RESEARCH AND PRACTICE
IN HUMAN RESOURCE MANAGEMENT

Pearson, C. (2012). Recruitment of Indigenous Australians with Linguistic and Numeric Disavantages, *Research and Practice in Human Resource Management*, 20(1), 66-80.

Recruitment of Indigenous Australians with Linguistic and Numeric Disavantages

Cecil Pearson

ABSTRACT

Recruitment challenges for mining corporations operating in Australia have intensified with the increasing global demand for mineral resources and the 1993 Native Title legislation compelling negotiated land use agreements. A finite labour pool, further compressed by an ageing and retiring workforce, competition for labour, a poor industry image as well as a requirement for applicants to possess particular educational and vocational competencies has not been offset by greater Indigenous participation, despite training provisions being a feature of land use agreements. This paper presents an analysis of a novel recruitment technique that is devoid of the need for English literacy and numeracy skills, for Indigenous people with expectations to be employed in the extensive mining operations at Nhulunbuy on the Gove Peninsula of the Northern Territory (NT) of Australia. Predicating the scheme design was a comprehensive literature reporting that the English literacy and numeracy skills likely to be held by Australian Indigenous people would preclude them from usefully participating in standard Western recruitment procedures. Analyses reveal that the scheme is a robust predictor of sustainable employment. This leads to a line of reasoning that discriminatory recruitment practices can be substituted with alternative methods to identify human work related potential and, subsequently, address economic challenges and social dislocation of marginalised Indigenous groups.

INTRODUCTION

A major challenge for the minerals industry, which is of strategic importance to the Australian economy, is how to recruit highly skilled people to remote mining operations. The Australian minerals industry is a leading world producer of

bauxite and alumina (1st), lead and ilmenite (2nd), iron ore and uranium (3rd), black coal and nickel (4th) and brown coal and copper (5th) (Roarty 2010) to account for nearly 10 per cent of the nation's gross domestic product (Martinez-Fernandez 2010, Mining 2010). Sustaining the mining operations, enhancing productivity, and maintaining market competitiveness elevates the importance for the formulation and implementation of effective human resource management (HRM) practices, especially recruitment. An indication of the difficulty to attract and retain employees at the regional and inhospitable sites of Australian mining operations, which have the longest working shifts (e.g., 12 to 17 hours) of any industry in the nation with physical and emotional demanding job settings (Colley 2005, Zheng, et al. 2007), is reflected in the high turnover rate (Elliot 2010).

The Australian mining industry, reliant on a finite pool of potential employees and contractors, employs a variety of recruitment mechanisms. Contemporary Australian mining operations are among the most technologically advanced industries, and sustain production with specialised personnel, but for a range of reasons this workforce is shrinking (e.g., ageing, retiring, leakage to competitors, extensive knowledge skill sets and certification requirements) (Mining 2010). Some of the prominent endeavours by mining corporations to attract and retain personnel with specialist competencies and the certification to work at high capital investment centres include building closed mining towns (Thomas, et al. 2006), using fly in fly out operations (Beach, Brereton & Cliff 2003, Martinez-Fernandez 2010), broadening the classification of jobs (Zheng, et al. 2007), and by providing attractive incentives and compensation packages (Menghetti 2005). And while these strategies as well as investment in specialised technology (Hooper 2010, Tedesco & Haseltine 2010) and fostering political leverage (i.e., permits for foreign workers) labour shortages in the Australian minerals sector persist (Latimer 2011). In a context of the experienced severe labour shortages Australian mining corporations have begun to take a more concerted approach to engaging the Indigenous communities on whose land the mining operations are undertaken (Tiplady & Barclay 2007, Brereton & Parmenter 2008).

The emerging practice of increasing Indigenous participation in mining workforces is being driven on two events. First, the short fall in suitable people is being exacerbated in the midst of a resources 'boom' (Elliot 2010), and on pragmatic grounds mining operators are focussing on the potential of Indigenous communities, within close proximity of the mining operations, as a potential source of labour. Second, while some confidence for this initiative lies in a precedent Indigenous people have been employed in menial type work at Australian mining sites (Anderson 1983, Halcombe 2004), an obligation to employ Indigenous people is embedded in the 1993 Native Title legislation when a landmark decision of the High Court of Australia provided a legal right of the Traditional Land Owners to negotiate land use agreements with the mining corporations (Native Title 2009). A feature of these agreements, which initially narrowly focussed on financial benefits, has been the provision for training and

vocational opportunities for Indigenous people (Barker 2006, Daff & Pearson 2009). But as the educational background of these Aboriginal people is often at levels precluding their success in standard Western recruitment practices of the contemporary organisation (Bradley, et al. 2007, Hughes 2009), few Indigenous people are employed in mainline jobs at Australian mining operations (Harvey & Brereton 2005, Collier 2010).

In spite of the recognised importance of Aboriginal recruitment HRM practitioners are hindered by the few robust tools available to assess Indigenous people in the Australian mining industry. A key objective of the selection process is to predict applicant job performance by assessing aptitude and general intelligence (Anderson et al. 2004, Brennan 2004, Mehrabad & Brojeny 2007), but the use of instruments that require competency in English literacy and numeracy is inappropriate for assessing Indigenous people who are deficient in these competencies (Bradley, et al. 2007, Hughes 2009, Pearson & Daff 2010). This paper describes the theoretical foundation of a selection instrument, named the Discovery Session 3, that is devoid of the need for English comprehension or numeracy skills. The paper acknowledges other similar, but inappropriate screening devices, and demonstrates with analyses of relevant data the Discovery Session 3 is less discriminating than traditional Western recruitment practices to allow Indigenous men and women to establish work as a central life activity.

NON LITERACY AND NUMERACY SELECTION PRACTICES

Participation of Indigenous people in mainstream jobs in the Australian minerals industry is impeded by traditional recruitment methods. Entrenched in the recruitment process of contemporary firms are techniques that assess the intellectual abilities, which are believed to be predictors of task performance (Patrickson & Hayden 1988, Dimilia & Smith 1997, Dimilia 2004). For instance, entrance to university is determined by the score gained in the Australian Tertiary Admission Rank. And recruitment practices of contemporary organisations demonstrate a fascination with assessing intellectual capacity when they gauge applicant dispositions of literacy aptitude, verbal comprehension, spatial visualisation, memory as well as inductive and deductive reasoning (Wittman & Hattrup 2004, Evers 2009). The measurement of these cognitions compels the applicant to employ English literacy and numeracy competences, but when there is linguistic disadvantage more appropriate less discriminatory recruitment practices are warranted.

Raven Test

A provocative idea, that emerged with the growing importance of the centrality of work, was the concept of intelligence is related to performance (Wittmann & Hattrup 2004, Côte & Miners 2006). Despite a popular interest in this novel conjecture the initial approaches required a level of English literacy competency,

which was a barrier for unschooled adults during the earlier years of the 20th century. To some extent this discrimination was distilled with the availability of Raven's Progressive Matrices (RPM) (Raven 2000). These matrices are standardised intelligence tests that consist of visually geometric – analogy – type problems (Kunda, McGreggor & Goel 2009). They are multiple choice tests and are offered in three categories of matrices 1) Standard progressive, 2) Coloured progressive, and 3) Advanced progressive), for participants of different ability.

The RPM are pictorial tests of abstract reasoning. A test is presented as a matrix (2x2 or 3x3) of pictures, usually of geometric shapes, with one entry missing. Below the matrix is a set of similar pictures, and the task of the solver is to choose the correct missing picture from the provided solution alternatives (Cirillo & Ström 2010). The theoretical framework, that guided the development of the RPM, is in the work of Charles Spearman (1904), who identified two components of general intelligence 1) educative ability, and 2) reproductive ability. Casé, Neer and Lopetegui (2002) summarised the four main characteristics of the RPM.

1. A test of intellectual capacity.
2. Contains an educative capacity.
3. Is a non literacy numeric test.
4. Features multiple lacuna choice testing.

In the advanced scales there are two vocabulary verbal versions for United States and British participants.

The immense practical importance of RPM has attracted considerable evaluation with equivocal outcomes. One stream of the findings suggests the standard progressive test has limited discrimination at the upper and lower levels. However, this blemish can be overcome by using the advanced and coloured matrices (Raven 2000). Observations reported from a second stream of investigation are more disturbing. Extensive evaluation shows the mean scores regularly increase with time irrespective of the country in which the test is conducted (Flynn 1987, Casé, et al. 2002). And while this phenomenon has raised questions about the meaning of intelligence, and there has been a major increase in the availability of knowledge and acquired personal cognitive development worldwide during the past 60 years, there is also inquiry about the application procedures. The Raven tests are available both in booklets and now on the internet. Hence, more contemporary candidates can become increasingly experienced with the test profile as well as preparing before being tested. In spite of the criticisms the RPM are verbally based, they can require considerable language proficiency and are employed to assess general intelligence (Snow, Kyllonen & Marshalek 1984).

Queensland Test (Q Test)

There is an extensive lineage of literature acknowledging the cultural complexities of understanding the psychological assessment of Australian Indigenous people. An overview of the material and the identified difficulties (i.e., communication, lack of independence, learning strategies, learning source acceptance), was provided by Westerman and Wettinger (1997), and later extended by Harrison and Greenfield (2011). Nevertheless, the broad range of barriers, that can be encountered when understanding human thoughts, feelings and behaviours of Indigenous Australians, have been tackled. For instance, in the early 1900s, Porteus (1917) devised a test at a mission school for screening pupils. Later, in the 1930s Fowler (1940) compared the intelligence of Indigenous people from the Gascoyne region of Western Australia with non Indigenous people. During the 1950s McElwain and Kearney (1973) used the Queensland Test (Q Test) with Aboriginal children and adults to compare them with local Europeans. These researchers concluded the test was not acultural as the study results demonstrated an influence of Western learning.

The Q Test is described as a non cyclic omnibus, individually administered performance test of cognitive capacity (Kearney & Davidson 2006). This test requires candidates to construct, manipulate and recall patterns with portable coloured beads and tiles. The test is comprised of six sub tests, each of increasing difficulty. A candidate is required to demonstrate a level of cognitive performance in the six sub tests of 1) sequential memory, 2) visual memory, 3) planning, 4) abstract manipulation, 5) pattern matching, and 6) design sequencing. The overall test, which takes about one hour to administer, has been employed in Papua New Guinea, New Zealand, and some island nations east of Australia. A prominent strength of the test is it does not require written competencies or numeracy skills, and is orally administered. The Q Test has several boundary conditions. A psychologist who is skilled from previous experience with the Q Test is required to administer the test. Also, a psychologist is required to interpret the results. A considerable restriction is the Q Test is a proprietary licensed tool, and, therefore, is subject to commercial application, which is expensive. And as the test is individually administered by a trained psychologist it is labour intensive. Although claims have been made the generated assessments are reliable, for a firm wanting to use the test to assess applicants for job positions or training programmes, there is no provision for the company to acquire independent test usage. These caveats are considerable barriers and encourage diversification into other alternative systems.

Discovery Session

In 2006 Alcan Gove, which was the mining operator at Nhulunbuy, invested in a training vocation corporate community initiative. During that year an extensive document (A Response 2006) was prepared in the Alcan Community Affairs Department to obtain support from a wide body of stakeholders (e.g., Three levels of the Australian governments, Traditional Land Owners, Indigenous groups, education sector, peak industry bodies, mining industry, local

community) for the installation of an education vocation programme for Indigenous people. This initiative was a social investment into the regional Indigenous community as the mining operations had been commissioned in 1972 well before the 1993 Native Title legislation, and the obligation for a negotiated land use agreement. The scheme was labelled the Alcan Learning Educational and Regional Training (ALERT) programme. When Rio Tinto Alcan became the mining operator in late 2009 the acronym was retained while Alcan was replaced with Arnhem, the regional name that had been acquired from the name of the ship (Arnhem) captained by Williem Joosten van Colster, who sighted the land in 1623 (Trudgen 2000).

The ALERT programme was scheduled to commence with 15 Indigenous candidates in July 2007. Despite considerable searching a satisfactory system for selecting the best candidates from the expected pool of applicants had not been attained by the beginning of June 2007. A major problem was traditional Western recruitment practices are designed to assess the employability of applicants by examining competencies with tests that require application of English literacy and numeracy competencies. However, investigation had revealed within the population of potential Indigenous applicants most had not progressed beyond the lower grades of primary school, seldom had they engaged in mainstream work, and all were likely to have linguistic and numeric disadvantages. In mid June 2007 the author was invited by the Alcan Gove management to travel to Nhulunbuy to design, pre test, and install a selection procedure for assessing the work potential of Indigenous applicants who lacked English literacy and numeracy competencies. This recruitment method, which is a mixture of oral and activity based assessments, and is called the Discovery Session 1, is comprehensively described by Pearson and Daff (2008) and is now completed by all ALERT applicants. The Discovery Session 1 was subsequently evaluated and found to be a robust predictor of employability (Pearson & Daff 2011a).

The Alcan Gove expansion provided an accommodation legacy for ALERT. From 2004 to the close of 2007 the alumina manufacturing capacity of the Nhulunbuy operations was doubled to 3.8 million tonnes per annum (mta) in an expansion programme of over US $2.3 billion, and the 1700 strong workforce had to be accommodated in temporary transportable single person units in the town precincts and bused to the construction sites (Alcan Gove 2008). On completion of the project the workforce was disbanded and most of the excess accommodation was progressively removed from the region during 2008 in an agreement with the Indigenous Traditional Land Owners. The remaining additional accommodation units provided an opportunity for ALERT applicants from other regions of Australia to travel to Nhulunbuy and attend a one week residential assessment programme with features of oral activity team relevant work behaviours, that were assessed with the Discovery Session 3 recruitment instrument.

A central plank of the Discovery Session 3 is the contribution of Edward Lawler. In the book *Motivation in Work Organizations* Lawler (1973) contends aptitude is a function of ability, which he presents as equation 1.

Ability ≈ (Aptitude) (Education + Training + Learning experience + …) (1)

Equation 1 expresses aptitude has a multiplicative influence on learning behaviours such as education, work experience and training. This contention extrapolates that for low values of aptitude regardless of the extent of learning activities ability will remain relatively low. In short, Lawler argued that in the same learning context those people with higher aptitudes are likely to acquire greater benefit than those people who have lower aptitudes. By aggregating a number of aptitude scores a total value can be realised for an individual and by comparing the total aptitude scores for a number of people the individuals can be ranked. The Discovery Session 3 assesses aptitudes to gauge the potential of Indigenous people to engage in mainline work without prejudicing them because of a lack of opportunity to work previously or by judging them against benchmarked literacy and numeracy competencies.

METHODOLOGY

Respondents

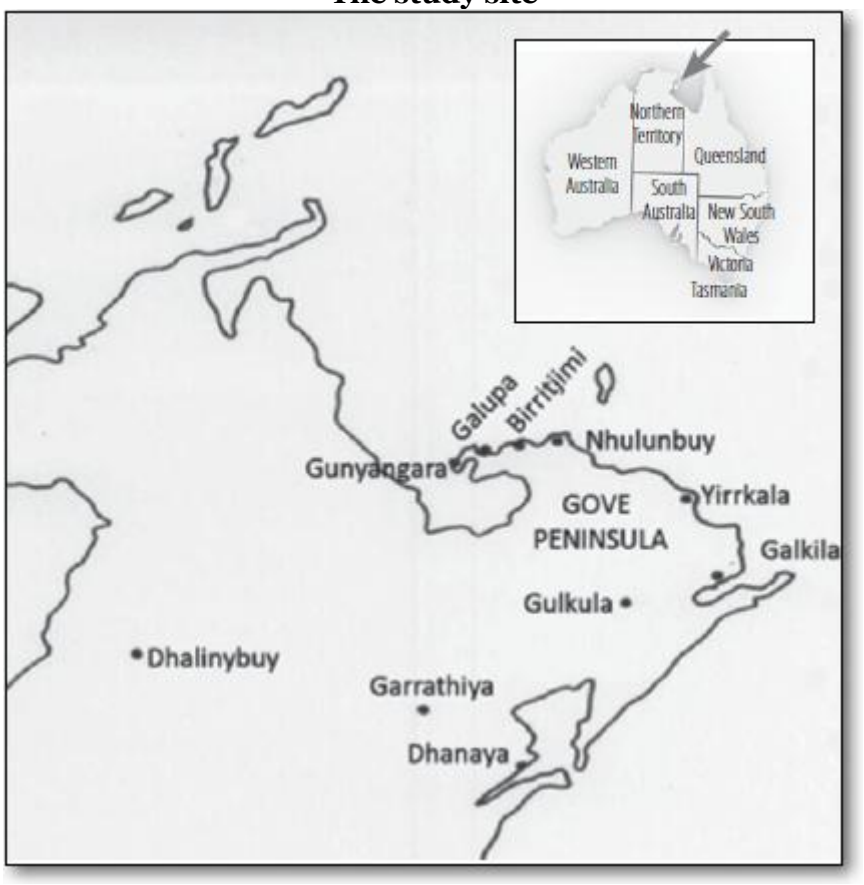
The respondents were the 97 Indigenous Australians who attended the one week residential programme at Nhulunbuy. These Indigenous people were participants of the ALERT programmes in 2009 (2), 2010 (2), and the first programme of 2011 as there was two programmes per year. All of the respondents completed the Discovery Session 3 activities. Participants of later ALERT programmes were not included in the study as their potential work period was considered to be too short for analysis (i.e., less than 8 months).

The study sample was partitioned by the extent of employment after joining the ALERT programme, and there were three categories. Category 1 (n = 40) had participants who completed the ALERT programme and usually worked for a relatively short period (i.e., 1 week to 4 months), when they withdrew voluntarily or involuntarily (i.e., dismissed, medically unfit, custodial). The subjects of Category 2 (n = 32) completed their ALERT programme, and all except one subject are still in employment in mainline jobs at Nhulunbuy, mostly in the mining industry. Category 3 is comprised of those Indigenous people (n = 25) who completed the ALERT programme, held employment in the mining industry for a reasonable period (i.e., 1 month to 1 year), and then left for employment opportunity either locally in Indigenous organisations (e.g., Gumatj Corporation, Dhimurru Aboriginal Corporation, East Arnhem Shire, Laynhapuy Homelands Association) or in other more geographically dispersed regions of Australia.

Site

The site of the study was at Nhulunbuy on the Gove Peninsula of the NT. Candidates were given instruction at either the ALERT premises, the Nhulunbuy Technical and Further Education (TAFE) buildings, else at the mine site or the refinery. The ALERT premises were refurbished and developed in 2006, 2007, and early 2008 by the operating mining corporation Alcan Gove. These premises are comprised of two comprehensively equipped teaching rooms, accommodation for the seven administrative/teaching personnel as well as ancillary buildings (i.e., Toilets, washrooms, storage for technical equipment, washing machines and driers for trainee work clothes). When at these premises the participants are engaged in a range of learning activities including certification to be employed in Australian mining operations. At the TAFE workshops and training rooms the trainees receive instruction in carpentry, metal working, painting and welding. Vocational experience is provided at the mine site or the refinery by dedicated mining company supervisors and once the ALERT candidate has acquired required competences and certification is then allowed entrance to these places to undertake mainline work. The region in which the study was undertaken is shown by Figure 1.

Figure 1
The study site



Procedure

Candidates who apply to enter the ALERT programme undergo a selection regime that has been extended in intensity. Prior to 2009 applicants were

assessed with rudimentary literacy and numeracy tests (i.e., flash cards of simple words, order a set of five numbers including decimals), the Discovery Session 1 (Pearson & Daff 2008, 2011a), and entrants to the ALERT programme had to successfully complete a medical examination that explores for substance abuse. The applicants of the first three ALERT programmes (i.e., July 2007, May 2008, October 2008), and a majority for the first programme in 2009 (March) were Yolngu Indigenous people from the nearby outland centres (Altman 2003) of Birritjimi, Galupa, Gunyangara and Yirrkala. As these places were in close proximity to Nhulunbuy the ALERT participants were transported to the learning centres and back home by the mining company bus. Despite considerable investment in selecting the candidate, including support from the family and clan elders, the attrition rate was relatively high (Pearson & Daff, 2011b).

There were two prominent events in 2009 that led to invigorating the selection criteria. First, the mining company was able to provide fully messed single person accommodation, which enabled extension of the catchment of potential ALERT applicants. Second, the ALERT programme was awarded the most innovative education vocation scheme by the NT Department of Education Training. This unsolicited exposure was followed by a flood of electronic applications by Indigenous people from most Australian States. As the capacity of an ALERT programme was 15 Indigenous people a short list of applicants was determined from the submitted documents (e.g., previous work experience, education qualifications, Certificate of Aboriginality, driver license). These people were invited to fly to Nhulunbuy (at their expense) to be accommodated (at the mining company expense) for further evaluation in a week long residential assessment course. While the Discovery Session 1, which all candidates completed, was for the assessment of individual aptitudes there was an opportunity during the one week residential programme to intensely scrutinise candidate behaviours as well as their team related aptitudes. The team related aptitudes of the candidates were assessed in four group activities in what has been conveniently labelled Discovery Session 3.

Measures

Respondent personal, vocational attributes, and Discovery Session 3 assessments were scored. The age and gender of each respondent was recorded as a part of an extensive data set. All respondents acquired a vocational record which commenced at the close of the residential assessment week. The time of employment was scored in months (e.g., five weeks = 1.25 months).

The Discovery Session 3 measures 12 team work related aptitudes. This instrument is closely aligned with the Discovery Session 1 (Pearson & Daff 2008, 2011a), and was developed in consultation with the ALERT teaching/ instructing personnel. The Discovery Session 3 instrument has four group activities and each activity has been chosen to provide foundation for assessing three team

task related aptitudes. Each aptitude is measured with seven interval scales. There is one, seven point Likert scale; and six, seven point bipolar scales, giving a maximum score for each aptitude of 49 (i.e., 7x7). An arithmetic sum is obtained for all the aptitudes and the total possible score is 588 (i.e., 7x7x3x4), and the minimum score is 84 (i.e., 7x1x3x4). Each activity and the accompanying aptitudes are outlined, next.

Pre Start Vehicle Check

The relevance for this activity is embedded in a requirement to examine mining company moveable vehicles each morning prior to use. Many contemporary organisations (e.g., Australian Army, Railways, Main Roads) with large fleets of vehicles have similar procedures and it is a practice worthy of adoption by private vehicle owners. The three aptitudes assessed when this activity is undertaken by two Indigenous ALERT candidates are (a) attentiveness (listening to instructions), (b) conformity (following instructions), and (c) time management.

This activity begins when the ALERT participants are assembled, together with the instructor. A motor vehicle is in close proximity as are the assessors who are aware of the two candidates they have been assigned to evaluate. The instructor demonstrates how to undertake the vehicle inspection and record on the check list form the quality of each component (e.g., oil level, radiator coolant, body work, vehicle cleanliness) to ascertain the road worthiness of the vehicle. Students are encouraged to ask questions, and generally, be actively involved. The activity has been preceded by earlier class room discussion about the need for vehicle inspections, how to complete the form, and the action to be undertaken to comprehensively examine the road worthiness of the vehicle.

Completion of this activity compels the two candidates to have some elementary English comprehension. At the beginning of the ALERT programme few candidates possess a driving license. One objective of the programme is to have each candidate given professional instruction by staff from a driving school (from Darwin) so each trainee will become a qualified driver. Over time reading skills (e.g., traffic signs), ability to complete vehicle log books as well as time sheets will be acquired, but during this activity the assessor may assist candidates with the literal meaning of words on the form they have to complete.

The activity requires the two candidates to inspect the vehicle and record the condition of some 20 items that are listed on a form. As each item is inspected on the vehicle a record is made on the form as a category 1 or 2 or 3. If a category 1 is assigned the vehicle is not to be moved (e.g., lack of engine oil, flat tyre). For a category 2 the company garage is to be advised immediately and the item is to be rectified to a programmed time nominated by the garage mechanic. A category 3 means the garage is to be advised and the repair/attention is to be completed within a week. The activity draws to a close when all the items on the form have been given a category score. On completion of the form the assessor and the two candidates meaningfully discuss the activity in terms of the

importance of inspecting motor vehicles, and then the candidates are told of their assessments.

Blindfold Activity

The blindfold activity pillars work relevant theoretical and practical processes. Group communication, one of the most visible activities vital for effective functioning, compels employees to judge the quality of member relationships in terms of mutual confidence and trust. The blindfold activity is undertaken to demonstrate the important climate of trust and to show fostering credibility among potential workers can overcome barriers to effective communication. But the exercise has an important pragmatic dimension. Alumina refineries are dangerous places where slurries at high temperatures (e.g., steam) and pressures are transferred around the workings in pipes, and leakages do occur. One of the most corrosive is caustic liquor, essential for the Bayer process, that is used at Nhulunbuy for the refining of bauxite ore. At regular places within the refinery are well lit (green neon) showers where workers, who might be splashed with dangerous fluids, can be doused with high volumes of water. The blindfold activity provides an opportunity for an ALERT trainee to experience the roles for quickly getting an employee, who is drenched with an alkaline or an acidic fluid and temporarily visually impaired, to a washing location.

The blindfold activity is conducted to assess three aptitudes. These three aptitudes are nominated as 1) Task management, 2) Communication modes, and 3) Safety awareness. In this activity there is a subject who is blindfolded, a second person who guides the subject through a maze, and an assessor who evaluates the guider. The objective of the activity is to have the subject promptly and safely traverse the maze (i.e., not collide with obstacles). Boundary conditions are the guiding person can talk; but the blindfolded subject can only respond with 1) yes, or 2) no, or 3) stop until comfortable to proceed; while if the assessor judges the blindfolded subject to be endangered can cease the activity temporarily or terminally.

There are three stages to the blindfold activity. In the first stage all the candidates are assembled, with the assessors, in a classroom where the theoretical elements of group communication are outlined, and the nature of the activity is disclosed. The second stage provides an opportunity for the candidates to clarify their roles. By walking through the maze as a group where each person can visualise the task problem and seek additional information by asking questions. The exercise, the third stage, was undertaken when the blind folded subject, the guider and the assessor traverse the maze. After a pair of trainees (i.e., subject, guide) completes the maze the assessor invites the subject to openly tell the three person group how the style of the guider was appreciated. The subject is then dismissed and the assessor provides the guider with scoring on the three aptitudes and invites comments in an open learning context.

Skills Relay

Embedded in the skills relay activity are the three aptitudes of 1) Involvement, 2) Teamwork, and 3) Rule adherence. In contemporary Australian mining contexts these three aptitudes are expressed when individuals use their skills and competencies to effectively employ the provided technical equipment. Developing this notion is fundamentally relevant for the Indigenous trainees at Nhulunbuy as most have not previously worked in commercial enterprises. When the ALERT trainees complete the skills relay activity estimates are obtained for their involvement in personal intensity to build attributes of teamwork as reflected in goal attainment while developing trust and interpersonal relationships among the members as well as displays of rule adherence to consistently meet their obligations to the explicit statement of what ought to be done. The activity is a generic abstraction of work.

The skills relay integrates techniques used in men's basketball and basic organisational tenets. At the commencement of the activity the candidates are given functional instruction in throwing, catching, and dribbling a basketball. This segment of the activity is followed with a brief session when members are formed into small groups where they practice throwing and catching with remedial instruction as necessary. The groups then practice dribbling the ball. Next, two separate lined groups are formed, with members one metre apart, and the people align themselves to look at the back of the member in front of themselves, while the lead person looks to a line five metres ahead. To complete the activity each member is required to complete a sequence of events, and when all members have done the task the team sits down. The first team to be seated is the winner.

The sequence requires members to throw, catch, and dribble the basketball. To begin the activity the last member in the line dribbles the basketball to the five metre line. When there the person throws the ball to the person at the lead of the line who catches and return throws to the person five metres away. On catching the ball the member then dribbles the ball to the lead of the line, turns and faces the distant five metre line and then passes the ball overhead to the person behind. During the time the member is dribbling the ball back to the lead of the line all the members shuffle back one metre so as the front of the line is effectively located at the same place. The passing of the ball to the back of the line is alternatively overhead and between the legs of successive people in the line. When the ball is received by the last person in the line the described process is repeated until all members have done the task. From the beginning of the activity, when the ALERT trainees are introduced to the ball skills, they are being assessed as the assessors have been assigned three members to evaluate. After the activity is completed each trainee is independently appraised of their score by their assessor, when meaningful feedback is given.

Car Activity

The car activity provides an opportunity for the participants to demonstrate the management of systems, processes, and procedures. Building these teamwork

qualities is essential for interdependent groups in organisations operating in the increasingly complex, competitive marketplace. The three aptitude assessed are (a) precision system, (b) pressure control process, and (c) improvement.

There are two stages to the car activity. In the first stage the pit crew (three members) assembles the racing car and then give it to the driver who races the vehicle the length of a four metre straight course one metre wide. The time taken from the beginning of assembly until the vehicle completes the course is measured with a stop watch. In the second stage the first driver becomes a pit crew member, and a member of the original pit crew assumes the role of the second driver. After rebuilding the car it is raced for a second time. An arithmetic mean of the two race times is obtained, and the difference in race times (race 1 time - race 2 time) is noted.

To complete the car activity a team of four ALERT participants build a small four wheel vehicle (19 cm long 4 cm wide) and race it in the classroom. The vehicle is fabricated from plastic components (e.g., wheels, cogs, rods, strips, nuts) and the rear wheel axel assembly is rotated when a tensioned elastic band unwinds. Rotation of the rear wheels anti clockwise tensions the elastic band, and when the vehicle is released the untensioning of the elastic band propels the vehicle forward. Three members of the team (i.e., pit crew) assemble the vehicle and the fourth member is the driver, who is responsible for tensioning the elastic band and ensuring the vehicle is propelled forward to travel the race course.

When the two races are finished there are two assessments. In the classroom the race times of each team is revealed. The teams that win are 1) the minimum time taken, and 2) the most improved time. The moral is the mining company expects employees to work together to get jobs done efficiently and safely. The second assessment is undertaken when each team member independently meets with the assessor and scores of the three aptitudes are discussed while giving relevance to work settings.

Analysis

The respondent Discovery Session 3 scores were subjectively assessed. During the study period there was a total of 12 assessors, and seven of them were Indigenous people. Their evaluations were examined for consistency with reliability assessments (Cronbach 1951).

Data were partitioned by the extent of employment. The three categories (see **Respondents** sub section) provided foundation for evaluating the variables of age, Discovery Session 3 scores, and the duration of work with ANOVA, and the mean differences were assessed with Tukey tests. Gender could not be satisfactorily evaluated as despite 25 per cent of the sample being female there was too few women participants in category two and category three.

RESULTS

Table 1 presents the reliability assessments of the assessors' scores. The consistency of reporting of the behavioural responses of the ALERT candidates over two and one half years by a range of assessors show the data are robust. Arguably, the consistency of reporting may have been underpinned by 1) a one page A4 document (for each activity) that outlined for the assessors how to undertake the assessment, and 2) additional guiding words on the Likert scales (above the integers), that was designed to provide assistance when employing the scales.

Table 1
Reliability assessments for aptitudes (N = 97)

	Aptitude	α
1.	Attentiveness	0.96
2.	Conformity	0.96
3.	Time management	0.95
4.	Task management	0.95
5.	Communication	0.95
6.	Safety awareness	0.95
7.	Involvement	0.96
8.	Team work	0.94
9.	Rule adherence	0.96
10.	Precision	0.96
11.	Pressure	0.96
12.	Improvement	0.97

Table 2 presents the ANOVA results and comparison of means for the three categories of employment sustainability. The non significant differences for age is an expression each category had a profile of 17 years to 44 years. It is shown in Table 2 the Discovery Session 3 scores were a predictor of employment continuity. Gender effects could not be assessed despite 25 females in the sample as there was only six and seven women in categories two and three, respectively. The significant effect for work (months) is a reflection of partitioning the data.

Table 2
Means, standard deviations and contrasts across employment groups (N = 97)

Variable	Group	1	2	3	ANOVA		Means comparison
	Subjects	40	32	25	F	p <	Tukey
Age		24.4 (7.1)	26.3 (8.3)	28.5 (9.9)	1.89	0.16	n.s.
D.S. score		401.2 (71.4)	500.3 (21.2)	473.4 (27.7)	28.9	0.00	2 > 1***, and 3 ***
Work		3.25 (5.66)	13.53 (7.24)	5.64 (3.63)	38.4	0.00	2 > 1***, and 3 ***

Notes: a. Age in years, D.S. score = Discovery Session 3 score, and Work in months.

b. Values in parentheses are the standard deviations of the means.

c. n.s. = non significantly different.
d. ***p < 0.001.

DISCUSSION

The Australian Federal Government has envisaged the granting of mineral extraction licenses will provide Indigenous people with vocational opportunity and reduce their socio economic disadvantage (Barker 2006). But the reality is few Australian Aboriginal people are employed in the knowledge intensive capital intensive mining industry (Harvey & Brereton 2005, Brereton & Parmenter 2008, Martinez-Fernandez 2010). Although the low participation rate has complex antecedents the regulative requirements (Banks 2003) for employees to be qualified and certified encourages the use of recruitment processes incorporating applicant demonstration of literacy and numeracy competencies (Zheng, et al. 2007, Dickie & Dwyer 2011). Consequently, many Indigenous people, who are unlikely to have literacy acquisition beyond primary school (Tiplady & Barclay 2007, Kral 2009, Pearson & Daff 2010) would qualify for acceptance. This condition promotes the adoption of less discriminatory recruiting practices.

Assessments of the quasi longitudinal (different subjects same instrument and time intervals) Discovery Session 3 scores demonstrate they are useful predictors of work potential. The pragmatic value of the instrument has several supporting pillars. For instance, there is a non requirement for specialist professionals (e.g., psychologists) to administer the activities and evaluate the displayed behaviours. In fact, the administrators and the assessors, who were both Indigenous and non Indigenous people, were para academics (e.g., school teachers, TAFE accredited, high school graduates with work experience), who readily learned how to effectively adopt their roles over time. And as the Discovery Session 3 was developed 'in house' it was free of political, economic and operational encumberances. Thus, it is not like the expensive proprietary Q Test, and the usage time can be determined by the corporation as it is available 'on the shelf'. Indeed, a feature of the Discovery Session 3 is the lack of high infrastructure cost that can arise when firms outsource testing of candidates for recruitment or selection for training programmes. An unexpected benefit was revealed by the ALERT candidates who claimed they enjoyed doing the activities, which they said were novel, fair and unbiased. When employing assessment tools it is vital candidates understand the task, and support from the local Indigenous communities for continued employment of the scheme was welcomed as a sign cultural differences were accommodated. Nevertheless, conducting the Discovery Session 3 only optimises assessment when selecting/choosing/recruiting Indigenous applicants.

Despite the Discovery Session 3 scores being associated with the work life of the ALERT participants (who had modest formal Western education and industrial vocation experience) other dominant factors influence employment

predictability. Information obtained from exit interviews revealed the involuntary and voluntary withdrawal could be traced back to a lack of reconciliation of cross cultural relations. From a broad perspective this position is exposed by Mazie McKenzie (1976) in *Mission to Arnhem Land* when she recounts how a Yolngu man told her white people have a work fetish. There is historical evidence the Yolngu were seasonally engaged in paid work (usually goods) for the Macassarese (Berndt & Berndt 1999) in the preparation of trepang and elements of the shell trade (i.e., oyster, pearl, turtle) from the early 17th century till 1907 (Worsley 1955, Ivory 1999, Russell 2004). In spite of this prolonged effect there does not appear to have been a radical departure from the traditional lifestyle of retaining traditional preference "… in a fundamentally different customary economy." (Altman 2002: 35), which includes hunter gatherer pursuits, attending ceremonies, and extensive periods at funerals. Indeed, it is not unexpected to view families of Indigenous people long grassing. On certain days family groups, armed with hunting weapons, can frequent the periphery of Nhulunbuy after they have briefly visited the town site government or business agencies and then begin to return to their ancestral lands. The often unannounced absences from the work place have considerable consequences, particularly in mining operations that are oriented to maximising production (Barker 2006, Tiplady & Barclay 2007, Brereton & Parmenter 2008). Clearly, a notion the development of mining operations in remote regions of Australia will create job opportunities for Indigenous people, which in turn will lead to a reduction in community socio economic disadvantage warrants further investigation, which is beyond the scope of this paper.

CONCLUSION

A salient revelation of the paper is exposure of a substantial challenge for leading sector institutions, both government and business corporations, to better fulfil their responsibility for the sustainable wellbeing of Australian marginalised Indigenous communities. The central plank of the manuscript demonstrates the generation of an acultural, non discriminatory recruitment instrument (or an alternative substitute) can be employed to identify people, who have been labelled as being linguistic and/or numeric disadvantaged (when compared to the dominant national culture benchmarks), for mainstream employment. For a considerable time prominent employer entities in Australia have continuously impeded the entrance of 'disadvantaged people' to meaningful work contexts by employing selection/recruitment processes that have entrenched within them assessment techniques requiring applicants to demonstrate competencies in English comprehension and numeric skills, and these strategies deny Australian Aboriginal people the opportunity to display their cognitive processes. An assumption that Indigenous Australians have lesser or inferior cognitive abilities than non Indigenous Australians is unjustified and should be abandoned.

Successive Australian governments have encouraged complicity in a lack of Indigenous citizenship reconciliation. Foremost is the process of Indigenous policy formulation and in particular the introduction of social security payments and the soon to be scrapped political experiment (since 1977) of the Community Development Employment Programme. These ill conceived initiatives as well as other schemes that developed institutional dependencies have led to the abandonment of responsibilities by the broader Australian Indigenous community and the emergence of unsatisfactory economic and social consequences. Widely acknowledged is Indigenous people are likely to have lower incomes, lesser workforce participation, poorer education, higher unemployment, worse health, live in more unsanitary accommodation, have lower life expectancy, experience greater incarceration rates and higher substance abuse than the non Indigenous population. These issues manifest in remote communities, especially where mining corporations establish their mine sites and refineries, where centres of populations surge to provide operational infrastructures to service the mining operations. Irrespective of the claims of the corporate miners, that they are proactively engaging the Indigenous communities, on whose land the minerals are being extracted, the reality is few Australian people are employed in sustainable jobs in these mining operations. This fact is reinforced at two levels. First, is a reluctance of the mining companies to delineate how their operational practices have led to specific vocational education attainments of the resident Indigenous communities. Second, when in need of a vibrant workforce mining companies pressure State governments to appeal to the Commonwealth government to relax restrictions on employment visas to allow large numbers of overseas workers to fill mining labour shortfalls. Implications for Australian governments that allow large scale multi nationals to operate in geographically remote regions of the country compel a revisitation to political agendas to recast dimensions of corporate social responsibility so there is greater representation of marginalised Indigenous people in the Australian labour force.

Author

Cecil Pearson earned his PhD at the University of Western Australia. His initial vocational appointment was with the Ministry of Education (WA), but after obtaining an Engineering degree joined the State Railways of WA. After 25 years as an operational engineer and occupancy in executive roles Cecil joined academia. He has published widely in education, engineering and management.

Email: Cecil.Perason@cbs.curtin.edu.au

References

A Response. (2006). *A response to the Australian and Northern Territory's Government Bilateral Steering Group boosting Indigenous employment and economic development*. Nhulunbuy, NT: Alcan Gove.

Alcan Gove. (2008). *Third stage expansion project review: A historical account of one of Australia's biggest industrial developments*. Nhulunbuy: Alcan Gove Pty. Ltd.

Altman, J. C. (2002). Indigenous hunter-gatherers in the 21st century: Beyond the limits of universalism in Australian social policy. In T. Eardley & B. Bradbury (Eds.), *Competing visions: Refereed proceedings of the National Social Policy Conference* (35-44). University of New South Wales, Sydney: Social Policy Research Centre.

Altman, J. C. (2003). People on country, healthy landscapes and sustainable Indigenous economic futures: The Arnhem Land Case. *The Drawing Board: An Australian Review of Public Affairs*, 4(2), 65-82.

Anderson (1983). Aborigines and tin mining in north Queensland: A case study in the anthropology of contact history. *Mankind*, 13, 473-498.

Anderson, N., Lievens, F., van Dam, K., & Ryan, A. M. (2004). Future perspectives on employee selection: Key directions for future research and practice. *Applied Psychology: An International Review*, 53(4), 487-501.

Banks, G. (2003). *Minimum effective regulation and the mining industry*. An address to the Minerals Council of Australia's Annual Industry Senator Old Parliament House, Canberra 3 June, 2003.

Barker, T. (2006). *Employment outcomes for Aboriginal people: An exploration of experiences and challenges in the Australian minerals industry*. University of Queensland, Australia: Centre for Social Responsibility in Mining Sustainable Minerals Institute.

Beach, R., Brereton, D., & Cliff, D. (2003). *Workforce turnover in FIFO mining operations in Australia: An exploratory study*. The University of Queensland, Australia: Centre for Social Responsibility in Mining and Minerals Safety and Health Centre.

Berndt, R. M., & Berndt, C. H. (1999). *The world of the first Australians: Aboriginal traditional life past and present*. Canberra: Aboriginal Studies Press.

Bradley, S., Draca, M., Green, C., & Leeves, G. (2007). The magnitude of educational disadvantage of Indigenous minority groups in Australia. *Journal of Population Economics*, 20(3), 547-569.

Brennan, D. (2004). *Successful intervening and staff selection*. Paper submitted in partial fulfilment of the requirements for election to fellow status in the American College of Medical Practice Executives.

Brereton, D., & Parmenter, J. (2008). Indigenous employment in the Australian mining industry. *Journal of Energy and Natural Law*, 26(1), 66-79.

Casé, L. R., Neer, R., & Lopetegui, S. (2002). Raven's progressive matrices test: Scale construction and verification of 'Flynn effect'. *Orientación y Sociedad*, 3, 1-11.

Cirillo, S., & Ström, V. (2010). *An anthropomorphic solver for Raven's progressive matrices*. Götebory, Sweden: Chalmers University of Technology.

Colley, P. (2005). *A career and a life in mining: What needs to be done*. Paper presented to the Sustainable Development 2005 Conference of the Minerals Council of Australia, Alice Springs, 31 October – 4 November 2005.

Collier, P. (2010). *National resources sector employment taskforce – Discussion Paper: Resourcing the future*. Submission to Employment Taskforce. Perth: Government of Western Australia.

Côté, S., & Miners, C. T. H (2006). Emotional intelligence, cognitive intelligence and job performance. *Administrative Science Quarterly*, 51, 1-28.

Cronbach, L. J. (1951). Coefficient alpha and internal structure tests. *Psychometrika*, 16, 297-334.

Daff, S., & Pearson, C. A. L. (2009). Indigenous employment: The Rio Tinto Alcan initiative in northern Australia. *The Journal of Contemporary Issues in Business and Government*, 15(1), 1-20.

Dickie, C., & Dwyer, J. (2011). A 2009 perspective of HR practices in Australian mining. *Journal of Management Development*, 30(4), 329-343.

DiMilia, L. (2004). Australian management selection practices: Closing the gap between research findings and practice. *Asia Pacific Journal of Human Resources*, 42(2), 214-228.

DiMilia, L., & Smith, P. (1997). Australian management selection practices: Why does the interview remain so popular? *Asia Pacific Journal of Human Resources*, 35(3), 90-103.

Elliot, J. (2010). *Increasing employee turnover reinforce "skills shortage" fears*. Retrieved 12 February 2012 from: http://www.theresourcechannel.com.au/blog/increasing-employee-turnover-reinforces-%E2%80%9Cskills-shortage%E2%80%9D-fears

Evers, W. F. (2009). *The relation between meta cognitive skilfulness, intellectual ability, prior knowledge, causal mechanisms and inquiry learning performance in fourth – and sixth graders*. Bachelor Thesis, Faculty of Behavioural Sciences. The Netherlands Universiteit Twente.

Flynn, J. R. (1987), Massive IQ gains in 14 nations: What IQ tests really measure. *Psychological Bulletin*, 101(2), 171-191.

Fowler, H. L. (1940). Psychological tests on natives in the north west of Western Australia. *Australian Journal of Science*, 2, 124-127.

Halcombe, S. (2004). *Early Indigenous engagement with mining in the Pilbara: Lessons from a historical perspective*. Australian National University, Canberra: Centre for Aboriginal Economic Policy Research.

Harrison, N., & Greenfield, M. (2011). Relationship to place: Positioning Aboriginal knowledge and perspectives in classroom pedagogies. *Critical Studies in Education*, 52(1), 65-76.

Harvey, B., & Brereton, D. (2005). *Emerging models of community engagement in the Australian minerals industry*. A paper presented at the UN Conference on engaging communities in Brisbane, Australia, 15 August, 2005.

Hooper, M. (2010). Taking technology beyond the horizon. *The Australian Mining Review*, (November), 36-38.

Hughes, H. (3 March 2009). Northern Territory's education apartheid must end: Aborigines need mainstream teaching, not pretend schools. *Canberra Times*, 9.

Ivory, B. (1999). Enterprise development: A model for Aboriginal entrepreneur. *South Pacific Journal of Psychology*, 11(2), 62-71.

Kearney, G. E., & Davidson, P. (2006). Optimising assessment and selection with Indigenous people in remote communities. Retrieved March 19, 2012 from: http://www.valuedge.com.au/files/AUSIMM_paper.pdf

Kral, I. (2009). *The literacy question in remote Indigenous Australia*. Centre for Aboriginal Economic Policy Research: The Australia National University, Canberra.

Kunda, M., McGreggor, K., & Goel, A. (2009). *Addressing the Raven's progressive matrices test of "general intelligence"*. Association for the Advancement of Artificial Intelligence. Retrieved February 12, 2012 from: www.aaa.org

Latimer, C. (2011). *Mining; recruitment on the up: Australian mining*. Retrieved February 9, 2012 from: http:www.miningaustralia.com.au/news/mining-recruitment-on-the-up

Lawler, E. E. (1973). *Motivation in work organizations*. Monterey, California: Brooks/Cole Publishing.

McElwain, D. W., & Kearney, G. E. (1973). Intellectual development. In G.E. Kearney, P.R. de Lacey & G.R. Davidson (Eds.), *The psychology of Aboriginal Australians* (43-56). Sydney: John Wiley.

McKenzie, M. (1976). *Mission to Arnhem Land*. Melbourne: Rigby Limited.

Martinez-Fernandez, C. (2010). Knowledge-intensive service activities in the success of the Australian mining industry. *The Service Industries Journal*, 30(1), 55-70.

Mehrabad, M. S., & Brojeny, M. F. (2007). The development of an expert system for effective selection and appointment of the jobs applicants in human resource management. *Computers and Industrial Engineering*, 53, 306-312.

Menghetti, D. (2005). Invention and innovation in the Australian non – ferrous mining industry: Whose technology? *Australian Economic History Review*, 45(2), 204-219.

Mining. (2010). *Industry snapshots*. Retrieved January 10, 2012 from: http://www.skillaustralia.gov.au/PDF/Industry/Snapshots/2010/Mining.rtf

Native Title. (2009). *The rights of Indigenous Australians*. Retrieved July 27, 2009 from: http://rodhagen.customer.netspace.net.au/nativetitle.html

Patrickson, M., & Hayden, D. (1988). Management selection practices in South Australia. *Human Resource Management*, 26(1), 96-104.

Pearson, C. A. L., & Daff, S. (2008). Recruitment challenges of Yolngu Aboriginal groups from remote communities in Australia: A case study of the Rio Tinto Alcan Gove initiate at Nhulunbuy. *Journal of Australian Indigenous Issues*, 11(3), 19-36.

Pearson, C. A. L., & Daff, S. (2010). Education and employment issues for Indigenous Australians in remote regions: A case study of a mining company initiative. *Journal of Human Values*, 16(1), 21-35.

Pearson, C. A. L., & Daff, S. (2011a). Extending boundaries of human resource concepts and practices: An innovative recruitment method for Indigenous Australians in remote regions. *Asia Pacific Journal of Human Resources*, 49(3), 325-343.

Pearson, C. A. L., & Daff, S. (2011b). Collaborative delivery of work-integrated learning to Indigenous Australians in a remote community. *Asia Pacific Journal of Cooperative Education*, 12(2), 126-145.

Porteus, S. D. (1917). Mental tests with delinquents and Australian Aboriginal children. *Psychological Review*, 14, 32-41.

Raven, J. (2000). The Raven's progressive matrices: Change and stability over culture and time. *Cognitive Psychology*, 41, 1-48.

Roarty, M. (2010). *The Australian resources sector – its contribution to the nation, and a brief review of issues and impacts*. Retrieved January 5, 2011 from: http://www.aph.gov.au/library/pubs/bn/sci/AustResources.htm

Russell, D. (2004). Aboriginal-Makassan interactions in the eighteenth and nineteenth centuries in northern Australia and contemporary sea rights claims. *Australian Aboriginal Studies*, 1, 3-17.

Snow, R., Kyllonen, P., & Marshalek, B. (1984). The topography of ability and learning correlation. In R.J. Sternberg (Ed.), *Advances in the psychology of human intelligence* (Vol. 2, 47-103). Hillside, N.J.: Erlbaum.

Spearman, C. (1904). 'General intelligence', objectively determined and measured. *Australian Journal of Psychology*, 15, 201-293.

Tedesco, L., & Haseltine, C. (2010). An economic survey of companies in the Australian mining technology services and equipment sector, 2006-07 to 2008-09. Canberra: ABARE – BRS Research Report 10.07.

Thomas, L., Burnside, D., Howard, B., & Boladeras, S. (2006). Normalisation in a non-normal environment: Issues in building sustainable mining communities.

SD06 – operating for enduring value. Retrieved March 14, 2010 from: http://www.minerals.org.au/_data/assets/pdf_file/0017/17072/LouiseThomas.pdf

Tiplady, T., & Barclay, M. A. (2007). *Indigenous employment in the Australian minerals industry*. The University of Queensland, Brisbane: Centre for Social Responsibility in Mining Institute.

Trudgen, R. (2000). *Why warriors lie down and die*. Darwin: Aboriginal and Resource Development Services.

Westerman, T., & Wettinger, M. (1997). Psychological assessment and intervention. *Psychologically Speaking*. Retrieved March 19, 2011 from: http://www.gtp.com.au/ips/inewsfiles/Psychological%20Assessment%20of%20Aboriginal%20People.pdf

Wittmann, W. W., & Hattrup, K. (2004). The relationship between performance in dynamic systems and intelligence. *Systems Research and Behavioral Science*, 21(4), 393-409.

Worsley, P. M. (1955). Early Asian contacts with Australia. *Past and Present*, 7, 1-11.

Zheng, C., Rolfe, J., DiMilia, L., & Bretherton, P. (2007). Strategic people management of coal mining firms in central Queensland. *Management Research News*, 30(9), 689-704.