LOOKING PAST POSITIVITY FOR INDIGENOUS AUSTRALIAN STUDENTS: A PRELIMINARY INVESTIGATION OF RACIAL DISCRIMINATION AND THE ILLUSION OF RESILIENCY IN ACADEMIA[1]

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Abstract:
At the beginning of the current millennium, a 'new' psychological perspective emerged in the guise of positive psychology. Following this movement, a number of authors have emphasised that positive psychology may be a critical factor in diminishing inequities between the educational outcomes of Indigenous and non-Indigenous students (e.g., Craven & Bodkin-Andrews, 2006; Martin, 2006). An underlying assumption of positive psychology is that its constructs may act as agents of resiliency and strength in the face of adversity. Little evidence though exists directly testing this notion of resiliency for Indigenous Australian students, especially when considering more unique cultural stressors (e.g., racism). As a result, this investigation has identified a multitude of positive psychology constructs (e.g., self-confidence, motivation, identity), and sought to determine if they act as agents of resiliency for perceived racial discrimination and its negative impact on school achievement patterns for Indigenous and non-Indigenous Australian students. Utilising a combination of confirmatory factor analyses and latent interaction techniques, the preliminary results suggested that although the positive psychology constructs were associated with higher levels of achievement, they mostly failed to act as agents of resiliency against racism for Indigenous students (thus negating racism's negative impact). As a result, any educational intervention for Indigenous Australian students must also address unique cultural stressors rather than solely focusing on a positive framework.

A number of authors have argued that traditional psychology has operated almost solely from a negative framework, whereby research has focussed too strongly upon 'cures' of maladaptive behaviours, cognitions and social interactions (Gable & Haidt, 2005; Martin & Marsh, 2008; Seligman & Csikszentmihalyi, 2000; Seligman, Steen, Park & Peterson, 2005). The implications of such a 'victimology' approach are well captured in the words of Seligman (2002, p.3) who argued that:

> Psychology… became a science largely devoted to healing. It concentrated on repairing damage using a disease model of human functioning. This almost exclusive attention to pathology neglected the idea of a fulfilled individual and a thriving community, and it neglected the possibility that building strength is the most potent weapon in the arsenal of therapy.

That psychology has traditionally shown too strong an emphasis towards the negative or 'dark-side' of humanity has seen a number of researchers and therapists suggest that psychology has offered little in understanding the virtues of humanity (Snyder & McCullough, 2000). On the other hand, we cannot ignore the negative side of human experience, for a sole focus on positivity may do little to negate the detrimental effects of unique stressors (Held, 2004; Lazarus, 2003), especially in the cross cultural context (Bodkin-Andrews, Seaton, Nelson, Craven & Yeung, 2010). Such a 'black and white' perspective offers little in

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understanding the human psyche, especially since one of the principles of positive psychology is that the virtues of humanity may offer a source of strength and resiliency to overcome such stressors (Martin, 2006; Martin & Marsh, 2008; Seligman & Csikszentmihalyi, 2000). As a result, this investigation will explore the cross-cultural validity of the assumptions of positive psychology by examining how such constructs may interact with the unique cultural stressor of perceived discrimination, and how such interactions may influence the educational outcomes of Indigenous[2] and non-Indigenous Australian secondary students.

Positivity, positive psychology, and education

Although a list of universal characteristics (e.g., emotions, traits and even social institutions) that contributes the most towards living life adaptively has recently been identified (Seligman et al., 2005; Peterson & Park, 2003), positive psychology is not a recent development. Even with a number of prominent proponents of positive psychology (e.g., William James, Gordon Allport, Abroham Maslow[3]), it was not until an *American Psychologist* special issue on positive psychology that the movement gained recent momentum (Clonan, Chafouleas, McDougal, & Riley-Tillman, 2004; Gable & Haidt, 2005; Lazarus, 2003; Seligman et al., 2005). In the introductory article, Seligman and Csikszentmihalyi (2002) reinforce that psychology's emphasis on the 'disease model' offers little information on how to prevent the very problems psychologists are required to 'cure', for "working exclusively on personal weakness and on damaged brains… has rendered science poorly equipped to effectively prevent illness" (pp. 7-8). Instead of the disease model, Selgiman and Csikszentmihalyi argued that by focussing on the positive characteristics of human existence, the strengths of the human psyche (e.g., optimism, hope, perseverance), one can build upon these virtues as buffering agents against mental illness and distress.

In a consolidation of the vast diversity of positive psychological constructs identified, Peterson and Seligman (2004) established 24 character strengths that could be categorised into six overarching virtues: Wisdom and Knowledge (e.g., open-minded); Courage (persistence); Humanity (kindness); Justice (leadership); Temperance (forgiveness); and Transcendence (hope). Arguably, one of the strongest findings of these virtues and character strengths is the relative consistency in agreement of the importance of these strengths across varying countries. Indeed, Seligman et al. (2005) cite research that has indicated that the character strengths of kindness, fairness, authenticity gratitude and open-mindedness have been strongly endorsed across 40 difference countries (see Park, Peterson, & Seligman, 2005). Of equal, if not greater, importance though is the effectiveness of the underlying positive psychology principles as a critical point of intervention for maximising human potential and satisfaction. For example, Seligman et al. (2005) reported on an internet-based intervention whereby participants utilised a number of techniques over time. For those who completed the intervention, two techniques stood out as effective agents of resiliency against depressive symptoms, and strengthening agents for an increased sense of happiness. Specifically, tasks using signature strengths in a new way (having a participant identify their five highest strengths and using one of those strengths in a different way for each day over one week), and relating three good things (participants were asked to write three good things that happened each day, and explain their causes over one week) saw increased levels of happiness and decreased depressive symptoms over a six-month period.

Despite the potential path to increased levels of happiness and general wellbeing that many have noted in the positive psychology movement (Gaible & Haidt, 2005; Seligman et al., 2005; Sheldon & King, 2001; Snyder & McCullough, 2000), some have raised concerns as to the extent to which positive psychology has been implemented within the academic environment (Clonan et al., 2004). Although schools ultimately aim to foster the positive development of their students, like clinical psychology, school psychology has too long been

[2] Within this paper, the term Indigenous Australians is utilised to represent the diversity of individuals and nations that are recognised as being of both Aboriginal and/or Torres Strait Islander peoples.
[3] McCullough (2000) also cites a number of classic philosophers who explore the notion of virtue (e.g., Plato and Aristotle)

focused on a deficit orientation that has for the most part ignored the majority of students. This seeming contradiction in the ultimate aim of education and its practise was stressed by Clonan:

> reducing school psychology's focus on deficit-oriented practices that are potentially unsubstantiated and target a relatively small proportion of the population seems prudent. Instead, an emphasis on a positive school psychology that employs empirically sound and prevention-oriented practice aimed at enhancing the academic and social-behavioral competencies of *all* students is indicated (p. 103).

Two primary concerns are immediately apparent from Clonan, et al.'s (2004) remarks. Firstly, in her criticisms of positive psychology, Held (2004) raises the accusation of the 'Tyranny of Positive Attitude', whereby it is a fallacy that the stressors and difficulties in life can be overridden or negated by simply thinking positively. Although Clonan, et al. are not specifically suggesting that good will automatically overcome bad, the very nature of the comment does allude to the very tyranny Held writes of. Indeed, in her criticisms, she states that the dominant message of positive psychology is that "Positivity is good and good for you; negativity is bad and bad for you…Farewell to individual differences; one size fits all" (pp.12-13). Although the research of Seligman, et al. (2005) does suggest that the value of positive psychology's strengths and virtues seem reasonably consistent across a wide variety of countries, can the same be said for negative stressors? Are there stressors that may be unique to particular cultural and/or minority groups? For example, would thinking positively effectively negate the impact of varying forms of prejudice and discrimination?

Perceptions of Discrimination

Recognition of the potential negative effects of varying forms of discrimination on the diversity of minority and/or disadvantaged group members have long been recognised by a number of scholars (Allport, 1954; Clark, Anderson, Clark, & Williams, 1999; Crocker & Major, 1989; Essed, 1990; Jones, 1972). Yet, only relatively recently has empirical research began to assess the impact of varying forms of discrimination upon individuals' general-wellbeing, physical health, mental health, and educational performances.

Generally speaking, the late emergence of research seeking to understand the impact discrimination may be due to experimental reservations or cited ethical difficulties in manipulating the receipt of discrimination (e.g., Fischer & Shaw, 1999). Yet, the more recent upsurgeance in target-based discrimination literature can largely be attributed to the development and use of a variety of self-report scales that have allowed researchers to begin to comprehend the stressful effects of varying forms of discrimination (Utsey & Ponterotto, 1996). This in turn saw recognition of the subjective nature of discrimination (Clark, Anderson, Clark, & Williams, 1999; Szalacha, Erkut, Coll, Alarcon, Fields, & Ceder, 2003), and thus the label of perceived discrimination arose within the literature. At its simplest, perceived discrimination may be defined as the subjective interpretation of behaviour or events as being discriminatory towards oneself or one's reference group. This is regardless of whether the discriminatory instance is overt, subtle, or even a misinterpretation of intent (Bodkin-Andrews, Craven, Marsh, & Martin, 2006).

Although there is an increasing body of literature identifying the link between perceived discrimination and both physical and mental health outcomes (Brondolo et al., 2003; Klonoff, Landrine, & Ullman, 1999; Paradies, 2006; Williams, Neighbours, & Jackson, 2003), literature examining the relations between perceived discrimination and educational outcomes is limited in comparison (Stone & Han, 2005). Verkuyten and Brug (2003) found that for 204 minority students of Surinamese, Turkish, and Moroccan backgrounds within the Netherlands, perceived discrimination significantly contributed to levels of disengagement from the academic environment, independent of the students' self-reported grades and the extent to which they felt their performance at school was representative of their ability.

Wong, Eccles, and Sameroff (2003) examined 629 early adolescent African American students to understand how perceived discrimination from peers and teachers impacted

upon academic motivation and achievement. Even when controlling for earlier measures of the outcome variables, gender, SES, and perceived discrimination, both peer and teacher discrimination was associated with lower ratings of the importance of school (r = -.16 for both variables), lowered ratings on the utility of school (r = -.27 and -.30 respectively), and lowered levels of self-perceived academic competence (r = -.15 and -.13 respectively). Additionally, in an extension of the previous analyses, Eccles, Wong, and Peck (2006) also identified a significantly negative association between perceived teacher discrimination and school grade point average (r = -.11), suggesting that as students perceived prejudicial attitudes and behaviours from their teacher, the lower their overall performance was in school.

With these consistent negative associations between perceived discrimination and varying education outcomes (with the strongest of which being centred around the value or worth of school), it is important that the effects of perceived discrimination over academic outcomes be more fully understood. In fact, numerous authors have stressed the importance of understanding the impact the varying forms of discrimination may have across unique cultural groups (Utsey et al., 2002; Noh & Kaspar, 2003; Szalacha et al., 2003).

Perceived Discrimination and Indigenous Australians

One unique culture (or more precisely group of cultures) that has been labelled as one of the most discriminated against in Australia is Indigenous Australians (Brennan, 1998; Craven & Marsh, 2004; Mellor, 2003; Sanson et al., 1998). Although there is a prevalence of research examining discriminative attitudes *against* Indigenous Australians (e.g., Augoustinos, Tuffin, & Sale, 1999; Pedersen & Walker, 1997), until recently, little research has directly addressed the impact of these attitudes *on* Indigenous Australians, especially within educational settings. This dearth in the research literature is concerning. As Lester (2000) argued, “racism is pervasive across all areas of community activity and the education domain is not exempt from its destructive forces… racism is still a major stumbling block to any program development in any Indigenous education and training” (p. 15).

In a seminal paper, Mellor (2003) identified a multitude of ways Indigenous Australians experienced discriminative events: verbal racism (e.g. name calling, jokes), behavioural racism (e.g. avoidance, assault), overt discrimination (e.g. denial of services, over-application of punishment) and macro discrimination (e.g. media misinformation, selective views on history). Mellor’s findings contradicted some research suggesting that racism (at least its more blatant manifestations) may be on the decline, leading Mellor to conclude that “not only was it the norm for participants in this study to have experienced racism in their daily lives but much of the racism experienced was one-on-one, blatant, old fashioned racism” (p.483). The implications of Mellor’s findings emphasised the critical need to further understand the impact such racism may have on the general wellbeing of Indigenous Australians. The following section will provide a brief overview of more recent research which addresses this need across physical, mental, and educational outcomes.

Indigenous research on discrimination and physical health. A number of recent studies have linked perceptions of racism and discrimination to varying levels of physical heath. For example, Larson, Gillies, Howard, and Coffin (2007) found that Indigenous Australians who reported experiencing negative racially based treatment were 3.6 time more likely to report a lower level of physical health than those who did not experience such treatment. More specific results can be identified in a large-scale study by Zubrick and colleagues (2006), who found that for a large sample of Indigenous youth and adults, perceived racism was significantly associated with health risk behaviours such as increased levels of alcohol consumption and cigarette and marijuana use. Finally, a study by Paradies and Cunningham (2009) found that 49% of Indigenous Australian respondents who experienced racism reported significantly increased physical stress reactions (e.g., headache, upset stomach).

Although such findings suggest that perceived discrimination is linked to poorer health outcomes for Indigenous Australians, the plethora of international research (see Pascoe, et al. 2009 for an overview; see also Paradies, 2006a) has found that the most consistent and strongest associations are between perceived discrimination and mental health outcomes.

Indigenous research on discrimination and mental health. Consistent with international research, Larson et al. (2007) found that Indigenous participants who reported experiencing negative race based treatment were 9.2 times more likely to report lower mental health scores when compared to Indigenous participants who did not report such treatment in the previous four weeks. Zubrick and colleagues (2006) found that Indigenous youth who experienced racism in the previous six months were significantly more likely to report clinically significant emotional or behavioural difficulties when compared to those who did not experience racism, and were 2.2 times more likely to report experiencing suicidal thoughts. Considering this link with suicide, we can no longer ignore the enormity of potentially negative effects of perceived racism on Indigenous Australians.

Indeed, in a follow-up study to his groundbreaking work on the types of racism experienced by Indigenous Australians, Mellor (2004) investigated the possible coping strategies to this cultural stressor. Such strategies included cognitions and behaviours entailing self-protection (e.g., withdrawal), self-control (e.g., ignoring), and confrontation (e.g., assertion of rights). Embedded in these emotional and behavioural responses were some disturbingly negative coping strategies which included: *Withdrawal and escape* – A form of psychological avoidance that included avoiding people who may express racist attitudes, or even turning to alcohol or drugs to avoid addressing racism; *Resignation of fate* – An implicit acceptance that racism will continue to exist that is associated with high levels of apathy and passivity; *Avoidance of further contact* – Avoiding people who may express racist attitudes and avoiding situations where racism may occur; and *Denial of identity* – Detach themselves from their very Aboriginality.

Indigenous research on discrimination and education. Although recent research has examined the relations between perceived racism and physical and mental health outcomes for Indigenous Australian participants, less can be said with regard to research directly testing the relations between racism and educational outcomes. However, the issue of experiencing racial discrimination did emerge either directly or indirectly within the existing body of research. Indeed, the impact of racism on the educational outcomes and engagement of repeated generations of Indigenous Australian students is one that has been acknowledged in long history of research (Brennan, 1998; McConnochie, Hollinsworth, & Pettman, 1988; Partington, 1998), and it cannot be denied that early educational policies, programs, and attitudes targeting Indigenous Australian peoples could be seen as being inimical to their true cultural identities, and general wellbeing and educational development (Parbury, 1999). Although educational policy may have improved substantially over the last few decades, incidental research suggests that the spectre of racism within education is far from being some insubstantial apparition.

Lester (2000), in a series of focus group discussions with Indigenous community members, found that the single largest reported obstacle inhibiting career expectations for Indigenous students was that of racism both within the workforce and the schooling system. These fears are also reflected in discussions with prominent Aboriginal Education Consultative Group members (Craven & Tucker, 2003) who highlighted difficulties in peer relationships for Indigenous students, largely stemming from racist attitudes towards them. In addition, more subtle indications of covert racism were alluded to in the unfair expectations and misconceptions with which Indigenous students are forced to deal. These fears voiced by community members and Indigenous representatives are also reflected in the students themselves. In a qualitative study aimed at identifying Indigenous high school students' future aspirations and perceived barriers to these aspirations, all 83 Indigenous students interviewed identified racism as a major barrier to achieving their life goals (Parente et al., 2003). Another qualitative analysis of 52 Indigenous adolescents highlighted the extreme impact experiences and expectations of discrimination may have, as overt discrimination was cited as a key reason as to why Indigenous students actually left school (Howard, 2002).

Identifying Resiliency?

In a review of the perceived discrimination literature and varying agents of resiliency, Szalacha and colleagues (2003) stressed that resiliency must be considered a

multidimensional construct, and that careful attention must be focussed on both the protective constructs as well as the constructs that exacerbate vulnerabilities associated with discrimination. As already discussed, perceived discrimination has been associated with lower levels of physical and mental health, and educational outcomes, yet the review probed deeper into such issues and explored a number of ways discrimination may be moderated by other variables. Firstly, the review highlighted the somewhat contentious debate as to personal factors that may lesson the possibility of perceiving discrimination, such as cognitive development, attributional ambiguity, varying world views, need for control, and finally the possibility of attributions of discrimination as a protective mechanism against internalising negative feedback. Although such mechanisms may vary the extent to which discrimination may or may not be perceived, Szalacha et al. are careful to stress that support for such findings (e.g., Crocker, 1999) may represent contextual or experimental methodological biases that fail to capture the pervasiveness of the long-term effects of discrimination (see Schmitt & Branscombe, 2002 for a comprehensive overview of this issue). Within the Indigenous Australian context, Mellor (2003, p. 483) issued a similar warning that extended past the 'life-experience' context by arguing that "two hundred years of colonization, dispossession, genocide, and cultural imperialism, as well as everyday racism, left little doubt in the minds of the participants that their experiences in day-to-day life are tinged with racism".

Moving beyond the conceptual limitations of factors that may protect against perceiving discrimination, Szalacha et al. (2003) highlighted a number of factors that may limit the damaging impact of discrimination, such as ethnic pride, cross-cultural competence and biculturalism. Although such results are promising, one must keep in mind the diverse impact discrimination may have on individuals from varying minority or disadvantaged group backgrounds. This is none-the-more-evident in research examining the extent to which identity may moderate the impact of varying forms of discrimination (e.g., sexism, racism, etc). For example, Sellers, Caldwell, Schmeelk-Cone, and Zimmerman (2003) found that for a sample of African American young adults, a higher sense of centrality (importance) in one's racial identity eliminated the significant negative effects of racial discrimination over levels of stress. Similarly, Mossakowski (2003) found that for a sample of Filipino Americans, a stronger ethnic identity buffered the negative impact of racial discrimination. On the other hand, Kiang, Fuligni, Gonzales-Backen, and Witkow (2005) found that for Asian-American and Mexican-American adolescents, the centrality of one's racial identity did not moderate or buffer the effects of discrimination over levels of anxiety. This variation in the moderating effects of varying conceptualizations of identity over the relations between discrimination and mental health outcomes highlights the need to be more sensitive to not only the particular measures being utilised, but also the particular group being examined.

With the immense diversity across cultural and minority groups worldwide, the stereotypes, stigmas and discriminatory attitudes and behaviours directed at these groups would also differ substantially. Logically, so would the effects of discrimination type and the potential effects of buffering and/or moderating variables. As result, especially within the Indigenous Australian context, it is imperative that directed research seek to more fully understand the impact of racial discrimination on Indigenous Australians, and also to identify agents of resiliency that may limit or buffer these negative effects.

Recently, a number of educational psychology researchers have emphasised the positive psychological perspective as a potential agency for promoting strength in Indigenous Australian students (Craven & Marsh, 2008; Martin, 2006). Considering the long line of research that has argued that positive constructs (e.g., self-concept, motivation, identity) may substantially contribute to the engagement and performance of students across a wide range of cultures (Bortoli & Cresswell, 2004; Marsh & Hau, 2004; Marsh & Köller, 2003; McInerney, 2003; Purdie, 2005), it is essential that such constructs be tested for not only their direct effects on Indigenous students' schooling outcomes, but also how they may buffer the negative impact of racial discrimination over the same schooling outcomes. As a result, this investigation shall examine how perceived discrimination, varying dimensions of self-concept, motivation, and identity may be related to Indigenous and non-Indigenous students'

academic achievement and aspirations. In addition, attention will be placed upon whether these positive psychology variables may negate the negative relations between racial discrimination and these outcomes for both Indigenous (minority group) and non-Indigenous (majority group) students.

Method

Participants

The total sample consisted of 1623 school students (from 5 New South Wales high school), with a mean age of 13.60 years. Of these students, 835 were male and 788 were female, with 338 being Indigenous Australian and 1285 being non-Indigenous Australian.

Materials

The Personal Discrimination Measure (drawn from the PGDD - Bodkin-Andrews, Craven, & Martin (2006). This 5-item measure was designed to assess an individual's experiences of racial discrimination at the personal (direct contact) level. All items were measured on a 6-point Likert scale, with higher scores indicating greater levels of agreement to experiencing perceived discrimination.

Multiculturation *(drawn from the PGDD - Bodkin-Andrews, Craven, & Martin (2006)*. A 4-item measure of perceived respect, acceptance, and pride from people within the larger Australian context. All items were measured on a 6-point Likert scale with higher scores indicating greater perceived respect and acceptance.

Cultural Identity (drawn from the Social Identification Scale - Cameron, 2004). Six positive items drawn from a larger measure, which include questions concerning cultural ties (ties that bind the self to the group), centrality (frequency of identification with the in-group) and cultural affect (emotional identification with the group). All items were measured on a 6-point Likert scale, with higher scores indicating greater levels of agreement to having a positive sense of identity.

The Self-Description Questionnaire II – Short (SDQII-S; Marsh, Ellis et al., 2005). The academic and general-self-esteem measures were drawn from this scale to measure different facets of adolescent self-concept. The original short form of the SDQII, formulated by Marsh, Ellis et al. (2005), consists of 51 items addressing a total of 11 facets of self-concept and all items are scored on a 6-point Likert response scale (1 = False to 6 = True).

The Student Motivation and Engagement Scale (SMES; Martin, 2004). Six adaptive motivation factors were utilised for this investigation to measure varying dimensions of students' cognitive and behavioural motivational strategies. The full SMES is a 44-item scale designed to measure a total of 11 motivational factors: three adaptive cognitive, three adaptive behavioural, three impeding, and two maladaptive dimensions. Students respond on a 7-point Likert response scale ranging from 1 = Strongly Disagree to 7 = Strongly Agree.

Wide Range Achievement Test 3rd Edition (WRAT-3). The WRAT-3 includes a set of two tests that were utilized to assess students' achievement in spelling and maths. Although scores for the WRAT-3 are traditionally computed based on the number of correct responses and are weighted/normed based on a student's age (Wilkinson, 1993), as the WRAT-3 has not been normalised for Australian samples, standardised scores were instead computed according to the School Year of the students.

Table 1 (see next page) provides a summary of the independent (including moderator) and dependent variables utilised for this investigation.

Procedure

The survey and achievement tests were administered in school halls under exam conditions. Across all schools, students were split into Year groups for each administration. To control for varying literacy levels, the survey was read aloud by the researchers using a microphone.

Statistical Analysis

In addressing the general research aims, a number of statistical techniques were conducted with MPLUS 5.1 using maximum likelihood estimation. The first set of procedures addressed the initial aim of this study of determining the validity of the measures to be utilised across the Indigenous and non-Indigenous samples. As a result, confirmatory factor analyses (CFA; see Byrne 1998 for an overview) were used to assess the psychometric properties of the measures across the Indigenous and non-Indigenous samples. The following goodness-of-fit indices were utilised to assess model fit: the Root Mean-Square Error of Approximation (RMSEA); the Tucker Lewis Index (TLI) and the Comparative Fit Index (CFI) as per the advice of Marsh, Balla, and Hau (1996).

The CFA results were extended upon by conducting factorial invariance testing (see Byrne, 1998; Marsh, 1994), which assessed whether or not the factor structure of any model is consistent across varying groups of interest (Marsh, Tracey, & Craven, 2006). Although factorial invariance testing involves testing the equivalence of groups across a number of separate and increasingly restrictive models, under the advice of Byrne (1998) and Marsh (1994), emphasis was placed on achieving invariance across the factor loadings and factor variance co-variances matrixes only, as models testing the invariance of the uniqueness (error variance) are often deemed too restrictive (Byrne, 1998). With regard to measurement equivalence, Cheung and Rensvold recommend the CFI, whereby a change of no more than .01 in the CFI fit index is representative of equivalence across groups. Marsh et al. (2006) also suggested examining variation in the 90% confidence intervals of the RMSEA whereby overlap in the interval indicates equivalence of measurement. The CFA models across the Indigenous and non-Indigenous student samples will also act as an assessment of how the designated indicator variables may be related to the outcome variables.

Finally, the CFA models for the Indigenous and non-Indigenous students will be extended upon to examine the interactions between personal discrimination and the other indicator variables over the designated outcome variables. Essentially, a modification in the Latent Moderated Structural (LMS) equation approach (Klein & Moosbrugger, 2000) will be utilised. In the LMS approach, the interaction term was represented as a random slope variable, and as a result, a series of analyses was conducted whereby the interaction term was used as the sole predictor (thus correlated) with the outcome variables. If the correlation was significant, a figure was then formulated utilising the interaction value and the correlations between the 'main-effect' variables and the selected outcome variable to determine the nature of the interaction. The authors are aware that this is not standard practice for latent interaction modelling, but such a procedure does give a preliminary indication of the nature of any potential interaction effect.

Table 1. Instrument summary

Scale	Description	Sample Items
Personal Discrimination	Perceptions of verbal, emotional, and physical racial discrimination emanating from personal interactions	"People have called me nasty names based on the culture I come from"
Multiculturation	A measure perceived respect, acceptance, and pride from people within the larger Australian context	"People I meet accept my cultural identity"
General School Self-concept	Student perceptions of their skills and ability in school subjects in general	"I am good at most school subjects"
Mathematics Self-concept	Student perceptions of their skills and ability in mathematics	"I do badly in tests in Mathematics"
Verbal Self-concept	Student perceptions of their skills and ability in English	"I learn things quickly in English classes"
Global Self-Esteem	Student perceptions of themselves with regard to their overall self-worth, self-confidence and satisfaction with oneself.	"Most things I do, I do well"
Self-belief Motivation	A student's belief and confidence in their ability to understand or do well in their school work	"If I try hard, I believe I can do my schoolwork well"
Mastery Motivation	A student's drive on being focused on learning, solving problems and developing	"I feel very happy with myself when I really understand what I'm taught at

	skills	school"
Value of Schooling Motivation	A student's belief that what they learn at school is useful and important to them and the world in general	"I'm able to use some of the things I learn at school in other parts of my life"
Planning Motivation	The extent to which a student plans and keeps track of their schoolwork, assignments, and study	"I usually have a plan for how to do my homework when I start it"
Study Management Motivation	How students organize, administer and take advantage of the study time made available to them	"I usually do my homework in places where I can concentrate"
Persistence Motivation	The extent to which a student keeps trying at their school work in the face of difficulty or challenges	"If I can't understand my schoolwork, I keep trying until I do"
School Enjoyment	The extent to which students reported that they enjoyed school and the activities at school	"I am happy when I am at school"
Instrumentality	The extent to which students rated school as an important process for achieving their future goals	"I do work assigned in school because learning the material is important for obtaining my dreams"
Cultural Identity	An indication of how positive a cultural self-identity a student may have.	"I feel strong ties to other people from my culture"
Home-Economic Resources (SER).	A total of 10 resources that could be found within the home environment to aid studying habits.	"Do you have any of these things at home: a desk to study on"
	OUTCOME VARIABLES	
Spelling Achievement	A normalized achievement measure based upon results from a 40-item spelling test	"*in* – They are *in* the pool – *in*"
Maths Achievement	A normalized achievement measure based upon results from a 40-item mathematics test	"15/5 ="
University Aspirations	A rating on how useful university may be for achieving future goals	"How useful might going to university be for helping you achieve what you want to do after you leave school?"

Results & Discussion

Table 2 presents the descriptive and reliability statistics for each measure under investigation for the Indigenous and non-Indigenous students. On average, both the Indigenous and non-Indigenous students disagreed with experiencing personal discrimination (although the proximity of the mean to the mid-score suggests a substantial amount of Indigenous students agreed with experiencing some form of discrimination), and agreed to possessing more positive levels of self-concept, motivation, identity, enjoyment and instrumentality of school and valuing the importance of a university education. By and large, these results are consistent with previous research that suggested that Indigenous students also possess more adaptive notions of academic self-concepts (Marsh & Craven, 2004), motivation (McInerney, 2003) and cultural identity (Purdie, 2005). With regard to the achievement measures, with the scores being standardised across school years (i.e., mean score equal to 0), Indigenous students were below average whereas the non-Indigenous students were slightly above average on both spelling and math achievement. Again, these results are consistent with previous research that Indigenous students often have lower levels of achievement when compared to non-Indigenous students (Bortoli & Thomson, 2009; Department of Education, Employment & Workplace Relations, 2008).

Table 2. Descriptive Statistics for all measures.

Factors	Mean		Standard Deviation		Cronbach's Alpha	
	Abr	Non-Abr	Indig	Non Indig	Indig	Non Indig
Discrimination (1-6)	2.66	1.93	1.35	1.06	.88	.89
Multiculturation (1-6)	4.75	4.88	0.87	0.85	.77	.73
Math Self-concept (1-6)	3.46	3.82	1.42	1.44	.87	.91
Verbal Self-Concept (1-6)	3.64	4.15	1.37	1.25	.89	.90
School Self-concept (1-6)	4.07	4.50	1.17	1.07	.80	.84
School Enjoyment (1-6)	4.16	4.18	1.36	1.19	.88	.83
Instrumentality (1-6)	4.55	4.86	1.16	0.93	.93	.93
Self-belief (1-7)	5.41	5.77	1.18	1.03	.76	.81
Mastery (1-7)	5.55	5.80	1.13	0.98	.84	.84
Value of School (1-7)	5.64	5.93	1.15	0.94	.81	.82
Planning (1-7)	4.58	4.63	1.37	1.29	.77	.77
Management (1-7)	4.97	5.19	1.47	1.38	.83	.86
Persistence (1-7)	4.92	5.10	1.43	1.26	.84	.84
Cultural Identity (1-6)	5.27	5.06	1.16	1.17	.81	.80
HER (1-10)	7.21	7.44	2.06	1.97	--	--
Standardised Math Achievement	-0.36	0.09	1.06	0.96	--	--
Standardised Spelling Achievement	-0.18	0.05	0.82	1.04	--	--
Importance of University (1-5)	2.02	1.93	1.25	1.16	--	--

Note. Abr = Indigneous Australian, non-Abr = Non-Indigenous Australian, brackets after factor labels indicate scale ranges, with a higher scores indicating more positive results (with the exception of Importance of University which is reversed).

Table 2 also shows the high reliability estimates, suggesting a strong level of internal consistency for each of the latent factors (e.g., personal discrimination). Reliability analyses are far from an adequate assessment of any one, or group of measures, especially when considering the sensitivity required in cross-cultural research (Byrne, 2003). As a result, an overall confirmatory factor analysis was conducted for the total sample (Indigenous and non-Indigenous students) as a stronger assessment of the psychometric properties of the instruments utilised, and to set the foundation for factor invariance testing across the Indigenous and non-Indigenous sample

Table 3 presents the overall CFA results for the total sample and show that the goodness of fit criteria were acceptable-to-strong, with the RMSEA being below .05 (excellent fit), the CFI being at .95 (excellent fit), and the TLI sitting at .94 (acceptable-to-strong fit). In addition, all item-to-factor loadings were above the minimally acceptable criteria of .30 (Hills, 2007). The factor correlations range from -.37 to .88 (Table 4), suggesting that while some of the factors are substantially related, they are not so correlated that they are measuring the same construct (that is nothing above .90 – Hills, 2007). In addition, the variables under the general positive psychology paradigm (self-concept, motivation and identity measures) were all positively related with each other, and either unrelated, or negatively related to the personal discrimination measure.

Table 3. Total Sample CFA results

Goodness of Fit Criteria					
χ^2	*df*	TLI	CFI	RMSEA	
5061.01	1866	.94	.95	.032	
Factor Loadings					
Item #	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6
Discrimination	.78	.79	.76	.82	.81	--
Multiculturation	.68	.65	.64	.59	--	--
Math Self-concept	.80	.91	.86	.78	--	--

Verbal Self-Concept	.71	.74	.84	.89	--	--
School Self-concept	.65	.70	.82	.84	--	--
School Enjoyment	.60	.80	.80	.64	--	--
Instrumentality	.83	.85	.87	.76	.75	--
Self-belief	.75	.59	.73	.82	--	--
Mastery	.72	.77	.76	.78	--	--
Value of School	.66	.77	.68	.81	--	--
Planning	.74	.72	.80	.50	--	--
Management	.73	.75	.86	.75	--	--
Persistence	.72	.75	.74	.81	--	--
Cultural Identity	.47	.67	.71	.78	.62	.64
HER	1.00	--	--	--	--	--
Math Achievement	1.00	--	--	--	--	--
Spelling Achievement	1.00	--	--	--	--	--
Importance of University	1.00	--	--	--	--	--

Note: χ^2 = Chi Square, *df* = degrees of freedom, NNFI = Non-Normed Fit Index, CFI = Comparative Fit Index and RMSEA – Root Mean Square Error of Approximation.

With the total sample CFA results providing a strong indication of acceptable psychometric properties for the combination of measures being utilised, the foundation was set for answering the question of measurement equivalence across the Indigenous and non-Indigenous students, thus ensuring that the structure and meaning of the instrument is the same across both groups (Bodkin-Andrews, Ha, Craven & Yeung, 2010; Marsh, 1994; Parker et al., 2007).