a considerable body of evidence regarding the validity of the MBTI that exists (p538). There are some questions regarding the use of bipolar discontinuous types (parameters) and the resultant combination of sixteen types (as in personality types). The range goes from the almost non-existent evidence of "bimodal distributions of preference scores" to evidence of type distribution of some vocational groups and the intuitive type (p538).

In another review DeVito (1989, p1030) points out that the MBTI is "not trying to measure people but to sort them into groups" and a further significant feature that the instrument is "intended more for the respondent than the

professional" (p1030) a significant difference from most other psychological assessments. The bi-polar parameters are seen as opposing rather than competing choices and this feature in particular is considered to be most useful in this study in that a preference, but not an exclusion of strategy or way of doing, is exercised by the individual when situations are encountered that require action to initiate or resolve. DeVito (p1032) recommends the use of the MBTI by psychologists in counselling and in research, and in the study of adult talent development the dichotomies that are evidenced on the bi-polar scales will be useful in indicating preferential ways in which individuals perceive and act.

One article by Pittinger (1993) provides further questions regarding bi-modality of scores on the individual scales (p471) and suggests that this may be that "the majority of subjects do evidence an intermediate development of personality preference" (p471). This fits with the Jungian idea that type evolves and individuals with a strong claim to type are seen as being the most effective.

Evidence presented (p472) regarding stability over time on all scales questions the stability of the four letter type code and there is a further question regarding individuals whose scores on one or more of the scales place them close to the zero point can be accurately designated by a type label. The question of sixteen unique "types" is also raised and is seen to be an artefact of the combination of the four bi-polar parameters rather than an actuality. However despite these cautions Pittinger states that there is ample evidence that "segments of the test can be used to make general predictions" (p 483) and this is the intention in this study, to concentrate not on the holistic type designation but rather to apply the useful constructs of perceptual preference and decision making preference, combined with Sternberg's interpretation of intelligence, to begin to shed some light on the question of in what manner adults develop their talents as they deal with the myriad of choices and strategies that present themselves or which they generate.

Piirto (1994) details supporting evidence to the utility of the MBTI in the talent development field and cites findings by Myers (1962), MacKinnon (1978), Myers and McCaulley (1985) and concludes that "The Myers-Briggs Type Indicator, if one subscribes to the Jungian theory of personality preferences, is a widely used, well validated instrument with many applications for understanding academically talented high school and college students" (p 303).

At the end of interview 2 the participants were asked to complete the MBTI form and post it in the envelope given to the address where it was to be scored by the MBTI Registered User. An explanation sheet was provided by the MBTI Registered User and the researcher answered any questions that the participants asked. The researcher has previously administered the MBTI under supervision a number of times and is familiar with the version used in this study. All the participants were offered the opportunity of further discussion on the MBTI Profile if they wished to, either with the researcher or the Registered User. The MBTI Profile was posted back to the participant who then released it to the researcher for use in the data analysis.

The critical path perspective and the MBTI

In this study of adult talent development it is proposed that there is a connection between intrinsic reward or benefit an individual gets from engaging in an activity of choice and what Lawrence (1993) terms "patterns of mental habits". These patterns of mental habits are built over periods of time through interaction with the world. As such they are both learned and based upon some form of underlying structure. In this approach to talent development it is proposed that these patterns are centered in and around the central nervous system and indicate genetically inherited structures that give rise to patterns of preferential activity, both mental and physical. These patterns are considered to be unique to the individual but may be grouped according to the way they were learned. There would be few instruments in the social sciences that might

indicate this phenomena. The MBTI may be such an instrument as it categorises people in order to group similar ways of learning.

It is reasonable to assume that just as different individuals prefer particular biological stimulation, an example being food preferences, so they may also prefer particular kinds of cerebral stimulation which reflect inherited genetic type. This means that just as in body type a kind of template is laid down by the genes, so in behaviour and personality these also indicate a kind of template which in life is reflected by the pursuit of certain kinds of stimulus preference which develop into patterns of thought and action.

The question must be asked is sensation and brain activity the same for all? When our nervous system is stimulated by a specific point source of light for example, is the activity in the brain the same for everybody - same place in the brain, same type of neurological activity, same frequency, modality, connectivity and intensity? Do we all perceive neurologically in the same way? Do we take action and pursue activity of certain kinds in order to match the patterns of our genetic inheritance? A Jungian interpretation suggests that we have individual preferences for stimulation, activity and ways of doing and it is suggested that the MBTI might illustrate this underlying process in a talent development process.

When engaging in a process of talent development an individual begins to learn quickly and effectively the ways of thinking and doing that bring results and enable rapid and effective progress along a (preferential) developmental path. In effect they accelerate their learning. This *accelerated learning process* may be triggered by a number of factors, one of which is an intense interest which acts to engage the individuals attention completely, either in extended bursts or for long periods. The individual may experience a significant life change with this intense focus and the effect may be that they live in a way in which their focus of thought, word and deed are almost entirely, or primarily directed to the activity of choice, their *major world activity*. The way in which

writers and artists work and athletes train and conduct their lives is illustrative of this phenomena.

As the mature, older, adult individual is proceeding upon a normal life course an event, such as an idea, happening, meeting or opportunity, presents itself. In the normal course of events this particular occurrence may never have had an effect, but in this particular case due to the synchronicity of the particular event and other contributing factors (eg. readiness, style), a critical response is triggered which results in the individual selecting or modifying an existing strategy, or developing a new strategy and precipitating a course of action which is characteristic of their way of doing things. This way of doing brings success, attention is intensified and focused and the result is a speeding up of the learning process which again brings more rewards in the form of stimulation in the manner of preference. The individual is in the process of achieving a best fit of inherited patterns of preference with environmental patterns by taking action in the world in a way that maximises the match. This is considered in this approach to be the process of talent development and in the case of the talented is an optimal process.

The categories or kinds of intrinsic events that are to be considered in this interpretation are seen to hinge around the individual's perceptions of events and the decisions made in response to those events, both intrinsic and extrinsic, that have a significant effect on the individual's path (ie they are critical to the change in trajectory of the developmental path). It is this molar or quantum change that differentiates the path of the exceptional from the path of the ordinary. Any personal preference or bias towards perceiving events in certain ways, responding in certain ways, or choosing strategies that reflect a particular way of doing things, would be a useful way in which patterns of action may be established and linked. By establishing critical influences on a *critical life path*, matching these with personal characteristics and describing the relationship that might exist between these, the exceptional progression of an

individual might be illuminated and the process of talent development become clearer.

It was considered that the approach of the MBTI was most suitable in that any significant change in a developmental path may have its genesis in the way in which the individual viewed the world and acted in it. The MBTI is designed to indicate preferences that are relatively consistent within the individual across different circumstances. This consistency is not necessarily fixed and immutable but is predominant although there may be shifts in preferences in individuals according to their perceptions of events and environmental demands such as vocational task requirements.

In summary the MBTI has been chosen as a way of identifying relationships between significant phenomena in the developmental path of the individual and personal characteristics. These phenomena and the connections made have a critical effect on the developmental path and cause a change in trajectory, one that results in a process of the development of personal characteristics that begin to form a body of talents.

DATA COLLECTION TECHNIQUES

The data was collected mainly by recording narrative at an interview. As an introduction and a reference the participants were asked to fill in a questionnaire.

Background information questionnaire

Each participant was asked to complete the background information questionnaire (refer appendix E) so as to enable the researcher to achieve some understanding of the participant's history. It was hoped that this would indicate features of personality, interests, style, experience, knowledge and practice that would help in an interview situation. In addition the information might be useful in checking progression along the developmental path and in identifying critical elements.

The Interview

"Narrative as a form of presentation has two great strengths - it is simple and direct to read, and it is subtle" (Stenhouse, Gajendra, Wild, Dixon, Sheard and Sikes, 1981, p29). The procedure allows the reader to explore the meaning of the questions asked and the answers given. Individuals will be able to identify those instances peculiar to their way and to compare these with the ways of others. They can construct their own categories and classifications in order to achieve understanding and relate these to how the subjects went about their activities. This searching for common ground and converging phenomenon then enables disparate individuals to develop similar conceptual frameworks and general principles for action which result in similar or shared outcomes. The process is described by Canter, Brown and Groat (1985)

Many psychologist have emphasised that the ability to function in the world relates closely to the ability to form categories and to construct systems of classification by which non-identical stimuli can be treated as equivalent.' (p79) and ' Procedures that allow some possibility for the respondent to frame his/her own answers are essential if the essence of any given individuals conceptual system is to be established. (p82)

An important consideration which can be ascertained from reported narrative is the recognition of an individual's world view that is "built around the categorisation schemes that people employ in their daily lives." (Canter et al, 1985, p80). This world view may be a critical factor in influencing the choosing of options that individuals encounter in their developmental paths. eg the competition/contribution dichotomy faced by many, particularly the young in choosing vocations. To elaborate - many young people face a personal choice of being involved in a vocation that has a primary objective of offering service- such as teaching, health, social assistance or the like. or in a vocation that has a competitive focus such as business. This orientation has considerable influence on their lives and the indications are from learning styles research that there is a direct relationship between their choices and preferences that

derive from the development of their psychological type. The descriptions derived from narrative would undoubtedly provide indicators of their particular learning style and world view. Brenner's (1985) identification of narrative as being able to convey ambiguity relating to cause and effect invites the respondent and the reader to speculate and to find their reasons for events, the important point here being that what works for one individual is not necessarily what works for another.

Brenner et al (1985, p4) identify the essential elements of the interview:- Informants, interviews and information, which are varied by scale, scope, time, interpretive schemes and format. In the interview the researcher is reliant on the respondent's interpretations of social actions that occur outside the interview situation and this interpretation indicates the practices and preferences by which the respondent operates, ie their particular combination of style, practice and the cumulative experiences they have engaged in because of their particular developmental path.

In this study of adult talent development the interview is the primary mode of information gathering. It is through the narrative of the participants that the essential elements of the developmental path and the influences that affect that path can be ascertained. It is only by directing their attention to these peculiar phenomenon that the effects can be subjected to scrutiny. When data is analysed and interpreted this distinction becomes a primary concern. With narrative, the individuals reported views are coloured by their style, their history of accumulated experience, their present conceptual structure and their culture. This presents the researcher with the conundrum of accurately interpreting the meaning of statements. This idiographic view is parallel and directly related to the way the individual thinks about the world and how they construct meaning (their world view).

In Interview 1 a general approach in which the participant talked about his/her life history and background was followed. Mechanical issues regarding recording position and tape changes were briefly discussed. The tape machine

was tested during this phase. The researcher encouraged initial discussion on aspects of the study, answered questions, asked the participants for permission to use their name in the study (written permission was also obtained) and then switched the recorder on. All participants agreed to the use of their names. Talent, talent development, adult development, life paths and trajectories and what were the important things in their lives were discussed before the interviews began.

The researcher stated the following, "This study is being undertaken for the purpose of investigating how adults develop talent. You are asked to begin by talking about what you see as your talents, how you developed them and the significant events and processes that influenced you in your development. I would ask you to talk about significant people who affected your trajectory, how and why you think they did, what actions and events took place and what effects these had. In the course of the interview I may ask you to elaborate on particular points as I see necessary. You may also wish to do the same. I would like you to ask me any questions you have, and discuss any points that need clarifying before we start. At any point in the interview you may ask for the recorder to be switched off and you may indicate to me the names of people, places or events that you wish to be protected by deleting or changing"

A pause then took place and the following statement was made by the interviewer. "The events you describe do not necessarily have to be in order as the information will be transcribed and discussed with you at the second interview and any alterations and ordering carried out then. Do you have any questions?"

At this point there were usually some questions about where to start. The interviewer encouraged the participants to start with their earliest memories which they all did. This enabled them to develop a flow of events which were very easy to keep track of. In a couple of instances the participants added influences out of sequence that they had missed earlier, but had no difficulty in

placing these correctly and with the import that they wanted. A further pause and then, "Would you like to begin?"

The participants name, the time, date and place were stated. A flow of consciousness kind of progression as the participant reminisced on the past was seen to be ideal so that the participant could give their own view of events. When the 90 minute tapes neared the end the interviewer signalled to the participant and changed tapes quickly. The participants all paused briefly while this was being done and did not seem to lose track of their narrative. The procedure for the second interview was then discussed.

In introducing the interview and procedure the participants were encouraged to ask questions and became quite enthused about the process of looking at their life paths from the research perspective. The opportunity to reflect in depth on their past seems to have been quite motivating for them and all the participants went to great lengths in their reminiscing on the past to describe the events and happenings in their lives. The interviews were conducted in the participant's place of choice at a time suitable for them, and the researcher was able to take notes as the taping progressed. Three interviews were conducted in work situations and two in home situations. The participants were able to limit interruptions and there was not a problem in this respect. The participants were encouraged to talk as they saw fit, the researcher making as few comments as possible and in most cases none after the introductory phase. The shortest interview lasted around one and a half hours, the longest approaching four hours during which all the respondents were able to engage in an almost continuous flow of narrative. The participants in most cases did not seem very interested in discussing or clarifying what they saw as their talents and generally skirted this issue without committing themselves. They seemed much more interested in looking back at their lives and making connections with the present.

Following the completion of the recorded part of Interview 1 the participants continued to discuss and elaborate on personal circumstances,

philosophies and events and the researcher was able to continue to take notes in some cases having to switch the recorder on again. The recorded data was then taken away, transcribed, analysed and a draft list of significant elements - people, processes and events that affected the respondent's life path was compiled. The notes were used to check for accuracy when the data was transcribed and the initial data lists drawn up.

Subsequent interviews took place in the latter part of 1997 and were carried out as below. In one case the second interview was not completed until mid 1998.

Interview 2

This interview was not recorded. The transcribed narrative and a draft list of significant influences compiled by the researcher from the narrative recorded in Interview 1 was presented to the participants who then reviewed the significant elements identifying those they saw as critical to progression along the path, making additions or alterations as they saw fit. They then worked through the procedure of assigning temporal effect, sequence, values and scores to the elements to construct a draft form of Table 1a and 2a (between pp. 105-106). In all cases the participants seemed to have little difficulty in identifying quickly and conclusively the critical influences in their lives. They were able to put them in order and assign a longitudinal effect to the *critical elements* very quickly. This data was used to construct a draft of Table 1a (between pp. 105-106).

- Temporal Influence and Sequence of *critical elements* in a Life Path Progression over 5 Year Spans. It should be noted that the draft list of significant influences was compiled by the researcher from the transcribed interviews. This was presented to the participant and included every event, person or activity that the participant mentioned in the recorded narrative. This was done to clarify all the influences and to save time in the second interview. The participants went through this list and the transcribed narrative as they saw

fit when identifying and describing what happened, adding or subtracting things as they went.

The concept of a *critical life path* was then discussed. In some cases the participants asked to have it explained in sketch form.

These processes resulted in much discussion, mostly one sided in which the participants adopted an almost musing type of approach in which they talked about the influences and what effects they had, when and how they happened and so on using the interviewer as a passive listener. The interviewer avoided commenting, making value judgments or introducing any opinions and directed the participants to use their own judgment on the relative effects of these elements.

The participants seemed to talk themselves to a standstill at which point they decided that they had sorted the process out to their satisfaction and could not think of anything else. None of them subsequently changed their minds about the values, order and effects of the elements, or added or deleted any other elements.

At the end of Interview 2 the participants were asked to complete the MBTI form and post it in the envelope given to the address where it was to be scored by the MBTI Registered User.

DATA ANALYSIS

Background Information

Information was initially collected about each participant by using a questionnaire form which was posted out prior to the first interview. The intention was to collect sufficient information to give the interviewer a feel for the developmental history of the participant. This information would also serve to allow the interviewer to be aware of the participant's story as they unfolded it and to allow a formative check as to sequence, accuracy and kind of activity that might come to predominate the developmental path.

The information was useful in that on a couple of occasions the interviewer was able to prompt the participant about incidents and processes in their life path story that they had not yet come up in the interview. The information was able to be used to check the transcribed narrative before the initial list of significant influences identified was drawn up.

Interview data

The interview data was transcribed directly from the tape recordings. Incorrect grammar and syntax were left as is and other anomalies kept verbatim. These transcriptions were read a number of times by the researcher and every single mention of person, place, incident, process and event was highlighted. These were collated into a single list which was presented to the participant at the second interview. From this list the critical elements were identified and the *critical life path* constructed.

Methodology of *critical life path Analysis*

In this study the significant elements were identified from the transcribed self report of the participants recorded at the first interview and the subsequent list of *critical elements* compiled and presented to the participant at the second interview. The *critical life path* tables were then constructed. The participant was asked to check these and any adjustments, additions, alterations or deletions were made at this time. From this list the participant was directed to identify all instances that were in their estimation "critical" to their progression along a developmental path to their present point. These instances were then recorded as the "critical elements" that were crucial to progression along the participant's life path. In addition the background information questionnaire and in some cases media reports, publications and notes made by the researcher were used as references to check against the participant's self report. Table 1 and 2 were constructed at this time in draft form as per the format for each table using Microsoft Excel 5.0 (between pp. 105-106). This data was then used by the

researcher to construct Table 3 (between pp. 105-106) and this became the *critical life path* trajectory display.

To ascertain the effect of the various elements on the developmental progression the *critical life path* diagram will show those events that have a critical effect. If the time scale is kept constant then changes in the path are easily seen. If the *critical life paths* of different individuals can be compared then the effects of certain types of events at certain stages of life and development may indicate patterns that might be significant.

The *critical life path* data display

A graphical method of showing the data, using Microsoft Excel 5.0 spreadsheet programme, was selected as best illustrating a number of features of the information gained. Firstly, the identification of individual elements that had critical effect was made and is shown on a bar chart (refer Table 1a, between pp. 105-106). Also shown on this bar chart is the temporal effect of those elements. The relative positive or negative effect of the critical elements was shown on Table 2a (between pp. 105-106). The cumulative effect of all the elements and the resultant path developing from the combination of critical elements was shown on Table 3a (between pp. 105-106).

The advantage of a pictorial view is that paths showing the intrinsic and extrinsic events may be overlaid, the paths of different individuals in the same fields may be compared and the paths of individuals in different fields may be compared. In addition phases within the paths may be subjected to scrutiny. This, with sufficiently large samples would aid in identifying stages of life cycles, choice points, critical maturational troughs, peaks and plateaux and significant changes in environment and world in which the participants live. This might allow comparison with economic, social and other indicators both within organisations and society in general, that affect how we operate over a lifetime.

The data was displayed in the form of bar charts in order to provide an easily understood way of interpreting the series of *critical elements*, their

relative importance and the connections between them. Examples of the display are as below. (refer Tables 1a, 2a, 3a, between pp. 105-106). The tables are examples only.

Table 1a shows the *critical elements* in terms of their sequence and their temporal effect. The solid colour bars indicate the time span over which the element is judged by the participant to have had critical influence. The categories reflect the participant's subjective judgment of the importance of each element as it affected the *critical life path* over time. A five year span was considered to offer adequate accuracy without being too cumbersome for presentation purposes or being lost in fine detail.

Table 2a shows the *critical elements* in sequence and their relative effect and valency. The scores indicate the participants judgement as to the relative effect and valency on a minus 10 to plus 10 scoring system. Positive influence shows as solid above the zero line, and negative influence is patterned below the zero line. Solid colour indicates that the participant judged the *critical element* to have a positive effect on his or her progression along the *critical life path* and patterned colour indicates a negative effect.

Table 3a, shows the *critical elements* in temporal order in a cumulative manner. Each of the bar scores from Figure 4 (p105) is added to or subtracted from the previous score. In the case of the individuals in this study their path is changed by events and people which they encounter. By following the plus or minus score for each element the progression can be followed. This is the *critical life path* trajectory.

The *critical life path* diagram is shown as a graph on a horizontal "x" and a vertical "y" axis. The vertical axis in Figure 4 (p105), shows the relative score out of 10, and its valency, indicated by solid colour for positive and patterned for negative. Elements that are both negative and positive are halved in the display, to show each part and how they affect the trajectory. The horizontal "x" axis shows each *critical element* in the sequence of development.

Within the path an upward progression is interpreted as an acceleration in learning - an *accelerated learning process*, a synchronous, best fit match between the individual's ways of thinking and doing and the requirements of the context in which the individual is operating. A downward progression is interpreted as a deceleration or stall in learning - a *conflicting learning process*. A change in trajectory downward indicates a mis-match between activity and competency requirements, environmental circumstances, intrinsic processes or a combination of these. The same *critical elements* may be both positive and negative at the same time or either positive or negative at different times.

Figure 4, below, shows a stylised *critical life path* and the cumulative influence of *critical elements* which make up the *critical life path* diagram.

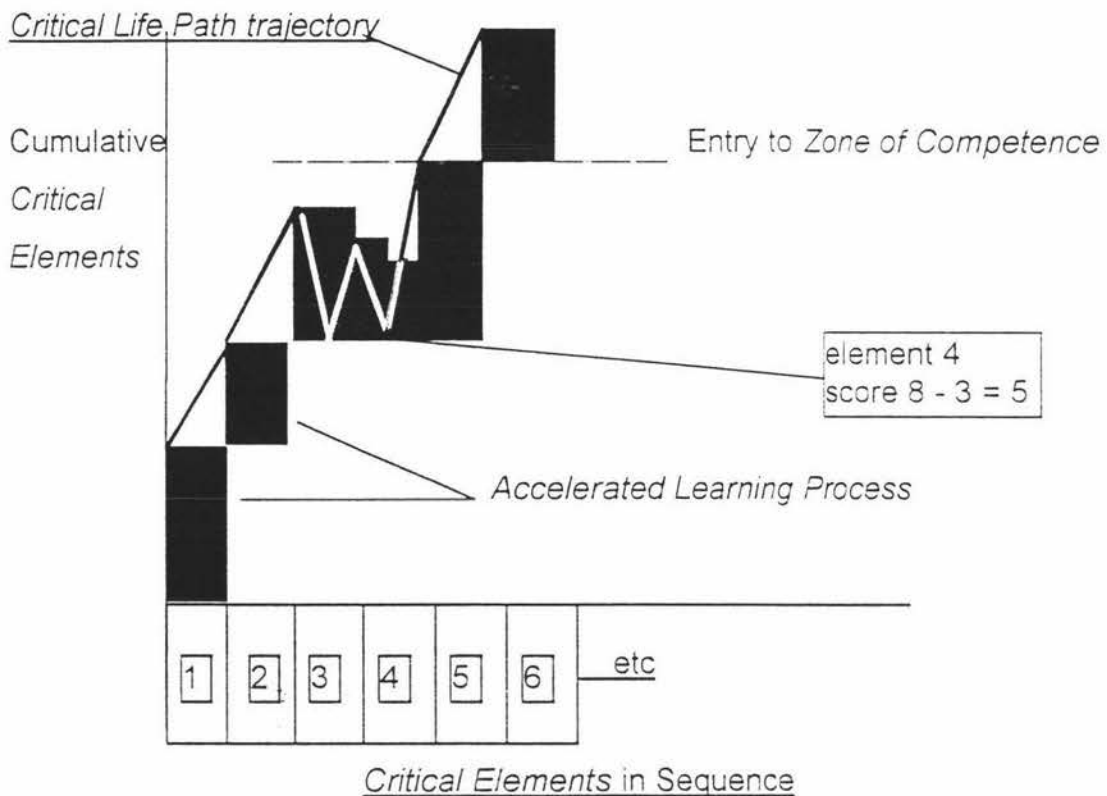


Figure 4 The *Critical Life Path Diagram*

For each participant the scores for Table 3 (refer each participants data display in Chapter 5) were taken from Table 2 and this can be seen when referring to each participants record (refer Chapter 5). The resulting path may

Table 1a: example

CRITICAL LIFE PATH EVENT CHART - Table 1

PARTICIPANT:example

Depicting the reported temporal influence of Critical Elements that influenced the trajectory over 5yr spans

ELEMENT	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	Notes
1	■	■	■	■	■	■	■	■	■	■	■						
2	■	■	■	■	■	■	■	■	■	■	■						
3	■	■	■	■	■	■	■	■	■	■	■						
4	■	■	■	■	■	■	■	■	■	■	■						
5	■	■	■	■	■	■	■	■	■	■	■						
6	■	■	■	■	■	■	■	■	■	■	■						
7	■	■	■	■	■	■	■	■	■	■	■						S
8	■	■	■	■	■	■	■	■	■	■	■						S
9	■	■	■	■	■	■	■	■	■	■	■						S
10	■	■	■	■	■	■	■	■	■	■	■						S
11	■	■	■	■	■	■	■	■	■	■	■						S
12	■	■	■	■	■	■	■	■	■	■	■						S
13	■	■	■	■	■	■	■	■	■	■	■						
14	■	■	■	■	■	■	■	■	■	■	■						
15	■	■	■	■	■	■	■	■	■	■	■						
16	■	■	■	■	■	■	■	■	■	■	■						
17	■	■	■	■	■	■	■	■	■	■	■						
18	■	■	■	■	■	■	■	■	■	■	■						
19	■	■	■	■	■	■	■	■	■	■	■						
20	■	■	■	■	■	■	■	■	■	■	■						
21	■	■	■	■	■	■	■	■	■	■	■						
22	■	■	■	■	■	■	■	■	■	■	■						
23	■	■	■	■	■	■	■	■	■	■	■						
24	■	■	■	■	■	■	■	■	■	■	■						
25	■	■	■	■	■	■	■	■	■	■	■						
26	■	■	■	■	■	■	■	■	■	■	■						
27	■	■	■	■	■	■	■	■	■	■	■						

KEY ■ Critical Element effect
 ■ Zone of Competence
 S Element indicating synchronicity




Table 2a: Example

CRITICAL LIFE PATH EVENT CHART - Table 2

PARTICIPANT: Example

Depicting the relative effect of critical elements on the developmental trajectory in temporal progression

The values and valencies of the critical elements are assigned by the respondent

KEY
 Critical Element - Positive effect
 Critical Element - negative effect
 Zone of Competence

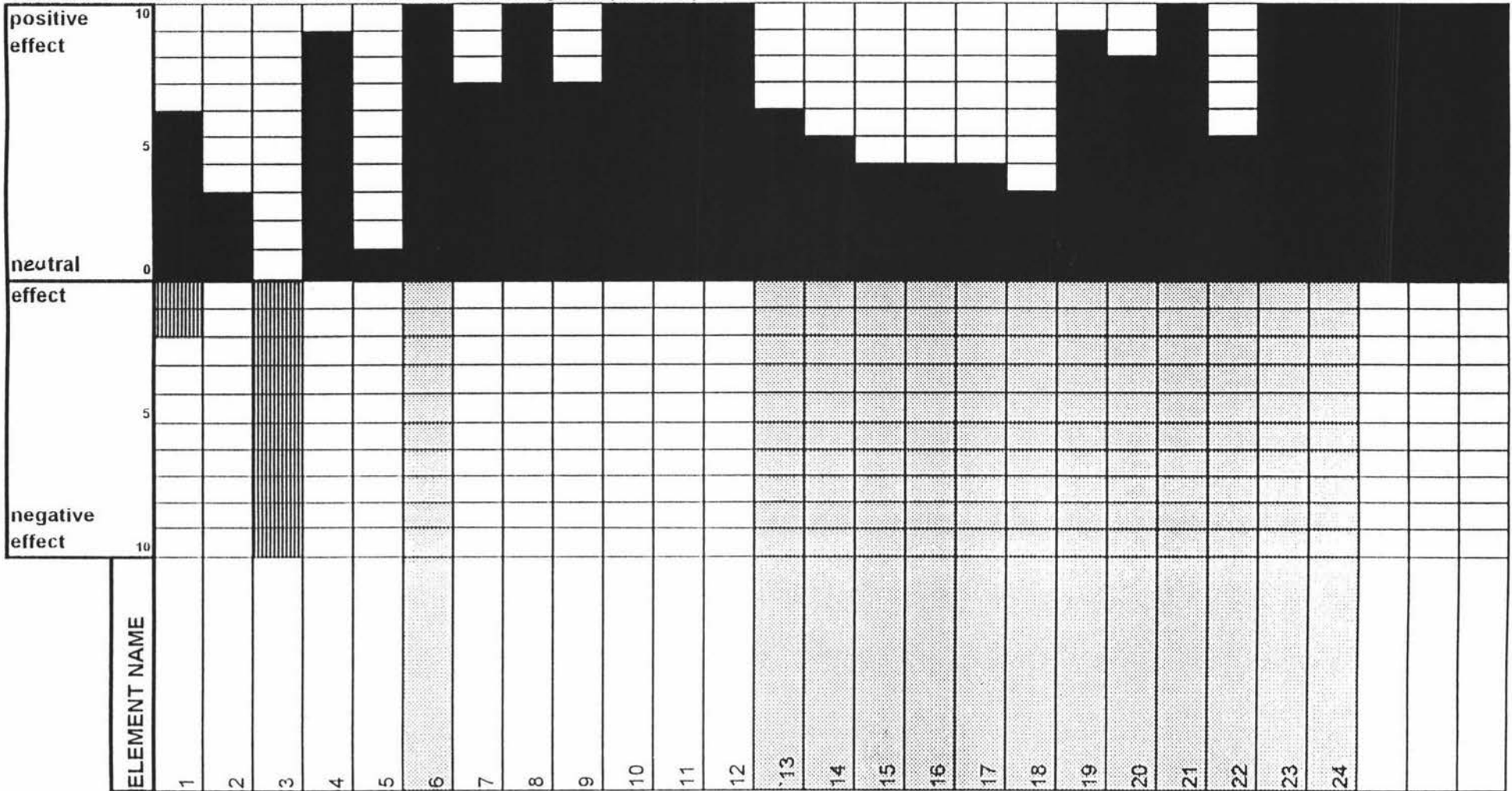
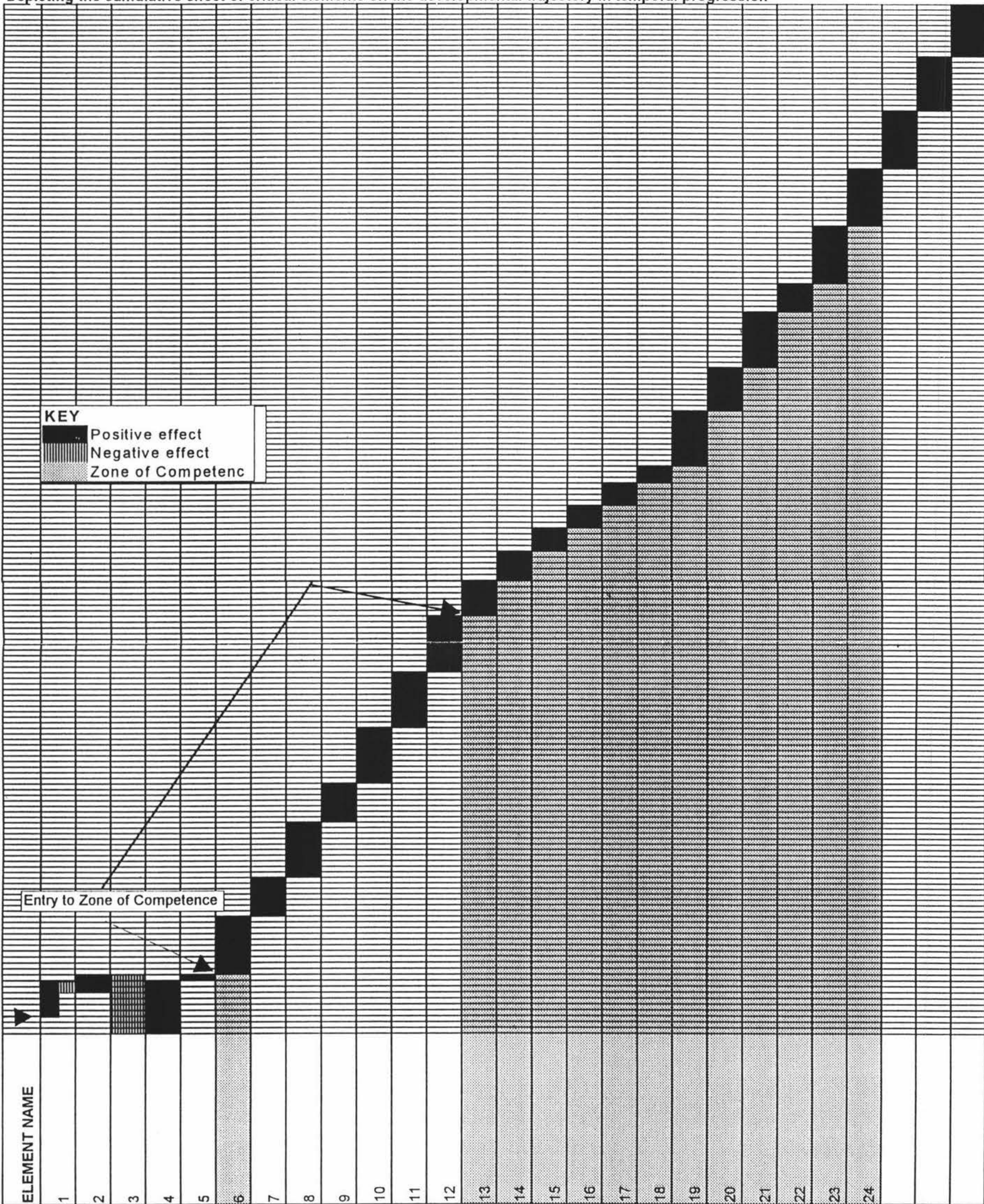


Table 3a: example

CRITICAL LIFE PATH - Table 3

PARTICIPANT: Example

Depicting the cumulative effect of critical elements on the developmental trajectory in temporal progression



indicate strong progression, peaks, troughs and periods of stall or decline. Positive scores are solid colour, negative scores are patterned. If a *critical element* was both positive and negative the scores were added (eg $+8 -3=5$). In element 4 the *critical element* had a positive 8 influence, but there was also a negative 5 influence to it as well. This meant that the Element contributed positive 3 to the rise in trajectory. The *critical life path* Trajectory is shown by the line connecting the positive or negative score points of the *critical elements*. The value of each *critical element* is shown by the size of the bar score. The valency is shown by shading. In the schematic below, *critical elements* 1,2,5 and 6 are positive. *critical elements* 3 and 4 have both positive and negative components and these are shown as split elements, with one part positive in solid colour and one part negative as patterned.

Each positive *critical element* is conceptualised as an *accelerated learning context* and two or more is conceptualised as an *accelerated learning process* in which the successor element builds on the predecessor element. The negative element or part is conceptualised as a *conflicting learning situation* in so far as it is seen as conflicting with development along the *critical life path*. At the initial stage of element 6 is a line indicating that the individual has entered the chosen field of major endeavour in which they may become expert and eminent. This is their *zone of competence*. This element would usually be a vocation, activity or other endeavour which can be identified and possibly labelled (eg nuclear physics research) and is the focus of the individuals *major world activity* that is being described in the critical life path display. In this depiction the trajectory shows two sequences of steep progression and a trough around elements 3 and 4.

The Myers-Briggs Type Indicator (MBTI)

The MBTI was completed by the participants and the profile made available to the researcher with their permission. The intention was to look carefully at the critical elements and the critical life path to see if there were any

patterns of development that could be related to the individual's MBTI profile. Patterns that might be evident could centre around the talent development area itself and within that the particular activities that the participant was primarily involved in - their major world activity. The hypothesis was that if talent development is an efficient process of learning then the patterns of development should fit with the individual's own particular preferences for thinking and doing, that is their own specific patterns of habits. The reasoning behind this is the proposition that all individuals who do very well at life's activities do so because of an increasingly optimal fit between their own patterns of genetic inheritance and the demands of the environmental context which they have entered. Additionally these contexts will become increasingly adapted by the individual until the locus of control over many of the significant contingencies comes more and more within their sphere of comprehension and influence. This two-way process of patterning may be evident by comparing their learning style from the MBTI and the kind of talent development field and activity they are engaged in.

The participants were encouraged to project the *critical life path* into the future and this opportunity resulted in some further discussion with a number of them. This data is not shown on the Critical Path diagrams as the projected paths are only conjectural. It was explained to the participants that the *critical life path* Trajectory could not be accurately drawn freehand although the basic procedure of adding the scores on a graph that showed sequence, valency and progression was sketched and discussed and the way in which this would be interpreted to develop the theoretical approach was elaborated on by the researcher. The participants all expressed an interest in the final outcomes and some asked for copies of the recordings and other data. The participants were all provided with a copy of the final research project.

CHAPTER 4

RESULTS: PART ONE

CASE STUDY SUMMARIES: PARTICIPANTS STORIES

In each case study the interview narrative is summarised and details the significant life events of the participant. In the passage the quotes from the interview transcripts are in italics for easier identification and enclosed in quotation marks.

In each case it is entirely the participant's view of their past that is important, not any interpretation in terms of history, social movements, theories, views or opinions of others. The logic behind this approach is that the respondents act upon their interpretation of reality regardless of whether or not it is biased or influenced by other phenomena. It is still their interpretation of all that goes on that affects their focus, perception, decision and action upon the world regardless of anything else.

This chapter details the individual paths as they were recounted. Interpretation in terms of the chosen theories and constructs is attempted in Chapter 5, Results: Part 2.

Participant : Warren Hollings

Warren Hollings is a senior construction project manager for Fletcher Building based in Auckland. He has a high profile within the construction and allied sectors and a reputation for getting the jobs done despite any difficulties. He has developed a powerful team based approach to project operation that would without doubt be one of the most efficient and effective in construction in the Southern Hemisphere and would compare favourably with any similar team world wide. His approach is forthright, vigorous and involves meticulous planning in a unique combination with innovation and creative problem solving. His style is focused on leading and producing leaders rather than just simple management and he maintains a belief and practice that

emphasises that people are the principal element of success and is not a follower of current ideas in business that technology and resource are what makes things happen. His background is a tale of perseverance despite problems and difficulties and his success is an example of the fortitude and resilience of the human spirit.

Warren grew up in small town New Zealand close in Helensville close to Auckland city's northern suburbs. His father he describes as "... *my father was always pushing me and he was a very educated man, top in everything he did, very, very bright man... He always pushed me, pushed me and while he pushed me he never encouraged me and he always made me feel bad when I wasn't doing well and I think in the end I rebelled against that as well but pretty soon the old man left the family and he was only there on the fringes and I was left to my own devices.*" The relationship with his father was not supportive or close and this was to have significant effect later on. His mother never pushed him, just accepted what he was and on one occasion when an aunt was talking to Warren she said that underneath the front that he put up that he always seemed to be a sad boy. The father left when Warren was in his early teens but the split had been coming for many years and Warren had had little to do with his father over his childhood. "*Dad is dead now and it was very hurtful when the family split up. That gave me very, very low feelings of esteem looking back of what I was about and probably still am. I think it affected my schooling. I wasn't very motivated. I was always a reactionary in class. I used to tell the tutors to get stuffed and I used to get beaten up all the time and at primary school I was always bottom of the class and I didn't give a shit and I was a rebel and I used to play up and cause trouble.*" However at primary school despite the trouble Warren got into he found one thing that gave him a sense of satisfaction and that was art. He was very good at art, gaining some recognition and this success was significant in that he learned that he could succeed at something. This realisation was to have an effect on the way he went about things later on in his early development.

His subsequent schooling was not happy or successful with frequent fights and rebelliousness until, *"Then something happened to me one day that I think was significant. I was always good at art and I still like it but don't have time for it and tech drawing was like an artistic subject and my drawings were beautiful. They weren't that accurate but the tutor loved them and he took an interest in me. He said, 'You know Warren, you're not a bum,' he said, 'You are good at this stuff. Look at the way you do this. It is so great to look at your drawings. They are great.' "* This was to spur Warren on to greater and greater effort until things began to happen for him. *"Anyway a year later I was top of the class in technical drawing mainly because he supported me and I remember one of the intellectual boys looking at my drawings and saying, look's alright but there are inaccuracies everywhere. I said ' I am the top of the class.' He said, 'Yeah but you haven't got it right.' and I said 'Fair enough.' and I looked at it and he was right. I didn't have it right but the tutor had read more into it. He had read into the artistic style and he was obviously supporting me. The end result of it was I was top of the class. It never sunk in for months until months later I believe and then I thought to myself, I kept saying to myself, I'm not dumb. I'm not a bum. These guys are ordinary. They are not better than me."* The catalysts of the art prize and the support of this teacher were to confirm Warren's idea that he could succeed and from that point on he began to realise that hard work brought rewards.

"I think that is what was the change. Then I said to myself, well I don't have to be bottom of the class anymore. I'm already top in one and bottom of the rest. How long will it take me to be top of the class in everything. I thought about that and I thought about it and I don't know how that happened but I committed myself to try. Two or three years later I was top of the class in every subject except one.... That made me realise that what I could do, I could do so there was flashpoint. At that point I taught myself the value of hard work because I had been there. I knew that I could outwit them all. I put in the effort, they didn't and I knew when I did that I could beat them all. The ability to commit

extraordinary effort is a powerful characteristic in Warren's psychological makeup and was to have a very positive effect in his later life.

With this characteristic firmly cemented into his patterns of habits, Warren's life began to change. *"Then I started winning things. Things started happening for me and I started to get a more confident person and I did my New Zealand Certificate of Building at tech. At the end of the School Certificate year I won a Commonwealth prize that was \$8,000 which I spent on a car. After that I did the New Zealand Certificate of Building.(NZCB) I really struggled with the new competition. They were really much tougher, these guys from university coming down and being part of the course. I thought if these guys are even harder I will have to work even harder still. I asked myself for more effort and the next year I was top of the class again. I learned a lesson for myself that it was all up to me. That gave me the confidence as a person."*

While this was going on Warren had joined the largest construction firm in New Zealand, what is now Fletcher Construction and he was to win another prize during his time studying NZCB which was a trip to the United Kingdom. *" I would have been late 20's, mid 20's and my boss said to me, well we have educated you now. If you want a trip to England, you were top of the nation in your finals."* He went to the United Kingdom and worked for Geo. Wimpey, the largest construction firm in the U.K. This broadened his outlook, gave him many new experiences and further made him realise that if he worked hard enough he could foot it with anybody in his line of work, anywhere in the world.

Returning to New Zealand he spent time on construction sites, carrying out the full range of menial and physically difficult tasks, working with tradesman, engineers and the range of people involved in major construction work. *"I was very lucky to join Fletchers because they taught me things. They taught me about underlying philosophy. They taught me about how to get along with people and basic human values. By this stage I knew I could do well and I wanted to make a difference. I saw these huge construction sites and I thought to myself, they are terrifically complex places, all of them to some extent were*

late and I got my chance when I was only young." He was offered the job as Project Manager of a large multi-storey building in Queen Street, the Auckland Building Society building. At first he turned it down but was persuaded by one of his mentors, George Bourke who said to him *"You have got the qualifications. You are ready for leadership. I am going to give you a job in the city. We have not built a multi-storey building in Queen Street on time for 50 years. I will give you my best people and you are going to do it."* This opportunity was the big step that every budding Project Manager was looking for and this gave Warren much cause for reflection on who and what he was and how he would go about this major and very complex task.

"At that stage I was in the deep end. I realised what life was all about for me. I realised I always loved being a builder. I always loved that stuff and here I was in the middle of a construction nightmare and I looked at the old things that were happening. The industry in those days was very bull-headed, run by very powerful, natural leaders. I thought to myself, am I like them. I thought, no not really, I'm not like them. I am only a little bit. I think that in those days Fletchers taught me that I could get the multiply out of people if I could put the effort into them and that my approach was to find the guys who would work well with us, to work hard on the good methods and to put together a team and this is where I started to realise the power in me and what we could accomplish." With this approach Warren successfully completed his first major project. *"That project was the first project in many, many years built on time. In fact it was built early and that cemented to me those values, that leadership is vital but teamwork is probably just as powerful."* Warren began to develop a style that was very idiosyncratic and he became a man driven by the new and exciting taste of success. *"...by this time I was like a shark. I tasted blood and I wanted success. I was right in the middle of the town in an old industry, in the oldest company in the nation and everybody was telling me how to do it. I had a different view. I wanted to do it differently. I have always wanted to do things different and I have always believed in doing this different, and innovation, and coming up with more*

and more ideas that are completely different. I haven't always been brave enough to try them." Throughout this period and subsequently he was in constant contact with individuals from whom he learnt a great deal, his boss George Bourke and two other men, Jim Lowry and Ray Vuksich, all of whom had a powerful effect on his development.

However he became totally convinced that the team method was the way to success and he began to build around himself a group of people that fitted his criteria. *"The thought though underlining it all was the teamwork effort. I then started working very closely with what I considered to be people of talent. Picking them up and winning them over, bringing them into the team and trying to get them to join up with the other people in a powerful way. As time went on the company sent me on courses and I listened to all the experts about management. Over the years I have made up my own mind about what was important and what wasn't. The jobs kept coming and I did my best to keep my senior people together and to educate them, train them, cajole them and preach to them the philosophy that we can be the best. Because we can be, we should be."*

A succession of successful projects followed and he established himself as a leader in his field. He also saw his task as providing leadership rather than management and the task itself as a journey of fulfilment for all the participants. *"The jobs are not just for the client. The jobs are for the company but are also for us. They are for us as well and a chance for us to show the town who we are. A person like me finds that important."* His early problems with recognition and personal value as a young boy can be seen to keep coming back and driving him onward. *"Knowing what it was like to be an absolute bum at the bottom of the heap still motivates me today to look for success and that is certainly part of the motivation."*

His philosophy on success is oriented towards being the best and he considered that if you are not completely successful then you have failed. This was borne out in subsequent interviews in which he reiterated the view that winning was everything, being second was nothing and in a sense because of this characteristic he took on extraordinary challenges that all others had passed by as too difficult. Two of these challenges are listed amongst his successes - the Sheraton Hotel job, and Sky City. *"I think I can finish by saying, talking about myself I think, that all that finishing half a billion dollar project (Sky City) and I look at the stats on that project while we were planning it, I was suitably impressed. We had done some of the most fabulous jobs in the city over the last 10 years and that job was staggering and I thought to myself, well, it's a little bit like being a champion runner and you are the Olympic champion and you run 100 yards in 9.8 but to win the next gold medal against an alien who is allowed in the race, you will have to run a 9.5. Now that was how difficult I saw it but I believed that we could do it as long as we invested some teamwork and I should probably use the relay race as an example."*

The Sky City project had been rejected by every other company in New Zealand and even Australian interests left it alone but Warren decided he and his team could do it. Given 2 years and a start date by the City Council to complete the project, against all the odds they succeeded using the most innovative construction techniques anywhere in the world, completing the project in 18 months. The major innovation was to split the entire project into eight separate construction sites and build simultaneously sideways, upwards and downwards at the same time, resourcing each site separately. The statistics on reading are quite staggering and examples of these are:- 30,000 people were involved in the project at various times, 4 large tower cranes were simultaneously working on a cramped inner city

site, there were up to 2000 people on site at any one time, 50,000 cubic meters of concrete were trucked into the site (that is around 10,000 truck loads), the site cleared the entire national stock of steel beams, 8.5 km of structural steel beams were used, one truck of earth left the site every 1.5 minutes, 14 hours a day, 7 days a week for 4 months, more than 32,463 design drawings and modifications were made (the manual count was lost at this point), and more than \$1,000,000 a day was spent on the project at peak. *"There I have 8 pieces that I can do a parallel. Now of course the resourcing becomes fantastic. I said I will solve the problem somehow. I want the side to work to give me a chance. I had to convince the client to pay for it. I had to convince the consultants to make it work and I had to convince our people to actually do it. They are not too hard because I know they liked one of the ideas that we picked up. We got a national award for that idea because the judges were suitably impressed that we actually made it work. We made it work. We chopped 6 months off a massive programme."*

Warren's attitude to the task is typified in the following passages. *"I think the thing that motivates a man like me is the sheer excitement in that. We had to make it work. Somehow I lead them through that and get them to accept that we could do this. Even with weeks to go before we actually started building the critical things, my senior engineers would fully admit I was mad. "Look at the problems." they said. I said, "You have to solve them. You are going to solve every problem because there is no going back. We are down this road now. There is no going back because the alternative in two years' time is failure. That is not going to happen. This is our lifeline and you are going to grab it."*

He is also increasingly being asked to speak on leadership , management and the learning process in these areas related not just

to construction but also in a wider fields in business and he has evolved strong views on aspects of these learning processes.

"What we are now getting is a lot of people in high places who I meet all the time in the development world who are not really, they don't really understand how people work, how the teams work and how things might happen. I talk to people now about philosophical teamwork stuff and they think I am crazy. They think I am loony. Maybe I am. I'll tell you what, my team got Sky City done. I really don't know if anybody else could have done it. They didn't get a chance of course. Plenty of people say they could have but I will tell you what.-a lot of people at the hearings that said it couldn't be done. All the experts in town said it couldn't be done. So at least I shut them up."

Warren's feeling and reliance on the team brings into context his early years when he felt rejected by his father and was deeply affected by the family break-up. *"When I was young I know what it was like to feel like you are a bum. I know what it is like to feel like you are nothing. Now I know what it feels like to be a bit of an addict. I want to keep doing it, not so much for myself anymore but basically we created an animal and the animal is the team. We all feed from it. We all get things from it and we all get life and standards, enjoyment and now I have got to do my part and my part is the leader of the team and on site anyway and my part in it is basically these days to just keep the team around."* In this sense the team and Fletchers has given him back what he missed out on and has enabled him to succeed well at what he found he can do best, organising and motivating others. *"It's not just talent that adds. It's talent at the right time and in the right place that adds and if you put good people in the wrong spots they can actually not give you much back for your bucks and if you put really good people in exactly the right spot they will tend to grow and add more power and will go forward for the team and it's a very important*

job for the leader to do the organising but the local term is that the definition of that is the allocation of the kind of work to individuals or groups."

After the Sky City project Warren has taken stock of himself and finds himself a different person, one who never again would drive others so hard as he now says the cost on others was too high. "A rest. A chance to redefine what is important to me. A chance to patch up the relationships that have suffered as a consequence of a big effort. A chance to reassess of my own personal identity in the scheme of things and to get myself ready again."

He also has other interests. "I have a family now with a little girl who is 7 years old that has come into my life, which is fantastic and I try to find a bit of time for her and that was pretty tough during casino but I can't imagine what it would be like not having her." At present Warren is Project manager for a \$150 million construction job in Auckland City and is looking forward to new challenges and to spending much more time with his family.

Participant: Lino Nelisi

Lino Nelisi is a Nuiean Islander who came to New Zealand in 1977 and became a permanent resident. She is well known in children's literature circles having written a number of books specifically from her experiences as a child growing up in Nuie and can be considered a very successful children's author. She is at present an adviser for the Ministry of Education based in Auckland and she spends much of her time in primary schools in Auckland promoting Pacific Island culture and language and assisting teachers with reading and language programmes. Lino also carries out consulting work in the language area for individuals, businesses and governmental organisations. Her manner and conduct in the schools has gained her a reputation in an interesting manner. She seems to be able by sheer force of her quiet personality not only

to present her literature in an effective way but to capture the complete attention of all children in the room she is in, even the most disruptive and ill attending children. The effect she has in this situation is described as almost magical.

Lino's story begins with tragedy, the death of her mother when she was only three years old. *"The only recollection I had of my mother was when she used to sing to me and also the biggest memory I have of her is on her funeral day and those are the only things I remember of her."* Her earliest memories are of sadness and loss and in response to this trauma she developed her own inner world. *"From the age of three, I found that it was the saddest, the loneliest time of my life."* She was an only girl in a family of five. The family background is also tragic with two brothers having passed away at early ages and another brother living with relatives. However she was supported through this, by an older brother and a father who had strong and positive values. *"My brother was my best friend and also the person I could rely on."* She considers her brother to be her best friend during this time and he did some special things for her such as buying her a motorbike and teaching her how to ride it. Her brother also was a strong influence and supported Lino throughout her young years. Her father encouraged his children to never give up, to support each other and to put as much effort as possible into their tasks. This rather unique man also imbued Lino with a philosophy of service with helping her fellow Nuiean people and others as well. *"We listened to him. The money we got, my father said, you have got to save your money, work hard, save your money so you don't need to beg people for money. My father died at the beginning of this year and I miss him a lot. I miss him very much but the things he taught me, things he taught me as a little girl I will always remember his advice. To look after your family, work hard - these are the things my father used to say and now that I am working in this field in the Education Department he told me 'Don't just help the Nuiean people, help anybody. Anybody who asks for help, give them help.'"*

Despite these difficulties she had an early childhood of great stimulation and diversity, engaging in many experiences that other children especially girls

did not do so much of - fishing, planting and hunting amongst other things. The traditional role separation of the girls and boys in Nuie did not take place in her family - this was to have a considerable influence on her life. *"... but our family is rich in different experiences where I do a lot of different things, so I assume that my experiences when I went to school were far richer than those children who didn't do anything, who didn't go out fishing, who didn't go out planting, who didn't go hunting."*

She entered school at the age of 6 a source of great embarrassment for her as it seems her father had lost her birth certificate and forgot her age. She found school tough, being the victim of bullying partly due to her mixed parentage, her father being Nuiean and her mother Samoan. The children at that time also had to walk to school, getting up at 4am in the morning and walking 4 hours to school and 4 hours back again at the end of the day. *"I don't want to walk to school and if I am to walk to school for 8 hours, 4 hours each way, I would like to get something out of my education."* She also did not like the style of teaching with very strict and conservative methods being in vogue at the time. *"As a little girl the children used to hate me at school. The teachers used to hate me. They used to punish me and the same with my brother because we came from a poor family I think and because our mother was from Samoa, they hated us. They used to let my brother fight in the playground with other kids while I watched and they used to strap me at school. I said OK, I am going to try my best and one day I will be better than you. That is what I used to say to myself as a little girl. You can punish me now, you can strap me now, you hate me now, but one day I am going to be somebody."* She did well at sports however and gained some status and a feeling of worth from her endeavours in these pursuits. Although she considers herself not academic she worked very hard and in the High School Entrance Examination she came 18th out of 500 students and felt this was a very big achievement. Following this she again applied herself diligently in the secondary school years and in the 7th form she ended up with an 8th placing.

On leaving school Lino discussed her future with her brother and father and although she wanted to be a nurse she made a decision to be a teacher as her mother had been. She completed her training and taught for 7 years in Niue schools developing her style and expertise, a style she describes as strict but fair, with no physical punishment and always explaining things that she did.

At age 21 Lino married a Niuean man from a village next to her own. He came from a family of 8 brothers and one sister. Going from a small family of three she went and lived with a big family and hated this. It seemed to her as though she was just an unpaid servant and considers this to be the worst time of her life, becoming so depressed that she became physically ill and she felt like she nearly died. *"After work I would have to do the washing. After work I had to do the ironing. ... I wanted to continue teaching but because of the stress I got from living with this big family, I got sick but my mind was on my job. I got very sick that I nearly died"* Being unable to cope with this lifestyle, but still wanting to teach she decided to emigrate with her husband to New Zealand to seek medical help and start a new life. Her brother paid for her air fare, so in 1977 she came to New Zealand and things began to change for the better.

"When I came to New Zealand things started to change." In the new country however she was not confident and she became involved in a number of unusual incidents which seemed to make a new pathway for her. One incident involved her walking up to Karangahape Road, a main arterial transport route, and catching the first bus she saw thinking that it might take her somewhere where she could get a job. *"One day, I think it was a week since we came, I walked up to K Road and then I boarded a bus. I didn't know where I was going."* This bus took her to New Lynn, a suburb where there was a china and porcelain factory beside the railway lines. Getting off the bus, Lino decided to cross the railway lines in the path of an approaching train. Never having seen a train before she misjudged the speed of the vehicle and had a very narrow escape. Undaunted by this she applied for a job in the factory and worked there

for three months proving to herself that she could now cope with this new, fast, city environment.

Another in the series of unusual connections happened when she walked up Queen Street one day and looked up at a different building, the Hotel Intercontinental, where she went in and asked for a job and ended up working as a housemaid on the 12th floor. The hotel looks out to the University and every break Lino used to look down at the University grounds across the road and say to her friends *"...I don't think this place fits me. I don't think I would like to work any longer in this place. I think I want to work across at that place"* and pointed at the University across the road. Her friends laughed at her but this did not put her off. This event served to raise her sights again as she began to see where she wanted to be and what she wanted to do. At this point she had intense dreams of 'flying' - her view was that the dreams were telling her that her life was going to change dramatically. Times were hard and Lino had to finish working at the hotel when she had a child in 1979, followed by another in 1980. *"We didn't have enough food sometimes. We had to go to bed."*

One night Lino did something she had never done before - she turned the radio on and within a few minutes she heard an ad asking for pre-trained Pacific Island teachers to apply for New Zealand teacher training. *"I listened to the radio one night and heard an ad asking for pre-trained Pacific Island teachers and I thought that was a blessing because I never listened to the radio, but that night I listened and I heard them advertising for teacher trainees from the Pacific islands to apply."* She immediately applied, was accepted and at the start of the following year she began training. *"I cried when I received the papers saying that I was accepted because I didn't know what I was going to do. Who was going to look after my children when I go to school?"* Thrilled, but very scared and very nervous Lino struggled through her college experience. Very reticent, unsure of herself, unable to make friends and desperately short of money she managed to complete her training, often walking miles to save busfares and going without food for the whole day. *"Sometimes when I went to*

Teachers College I had to go without lunch...but being poor, having no money for lunch, going hungry didn't make me give up. I didn't want to give up at the time. It was cold in the morning when I went to school and I had to take my 3 year old daughter sometimes..." At Teachers College having English as a second language made study difficult. *"Being in the classroom at Training College was very difficult because I was trying to fit with all the students who were very clever. I always felt shame when I wanted to say something otherwise I would make a mistake. I didn't know what to do sometimes with my assignments but I was ashamed to ask the lecturers at the college, but I tried my best. I didn't have any close friends at the college to help me with my assignments..."*

Following her graduation she began teaching at Glen Taylor School an experience she loved. *"I was the only Pacific Island or Polynesian teacher at that school. The European teachers who were brought in encouraged me but I didn't really relate to them. I wanted to work alongside my own people because there are things we need to talk about, there are things we need to do together."*

She taught in schools for 5 years and then decided that she wanted to do something different, to do something that few Polynesians seemed to do, to write and produce books about the Pacific Islands which could be used by children. *"Being in the classroom, that was when I started to think seriously about my life now that I had become a teacher. What am I going to do to change the education of the children I was teaching and also to change mine."* Lino began writing and although finding it difficult at times she persisted for two years. *"As a little girl my father used to tell me stories, here, that is why I said my family was rich in the knowledge of story telling, rich in the knowledge of doing things."* At this point she decided she wanted to publish her work but had absolutely no idea how to go about doing this. She went into a bookshop and asked about publishing her work but was unable to make any progress until one day a friend persuaded from school persuaded her to go to a reading conference at the Teachers College. At this conference was a representative of

a Wellington firm involved in education publishing and this provided Lino with her first opportunity to publish her books. Strangely enough the publisher was searching for books with Pacific Island themes and stories at that very time so that they could produce them for Pacific Island children. This meeting was to set Lino on her present path and the end result is that she developed her unique style to the point that she is now a very successful children's author. Her stories are based on her rich experiences as a child. These stories seem to strike a chord with children, not just Pacific Island children, but children from many backgrounds. Her first story was published in 1990, in the School Journal. Following this other stories were published in book form, "Fishing with Spider Webs" (1994) being one that is well known.

Lino commits herself intensely to all her activities, and this can be illustrated by the manner in which she carries out the task of writing. She goes to bed at around 8pm, sometimes even earlier, and then wakes up and writes from 1:00 in the morning till around 6am - most of the writing she says is rubbish, but some is good. *"Writing for me is like withdrawing myself away from my family and being my own person because I really want to be a writer and do something different."* She has strong, humanitarian values and practices what she preaches, treating children in particular with respect and a belief that if they can be taught well they will grow to be good citizens. *"The children liked me. I related well to them. There were no problems with behaviour. I had no problems with the children. Most of the children had behaviour problems in the school but when they came to me they don't have any problems"* and *"I believe in what I do and teach the children well. I want them to achieve. I want them to be good children, to be good citizens when they grow up and if you teach children well and they grow up they will always remember you."* She carries out volunteer work at the Auckland Starship Children's Hospital, she contributes time and money, indeed all the proceeds from her publishing goes to charities, schools, church work, scholarships and the like.

In her future she wants to write a novel and be challenged constantly by new endeavours, believing that in ten years time she will be doing something else. Her goal is still to go to university. She reports vivid dreams and intense feelings of precognition at times especially when her life seems to be headed for change. She considers that she was able to preserve her inner self despite early trauma and problems, did not follow others, did not give up, but remained very determined and kept looking for better things, all the while determined that she could improve herself and be of service to others.

Participant: Graeme Platt

Graeme Platt is an individual of mixed and wide ranging talents. In the early 1970's he began a project that was to have a major effect on the New Zealand plant industry - he started New Zealand's first specialist native plant nursery. Against the current trends in the industry the business flourished and he became a well known national figure with a reputation for a breadth and depth of knowledge on New Zealand flora. During that period and subsequently he has written numerous articles on botanical subjects, has consulted for government agencies in New Zealand and Australia and has developed an international reputation for his theories and knowledge related to fauna evolution. He has a high standing amongst academics in the field on the world stage but finds himself in disagreement with them at times. At present he runs a consulting business in his field and has a number of profitable business interests which allow him to engage in many stimulating activities of a wide variety. In his early years he had a great deal of difficulty at school, did much of his most useful learning outside the formal educational context and has found now that learning to use a computer has allowed him to develop language and communication skills that he previously lacked.

Graeme's mother was a very resourceful, organised and supportive person in times when raising a family was much different from today's world. The family had little spare income and the children were often dressed in flour

bag clothes and all the vegetables and fruit that the family needed were grown on the property. *"I can remember Champion flour written on my clothing."* His father he saw as a brilliant but frustrated man, austere and distant, and not very good at passing on knowledge to his children. Later on in life Graeme worked with his father but said that this was not a good thing to do. *"My father was a brilliant man who was totally frustrated in the sense that he had under floor heating for chicken sheds back in the 50s, you know poultry running round on warm cables in the floor and things that didn't come into normal existence. He used to make telescopes, build spas in his spare time and this sort of thing so while he was a brilliant man his ability to pass it on was practically zilch."*

His early life was spent in a rural setting where his greatest joy was to be able to play outside, explore and experiment. He views this activity in the rural setting as informal education, gaining tremendous satisfaction from nature and the rural environment. He also loved tinkering with machinery and using tools and equipment. He sees this phase of development as being critical to his later success as a lack of successful formal education enabled him to think and act divergently and creatively. Formal education in the school system was difficult for Graeme and he had trouble with academic subjects but excelled at woodwork, metalwork and nature studies. *"I probably lived in my own world at school when I think about it, but I didn't achieve a thing."* Although he had difficulty in academic disciplines he read a great deal and was excited and inspired by what he terms *"Other peoples dreams"* - the great stories of Kipling, Haggard, Stevenson and others. This phase of reading was to awaken a sense of adventure and was to significantly influence his later life. *"I had great difficulty reading to start with until I could finally come to grips with reading and then I found books like travel books, you know there were these great white hunters in Africa out there shooting rhinoceros and so forth and while I don't enjoy shooting animals I certainly very much found the adventure of information contained in books. Those were the types of books that impressed me, the Rudyard Kipling's India and so forth."*

During his later boyhood two influences were significant. The first was his friendship with Noel Crump with whom he later travelled overseas, a friendship which still lasts. The second was joining the Scouts, and the influence of the Scoutmaster, Murray Jones, who introduced him to adventures such as caving, snow and other outdoor pursuits. *"Now whether the Boy Scouts actually taught me anything or not I don't know but it gave me the opportunity to become myself."*

After leaving school Graeme had a number of jobs but his interest was in travelling and he left New Zealand with his friend Noel and set out for Asia. *"Anyway when we were 19 Noel and I left for Sri Lanka (it was called Ceylon then) so we got on a boat, 99 pounds to England, 40 pounds to Sri Lanka, so we hitch hiked around Ceylon. Hitch hiked the length of India up into the Himalayas. This was now 1962."* He describes the intense and exhilarating feelings that he experienced travelling in the Himalayas and looking across these enormous mountains towards China and thinking to himself that this was where it all happens, this is where history is made. *"We hitch hiked across India through Pakistan, across Iran into Turkey right through into England."* He travelled on further to the UK and Europe and embarked on a series of adventures including being engineer on the private yacht of one of Europe's most aristocratic and wealthy families. *"...and there was this Canadian guy there saying he had just got a job on a yacht but he didn't want it because he only wanted to do a trip from Gibraltar up to Cannes in France and they wanted someone all season, so I said I would do the season. So I got a job on this German E boat which had been converted into a luxury yacht and I later found that I got the job through a misunderstanding. They said have you had any experience and I said that I had knocked around on my friends' tubs you see and they thought I had said that I had worked on tugs, you see, well anyway it didn't matter. I basically went on as deck hand and then the original captain left and they wanted an engineer and I said I would do that. The boat had twin rolls Royce engines and I just made the assumption if I was good enough to be able*

to fix a car engine and general messing around". (Graeme left unsaid the idea that since he could do this he could look after these Rolls Royce engines) This situation brought an aspect of Graeme's character that is most evident in his present situation. "...and they gave me the wheel and I had never steered a boat in my life before. Here I am in a 90 foot, 90 tonne luxury yacht E boat and everybody went to bed so I was sitting, it was just going dark, and I was at the wheel of this thing. I had never navigated a yacht in my life, I had never sailed a yacht. When we talk about a yacht over there they call a motor boat a yacht so it had no sails. So I went through the Straits of Gibraltar, the most frightening experience of my life I think. There was tankers going past through the Suez Canal, there was lighthouses flashing and I had a course which I was to steer so anyway I think that that made me mature more than anything else. I got through my shift alright and from then on I never thought about it."

Asia, Europe and the UK was a powerful experience where he was able to experience some of the "other peoples dreams" that he had discovered in books in his youth and immerse himself in the culture and history of his forebears. While in the UK he worked for Garrard, an electronics firm and developed a strong ability to solve problems, be innovative and inventive. *"...and I worked with Garrard record players and again I feel that was a milestone because it was my first taste of production engineering."* He was soon employed by the firm as a trouble shooter, a person who was called upon to fix mistakes and solve the problems of manufacture and development. He found this type of work intensely stimulating and this was to remain a central core of his 'ways of doing' for the rest of his life.

Returning to New Zealand he received a rude awakening. Nobody was interested in what he had done and he found he had outgrown the people and situations of his youth. *"...but when I got home I got the biggest shock of my life. It really devastated me. There was a tragedy whilst I was in Europe too. My sister got killed. She was killed here in New Zealand. She had been dead and buried two weeks before I had even heard about it anyway. I probably never*

got over it because it wasn't until I got back it was another shock. Anyway I got back to New Zealand and what had happened was in two and a half years I had grown from a farming kid to now I had an international intellect and to come back and see where I was born, my friends were friendly intellectual retards in that I was now, I got a shock because the people I thought were my friends I no longer had anything in common with and they of course didn't want to know me because now it was a classic tall poppy syndrome. I was now a threat to them as opposed to a friend and I actually went through a traumatic time when I came back because my world as a child which was so important to me had shrunk to nothing." Finding this situation unsettling he turned to travel, this time in New Zealand and once again engaging in a series of adventures - crewing on fishing boats, fencing on the West Coast and working on major projects in the South Island.

He ended up in Dunedin working for a business selling and servicing sewing machines, and carrying out a similar role to that with Garrard in the UK. "I looked through the paper and there I saw a job as a sewing machine mechanic and I thought I'm a mechanical sort of guy and I've looked after a Rolls Royce engine. I can cope with sewing machines. The sewing machines happened to be a Swiss company, Elna sewing machines and it was the most brilliant thing I ever did because it wasn't just fixing machines. I had a short training course but it was actually selling them as well and the most important thing I learned to do was salesmanship." This phase was very important and satisfying as he learnt the value of selling himself and his ideas and had a very positive relationship with his employer. During this period he married and then he and his wife left Dunedin to settle in Auckland. "I got married. My friend was Rosemary who then became my wife. I had met her in Auckland actually and she went overseas and then came to Dunedin and we got married not long after that." In Auckland he continued to work for Elna, initiating a sideline in which he rebuilt written off sewing machines. He gained great satisfaction from taking these and recycling them as useful machines again and this characteristic was

to be an important philosophical consideration subsequently. His relationship with his boss in Auckland was unsatisfactory and he eventually left taking up employment with New Zealand Breweries as a laboratory assistant. He and his wife bought properties and worked long hours at many jobs to pay them off quickly. Graeme worked in the weekends on a farm belonging to a Mrs Williams and it was while he was doing this that he decided that although he loved the rural lifestyle, the sheer monotony, drudgery and kinds of work that farming required was not for him. Although the job did not last the positive relationship with Mrs. Williams was to last many years and continue while he raised his own family.

At New Zealand Breweries he once again found a job that he enjoyed and which stimulated him, but after being repeatedly passed over for promotion, despite his filling the role of the acknowledged expert in the situation, he left the brewery and began what was to be the most important project of his life, one that set in place all the subsequent activities that were to bring him the success in the field he is now known for. *"We decided to have a native plant nursery so while I was working for the Breweries I used to in my lunch time go round the parks and collect seeds in the weekends or when I did have time off which wasn't very much I would collect seeds so I had spent 18 months preparing for my departure by growing trees so I now had tens of thousands of little seedlings and we now had 2 houses."* This project was the establishment of New Zealand's first wholly native plant nursery, an endeavour which he had been experimenting with for some time previously by collecting and propagating specimens of New Zealand flora. This development was to establish him nationally as an innovative entrepreneur, as an expert in the field of New Zealand plants, despite his having no formal qualifications in the area, and coincided with the rise of the green movement resulting in a very profitable and influential business which generated a large number of similar ventures around the country and the popularisation of New Zealand's indigenous plant species. This industry generates in excess of NZ\$15 million per annum turnover today,

including export income and local employment. The native plant nursery project continued for 25 years.

A feature of this period was that Graeme became one of the foremost experts in the botanical world on New Zealand flora, also being recognised internationally as an eminent person on the subject of plant species throughout the world. He was asked increasingly to expound his sometimes controversial views both in New Zealand and overseas on the subject of botany, different plant species and their connections and origins. *"I will never forget the day we opened the gate I sold one tree for \$1.50. That was the first dollar that I ever earned in my own account if you know what I mean as opposed to being paid or something else. Basically the nursery became a great success. The next day I remember selling \$70. I thought I was in heaven. There was luck came in here that we started it just as the Green movement was getting going. Values party nonsense and all this sort of thing so that was something like 25 years ago now so we hit it brilliantly at the right time. Now that was luck, not management because I had been planning it since the 50's and the way the world went so the nursery never really looked back. It made me both nationally and internationally well known. I can pick up books here and see my name mentioned."*

Another project which was to spin off from the native plant enterprise was the development of pine bark potting mix for propagation purposes. This innovative development was carried out despite contemporary advice from experts that it would not work. The project however was successfully worked through and production coincided with the wettest winter for many years which resulted in peat, the traditional source of propagation mix becoming unavailable due to the suppliers inability to extract the raw material from the ground. Although Graeme did not become involved much in the production end of this enterprise, he had the major role in the development and use of this material which now contributes around \$15 million to the forest sector economy. *"Again the greatest thing that ever happened to me in the nursery was that I was untrained. So everything was looked at in the light of a new day and I did*

various experiments with potting mediums and I found that pine bark was fabulous so I developed a pine bark potting medium which again offended everybody grievously because even people at Universities, I have actually since read a report that I was a troublemaker which was no such thing."

During the latter stage of the nursery project Graeme contracted Chronic Fatigue Syndrome, (CFS), or what is commonly known in New Zealand as Tapanui Flu, a debilitating long term affliction which leaves sufferers chronically unable to operate in a normal energetic manner. *"I had had a condition known as Tapanui flu, chronic fatigue syndrome or call it what you damn well like. It is now known as chronic fatigue syndrome but at times I couldn't get out of bed I was so ill. I went to 22 doctors. It was the agony of daily life was unbearable because of my physical condition and you would go off to doctors and they would do 3 blood tests, tell you were a nutter and pull yourself together and give you drugs and anyway this went on for 8 years and in desperation I decided that I was suffering from mineral deficiency."* This problem was to last for many years, with many visits to doctors and hospitals to try and pinpoint causes and treatments, all to no avail. During this time he developed a close relationship with an elderly medical practitioner, Dr. Mervyn Gatman, who assisted Graeme with his debilitating problem. Eventually with no answers becoming evident Graeme began to solve the problem his way. He researched the subject extensively, used his extensive, experiential knowledge of plant and animal husbandry and began to develop a theory based on nutrition available to higher order animals through the entire food chain. The hypothesis was that the condition was traceable to the absence or insufficiency of basic minerals in the diet that were essential to cell operation and that if a person was not getting enough of these then this would set up in the human body, a condition that would allow invasion of micro organisms, bacteria and viruses that under normal circumstances would be dealt with by the bodies immune system and would cause no long term problem. This problem is quite common in livestock husbandry where many domesticated animals become chronically debilitated if

their diet is not complete, examples being "bush sickness" in livestock in the central plateau area of New Zealand, where the absence of one single trace element, cobalt, caused cattle to sicken and die; and selenium deficiency in horses on some Waikato pasture lands. Considering many factors at length, Graeme developed a patent mixture with seawater as a base, as it has the same pH level as human blood, and 26 different base minerals which he began to dose himself with. After a period of time his health improved greatly and he began to use the mixture with his family in an attempt to alleviate some long term conditions, asthma being one. This also seemed to improve their health and he was asked by many others to supply his mixture for their problems with a great deal of success. Eventually in response to demand, he commercialised the production of this formula, and now supplies many people in New Zealand and Australia, including hospitals and the medical profession. The formula is undergoing clinical trials in a number of medical establishments around the world for cases as diverse as cancer treatment and long term conditions such as arthritis.

At present Graeme is still exploring many ideas and developments one of which is the New Zealand Botanical Research Institute, a business which engages in research and development in botany and related fields. He has an ANZAC Fellowship from the Australian Government to research eucalypts, carries out consultation work for national and international organisations including governments, carries out research and development of his own, writes scientific articles for a variety of publications, and amongst all this is still avidly pursuing ideas and theories of his own, some which are quite controversial and some which are totally unrelated to anything he has done before. He has evolved theories on the extinction of the dinosaurs based on his work with plants, and these and other divergent theories are attracting interest from around the world including within the academic world. *"Well it was a mere 65 million years ago when the dinosaurs died out and when the gymnosperms lost the advantage to the angiosperms because the world evolution and life took*

place in a geothermally heated planet and it is only in the last mere 65 million years that we have had plant seasonal solar heating on this planet. Before that it was geothermal."

Graeme Platt is a person with idiosyncratic insights into human behaviour and society. The following quotes give some idea of the depth and breadth of his knowledge and the way in which he contemplates the world.

"I am now writing a book on the ecology of New Zealand and how we should bring it into our lives. We as New Zealanders have rejected our ecology. We've imposed ourselves on it where in my opinion is we should be like the Chinese. We should look at the beauty and bring that into our lives so that the elements that are New Zealand should be tree ferns and cabbage trees and flaxes and the things we chop out and put rose bushes and camellias."

"All societies are matriarchal. The females actually rule the roost. The stupid males spend all their time head butting and pretending they are boss but all they are doing is fighting to get in front of the queue to do the dirty deed if you know what I mean and boy have those sheep changed my views or formulated my views or confirmed my views of animal behaviour. The importance of the male, the dominant male gene for genetic improvement and you see it in plants as well. All females breed no matter how good or bad they are. Their job is to produce an offspring but the male's job is to improve it so all these males fight to get to the front of the queue. It is the top few that breed and this is how you get chronic dimorphism in certain birds for example. The females will be dull and uninteresting and the males will be totally bright. There is probably two reasons but the major reason is that only those with every feather perfect ever breed so they get more and more beautiful."

"We have a problem in New Zealand. When you hear somebody crowing about something you know it's a cover-up not a truth. When you get someone crowing about clean, green New Zealand we are the filthiest country on earth because every New Zealander produces more rubbish than anybody else known on earth. We even beat the United States per head, 2 tonnes each per

year. Our wildlife, we talk about our clean green land but where is our wildlife. It is non-existent. It is in absolute tatters. We are down to a few birds on a few offshore islands so I have learned when I hear New Zealanders crowing it is to cover-up, it is not a fact. The reality is to reassure themselves that this exists when in fact it doesn't. The issues will demonstrate that will clearly would be the state of our wildlife. If everyone in China behaved like a New Zealander there would be nothing left in China."

"We are the only country on earth that hasn't developed one economic resource from a native plant. We don't have one native forest plant. We don't have one industry to boast from over plants other than plundering them out of the wild. I was the first person in New Zealand that I know of to create pay for my family with creative use of native fauna as opposed to the destruction of them. A lot of people made a living from chopping down Kauri trees but I made a living planting them and there is a big difference."

"If I have an ambition now it is politically to set up a constitutional society. I would love to form a body in New Zealand which protects people's rights and it tells people in the Government particularly what they will not tolerate. A constitution to me is a document by which we tell everybody what we will not tolerate and today New Zealanders are probably the most exploited people that I know of in the sense that they are at the mercy of the Government. They are at the mercy of the system. They are at the mercy of the lawyers and people are being cheated out of their rights."

"We all take things up to the depth of our own past experience and this is why I think over-educating young people is a waste of time. We should be giving them the basics and then making their life. Drag them out in the world. Take them up the mountains. Take them into caves. Take them out to sea. That is education. Give them a world. Get them to invent their own."

Participant: Elwyn Richardson

Elwyn Richardson is an educator who began teaching in the 1940's. He took sole charge of a small school at Oruaiti in the Far North in the early 1950's and began to develop what was for the times, a radical approach to teaching. His was an innovative and dynamic approach involving integrating all subjects and activities in the learning context and moving within these areas to develop children's abilities. His programme was spontaneous, based around the immediate environment of the school setting and the children developed their learning process through art and experimentation much of which took place in the natural environment surrounding the school. The situation allowed the children to learn very much in their own way, with them often deciding what and how to do activities. He achieved remarkable outcomes in a broad range of subject areas as the children learned through this integrated process.

After Oruaiti he moved to Auckland and was involved in gifted education at Auckland Teachers College and then in various schools. During this period he published the book 'In the Early World' a recounting and graphic depiction of his experiences at Oruaiti. This book was to have a significant effect on two generations of teacher trainees in the 60's and 70's. Subsequently he has been involved in various aspects of gifted education and learning, publishing and other activities and at the age of 72 he is reviving his past endeavours in palaeontology and has begun a number of field explorations and research on New Zealand fauna of the shellfish variety. His manner of teaching is still an ideal which many teachers may aspire to emulate with its creativity and naturalness, but in today's overstructured educational world his practices may only be enjoyed by a few. He was awarded the Order of the British Empire (OBE) for his services to education.

Elwyn grew up in rural pre World War 2 New Zealand. He spent his early years on Waiheke Island in the Hauraki Gulf. His mother he describes as a well educated, completely unworried, permissive parent, "*...but my mother was a very unworried person, I can say that. I*

used to disappear for a whole day with my cat in a basket and my fishing gear and go all over Waiheke Island where we lived fishing, crossing deep streams, over precarious bridges and all this kind of stuff but she never worried. God knows why. Complete opposite of mothers today." and his father as an expert bushman with a vast knowledge of Maori life and of native flora and fauna. *"One of them was my fortunate gift of a parent, a father who knew the forest. That was the first thing that happened. He was the most significant person I met at a very early age and he would take me into the bush. He was a bushman and cut out a lot of forest and I used to live with him in holiday periods and I used to live with him before I went to school in what you call bush whares and there we lived a pretty primitive and very, very satisfied life."* In this very rural environment Elwyn discovered clay, experimented with water, made fluttermills and *"discovered air"* - a great scientific revelation. How Elwyn *"discovered air"* is intriguing. His favourite place as a pre-schooler was a ditch at the bottom of the driveway, beside the road. In this ditch Elwyn experimented, making dams, moulding and shaping waterways and channels and making technological systems in order to make things happen. One of the devices he used was the fluttermill. A fluttermill is an axle with pieces of cardboard or other material that are fixed around the axle facing along the axis and this device can be placed in a stream of moving water so that the paddles of cardboard are at right angles to the flow. The axle is fixed on the extremities to the sides of a channel and the stream of water moves the paddles much as a paddle steamer works. This is all very well as long as the stream of water is constant. However when the water level is lowered below the paddles something happened that Elwyn found remarkable. The fluttermill continued to spin - Elwyn worked out that something else was moving

along with the water through the narrow gap and causing the fluttermill to spin - at the age of 3 years he had *"discovered air."*

During this period of intense play Elwyn had an imaginary companion with whom he discussed his endeavours at length. This friend, Joppy, as he was called was always blamed when things went wrong. Throughout his early life Elwyn experimented with natural materials, working with clay, making marbles and firing them in his mothers oven. He made figurines, plaques, pots and a variety of artefacts and sold some of these at school. It was in this early school period that he met Ray McReady who became a life-long friend. When Elwyn met Ray his imaginary companion, Joppy, disappeared. It was also during this period that a very influential adult appeared. Walfred Moffat Fowler was an Oxford graduate with a MA in Zoology and a tremendous wealth of knowledge of English literature. *"This man did marvellous things with me. He introduced me to literature. Every night he would read to Errol and I around the kerosene lamp and that had a profound effect upon me in terms of my beginning and the reading of literature."* He introduced the young boy to great stories and great authors - King Solomons Mines and R.M. Ballantyne being but two. *"I had the wonder and the mystery of Wal's reading every night. He read us stories of adventure, stories that he got out. His brother was a Cornish Earl and he sent us parcels of books about every 2 or 3 months. Our library grew."* Fowler also introduced Elwyn to insects, plants and animals in a way that fired the young boy's imagination. *"Around that time I gleaned an enormous amount of knowledge about the forest. That became very significant and has been significant right through my life. The idea of the environment being familiar with the environment knowing its names in many instances and knowing how one can live by it."*

Before Elwyn went to school he came to know the schoolteacher, Mrs. M. Who visited his home on occasions. His preschool impressions of her were favourable but when he entered school he found another side to her, which he describes as "*vicious*". He perceived himself as more advanced than other children because he could read and spell, knew more and this resulted in him being socially ostracised by his peers and teachers who viewed him as a know-all. This situation was to be the start of difficulties that followed him through his school years. At a later primary stage Elwyn went to Dilworth School, a boarding school in Auckland operated by a church trust. At Dilworth, Elwyn had extreme difficulty in fitting in, being appalled by the bullying and the teacher's treatment of students. He suffered from nightmares, which continued until he was around 40 years of age, suffered from sleepwalking incidents, in one case leaving his room in the middle of the night via the window and a drainpipe under the horrified gaze of some of the dormitory students and even today Elwyn will not return to Dilworth because of painful memories. He views this period as the most negative of his life with only a few positive instances he can recall. (It must be said that the Dilworth School of this era is in no way like the Dilworth School of today - indeed the present day school is an exemplary model of educational endeavour. The Dilworth School of the past was a product of the times and was probably no different to other boarding schools of the day.)

Three incidents which Elwyn saw as positive concerned his appointment by the Chemistry Master to take care of the laboratory equipment, a task he enjoyed and took great pride in and for which the master gave him recognition. A second incident was a story he wrote on bees in which he could show his superior knowledge and understanding and when this was acknowledged he felt an inner "*glow*". A third incident was the car design competition in which the students were asked to design a car for the future. Elwyn's car was extremely radical and aerodynamic. He gained first prize and the teacher asked him about the shape to which Elwyn replied that he understood about air and aerodynamics. This incensed the teacher who called him a know-all, took the

first prize away from him and gave it to the second placed boy who produced a design that Elwyn viewed as absolute rubbish.

After surviving Dilworth with what Elwyn describes as "*preserving his central core,*" he entered Mt Albert Grammar, a school he viewed as positive compared to Dilworth. Completing high school he enrolled at Auckland University, enjoying the intellectual stimulation and studying chemistry, geology and botany, the last subject being one which was to remain a central focus of his life from that point on. He became intensely fascinated with the diversity of forms in nature particularly fossils.

Following university, Elwyn entered teachers college, a slightly negative experience in that he felt as though he was treated like a child, but doing this enabled him to teach, an endeavour he loved. Following teachers college he looked for teaching jobs but had a mixed period of life in which he seemed to cast around for direction, finally accepting a post in the Far North at the coastal settlement of Oruaiti. It was in this period that he quarrelled with his mother, worked for his father and was married for the first time. Going to Oruaiti was the situation that was to be the beginning of a journey of discovery and an intense commitment to a way of life that was to shape all that he did from this point onwards for many decades. The school at Oruaiti provided a backdrop for Elwyn to develop his innermost self. He began to teach the way he wanted to, a way which was totally integrated with the children's surroundings, without any formal planning, acting upon the urge of the moment and evolving things as he went along. The children drove the subject matter and Elwyn the teacher made it possible for them to do this. It is difficult to describe in words the way in which he ran the school but visiting Department of Education inspectors recognised something absolutely unique was going on. "*...he was the first school inspector I ever saw in the wilds of the far north and he understood that there was something going on between me and the kids. He said even when you were teaching arithmetic you have got this sort of something going on.*" Some of the ways in which this was evidenced were instances in which swaggering, foul

mouthed bullies coming into the school from other schools were transformed into responsible reasonable people in a very short time. One example was the boy referred to as "Nicky" who went on to become a prefect at Kings College and subsequently graduated from university. This was a boy who everybody else had written off. *"It was a family thing I used to say. Do you want to be in our family, knowing and appreciating and understanding. The new kids that came in were always told this and Nicky when he came in, Nicky used the foulest language and of course the kids were used to not being pulled up if they said dam or something like that but he had filthy language which was completely unacceptable by the kids. ... I found it absolutely astounding and young Nick, they dealt with him in funny ways. They would laugh at him and say, you are pretty clever Nick, when you swear in front of the girls they are the ones that really care. You have worked that one out haven't you. This was shattering for me because he had been understood. I remember at that stage we were beginning pottery and Nick wanted to do pottery and he was flicking it round the room, doing all the things a naughty person does, and he didn't get anywhere. While the other kids were making lovely pottery Nick was trying to put a coil on he would put another one on and it would collapse so I gave him a girl to help. I thought that was justice and one of the big girls came along and said she would help you Nick and he said no. No parents came along to complain. No kids went home to complain and as his coil fell off this girl helped him to put it back again became partly hers, mainly hers and gradually Nick's exuberance grew. When he was finished he got some paint and was allowed to paint it and to cut through it to make designs and he just did it and over did it. In the end it was a great treasure and he carried it away and they all came around and they said, a little sarcastically, Nick you've done well. That is very good. All this sarcasm was going on the whole time. Nick was a guy who was thrown into my bus in the morning by his father where I picked him up and he would lie on there waiting for a reaction from the next person that got in or somebody who was in there because he had been thrown there by his father. That night he went home*

joyful, utterly joyful. He rushed in to his father's arms when he met his father at the bus stop, put his arms around him and he went home and he was a model boy and Dad rang me up that night and said what have you done to this kid of mine. The little bugger has come home and he is all over me like a rash and he's nice. He hasn't sworn once. So I told him the story on Nicky from the top. Nick was a completely transformed boy from that moment on. Something that happened. I told this inspector guy this and I told him the story and I told him about the language. He looked at Nick and he sorted Nick out later on and he had a good old yarn to him - what do you think of school and all that and Nick was a reformed kid. I reckon I turned him round. He was street fodder when I got him. He had come off the streets of Oamaru where he lived with his mother. The father had divorced and remarried and he used to get up at night time and you have read about the kids that come out of the windows and out of the houses, about a gang of 12 and they busted the warehouses, they busted the shops, they had money, they had sweets, they had stuff they didn't even want. He must have been 7 or 8 or maybe 9. Anyhow he got caught and Welfare said the only hope for him was Social Welfare and someone to look after him. So they sent him back to his Dad. So he came back up north where his Dad looked after him. Well Nick was such a reformed kid you know. He stayed with me just about the whole time I was there and then his grandfather suggested when he got to standard 4 that he should go to King's. He went to King's in Auckland as a boarder at the prep school in Remuera and he became a prefect. He graduated from there to King's in Otahuhu where I kept in touch with him through his father where he got a university degree." Another way in which this uniqueness was shown was in the unusual and exemplary art and craft work that the children produced. They did all their language, maths, science and every other subject in a totally integrated way, much of it outdoors where they carried out major projects such as designing and building pottery kilns.

For twelve years Elwyn remained at the school developing and experimenting with teaching his way. *"David was a lad I met him at the gate of*

his father's property and opened the gate for him and as he went through he came back to me and shook my hand and said 'Matua' and I said, 'Yes I remember you. You were one of mine years ago' and he said, 'You made my life. Every day I wake up, every moment of my life I am aware of where I am and what my people are,' (because he had become a Kaumatua.) 'The trees, the fish, the sea, the colour of the sky, the colour of the water,' he said' all of those things had become available to me all my life because of what I learned with you and the other kids at school.' " At Oruaiti he met a great number of people who had enormous influence on the children and on his experimentation and development of teaching style. Some of these people are now very well known, highly skilled and successful artists. Such people as Ralph Hotere, Vic Grey, Jim Allen, Merv Holland, Len Castle and Barry Brickall visited Oruaiti during these years. *"Ralph Hotere had always been every since the very beginning, he was an isolated fellow. He was isolated in the north as an art 'wallah'. He had a job going round stimulating art in the schools and was responsible for art in the schools but he was a sort of a hang dog lazy sort of a guy in a lot of ways and he spent most of his time getting stimulation for his own painting. He used to leave a lot of his paintings with us all the time so we had the influence of his paintings hanging on the walls with the kid's paintings. He was very close to the kids in a matey kind of a way. He and David who was my best painter became great pals and they spoke in a very lower level of guttural communication. 'Unusual colour.' 'I messed around. 'I liked that - that sort of guttural sort of - I used to love it. I couldn't speak that stuff. That was a different kind of speaking but it was sort of like the guy living on the needles of his intuition."* A constant stream of other people were involved in the Oruaiti experience from the National Library Service to College of Education principals, to businessmen who provided assistance. *"Vic Grey went to England and became a Royal Academy painter. A famous portrait painter and as far as I know, what's the name of that Spanish painter that painted that way I can't remember his name, but he was very influenced by him and he painted those*

sea gulls. Vic Grey. Vic and this other guy whose name escapes me for a moment but it doesn't really matter because he wasn't really an artist in his own right. He was a teacher in his own right. These guys became part of a collection of people who stood off beside me, visited me, barracked and enjoyed and gave me the urge for this enormous impetus to go on thinking, to go on wondering. It was only because of them I think, more than anybody else that I began a kind of neurological kind of occupation. I found myself going into daydreams. I found myself day dreaming while I was driving the kids because I ran a school bus. I drove 76 miles a day driving round picking up kids and that takes a lot of time on country roads but I would find myself having completed the whole set of it but had no visual memory of anything I had done on that 35 mile trip. It frightened me. It was absolutely utterly frightening but the whole time my mind was turning over ideas and wondering and interpreting, enjoying and thinking about where we were going next. What will I introduce. This study was starting and what should I stimulate it with. What books should I have. What stories. All of these things going on in my mind. Some of it was scary I must say. That kind of stuff used to go on while I was sitting at home in front of the fire or sitting with my wife and she would get sort of, are you with me? Where are you? I was just thinking about school. She said, you do it all the time my dear. Don't you rest. Don't you get tired. I said, no. I would go out with my son fishing in the latter years and I would sit there fishing and I wouldn't care that it didn't have bait on the end of the line, I hoped it didn't and sit and dream."

"I read a very interesting paper in the middle of all this. It was someone who did a study about, in America, of kids and why their teacher was enormously successful and the guy came up with the idea that this teacher had so many friends who were writers and artists who chimed in and influenced his class. Influenced them in some sort of intuitive way and I read that paper and thought well that is exactly what is happening to me. I can think of no better situation in anybody's life than the influences of people like Walfred Moffat, Fowler, my influences of Ray McCready, my mate who collected clay with me

and who walked over the island, my father who was a botanist in a crude sense, my mother who read books and really was so warm, sweet and accepting. She gave me a human quality. I needed that. The simple things of humanity with no instruction with enormous amount of freedom. I was never too late. I would get home in the dark. My cat sitting in the basket. I used to have to carry the cat. It would walk for a little way then want to get in and sit on my lunch and be carried. It would go 10 or 15 miles in a day, or perhaps 5 miles let's say. What mother would allow their kid to go fishing 5 miles away in some foreign shore and not know where the kid was."

"Len Castle and Barry Brickell had enormous influence on the kids and their pottery. They helped me build an enormous down draft kiln. I got technological help on that score. They stood around and fired. Remember that video. That gives you a look in because Barry Brickell is in that. I gave you a copy of that didn't I. I did a bit of fabric printing because of Vic Grey teaching me. I went along with kids That was something I learned to do. Work along with them and quite often when they wrote I wrote and they said, what did you write sir and I would say, nothing very good and they would say we've all done nothing very good. Can we hear yours first so I read it out and they would say, yeah nothing very good. They would all laugh and pull my leg."

In 1961 after 12 years at Oruaiti, Elwyn was asked to come to Auckland and teach at the Auckland College of Education and develop his ideas and teach his methods and experiences. During this period he published the book which was to become the bible of creative education in New Zealand for almost two decades. The book was used in teacher training, by teachers in the field and gained Elwyn international recognition. It is one of the few concrete records of this unique way of educating and it can only be surmised that if Elwyn had bothered to keep paper records and write more about himself his exploits would rank alongside some of our most unique educators such as Sylvia Ashton-Warner. *"When I went to America to work in the Universities over there... and the professors and associates who were there met with me for coffee afterwards*

and they said, you know we have often looked at your book and we felt had you introduced a bit of measurement into it in some kind of way, you would have got a doctorate just like that. I didn't even get an honorary BA or an honorary MA or anything like that. I know I used to get six pound a year extra because I had qualifications, that as about all." At Auckland College of Education Elwyn developed his ideas on creative writing and became involved in the area of gifted education. He subsequently went back to the classroom as a teacher and in administration as a principal.

While becoming involved in children's writing he developed a passion for printing, setting up his own press and small publishing endeavour and he still operates this today. *"I began to be a printer. I began to read up everything I could on printing. I visited printers I visited printing shops. I started to get the feel for type, the aesthetics of type, the whole business of coordinating of one particular font with another. I gave up pottery at that stage. That was 1963. From there on I started to amass printing."* He became interested in flower breeding, producing a bi-colour geranium, and later writing a book on Teaching Gifted Children which he published himself - a book about actual examples and how it can be done in the classroom. He contracted a rare illness called polymyalgia which held him back for years but from which he recovered to go on.

Today Elwyn has gone back to his first love, the subject of the natural world and he is once again at the age of 73 presenting new and innovative developments in the field of palaeontology, driving off all around the North Island, collecting tons of dirt, and sifting through this to find exiting new reasons for why things have or have not happened. He has also decided to write more papers on the subject of gifted and talented education and present his unique, and sometimes controversial views of what is and should be happening in this area of education.

Participant: Marilyn Waring

Marilyn Waring is a well known New Zealander having first come to public notice in the 1970's when she was elected as the youngest ever female Member of Parliament. She was brought up in rural small town New Zealand, went to local schools and to an all girls boarding school where she excelled in sport and academic pursuits. She went on to university and travelled overseas, returning to New Zealand and being nominated for election to parliament.

After a successful campaign she was elected to a constituency seat in what was a conservative government. However Marilyn's philosophies did not conform to the reactionary and conservative policies of the time and she began to speak out on matters that she saw as important not just to New Zealand but a world faced with a major choice, whether to allow the proliferation of weapons of mass destruction - the nuclear bomb, or to develop some responsibility and morality in the use of these weapons and the exercise of the power associated with them. She had a major role in what was to become the first challenge to a major world power, The United States, over the nuclear issue. Voting against her party, the government of the day, she forced the issue to be debated and this was a major step in the development of not only New Zealand's stance on the nuclear issue but showed the rest of the world that the larger powers could not bully smaller countries any longer. She was also involved in protest about the apartheid regime in South Africa, women's rights and the treatment of women in societies particularly in latter years in the third world. At present Marilyn is a prolific writer, speaker and researcher, is still heavily involved in contentious issues of conscience, and maintains a high profile in the area of economics and social policy both in New Zealand and around the world. She has an international reputation in women's social politics and her book "Counting for Nothing" created and is still creating considerable debate in economic and social policy fields throughout the world.

From an early age Marilyn was read to by her parents and three of the four grandparents. This constant exposure to ideas, language and connections

was to play a critical role in her life. At kindergarten she could recognise all the letters of the alphabet, read some words and had some numeracy skills. *"My paternal grandmother, all my grandparents read to me, like heaps. Not my paternal granddad. My paternal grandmother and my mum's dad and mum read to me heaps. I was read to apparently all the time. When I went to kindergarten I could recognise all the letters of the alphabet, print and had some numeracy skills before I went to primary school and since I was probably 6 at the time and I actively remember sitting on the floor with the Herald reading about the Black Budget and asking what the Black Budget was."* Her parents committed a great deal of time to the family and were constant supportive influences in her life. The rural upbringing had considerable influence and has reappeared in her later life and it was during this time that she was able to form enduring relationships with Maori people and culture, an influence that still is important today.

In New Zealand of the time radio played a big part in bringing the outside world to the small rural settlements and this was a considerable influence in the life of a young person especially in the evenings as television was still a long way away then. All the members of the families of the day found some interesting things on the radio and many children shared their parents tastes and experiences through this medium. Libraries were also a considerable influence in her early life as books were in short supply and at the age of 10 she was reading adult books. *"The radio featured in quite a big way in the house. We used to listen to serials on the radio. I know I used to listen to all the kid's programmes on the radio and do things like write letters and that kind of stuff. Libraries were a big deal in the life because you couldn't own books, but there was a little wee library where I lived and my grandparents lived in Hamilton and they joined me up to the Hamilton public library and they always went to the library so every time I went to Hamilton I got to go to the library and get some books and that was quite sort of arranged. By the time I was 10 or 11 they were getting books out of the adult sections for me because I'd finished most of the*

kid's section." What books there were in the house she read many times, searching all the time for new stimulation and ideas. A ten volume set of encyclopaedias she said she read at least three times from cover to cover. Her favourite books reflect her view of herself - books about the "...*independent, slightly solitary, slightly defiant, slightly naughty, highly athletic sort, who defied whatever it was...*"

Attending the local primary school it became evident to Marilyn that she was more aware and able than the other children and suffered at times because of it, being so far ahead of other children that she became bored and disruptive at times and was occasionally punished by her peers for being too smart. *"I was always the youngest in my class and sometimes significantly the youngest. I was quite physically smaller than the kids in my class. I was related to most kids in the school so when I was too bright or too good at things my cousins would thump me back into shape and even though I was the youngest I was always top of the class and I was very good at any sport I touched as well and very good at music and had no capacity whatsoever to draw anything at all which was very memorable because it was a great relief always to my classmates because in those days you always spent hours on art and I was hopeless."* However having absolutely no artistic ability in art was a relief to her classmates as she could not compete with them in this area.

At secondary school she began to understand that she loathed competition and competitiveness, refusing to take part in speech competitions and other events, even though much of her life at least in earlier years revolved around this facet of human behaviour. It was also at secondary school that she experienced a culture shock, going from a small rural settlement where she was surrounded by Maori, to a private girls boarding school where there were few Maori and everywhere the trappings of success of the parents of her schoolmates, the Jaguars, BMW's, clothes, houses and lifestyles, quite a contrast to the small town of her youth. *"It was a very important town to Maoridom. It is funny you know. As a kid you are never conscious of it but in*

retrospect I remember this pidgin. We talked pidgin all the time, like you talk this mixture. You talk about kai and just(75) the whole strange mixture and I never think about it until now... I had a big culture shock at about the age of 14 when I got moved from my town and my people and sent to a private girl's boarding school where instead of totally being surrounded by Maori, I could count the number that I saw in any day on the fingers of one hand." She found herself in trouble when she was bored, became outspoken about incompetence, laziness and prevarication. Teachers she describes as "staggering" and "brilliant" had a powerful effect on her education although in a couple of cases she had teachers whom she considered incompetent and whom she clashed with.

"...though I was the only prefect in the history of the whatever for telling adults who were idiots that they were mostly. I have a real contempt for incompetence and wherever it appears. I don't mind if people are slow. I can be the most tolerant, the most patient, but if somebody holds a position and they can't do it and they grandstand about it, like I'm the flashpoint before you could blink your eyes. I can't stand laziness. I can't stand prevarication but I can play with the best of them when it is play time"

She was very successful in sports, especially skiing which she loved, and began singing lessons and music study which she carried on to university years. *"About that time too I was asked if I wanted to take classical music lessons for voice. Probably at about the age 16 I started that. I had to give it up at the age of 22 when I became a parliamentary candidate and it was the thing I was best at in my life. It was a real Achilles heel after I became a candidate and after my last concert when you can't use the instrument for 3 hours every day so you just lose it. It took me probably 8 to 10 years to have the emotional fortitude to go to an orchestral concert and listen to a female's voice because for me I had lost really."* However she gave sport a miss as the responsibility of getting through university, having no financial resources to fall back on, could be compromised by a broken limb or accident that would stop her from completing her studies.

At university she studied politics, not because she wanted to do a political degree, but because it was something completely different from her other areas of study. However she became obsessed with politics and in the end it became a major focus of study. During this period she became politically active, involved in anti-apartheid protest, the feminist philosophies and movement of the 1970's, spent much of her time working to pay her way through university and involved herself in music and theatre. *"I never went to university to do a politics degree. I took politics in the first year so it didn't feel like the 8th form so I was doing something that was different from doing English and German and you know, the legal system was different but it wasn't really, it was like history of a tediously different sort and music performing so there had to be something that went in there that I hadn't done before and when I asked around people said you either did psyche which had 600 people and sounded awful, or politics, so I did politics and then I carried on doing politics. I just became obsessed with politics really but always my family were terribly bothered because of course you went to university and were supposed to get a career but what kind of a career were you going to get, so that was a bit of a joke. Of course when you are doing units like that all over the place and you are cleaning houses for the top family and delivering gas pamphlets for the Wellington gas company and all kinds of other things you don't do spectacularly well academically. I went skiing and playing (perversely short you see) so I played for the Vic women's indoor basketball team and doing lots of music. I would go to every to downstage production and all the dances, the film festivals and sitting down in the middle of Willis Street to try and stop and apartheid tours and marching on Sharpsville Day and going to listen to Germaine Greer and they were very breathless sort of years really."*

Following graduation she went to London for further study in music and singing, working in a pub, going to Covent Garden and spending every weekend exploring the English countryside and history. *"Working in a pub and doing the kiwi thing and going to Covent Garden all the time and spending every*

weekend at the cathedral of Canterbury or Eyrie or out on the plains and just doing all the stuff you had been taught at school. All the places that you had learned and sort of doing Europe as well and doing food and art galleries and practising your old French and German. A very special time and prepared to put up with the most extraordinary amount of discomfort to do it that you would never do now."

After this "magic year" as she describes it, she returned to New Zealand to more music, working as a telephone technician, then taking a part time job in parliament. *"...so I went back to Wellington to study with my old teacher and became a telephone technician because I could do that whenever I wanted and do music whenever I wanted and then was called by my old professor to take a part-time job in parliament and that was about flattery really. I really couldn't have cared less about working in parliament but you know, it is always flattering. They had called him to say who have you got and he had called me and you just felt flattered so you went and did it. It was a sort of that guile misuse sort of stuff and being part of the sort of the liberals and not having enough women candidates and going off to all of the electoral lobby meetings and sticking your name in for candidacy but always you know you don't have a show of winning and never considering the outcome, just never, because it just was not possible. Then the rude shock of being selected and a completely different education then which was like the thousands and thousands of people telling you their life stories and I believed them."*

"...and there were things like that were stories of courage and valour and battery and deprivation and all kinds of things so then I got educated all over again real fast like nobody had taught me before. That sense of outrage constantly. I did a postgraduate degree in politics. I knew what participation and democracy and you know the people, the community and all of that was about. But actually it was about corruption and about lies, deceit, half truths and bullying and it was outrageous and I was young enough and energetic enough and inexperienced enough just to live in a constant state of outrage."

This was to eventuate in her being put forward as a candidate for the election, not really considering that it would ever result in actually being elected. Then came the rude shock of being elected and suddenly being immersed in a life where she listened to literally thousands of stories of courage, heroism, despair, bullying, violence, deceit and lies and a feeling of being constantly outraged.

Her stay in parliament involved her in much controversy and national prominence. *"When we were all told that bullshit about how ANZUS committed us to having nuclear bombs in our harbour nobody actually went back and read every ANZUS communication since 1951 onwards and proved that there wasn't a bloody thing we had ever signed that said that we had to have bombs in our harbours. Everyone just believed it for years you know."* When she left she spent some time coming to terms with what she had experienced. One interesting experience was an incident in which she went to a management consultants to be interviewed and assessed as to possible employment options. During this visit she finished the assessments very quickly and everything was fine until the assessors came to the section on personal ambition saying that she seemed to have none and they were very disturbed by this as it was totally inconsistent with the rest of the profile. Her opinion on this is that people always assume that when you are in a position of power, they seem to think you want more and more of it and want to use this power and don't seem to understand that it may actually be a quite distasteful and disturbing thing which is how she actually saw it. If she has an ambition at all she says, it is to be a really top goat farmer.

Following this episode Marilyn became involved in academic life, researching extensively on issues of equity, economics and social justice. She wrote a book *Counting For Nothing* - a study of the place of women and their work as caregivers in the world and how modern theory and practice of economics in particular completely discounts this major contribution to society. Following this a documentary film was made and she travelled to many parts of

the world becoming recognised as one of the most eminent people in this area of endeavour and study. Other books, studies and endeavours have followed, all of them pursuing explanations and answers required in understanding significant aspects of the modern world society. She is a strong advocate for human rights, for treating the natural world with respect and care, and by means of research and the reconstruction of rules, (and no small intellectual endeavour) dearly loves to rub the noses of the people and nations who contravene basic human rights and dignities. That she can do this is partly by virtue of her considerable standing in the international community and by her diligence in demystifying the important issues.

In her personal life Marilyn has engaged herself on her farm where she is involved in the husbandry of a herd of goats. *"I mean the happiest times of my life is when nobody comes to the farm for 4 or 5 days. My little agendas I have for myself. For example at the moment I am trying to work out how to screw every country who've sold all human rights covenants, who is a donor to the ADB in terms of the UN system, and the human rights obligations. Now if I'm going to work through that I don't need anybody interrupting. I clip my goats back and work out how to do it and I will work out how to do it you see."* She now shares her life with a partner and family on her farm and at long last has her own extensive library, a place where she can shut the world out and immerse herself in the interests of her youth. *"It's like, I think it's probably the only kind of place I feel comfortable and still can't stand the city, can't stand quarter acre sections, can't stand neighbours, it just drives me crazy, can't stand noise. I love animals rather than people."* She gains great satisfaction from her "ready made family" as she puts it and the people in the community, and feels as though she has come home to a place where nobody counts the cost of anything and everybody keeps an eye out for everybody else..

"I was going to say how do I see myself, what sort of person am I. I think I am probably very phlegmatic. Probably either five star gorgeous or five star bitch and not much in between. You want to make sure you hit me on the right

day. It is probably not quite that extreme but I'm certainly not a passive character. I am always constantly saying that I am going to slow down, withdraw, pull out, whatever but my brain doesn't stop and you get another idea and then the adrenaline starts and you think 'gee' I could do that and even if you couldn't do it you could really piss them off and off you go."

CHAPTER 5

RESULTS: PART 2

TALENT DEVELOPMENT AND THE CRITICAL LIFE PATH

The information from the interviews and the developed data display (Tables 1,2 and 3) for each participant were analysed and description and explanation attempted according to the *critical life path* approach.

The longitudinal effects of the *critical elements* (Table 1) were looked at first. The intention was to try and identify any stages or periods of critical development and what kinds of *critical elements* might be typical of any of these temporal periods. The long or short term effects of the *critical elements* were looked at to give an indication of how long influences lasted and possibly why.

The relative effects of the *critical elements* (Table 2) were analysed with a view to identifying the kind of influence the *critical elements* had on the progression in the life path. Some of these may fall into groups, such as family influences, and some may be isolated such as one-off events.

In Table 3, the relative effects of the *critical elements* were combined to show a *critical life path* trajectory. Significant features of stages, acceleration and category of the elements were looked at.

Interpretation.

For each participant their *critical life paths* were analysed in terms of a number of features as follows:

The *critical life path* and psychological type (MBTI Profile): The data was interpreted from the Myers-Briggs profile perspective to establish connections between the psychological type indicated, the *critical elements* and the *critical life path*.

The *critical life path* and intelligence: The *critical life path* should indicate an efficient developmental progression. In order for an individual to profit from interaction in the world it is considered that they must be intelligent and apply this in certain ways. The theories of multiple intelligence were considered as best fitting this situation. Sternberg's Triarchic Theory was used as a form of interpretation in this respect but it was found that the application was not particularly successful. Gardner's (1983) multiple theory of intelligence may have been a better choice as the seven intelligences, plus an eighth proposed in 1995 (cited in Shores, 1995), fit much more closely with talent areas.

The *critical life path* and readiness: The *critical life path* may indicate that when *critical elements* are encountered and engaged in the individual is able to maximise the payoff from the interaction. In the case of negative elements the *critical life path* should indicate that the problem has been mastered and progression continues.

The *critical life path* and the *accelerated learning process*: Each of the *critical elements* that is identified should indicate that during exposure to these the individuals learned well the ways of thinking and doing that enabled the instance to contribute in a significant way to the developmental progression. They are considered to be involved in a positive learning context in which they are building flexible patterns of habits of thinking and doing that overlay their inherited patterns and that will enable efficient progression along the developmental path. A *critical life path* should show instances and possibly extended periods of accelerated learning and this will be illustrated by a steep upward trend in the trajectory as the learning situations combine to enable positive progression.

The *critical life path* and the *ecological context*: The *critical life path* may show a gradual movement towards the establishment of an increasingly specific environment which in large part is in sympathy with the personal characteristics of the individual. The form this takes may range from the purely physical living and operating conditions that are compatible with the individuals personal tastes, to the opportunities to engage *major world activities* that are synchronous with their personal preferences for expression. These activities may be vocational, familial, social, physical or whatever but are likely to occupy a large part of the individual's daily life.

The *critical life path* and the *zone of competence*: The *zone of competence* is the outcome of a progression over a period of endeavour from a generalised environmental involvement through a series of stages including a developing *ecological context*, to the development of a specialised field of involvement and endeavour. The *critical life path* may increasingly show *critical elements* that are within and around this specialised area and ultimately the path may indicate that this context has been evolved for the purposes of supporting and enabling the optimal expression of characteristics indicated by the MBTI profile. The individual may actively select those *critical elements* that contribute to progression along the path. These selections may be influenced by the individual perceiving and judging that the elements offer an optimum opportunity for expression and progression along the path.

The *critical life path* and synchronicity: Synchronicity is used in two ways. Firstly, it is used in a singular sense to describe the event or process that has no direct connection to the life path of the individual, or is a seemingly random instance, but has critical effect on the trajectory. This is the a-causal influence. A *critical life path* may indicate instances of this kind of synchronicity. Secondly synchronicity is used in a plural sense to describe the pattern of interactions that best fit, enable or allow accelerate progress along *the critical life path*. In this sense the individual and context are in a state of mutual resonance. The *critical life path* may indicate instances of this kind of synchronicity. The *critical*

life path may indicate that *critical elements* in the path are synchronous with the individual's style and direction and that even a-causal elements are able to be influential in altering or maintaining the trajectory. Instances of this may be found within the *critical life paths*.

The *critical life path* and talent: The *critical life path* may indicate that the individual is heavily involved in a context where their developing talents are synchronous with the requirements of the opportunities available. This orientation to talent is not the usual one. In this interpretation talent is considered as the ability that the individual develops to structure an environment to increasingly synchronise with their individual characteristics. The patterns of action are conceptualised as a mirror image of patterns of inherited characteristics which result in optimal development of phenotype.

Participant : Warren Hollings

Longitudinal effects of the *critical elements*: Table 1

The influences in Warren's life seem to be grouped into three areas. The first are the family related influences, his mother and father and the family troubles eventuating with the split between his parents and his father's departure from the family home. His father's diminishing influence only lasted until Warren became firmly involved in his vocation and the building firm of Fletchers. The effects of the family troubles on the young boy can only be guessed at but it would seem reasonable to assume that these events happened at a critical stage of development and had a significant effect on Warren's view of the world, including his own place in it, for some considerable time. The effect seemed to result in a lack of self worth and a continuing struggle to achieve recognition as someone of consequence and Warren found that he could achieve acceptance, recognition and success in his art work which led on to further successes in technical areas. These influences can be interpreted as formative and indicate the establishment or not, as the case would be, of a base from which subsequent development might take place. In



Table 1: Warren Hollings

CRITICAL LIFE PATH EVENT CHART - Table 1

PARTICIPANT: Warren Hollings

Depicting the reported temporal influence of Critical Elements that influenced the trajectory over 5yr spans

ELEMENT	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	Notes
Father																	
Mother																	
Family relationships																	
Top in Art at primary school																	
Weekend Trips																	
Top in tech drawing at school																	
Commonwealth Prize																	S
Joined Fletchers																	S
UK prize and trip																	S
Mentor- George Bourke																	S
Mentor - Jim Lowry																	S
Mentor - Ray Vuksich																	S
Queen St project																	
NZ News																	
National Mutual																	
School of Architecture																	
BNZ																	
Auckland City Library																	
Sheraton																	
Regent Hotel																	
Aotea Centre																	
NZI																	
Sky City																	
Team Development																	
1st NZ Building Mgmt Award																	
Family																	
2nd NZ Building Mgmt Award																	

KEY  Critical Element effect
 Zone of Competence
 S Element indicating synchronicity

Present age 53




Table 2: Warren Hollings

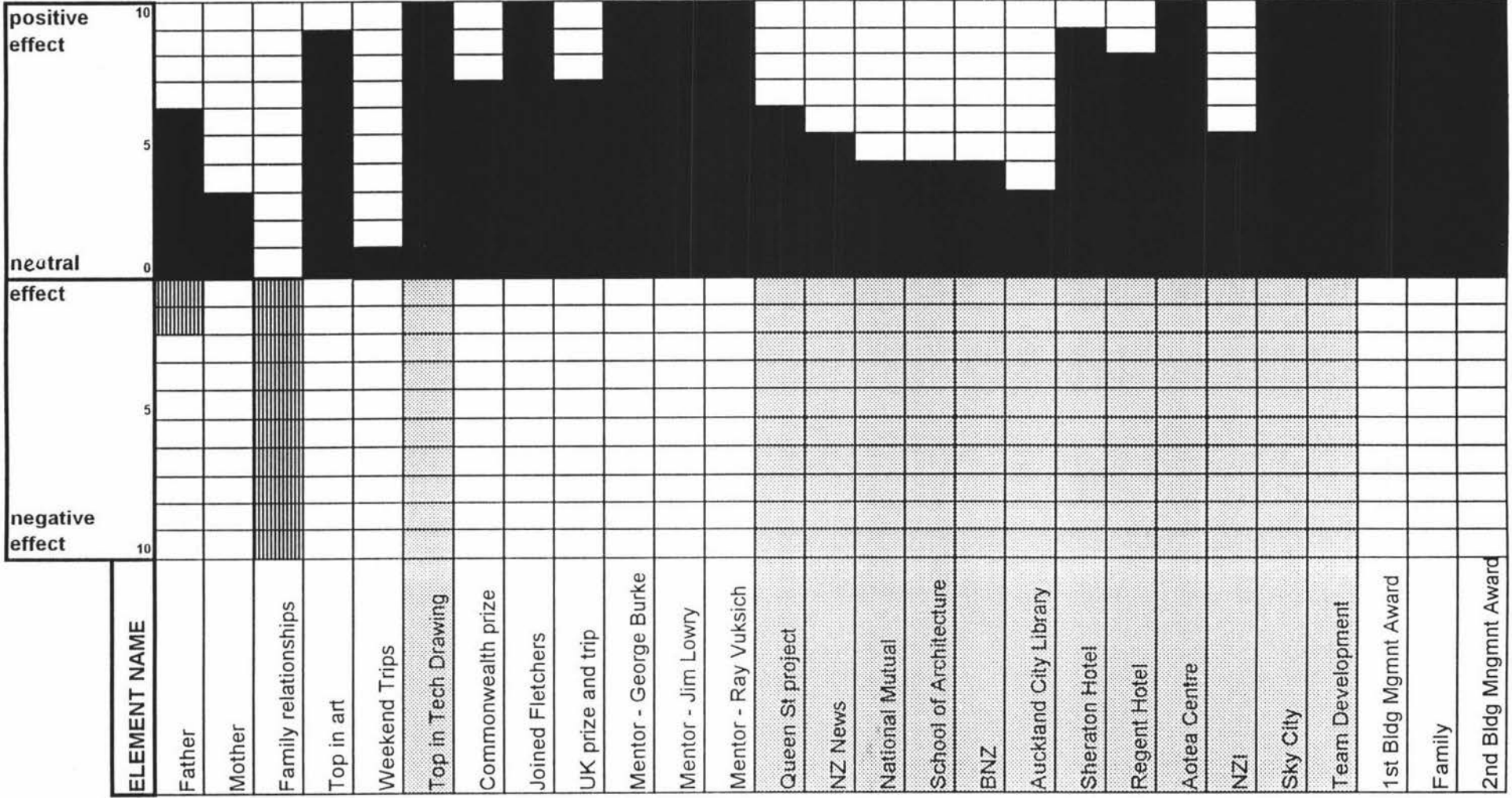
CRITICAL LIFE PATH EVENT CHART - Table 2

PARTICIPANT: Warren Hollings

Depicting the relative effect of critical elements on the developmental trajectory in temporal progression

The values and valencies of the critical elements are assigned by the respondent

KEY
 Critical Element - Positive effect
 Critical Element - negative effect
 Zone of Competence

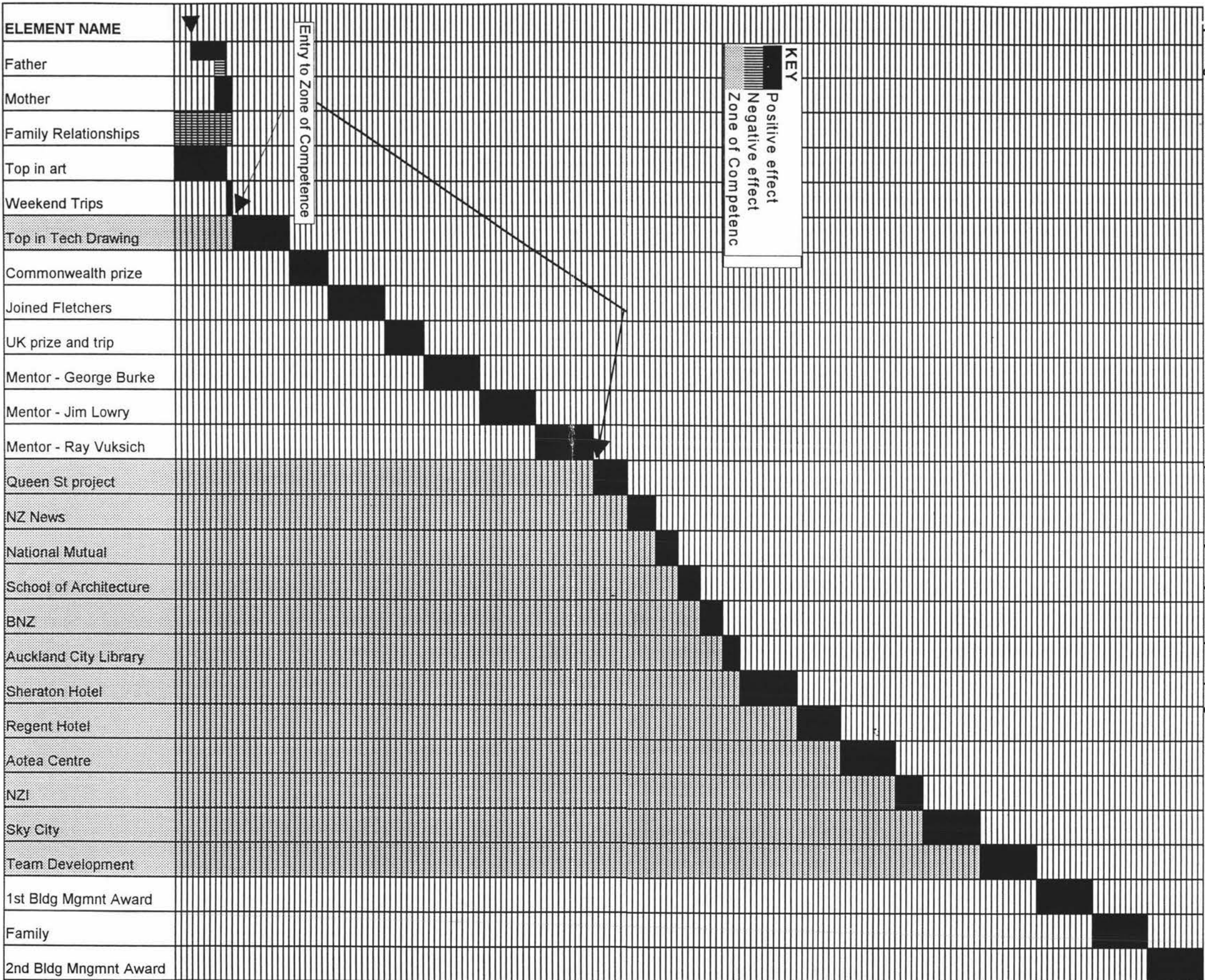


CRITICAL LIFE PATH - Table 3

PARTICIPANT: Warren Hollings

Depicting the cumulative effect of critical elements on the developmental trajectory in temporal progression

Table 3: Warren Hollings



this case the supportive environment of the family was lacking and this seems to have created a conflict which was to have the effect of unsettling the developing child. This lack of a supportive environment was later solved by Warren entering an environment in Fletchers which was to act as a sort of substitute family. Also within this early set of influences was the weekend trips to Auckland City. On these trips Warren observed large construction sites and was always intrigued by the seemingly chaotic scenes. These early impressions were to create an interests in construction which had a later guiding effect.

The second set of influences stem from his youthful educational experiences and could be seen as catalysts to action. These are the art prize, the technical drawing prize and the trip to the United Kingdom. It is interesting to note the effect that the technical teacher had on his subsequent development. The teacher concerned is not singled out as significant but the pattern of events that sprang from this interaction were to lead on to greater things and provided a pathway for the development of preferential activities in his preferred vocational area.

The third set of influences are the critical elements associated with his joining Fletchers and his work and there are a large number of these, most of them related to the successful completion of large and complex construction projects. These elements can be interpreted as the active phase of establishing a supportive context in which preferential activities took place. The first of these the Queen Street, Auckland Building Society project, was to set in place almost thirty years of intense and focused activity that went from strength to strength and included a good number of highly significant city landmarks. Alongside these activities the significant influences of his mentors were to add to the developing pattern of high level expertise and success. Recognition of the successes was also forthcoming in the awards and the industry and public accolades that the construction teams headed by Warren gained for a number of projects. These critical elements show long term effect and are within the *zone of competence* that has been established.

A fourth set of influences, his family, is increasingly seen to be appearing as very significant as he reorients his lifestyle and philosophy and seems to be more reflective and responsive to other peoples needs.

He appears to have worked through a process of coming to terms with his father's influence and the lack of early support and all the problems it brought upon him and then he gradually replaces his lost family with a work related family in the building firm of Fletchers. It is significant that the catalysts of the art prize, the technical drawing prize and the trip to the United Kingdom were to enable him to maintain a degree of self worth that seemed to have been under threat in his youth and later to experience the first tastes of success that he began to avidly pursue in his career.

The relative effect of critical elements: Table 2

The first cluster of critical elements, the family focused ones, show a medium positive influence of the mother and a negative and positive combination of the father's influence. In neither case are the influences particularly powerful, however the troubled family relationships element shows a very powerful negative influence on development.

Following this the next cluster of influences are the youthful developmental ones of the achievement and recognition of his talents firstly in art, within his primary years, and then technical drawing during his secondary years. Following this the next group showed further achievement and recognition in the tertiary area. The combinative effects of the lack of a supportive familial environment and the variable intervals over which reward was forthcoming over this period were enough to keep him on track and resulted in his choosing a path with Fletchers that in effect eventually replaced his "lost" family. Within Fletchers he found a supportive environment in which he could display in acceptable terms the toughness he had acquired as a rebellious youth and what could be interpreted as an almost abandoned, or at least ignored childhood, and this was coupled with his talent in the technical

matters related to building. It is useful to note that his ability in art reflects a creative aspect of character that turned out to be most appropriate within construction as he has been able to develop new methods and ideas when faced with what were to others, insurmountable problems. The powerful influences of the Fletcher environment, a group of significant mentors and the opportunity to achieve through the various construction projects show in the display and a succession of significant successes can be seen over a number of decades. Recognition within an industry he loves was forthcoming with his first Building Management of the Year award.

The continuing problem finding activity typical of the talented is clearly shown in the progression of major projects and culminates with the greatest challenge he has faced, the Sky City project. Following this the second Building Management of the Year Award and awards for innovation were forthcoming.

Through all of this the growing awareness of the importance of the people around him has had significant effect and is now a cornerstone of his values and conduct and this very person centered characteristic can be connected with the lack of support evident in his early life.

The *critical life path* Trajectory: Table 3

The *critical life path* Trajectory shows a pattern of early disruption and imbalance. School experience was not seen as significant however the positive *critical elements* of the achievements during this formative period, including the tertiary experience, were enough to provide a critical connection to what followed, a rapid and positive rise that carries right on through and includes the changing context of family. The *critical life path* trajectory shows a steep and uninterrupted rise once the supportive context within Fletchers is established. A high number of very positive *critical elements* have contributed to this very steep rise and there are no *critical elements* which detract from the last 30 years of activity. The appearance of a significant influence of family in the last few years is the only influence that is not within a work focus.

The *critical life path* and psychological type

MBTI type: ENTJ

The type designation in broad terms fits with the general type designation typically found within engineering and construction. The most typical MBTI type found in these areas is ISTJ. This type is typified by a preference for ideas rather than people, by the preference for dealing with the facts as they are rather than connections and possibilities, on making decisions based on logic and analysis rather than feelings and on an organised and planned pattern of lifestyle and approach to task behaviour rather than a spontaneous and flexible approach. In Warren Hollings' case there is a distinctive departure from the usual type. The E parameter, Extraversion indicates a greater focus on people rather than ideas and this is evident in the strong teamwork philosophy and practice that Warren has evolved over the decades. In addition it is unusual to find a N designation within the type profile. This N, iNtuition parameter indicates a preference for patterns and connections and can be firmly related to his orientation to art and drawing. Also it means that his desire to do things differently is more readily evident and the consequence of this is his strong ability to come up with innovative and new ways of doing things. The T, Thinking and the J, Judging parameters indicate strong preferences for logic as a way of making decisions and planning and organisation and as a means of conducting his affairs, particularly at work. The style is very compatible with his vocation at the levels at which he works. The MBTI details the ENTJ type as natural leaders and organisational builders. They conceptualise and theorise readily and translate possibilities into short and long term objectives. They are able to quickly see inconsistencies and correct them and are adept at organising people and situations to achieve useful outcomes. They like complex problems, use intuition to conceive of possibilities are innovative thinkers and planners. They are also action oriented, think ahead and can marshal people and materials to achieve goals. In

Warren's case his type fits closely with his career path and the *critical life path* progression.

The *critical life path* and intelligence

Warren's intelligential development can be interpreted as a mixture of Sternberg's contextual and experiential sub theories. The contextual subtheory - Warren's school and academic performance weren't the best early on but with a great deal of application and commitment he was able to learn how to develop this process and came to use his intelligence in the manner required by the context . Later on it becomes evident that Warren begins increasingly to utilise the experiential aspect of intelligence - the context of major project work involves finding problems and solving them before they happen, and also dealing with problems in an innovative way when they arise.

The *critical life path* and the zone of competence

The first evidence of a developing contextual zone is when Warren begins developing his art skills. The drawing skills and knowledge that Warren developed were translated into the technical drawing area. The precision and accuracy required in technical graphics had to be learned over a period of time but the flair for representation and the artists eye were a natural talent that was effectively channelled into many areas within the highly technical and formalised domains of construction and civil engineering. The initially developing zone related to artistic skills was superseded by the developing preferential zone of technical drawing and then building in which Warren was to become intensely involved and developed high level expertise. Within this zone Warren has now spent almost thirty years and has made unique and durable contribution to the state of knowledge, understanding and practice. He is also involved in a secondary zone of speaking engagements on management and team operation. This is a minor area of activity however and is unlikely at least at present to grow.

The *critical life path* and the accelerated learning process

The *critical life path* shows initial indications of an *accelerated learning process* at the point where Warren begins to succeed at technical drawing and this continues and spreads to other subjects as he asks himself for more effort. The learning pace and efficacy becomes evident as the successes of the late teens and early twenties period begin to show. The combination of intense focus, extraordinary effort and rewards in the form of recognition and prizes were to enable the maintenance of endeavour and resulted in a rapid acceleration of learning. With the aid of a very supportive contextual environment, significant and highly competent mentors and the opportunity to prove himself with an initial management project, Warren's path began to show exceptional outcomes. This process continued over the next two decades and established Warren as an expert leader and innovator in the field of construction technology. Within this field the range of expertise required goes from such aspects as the accurate interpretation of highly sophisticated engineering drawings to the ability to motivate, lead and organise, effective and disparate teams within a project.

The *critical life path* and readiness

The concept of readiness is indicated within the *critical life path* where Warren begins to respond to the support of the technical drawing teacher. This initial event of the teacher giving him recognition and encouragement was followed by the continuing support of the teacher and then culminated in Warren achieving the Commonwealth prize. Following this further indications can be found of readiness in the manner in which further studies were followed. The question must always be asked in discussing the notion of readiness is regarding the synchronicity of his maturational state and the presentation of opportunities. If any of the opportunities were not available or not synchronised then it is debatable whether or not the process of accelerated learning would have taken place to the same extent. Readiness in this case can be related to

many aspects of person and place such as personal characteristics and that persons knowledge and skills at that time, their ability to focus and commit effort and the pathways to further qualification offered within an educational system.

The critical life path and talent

Warren's talents extend from the ability to focus intensely on a problem and commit extraordinary effort to the ability to motivate people to perform beyond their own expectations. In the final months of the Sky City project many of the management team were doing 100 hour weeks in an effort to meet the deadlines and this is an example of his ability to inspire people. The tasks entailed in effective project management are many and various but centre around two main areas - people related and technically related. The people related talents revolve around organising, motivating and managing people and above all providing an example to follow as a true leader should. He is able to deal effectively with a range of construction and management professionals, site workers, suppliers, sub-contractors, even journalists and researchers. Warren expresses strong views on leadership and is totally committed to a team approach believing that teams in the modern age will always be stronger than individuals. In the technical areas his problem finding and solving abilities are second to none and he has become as he puts it planning mad. He has plans, contingency and fall back plans for every conceivable eventuality. He has numerous high level skill and knowledge areas related to construction and engineering from the ability to read sophisticated and complex drawings to understanding and operating cost and budget control procedures, project logistics, systems analysis and planning methods. It could be said that his major talent is to learn quickly and effectively the best ways to complete a set task in the most efficient manner possible.

The *critical life path* and synchronicity

In the *critical life path* there are no strong indications of a-causal synchronicity but there are indications that some events and processes happened at opportune times. Examples of these are the incidents of winning awards and prizes as a school student and later as a tertiary student. The incident where the technical teacher gave him positive feedback is one such incident that tends more towards the a-causal as it set was fortuitous and set him on a path which began to offer him further preferential opportunities. In his working life some elements reflect a kind of synchronistic a-causality that could be interpreted more as resonance. The appearance of mentors, the offer of the first major project have a more causal nature to them as Warren was in a context within which the likelihood of these elements occurring became higher and higher as he gained expertise and credibility.

Summary

Warren Holling's *critical life path* shows early influences that were antipathetic to even and staged development. However the appearance of significant reinforcing events in the school years were to have critical influence on subsequent development, both in areas of preferential activity and on the personal characteristics of the maturing person. His developing style was able to be expressed in preferential areas of activity and once a supportive environment was entered and established the characteristics of a well individuated type were able to be acted out in his vocational area. The contextual patterns of requirements and opportunities of the developing *zone of competence* began to achieve a proximal fit with his own personal characteristics and allow an *accelerated learning process* to take place that set him at the forefront of his field, a position he still maintains. Within this field he has made unique and durable contributions to knowledge and practice and is an acknowledged leader and expert in the fields of construction and management.

A number of conclusions may be drawn from the *critical life path*. These are:

- that characteristics of type were able to be developed and expressed within an environment in which the inherited and developed patterns of his persona could be matched with existing requirements of the context.
- that once the special supportive context of Fletchers was entered there was opportunity to develop and accommodate idiosyncrasies of type, namely his intuitive side and his person focus. This resulted in a very effective specialised context being created in which he became the foremost expert within the field. The progression approximates the theoretical sequence put forward by Scarr and McCartney (1983).
- that strong well formed patterns of habits are evident in his approach to tasks and in his ability to deal effectively with people.
- that the obligatory decade of intense focus and involvement was initiated early on with the success at technical graphics, could be said to slightly compressed within the late teens, early twenties period and was then developed over successive decades of involvement.
- that a feature of the path was the early entry into the *Zone of Competence* and the major initial talent development took place when Warren was relatively young, in his middle to late twenties.
- that a major feature of the *critical life path* progression is the number of strong positive *critical elements* that shape the steep upward trajectory and the fact that once the supportive context was entered there were no negative critical influences.
- that the *critical elements* after adulthood is reached are, with the exception of family, all work related.
- that in his work context, the missing context of a supportive family was replaced and restructured at an early stage. This allowed accelerated development and a succession of distinctive successes. The trend found with the other participants that the positive impressions of their "Early World" (after

Richardson, 1964) were recreated is in this case the obverse - the missing positive elements were recreated by entering and reconstructing an environment that contained the essential characteristics of what perceived as missing from the early family context.

- that within the path the indications of synchronicity tend towards the causal end or what can be described as the resonant end of the spectrum rather than towards the a-causal or purely synchronistic end. This situation is entirely consistent with the MBTI type profile for the participant - that processes should be more rather than less controlled and that possibilities should be translated into achievable objectives. In this sense it is likely that although a-causal influences do appear they are analysed and if they do not fit the range of expressions available they will be discarded. With another type profile such as a strong N and P type score it may be likely that other more extraneous a-causal influences would become critical

The *critical life path* of this participant indicates an efficient and systematic reconstruction of patterns of possibilities that provide a best fit of person to context and vice-versa.

Participant: Lino Nelisi

Longitudinal effects of the *critical elements*: Table 1

Table 1 shows the longitudinal effects of the *critical elements* in Lino Nelisi's life. From this it is evident that *critical elements* that have the longest effect are the early familial ones - mother's death, father's influence, brother's influence, her family experiences and her early school experience. Each of these is seen as absolutely essential to her present situation. Her marriage is a continuing source of support from the mid-period of her life. The elements that have a critical effect now are her writing, her volunteer work and these are coupled with a strong belief and value system that continues to be a major contributor to the activities she engages in. The beliefs and values can be traced directly to her early family and the influence of her father.



Table 1: Lino Nelisi

CRITICAL PATH EVENT CHART - Table 1

PARTICIPANT: Lino Nelisi

Depicting the reported temporal influence of Critical Elements that influenced the trajectory over 5yr spans

ELEMENT	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	Notes
Mothers Death																	
Father																	
Brother																	
Family experience																	
School - early experience																	
Sports																	
High School Entrance exam																	
Secondary School																	
Teachers College																	
Teaching in Nuie																	
Marriage - early experience																	
Husband																	
Emigration to NZ																	
The first bus																	S
Hotel experience																	S
Radio advert for P.I. tchrs																	S
Teachers College																	
Writing																	
Teaching in NZ																	
Reading Conference																	S
Volunteer work																	
Beliefs and values																	
The future																	

KEY  Critical Element influence
 Zone of Competence
 S Elements indicating Synchronicity

Present age 44




Table 2: Lino Nelisi

CRITICAL PATH EVENT CHART - Table 2

PARTICIPANT: Lino Nelisi

Depicting the relative effect of critical elements on the developmental trajectory in temporal progression
The values and valencies of the critical elements are assigned by the respondent

KEY

-  Critical Element- positive effect
-  Critical Element - negative effect
-  Zone of Competence

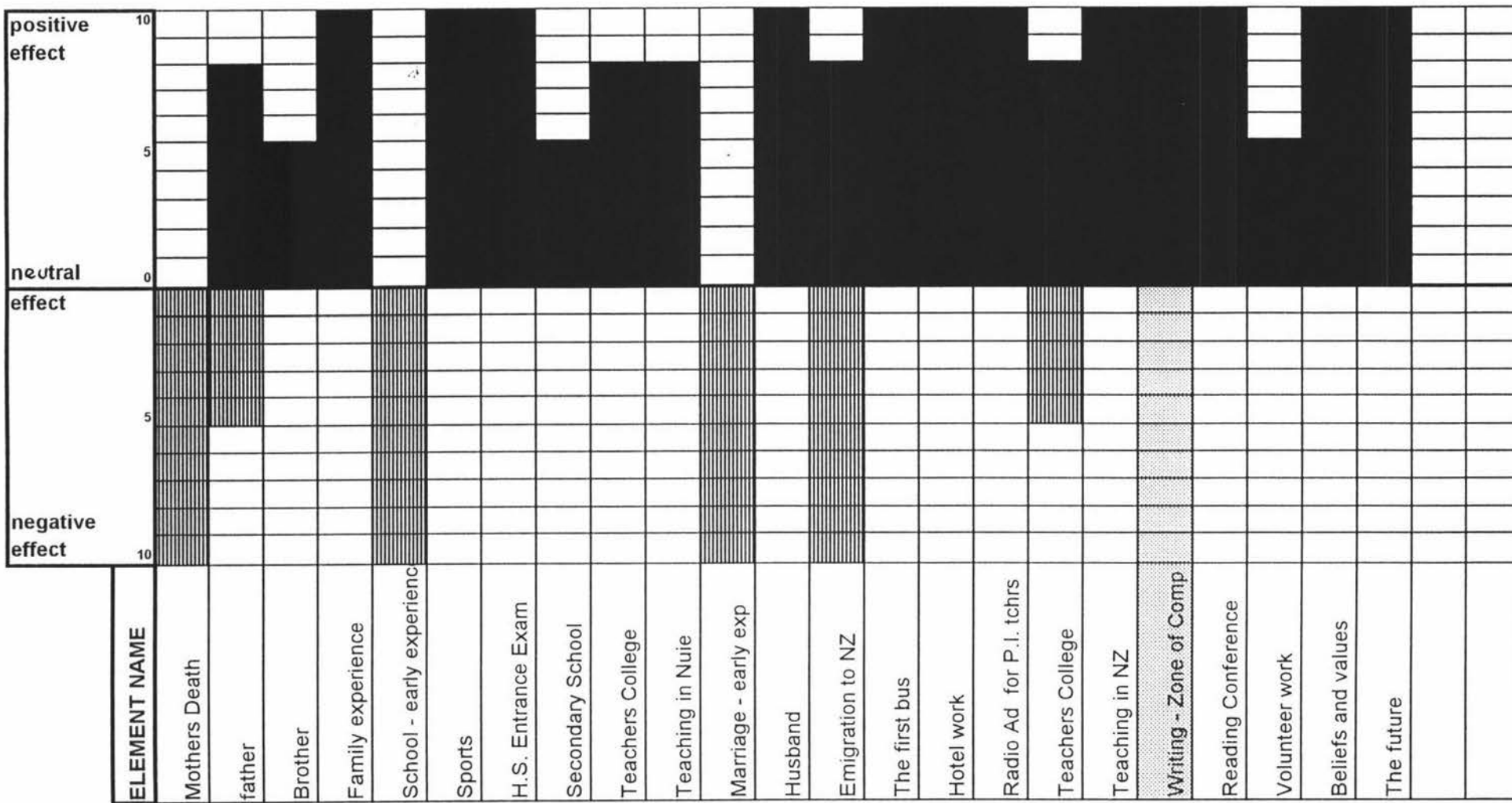
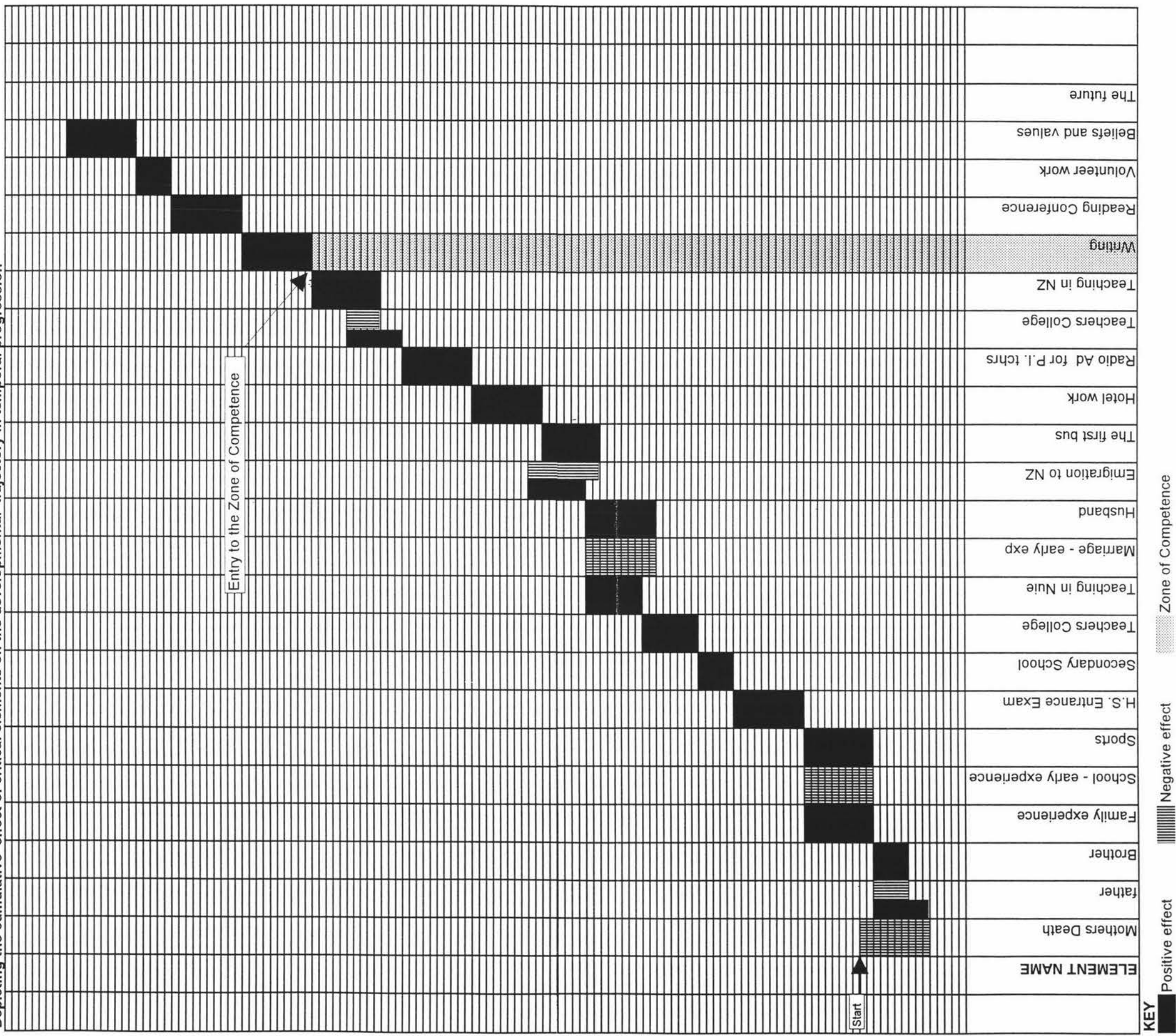


Table 3: Lino Nelisi

CRITICAL LIFE PATH - Table 3
 PARTICIPANT: Lino Nelisi

Depicting the cumulative effect of critical elements on the developmental trajectory in temporal progression



To a lesser extent the experience at Teachers College is influential as it set the stage for her to progress into the preferred areas of activity that she now engages in. An interesting feature is the importance of the future - she is a person who sets goals and looks ahead, working diligently at tasks to achieve significant outcomes. In the middle period of her life there were a number of critical influences that enabled a new focus to be found - emigration to NZ, the first bus trip, the hotel work and the radio advert for Pacific Island teachers. These influences although of short duration were part of the search for a new path and served the purpose of broadening the range of options available to her as she went about finding her preferred area of activity.

The early cluster of *critical elements*, Mother's Death, Father, Brother, Family Experience and Early School Experience continue to influence the way in which she operates and the activities she engages in. A second cluster of *critical elements* are the ones that evolved within the New Zealand educational context and reflect her engagement in activities concerned with doing useful things for other people as well as achieving highly at whatever activity she engages in. This aspect is directly related to the beliefs and values established in her early years. It is noticeable that the educational aspects that gave a platform for development, the years at school, Teachers College, teaching in Nuie and New Zealand are not considered to have a long term effect and can be interpreted as secondary or background influences rather than primary or foreground influences.

The relative effect of critical elements: Table 2

Table 2 shows the relative effects of the critical elements in Lino Nelisi's life. The most powerful effects in early life form a cluster that has within it significant negative elements - the death of her mother, the positive and negative effect of her father and the positive influences of her brother and family environment. The next cluster - the years of formal education begin badly also, but powerful positive influences are seen in related areas especially in

secondary school and this indicates both a desire to achieve in line with the values of her father and also the first movement towards her adult area of expression - writing. The next cluster, relating to the change in life when she left Nuie and came to New Zealand also shows a negative start but again powerful positive elements allow a change and adaptation to come about and the negative elements are overcome. As she enters adulthood a series of critical negative and positive experiences takes place and it can be readily seen that she is searching for and then trying out the contextual contingencies for a way to express herself until two events take place - the radio advertisement for Pacific Island teachers and the meeting with the publisher from Learning Media - that begin her journey along the present path. Again there is a degree of separation of what could be called primary or foreground influences and secondary or background influences - the primary elements are those that are the most powerful and immediate - writing, teaching/consulting, service; the secondary elements are those that are less powerful and a little more distant - Teachers College, volunteer work and so on.

The *critical life path* Trajectory: Table 3

Table 3 shows the *critical life path* components and the resultant trajectory. The *critical life path* shows early negative influences that are overcome by the more powerful effects of father, brother and family experiences. These elements are to play a long term critical role in development so that throughout Lino's life she is able always to fall back on these familial structures and ways of doing and keep going despite the odds. The trajectory shows two major recessional or plateau periods - early family and school experiences and the period of flux during which Lino married and ended up coming to New Zealand. It is evident that the events that acted as triggers to change the *ecological context* she had begun to construct, began to have an accelerated effect - the *accelerated learning process* which began to take place when she started to learn how to write *and* get her work in front of her target

audience. This acceleration is evident in her writing when she began to learn how to put together the appropriate literary structures in the actual writing and bring together the critical influences - meeting the publisher from Learning Media, adopting a particular working style and other contextual elements that were necessary for success.

Lino's *critical life path* is typified by a negative start in her early years and a period of steep rise with a number of *critical elements* during her later childhood that contributed to a platform that later on enabled her to succeed in a chosen area of activity. Following this came a period of searching, testing, changing of context with a mixture of both positive and negative influences. It was during this period beginning with emigration to New Zealand that the effect of a-causal influences - the bus trip, working at the hotel and the advertisement for Pacific Island trained teachers had a major effect in reorienting Lino to a period of activity that began to bring her closer to her goals. These a-causal influences were effective because Lino was in both a physical context and a psychological state to react to them in such a way that they were to initiate a critical change in the developmental path that enabled further progression and eliminated or reduced the problem of stalling or negative development. It is noticeable that once these negative influences were overcome that the *critical life path* shows a continued steep and positive trajectory to the present. The process of problem solving in a wider sense was extremely effective with *baseline capability* (the *critical elements* of preparation via schooling, family experience and other earlier elements) combining with a *state of readiness* when the critical a-causal influences appeared (or were encountered). This combinative state enables the notion of synchronicity to be useful, as a tool of description and contribute to a partial explanation of events as they unfolded. Lino's path in the stage where she left Nuie and came to New Zealand shows a strong sense of searching for new directions of expression of self. The critical a-causal elements that were encountered were a result of her own actions tipping the scales of probability - it is inevitable that there would be encounters of this

kind as long as she was still looking for them. She managed to use these to create a new path and a context within which she could work through her desire to express herself in preferred activities within contexts in which she had the tools of self expression. It must also be considered that if these particular influences had not occurred, others that enabled development might have, or they might have happened at other times. The question that must be asked is, would they have had the same critical effect, and, why did these critical influences happen just then? Once again determinist analysis gives no explanation and reference must be made to entertaining notions of quantum possibilities - that the individual themselves has some small but critical effect on the appearance within a *critical life path* of influences that will have significant and timely effect - synchronicity.

The *critical life path* and psychological type

MBTI Type ISTJ

The ISTJ type is typified by a focus on ideas (Intraversion) rather than things or people; the preference for using facts and being accurate about whatever information they are using; using logic and analysis when making decisions; and being organised and settled about their lifestyle.

The *critical life path* shows :- a preference for focusing on the inner world of ideas and impressions. This fits well with the inner world Lino developed as child, with the powerful impressions of her young years and her ability to reconstruct these in her writing. Her ability to reflect, to work quietly and to earn success by concentration and focus are typical of the Introverted (I) preference. Working individually is also a characteristic of this type and writing is certainly one activity that is compatible with this. The Sensing preference (S) shows a reality based focus for perceiving the world is evident in her early years when she experienced and gained from exposure to the broad range of activities that she did with her family. This focus is concerned with details - examples are her

ability to weave into her stories the real and detailed experiences and impressions she picked up in her youth. This is a moderate preference.

The (T) Thinking style shows a preference to make decisions on the basis of logic and analysis. To be able to critique and be critical of herself and use reason when putting forward an argument or a case. This shows through in the way in which she works, with her ability to discipline herself to write at the unusual hours she does because the job needs to be done and it would be illogical to do it at other times. This preference is the least developed.

The lifestyle preference of the Judging type (J) shows a preference for organisation, again evident in her work ethic and practice. This preference is typified by the setting of goals, being systematic and looking to control ones life and all these are readily evident in Lino's story. This is a very strong and well developed preference.

In summary the combinative type preference is "Serious, quiet, earn success by concentration and thoroughness. Practical, orderly, matter-of-fact, logical, realistic, and dependable. See to it that everything is well organised. Take responsibility. Make up their own minds as to what should be accomplished and work toward it steadily, regardless of protests or distractions. Live their outer lives more with thinking, inner more with sensing" Lawrence (pA-7, 1993) Lawrence also identifies characteristics that can be found in Lino's ways of doing things - her acute powers of observation, found in her story Fishing with Spider Webs (1994) and typically found with mature Sensing types. Also her sense of justice and fairness, a theme which runs through her life is a characteristic of Thinking types. Thinking / Sensing (ST) types typically have good technical skills and Lino's exposure to the more technical nature of what was usually boy's or men's activities in Nuie allowed her to develop a very wide range of expertise and experience that females in her society did not typically engage in and so she can relate well through her stories a very wide range of impressions and events.

The *critical life path* and intelligence

Lino's path is an example of Sternberg's Experiential application of intelligence. The Experiential type of intelligence is typified by a person who does not have the greatest test scores but thinks and acts creatively, combining different experiences in insightful ways.

This insight is described in the theory as taking place in three ways: -

- as Selective Encoding which is the ability to focus on critical information. In Lino's life and literature there are examples of this where she was able to select out of the larger background, things that were important to her and would serve her well in setting about her path - her focus on her desire to succeed, to hold to her values, to be useful and productive, to take opportunities and use them.

- as Selective Combination which is the act of combining critical elements to make a course of action that allowed her to more fully express herself. This is evident in her stories where she combines disparate impressions and activities of her youth and connects them in a way that is meaningful to the young reader.

- as Selective Comparison which is being able to see an old or unrelated thing in a different way. Lino does this with her stories, taking the impressions of her youth and weaving a new pattern around them all the time giving the children a new world to take in.

The Triarchic Theory relates cognition to context and in Lino's case this context, her "Early World" (Richardson, 1964), is able to be recreated in her stories. This process is an indication of the drive to express the powerful impressions of her youth in a manner which is both a fulfilling expression of phenotype and the application of intelligence in a manner compatible with her psychological type. This integration of the internal world, the external world and experience is central to the Triarchic approach and is compatible with the both MBTI and Scarr and McCartney's approach.

It would be incorrect to say that Lino exclusively uses what Sternberg terms Experiential Intelligence, indeed it is evident reviewing her history that at

times there is evidence of both the Componential and the Contextual application of intelligence being used. However for the purpose of this study the major activity area - literature, in which there is a high level of expertise, excellence of outcome and eminence, is where the Experiential kind of intelligence is often found. If another facet of Lino's life was analysed it may be that one of the other kinds of Sternberg's intelligences is primary. However it is the area in which she has achieved eminence that shows the preferential application of what the Triarchic Theory describes as Experiential intelligence.

The *critical life path* and the *zone of competence*

The primary *zone of competence* that Lino can be associated with is in the area of literature and specifically Polynesian children's literature. This makes her zone a specialty one, a context that she has had a large hand in creating as before she began her writing there was little if any formal publication of Polynesian children's literature. This *zone of competence* is evident at the point at which she begins to get her literature into the public arena and is shown on the *critical life path* at the point where she attends the Reading Conference and meets the editor from the publishing company. Following this critical influence she begins the creation of a specialised context in which she became an acknowledged expert and at the time the most eminent practitioner. From this point on the zone is established and others have since followed her lead. This *zone of competence* is at the centre of Lino's actively selected environment - her specific *ecological context* in which she has a central focus, high level competence and a network of connections that support and maintain her continued success. Subsidiary zones are found in teaching and in her community work and although she is no doubt competent in these, it is in the Polynesian children's literature area that she is a major success and influence.

The *critical life path* and the *accelerated learning process*

The *Accelerated Learning Process* is evident in the *critical life path* most noticeably at the point where she begins to develop the ways of becoming successful in her preferential field of activity - when she begins to have her work published and then goes on from there to write and publish more. In prior activities family experience and secondary school can be found examples of accelerated learning but they are not primary as is her learning in the literary field. It should be noted that for a Polynesian writer with no prior experience, to quickly learn the ways of writing and publishing successfully in an English language context in a new country is an impressive achievement and indicative of a very quick learning process.

The *critical life path* and readiness

Example of readiness can be found in the New Zealand experience when Lino took unusual steps to get something happening - her bus trip, working at the hotel, turning the radio on at an opportune time, going to the reading conference (also examples of the influence of a-causal events and the notion of synchronicity). Each of these influences shows a readiness to initiate action towards some end, and to act upon the event in order to find ways of getting there.

The *critical life path* and talent

Lino's talents lie primarily in her abilities to set achievable goals and to work, despite setbacks, towards them. This strong characteristic is coupled with her ability to write in such a way that she can give the reader a virtual view of her world in story form. These characteristics are patterns of mental and active habits that are typified by her successful writing of children's stories, by her work habits, by her use of language and context to create something very readable for children's minds to grasp and empathise with. If Lino has a talent or talents it is this high level performance - she is talented at writing stories for

children. That she has other talents is not in dispute, but this is the particular one or set that she is expert and eminent in.

The *critical life path* and synchronicity

Examples of the notion of synchronicity can be found in the *critical life path*. Firstly the bus trip incident, not an entirely a-causal event but the question has to be asked, why did this happen, and why at this time? In a mechanistic interpretation there is little opportunity for explanation, however keeping quantum notions in mind it is easier to see that this was an option in a huge range of possibilities, given that there was something driving Lino to move on, to initiate some action that would help her towards her goals. Similarly the act of turning on the radio just in time to hear the advertisement for Pacific Island teachers can be called coincidence, but why did she turn it on when she never listened to the radio, and why did the advertisement happen then? The reading conference is another example of the synchronicity of influences that is very difficult to explain in a mechanistic interpretation. All these influences can be described much more usefully in quantum terms using the construct of synchronicity and readiness. The events/influences were in the path of the person as possibilities, just like any range of options is open for action by anybody, but the preference for action may be determined by type in a way akin to Dobzhansky's (1983) "Norm of Reaction" This is the idea that genotype gives latitude for a range of phenotypic expressions depending on the context. Scarr and McCartney's (1983) Theory of Genotype --> Environment Effects also presents a way of interpreting these events in that the individual is seen as being involved in an "active kind" of idiosyncratic environment. This environment in this case is one in which opportunities are likely to occur, opportunities that may not necessarily be of a mechanistic causal kind, but possibly of an a-causal kind, almost like a desperate attempt to get something going. These events/influences are then acted upon, something that would not happen in the normal course of events, but are directly connected to the genetic

pressure to express phenotype. Scarr and McCartney argue that these environments are correlated with the talents, interests and personality characteristics of the person. This synchronicity emanates from genotypic pressure to establish and develop expressive outlets that are compatible with the genotype and are evident in the preferences illustrated by the MBTI and by the Triarchic Theory of Intelligence. Such synchronicity of experience, of genotype/phenotype expression would seem to be logical in any life path portrayal and are evidenced in this case on the *critical life path* as options taken that may be at the far end of certainty.

The reasons why they were taken *at the time* is conjectural, however the possibility is that according to quantum interpretations there is a likelihood of such things happening and that the individual, in this case Lino, took action which was synchronous with the event happening. If she had not turned the radio on at that point how likely is it that she would be where she is today? Was she using the preference of perceiving the world based on intuition, one that was auxiliary to the dominant one of sensing? Was she using Sternberg's insight - Selective Comparison? Did she somehow know or initiate action, knowing that something had to happen given her desire to progress along her path somehow, by whatever means possible? The answers are not conclusive but are certainly a little better than explanations (sic) of chance, coincidence and luck! The explanation lies more in her being involved actively in a context where there was more likelihood of something critical coming along than there was of nothing at all happening.

In some cases fortuitous influences such as in Lino Nelisi's path when she met with the publisher from Learning Media may have taken place in different contexts and at different times. However if she was not ready for this then would the event have had the same effect and enabled progression along the developmental path to the same extent? A meeting well before she began writing and a publisher not interested at that time in Pacific Island children's literature would undoubtedly have had little influence. Similarly a meeting well

after she had written a number of works might have found her at a time when she had lost motivation or been unable to produce the quality required.

Summary

Lino's path is an example of a path directed by an innermost desire to express her true self, one she kept intact despite trials and tribulations along the way. It is an example of moving through a number of contexts from the already constructed, passive environment, to the evocative and to the active (as Scarr and McCartney propose, 1983) and finally into a new and special context in which her unique contributions were outstanding features. It is also an example of using intelligence in a way that best fitted the developing context and of the best fit of her personal characteristics, illustrated by the MBTI, to a specialised ecological environment in which her underlying characteristics could be matched with the patterns that were implicitly possible in this context. Accordingly, in terms of the underlying constructs of the *critical life path* approach and of Scarr and McCartney's theory, the outcome was a fulfilled phenotypic expression of the drive by the genotype towards outward expression within a context which was increasingly compatible with the chosen manner of expression, an activity based on ideas expressed through writing for an audience which was reminiscent of her young years and the memories of her youth, a re-creation of her "Early World" (Richardson, 1964). It should be noted that many writers explicitly re-create their "Early Worlds" in their literature, sometimes in true form, other times in the form of patterns of connections and possibilities.

The unique patterns of inner world, outer world and experience in Lino's life show a connectivity of purpose, the expression of an innermost desire for want of a better word, to express herself in the world in which she found herself and aspects of this are able to be interpreted and described in a number of complimentary ways, via Sternberg's intelligences, by Scarr and McCartney's approach and by the MBTI approach. However it is only the *Critical Life Path* in

this author's estimation that illustrates an holistic and interconnected life path and can definitively show an individual progression and how the *major world activities* of the individual cumulate to provide impetus and direction to the life passage.

Participant: Graeme Platt

Longitudinal effects of the *critical elements*: Table 1

The longest lasting influences from Graeme's early years are seen as being the influence of his mother, his rural childhood and the increasing importance of an informal education. This early cluster of influences is unmatched until much later in life with his marriage and the Native Plant Nursery project being significant influences in the middle years. The Biospectrum and Botanical Research Institute projects form a third cluster of influences that are at present the major areas of activity.

His mothers influence of being supportive, adaptable and resourceful are lessons he still carries with him and continue to influence his actions. His fathers influence was significant until around the age of 20 when he left New Zealand and established his own independent life. It is noted that the fathers influence was only seen as critical until Graeme was 20 years old. This would be a common situation amongst New Zealand males in many cases as the young male adult establishes himself independently from his father. The rural childhood is still an important factor in his preferences for the lifestyle and reliving his youth and this re-creation of the early context is very evident in Graeme's present lifestyle. He lives on a small block where he runs his own enterprises and takes pride in being almost totally independent of the outside world.

Graeme makes a distinction between his formal education and the learning that he did within his surroundings. He sees the informal learning as allowing him to think outside the square very easily, to cut through the camouflage and get right to the crux of things very quickly in spite of accepted

Table 1: Graeme Platt



CRITICAL LIFE PATH EVENT CHART - Table 1

PARTICIPANT: Graeme Platt

Depicting the reported temporal influence of Critical Elements that influenced the trajectory over 5yr spans

ELEMENT	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	Notes
Mother																	
Father																	
Rural childhood																	
Informal education(NB)																	
Formal education																	
Reading adventure books																	
Scouts																	
Noel Crump																	
Overseas travel																	
Garard- prod. engineering																	
U.K. experience																	
NZ / stepping stones																	
Elna -Dunedin/Auckland																	
Marriage																	
Mrs. Williams/farm job																	
NZ Breweries																	
Native Plant Nursery																	S
Pine Bark Project																	S
Tapanui Flu																	S
Dr. Mervyn Gatman																	
Biospectrum																	
NZ Botannic Research Inst.																	

KEY

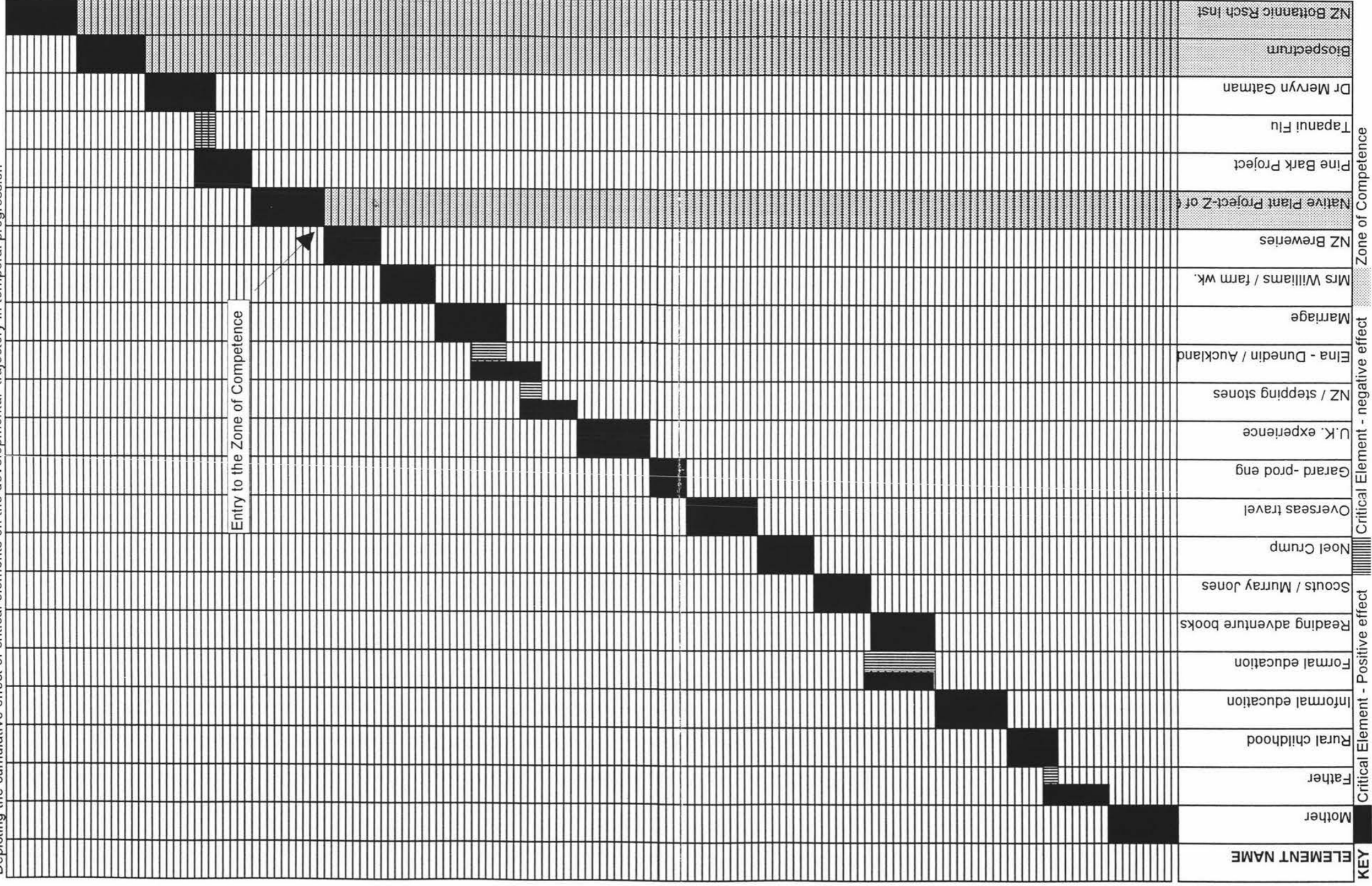
-  Critical Element influence
-  Zone of Competence
- S Element indicating Synchronicity

Present age 52

Table 3: Graeme Platt

CRITICAL LIFE PATH - Table 3
PARTICIPANT: Graeme Platt

Depicting the cumulative effect of critical elements on the developmental trajectory in temporal progression



thinking at odds with his ideas. This informal education he sees as essential to his ability to solve problems and never be at a loss for a solution and this continues to be a critical influence in his life today. He considers himself a failure at school but that the formal education setting has given him some skills but more importantly knowledge and insight into how things are done in the education system so that he can now look at the system and decide what is good and what is bad about it. Formal education he sees as being significant only over the period of schooling after which it had no further critical effect in getting him where he now is.

In his youth a number of significant influences had an effect over a period of 10 years. These were the influences of friends, books and Scouts which together combined to provide avenues for adventure and set a platform for Graeme to go out and explore the wider world. Following these youthful influences the *critical elements* show significant but short term effects of travel adventures and work until he began his native plant nursery project. Many of these elements were steps to further action rather than enduring areas of activity.

His marriage is ongoing and an obvious influence in support of his lifestyle and business and his wife has been instrumental in much of the enterprise he has engaged in over the years. The native plant nursery is perhaps the most significant influence in his adult life in terms of activity as it has had the longest effect and is still a factor in his present operation even though the nursery is now closed and he has moved on to other activities. One of the reasons for its significance is that over this period of time it gave him financial independence so that when he moved on he was able to engage in new activities. The success of his Biospectrum venture and the NZ Botanical Research Institute also contributes to financial independence and has meant that new ventures can begin without need for outside money.

The relative effect of *critical elements*: Table 2

The most powerful positive people influences are seen to be his mother and father, Scouts, his friend Noel Crump, his wife and Dr Mervyn Gatman. Each of these people had effects which are still influential today. The fathers influence was seen to be both positive and negative - again a fairly common thing amongst New Zealand boys at least and probably boys in general.

The most powerful event and process influences are his rural childhood, his informal learning experiences, formal education seen as both positive and negative, and the elements relating to his exploring of the larger world - the experiences of Scouts, travel, working in the UK and in Europe, and then coming back to NZ and proceeding through the series of initial and subsequent stepping stones with travel, work in the South Island, and then the move to Auckland and the beginnings of setting up a series of new ventures. All of these elements had critical effect and there are at the present business/interest ventures which will continue to be central to his progress. (He is at present working on other innovations and developments)

The *critical life path* trajectory: Table 3

The *critical life path* depicted shows the early positive influences of parents and home life in the rural setting - high positive value attached to these influences indicate that Graeme was able to proceed from a stable base initially and gain much positive effect from these interactions. The perceived negative effects of fathers influence and formal education were offset by the more powerful effect of the greater number of positive influences. Development was allowed to proceed at a pace that in the larger ecological sense was efficacious. Informal learning was seen to be by far the most powerful influence with many contributing facets as shown. The positive influence of learning in the education setting was counterbalanced by the negative influence of the process. Subsequently the developmental trajectory was interrupted only by negative influences which were overcome quickly and the upward path

continued. At a later stage even negative influences - farm work, Tapanui Flu - were seen as ultimately positive and enabled the *critical life path* to proceed at pace to the present situation.

Features of the *critical life path* - it is interesting to note in the depiction the range of critical influences. The foremost lifelong influences focus around experiential elements - rural childhood, travel, work, later circumstances, with the more formalised elements of home and early education only having critical effect within a narrow time frame. The influence of the early rural upbringing has played a major role in placing Graeme in a continuing rural setting where he still operates today. Another feature is the influence of venture type enterprise - problem finding and/or problem solving challenges are evident.

The *critical life path* and psychological type

MBTI Type: NTP

Lawrence (1993) identifies characteristics of the INTP type as:- "Quiet, reserved, brilliant in exams, especially in theoretical or scientific subjects. Logical to the point of hair splitting. Interested mainly in ideas, with little liking for parties or small talk. Tend to have sharply defined interests. Need to choose careers where some strong interest of theirs can be used and useful. Live their outer life more with intuition, inner more with thinking." (pA-8)

In terms of Psychological type it is evident that the effect of preferences are expressed within the settings that Graeme engages in. Examples of acting out of Psychological Type preferences within the developmental path :- The constant search and engagement in developments showing a preference for ideas and impressions, detachment and contemplation of situations e.g. why the dinosaurs died out - typical of 'I' types with the activity taking place inside the head- the development of abstract connections between elements based on what are initially barely perceived links and what at first glance appear to be unconnected phenomena.

The tendency towards insight problem solving - in the case of the 'P' type finding ingenious ways of solving things - looking for possibilities and relationships rather than just the facts as they are - e.g. the answer to the Tapanui Flu problem, connecting the change in the status of differential fauna types to the extinction of the dinosaurs and the change in the earth's climate. In addition the constant curiosity of the type - Graeme is currently working on an idea totally unconnected with any previous venture and one in which he has absolutely no knowledge or experience as yet.

The strong, cynical scepticism of the 'T' type with a mistrust of any system or process that does not have consistency and logic within it. Inclusive in this is the mistrust of any individual connected with any process or idea that is seen as inconsistent or flawed. This preference is evident in the attitude to established scientific views within Graeme's field and further to other areas of societal endeavour in which (in Graeme's view) people of dubious competence and sometimes character may be engaged in - politicians, lawyers and so on.

The lifestyle preferences of the 'P' type are very evident in Graeme's lifestyle. The loose, constantly moving background, the change of circumstance and endeavour every few years, with the exception of those that engage him in intense interest and constantly changing practice and challenge such as the Native Plant Nursery project.

The INTP type fits well within the *ecological context* that Graeme is in - the preference to engage in activities both intrinsic and extrinsic that are consistent with his type preferences for stimulation. The selection of flexible, rural lifestyle with its opportunities for intense periods of solitary activity coupled with both intellectual (with other like people) and practical stimulation, to be financially independent and not have to work at a nine to five job every day but to be able to work whenever the urge takes him, (on his own endeavours rather than someone else's). The endeavours that Graeme engages in are primarily of a logical kind rather than an emotional kind. As the endeavour develops the emotive content develops. The immediate, the mundane and the ordinary are

taken care of by financial independence and the real work of stimulation, of connection and possibility are at the forefront of activity. The pace of activity is characterised by periods of intense activity followed by periods of recuperation and regaining of energy for the next activity. A need to be useful and do useful things in the larger picture of society is evident. INTP's very often feel a powerful need to be useful in a larger ecological sense and often ignore or put aside the details of daily living until the big picture is clear.

Graeme is an excellent example of a person constructing their own *ecological context* within which they have paramount control over the events which affect their lives and within which they can act out the preferences for specific kinds of activity that best fit their type. The *critical life path* repeatedly shows the preference for open ended activity, for activity which leads to the opportunity for intense focus, high levels of stimulation on task and a global outlook. The dislike of doing the same thing again and again - the mundane the ordinary, being able to put up with disruptive influences, looking for a useful purpose eg. taking the Biospectrum idea and developing it for use of others is an example of this characteristic.

The *critical life path* and intelligence

Graeme's bias is towards the Experiential subtheory of Sternberg's intelligence. The emphasis on insight, the manner in which he describes how he reacted to problem situations - working as engineer on the private yacht, the incident of navigating through the Straits of Gibraltar, the development of ideas relating to the extinction of the dinosaurs, the solution to his illness, are examples of 'selective encoding, selective combination and selective comparison'. (Sternberg and Davidson, 1986) Selective encoding seems to align closely with the Myers-Briggs Intuitive type preference. Selective combination seems to align closely with the Myers-Briggs Thinking type and selective comparison sits between the two with a constant to and fro interaction as the situation progresses and is more indicative of pure cognitive process.

Graeme's high level of Sternberg's 'tacit knowledge' leads into Sternberg's Contextual subtheory. It is noticeable that individuals who are very successful in their chosen field seem to fit more than one category yet while they were developing they may have been mainly operating in one modality. With the wide and multiple experiences of the world and the interaction with many types of people it is probable that a mature and motivated individual will learn ways of thinking and doing other than the preferential way. However when a problem presents itself or is found there is still the likelihood that the initial approach will be according to the developmental bias. In addition it is likely that an individual will grow up preferentially using one kind to deal with their world but as they get older they may learn other ways that fit some situations better.

Within the *critical life path* portrayed incidents of particular focus of intelligence become apparent. Graeme's preference for global strategy planning is confirmed by Sternberg (1985). Sternberg's appreciation of intelligence as being essentially and necessarily applicable to real world experiences, as characterised in the way it is applied to an individual's life within a specific culture, within the selection and shaping of personal environments, and the purposive nature of its application is very compatible with the direction and development of a *critical life path* - in this case Graeme's *critical life path*. It can be seen looking at the trajectory that the processes of application to, adaptation to, selection and modification of environments are all carried out by the participant and the options followed and outcomes eventuating faithfully reflect both the MBTI and Lawrence's preferential "Patterns of mental habits", and the preferred movement of an individual to the kinds of activity that give stimulation according to psychological type.

The *critical life path* and the *zone of competence*

The *critical life path* does not begin to show indications of the selected activity area - the *zone of competence* - until Graeme is well into adulthood. The seemingly false starts that are evident - the work with the Elna company, NZ

breweries, the farm job were more experimental and a time for testing skills and discarding activity foci which were not compatible with the preferred patterns of stimulus indicated by Type development and the development and application of intelligential preference. It was not until the Nursery project began, triggered by the frustration of not progressing within the job at NZ Breweries and the realisation that mundane farmwork was not for him that Graeme began to develop his own *zone of competence*. In his case the zone was a very idiosyncratic example of the wider field of his youthful *ecological context* and a culmination of extensive searching and testing experiences of his formative years. The wider field of Botany, his love of plants especially native fauna and the rural lifestyle of his youth provided the background for the development of a *zone of competence* in which he became the leading figure.

Graeme's selection of area of activity, the subsequent narrowing of focus to develop his own *zone of competence* is a natural and common occurrence. Musicians such as Eric Clapton, sculptors such as Henry Moore, architects such as Frank Lloyd Wright, scientists such as Lord Rutherford and countless others have defined within larger fields, specific areas of activity in which they were the masters.

The *critical life path* and the *accelerated learning process*

Within the *critical life path* evidence of the *accelerated learning process* is evident. The wide diversity of experience, the intensity of these experiences and their longitudinal effect are obvious. The regular shifting of focus until the Nursery project began were examples of the start of acceleration, however these were ultimately false or (perhaps a better term) complimentary starts, and it was not until full attention was enabled in the preferential activity area that the *accelerated learning process* came to fruition. During this time Graeme built a reputation second to none, developing his non-conformist patterns of mental and overt activity. He learned as much as possible by various means about his chosen subject - the process is an example of Simon's (1967) identification of

control of attention as being the most important function of motivation. Attention in these years was totally directed to the project - indeed it was a complete engaging lifestyle.

The *critical life path* and readiness

The readiness of Graeme to engage in the process is evident in his description of working at NZ Breweries, however the environmental opportunities were not synchronous, so a move was made and ultimately a return to the broad *ecological context* of his youth was made within which he was able to make his own area of competence. At this stage his readiness is apparent - aged 33, with many of the prerequisite conditions in place which if not absolutely essential were certainly complimentary to progress. Since moving on from this major project, new doors have opened as the opportunity for diversity is encountered and new capabilities are themselves ready for use. At this point Graeme has a broad range of readiness, a wide selection of contextual options and the opportunity to select activities which best fit his preferences for stimulation.

The *critical life path* and talent

What are the talents that the respondent has developed? They can only be defined in terms of the performance at various stages of the progression.

The initial starting point according to this ecological theory approach to talent development has to be the organic talents - the patterns of perception, cognition, decision and action that are intrinsic to the individual. The maturation of perceptual processes that link with the development of how intelligence is utilised, further linked with the mode of decision making and the ensuing action taken are specific to the *ecological context* that the respondent has successively constructed around himself. These are the underlying talents that have been developed. eg. a talent for seeing underlying and hidden meanings and patterns in nature, (Gardner's 8th intelligence/talent, in Shores, 1995; the

MBTI “N” type characteristic and Sternberg’s Experiential Intelligence) They have served the respondent extremely well, enabled him to achieve a relatively large proportion of control over circumstances and increasingly allowed him to benefit in preferential ways from his environment.

Specific classically termed talents lie in the developed performances. (eg. in plant husbandry) - having ‘green fingers’ is the phrase frequently used to describe good gardeners and the like; to be able to verbalise complex ideas and then ‘sell’ them are examples of inorganic talents (developed, learned) Graeme has a developed talent for pushing aside the rhetoric and smokescreens surrounding issues and of quickly seizing upon the essentials of an idea and then exploring it and taking firm action. This is a characteristic of the INTP type.

The *critical life path* and synchronicity

Instances of these in this *critical life path* are:-

The simultaneous rise of the Green Movement when the native plant nursery project was developing - this enabled the venture to succeed in a way that would not have been possible if this had not happened. The occurrence of the wet winter at a time when the pine bark project was developing - the lack of peat based potting mix enabled the sales to be made which eventually established the industry as legitimate and viable. Further is the occurrence of events such as the offer of a job on the private launch in Europe. All these and other types of unforeseen eventualities are common place in everyday life. However within this developmental path these events were critical to progress - without them the path may have been quite different or ended in a different place. The subject was ready to benefit from the synchronous occurrence

Summary

The analysis of the data is focused on general trends and patterns. Some specific instances are documented but the intention is not to deconstruct

the ecological whole into endless minute pieces but to show how elements relate to each other and serve to build a dynamic picture of a person proceeding along path of talent development within an increasingly personalised *ecological context*.

The data displayed must be interpreted in terms of the perceptions of the respondent and is seen to be his view of the events and processes at this time. The possibility of a myriad of influences that may have altered memories, past perceptions and decisions is not disputed. The record stands as it is at present.

The data display for Graeme shows a steeply rising trajectory with many positive elements that have initial critical effect and either - long term critical effect, significant effect or little subsequent effect. The negative elements are minor compared with the positive ones. The effects of early childhood experiences and the return to these influences is evident. (the current expression is 'getting back to my roots')

A number of conclusions can be drawn from this path -

- that aspects of positive early childhood experiences which are synchronous with type development have helped shape the eventuating developed *ecological context* of the respondent.
- that during the formative stages the respondent tried many activities which enabled preferred patterns of stimulation to be experienced but without the intensity, longevity and opportunity required for continuing engagement.
- that the present *ecological context* in its development and operation fits well with the respondents preference for both mental and active patterns of habits.
- that mastery over the environmental contingencies is at a high level at present and the subject is relatively more in control of the contingencies than they are of him because he has constructed the environment in which he lives and operates.
- that the trajectory is continuing - as one area of activity is mastered to the satisfaction of the subject, another is found or developed (a fairly typical problem finding attribute of talented individuals) The subjects preference for

beginning new projects, periods of intense stimulation and a constantly changing stimulus background are typical of the type.

- that the major talent development took place late in the developmental path, around mid life, not when the respondent was younger or a child.
- that the length of time in the *Zone Of Competence* is at least equal to and succeeds the decade of endeavour that is commonly accepted by experts in the field as being necessary for the development of high order talent
- that the *critical elements* are in the main of a high order score > 5 - they had critical effect, some of them long term, some shorter.
- that within the path there are instances of synchronicity - events which triggered development - eg. the establishment of the nursery and the rise of the green movement, the wettest winter and the pine bark project, getting the job on the boat in Europe. These events are influences from outside the *ecological context* and indicate the workings of what Jung alludes to as the a-causal connecting principle of synchronicity. However they are still within the predictable range of events and are perhaps not true or momentous examples of the more mystical synchronicity that Jung was alluding to.
- that the *critical life path* is in constant movement, there are few significant plateaux, that negative elements seem to be overcome despite the level of difficulty, that the subject is in a constant state of readiness for new challenges.

The *critical life path* portrayed is a progression towards a controlled and interactive environment in which the major uncontrolled contingencies are either minor ones of everyday living, or instances of a more resonant nature - chance transformed into opportunity.

Participant : Elwyn Richardson

Longitudinal effects of *critical elements*: Table 1

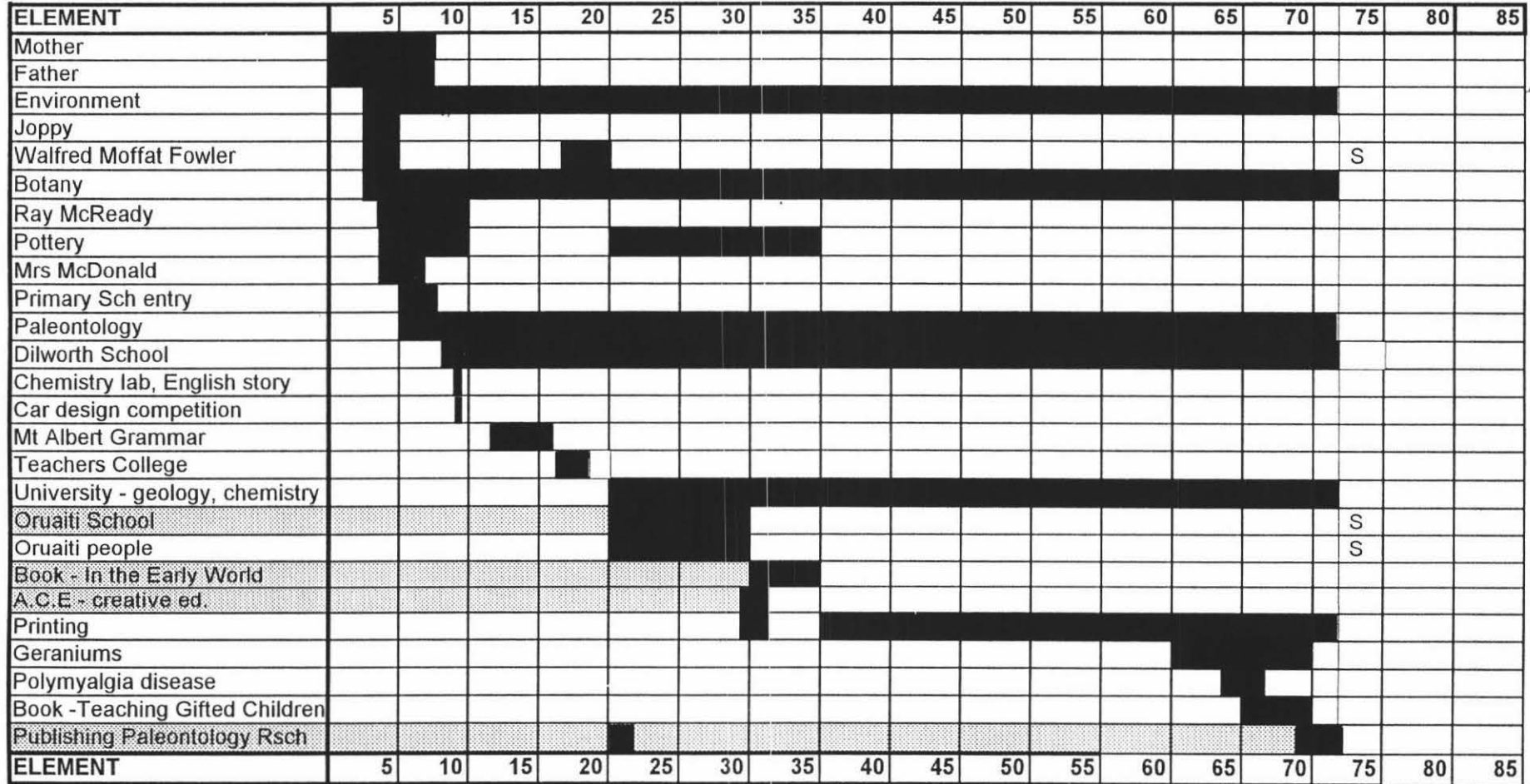
The longest lasting influences are seen by Elwyn to be the effect of his intense solitary involvement with his surroundings on the island he grew up on. The opportunity to wander in a Garden of Eden type of situation, without any

Table 1: Elwyn Richardson

CRITICAL LIFE EVENT CHART - Table 1

PARTICIPANT: Elwyn Richardson

Depicting the reported temporal influence of Critical Elements that significantly influenced the trajectory over 5yr spans



KEY Critical Element effect Present age 72
 Zone of Competence
 S Element indicating synchronicity

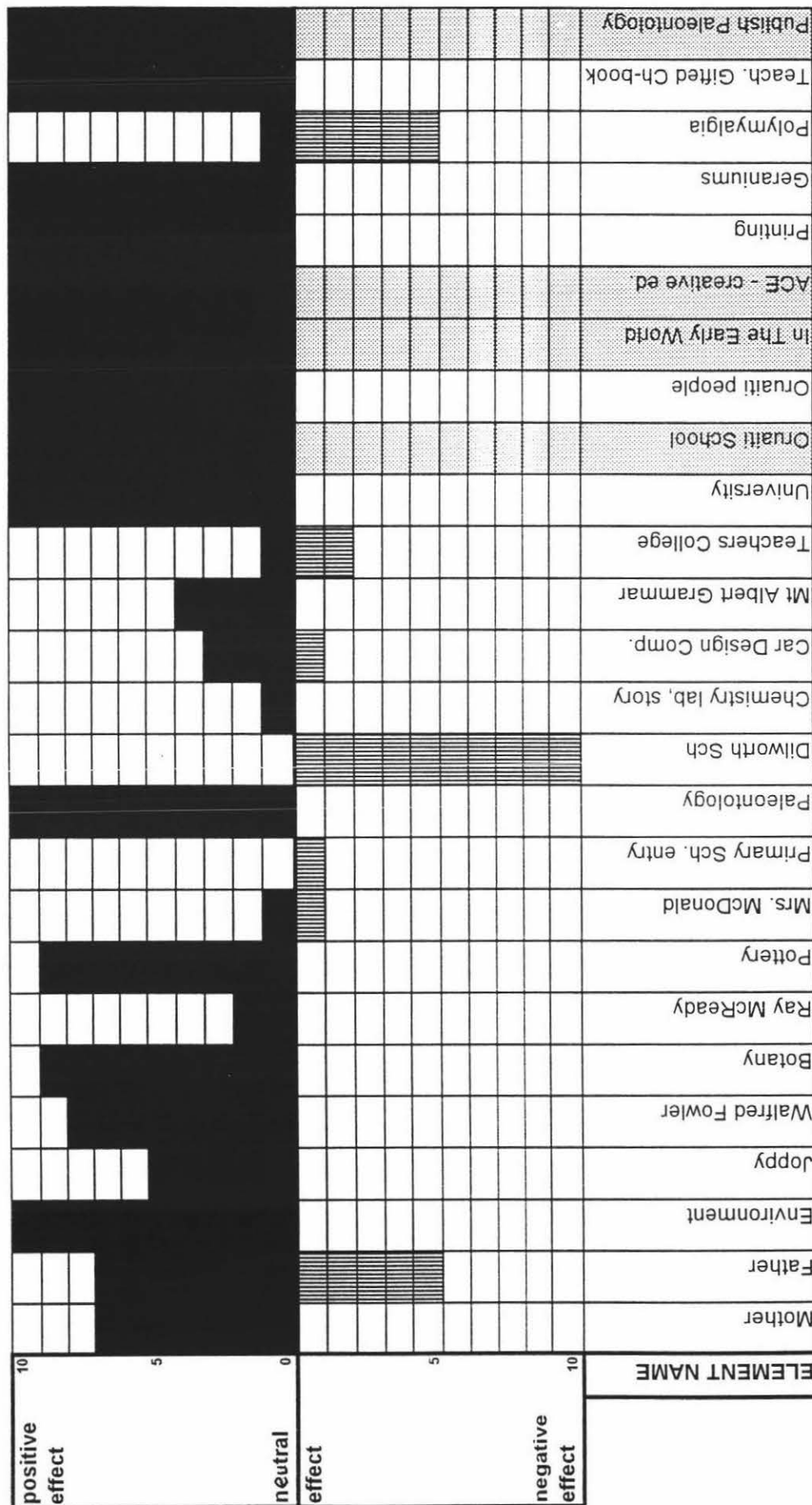
Table 2: Elwyn Richardson

CRITICAL LIFE PATH - Table 2

PARTICIPANT: Elwyn Richardson

Depicting the relative effect of critical elements on the developmental trajectory in temporal progression

The values and valencies of the critical elements are assigned by the respondent



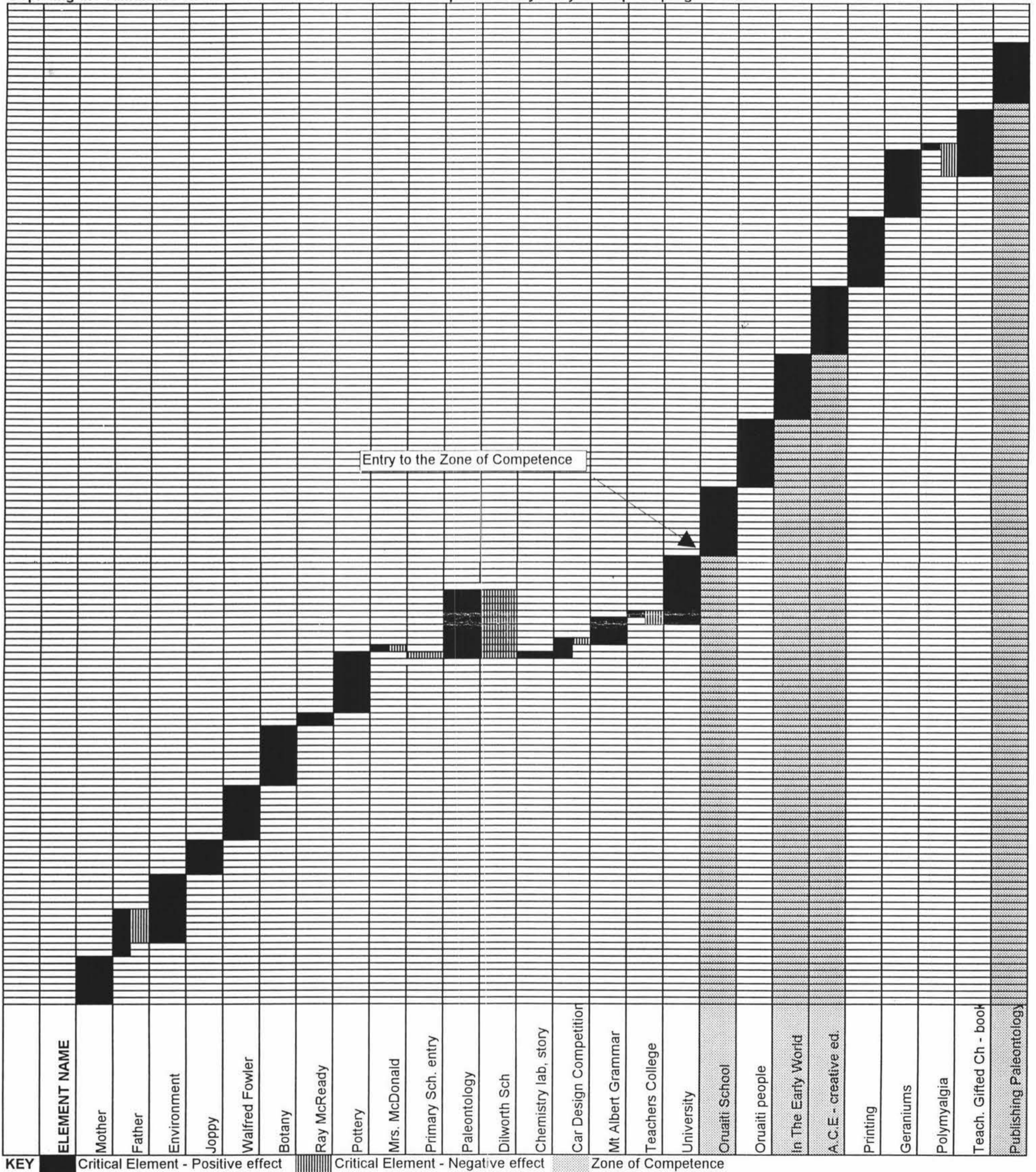
KEY
 Critical Element - positive effect
 Critical Element - negative effect
 Zone of Competence

Table 3: Elwyn Richardson

CRITICAL LIFE PATH - Table 3

PARTICIPANT: Elwyn Richardson

Depicting the cumulative effect of critical elements on the developmental trajectory in temporal progression



KEY ■ Critical Element - Positive effect ▤ Critical Element - Negative effect ▫ Zone of Competence

real danger to himself, to explore, to experiment, to play and to go from there to more mature understandings and manipulations of the environment, to discover and understand natural processes - 'air' - were intensely exciting events. When he began teaching he gave the children the opportunity to do exactly as he had done. "How do we provide those things for kids. I tried to duplicate them in a lot of ways" The long term influences of botany, palaeontology, study at Auckland University, all combined to drive the resultant path and add *critical elements* at different stages. Printing is also an engrossing aspect of his life - perhaps a compensation for his lack of intellectual writings - he has been told by many authorities that if he had kept good records and published his experiences and findings in an academic way he would have had a Ph.D. However his creative urges were more a more powerful preference for activity than the strictured process of academic writing. The major elements of environmental influences, his love of botany and palaeontology and the natural world, and the engrossing activity of printing are still ongoing critical influences. His activities involving pottery were intermittent but still a mixture of critical or significant depending on the activity being carried out at the time. The short term but critical influence of Fowler helped set the stage for future development and choice of activity area.

Lesser but significant longitudinal effects : The influence of his mother he sees as lasting until he cut his ties with home after Teachers College. His fathers influence was short lived - up to around 8 years old, and then a gap of a few years until it significantly influenced him again until he was around 50 years. This situation was an example of the construct of the approach/avoidance phenomena - the child reacted against the authoritarian interaction and removed himself or was removed from his fathers influence for a while and then a relatively influential relationship was reaffirmed.

His friend Ray McCready, the long term effect of being at Teachers College and being able to engage in teaching activity, are also significant influences that add to the developmental trajectory.

The very negative effect of his experiences at Dilworth School also have a continuing significant influence.

The relative effect of *critical elements*: Table 2

The most critical influences are shown as the environmental ones - the surroundings of his young life, the natural flora and fauna, the influence of Fowler and pottery.

His mother and father are seen as critical but have a lesser effect as perceived at present. His father is seen as both negative and positive - a fairly common occurrence particularly with young boys in our society. There is a noticeable absence of other powerful elements in the school years - an interesting feature considering that Elwyn became a teacher.

The most noticeable feature is the large number of extremely *critical elements* that influenced the trajectory as Elwyn began to create his own *ecological context*. With the beginning of Teachers College, University study, Oruaiti and the various activities that he engaged in and still is engaging in over a 50 year span show in intensity and divergence that few others could compare with. " I have wandered from one science to another" Each activity is an intense experience which became totally engrossing until the phase came to its natural end or a new more stimulating activity was begun.

The *critical life path* trajectory: Table 3

The early positive start is evident and this phase lasted until school entry. The realisation that school learning was not like natural play learning was to have a profound effect and it is evident looking at the trajectory that the love of learning in the natural context was not regained until he began university and teaching. The major plateau in the school years is very evident. During this period Elwyn managed to maintain his inner and essential core - the core that had been shaped by his early 'play' experiences. His trajectory is a trajectory of constant learning - stimulation from many directions, many projects and

activities of an intense nature. The influence of contextual learning processes is critical and it was only at university that the formal learning context became positive again and enabled a greater choice of preferred activities again.

The *critical life path* that Elwyn followed is typified by the intense and stimulating early focus and rapid development, followed by an almost stalled trajectory within which traumatic events took place. Once the *ecological context* changed and a locus of control was regained Elwyn then reconstructed his early environment in a most unique manner and engaged in this experience until prevailed upon to diversify in a series of different but related settings.

The *critical life path* and psychological type

MBTI Type: INFP

Lawrence (1993) identifies the characteristics of the INFP type as "Full of enthusiasms and loyalties, but seldom talk of these until they know you well. Care about learning ideas, language and independent projects of their own. Apt to be on yearbook staff perhaps as editor. Tend to undertake too much, then somehow get it done. Friendly but often too absorbed in what they are doing to be sociable or notice much. Live their outer life more with intuition, inner more with feeling." (PA-8). Elwyn's Psychological Type is evident in the selection of and development of activities and the construction of his *ecological context*.

The early development of ideas -air, clay - the experimentation with environmental materials, the effects of books, other peoples adventures, and the fascination with the complexity of the natural world are all typical examples of an individual who is prefers to focus on ideas and impressions - the 'I' type. The most illuminating feature of type and this *critical life path* is the strong influence of the Intuitive parameter - the 'N' type. Throughout the interview intuition is referred to frequently, and the patterns of natural forms, the preference for seeing the interconnectedness of aspects of the preferential environment and the possibilities are evident - the incident with the door latches in Spain and how he could see how they could be made, the beehive kilns,

giving up all forms of written planning at Oruaiti ""- diagrams which ran across sheets of paper with lots of question marks about possibilities." The intolerance of structures and rules, the desire to work autonomously and the valuing of individuality and growth indicate the preference of the type for keeping the options open and making decisions based on inner human values. The experiences at Dilworth probably made Elwyn very sensitive to the children that he taught and so he was able to develop that 'sort of something going on' between Elwyn and the kids - a timely maturational development of the 'NF' type. The *ecological context* that Elwyn developed at Oruaiti suited his preferences for activity well - the environment with its strong impressions, the solitary intense lifestyle revolving around a constant flow of ideas, the interaction with young developing minds and the subjective person centered values and open and flexible work/lifestyle.

The *critical life path* and intelligence

Applying Sternberg's approach to intelligence it can be seen that within the *ecological context* that Elwyn operated in at an early age that the development tended to an Experiential Intelligence. His creativity is readily evident, the constant reliance on insight - the selective encoding, selective combination and selective comparison of the theoretical approach are readily found in the interview - using clay, making marbles and then saying to himself that he could make figures, discovering 'air', the car project. The preferred perceptual processes of intuition - connectedness, relationships, patterning are part of the Contextual intelligence approach.

The *critical life path* and the *zone of competence*

At an early age Elwyn had an *ecological context* in which he blossomed, quickly learning the symbolic and practical concepts of the environmental features that interested him. His entry into the formal learning context was a significant shock - he learned that things weren't the same and that the

machinations of adults tended to change the outcomes in ways which were not always pleasant. It was not until he began teaching that he began to construct an area of competence that was a good match for his preferential exercise of personal style and intelligence.

The *critical life path* shows a significant plateau during the formal primary and into the secondary years and it is not until university that an *ecological context* was entered that suited Elwyn better. After university Elwyn had a short time where he was at a loose end and then came the Oruaiti experience. This *ecological context* was one in which Elwyn was able to construct a *zone of competence* in which he was the leading light and in which his opportunities for acting out his preferences (phenotype) were maximised. He immersed himself in ideas and their evolution. He experimented, tested and constructed a reality which was highly individualistic and he shared this with children - people who had the same childlike sense of wonder and excitement that he still had from his early days. This context was to last for 12 years until he moved back to Auckland and became involved in a related field at Auckland College of Education and from there into Auckland schools.

The *critical life path* and the *accelerated learning process*

The examples that stand out in this area are readily apparent - the ecological environment of his early childhood, the university years and the Oruaiti experience. In the first case - in the "Early World" (to borrow the title of his book) he was the learner, acquiring knowledge and experimenting with the world around him. In the second case he was also involved in this but in a sense of achieving something tangible (knowledge, qualification) that would enable him to do the things he wanted to. In the third case all this was being put to good use but again with a significant proportion of the early approach - it is still evident that even as an adult teaching at the school he was still very much in the 'learning for the sake of learning' mode without regard for adult usefulness that is a characteristic of children's learning, no doubt one of the

reasons he was so very successful. This characteristic is still very much in evidence in his conduct in the world today but the process now is much more selective. The focus - daydreaming and planning inside his head while driving the bus and not being able to recall anything about the journey are examples of the motivational intensities that so many experts in the field find in the habits of talented people.

The *critical life path* and readiness

Readiness to learn in an indiscriminating way is a feature of his very early experiences but evidence of the selection of activities shows up in the involvement with clay and natural phenomena - air, water, the intricate botanical features of animals and plants in his environment.

This readiness to learn was not successfully transferred to the formal learning situation and again the *critical life path* was almost stalled until the critical element that altered the trajectory - university study, provided impetus again to the trajectory. By the time Elwyn went to Oruaiti he was once again 'ready' and the resultant path from this point on with minor glitches shows a steep and consistent rise which continues today. In all of these activities a 'readiness' to take the selected circumstance and learn quickly and efficiently by intuitive means and practical experiment is evident . eg. the breeding of Geraniums - using preferred contexts and natural forms, testing and trying ideas and achieving the results.

The *critical life path* and talent

What talents does Elwyn have? A talent for learning in the area of preference is certainly obvious. The preference for ideas and impressions and the ability to perceive connections and patterns especially in the area of early focus shaped his intelligence and enabled him to construct around himself an *ecological context* at Oruaiti that matched his preferences almost perfectly. His talents lie in his performance - in the school at Oruaiti - his ability to inspire the

children to do things and learn in ways that are still dreamed about in modern education; in taking natural forms and experimenting with ideas, investigating how things work, putting interesting experiences down on paper so that others may benefit - these are some of the talents that Elwyn has. Again as it is with the other participants in this study the talent is the performance - it is the doing that counts, not the having.

The *critical life path* and synchronicity

The examples of synchronicity in Elwyn's trajectory begin with the appearance in his life of Fowler. How likely is it that an Oxford graduate with an MA degree in Zoology would appear and live within Elwyn's *ecological context* at a critical formative learning stage of his life, at a time when a solitary child with a fascination for the impressions and patterns of natural forms and processes was entering the larger world. An example of resonance in this period was Elwyn's discovery of clay - it was likely that he would discover clay - he was in tune with his environment and it was there waiting to be discovered - it was part of his *ecological context* and within the event horizon.

Later examples of synchronicity that had critical effect are the meeting up with McLure who happened to be the chief chemist at Amalgamated Brick and Pipe, and who happened to have a brother who happened to be an art adviser at the Education Department in Newmarket. It is possible that Elwyn may have met this person at some stage but Oruaiti was very small and remote and it is unlikely that the school would have come to the art advisers notice.

Examples of resonance bordering on synchronicity are also in evidence. The story is told by Elwyn of taking a holiday in the Far North a few years ago. At the top of a hill he came to a stop at a closed and wired up farm gate. Hanging on the gate was a sign which said in effect - Keep out and don't come back. Coming up the track was an old Landrover. Elwyn opened the gate for the driver and then closed it after him and prepared to turn his vehicle around and leave. He was stopped from leaving by the man who alighted from the

Landrover who approached him and said "Kia ora , Mahita - you're Richie." Greetings were exchanged and it turned out that the man was one of Elwyn's students 40 years ago "What you did in Oruaiti changed my life - you opened my eyes. My life has never been the same since." he said, and he went on to tell Elwyn of the ways in which he saw the world had changed dramatically for him since that time. This instance is not so much an example perhaps of synchronicity as of a resonant process - the statistical probability, greater than chance, of an event of this nature taking place, the activity and presence of one person of significance in a past *ecological context* crossing paths with another person of significance in the same *ecological context*. Quantum notions would indicate that the distribution of these kinds of events could be statistically calculated. The significant feature in this incident is not that it happened - it is the connection that is important and gives reality to the situation.

Summary

Elwyn's path is an example of the importance of early experiences in developing the phenotype. The *critical elements* that shaped the preferences for activity, for an *ecological context* that was reconstructed later in life, and the development of a contextual intelligence are to be found in the 'Early World'.

His preferences for ideas and impressions, for using the intuitive process, for using an intelligence developed contextually within a specific ecological environment - 'contextual' intelligence, for basing his decisions affecting his *critical life path* on human values and feeling and being useful - in teaching, combined with his preference to keep his lifestyle spontaneous culminated in the construction of an *ecological context* that mimicked his early world and from which he matured and developed as though going through his childhood again - growing up in a way that he had perhaps missed out on or enjoyed so much he had to repeat it as a mature adult.

The reconstruction of an *ecological context* that has significant elements of an early stimulating and rewarding environment could be a typical attribute of

the talented - after all they are exceptional and perhaps more aware, more able to express themselves and more in control than the average.

Participant: Marilyn Waring

Longitudinal effects of *critical elements*: Table 1

The *critical elements* that are most evident over time are the childhood ones. There are a large number of early familial influences that are very strong and set the platform for Marilyn's subsequent development. The strong support of mother and father and the rural upbringing set in place a secure and supportive environment in which her intellect developed and life experiences were in synchronicity with her path. The attention of the grandparents and the way in which they contributed to Marilyn's reading development, the radio and the influences of books and libraries enabled her to learn well the intricacies of language and literature and this characteristic is very evident in the way in which she has produced the ground-breaking work for which she is now well known.

The early contact with Maori people and culture also is evident today in the orientation to this work and her appreciation of this culture can be said to have had an influence on how "Counting for Nothing" evolved to be a major influence and subject of debate in the fields of social policy and economics throughout the world. Sport and Primary school were allied long term critical influences but they play little direct part in what she does now.

One of the number of shorter term but significant influences which contributed to her development was singing which she describes as the best thing she ever did. However this line of endeavour was not to be pursued for long as other events became major influences in her developmental path later on.

The next major cluster of critical influences were the ones that took place around her university years. University itself may have been a shorter element as far as the time spent there went but the experiences that evolved from this

Table 1: Marilyn Waring

CRITICAL LIFE PATH EVENT CHART - Table 1

PARTICIPANT: Marilyn Waring

Depicting the reported temporal influence of Critical Elements that influenced the trajectory over 5yr spans

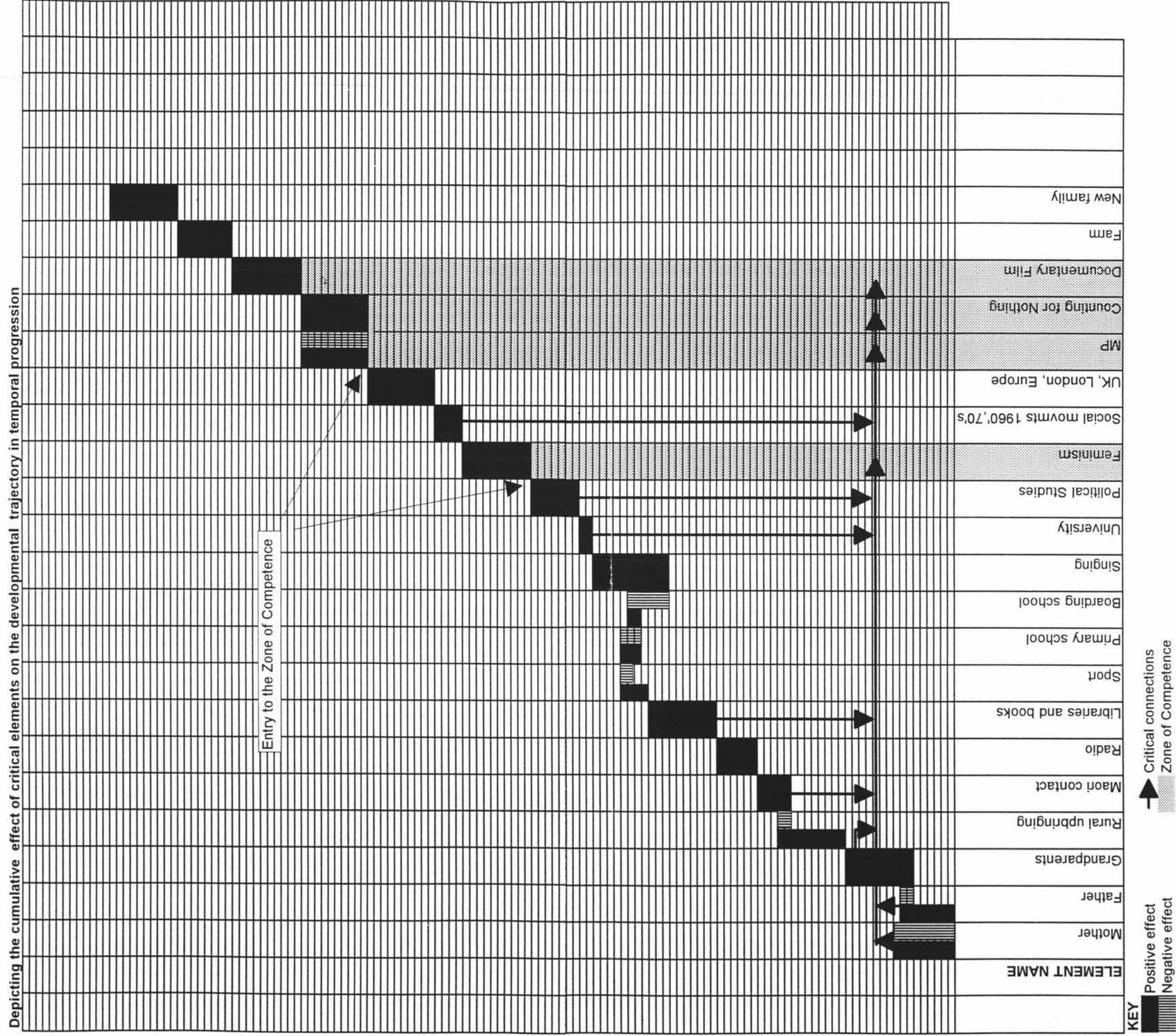
ELEMENT	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	Notes
Mother	■	■	■	■	■	■	■	■	■								
Father	■	■	■	■	■	■	■	■	■								
Grandparents	■	■	■	■	■	■	■	■	■								
Rural upbringing	■	■	■	■	■	■	■	■	■								
Maori contact	■	■	■	■	■	■	■	■	■								
Radio	■	■	■	■	■	■	■	■	■								
Libraries and books	■	■	■	■	■	■	■	■	■								
Sport	■	■	■	■	■	■	■	■	■								
Primary school	■	■	■	■	■	■	■	■	■								
Boarding school	■	■	■	■	■	■	■	■	■								
Singing	■	■	■	■	■	■	■	■	■								
University	■	■	■	■	■	■	■	■	■								
Political Studies	■	■	■	■	■	■	■	■	■								
Feminism	■	■	■	■	■	■	■	■	■								
Social movements 1960's, 70's	■	■	■	■	■	■	■	■	■								
UK, London, Europe	■	■	■	■	■	■	■	■	■								
MP	■	■	■	■	■	■	■	■	■	S							
Counting for Nothing	■	■	■	■	■	■	■	■	■								
Documentary film	■	■	■	■	■	■	■	■	■								
Farm	■	■	■	■	■	■	■	■	■								
New family	■	■	■	■	■	■	■	■	■								

KEY

- Critical Element effect
- ▨ Zone of Competence
- S Element indicating synchronicity

CRITICAL LIFE PATH - Table 3
 PARTICIPANT: Marilyn Waring

Table 3: Marilyn Waring



aspect of her life were to shape the outcomes for which she is well known today. Political Studies undertaken at University, the consequent growing awareness of politics, feminism, social issues that had begun in the 1960's and carried through the 1970's and the big overseas adventure to London, the UK and Europe all helped incubate and formulate what happened consequently.

The next critical influence was the unexpected nomination and acceptance as a candidate for election to Parliament and the intense and life changing experience that followed resulted in her withdrawal from parliamentary life and the period of life in which she entered the academic field and produced amongst other things the *Counting For Nothing* book and the subsequent documentary film.

The critical influences in Marilyn's life at present are her new family, her farm and her continuing interest in new research and projects promoting and developing the field of social policy, equity and the place of people on the planet.

Looking at the longitudinal effects of *critical elements* in Marilyn's life it is evident that there are three periods of criticality - the first being her early background. The second is the period when she stepped out into the world which took place around her late teens and early 20's. Following this is a period which although significant as a sub-cluster follows on from the University /travel/Parliamentary period in which she produced the significant book and film and this period is typically one in which she looked outward and became heavily involved in the lives and welfare of other people. The third period is the present situation of new family and farm and it is this period that is typified by a more reflective and personal journey and a pursuit of her own world - she is at an earlier age than most perhaps in recreating in part her "Early World." (Richardson, 1964) However the powerful influence of her independent, rebellious and controversial years is still there in her continued involvement in matters of what she considers to be of prime importance - matters of social conscience.

The relative effect of *critical elements* : Table 2

The early cluster of *critical elements* reveal a high positive value familial influence in the home and in the setting. The positive and negative influence of her mother is perhaps a fairly typical phenomena in growing up and in the case of boys it seems to generally be the other way around. To a lesser extent a slightly negative view of the rural setting may be seen to be the outcome of the present ability to reflect on the past. The radio, contact with Maori, sport and primary school all added to the mix and are relatively positive. The influence of books and libraries shows a powerful and positive affect. The last of the early cluster of influences, boarding school, shows a small positive and a much larger negative effect and it is evident that by this stage the young Marilyn had begun to form strong views about her world and was prepared to express these in a forthright manner.

The lone positive influence of singing, a very personal thing, is evident and is perhaps indicative of what happens when talented people have to make, or in this case are driven by circumstances, to choose paths which are not initially at least an outward expression of what they really would like to do at that stage of life. Following this, University shows a low positive influence but the elements that spring from this - political studies and feminism show larger positive effect and the social movements of the times adds to this cluster of related influences.

The positive influence of overseas travel is in the period that builds on independence and the important *critical element* of Parliamentary catapults Marilyn into what was to be a powerful positive and negative experience which resulted in her taking off on the next phase of her developmental path.

'Counting for Nothing' and the subsequent documentary film were important positive influences and are still instrumental in shaping her present path. However these influences seem to have created a watershed and Marilyn has now added to her life in a personal way by becoming involved in two very

positive and ongoing experiences - her new family and her farm, the essential elements of which can be readily found in her "Early World." (Richardson, 1964)

It is noticeable that there are many high value positive *critical elements* in her life and a number of lower value but useful influences which have contributed to development..

The *critical life path* trajectory: Table 3

The *critical life path* Trajectory shows an initial set of conflicting influences that rapidly turn into a steep rise that continues to the school years when sport, Primary and Boarding schools had a mixed influence on the developmental path. The singular and positive influence of singing was followed by another period of complimentary influences until the element of parliamentary endeavour which was both a powerful positive and a powerful negative influence. Following this the influences were all positive and represent a period of accelerated learning in which there seems to be little influence that stalled or regressed the path. Marilyn's path is typified by an early developmental period of mainly positive influences followed by a middle period of establishing independence and experiencing the world. Then the almost coincidental and fortuitous series events of being nominated then elected for parliament and suddenly a quantum change in the life path appears. It is evident that Marilyn's path could easily have been different, she may have become fully engaged in singing and related stage and theatre life. However this quantum change in direction was to precipitate a series of positive developments which are still in evidence and can be seen in the last part of the path.

The *critical life path* and psychological type

MBTI type: INTJ

The INTJ type is typified by a focus on ideas (I) rather than things or people; the preference in situations for using intuition (N) to perceive the world, making connections and looking at possibilities in and between parts of the

world rather than concentrating on facts and information; using logic and objective analysis of cause and effect (T) rather than feeling when deciding how to act; and planning and organising an approach to life and a preference to have things settled (J).

In Marilyn's case the preferences for activity area and type are clearly shown on the *critical life path*. Examples are;- the rapidly developing global view that is evident for example in her early reading; the selection of political studies and social issues as a vehicle of expression and the resultant involvement in the political arena precipitated by the unexpected nomination and election to Parliament. Her involvement in farming enables her to express herself in a familiar rural environment in a way which allows self expression of type - the opportunity to make logical decisions, develop ideas, husband her livestock by using her intuition, and impose a settled order on the process all the time in a situation that is reminiscent of the rural background that she came from. Further evidence is found in her reflections upon school and then her involvement in larger political and social issues; her insight and creative synthesis of ideas that evolved into "Counting for Nothing"; her rise to leadership in her field; her toughness and decisiveness in the face of adversity and the abhorrence of incompetency, confusion and inefficiency.

Lawrence (1993) identifies the characteristics of an INTJ type as "have original minds and great drive which they use only for their own purposes. In fields that appeal to them they have a fine power to organise a job and carry it through with or without help. Sceptical, critical, independent, determined often stubborn. Must learn to yield less important points in order to win the most important. Live their outer lives more with thinking, inner more with intuition." (pA-8)

The *critical life path* and intelligence

Marilyn's application of intelligence can be viewed as an example of Sternberg's Componential sub-theory. The focus on analytical thinking,

achieving high test scores and the use of Sternberg's meta-components - planning, monitoring, evaluating and knowing when to adjust the activity to suit the task. These mental processes are related in the Componential sub-theory to two others - performance components and knowledge-acquisition components. Within Marilyn's path certain aspects of this approach can be readily found - recognising a problem, the plight of women in third world countries; deciding upon the nature of the problem - where it fits into the scheme of things; selecting strategies that will help solve or illuminate it - one of these is the seizing of the moment of being elected to Parliament and utilising it to help solve perceived problems in the world. Another is Marilyn's use of linguistic strategies to move through the complexities of a problem; allocating mental resources - Marilyn's emphasis on global strategy planning is a characteristic of better problem solvers and part of the Componential sub-theory. Marilyn also shows later on in her path strong indications of Sternberg's Contextual intelligence, with a developing ability to play the game well and to manipulate certain selected circumstances in order to make the best approach to solving the problems, a major one of which was to publicise the circumstances of women in different societies around the world.

The *critical life path* and the zone of competence

In Marilyn's early years she quickly developed competency in her academic pursuits and in sport. As she matured and other opportunities developed she ventured into music which although an extremely personally rewarding area of activity was soon replaced by politics. This area of activity can be said to be her primary *zone of competence* in terms of the *critical life path*. However Marilyn has evolved this zone further and she has established herself in a unique area of contribution to a wide field of endeavour that encompasses a number of worlds - those of political, economic and social endeavour. It is in this zone that Marilyn has made contributions and expressed herself in a unique and idiosyncratic way and can be said to be amongst the

most eminent practitioners engaged in the field. The *critical life path* shows entry to this zone at the time of election as a Member of Parliament. Further delineation of the zone and the establishment of a specific area of competency can be said to have begun when she published the book that brought her international recognition and evolved a whole new way of looking at the world - a new world view.

The *critical life path* and the accelerated learning process

In the *critical life path* it is evident that the learning process is accelerated from an early age. Reading, books, academic endeavour at school, sports are all areas in which Marilyn can be said to have learned better and faster than her peers. Singing can perhaps be included here although it was not to be a long lasting accelerated learning curve. At university the engagement in Political Studies and social issues of the day also was the beginning of an accelerated process of learning about that particular area of human endeavour. However the most notable evidence of an accelerated process of learning is when Marilyn began to define and develop her particular area of research and endeavour which culminated in the publication of her book. This process is still continuing with the publication of further work and the engagement in further projects in her field.

The *critical life path* and readiness

The notion of readiness in the *critical life path* is best illustrated by the period of time in which Marilyn was nominated, then unexpectedly elected to Parliament. She was able to take these events and deal with them in a manner which shows that she was ready for the challenge and able to make the best of them in the manner of her style and approach to the world. Her recounting of her experiences with her constituents is indicative of a person who was able to take on board many diverse and often disturbing experiences and do something useful and positive to benefit people. Again her global view in the manner of her

type was able to be developed to an enormous extent as the consequences of what she heard and did went far beyond what is average or the norm - she has been able to spread her views across the world and make a difference in the lives of many others.

The *critical life path* and talent

The question of what are Marilyn's talents in relation to the *critical life path* can be considered as her well developed maturation of type and the evolution of effective strategies to express these in a global sense. The expression of genotypic potential via phenotype is in her case a highly effective and evolved one as she is able to express her individual characteristics via a wide range of endeavours each of which builds a picture of a mature individuated type - her expression of self via politics, academic and political involvement. Her expression of self via her new family, and her expression of self via her animals and farming. Specifically her ability to search out, analyse and evolve structures and strategies to achieve her goals, to make use of logic and analysis, to cut through the smokescreens and the rubbish and get to the essence of a situation can be considered to be her greatest talents. Alongside that goes her ability to deliver this to people in a persuasive form that disregards popular opinions and authority that is seen as wanting or erroneous.

The *critical life path* and synchronicity

In this *critical life path* there are few examples of synchronicity at least of the kind that changes a life path. However there is one situation which borders upon this and that is the events surrounding her nomination as a candidate for election. This situation was initially unexpected as the narrative shows. What precipitated this event was her working for her old professor part-time at Parliament. When he was asked for potential candidates he nominated Marilyn. Her name was then put forward for candidacy which eventually resulted in her being elected. It is only conjecture as to the timing of these events but it is

certainly a case of being in the right place at the right time. The notion of synchronicity is that there is a principle underlying these events and that is a barely perceived connection between person and event. The connection in this case is to do with the possibility of a range of situations happening. In Marilyn's case being nominated was one of these, given that candidates were being looked for at the time - the right time, she had suitable qualifications and style - the right person, she was working there - the right place and she was ready and able to express herself in the role expected. It seems as though synchronicity in this instance is not the mythical "chance, coincidence or luck" but a combination of qualities of possession and action that precipitate a (fortuitous) event that results in a quantum change in the life path of the individual.

Summary

Marilyn's *critical life path* is an example of a fulfilled expression of self, combining personal and idiosyncratic characteristics with the contexts in which she first of all found herself, then selected, then constructed into a world which contained many of the features of her early life and her developing world view. This evolved world in which she now lives has many contexts each of which is well ordered yet still has the essential elements of challenge and diversity that she needs for self expression. Her *critical life path* is evolutionary and it appears as though she will continue to evolve new ways of stimulating and expressing herself even though some may not necessarily have a global effect, they may be more local and personal such as her new family.

The *critical life path* diagram

On Table 3 for this participant an interpretation has been depicted that shows causal connections of *critical elements* to the *zones of competence*. This has only been done for this participant and is a trial by the researcher to attempt to show a further development of the *critical life path*. The connections are shown by arrows from prior *critical elements* that are considered by the researcher to have direct connection to subsequent areas of expert activity. It

should be noted that this is the researcher's interpretation without reference to the participant and in a further study this procedure could be carried out in consultation with the participant. The intention is to begin linking the precursor elements into a pattern that contributes directly to the area of expertise, the zone or zones in which the individual is preferentially involved and in which they have developed their talents to the point of eminence.

CHAPTER 6

DISCUSSION AND CONCLUSIONS

In this discussion implications of the *critical life path* approach will be presented. Some related aspects that are seen as important will be discussed and the discussion may involve some debatable points. The *critical life path* methodology as it has evolved here is by no means complete and there are many issues that could be explored. In an attempt to build a sound theoretical base for this approach, to develop a model and methodology that may be made reliable and valid is not possible in one study especially a very preliminary one such as this.

The primary question asked in this study, how do adults develop talents, is described by the *critical life path* and the description in this context is derived from the linking of critical developmental elements in the individual's history to evolving areas of preferential activity. The description is a molar, quantum one, at a fairly global level that has a real application to people's everyday lives and their histories. The *critical life path* approach is an attempt to show that it is the unique pattern of interaction of the individual and the environment over extended periods of time that is the important feature of talent development. This multi-faceted approach is in contrast to the kinds of views often promoted in public that talented (and very often successful) people become talented (and

very often successful) because of any one thing. The popular press in particular are given to identifying, sometimes at all costs, a single factor which caused or enabled a process to take place. The most frequently heard one and one which is popularised in motivational type seminars and courses, particularly in business is concerned with a persons wanting something enough to get to the point at which they are recognised as being successful. The irony is that very few, if any of the people under scrutiny are likely to say they succeeded for any other reason than doing it themselves. By focusing on this singularity, too many of the essential elements of the developmental process are ignored. In scrutinising the *critical life path* display for the participants in this study it is evident that a unique pattern of contribution backgrounds each individuals path to the point of optimal talent development. By focusing on any one part of the picture, the unique pattern of mastery in a life path is ignored. The pattern of development involves elements that develop into a system that has unique emergent properties. No one piece is sufficient to reach this level of development. It may also be proposed that without any one of the critical elements this level of development would never have occurred.

This approach is in contrast to the way in which gifted and talented development is often approached currently in education - that giftedness/talent is a quality of the individual evidenced by the precocious exhibition of specific competencies relatively independent of circumstances. The *critical life path* approach emphasises the essential linking of special contexts with efficacious patterns of flexible habits which form the basis of talent progression and performance. These habits of thinking and doing are based on inherited preferences and are so well learned and practised and so able to be adapted to suit new areas of stimulation and endeavour that the individual can master all the imperatives and challenges of their context and in doing so is able to push back the boundaries of their field of endeavour. In doing this they make unique and durable contributions to the field of endeavour and in a larger sense to the society they live in.

Implicit in the theoretical approach in this study is the notion of the drive by the genes to fulfil genotype by the process of interaction with environment. In the case of the talented what they are considered as developing to the highest possible level is the idiosyncratic expression of their true self, a matured phenotype that is in optimal synchronisation with a unique context which they have had a large part in constructing. Along the way the individuals encounter influences which have a critical effect on this evolution. Because of the synchronising of their idiosyncratic patterns of habits and the patterns of environmental influence they learn at a much faster rate and in a more efficient way than others do, in that context, and so they can influence the environmental contingencies to a greater extent than others can. The critical influences they encounter serve to accelerate their learning so that they rapidly master the imperatives of the environment and benefit to a greater extent than others. The whole process is viewed as an integration of the internal and external worlds via the mediation of experience. (Sternberg and Frensch, 1987)

In the succeeding discussion much of the argument has no reference available in Social Science literature. The *critical life path* methodology has never been used before to this author's knowledge and much of the discussion centres around notions which are not the usual issues discussed in research investigations in the Social Sciences.

Patterns of development

The data has a mathematical regularity to it in its presentation, and in its diagrammatic form it is readily evident that there are patterns that have developed within the life paths of the participants. However the intention is not to reduce the process to a system of mathematical formulae but to indicate that there is purpose, pattern and some regularity to the way in which developmental paths evolve and aspects of these are common between individuals and contexts.

The patterns have some commonalities:-

- The valency of the *critical elements* is predominantly positive.

- The relative effect of the positive *critical elements* indicated by the assigned scores is predominantly towards the upper end of the scale from 1-10
- There are a large number of high score *critical elements* in each of the life paths.
- The negatively valenced *critical elements* are of a generally low relative effect and are often paired with or part of positively valenced elements. This means that despite the setback of negative *critical elements* the nett effect is progression.
- There are a few *critical elements* in each path that are seen to have critical long term effect and these elements tend to be in clusters. These clusters tend to be in stages of maturational development.
- The *critical life paths* show steep rises in general and the plateaux are often followed by a series of high score elements and a return to the steep trajectory.
- The reconstruction later in life, of an early *ecological context* that approximates or incorporates *critical elements* of this early context becomes evident in the path as experience and mastery proceeds. This phenomena seems to reflect the importance in the developmental path of the influences of the individual's "Early World" (Richardson, 1963)
- Some of the *critical elements* are short lived but have the effect of enabling a significant change in context or relationship to take place. This change of context allows the individual to either have a greater range of activities to select from or allows them to refocus attention on preferential areas.

The important features that can be gained by looking at the overall picture of the five participants are these:

1. That talent development takes place in many spheres of world activity.
2. Talent can be developed at any age, in any context and by any person within the limits of an individual's potential capabilities. However these potentials may be extended, enhanced and developed by deliberate practice

and exposure even if remote. In addition technologies that fit contextual requirements can extend the efficacy of baseline characteristics. The talent development process, as opposed to the 'gift possessed' paradigm is available to anyone regardless of age or any other characteristic.

3. To develop talent an individual needs to learn how to select, adapt or construct a special context within which they may express the proposed preferences of their genotype. These contexts enable maturational development of phenotype. Within these preferential *ecological contexts* there will be aspects that are compatible with the preferential patterns of activity. As mastery proceeds and the locus of control shifts from the context to the individual, the *ecological context* begins to become a reflection of the individual's ideas about how the world should be for them and they become more aware and highly skilled. The almost statutory time frame for development of this context and locus of control seems to be around the 10 year mark. (Note below - the exceptions/entry level to the *zone of competence*). As the *ecological context* expands the individual developing talent continually selects, adapts and constructs new paths within the existing context and ultimately creates a new differentiated context within which they may be the current expert.

4. The *critical life path* analysis shows a strong element of mastery in the life path progression - to construct environments in which the locus of control incrementally begins to swing from context to person, and in addition, from others within the context to singular expert or eminent person or group within the context. In the case of the individual who has developed talents to a level of effectiveness that puts them at the forefront of a *zone of competence*, the locus of control has moved towards them, the quantum probabilities of connections and patterns of events that tend to mastery have increased in favour of the well developed talent.

The *critical life path* analysis and the resultant data display shows that there may be consistent patterns within and across life paths of individuals that may enable the process of talent development to take place at an accelerated

rate and in a highly efficacious manner. The patterns are formed over extended periods of time by the interaction of personal characteristics, and *critical elements* that interact with the life path progression. The *critical elements* are essential to progress and may be either causal - instances of event, person or process that have apparent connection with the individual's life; or a-causal - instances of event, person or process that have seemingly a random, coincidental or chance connection with an individual's life.

The developing individual progresses along a path in which many high value, positive *critical elements* cumulatively act to accelerate the rate at which the individual gains increasing influence over the environmental contingencies. The individual rapidly learns the most appropriate *patterns of habits* that free them from the need to continually master the mundane and imperative requirements of the environment. This enables them to focus on new challenges, to seek out new stimulus and in doing so to increasingly create a specialised context in which they have greater relative control and greater ability to express themselves in an idiosyncratic manner. This tendency towards certain kinds of activities is consistent with Lawrence's (1993) patterns of mental habits illuminated by the MBTI learning styles instrument. They also appear to have well developed patterns of active habits as proposed by the author, that free them from the menial the mundane and the ordinary. They also appear to be in the "active" stage of Scarr and McCartney's (1983) Genotype--> Environment Effects Theory.

In a *critical life path* approach it is evident that the construct of talent has assumed a different flavour. It is no longer seen from this perspective that an individual is talented at a singular kind of thing such as tennis, scientific research, making money or writing stories, but rather that their talent lies in optimising the match between their own inherited and learned characteristics with the opportunities available in whatever field of activity they become involved with in the world. As such this process involves a person knowing very much what their own characteristics are and then being able to select , adapt

and create a context within which maximal expression may take place. This knowing may not necessarily be a totally upfront, conscious kind of knowing, it may often be much more implicit. How they might “know” their own characteristics could be in two preferential ways:- the first is by perceiving the world in terms of their preferences, then, secondly by selecting patterns of activity that reflect these preferences, so that maximal stimulation, in the manner of preference, takes place. At this point it becomes evident that therein lies the linkage between the “I really wanted to do this” and the level at which they succeed at, but it is in terms of perception and decision which optimises preferential patterns of stimulation.

The *critical life path*

Within any *critical life path* there are elements - events and processes which initiate or aid a change in momentum or direction. These are the *critical elements*. Against the background of a standard societal or culturally based paradigm any change in a *critical life path* can be identified. For example in New Zealand society it is standard practice for children to attend school and achieve formal learning outcomes. In times before universal education was instituted, any individual who could gain an education in a formal way could be said to have been influenced by a *critical element* which altered their trajectory. The *critical element* in this case is the molar element of education which would separate one individual or group from another and enable an *accelerated learning process* to take place. Against a background of universal education a change in trajectory in any *critical life path* is less noticeable so a closer look has to be taken at other factors.

Taking the formal educative process as the area in question, now that universal education is the norm, what are the *critical elements* that may trigger a significant outcome? The obvious ones are factors within the context of universal education - teachers, subjects, home resource, motivating factors, opportunity and so on. However it is not the event, such as teacher meeting

pupil, that is important, it is the patterns of connections that takes place in this context that defines and describes the real meaning and gives impetus to the *critical life path*. A simple example is the teacher who makes a motivational connection with a student and initiates or enables a change in the characteristics of that student's *critical life path*. The student may begin a journey which has extremely beneficial outcomes and results in them doing something that becomes a lifetime source of satisfaction and endeavour. An example is the influence of Fowler on the young Elwyn Richardson. It was not the appearance of Fowler that triggered a change in the *critical life path*, it was the pattern of relationship and connections that were subsequently formed that had critical influence.

The *critical life paths* depict the instances of what the respondents perceive as critical influences on their lives - foreground effects. There is however as discussed above, the need to take into account the background against which the individuals are moving and the array of influences that may not be personally significant but which are significant in a wider sense and these are influences that change the trajectory of larger clusters of humans within a or any society. These include factors such as universal education, the development of the middle class, equity, social mobility, differential resourcing, technological development and many others. It may be that many of these background influences are significant for talent development along a *critical life path*, but in the context of the world in which these people live they are not identified as critical. It is evident that the data with which the *critical life path* is constructed is very much dependant upon the view of the world which the individuals hold at the time of enquiry. This does not make it any less valid but it does illustrate that individuals operate in terms of how they perceive the world and reflect upon it.

The *critical elements*

Primary questions that have to be asked in any societal context, be it education, business, the arts whatever, are based around what are the *critical elements* within any context, which ones have generic qualities, which ones are specific and how may we develop and utilise these? Secondary questions need to focus on the nature of specific elements, their characteristics, utility, amenability to modification and so on. It is essential to view the elements as ecological processes not just as simple isolated stimulus events.

The *critical elements* themselves are conceived of as two broad types - people based and context based. People based elements are inclusive of familial, community and societal structures, values, idiosyncratic behaviours and emotional and social links. Context based elements are inclusive of environmental circumstances and events and the pervasive effects of technology and the built world. They are the result of the environment being transformed causally or a-causally by the individual into a special *ecological context* and further into a special *zone of competence* as the life path develops.

The *critical life path* methodology encourages the reader to consider connections and purpose in a life path. The path shows that life's influences do not have to be random, only driven by the immediate environmental imperative and a result of seemingly much unconnected happenstance. The *critical life path* shows that much of what a person does in life has a purpose about it that in the instance of the cumulatively developed talent is perhaps much more evident than in an ordinary path. The exposure to and mastery of many seemingly diverse and divergent circumstances and influences in the life paths of the developed talent indicates powerful guiding influences that underlie the individual's actions and influences the selection of world activities. The difficulty for the researcher, and the individual, is to decide what these disparate influences are, how they work and to make the connections between them. This can only be done by further research and discussion and the development of theoretical frameworks and models that allows more accurate description,

analysis and prediction. The most pertinent feature of the *critical life path* display itself is the illustration of purposeful progression and the influence of extraneous phenomena - activity and encounter, causal and a-causal, that intersect a life path.

Prediction

If individuals travel along a path of development and critical influences are identified then predictions may be able to be made about these critical influences and how they affect life paths. A slightly different orientation to prediction is proposed in the critical life path approach. In this instance the process of prediction should not be directed to say or show what an individual will do, but rather what is the likelihood of certain circumstances, influences and events arising or being encountered along a life path and then what are possible outcomes of this interaction given their unique characteristics and patterns of development. Given the nature of human existence it is likely that unforeseen events and processes will take place in a life path, that some of these will be absolutely certain and some completely remote. The individual will act within a range of possibilities that reflects underlying patterns of inheritance and these actions may be predictable. They may be at times certainly predictable and at others almost unpredictable.

The patterns of development in the critical life path approach are interpreted in terms of the MBTI profile and connections drawn between psychological type and areas of activity. This means that according to the approach an individual will select those courses of action that best fit patterns of inheritance. They will do this increasingly within specialised contexts that act to support and maintain this individuation.

Scarr and McCartney's (1983) developmental stages of Genotype-->Environment Effects supports the idea and adds more substance to the notion that individuals select, adapt and create contexts that best fit genotypic characteristics. This means that an individual could be better prepared for

possible happenstance. Readiness for the unexpected as well as the expected is considered to be a major factor in the development of talent in this contextual approach. The possibility of such significant influences as coincidence, chance and luck occurring, should be considered, not as random, but as probable on a statistical scale from almost zero to almost certain.

In addition the possibility that powerful developmental processes may allow, encourage or enable an individual to influence events and processes commonly assumed to be chance, coincidence or luck, must be considered. In a subjective manner it is noticeable that many of the most talented individuals in our society seem to be blessed with good luck - timing, opportunity, the best fit of action to perception and so on. Why is this? Are they lucky? What is luck as opposed to chance or coincidence? Why are some people in the right place at the right time? The standard contention is that chance may be random, however luck may not be, and how, why and when may chance become luck? There are few answers to this conundrum but by being ready both environmentally and personally, there is every likelihood that so called chance events both positive and negative, will occur at irregular times in an individual's life path and chance may become opportunity.

In a critical life path, an individual with well developed and flexible patterns of habits, with a perception of the world tuned to an increasingly optimised context, with the resources to decide and act most efficiently and with a focus on personal preferences that are in synchronicity with the developmental direction, will almost certainly have an edge over others in selecting the most beneficial options to take. As such this individual is most likely going to be able to predict likely outcomes better than others.

Considerations.

An understanding of quantum notions and of influences that traditionally are not developed within academic discussion in this field of investigation, such as coincidence, uncertainty and synchronicity, is considered essential to the

interpretation of the *critical life path*. The participant's paths shows instances of indeterminate phenomena affecting the progressions in the study. It is not good enough to discount these as either random, coincidence, chance or luck in an explanation of an individual's progress. The reason is that the phenomena have an effect and if investigation is to be carried out in a rational manner then an effect on a life path must have had a past precursor (or a future precursor) no matter how unconnected, inexplicable or unforeseen. The cause may not be able to be pinpointed but the likelihood of events of an a-causal kind intersecting with a life path may possibly be able to be calculated.

The only substantial theoretical approach which deals with this situation is found in quantum physics. It is difficult to translate quantum notions into psychology partly due to the strong presence of determinist enquiry methodology. However determinist enquiry and explanation does not allow explanation for a-causal phenomena whereas a quantum approach does. Essentially quantum enquiry in sciences is concerned with understanding the behaviour of small particles, specifically sub atomic particles. However what is being found and evolved in the field is the realisation that at the fringes of our understanding about life and the universe, the certainty and separateness of entity that Newtonian science (cause - effect) gave us does not work when the behaviour of fundamental building blocks of existence are subjected to minute scrutiny. One of the essential features of a quantum approach is that none of these fundamental building blocks may exist separately from each other, i.e. they have no existence by themselves. They are part of an integrated system that is dependant on the context in which they are perceived. Similarly in human development, of which talent development is part, it can be said that in order to understand the process, attention must be focused on the connections between the parts not the parts themselves and so quantum notions of connectivity is what must be pursued not the separating of constituent parts. The objective is to looking beyond what appears to be isolated and independent to substantial patterns that interconnect and underlie events in the world.

People and the events of the world do not often seem to be organised in terms of logic, sequence, or mathematics. It is difficult for an individual to learn if cause and effect cannot be reliably connected and so the only alternative that becomes viable is to think and analyse in terms of systems and systems function as a whole, not as a collection or heap of parts. An example is the modern motor vehicle - it can be a heap of parts, in this case it will do nothing. On the other hand it can be a systematic, connected heap of parts that carries out a function - it does something. Similarly in talent development the life path of an individual is an integrated whole that does something - it works as a system, the arrangement of pieces is critical and if any part is missing the system is incomplete and the outcome may change. The system itself has emergent properties that are not found in the separate constituents.

The essential difference is about the difference between analysis and synthesis. The overriding consideration is that the life path in a critical life path approach be viewed as a complete entity and a focus on a reductionist approach will not encourage the vital connections to be made within this dynamic process. The choice of the Myers-Briggs Type Indicator in this study does not preclude the use of other theories, constructs or models. *Critical life path analysis* could be used in a variety of ways and with a variety of instruments.

The *critical life path* methodology and quantum notions of interpretation offer connectivity, purpose and process, and instances in a life path can be interpreted as sequential, cumulative and reflecting underlying and subtle influences that are personal and idiosyncratic as well as universal.

The Shape of the *critical life path*

Shape is given to the developmental process by complex intersecting patterns of interaction between the individual and the *critical elements* that are encountered in evolving the context. Until these patterns are recognised and not treated as purely isolated or atomistic then the process of talent

development in adults will remain obscure. Any potential (gifts - organic talents) that individuals have, will not be manifest or developed until a context in which they can be expressed is either encountered or developed. To graphically illustrate the complex network of connections is not feasible in this study as the resultant data depiction would resemble nothing more than a tangle of vectors. However by focusing on a linear path across time it is easier to show a major progression. Sub systems and paths within the major *critical life path* may be workable but are not a focus of this study. The data for one participant (Marilyn Waring) was depicted in terms of what will be termed "modal connections" that serve to show the proposed connection between critical elements and evolving zones of expertise and eminence. However this was done without reference to the participant and as such has no validity in the context of this study and is only an illustration of possible further developments.

Synchronicity

Within the life paths is a strong suggestion of synchronous timing in two ways. Firstly of singular instance of an event, process or person intersecting the life path at a critical point which enables a change or maintenance of progression. Secondly of a general tendency towards matching the complex patterns of thought and action to the complex requirements of a context in order to best express the proposed underlying genotype. Central to this process is the notion that the individual is developing phenotype to the highest and most evolved level possible within an existing environment and when the existing environment becomes inadequate for this expression it is modified or a new one is evolved.

In the critical path perspective it is this process that is viewed as the core of talent development - the drive to match patterns of genotype with available patterns of activity in the world. The result is accelerated and emphatic evolution of self through selected areas of interaction in the world.

To achieve efficacious development it is considered that the whole developmental process must reflect a synchronicity of timing and fit. Coincidence, chance and luck are elements that have an effect which may be positive or negative and take place at a critical time or stage. The individual is more likely to select the positive elements or aspect of an element that support development of the phenotype and act upon these, than to select the negative elements or aspect. However if the individual cannot control the negative element or aspect of an element then the situation may become asynchronous. It becomes evident that if negative elements are encountered then mastery or control of these in some manner or form is essential to further progress. The usual human reaction to this kind of stressful situation is when our biology makes the choice of either "fight or flight." However in the case of the talented there seems to be more of a "third way" of acting on the world. Fight or flight offer only two choices, neither of which tend to be particularly advantageous or involve long term benefit as only the immediate and imperative problem is solved. However a "third way" or course of action offers exponential choices and in the case of the talented this "third way" involves the development of considerable autonomy and diversity - the range of their expression has evolved from a limited knee jerk reaction to the immediate stimulus, to an opportunity to exercise control over the contextual contingencies in a manner of preference that encompasses a large range of choices and strategies, in other words a complex system in which interconnectedness, parallel activity and patterns of synchronicity are evident. Until this takes place the *critical life path* may be stalled or become negative and mitigate against the development of a supportive context. The learning process then is no longer accelerated but is conflicting with the development of phenotype. Synchronicity in this case is a single instance of best fit of personal characteristics to the instance to achieve a continuing process of beneficial development.

The notion of synchronicity is also used to describe the general process of the individual best fitting their developing characteristics, talents, to the larger

environment and beginning to create or adapt specific circumstances to support and enhance their control over the contextual environment in which they are moving through the process from novice to expert and then to eminence. With the locus of control of imperative elements under their influence and strategies for mastery in place then they can rapidly achieve control over new elements by selecting, seeking out and shaping the context to best use to fit their own characteristics. Their patterns of actions are synchronous with the patterns of contextual opportunity. It is important that the whole process be viewed as one of patterning - patterns of action are seen as being the key, not isolated reaction to specific environmental demand as in a reductionist approach. This latter process could possibly be termed "resonance" rather than synchronous as the notion of resonance implies a reinforcing and linking of multiple instances of synchronicity.

From a determinist viewpoint the *critical life paths* of the respondents in this study show many direct cause and effect connections. From a quantum view the paths show probabilities of connections. Dobzhansky's (1983) 'Norm of Reaction' tends towards the quantum view - that there is not one possibility of expression but a range of expressions that are partly dependant on context interacting with inherited tendencies to produce an optimal fit.

In a talent development paradigm as opposed to a gifted possession paradigm it should be evident that a larger view is required of the process and if this is not done then the process is no longer a process but a series of discontinuous and disparate elements that may be isolated, studied and described but never contribute to the explanation - why this particular person "made it." In the critical life path approach there is no one instance in the life paths that made the participants talented.

In essence the *critical life path* is about the big picture of a life progression. The foreground details of incident, activity, event, people and process move against a background of societal and historical influences. The *critical elements* are a combination of the individual's personal characteristics

being developed initially against a broad and relatively non-specific background. Within familial and educational settings there may be support and selected opportunity and this situation changes dramatically as the child becomes adult and independence and individuality become issues. As the individual develops expertise they progress from being a recipient of environmental stimulus to an agent of environmental change and eventually to a creator of specialised contexts which allow for the extended expression of phenotype and by doing so extends the boundaries of human experience.

The individual's patterns of active habits and patterns of mental habits (Lawrence, 1993) must best fit the optimum patterns of opportunity that the environment offers. It is considered in this approach that there need not be a perfect fit, a one to one match as in a mechanistic 1:1 connection, rather that a quantum range of possibilities of action intersects with a quantum range of probabilities of events to offer a diverse selection of outcomes from which the individual makes a choice guided by acting upon their preferences for stimulation. The talented individual will interpret and select the best fitting patterns and in so doing begin to create contexts in which they may become the optimal performer, ultimately perhaps making unique contributions to the field of endeavour. It is considered almost necessary that there is a close but not perfect fit between individual and context - in other words an optimal fit, not a perfect match. If there was a perfect fit then it may be that extraneous quantum characteristics would not be present and there may be no further development as there might be complete mechanistic equilibrium which may serve to reduce progression. Sternberg (1996) touches on an example of this when arguing that "A common mistake is to believe that self-esteem is important for success. It isn't. In fact many successful people do not have particularly high self esteem..." (p20) In this case, the individual's qualities and characteristics may not be a perfect match and this missing part of a pattern requires the individual to optimise other characteristics to compensate for the lack of fit.

The process can be likened to making a technological artifact to fit a very complex and constantly evolving template. However once a template is approximated new patterns can be evolved. Examples of this can be found in mathematics and are useful illustration. Fractals are a mathematical example of infinite yet rational variation - the snowflake curve is an example. In this phenomena, identical geometric patterns are repeated continuously, evolving into larger complex patterns, all of which are infinitely variable and idiosyncratic. However a further variation of the geometric fractal is the random fractal in which non-identical patterns are continuously repeated, each with a variation. The reader may have encountered these in maths books dealing with computer generated patterns and in books on the subject of modern art. The interpretation that relates to the development of talent is that the individual developing talent first of all fits their patterns to the requirements of established contexts - as in geometric fractals, much as most learners do in the education system, and then as they become expert they begin to establish new patterns - as in random fractals, new but still rational variations on the existing. In this way the boundaries of the context are extended and this part of the context, because it is made to fit the learner's patterns, supports the talent developer and may become a specialised *zone of competence* in which they are amongst the eminent practitioners. Bloom's (1985) favourable learning and support conditions have clear application here. These quantum notions may be difficult for the reader to grasp immediately but the interpretation offers a way out of a viewing behaviour as a one-way response to environment as in a behaviourist perspective and encourages the exploration of new action, process and encounter, in essence, the notion of creativity and an evolution which has a strong self-generative component (an emergent property) to it rather than just a one-way response to environmental demands.

Data depiction

The method of graphical depiction used in the *critical life path* seems to be gaining favour amongst academics and is a useful way of showing significant trends, developments and influences of a more molar nature in peoples lives and to show connectivity between constructs that words and figures might fail to do. Examples of a graphical approach are Renzulli's Three Ring Model of Giftedness (1985), Gagne's "Differentiated Model of Giftedness" (1985) and Piirto's Pyramid of Talent Development (1995). In these cases the use of graphics enables a systems view and gives the reader an idea as to relationships between parts of the theory or model. Similarly the Critical Life Path display also gives a connected view of parts of the approach. It is this author's opinion that the methodology is not used enough and if it was, would clarify many issues in the Social Sciences that remain obscure because they are either buried in explanation or vast quantities of confusing statistical data. The mania for mathematical data analysis and explanation of the kind used in the classical sciences and particularly in engineering, mathematics and statistics is often misplaced in the Social Sciences. A simpler more relevant depiction of results that encourages spatial thinking and connection would serve a more useful purpose to people such as educators who do not have the time, expertise or inclination to become experts. If one of the aims of Social Science investigation is to illuminate social issues and the human condition then more effective ways of delivering the body of knowledge must be encouraged. Social scientists must learn to communicate more effectively. One cave full of Neanderthal drawings tells us more about past societies than any number of books could.

Reliability and validity

The *critical life path* has limited reliability unless sufficient cases are carried out. In this study only five people were interviewed and no control or contrasting group was interviewed. However the examples provide the instance

and the step to action and from these further cases may evolve and greater reliability be achieved. In addition further development of the *critical life path* approach is envisaged. The main questions regarding reliability center around the whether the *critical life path* instrument can be reliably used with larger numbers of subjects. The answer to that is conjectural and unable to be determined in a small scale study such as this one. Further questions concern the conditions under which the data was gathered - is it the same for each participant? The answer to that is no, the conditions were not the same as in an experimental methodology, because physically the places, times and surroundings were all different. However the extraphysical conditions, namely a comfortable place for the interview chosen by the participant, the logistical sequences of introduction to the interview, and the interview format and process were as similar as possible given the physical settings. Each of the participants reacted in the same way, starting with earliest memories, recounting the passage of their lives, elaborating on significant instances and at the end musing upon their development. When deciding in the second interview the relative significance of the various elements, they also responded in the same manner, one feature which was particularly noticeable being that they had virtually had no problem deciding on the importance of the *critical elements* and then did not change subsequently their minds. This process indicates a fundamental reliability within their life stories and between their stories. This reliability shows some consistency, stability, dependability and a certain degree of predictability.

The question of whether the participants would give the same story in a years time is unanswered by this study, indeed it would be interesting to carry out a "test - retest" follow up to determine the effects of new experiences on the judgements of the past. Standard methods of determining reliability have little application to a *critical life path* methodology and the test - retest method is probably the only one that would give an indication of reliability intra-subject and across subject.

The question of validity hinges around the question of whether the process illuminate what it sets out to discover. Since the process is not a test or experiment and the methodology is descriptive rather than prescriptive different outcomes must be expected and a unique kind of validity may be achieved. The *critical life path* methodology is a framework from which, if required other approaches may be used as valid methods of interpretation. In this study the MBTI, the Triarchic Theory of intelligence and a number of other constructs were used as adjuncts to interpretation. However without these the *critical life path* methodology stands alone and may still be used as a method of analysis of a life path progression.

The question is, what is the *critical life path* describing? Content validity requires a close fit between the objectives of the method and the results obtained. *critical life path analysis* is not a test, an assessment or even a method of enquiry, it is fundamentally a method of analysis. As such content validity has little if any application. Predictive and concurrent indicators of validity also have little application to *critical life path analysis*. However, if the methodology was to be used in a planning or intervention way in say school education then the methodology would have to have some sound indications of both predictive and concurrent validity.

Construct validity and face validity do have some application to *critical life path analysis*. The interpretations must show internal consistency - the *critical elements* should be reasonably similar within a life path and across life paths. The similarities are found in all paths with the specificity that each subject identified their particular influences. They had no difficulty at all in identifying critical influences. The judgement is subjective and no doubt an objective method of assessing this facet of validity could be evolved but this is not attempted in this study. Construct validity in this instance has evolved from the theoretical notion that within every life path there are critical influences that shape the developmental progression, and further that these influences are

traceable to the drive by the genotype to achieve a developed phenotype that is consistent with opportunities available in the context of the larger environment.

In the case of face validity, the question asked of the subjects was if they could identify the most significant influences that they perceived in their lives. The data shows consistently that they had no problem at all in identifying elements that had critical effect and so the simple directive to identify the relevant influences indicates very strong face validity.

A further question concerns the method of presentation. Is it valid to analyse and present the data in this way? There is no answer to this as such as the methodology has no similar reference to be measured against. The only indicators may be - does the methodology do what is required and is the data display useful? Will it be of benefit to others in educational or organisational settings and can it be of personal benefit? These questions may be answered in time and with more investigation.

Is the procedure able to be replicated? The answer to this is yes, quite easily, as the procedure is quite simple. The interpretation however is more complex and a comprehensive theory must undergo further development in order to become more reliable and achieve more global validity.

The participants

It became evident in the succeeding interviews that the *critical life path* depiction methodology was able to clarify and illuminate life path processes, connections and progressions to the respondents in a new and stimulating way. This outcome was one of the intentions of the study in that by using this methodology it was hoped that it would ultimately be able to offer to any individual a way to look critically at their life path to that point and possibly be able to assist them in projecting the life path in a manner in which the locus of control could increasingly come within their sphere of influence. In addition it was hoped that their own phenotypic development would become more evident and a more satisfying expression of this development be enabled.

There appears to be a tendency for these individuals to try and create a specialised context which has certain features. Amongst these features are the reappearance of elements in the life path that can be found in their youth and which had considerable influence. Examples of these are found in Elwyn Richardson's pottery and surroundings, in Graeme Platt's rural upbringing, and in Marilyn Waring's love of books. Also evident is the creation in some instances of a context that has elements that are perceived as lacking in an individual's youth - Warren Holling's family. His perceived lack of family has been created in his work environment and his work and the people around him became a place of belonging. This re-creation of familiar and missing contextual elements is considered to be an outcome of the drive by the genotype to develop a phenotype which is congruent with patterns of possibilities laid down within the unseen structures of microgenetic inheritance and developed in the "Early World" - to use Richardson's (1964) phrase. It is almost as though each individual is replicating a pattern of human life in such a way that if the essential elements were originally there in their early lives they then recreate them in an evolved form and if they were not there then they create them so that they fill the gap.

Context selection and creation

In human society people choose, perhaps without too much deliberation, common and already constructed contexts in which change is incremental and within which contribution may be made in a more microscopic and determinist manner. Areas of activity and competency zones may be broad and ones in which many participate in ways not too different from each other such as family life and a common vocation. The talented however appear to be braver and choose environments in which change can be more macroscopic, idiosyncratic and quantum and which may be a fringe context or even a radical development of an existing one. The construction of this particular environment results in a highly specific *zone of competence* in which they are often the leaders. They

are the individuals who expand the boundaries of the common *ecological sphere* and who contribute to the acceleration and change of the common *critical life path* - the human life path.

The construct of the common *critical life path* is one in which history is the indicator and guide to construction. It would not be difficult to construct a *critical life path* to show the evolution of specific groups within and across societies, of groups of peoples under threat of losing their cultures and lifestyles in modern society e.g. Amazonian Indian tribes, or indeed for human society itself. The identification and isolation of *critical elements* in micro, macro and global contexts through a history of a group would be relatively simple if time consuming. It could be seen that each group attempted to create a common and special context in which they could survive well. A case in point is the situation regarding the culture of the Maori in New Zealand. As colonisation took place and critical events intersected the path of the group, their culture was pushed to the background and their identity within a foreign *ecological context* changed so dramatically that now their task of re-construction of a context that reflects their unique group characteristics within another asynchronous culture has become an enormous, often frustrating and complex task.

In a talent development sense the more specific the *ecological context* the less generic, less transferable and more complex the connections will be just as in any well developed field of expertise the ways of operating are particular to that application. The underlying constituents themselves will still be holistic and generic - they may not be exceptional e.g. Elwyn Richardson's pottery, Lino Nelise's story writing. What becomes exceptional is the patterning of the activity that springs from this. The connections and the resultant outcomes reflect the idiosyncrasy and quality of the activity and the expertise develops from the interaction. The process of pattern development is described by the *critical life path*.

In "Patterns of Influence on Gifted Learners" (Chapter 9, VanTassel-Baska and Kubilius, 1989), the question is asked regarding why some adults

become eminent and others do not. Superior intellect carefully nurtured, *zeitgeist*, luck, sociological factors relating to family circumstances, child rearing practices, education, peer relationships, timing, location and opportunity are all points raised for questioning. However, the quest is inevitably for singular answer in a reductionist manner. A *critical life path analysis* however does not show a single instance. What a *critical life path* shows is a pattern of influences that in the case of the talented adult is largely self determined. A feature of this specialised context is that it is inevitably historically and culturally bound - the talent of today, or of this culture, may not be the talent of tomorrow or of another culture, or, it may not be recognised until time has passed. VanTassel-Baska et al (1989) provide a clue to the development of talent. "In the final analysis, it may be that the individual's perception of past and present events that shapes behaviour patterns" (p155) To this the *critical life path* approach would add perceptions of the future, perceptions constructed in such a way that in quantum terms the range of possible options is extended to the point where an increasing number of them may contribute to development.

VanTassel-Baska et al (1989) say that achieving eminence means breaking patterns at very fundamental levels. These risk taking and problem finding characteristic can be found in the *critical life paths* of individuals in this study and is the basis for the proposed selection, adaptation and creation of specialised contexts within which the talented individual expresses their phenotype. A feature of the proposed contexts is that the individual/s who is/are eminent in it set the competencies, and they are an optimal fit with their own. The patterns of habits that these talented people form are not rigid and time bound but flexible and transferable.

Outcomes

This study of adult talent development had a number of aims. The primary aim was to investigate the life paths of adults who were eminent in their fields and could be said to have developed their talents to a high degree of

efficacy. The important and essential features of these paths were to be identified and connected with recognisable individual characteristics of the subjects by means of a personality/learning styles profile, the Myers-Briggs Type Indicator. It was intended that this approach might shed some light on the developmental path and illuminate some consistent patterns and influences that might be important in a talent development process.

Intelligence was considered to be an essential dynamic factor in the development of talent and Sternberg's Triarchic Theory of Intelligence was originally used in this study as a means of illuminating an essential orientation - that in order to develop talent an individual must apply a type of intelligence that was consistent with contextual demands and personal style and that the intelligence itself must be of an evolving and dynamic kind. The psychometric approach was rejected as being of limited use and application in a dynamic theory of critical life path development. However the case for the use of the Triarchic Theory as a model to assist in the interpretation of the *critical life path* was also not as convincing as was hoped. The reasons lie in the fact that the theory is a complex and as yet not entirely proven model from which to work and many of the constructs can be difficult to fit to another process such as in this study. What may have been more relevant to use was Gardner's (1983) approach to intelligence, an approach where the multiple intelligences identified tie more closely with talents. Gardner's original seven intelligences are a closer fit with context and specific talent zone are and his identification of an eighth intelligence (Shores, 1995) fits accurately with one of the participants in the study. The Triarchic theory looks closely at the unseen workings of intelligence whereas Gardner's focus is more on the observable outcomes of what is considered intelligent behaviours. As such this contextual focus could be more useful in interpreting a *critical life path* process..

A further major aim was to develop a method of analysis which could be used to investigate how and why some individuals become eminent in their fields of endeavour. The central notion was that these individuals had

developed talents to a degree which enabled them to control their specific environment and events and express their personal characteristics in the most evolved and self-fulfilling manner possible. In order to investigate this the focus was on older adults who had gone through an extended learning period and had become eminent in their fields of endeavour.

The theory relies on quantum notions - of interrelationships, connections and probabilities that result in identifiable patterns within individual life paths, between context and participant. *critical life path analysis* in this sense is a system of observing - it is a classical system, in which there is a one to one match of cause with effect. However the match is not a 1:1 match, rather a combination matched with a combination. What is being observed is another system - a quantum system, a human being, in which there is not necessarily a one to one match but a possibility of change of one or of many kinds. The connections between what is before and what is after are not necessarily linear and sequential. They may be the result of non-local effects, such as observation, of action at a distance, of coincidence, chance and luck and these are considered to have spatial, 3-dimensional characteristics acting over time to integrate the life path.

Within this study the focus is on the talented individual and comparison needs to be done with the "ordinary" individual and over larger numbers until statistically reliable indicators can be ascertained as to which elements are identified as common and useful for instance in education, and which are specific.

The Results

The recorded and transcribed data was analysed in terms of influences that the subjects reported as critical to their developmental progression. These influences, the *critical elements* were depicted on data displays in terms of their temporal, relative and cumulative effects.

From this data the construction of a theoretical framework was attempted. The approach focused on identifying and describing the various personal, environmental and interactive processes that were considered as essential to a developmental process and a number of aspects, including some that are not the usual in a Social Science context were put forward for discussion.

It is evident that the subject is larger than one study and there appears to be many facets of the approach that need more consideration, investigation and development. It was considered at the outset that this might be the case but the intention was to provide some groundwork for possible future development.

The data shows some consistencies and patterns within life paths and between subjects to indicate that there may be cause for further investigation of life paths using *critical life path analysis* and further clarification of some of the issues which are not yet sufficiently developed or are a little unclear.

The question of validity of the instruments and approaches used in the explanation building is a problem of personal choice and perceived suitability. If the instruments chosen, whatever they may be, are based on theory themselves then in order to accept the conclusions, the validity of the theory on which the approaches are based must also be accepted. Such is the case in this study with the MBTI.

The *critical life path* method is based on the assumptions that the critical influences as reported by the subjects are actually what happened. It is entirely their interpretation which is in question and the validity of their own observations has to be accepted as a subjective and reflective estimation which is relevant in the time and place. It is context bound within the present.

The author considers that a useful application of *critical life path* Methodology could be in the area of the talented groups - organisations, agencies, co-operative enterprise, businesses, cultures and nations. One of the intentions of the development of this methodology was that it might apply as much to groups as to individuals.

Implications for education.

Are there any lessons for education? The *critical life path* shows that there may be possibilities for useful intervention, planning and modification of programmes and strategies in the field of Gifted and Talented Education. If educators wish to develop talent they will need, in this author's opinion, to teach children more about how to select, adapt and create environments in which they can more readily progress along a path that should be presented as continuous and interconnected. They need to teach children about patterns, relationships, connections and projection in their lives and not just accelerate or challenge children within subject areas in educational settings. A focus on emergent properties of knowledge, skills and understanding that may be integrated over time into holistic systems of capability could pay dividends. By teaching children to create contexts, educators can also teach them how to be creative and to develop creativity, a kind of creativity that is more about what they live amongst and not just what they produce in the way of product. Children can be taught to understand that the specific environments they operate within the educational world are only a starting point for establishing longer term, supportive contexts in which they can specialise and express their innermost selves as they progress along a life path. They also need to know that a narrow score based view of intelligence is by no means the way in which the world outside operates and that scholastic achievement and precocious performance are only some of the indicators of success in life. In other words what happens at school is just part of a much larger picture of life path progression.

However contextual and integrated learning is not particularly popular in a school system in which children are separated by subject, remote from "real world" application, assessed on individual performance, and achieve recognition through a structured system of credibility which may be largely based on abstract performance in a single instance of place, time and subject matter. The contextual and integrated forms of learning of Richardson's school at Oruaiti, of apprenticeship, of oral traditions of passing knowledge and

practice for example do not fit comfortably in a world driven by constraints of time, economy and specificity. However contextual learning is what takes place in the major part of our lives - as infants, as preschoolers and then when we leave school and engage ourselves in vocation, family and community. It is where the learning is not as remote as it is in school or as it is in a modern idiom via the virtual context of computer based learning which in itself is viewed by this author as system substitution. (An example of this is the pervasive and increasing use of technological systems as substitute for human capabilities and skills - e.g. the use of calculators in primary schools for simple maths calculations. This builds too many dependencies and in the end is antipathetic to effective life strategies)

It is this author's opinion that within education any development or intervention in the field of "gifted" and talented education is only going to be partly successful unless an holistic, ecological base is established within each student's individual context. The isolated nature of much of the educational process must be limited and closer connection made with the daily world. The gap between knowledge and application can only be closed by the formation of flexible patterns of habits that lead on to thye development of more advanced habits which ultimately will fit a reality of the everyday world. It is seen as more important that long term connections are made and patterns of perception, cognition and action established in interventionist procedures within education than that subject acceleration or the like is promoted, or that information is delivered remotely from it application. The linkage must be understanding through application. Subject acceleration by itself may be relatively useless without the establishment of strategies to establish a context in which the characteristics looked for in acceleration may be developed, in particular, contexts subsequent to the education context. In maths for example just accelerating a child within the subject area by feeding in problem solving, extended difficulty examples and the like is useful but great mathematicians are in control of their context more than just the subject material. It is all very well to

accelerate and promote children within an educational context but if there is little relevance to, or application past the point of disengagement then the intervention may be severely limited in its functional use outside the educational context. The implications are that narrow subject based curriculum, limited practical and real application opportunities available in schools and the overwhelming amount of information that an individual in education is required to become cognisant of means that new strategies of learning are going to have to be evolved so that learners may integrate, select, adapt and create new supportive environments in which the ordinary, the mundane and the automatic are well taken care of. The learner may then go on to more rewarding, productive and stimulating activities of choice.

Maturational periods of development are being extended as human societies progress. The period of learning and developing expertise should by all accounts be increasing as more information, training, practice and exposure would seem to be required to achieve competency, expertise and eminence. The question that has to be asked is - is this the case? Or are we finding ways that circumvent the longer learning periods seemingly required? Are such things as intensive deliberate practice, technologies that extend (not substitute) human performance and perception, medical advances and greater understanding of the human condition enabling us to achieve cumulatively greater and greater competency and variation by enabling us to construct more and more specialised contexts within which we are the masters of the circumstances and are increasingly fulfilling the diversity of our genotypic development?

All around us is evidence of societal groups increasingly creating contexts in which they can express themselves, modern pop culture being a pertinent example. Within these contexts individuals also express themselves in creative and useful ways. Many of the contexts we operate in are co-operative and have been in existence for long periods of human history with minor changes that make them contemporary and still workable. Most people operate within these contexts and make minor variation to them, reinforcing their

working by common contribution, the organic family in its various forms is the most obvious example. Others create striking variation to these contexts which enable them to step out from the common crowd and make critical contribution to an aspect of the general human condition. These are often the talented people of our societies. They are not always noticeable, evident or eminent, yet they are expert.

Children of promise, and all children qualify here, will never be able to achieve a great deal unless they have the skills of context selection and creation, even in a local and conformist sense. How can this be done? By teaching and showing them that manipulation of the physical and cognitive environment by such means as effort, practice, contribution, co-operation, experimentation and planning have a demonstrable payoff for both themselves and others. Once again it can be said that from a *critical life path* perspective, subject matter expertise is not enough.

Patterns of habits and the process of talent development

By building flexible patterns of habits both mental and physical the process of talent development can be enabled. Patterns of habits mean that freedom from the mundane and menial is much easier to attain and new and stimulating endeavour may be forthcoming as a result of this freedom from necessity or the imperative. This view may not be popular in liberal education philosophy and practice, as the implication is that repetitive practice of basal mechanistic operations (including rote learning) does not encourage creativity. However this author's view is that deliberate practice to establish flexible patterns of thought and action free the individual to further develop the multiplicity of choices that lead to creativity and self development, a development of a third modal way of acting upon the world. (The first two being flight and fight). The problem is not the rote learning, it is what is done with it after that should count. All the participants in this study display strong patterns of habits, habits formed by testing and practice, and these habits allow them to

go on, free from the mundane and the ordinary to levels of exemplary performance. High entry level to a *zone of competence* can be attained by the possession of prior gifts or of developed expertise. Both processes are legitimate. One may be called giftedness, the other may be called talent development.

In addition children could be taught to recognise useful and necessary contexts upon which societal and individual progress is based, and to differentiate contexts that are specialist and possible in the future. The cult of individuality and competitiveness which seems to be so prevalent in the west may need to be modified so as to be less self indulgent and more co-operative and contributive. One way of doing this is to reach children about their connectivity with the processes of the natural world and each other, not their separateness from them. The separateness of the Newtonian world, which influences much of our philosophy and activity in the western world, may need to be adjusted to emphasise our connectedness with a quantum world.

Larger implications and a philosophy.

The implications for New Zealand as a nation is that future development must focus on creating the most supportive contexts in which individuals and groups can operate effectively both inside the country and outside or we may face considerable difficulty surviving in an adequate manner in the world community of the future.

The patterning of human societies as they evolve becomes obvious when viewed from a notion of criticality. The human race has moved from individualised, imperative and primitive contexts which have competition as the basis of resourcing, to, future oriented and sophisticated contexts which will increasingly rely on cooperation and integration as the basis of resourcing. The histories of groups and nations have *critical elements* which intersected their paths and have acted in a way that has enabled them to reach stages that reflect the character of the group, but not always in an optimal manner. The

possibilities of human inheritance are becoming evident. It is often said that the human brain is much larger than is necessary for everyday living- why is that and if so what is the extra capacity used for, or is it used at all? Is it part of the potential that nature has set up for evolutionary change? Human societies and individuals are beginning to cast off the protective mantle of primitive reactions, of fight or flight, and to assume the mantle of unlimited variation in a different way of being and this different way of being gives quantum, not mechanistic possibilities. As such quantum notions require a different way of thinking and doing and extra neural capacity may be a useful thing. In a situation of fight or flight, the physiological system is short-circuited in a manner of speaking and extra neural capacity required for reasoned action may be unnecessary. However with a third modal way of being seemingly developing in larger groups in society superfluous neural capacity may be useful. The talented individuals in this study may utilise this function more efficiently than others.

A critical life path approach emphasises that the well developed talent has an experience of the world which society would well do to take notice of, and an efficacy of interaction which is at a pinnacle of development within the realm of human influence.

The conceptualisation of a species *critical life path* is a further step from the individual and group path and this may have rather disturbing implications especially for technological development and population growth.

History repeats?

It would seem that looking at the data, there are indications of something that may be unrecognised in human development, that people tend to reconstruct in their later lives, familiar or missing elements of their early lives but in a more mature and evolved way. Along with this elemental process goes the addition of variation, of things that are selected and created from the world which are preferentially stimulating. Many of these things are stimulating, rewarding and contribute to the individual and common good, as Reis's (1996)

study points out. The paths of individuals are not aimless - there are indications of consistent, age old and subtle forces acting to guide action in the world even when the way is seemingly lost.

Elwyn Richardson's retention of his inner self, Warren Hollings' battle for survival, Lino Nelisi's search for a context in which she could be satisfied, recreating in a new form her early experiences and the need to act out her underlying preferences, are examples of the development this. Perhaps the greatest talent they have as individuals is to recreate in a new way many of the familiar patterns and relationships of their "Early World." (Richardson, 1964) This re-creation of familiar things in new ways is something that humans habitually do over a lifetime both for themselves, their children and their group of belonging, and ultimately for their species.

There is no evidence in the literature that this phenomena has been identified and it would seem that life path theorists could pursue this area of investigation and illuminate what this author considers to be a major feature of the lives of the most effective members of our species.

Summary

The central question - "How do adults develop talent?" can be answered with a mixture of conjecture, description, and explanation. Adults can develop talent by developing their genotype within increasingly specific and supportive contexts. This phenotypic outcome of the efficacious and synchronistic interaction between the internal world and the external world reaches its culmination in the life paths of talented adults and is mediated by the intricate experiences on the life path.

The experiences on the life path can be described by the use of a framework of investigation and analysis - *critical life path analysis*, (or perhaps more properly, synthesis) which has a central construct that sets out to identify the most significant influences - the *critical elements*. These life paths can be described by the framework and may be subject to interpretation by the use of

various theoretical and instrumental methods which show how development may have taken place. In this study the MBTI instrument was used as a means of illuminating the developmental progression and the way in which individuals might approach how they dealt with the world.

Other levels of explanation and complimentary ways in which adults may develop talent are indicated by Ericsson et al's (1993) construct of "deliberate practice", by Lawrence's (1993) "patterns of mental habits" along with the author's construct of "patterns of active habits." These three concepts are considered as the key elements in any development of competency or expertise in any life path and at the core of the developmental paths of the participants in this study. They cover the internal world of thinking, the external world of action, and the absolute requirement for exposure and practice in the building of flexible patterns of habit that form the basis of all skills, knowledge, understanding and application in world activities. This view is contrary in many ways to modern educational practice in that the author views the development of these efficacious patterns of practiced flexible habits as the sole criteria for highly effective life path development. No technology, no opportunity, no motivation is seen as being able to surmount this requirement and it is further considered that creativity and innovation are habit dependant in order to take place. Unfortunately there is a pervasive school of thought that exists in modern education that exposure equals competency and that a once over lightly is sufficient for further development. There is also an unfortunate point of view that mindless and endless practice which forms rigid habits is also effective. The truth likely lies somewhere between and the orientation in this study is that habits are vital but they must be flexible.

This view was reiterated almost one hundred years ago by Dewey and in a series of published works from 1899 to 1929 Dewey elaborated his views of functional reconstruction in education in an attempt to bring the disparate dialectics together. Dewey stressed that stimulating personal growth forms habits and that these habits are not ruts to climb out of in which the manner of

behaviour is fixed, but are adjustments to environments. Habit formation according to Dewey, requires the individual to learn from experience and then new habits are formed. Flexibility not rigidity is the key. (Dewey, 1900). Dewey also identifies active habits "Active habits involve, thought, invention, and initiative in applying capacities to new aims (Dewey, 1916, pp57-58).

The life paths of the participants in this study show a wide, but intense and involved range of activities over time and the selection and channelling of *world activity* into a specific contextual zone in which they have become the eminent practitioners. They have been able to do this because their ways of doing are synchronistic, compatible, efficient and practiced, and therefore they achieve a better fit between contextual demands and opportunities, and their own characteristics. If individuals wish to develop talent then they must be prepared to put time and effort into the creation of specific context that is compatible with their personal characteristics and this can take place at any stage of life. Along this life path they will experiment, explore and be intensely involved until ultimately they may achieve a unique fit of self to world that is a culmination of genotypic expression within the unique part of the world in which they live - their own *ecological context*.

The *critical life paths* of the participants in this study show that critical influences in the developmental paths shape behaviour and pathways that act to differentiate available options. In other words because the individuals have efficacious habits of thinking and doing they can split their options more efficiently and take the most beneficial actions to give optimal fit between their perceptions of the world and what it could be like for them. The options or choices pursued are considered as faithful reflections of unseen and natural preferences for stimulation that are based on inherited tendencies. The individuals act upon these and create increasingly supportive and resonant environments around themselves that progressively bring the locus of control within their sphere of influence. Even disparate and unconnected influences may become part of the total pattern of mastery. In the maturing stages of this

process the individuals may reconstruct missing or rewarding aspects of their "Early Worlds" (Richardson, 1964) that have become part of the synchronous pattern of inheritance and learning. Their major talents they have developed are their abilities to shape the world in the manner of preference so that a proximal fit is obtained between their internal and external worlds. They do this in part by narrowing the focus to an area of major activity that is characteristically intense and synchronous in its form of expression. The mix to achieve this is not dependant on any one part but is rather an emergent property of the combination of critical parts of what has become an efficient system of self expression. The process would not take place if any one part was incomplete or missing. This eventuality is contrary to a reductionist "quick fix" approach and to the trite and misleading messages and methods popularised by the motivational gurus and other self proclaimed experts in human development who are often encountered in the everyday world.

Talent development is part of the much larger process of human development. As such it explores the extremes of the performance of individuals. Talent development essentially shows the culmination of the process of mastery over, and adaptation of human beings to environment - and vice versa.

It is time to extend the construct, study, and endeavour of talent development out of the formal education setting and make it available to anyone in order to assist the development of human potential and societal evolution. Hood (1998) presents a view that a paradigm shift is essential for New Zealand education and the idea that the attainment of excellence by a select few should be replaced by the idea that everyone should have the opportunity to acquire knowledge and skills. This is a view that is in close agreement with the orientation of this study and the people presented in it. Hood's promotion of contextual and thematic learning is not new but emphasises that the work of people such as Elwyn Richardson in education, of the development of talent

within special contexts such as is portrayed by Warren Hollings, Marilyn Waring, Lino Nelisi and Graeme Platt in this study is essential to understand

Hood (1998) makes the statement "every child has talent; every child should have the opportunity of having that talent developed and the opportunity to strive for and achieve excellence." (p132) This means amongst other things, broadening the curriculum base, minimising traditional assessment procedures, looking to integrate instruction and assessment, less focus on identifying the "gifted" and more on identifying what are gifted behaviours and how these can be developed as talents and working towards a closer match of reality with the classroom. This process has been recognised in our history and the old technical education system went part way towards this even if there was a bias to vocational outcomes. Further to this is this author's proposition that many talents and opportunities for talent are not and should not be viewed as dependant upon early identification. The emergent properties of later experience, maturation and readiness indicate that talent development may happen anywhere, at any time and at any age for any individual. Indeed, many forms of talent may only become reality when individuals are older. However in many societies the potential and exploits of the young are popularised especially in education and through the media and the potential of the matured talent is too often ignored. The implication that underlies this is that it is the older individual's contribution that is under-utilised and under-valued in modern western society.

A critical life path approach offers an opportunity for people to reflect upon experience, to place in perspective the significant influences of their lives and to maybe plug the gaps that may appear so that they may fulfil the potential of their inheritance in the manner that they prefer and within the setting that they may create. That does not mean they will be rich and famous, successful and satisfied, rather that they will be stimulated and challenged by the process of acting out their natural tendencies to achieve a consistency with the patterns

of their genetic makeup. The habits and performance of the most talented adults in society should become the subject of intense scrutiny, given that these individuals also have a right to privacy. The educational, economic, social and emotional problems of any society are not going to be solved unless the examples set by the most effective members of the society become major models for development. A focus on political quick fixes, throwing money and resources at problems will not work as effectively as targeting the most effective people and strategies and applying these principles to achieve beneficial outcomes. A *Critical Life Path* model offers the opportunity to learn from the past to better develop the future.

In the Republic, Plato asks the question how society is made up. He finds the underlying principles to be two - the first is mutual need, as humans are not of themselves self sufficient. The second is difference of aptitude, each person is able to ^{do} some things better than others. Plato identifies the salient features of this difference - that a skilled person should concentrate on one thing and that there is a right moment for action. It is this difference and these features that can be described by *Critical Path analysis* and it is through this process of mutual need and the development of potential that an individual may benefit for themselves and contribute to the society in which they live .

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Appendix A

12 East St
Drury
South Auckland

24 -07-97

Dear

I am currently undertaking a study of the development of talent in adults as part of a requirement for the degree of Master of Education at Massey University. The focus of this study is to investigate how adults in a range of endeavours develop their talents.

This study has been designed in accordance with Massey University's Code of Ethical Conduct for Research and Teaching Involving Human Subjects. It is being conducted under the supervision of Dr Alison St George and Dr Tracy Riley, Department of Educational Psychology, Massey University.

Please read the information sheets carefully and if you require further information do not hesitate to contact me. The information sheet is enclosed.

If you are willing to participate in this study, could you please complete the attached consent form and return it to me as soon as possible. Thank you.

Yours sincerely,

David Redwood

INFORMATION SHEET**PROJECT TITLE: THE DEVELOPMENT OF TALENT IN ADULTS**

The study

The focus of this study is to investigate how adults develop their talents. It is being conducted by David Redwood as part of a Masters of Education degree at Massey University, Palmerston North.

At present there is little academic research both in New Zealand and overseas in this area. This rather surprising situation is largely due to the emphasis on resourcing and funding of educational research which is primarily focused on children and educational institutions. With adult education becoming a major activity in education and with the changing developmental paths of identifiable groups in the society, (eg. women entering the workforce after child rearing, new immigrants beginning new lives in their adopted countries, and the innovative and entrepreneurial developing new ventures), it would seem essential that we begin to look closely at all stages of talent development and in this case in particular the development of talent in older adults.

The intention is to investigate, using the case study approach, the developmental paths of a selection of significant adults who evidence aspects of eminent and expert performance at various stages of life and who would be considered to be at the upper end of the competency range in their fields. With the data gained it is intended that critical influences might be identified, common patterns established and conceptual frameworks developed to illuminate the developmental process. An additional intention is to draw attention to the need for research in this as yet relatively unexplored area.

Participant involvement.

Those participating in the study will be required to undertake the following activities at times, and in locations, which are agreeable to them. The study will be carried out during the remainder of 1997.

- Participants will complete a questionnaire requesting background biographical information. This is expected to take around 15 minutes to complete.
- Participants will be interviewed twice by the researcher. It is envisaged that this will take between one and two hours the first time and the second time will be to check the accuracy of data, expand on various points and finalise the Critical Path. Interviews will be audio taped with the permission of the participants.
- Participants will be provided with a transcript of the interview to check details for accuracy and to elaborate on information given should they wish, or if clarification is requested by the researcher.
- Participants will undertake an assessment procedure, the Myers Briggs Type Indicator (MBTI) to help identify any particular learning style preferences which may have significantly influenced their developmental path. Completing the MBTI will take between half an hour and one hour and the profile resulting from the assessment will be made known to the participant. If the participant wishes a fuller explanation of this profile and the underlying theory this will be made available.

The interviews will be recorded on audio tape, transcribed by an assistant, checked for accuracy and copies made available to the participants. The research assistant will be required to sign a confidentiality agreement. At the completion of the study the participants may retain the tapes, agree that the tapes should be destroyed, consent to their storage in a research archive, or ask for copies in the case of the last option. In addition a summary of the study will be available to participants should they want it. All personal information will remain confidential except where permission is given for its use in the study.

The research will be subject to the ethical guidelines as laid down by Massey University's Code of Ethical Conduct for Research and Teaching Involving Human Subjects and anonymity and confidentiality will be protected as far as possible. In this particular study it is acknowledged that some of the participants are well known in the public arena and complete anonymity may be difficult to achieve. Dates, names, places and circumstances may be disguised, deleted or changed at the request of the participant to protect themselves or others as necessary, or participants may allow their names and details to be used as they see fit. The study will be reported in a Masters Thesis through the Department of Educational Psychology, Massey University, Palmerston North.

Participation in this study is totally voluntary.

You are invited to take part in the study and if you do so you have the right to:-

- Refuse to answer any particular question and to withdraw from the study at any time.
- Ask for the audio tape to be turned off at any point during the interviews.
- Ask any questions about the study at any time during participation.
- Provide information on the understanding that your name will not be used unless you give permission to the researcher.
- Be given access to a summary of the findings of the study when it is concluded.

Researcher -

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Appendix C

PROJECT TITLE: THE DEVELOPMENT OF TALENT IN ADULTS

CONSENT FORM

RESEARCHER: David Redwood

I have read the Information Sheet for this study and have had the details of the study made known to me. My questions regarding the study have been answered to my satisfaction, and I understand that I may ask further questions at any time.

I also understand that I am free to withdraw from the study at any time, or to decline to answer any particular questions in the study.

I agree to provide information to the researcher on the understanding that my name will not be used without my permission.

(The information will be used only for this research and publications arising from this research project)

I agree / do not agree to the interviews being audio taped

I also understand that I have the right to ask for the audio tape to be turned off at any time during the interview.

I wish to participate in this study under the conditions set out on the Information Sheet.

NAME _____

SIGNED _____

DATE _____

Appendix D

PROJECT TITLE: THE DEVELOPMENT OF TALENT IN ADULTS

CONSENT FORM

RESEARCHER: David Redwood

1) I consent to the use of my Myers-Briggs Learning Styles Profile in this study

NAME _____

SIGNED _____

DATE _____

2) I consent to the use of my name in this study.

NAME _____

SIGNED _____

DATE _____

PROJECT TITLE : THE DEVELOPMENT OF TALENT IN ADULTS

BACKGROUND INFORMATION

1) FULLNAME _____

2) ADDRESS _____

3) PHONE No (Pvt.) _____ (Bus.) _____

4) FAX No. _____

5) DATE OF BIRTH _____ 6) PLACE OF BIRTH _____

7) PARENTS OCCUPATIONS (Main long term occupations of both parents, paid or unpaid and any significant subsidiary occupations)

8) SIBLINGS _____ DoB _____ OCCUPATION _____

_____ DoB _____ OCCUPATION _____

_____ DoB _____ OCCUPATION _____

_____ DoB _____ OCCUPATION _____

9) POSITION IN FAMILY _____

10) SIGNIFICANT RELATIVES _____

11) SIGNIFICANT FRIENDS / OTHERS (Alive, deceased, historical, make believe or characterised who have influenced you.)

12) EDUCATIONAL HISTORY (List the schools, tertiary institutions and years attended and any qualifications gained)

13) TRAINING HISTORY (eg trade, professional or other. List provider and year)

14) WORK HISTORY (List the jobs and occupations you have held and the year)

15) INTERESTS HISTORY (List any strong interests you have pursued)

16) SPORTS / RECREATION (Detail any sports, recreations you have played or still play)

17) READING (Your favourite books, magazines, subjects. Detail the material you have to read for your job. Detail your least favourite material)

18) PASTIMES (What do you do in spare time? Has this changed over the years?)

19) TASTES (Are there any particular, individual things you like or detest? Have these changed over the years?)

20) LIFESTYLE (Note down some details of the kind of lifestyle you have and/or would like to have)

21) PHILOSOPHICAL / RELIGIOUS / WORLD VIEW (any strong or well developed views)

GLOSSARY

The terms used here relate to their specific use in this study - they may not coincide with dictionary definitions or usage in other areas. Many of the terms used are composite and only relevant within a *Critical Life Path* application. The terms in italics are the ones developed for use specifically in a *Critical Life Path* application. The terms are not in alphabetical order but are ordered in a pattern of connectivity as they relate to the methodology.

Critical Life Path Analysis - a method of investigating and analysing a process of human development to establish critical connections between elements that make up a life path pattern. In this study, the life paths of the participants.

critical - anything that is absolutely essential, at an indivisible level.

element - a part that cannot be separated or broken down without losing its relevance.

critical element - an essential holistic part of a larger context. *critical elements* are people, events and processes.

trajectory - a traceable path.

synchronicity - to occur or operate at the same or in a related time frame. Derived from Jung's a-causal connecting principle, but with particular application in a *Critical Life Path*.

ecology - the relationship of living things to their environment

context - that which fixes meaning; interrelationship of parts; circumstances; general information about ...

ecological context - that special part of the larger environment that gives meaning, circumstance and connection with and to an individual. A specific environment in which patterns of relationships are established between the individual and the context which gives meaning and support to the expression of phenotype.

zone of competence - an area of *world activity*; part of the *ecological context* with particular characteristics in which the individual can operate with ability and authority.

world activity - what people do in the world; a modal form of life activity.

major world activity - a domain of endeavour in which the talented individual is eminent and which involves a significant portion of their daily life.

baseline capability - the possession of minimal organic and inorganic characteristics that enable performance in a selected *zone of competence*

accelerated learning situation - in a *Critical Life Path*, efficient learning in a context that is supportive and promotes growth

accelerated learning process - the change in learning efficacy that occurs when a process of talent development takes place. An increase in rate and/or effectiveness.

organic - of the body.

organic talent - predetermined ability (inherited) which enables high entry level performance in a *zone of competence*. May be termed giftedness.

inorganic - not of the body

inorganic talent - postdetermined ability (developed) which results in high level performance in a *zone of competence*. May be termed talent development.

talent - inorganic behaviour (not of the body in its genesis) by way of expert or eminent performance in a *zone of competence* and developed by deliberate practice, vicarious or direct experience. Only those baseline competencies that are the subject of modification by incidental, deliberate or vicarious means and resulting in expert or eminent performance are termed talents in this approach. Talent in this study is viewed more as the creation of a specific supportive environment and being able to use the technologies and circumstances of that environment to fully express phenotype than actually to carry out a singular expert task within that environment.

talented - attribute ascribed to an individual performing at a high level in the age or endeavour grouping.

talent development - the process of making the performance of individuals better.

gift - the possession of an organic potential to perform a task or tasks at a high entry level in the *zone of competence* by way of genetically determined ability i.e. the task requirements are approximated without extensive deliberate practice or exposure by virtue of genetic inheritance which allows a close approximation of performance to the required modalities of the task or tasks at a specific level.

gifted - attribute ascribed to the individual possessing the potential for entry into a *zone of competence* at a level at the highest end of the singular age or endeavour grouping.

giftedness - *organic* (of the body in its genesis) behaviour usually evidenced as undeveloped performance at a level of expertise considerably in advance of the peer group. A possessed ability

deliberate practice - the term used by Ericsson, Krampe and Tesch-Romer (1993) to describe an organised, systematic and deliberate process of developing expertise. One way of developing talent.

classical/mechanistic theory - for every part of physical reality there is a corresponding part in the theory; cause - effect; 1:1 match

quanta - an amount (of energy)

quantum theory - a comprehensive set of ideas and principles based on the notion that energy is *indivisible*. In this study the notion that an individual's life path describes an indivisible pattern of development. It should be noted here that the pattern is what is considered as indivisible, not the events and phenomena within the pattern.

quantum analysis - describes the overall behaviour and predicts the *probabilities and connections* of individual behaviour.

quantum notions - considerations and concepts of quantum processes as used in this study.

causal events - things that happen that have obvious connection with something preceding - usually a 1:1 relationship

a-causal events - things that happen that seem to be unconnected - chance, coincidence or luck. Sometimes a 1:1 relationship, but can also be a 1:many; many:1; or many:many relationship.

non-local effect - different parts of a quantum system appear to influence each other even when a large distance apart in space or time and even when there is no evident connection between the two; an influence removed from the event under scrutiny. Action at a distance eg. gravity; observing a meteor on the outer reaches of the galaxy heading towards Earth on a collision course and taking action.

talent development - describes the process of increasing performance level within the zone of competence

entry level - the point at which the individual enters the zone of competence

developmental path - the trajectory of the individual's life path progression