

Achieving Australia
As an inclusive learning society

Why we can't and therefore how we can, given that we can't

An evolutionary psychological perspective

Abstract:

There is ample reason why Australia needs to engage in lifelong learning. The case for doing so is eloquently stated by Peter Kearns (2005) who offers suggestions as to how this needs to be achieved in the future. The lifelong learning debate is more frequently embedded in a normative discussion rather than in a descriptive one. In other words, the adult learning literature more frequently talks about what needs to happen and why, as opposed to understanding the blockages to that happening. Based on the premise that we cannot manage what we do not understand, this paper offers an evolutionary psychological perspective on some of the reasons why lifelong learning is not adopted at the pace its proponents might wish. It concludes by suggesting some microbehaviours that will enable a learning culture.

Introduction:

According to Kearns (2005) there are five key dimensions that need addressing in building Australia as an inclusive learning society. These are:

- empowering individuals as motivated and lifelong learners,
- sustaining and transforming communities through learning,
- using technology to extend learning and to transform the way we learn,
- developing the workplace as a key learning environment to underpin economic objectives,

- extending and connecting partnerships and networks to build Australia as an inclusive learning society.

The purpose of this paper is to offer the adult learning community some perspectives from evolutionary psychology and related disciplines. Evolutionary psychology is a relatively young discipline, tracing its origins to Charles Darwin. The contemporary evolutionary psychological literature is commonly pitched at understanding the dynamics within relationships, such as mate selection, kin altruism, etc (Buss, 1999). The discipline has broader application, for example to the field of management (Nicholson, 1998, Plowman, 2005) though very little work has been done. This 'left field' approach to lifelong learning might seem a little unorthodox, as indeed it is. The theoretical exploration which follows is eclectic, spanning a range of diverse literatures. As Barkow, Cosmides and Tooby (1992) argued, conceptual integration permits powerful growth in knowledge because it allows investigators to draw on ideas from outside of their discipline to solve problems within it.

Evolutionary psychology asks the questions — "What is the adaptive function of this psychological mechanism? What evolutionary problem was it designed to overcome?" (Buss, 1995:84). As Pinker (1997) explained, evolutionary psychology is a form of reverse engineering. In 'forward' engineering, one designs a machine to do something. In reverse engineering, one examines the machine to see what it was designed to do. Particularly importantly, evolutionary psychology explains why we are the way we are, not at the surface level of presenting behaviour or obvious dispositional characteristics (the stuff of conventional management), but at the deeper unconscious evolutionary level where the entrenched motives are critical for species survival (Wright, 1995). As Nicholson (1998) argued, by making the unconscious explicit, evolutionary psychology provides management with a framework for understanding behaviours in the present that are rooted in the past.

Each of Kearns' five dimensions will be commented on in turn from an evolutionary psychological perspective and policy recommendations offered. At first glance a reader might perceive my comments to be negative. This is not the intent. Rather the intent is

to provide some insights into the nature of our target audience, namely people, and their capacity individually or collectively to embrace the concept of lifelong learning.

At the outset, I acknowledge that I'm an 'outsider' to the literature and to the institutions with which members of the adult learning community are familiar. Therefore all of what follows is tentative and it is left to the sophisticated reader to determine the merits of these ideas within an adult-learning context. Having said that, I might reasonably qualify as a lifelong learner, having spent 30 of my adult years in full and part-time study at both a college and university level. Further, I've taught in both TAFE and university settings and spent nearly two decades in personal development and staff development roles.

Empowering individuals as motivated life-long learners.

The central feature of an inclusive learning society is that all citizens will be empowered and enabled as self-directed learners to have the motivation and capability to continue learning and developing throughout life. (Kearns, 2005:iii)

If governments and their agencies are to put mechanisms in place to foster such a society, it is worthwhile examining whether the aim is, in fact, achievable.

Human beings are small-tribe animals. For over 100,000 years we have roamed the earth in small bands of hunter-gatherers. The characteristics that we possess today are the characteristics that equip us best to be effective hunter-gathers. Though humans settled into more agrarian and urban lifestyles in the last 10,000 years, that period of time is far too short for evolution, through natural selection, to have changed any of our characteristics (Nicholson 1998).

The secret of natural selection is to avoid extinction. Any ancestral characteristic that did not aid survival was not transferred to offspring. Conversely, only those characteristics that favoured survival are retained (Buss, 1995; Miller, E.M., 1997). As a result, all human beings possess only a very small variation in genetic characteristics.

Though human similarities are obvious when pointed out, those similarities are largely invisible, since they are not salient. Differences are far more salient and interesting. And those differences are important in aiding human survival. More specifically, for this paper, those differences impact upon an individual's willingness or ability to learn. Comment on those differences is offered as a contribution to the conversation on lifelong learning.

(i) Sources of Individual Difference.

What causes us to behave the way we do? Is our behaviour really an act of free choice?

For years psychologists have debated whether human behaviour is something we are born with or something we acquire. It is often called the "nature/nurture" debate. Perhaps that debate is limited. Perhaps there are other sources of behaviour as well.

Evolutionary psychologists, such as Buss (1995), have suggested behaviour is guided by genetic, ontogenetic, and contemporary contexts. The genetic context provides humans, at birth, with a range of possible 'hard-wired' survival options; the ontogenetic or developmental experience selects from those options and then embeds, in a person's formative years, characteristics optimal for both survival and differentiation.

Subsequently, the contemporary context provides triggers or inhibitors for resultant behaviours. Thus, evolutionary psychology is an integrated and integrating combination of genetic, ontogenetic and contemporary determinism (Caporael & Brewer, 1995). In addition, I suggest there is a fourth determinant of behaviour. Sometimes it is accidental; sometimes it is deliberate. It is called creativity, the well-spring of innovation and adaptation.

(a) the contribution of genetics to individual differences.

The first determinant of our behaviour is genetics, which manifests as "instinct". It is an inheritance that predisposes us to behave in particular ways. This is the "nature" side of

the nature/nurture argument. “I am the way I am because I was born this way and, given that is the way I’m hard-wired, there is nothing that can be done to change my behaviour.” (If this argument was totally true, I would not try to learn anything. I either have natural ability or I do not). Perhaps it is partially true. Genetic predispositions in behaviour can be demonstrated by the nest-building practices of birds and the web-spinning of spiders. This is not behaviour that they have to learn. It is instinct. They have no choice. Each species of bird has only one nest design, each species of spider only one web design. Should the environment shift so that those hard-wired behaviours are precluded, alternate behaviours are not available. Hence that organism and its species might die out.

Prewiring can also be demonstrated in the human species by psychological differences between men and women. Women, on average, have greater oral ability. Men, on average, have higher spatial ability and are more competitive. On these characteristics, the human species has no choice. This is the way we are prewired; we did not need to ‘learn’ these attributes. The fact that humans are, perhaps more than any other species, highly adaptable to environmental changes suggests that we are not captive to genetic influences alone.

Human personality (how we prefer to act) is up to 50% genetically determined (Plomin & Daniels, 1987). And our genetic inheritance is a lottery. Half our genes come from each of our parents. However, which half comes from each is a lottery and the consequences of their combination is also a lottery.

Unlike birds, spiders, and other animals, human beings have choice over some behaviours, though how much choice is a matter of debate. In some areas of human behaviour, such as reproduction, the prewiring influence is very high (after all, our physiology is relatively fixed). In other areas of human behaviour, such as in occupational activity, the prewiring influence may be lower. Below the immediately visible surface of human activity however, the prewiring influence is very strong.

The challenge here for the adult learner and lifelong learning proponent may be to identify the dimensions of genetic variability that may impact on the individual's interest in or ability to participate in learning opportunities. Intelligence would be one of those dimensions. Gender differences would be another.

(b) the contribution of ontogenetics to individual differences

It is axiomatic of evolutionary theory that species success is the avoidance of extinction. Random adverse conditions can threaten an organism, and any phenotype (a representative of a species that differs slightly from others of the same species) that does not survive these adverse conditions disappears. Hence, a successful organism will produce offspring with phenotypic differences, suited to a broad range of possible conditions. Some plants exhibit what botanists call 'somatic polymorphism', in which plants produce seeds of different types. In some cases, a single plant may produce seeds that require either pre-heating by fire for germination or for which moisture alone is sufficient. Other plants produce some seeds which are winged and designed to be blown away, and other seeds that drop but remain dormant for long periods. Even under apparently unfavourable conditions one of the two seed types may survive (Miller, 1997).

Rodents also produce diversity within a litter. Not all the litter are equal in size or strength. The larger, more aggressive mice wish to remain in the territory where they were born since that territory has already proven its capacity to shelter and feed the mother. The less aggressive sibling mice tend to be driven away, to find new territories that are more problematic. Yet this duality of offspring strategies is insurance to the genetic interests of the mother (not her offspring). In the long run this diversification strategy has out-survived other strategies (Miller, 1997).

Humans, more so than other mammals, are born with the central nervous system only partially developed (Pinker, 1997). The purpose of this neural plasticity is to assist the organism in more appropriately adapting, during its so-called formative years, to the environment within which it finds itself. Plomin and Daniels (1987) maintained that families are vehicles for ensuring the survival of parents' genes through systematically diverse offspring. I contend that this systematic diversity becomes embedded during

formative years. Different structural characteristics of the environment impose different adaptive problems, the solutions to which will produce phenotypes (variations within the same genotype) that tend to match the environmental characteristics (Gangestad, 1995). This adaptation is also called co-evolution; as the environment changes, so does the organism. It can be clearly demonstrated in the imprinting of infant animals upon a human carer. Since human siblings share a genetic inheritance and geographic space, potentially leading to competition, within-family strategies of differentiation and co-operation have evolved to reduce that competition.

While genetic differences undoubtedly contribute to phenotype variation, the non-shared environment (NSE) of siblings plays a critical role over and above genetics. This is because no two siblings share an identical perception or experience of their world (Miller, 1997; Plomin & Daniels, 1987). Even monozygotic twins, genetically identical and occupying the same temporal/developmental environment, are differentiated phenotypically (Plomin & Daniels, 1987; Sulloway, 1995). Though phenotypic differences are often physical (height, hair colouring, etc.), the differences that are of interest to this paper are dispositional. Siblings are each dependent on parents and they compete with each other for scarce and limited parental investment (Sulloway, 1996, 2001). In order to attract that scarce parental investment and to reduce direct competition with each other, siblings differentiate (Miller, 1997). This is a strategy of learning to survive. Not only do siblings differentiate within families, the manner in which they do so creates patterns of similarity across families. In other words, siblings in different families differentiate themselves dispositionally in similar manner (Sulloway, 1995, 1996, 2001; Paulhus, Trapnell, & Chen, 1999).

Placing this research into the context of this paper, at its most fundamental level, learning is the acquisition of attributes, knowledge and skill by an organism that will consciously or unconsciously help that organism grasp opportunities and avoid threats and thereby continue species survival. Learning is not a passive endeavour; it requires the organism to do something. That 'something' is a behaviour or behaviours that benefit the organism through improving the quality of 'fit' between organism and environment.

It is argued that while the first determinant of this beneficial behaviour is genetic, the second is ontogenetic (formative) and is a niche differentiation strategy played out by offspring in the interests of parents' genes. The resulting individual differences are learned in our formative years from our experiences with siblings, with parents or with guardians. A child arrives in the world wishing to survive. It quickly realizes that resources for that survival come from parents and so the child discovers through trial and error what strategies will maximize those resources. Further, the child needs to establish for itself an ecological niche, one in which it is differentiated from others also competing for resources. The greatest competitors for resources in a child's life are its parents and its siblings. Growing up in the same family does not make children similar; it makes them different. Dispositional differences between children in the one family are as great as between any children chosen at random. Up to 45 % of personality is attributable to environment and 80 to 90% of that is attributed to non-shared within-family influences (Plomin & Daniels, 1987). It is sibling perceptions that are important and perceived differences may be very subtle. The strategies adopted for survival aim to differentiate and hence protect the ecological niche. These strategies may be the origin of motives.

Motives underpin the 'why' of behaviour. They explain *why* we do what we do, whilst personality traits are believed to describe the *how*. The former are largely unconscious. Three social motives that have been most extensively studied are *need for affiliation*, *need for achievement*, and *need for power* (McClelland, 1987). However examination of these social motives does not appear to have found its way into the literature on life long learning. As Gorard and Rees (2002) observe:

Questions of individual motivation ... are underexplored; and have generally been confined to research involving those who do take part in education and training of some kind, rather than considering those who do not. (p.17)

As Harrison (1993) observed, a disposition to learn (or not) may therefore be the most relevant determinant of lifelong learning, and yet is the most underestimated by survey methodology. Hence the contribution this paper makes.

Eldest children are more conscientious and seek parental favour through acting as surrogate parents toward younger siblings. They are more responsible, conservative, and defensive (Sulloway, 1996). The firstborn arrives in the world needing to survive and recognizes that its resource needs are being met primarily by parents. It seeks, through trial and error, to maximize resource acquisition strategies, thereby obtaining 100% of whatever parental investment is available. When a younger sibling arrives, available parental investment drops significantly, without warning. This creates anxiety in the young child who explores strategies to try to reclaim the lost resources and to restrengthen the probability of its own survival. The chosen anxiety-reducing strategy is to try to regain parental attention through taking responsibility and seeking to position itself advantageously in the resource flow. *"I'll be safe if I do what is expected of me and/or if I can control the resources."* From this strategy it is possible to see the *need for power* and/or the *need for achievement via conformity* emerging.

These individual differences have implications for lifelong learning. On average the oldest child, driven by achievement via conformity, attains the highest level of formal education. However, also being the most conservative, their desire is to retain what was rather than realize what could be. This may place a limit on any interest in lifelong learning. Those driven primarily by need for power have a political orientation. 'Who you know', not 'what you know' is what drives their agenda. Therefore formal education holds no primary intrinsic attraction though it can be a means to a political end. At an informal level, people with a high need for power will respond positively to favourable feedback, since it illustrates they have impressed another. However, negative feedback is not welcome at all, thereby reducing the potential of those driven by need for power to learn.

Middle children have broader interests, have lower self-esteem and tend to be more independent, innovative, risk tolerant, rebellious and open to experience (Kennedy, 1989; Kidwell, 1982). Middleborns also need to maximize resource flow to them. Middleborns have competition firstly from older sibling(s) who are stronger, more articulate and more

assertive and later from younger siblings who are more "cuddly" and charming. To attract those resources, middle children frequently adopt a strategy of differentiation through interests and pursuits. For example, if the firstborn shows academic inclinations, the middleborn will show interests in other directions. He or she attempts to build self-esteem and reduce anxiety through independence, rebelliousness, risk-taking, innovation and personal endeavour. *"I feel safe if I can prove my own competence and independence"*. This strategy might convert to the motive of *need for achievement by independence*.

The learning implications are that people driven by a need for achievement via independence will more likely pursue informal and practical streams of learning through entrepreneurship, through travel and through other forms of informal active experimentation. They tend to be curious, to explore and to experiment. People with a high need for achievement seek out feedback, be it good or bad, since they recognize the learning benefits of doing so.

Research into the 23 major shifts in scientific thinking between the 15th and 20th Centuries revealed that those who were the keepers of the prevailing wisdom were overwhelmingly the oldest in their families whilst those with the temerity to challenge them and create new wisdom were overwhelmingly laterborns. The statistical probability of this finding being a fluke, given the database of 3,800 scientists, is less than a billion to one!! (Sulloway, 1996). It is the role of the oldest to protect the status quo while it is the role of younger siblings to explore, challenge and invent the new.

Youngest siblings are described as less ambitious, less conscientious, and more socially oriented. They are sometimes described as popular, easy going, lazy or spoiled. Lastborns often enjoy considerable parental investment, though without the burden of parental expectation of 'success' (which is placed on firstborns) (Pinker, 1997). They also enjoy considerable support from older siblings, though this attention is often ambivalent. Sometimes the lastborn is feted and cuddled like the family pet; at other times told by its older siblings that it is a nuisance and to 'go back to mum'. It is quite possible that

lastborns intuitively know, through their 'genetic memories' that, throughout history, in times of severe resource shortage, infant mortality is highest in lastborns. This 'genetic knowledge' might result in the youngest child developing excellent social skills to ensure it continues to be included. *"I feel safe if I can be loved"*. Hence the lastborn's anxiety is fear of rejection, a significant subconstruct of need for affiliation (McClelland, Koestner & Weinberger, 1992).

Our research (Plowman, Ashkanasy, Gardner & Letts, 2004) showed an inverse relationship between the strength of need for affiliation and formal levels of education obtained. With a primary need for friendship and acceptance, academic pursuits do not service that need. Need for affiliation can, however, foster learning when such learning occurs in a social group.

Recent research (Plowman, 2005) has demonstrated that motives have their origins in formative years and are one of the mechanisms developed to differentiate between siblings and to help claim a unique ecological niche. For example, the need for power, the desire for status, for control and for influence over others, is most common in firstborns; the need for achievement via conformity is most common in first borns; the need for achievement via independence is most common in middleborns; while the need for affiliation is more common in lastborns. And, yes, there are exceptions. However, in any family of siblings, what is universally true is that no two siblings occupy the same ecological niche. They must differentiate from each other, in terms of motives, personality and other attributes, in order to get out of childhood alive.

These ontogenetic behaviours, embedded in our formative years commonly as a strategy for niche differentiation, are generally unconscious and are also highly resistant to more recent influences. Further, the research suggests they are enduring, being evident throughout adulthood.

I'm not suggesting here that there is an invariant relationship between birth order and motives that has an impact upon learning. Life is far more complex than that. Though

my research (Plowman, 2005) did support the relationships described above, there are lots of exceptions to these patterns. The key point is that siblings each occupy a separate ecological niche in order to reduce sibling competition for scarce parental resources. The resulting individual differences are stable and life-long. And those differences have implications for learning.

Recognizing the value of need for achievement as a driver of learning, psychologists and sponsor governments have invested heavily in courses, particularly in underprivileged environments, designed to teach adults how to think and act as though strongly driven by the achievement motive, (McClelland, 1987). Results were mixed. Positive benefits tended not to sustain except in the case of those participants who were in charge of their own businesses. In other words, they were entrepreneurs already possessed of a need for achievement. So the training was effective in enhancing behavioural attributes to which the participant was already predisposed. It was not effective in enhancing behavioural attributes of those who were managers in someone else's business. It would appear that learning was enhanced for those with a need for achievement, though not for those driven by other motives.

The literature is silent on the average percentage of people falling into each of the three motive preferences. Yet McClelland (1987) reports on a study that examined the themes of folksongs and folk tales, ancient and modern, with the assumptions that the enduring nature of these songs and stories would signal that they were reflecting the populations to which they appealed. Need for power was the most frequent theme, closely followed by need for affiliation. Need for achievement occurred 7 times less !! This suggests, and this thought is supported by my earlier arguments on motives, that most people, most of the time, may not be interested in achieving anything beyond being socially accepted and holding a position in a social hierarchy. The implications for those facilitating learning are that making their product or service available is no incentive for people to acquire it.

One research finding that picks up this point is worth exploring. Gorard and Rees (2002) examined the highest educational qualification of parents and their children. They were

puzzled by the observation that the frequency of each level of qualification is higher among children than their parents, but despite this growth in qualifications, more children have the same or lower level of qualifications as their parents than do not. As the researchers state: *There is clearly some form of family relationship here* (p. 67). Two factors might explain this result. The first is regression to the mean; the second is the variability among offspring in pursuit of academic qualifications. Just because one or both parents have obtained a level of academic qualifications does not mean that all of their offspring will be motivated to do likewise.

Plowman (2005) invited 379 siblings, each one of a family of three, and with a mean age of 40, to provide free response adjectives that clearly differentiated each respondent from the other two siblings. Table 1 shows the self-descriptions. Table 2 shows the descriptions provided by the other two siblings. Though this research did not address the question of lifelong learning, the reader is invited to consider the possibilities of those differences for lifelong learning, given these descriptions. Note that the different number of adjectives in each column is reflective of the number of respondents in each birth order. The highest proportion were first borns (conscientious) and the lowest proportion were last borns (lazy).

Table 1: Self-report adjectives that differentiated between siblings

Firsts	Middles	Lasts
Academic	Creative	Adventurous
Bossy	Organized	Quiet
Caring	Outgoing	
Conscientious	Responsible	
Empathetic		
Friendly		
Leader		
Shy		

Table 2: Sibling-report adjectives that differentiated between siblings

First	Middle	Last
Caring	Capable	Carefree
Conservative	Generous	Creative
Dominant	Independent	Easy-going
Outgoing	Introvert	Energetic
Sporty	Quiet	Focused
Uptight	Unreliable	Gentle
		Laid-back/lazy
		Loud
		Resourceful
		Self-centred/selfish
		Strong-willed/stubborn

My personal awareness of the influence of my formative years is to experience myself, in my mature years, acting like my father, using mannerisms that are clearly my father's, and adopting utterances that are outside my more frequent language - all these occur without any deliberate intention on my part. In fact, I'm often surprised when I experience these behaviours occurring. Enduring beliefs and ideologies are often established in these formative years. As the Jesuit Church is reputed to say: "Give us your child for the first seven years, and he/she is ours for life."

Whilst the importance of motives to individual differences to lifelong learning may not figure prominently in the literature, the importance of formative years certainly does. In their research into patterns of lifelong learning among three participating regions in Wales, UK, Gorard and Rees (2002) found that characteristics that are set very early in an individual's life, such as age, gender, and family background, predict later 'lifelong learning trajectories' with 75% accuracy.

Returning to the broader topic of individual differences developed in formative years, the challenge for learning proponents, particularly those responsible for policy formulation and for service provision is to accommodate these differences and to be more modest in the take-up expectancy.

(c) the contribution of contemporary society to individual differences

The third of the four determinants of our behaviour is the contemporary society in which each of us finds ourselves. People seem to quickly pick up social mannerisms such as accents and gestures when they relocate between countries or cultures. It is a case of the unconscious application of the maxim "When in Rome, do as the Romans do." Accents are a very obvious example. We acquire them unconsciously in order to fit in. The need for acceptance, for belonging, for not being too different (in other words the need for "affiliation") is prewired within us, probably strongly influencing the second and third determinants of behaviour.

Similarly our oral communication is underpinned by our prewired need to communicate between members of our species; our introversion or extraversion, coupled with the language we speak, is influenced by our formative years; yet our ideographic language is contemporary, constantly changing in subtle ways.

Behaviours influenced by contemporary society are quite malleable. Our adaptability as a human species attests to that.

The influences of contemporary society on interest in lifelong learning are adequately documented elsewhere. The work of Gorard and Rees (2002) is particularly valuable in that it explores the influences that inhibit participation as well as those that enhance it.

People's decisions as to whether they participate or not in adult education or training are crucially shaped by the opportunities that are available to them; the ways in which they understand those opportunities and their relationships to them; and the resources

(individual, familial, and community) on which they can draw in accessing these opportunities. (p. 31)

(d) the contribution of creativity to individual differences

The fourth determinant of our behaviour is accident, imagination, creativity or innovation - the ability to imagine, construct or do something hitherto unknown, at least to us. Although the bounds of our creativity, the range within which our creativity can occur, are limited by prewiring, by formative years and by contemporary society (technology, for example) we'll never know what those bounds are until we push them.

Behaviours based on the fourth determinant are very fragile. Witness the extent, in normal discourse, to which suggestions are tentative and easily dissuaded. The conservatism of the human species (anchored to prewiring, formative years, and contemporary society) attests to the extent to which creativity is not a strong behavioural determinant.

Yet it might be argued that all learning ultimately fits into this fourth determinant, doing or thinking something hitherto unknown. Therefore all learning might be regarded as an act of heresy and sedition since it challenges the status quo. And the conservative forces of the status quo, embedded in genes, in formative years, and in contemporary society are strong indeed.

There is nothing more difficult to plan, more doubtful of success, nor more dangerous to manage than the creation of a new order of things.....Whenever his enemies have the ability to attack the innovator, they do so with the passion of partisans, while the other defends him sluggishly, so that the innovator and his party alike are vulnerable.

Niccolo Machiavelli (1490), *The Prince*.

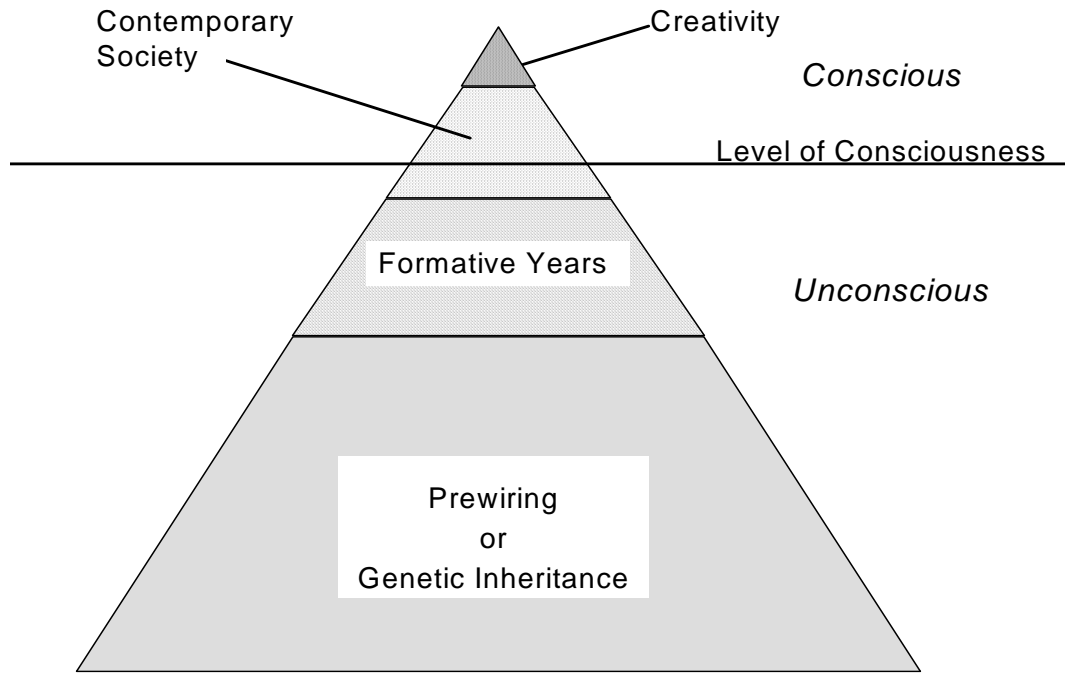
(e) in partial summary

It is suggested that our behaviour and our capacity to learn are influenced by our prewiring, by our formative years, by the behaviour of those around us which we model, and by our creativity or new experience. The former have a much greater influence on our behaviour than the latter and are more deeply ingrained.

Though there is considerable debate about the relativity of influence, the literature suggests that up to 50% of variability of personality is genetic, and that up to 45% of variability of personality is a product of the environmental influences in our formative years, and the bulk of that occurs within the family (Plomin & Daniels, 1987). Contrary to parental folk law, the influence of parenting practices on individual differences is very small while the perceptual differences of children in relation to siblings is a major contributor to personality (Sulloway, 1996). Note that both of these determinants are largely unconscious. In contrast the influence of contemporary society on personality and behaviour is perhaps 5 to 15% at best. The influence of creativity or new experience is small indeed, perhaps less than 1%.

The reader will correctly observe that all four determinants of behaviour are not independent of each other. My own prewiring will shape what I can experience in my formative years. It will also shape how others might influence me. The same applies to the influence of both prewiring and formative years upon my contemporary behaviour. Second order effects will impact on all but the first determinant. This observation strengthens the primary point, namely the enormous significance played by prewiring and formative years in shaping behaviour, yet it is largely outside consciousness. It is my personal view that the significance of prewiring and formative years on individual and organisational behaviour is largely unrecognised, yet its presence renders impotent much individual and organisational endeavour, including promotion of learning opportunities. Figure 1 illustrates the relationships between the four determinants.

Figure 1: Genetic, ontogenetic, contemporary and creative determinism



The argument being put here is that there are individual differences in readiness and capacity to learn. Most of these influences are unconscious. Further a learning event, new and original for the organism, will only be feasible if consistent with the influences of the other determinants. Table 3 illustrates examples of alignment or otherwise and the likelihood that a learning event will convert to new beliefs or behaviours.

Table 3: How alignment of the four determinants can enable or inhibit learning.

	Prewiring	Formative	Contemporary	New	Learning Consequence
Case 1	X	X	X	X	Likely
Case 2	X	X	X	Y	Fragile/unlikely
Case 3	X	X	Y	Y	Possible
Case 4	X	X		Y	Disbelief
Case 5	X	Y	Y	Y	Struggle
Case 6			Y	Y	Possible

To illustrate, learning to use a mobile phone is supported by a natural human predisposition to communicate (genetics), learning to communicate as a child (formative), seeing other people using mobile phones (contemporary), and discovering for one's self the benefits (new). In contrast, learning to be peaceful in the Middle East is mediated against by the predisposition of young males to run in packs, to be aggressive, and to desire revenge (genetics), childhood experiences of civil mayhem (formative), adult experiences of civil mayhem (contemporary). In this context the voice of the pacifist is indeed frail. Learning to make peace is very problematic given the other three determinants stacked against it.

(ii) Phases of Life Approach

Kearns (2005) refers to the phases of life approach adopted by the German Strategy for Lifelong Learning. This approach is to be applauded and adds to the complexity of engaging the individual in life long learning. Generalized intelligence and its two forms – crystallized and fluid - are relevant here (Horn & Noll, 1997). Fluid intelligence is the capacity to *learn* stuff; crystallized intelligence is the capacity to *know* stuff. Younger people have more of the former (the neural plasticity referred to earlier) and less of the latter; for older people it is the reverse. Therefore the older one is, the more one knows and the less one is able to learn. The technological divide illustrates what is also an age divide.

Note the contribution to individual differences being made here. Whilst the previous arguments on four determinants, including motive differences/sibling differences, relate to individual differences *between* people, the point about generalized intelligence is that it relates to differences *within* people. Lifelong learning is unlikely to ever be linear, no matter how hard we might try.

Comment was made earlier that our species is believed to have existed for about 100,000 years. We have been agrarian for about 13,000 years and settled in villages and towns for less than 10,000 years, far too little time for our psychology to have evolved beyond that of small tribe hunter gatherers. For most of human existence, the environment within

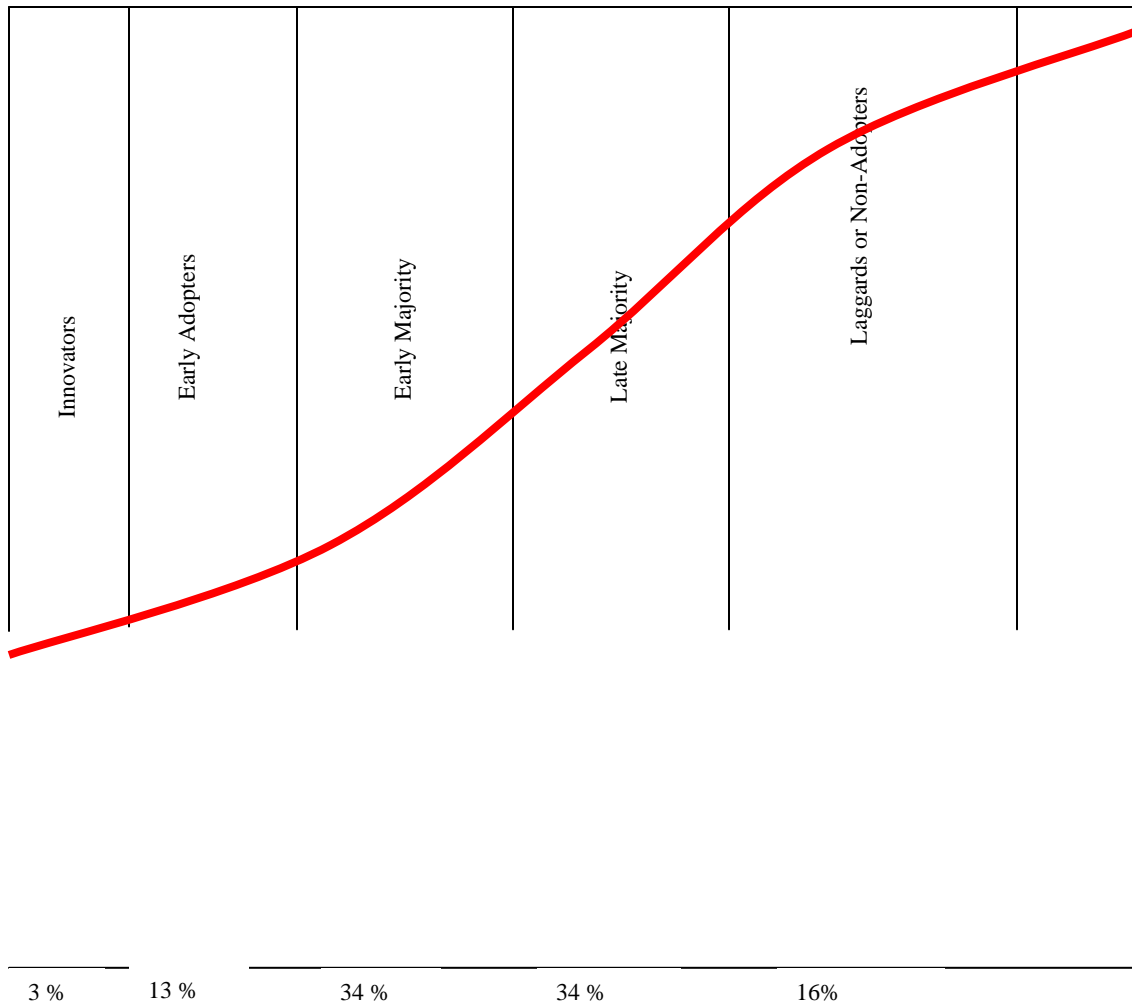
which we lived was stable. The wisdom of the elders enabled the tribe to survive. Hence children need the capacity to learn stuff and adults the capacity to know stuff, since, in a stable environment, the stuff one learned as a child sufficed throughout adulthood.

Learning anything else was unnecessary. As a result we are, on average, a conservative species, instinctively deferring to the wisdom of the elders. This instinct kept the species alive. However, this instinctive conservative behaviour becomes less valuable when the environment within which we live is less stable and the wisdom of the elders may be less relevant. And this increasing pace of change provides the imperative for lifelong learning, despite that change impacting on a species hardwired to be incapable, for most of us, of retaining our fluid intelligence throughout adulthood at the same rate as we could in childhood.

(iii) The Adaptation Curve

Further insights as to individual differences in learning are provided by Rogers (1995). The agricultural/cooperative extension literature has, for over half a century, shown an interest in why some people take up a new idea while others do not. Rogers' work demonstrated, on what he called the Adaptation Curve (see Figure 2), that some people were more inclined to learn and some people less so. Further his empirical work indicated the sort of learning approaches that worked for a particular demographic, though not for another.

Figure2: The Adaptation Curve



Segments within the Adaptation Curve, sometimes called the Adoption Curve, are as follows:

1. Innovators. Comprising approximately 3% of the population, the innovators don't mind taking what others might perceive as a risk, and are the first to create or adopt. Innovators tend to be individualists, often, though not necessarily, young and well educated. They are likely to be mobile and sophisticated - with many contacts outside their local social group and community. They are also able to

understand and apply complex technical information. Achievement via independence would be their motive.

For learning purposes, an important characteristic of innovators is that they rely on impersonal and scientific information sources - or other innovators - rather than on personal salespeople. They often read articles in technical publications, or in special interest magazines or newspapers.

Rather than 'buy' a whole idea, product or service, innovators are likely to 'buy' component parts so that they obtain the satisfaction of creating the whole. That 'whole' is often their own idea which they bring to fruition from a number of previously unassociated parts. It is this sense of creativity that gives them their satisfaction, a satisfaction that they often have no need to share with others.

2. Early Adopters. Comprising approximately 13% of the population, the early adopters are often high in confidence and they are commonly opinion leaders, respected by their peers. Part of the 'establishment', they tend to be younger, more mobile, and more creative than others on the adaptation curve. Unlike the innovators, they may have fewer contacts outside their own social group or community.

This group tends to be responsive to a personal sales pitch. They are also responsive to mass media. The reward for the early adopters is admiration of their peers for being "me first."

Early adopters are probably the only group that do not shun the innovators. They recognize that innovators are different, but they also recognize that the innovators can provide them, the early adopters, with ideas they can capitalize on to improve their social and financial status. Successful operators, their motive preference is likely to be need for achievement and/or need for power.

3. The Early Majority. Comprising about 34% of the population, the early majority avoids risks and waits to consider a new idea after many early adopters have tried it – and liked it. They watch the experiences of the early adopters – and ask for their advice. Whether or not this group “buy” is the measure of success of a product or service.

The early majority learn through seeking lots of purchase information. They have considerable contact with the mass-media, sales-people and early adoption opinion leaders. They interact regularly with their peers but usually are not opinion leaders. The reward for the early majority is “me too”. Their motive preference is likely to be achievement via conformity.

4. The Late Majority. This segment also comprises about 34% of the population. They are sceptical and cautious about new ideas. They are often older than the early majority group – and more set in their ways. So they are less likely to follow opinion leaders and early adopters. “Keeping up with the Joneses” is not important to them. In fact, strong social pressure from their own peer group may be needed before they take up a new idea.

The late majority make little use of marketing sources of information. They tend to learn more from other late adopters, rather than from sources they don't trust. Their motive preferences are not particularly strong but would include a sizeable proportion with need for affiliation.

5. Laggards or Non-Adopters. Comprising about 16% of the population, the laggards or non-adopters prefer to do things the way they have been done in the past – and are very suspicious of new ideas. They tend to be older and less well-educated. They may also be low in social status and income. Often socially isolated, they do not look to others for opinions or ideas. Their main source of information is others similar to themselves. They are likely to score low on all of the three motives.

For providers of learning services, there is little to be gained from trying to reach this group. Far greater returns are to be gained from pitching the lifelong learning message to those earlier along the adoption curve.

Rogers' research provides clear messages for proponents of lifelong learning. People who become aware of knowledge and learning opportunities early tend to be more cosmopolitan, have greater social networks, more technological sophistication, higher levels of education, higher socioeconomic status, and more exposure to the mass media. Reaching them is not difficult. The challenge is how to use this group as facilitators of learning for those further down the adaptation curve, because the latter are not responsive to the same approaches as the former.

Recommendation: Individual differences between and within people impact considerably on their interest in and capacity to embrace lifelong learning. It is recommended that policy makers factor in these individual differences and develop a market segmentation approach to the promotion of lifelong learning. Like the medical triage model, some people will seek out lifelong learning without help; others will not show interest no matter how much encouragement is given. It is to the group in between that effort can most productively be focused.

Sustaining and transforming communities through learning

Gorard and Rees (2002) recognized the importance of mobility in participation of lifelong learning. They found a positive relationship between mobility (moving into a particular location) and participation in lifelong learning. This is not to suggest that correlation is causation.

Research into innovation in country towns (Plowman, Ashkanasy, Gardner & Letts, 2003) provided some interesting insights into biographical and psychological differences. All people have mobility choices – to move towards a location that is attractive, to stay in

a location that is attractive, or to move away from a location that is unattractive. The question is: 'Who moves? Who Doesn't? and Why?'

Mobility is not random. Those who move tend to be younger, have higher levels of education, broader social networks, a higher need for achievement, and a lower fear of failure. They would probably slot quite comfortably into the 'Innovator' and 'Early Adopter' categories of Rogers' (1995) adaptation curve. As a result, towns with net inflows have more vitality and innovation. Conversely, towns with net outflows are losing the very creative talent that they seek and which often lies unheralded in their midst. As a result less innovative towns become increasingly conservative monocultures, uninterested in their own learning. The implications for providers of lifelong learning services are obvious. Communities with net outflows will have a much slower take-up of lifelong learning than will communities with net inflows.

As part of this particular research, 300 randomly selected citizens in each of the eight participating towns were invited to complete a questionnaire. One of the questions asked respondents if others in their town would regard them (a) as a community leader, (b) somebody with knowledge and expertise that could be called upon if required, or (c) a support person. Surprisingly, the least innovative towns reported the highest number of leaders! The most innovative town reported almost none! It had the majority of respondents in the second group.

Survey responses were then examined on the basis of these self-reported social roles. Not surprisingly, those who reported being perceived as leaders also scored highest on the need for power. Need for power in leaders has been shown to inhibit creativity and innovation in followers, thereby reducing the communities' capacity to learn.

Recommendation: There is a likely strong positive correlation between inward mobility and interest in lifelong learning. Resources invested in the facilitation of lifelong learning in communities that are growing will provide a much greater return than will investment in communities that are static or in decline.

Using technology to extend learning and to transform the way we learn

Research examining which regions and cities in the USA were thriving and which were dying (Florida, 2002) found, not surprisingly, that those which were thriving had net inflows. Like the research mentioned in the previous section, those who moved tended to include a high proportion of young professionals. They moved to a location that offered them a diversity of lifestyle interests, not to a location that offered them a job. In response, high tech industries followed the migration of these younger professionals, setting up where there was a desired labour pool. Florida's analysis of the characteristics necessary for a vital thriving learning community is summarized as the three T's: high on *talent* (education), high on *technology*, and high on *tolerance* for diversity. The cosmopolitan nature of such communities gave them the edge.

Interestingly, one of Florida's PhD students was interested in knowing where members of the gay community chose to live. Commonly they chose to live in those cosmopolitan, educated and technologically sophisticated communities that were thriving. Why? Because of the high level of tolerance for diversity those communities offered. Tolerance relates to openness, a prerequisite to learning.

The point made earlier about fluid and crystallised intelligence is particularly applicable here. The pace of technological change is greater than the pace of social change. Fluid intelligence aids the take-up of technology by younger people, leaving older people on the poorer side of the technological divide, struggling to keep up, even when they want to. Those born into a particular technology grow up with it as part of their environment and are referred to as 'digital natives', while those born before the advent of a particular technology and had to learn it as adults are referred to as 'digital immigrants'. In the same way that we are more fluent in our mother-tongue, digital natives are much more savvy than are the digital immigrants. Neural plasticity matters.

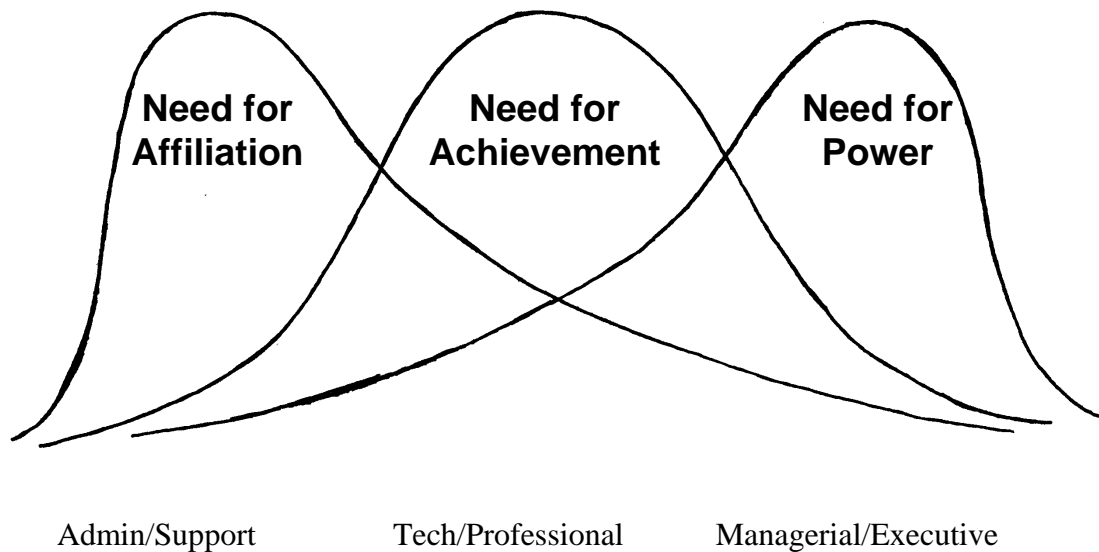
Recommendation: Technology-based learning delivery mechanisms will have a higher take up by digital natives than by digital immigrants. Therefore it is recommended that the delivery mechanism make allowances for the level of technological sophistication of the target audience.

Developing the workplace as a key learning environment to underpin economic objectives.

Kearns (2005) correctly advocates the workplace as an informal learning environment. Knowledge or skill can be acquired by individuals within the workplace, by groups of people or by the organization as a whole. However, there are a number of workplace dynamics that inhibit that learning potential. If the learning that Kearns and others rightly propose is to occur, these unconscious dynamics need to be recognized and managed.

First, there is a very clear relationship between ones preferred motive and one's subsequent occupational role. People in leadership and senior managerial roles, in teaching, and in senior academic roles are driven primarily by the need for power; people in technical professional roles are driven primarily by the need for achievement, while the need for affiliation defines those whose orientation is more towards support roles or the helping professions, such as nursing (Plowman, 2005; Stahl, 1985). The result is three separate clusters of people within the one organization, each 'marching to the beat of a different drum'. Figure 3 illustrates.

Figure 3: Motive distributions within an organization



Some interesting characteristics of Figure 3 are revealed through discourse analysis (Plowman, 2005). Those whose primary motive is need for *affiliation* and who are more commonly found in the admin/support ranks have language that tends to be subjective, typified by personal questions, and is represented by the pronoun 'we'. Those whose primary motive is need for *achievement* are commonly found in the technical/professional ranks. Their language tends to be objective, is a combination of questions and statements, and is represented by the pronoun 'it'. Those whose primary motive is need for *power* gravitate to supervisory/managerial/executive ranks. Their language tends to be subjective (though often disguised as objective). For example: "I was having lunch with the Prime Minister the other day and he was seeking my advice on". Utterances are largely statements and the representative pronoun is 'I'.

Here is an illustration of conservatism at play in organizational settings and explains why most organizations are extremely limited in their capacity to learn. Note that those driven by need for power, commonly populating the senior ranks, show a marked inability to ask questions. No questions mean no learning.

My research (Plowman, 2005) examined organizations in both public and private sectors. The research purported to be interested in organizational innovation (broadly the capacity to learn and adapt). Interviewees were drawn from the administrative support ranks, the technical professional ranks and the managerial executive ranks. Each person was asked to score the innovative dimensions of their organization against 16 questions. Scores were aggregated within interview cluster and across organizations. Respondents in the managerial executive ranks scored their organizations 27% higher than did those in the technical professional ranks!! Further, the former used *twice* the number of first-person pronouns as did the latter!! The managerial executive interviewees were clearly more subjective and more optimistic about the health of their organizations than were the technical/professional people. How this distortion thereby limits the organization's capacity to learn is obvious.

This behaviour is unconscious and limiting. Primates, operating in social groups, know how to operate co-operatively or hierarchically (Pierce & White, 1999). When resources are scarce, members of the troupe range widely. Whichever animal finds food indulges in it whilst calling for the others to join in. This sets up a relationship of mutual obligation and the system works because resource discovery is random. However, when resources are centralized and hence more certain (such as a tree laden with fruit; the corporate equivalent would be centralised budgets), the alpha male takes charge and the others all sort out their pecking order. Access to resources is determined by relative status, guaranteeing that all members get something, even if less than they might wish.

In such a hierarchical setting, driven by prewiring, the communication patterns are revealing. Frequent field experiments I have conducted reveal that, within hierarchies, there is a tendency to ask upward, tell downward; downward bullying is common, peer communication is unlikely (since rewards cannot come from peers, only from above), and external scanning is unnecessary. Development of competing 'silos' is common and rational, where those in another 'silo' are competitors for scarce resources only available from above. The function of these patterns of behaviour is to protect the status quo, a strategy that has served all primates, including mankind, well when the external

environment is stable. And when the external environment is stable, deference to the elders is necessary and lifelong learning is unnecessary. Formal learning institutions tend to model this dysfunctional behaviour. In such settings, learning might be more appropriately thought of as information acquisition and hoop jumping, where the sole purpose is to obtain the approval of the level above. One side effect is 'credentialism', as opposed to real learning.

It should come as no surprise that, in organizational settings, those most interested in learning commonly reside in the technical professional middle. They have the least need for hierarchy, more loyalty to peers and profession than to employer, and the highest mobility.

My research examined which variables predicted who would fall in the managerial executive ranks of organizations. They were age (older), gender (male), conscientiousness (low), and need for power (high). Interestingly, level of education had zero predictive capacity on who rose to senior ranks. Pursuit of education is a diversion from the main game, the acquisition of status, salary and influence. The highest levels of education were in the technical professional ranks.

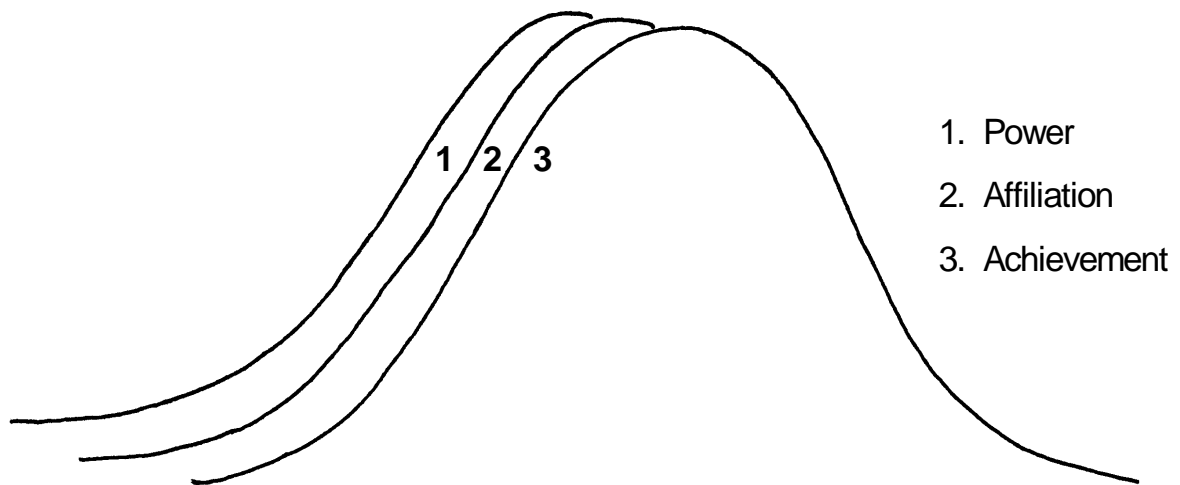
Considering birth-order, a related piece of research examining salary progression found that it was highest in first-borns and lowest in last-borns.

Australia's working environment, like other developed countries of the world, is facing a skills shortage. Yet older workers often struggle to find employment commensurate with their skills and experience. Evolutionary psychology explains why. In an increasingly technological era, the age of management is being driven downwards. Those who make recruitment and selection decisions are in a position of power since there is also a natural hierarchical relationship between employer and job seeker. In the past this power relationship was mirrored by an age relationship. This is now less so. So the employer 'alpha male' is reluctant to employ an older person since they are perceived as a potential threat to status and hierarchy. And post-menopausal females are no great addition to the

harem. For many older people therefore, the workplace is no longer available as a vehicle for informal learning.

This is not to suggest that enlightened 'learning organizations' do not exist. They do, though not frequently. Within high performance enterprises and communities, or "learning organisations" as they could also be called, it seems that what such organisations do is to try to minimise the unconscious incompetence occasioned by the first three determinants of learning illustrated earlier in Figures 1 and 3, to allow people to make a conscious choice as to which aspects they retain or abandon, and, in particular, to maximise the occurrence of creativity and innovation in affiliation and achievement-oriented settings. Figure 4 illustrates what the motive distributions might look like in a learning organization.

Figure 4: Motive distributions within a learning organization.



In contrast, low performance enterprises and communities are more likely to be shaped by unexamined habits, particularly those that are prewired, unconscious, and therefore outside of the arena of discussion and management. Particularly detrimental, it is suggested, is a predisposition towards self-serving power, a characteristic that in evolutionary terms is quite functional, but might be collectively destructive to enterprises and organizations operating in turbulent environments. (This comment is not intended to

be anti-power, but to highlight the enormity of the “prewired’ and formative issues that any individual or organisation that aspires to learn needs to address).

Recommendation: Organizations are social structures unconsciously engineered to maintain the status quo. Those most interested in learning tend to reside in the technical professional middle. With higher mobility and with greater loyalty to their profession than to their employing organization, these people are open to learning opportunities. A useful learning vehicle to access them is continuing professional development, now mandatory for many professions as a condition of continuing registration with a professional body.

Extending and connecting partnerships and networks to build Australia as an inclusive learning society.

Partnerships and networks are the last of the five dimensions recommended by Kearns (2005) as necessary to build an inclusive learning society. These partnerships and networks are a means of creating and enhancing social capital (OECD, 2001). In fact, they represent a contemporary institutionalized example of collaborative resource acquisition and mutual support identified earlier (Pierce & White, 1999)

Comments made under the previous four dimensions suffice to demonstrate why the formation of partnerships and networks are more problematic than might first appear, given the four determinants of behaviour, most of which are unconscious and which mediates against learning for many people in many contexts.

Where gains can be made and *are* being made in the fostering of networks and partnerships is at the small scale level of micro-behaviours. In fact, it might be argued that large-scale partnerships and networks will fail unless attention is paid to these microbehaviours.

Most of this paper has endeavored to explain the unconscious impediments to learning. In this final section of the paper I'd like to offer some solutions; namely how we can (facilitate lifelong learning) given that we can't.

Inhibitors to effective learning, though often societal and institutional, initiate at the microbehaviour level of the individual. And individuals, as Rogers' (1995) Adaptation Curve amply demonstrate, are largely influenced by each other. Through identification of the microbehaviours that (a) facilitate the exchange and adoption of ideas, and (b) block the exchange and adoption of ideas, processes for more effective dialogue can be developed.

What follows, as the conclusion to this paper, are some of the ideas that I offer clients as part of a consulting service aimed at improving their collective learning. These microbehaviours, collectively known as 'Meetings without Discussion ®', provide the continuously supportive process that builds learning partnerships and networks.

Have you ever attended a meeting where there was no clear agenda or where people did not stick to it, people argued, waffled or got off track, where one or two people dominated while quieter people said nothing, where decisions did not get made, or where you really wondered if you wanted to attend the next meeting, given that you had better things to do with your time?

These experiences, underpinned unconsciously by the first three determinants of behaviour covered earlier, are common and can result in groups losing vitality or even self-destructing, despite their great potential as enablers of learning.

Would you like to attend a meeting where none of the above occurred?

Whilst we are very aware of what we don't like about some meetings, we are less aware of what we can do differently.

Well, the good news is that there is a better way, built around a series of microbehaviours. After you have been exposed to them, my hope is that you will regard them collectively as possibly the most effective way to conduct a meeting, particularly one that is democratic rather than autocratic. If this is too bold a hope, then it will be sufficient for you to be aware that there is another way, one that people who have used it find immensely satisfying.

Jonathan Swift, the renowned 18th century British satirist, described the shortcomings of discussion: *...an impatience to interrupt each other, and the uneasiness of being interrupted ourselves, flooding listeners with self-indulgent talk, overemphasizing the importance of being witty, using jargon to show off, and the custom of pushing women aside during serious discourse* (Swift, 1738).

We live in a 'culture of advocacy'. *The advocate is one who tells, pleads, recommends, pushes a specific perspective, proposal, point of view or particular product. The advocate is convinced that his/her position is right and seeks others who will support it. The inquirer, on the other hand, comes at a topic with an open mind looking for a creative or viable option, or the facts of a particular matter* (Stanfield, 2000:8).

We are not good at balancing advocacy and enquiry. Many of us are inclined to be very good advocates, a behaviour that hierarchical structures mandate. While there is nothing wrong with persuasion, positional advocacy often takes the form of confrontation, in which ideas clash, rather than inform. As Stanfield (2000:9) observed *our egos are often so hell-bent on getting our own ideas out that we can hardly wait for the others to finish talking. What others are saying becomes a threatening interruption to what we are trying to say.*

This dysfunctional behaviour is a direct result of genetics, formative year experience, and contemporary influences. It is the sort of behaviour that is expected in hierarchical settings. Yet we also know how to operate co-operatively and are hardwired to do that as

well, in the right circumstances. And the basis of “Meetings without Discussion[®]” is to create those circumstances.

Some examples of the more beneficial microbehaviours will be useful. These are the behaviours that will aggregate into learning partnerships and networks because they build trust and co-operation, providing an experience that is as personally satisfying as it is rare. Nevertheless, it works because it does align with a hardwired appreciation of cooperation (genetics), childhood experiences of gaining more with less effort through cooperation (formative), and adult experiences of frustration with conventional meetings (contemporary).

1. Physical layout. We diminish hierarchy by seating people in small round table groups of six to eight people. Round tables create equity whilst the numbers permits a level of intimacy commonly found around a family dining table. This physical arrangement is quite different from most settings of formalized learning and therefore is less likely to trigger old memories of ‘school’.
2. Symbol of authority to speak: In a culture of advocacy people often compete for airtime and attempt to talk over each other, thereby effectively blocking any effective listening. By provision of a symbol of authority to speak – a soft rubber ball will do – only one person speaks at a time. Whoever wants to speak raises their hand and awaits their turn for the ball. Or the ball can be passed to that quiet thoughtful person whose views you value. Equality of turn-taking is also refreshingly different from conventional didactic settings.
3. Sandtimer: some people speak for longer than is useful for others. Provision of a one-minute sand timer to each of the parties in the small group dialogue serves as a gentle reminder to each of us how long we are taking. If one of our group is being a little long-winded, the rest of us can turn over our sand timers as a gentle reminder. This process is novel and is unlikely to have any connection with past formal learning experiences.
4. Thinking and writing before speaking. Some people are extraverts; they talk in order to help themselves to think. Others are introverts; they think in order to

help themselves to talk. In our population, extroverts are in the minority though they consume the majority of airtime during normal dialogue. While dialogue seeks to tap into the thoughts of both introverts and extraverts, each tends to diminish the capacity of the other. Introverts find it difficult to think whilst extraverts are talking; extraverts aren't being listened to whilst introverts are trying to think. Therefore, it is recommended, in response to a focusing question, that all participants write down their thoughts. This favours the introverts. Three minutes is about as long as an extravert can remain quiet. By then however, introverts have concretized their thoughts and, aided by the talking ball and sand-timer, we are now more likely to get equal value from both. Whilst writing before talking might be reflective of past formal learning experiences, its overtly stated purpose is novel, though non-threatening.

5. Visual rather than oral and aural. In small groups, information is commonly transferred orally (spoken) and aurally (listened to). Yet males are not particularly proficient in processing aural information. For them, visual information is far more effective. More importantly, when five or six ideas are being offered orally, the information occurs in temporal series. The human mind is more inclined to remember the first offering (the primacy effect) and the last offering (the recency effect), whilst ideas offered in the middle of the array tend not to be remembered when it comes to making a decision. Information that is worth offering is worth capturing visually in summary form. That means, when it comes to choosing between the ideas, all are considered at the same time.
6. Decision making. In the process of dialogue, decisions are commonly made using one of four processes. First there are decisions by exhaustion, where we make up our mind merely because we have talked the topic 'to death'. Second are decisions by dominance, where we relent to the incessant demands of the 'squeaky wheel'. Third are decisions by seniority where what the 'boss' wants is known in advance so we all save time and energy by making the decision that is expected, rather than on merit. Finally there are decisions made where a motion is put formally to the show of hands, thereby commonly creating some winners and some losers. Each of those four decision processes is suboptimal and unlikely

to select an outcome purely on its merits. We use them because they are the only ones we know. Yet, there is a range of decision tools that are non-adversarial, consensual and very efficient, resulting in higher levels of ownership and commitment. In most learning environments, it is common for 'information' to be imparted by an expert. (In reality, information is never imparted, only data. Conversion to information can only occur within a person's head.) Because the so-called 'learner' is passive, ownership of the information is limited. When people engage with their own information and make their own decisions upon it, their learning is likely to be much more deeply embedded.

Groups that use these microbehaviours rapidly develop trust and shared commitment. The processes demonstrate that scarce resources, in this case 'ideas', are random rather than centralized, so hierarchy is unnecessary. Further, the processes create a learning climate that maximizes information transfer between peers, fostering those very conditions that Rogers (1995) identified and which lead to effective adaptation. And in a rapidly changing world lifelong learning and adaptation are one and the same.

Recommendation: Whilst all of the factors identified in this paper and which limit lifelong learning continue to be present, the microbehaviours such as those outlined serve to diminish some of the detrimental effects whilst enhancing more positive unconscious dimensions of human behaviour. Their use is recommended in order to create the collaborative decentralized culture identified by Pierce and White (1999) and illustrated in Figure 4 earlier, where need for affiliation, need for achievement, and need for power are harnessed for collective benefit. Under such a culture, which is very simple to engineer, lifelong learning is not only possible, it is likely.

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July 2006

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Acknowledgement: My thanks to Dr Denise Reghenzani, Executive Officer – Policy: Training, Quality and Regulation, Department of Employment and Training, Queensland – for helpful ideas, resources, and constructive critique. Any errors and omissions are my own.

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