CHAPTER FOUR

RELIABILITY AND VALIDITY OF INSTRUMENTS
4.0 Reliability and Validity of the Instruments Used

Qualitative Analysis (Focus Groups) suggested the need to modify the Multidimensional Acculturative Stress Inventory (Rodriguez et al., 2002) for use in the current South African context and to quantitatively establish the reliability and validity of selected instruments used in the current research context, before quantitative evaluation of research hypotheses could be concluded. This chapter thus discusses quantitative analyses that were conducted with the current research sample (N=187) as part of the validation process, and findings that were considered necessary to establish the reliability and validity of the MASI-R, EAT26, EDDS and GHQ-12 within the current research sample. Frequencies recorded in the Demographic Questionnaire are presented first to provide a context within which findings may be interpreted and discussed. Tables of all results for the sample, each school and each grade may also be found in Appendices 8 - 11.

4.1 General Demographic Questionnaire

**Subjects:** The sample consisted of 187 black female learners from School A (N=25); School B (N=16); School C (N=90); School D (N=32) and School E (N=24) and Grades 9 (N=37); Grade 10 (N=50); Grade 11 (N=48) and Grade 12 (N=52). Subjects represented Grade 9 (N=37); Grade 10 (N=50); Grade 11 (N=48) and Grade 12 (N=52). Subject numbers for each School and Grade at each school may be found in the frequency table in Appendix 8.

**Age:** Subjects ranged in age from 13 years and 4 months to 24 years with a Mean age of 16.6 years (SD=19.72) and Median of 16.5 years. Median age for each school included: School A (Median=18 years); School B (Median=16 years); School C (Median=16.5 years); School D (Median=15.62 years); School E (Median=16.08 years). Median age for each Grade included: Grade 9 (Median=14.8 years); Grade 10 (Median=15.8 years); Grade 11 (Median=17 years) and Grade 12 (Median=18 years (Appendix 9).
**Body mass index (BMI):** BMI ranged from 17.4 to 41.0 with a sample mean of 25.03 and median of 23.90. Median BMI for each school included School A (Median=23.70); School B (Median=26.00); School C (Median=23.95); School D (Median=23.68); and School E (Median=22.50). Median BMI for each Grade included: Grade 9 (Median=23.70); Grade 10 (Median=23.99); Grade 11 (Median=23.76) and Grade 12 (Median=23.70), (Appendix 8).

**Number of years in a Multicultural School:** Most subjects (N=152; 81.3%) from the multicultural schools (MCS) had attended a multicultural school since Grade 1 with only 2 having attended a multicultural school for less than five years and 10 who left the item blank. All 25 subjects in School A had attended an ‘all black’ school since Grade 1. There were 81.3% of the sample who had ANY years experience in a multicultural school and 13.4% of the sample who had NONE (Appendix 8).

**Multicultural and Uni-cultural schools:** School A was the only uni-cultural school with 25 subjects and the remaining four schools (N=162 subjects) were multicultural, in varying degrees of numerical racial integration.

**Language:** Subject responses to primary language were sorted into categories which included: Zulu (N=73 subjects; 39%); English (N=22 subjects; 11.8%); Other African (N=5 subjects; 2.7%) fully bilingual Zulu/English (N=85 subjects; 45.5%) and missing items (N=2; 1.1%). Responses to parents’ language were also coded into these categories, which included: Zulu (N=145 subjects; 77.5%); English (N=3 subjects; 1.6%) Zulu/English (N=24 subjects; 12.8%); Other African (N=13 subjects; 7.0%) and missing items (N=2 subjects; 1.1%), (Appendix 8).

**Culture:** Subject responses to self-designated culture, were sorted into categories which included: Zulu (N=115 subjects; 61.5%); Western (N=8 subjects; 4.3%); Other African (other black South African and African cultures and a broader designation of ‘African Culture’ or ‘Black
Culture'), (N=38 subjects; 20.3%); Mixed Western/African (mixed groupings such as ‘Modern Zulu’, ‘Black-American’, ‘Rainbow Kid’, ‘Multi’ and ‘Modern African’), (N=16 subjects; 8.6%); and ‘I Don’t Know’ (subjects who identified that they did not know their cultural category; N=3 subjects; 1.6%) and missing items, namely subjects who left the item blank (N=7; 3.7%). Responses to parents’ culture included Zulu (N=128 subjects; 68.4%); Western (N=3 subjects; 1.6%); Other African (N=34; 18.2%), Mixed (N=7 subjects; 3.7%) and ‘I Don’t Know’ (N=3 subjects; 1.6%) and missing items N=12; 6.4%) (Appendix 8).

Cultural categories were then condensed into broader groupings to improve statistical power, namely Westernized (Western and Mixed), non-Westernized (Zulu and Other African) and subjects who were unable to designate themselves into a cultural group (‘I Don’t Know’ plus subjects who left the item blank, suggesting that they also did not know their culture). Frequencies in these categories included Non-westernized (N=153 subjects; 81.8%), Westernized (N=24; 12.8%) and ‘I Don’t Know’ (N=10 subjects; 5.3%), (Appendix 8).

**Home and Residential Area:** Responses were sorted into categories of Home Area (parental home) and Current Residential Area, indicating if they are living or boarding away from their parental home. Responses for each category were coded into ‘Black’ or ‘White’ area indicating whether these areas have, historically, been a white or blacks-only area. Most subjects (N=106; 56.7%) resided in a predominately black area although eighty (N=80; 42.8%) resided in a historically white area; and one subject (N=1; 0.5%) left the item blank. One hundred (N=100; 53%) subjects indicated that their parental home was situated in a predominantly Black area and eighty five (N=85; 45.5%) located their home in a historically ‘white’ area; and 2 subjects (N=2; 1.1%) left the item blank (Appendix 8).

**Socio-economic status:** Socio-economic status was determined by the highest ranking parental occupation, using a system for social stratification (Hollingshead & Redlich, 1953). Class 1 consisted of professional occupations such lawyer or medical doctor (N=10; 5.3%); Class 2
consisted of managerial and technical occupations of which the vast majority were nurses or teachers (N=88; 47.1%); Class 3 consisted of skilled occupations such as clerks (N=32; 17.1%); Class 4 consisted of semi-skilled occupations such as factory workers and shop assistants (N=18; 9.6%) and Class 5 consisted of unskilled occupations such as domestic worker (N=9; 4.8%). Unemployed parents were allocated to Class 0 (N=30; 16.0%). School A reported the highest rate of unemployment with thirteen (N=13; 52%) cases of unemployment in both parents. Fourteen (N=14) subjects failed to fill in an occupation; suggesting that these parents may also have been unemployed (Appendix 8).

**Presence or absence of Parents:** If parents were absent (unknown or not contactable) or deceased, subjects were requested to specify this in parental occupation. Eight (N=8; 4.3%) reported their mothers as either absent (N=2) or deceased (N=6) and 67 (N=35.8%) reported their fathers as either absent (N=46) or deceased (N=19). School A quoted the highest number of absent or deceased fathers (N=68%) and only six (N=6: 24%) subjects at School A demonstrated both parents as Present (Appendix 8).

### 4.2 The Multidimensional Acculturative Stress Inventory–Revised (MASI-R):

The Multidimensional Acculturative Stress Inventory (MASI; Rodriguez et al., 2002) was modified to reflect local requirements, as informed by the Focus Groups and administered as the MASI-Revised, which consisted of 34 items (Appendix 7a and b). These items were loosely organized into two factors namely Pressure to Acculturate (PTA: items 1-13); Pressure against Acculturation (PAA; items 14-24) and a new factor, CONFLICT (items 25-34) which was entirely drawn from comments made in the Focus Group and appeared to represent identity confusion in response to opposing bi-cultural pressures.
4.2.1 Reliability

Cronbach’s coefficient alpha for the 34-item MASI-R was computed at Alpha=0.935 for the whole sample which, following DeVellis (1991), may be seen as indicating ‘very good’ reliability. Alpha scores for each item ranged from Alpha=0.931 (item 27) to Alpha=0.936 (item 2) with no items scoring below the exclusion criteria of Alpha=0.70; suggesting that the 34 items of the MASI-R demonstrated adequate internal consistency and may indeed measure a common latent variable. The sample size of 187 subjects also yielded a potential power of 95% at 5% level of significance (2-sided), which may be seen to provide sufficient statistical power to limit the occurrence of a Type II error. Alpha coefficients for each school were also computed at: School A (Alpha=0.837); School B (Alpha=0.880); School C (Alpha=0.943); School D (Alpha=0.915) and School E (Alpha=0.956); suggesting adequate internal consistency across the various school contexts of the sample.

Principle component factor analysis with varimax rotation revealed nine (N=9) factors with eigen values above one (1.0) and factor loadings > 5.0. Only two (N=2) of these factors contained more than three (N=3) items. Factor One contained nine (N=9) items, eight (N=8) of which corresponded to the subscale of PAA (items 14-24). Factor Two contained eight (N=8) items, all of which corresponded to the proposed subscale of CONFLICT (25-34). These two factors accounted for 5.18% and 5.12 % of the total variance respectively. The seven (N=7) factors that failed to achieve more than three items all originated from the subscale of PTA (items 1-13). This subscale also, however, achieved an alpha coefficient above Alpha=0.70, thereby limiting indications for its exclusion.

A forced, three-factor analysis was thus computed and revealed three factors that accounted for 44.8% of the total variance and 6.5%, 4.9%, and 3.7% of the variance for each factor, respectively. These factors demonstrated eigen values of 10.49, 2.69 and 2.0 respectively, and factor loadings of >5.0. Orthogonal transformation matrices revealed that these factors largely corresponded
with the proposed subscales of Pressure to Acculturate (PTA), Pressure against Acculturation (PAA) and CONFLICT (Appendix 12). Factor One contained eleven (N=11) items, nine (N=9) of which corresponded (N=9/10) to the proposed subscale of ‘CONFLICT’ (items 25-34); Factor Two contained seven (N=7) items, six (N=6) of which corresponded (N=6/11) to the subscale of PAA (items 14-24); and Factor Three contained seven (N=7) items, all of which corresponded (N=7/13) to the proposed subscale of PTA (items 1-13). Nine (N=9) items failed to load on any factor at > 5.0. Of these nine (N=9) items, five (N=5) items originated from the original, MASI (Rodriguez et al., 2002); six (N=6) corresponded to the subscale of PTA and three (N=3) corresponded to the subscale of PAA.

Following DeVellis (1991), these items could be considered for exclusion in the final version of the test, if alphas were low or there was some other rationale for their elimination. None of these nine (N=9) items, however, scored below the exclusion criteria of Alpha=0.70 (Appendix 12), thereby limiting rationale for their exclusion. Four (N=4) of these 9 items (4/9) also correlated with their respective subscale at a factor loading of >0.4 which is acceptable in some academic circles, and one item (item 14) loaded onto a different subscale at a factor loading of >0.4. This left 4 items (1, 2, 7 and 15) that failed to load onto any factor at >0.4.

All of these items appeared, however, to have adequate face validity in the Focus Groups and appeared highly relevant for subjects in the study sample. Item 2, for example, was the highest scoring item in the research study. Alphas for each of the theoretically proposed subscales were also computed at: ‘Pressure to Acculturate’ (PTA: Alpha=0.787 with no item scoring below Alpha=0.76); ‘Pressure against Acculturation’ (PAA: Alpha=0.877 with no item scoring below Alpha=0.85); and ‘CONFLICT’ (Alpha=0.906 with no item scoring below Alpha=0.906); suggesting that each of the three subscales may indeed reflect a common latent variable and further limiting rationale for the exclusion of any items. It was thus decided to retain all 34 items of the MASI-R and to leave the proposed subscales as they were, for future research and larger samples to compute any alternative factors (Appendix 12). The MASI-R used in this study may
therefore be accused of being unnecessarily lengthy, with ‘reliability to spare’, item redundancy and factors which may need to be further refined. Following the original MASI (Rodriguez et al., 2002) the MASI-R also contained items which represented a double-concept (“It bothers me when...’) which following DeVellis (1991), may threaten the accuracy of responses. It was however, decided to retain these items as originally constructed and to evaluate their utility in the study. Difficulties were also experienced with the exact translation of some items into Zulu, which frequently requires more words to convey the same meaning. Some of the Zulu items were, therefore, overly lengthy and required verbal clarification by the research assistant during the administration of the test.

4.2.2 Content validity

Following DeVellis, (1991), items from the original MASI (Rodriguez et al., 2002) were assessed for face-validity in the Focus Groups and items were excluded and included accordingly; suggesting that the content domain of the MASI-R, as proposed by this study, may demonstrate adequate content validity. Subjects in the Focus Groups in multicultural schools reported that they felt pressure to practice ‘white’ ways of doing things and to be accepted by ‘whites’ (PTA). Conversely, that they felt pressure to be ‘black enough’ to be accepted by their black peers, and faced rejection by the black community if they become ‘too white’ (PAA). Comments in the Focus Groups thus also largely corresponded to the content domains of PTA and PAA, as operationalized by the original MASI (Rodriguez et al., 2002).

Pressure to acculturate (PTA) as defined in the MASI-R, thus aimed to identify stress due to feeling different, disrespected and unaccepted by whites, and pressurized to practice ‘white’ ways of doing things in order to be accepted. In contrast, Pressure against Acculturation (PAA) as defined by the MASI-R, aimed to identify stress due to feeling different, disrespected and unaccepted by black peers, family and community and pressurized to maintain ‘black’ ways of doing things in order to be accepted. Focus Groups in multicultural schools also voiced conflict
between these opposing pressures as cultural identity confusion and marginalization. “I’m too black for the white people, but then in my black community, I’m not black enough to be with them”. “We never really fit in anywhere – like we come into this white community and we try to act like the white people and we can’t- and then we go home – and then everyone – they are always on our case.” “It’s like having two different identities.” “We can’t become one person.” “You are lost between worlds”. This confusion appeared to reflect the consequence of these opposing pressures towards and against acculturation, suggesting the need to include an additional subscale to adequately reflect the content domain of acculturative stress in this context. The MASI-R thus attempted to operationalize this conflict between opposing pressures as cultural identity confusion in the subscale of CONFLICT. Items for this subscale (items 25-34) were also drawn directly from comments made in the Focus Groups.

Quantitative analyses also revealed significant inter-correlations between each of the subscales (PTA, PAA and CONFLICT and between total MASI-R and each subscale; suggesting that the content domain of acculturative stress may have been adequately reflected by the three subscales of the MASI-R in this research context (Appendix 11 and Table 1).

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<tr>
<td>PTA</td>
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<td>CONFLICT</td>
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** Table 1: Spearman’s Correlation coefficients between the MASI-R PTA, PAA & CONFLICT.**

** Correlation Coefficient is significant at 0.01: 2 tailed
* Correlation Coefficient is significant at 0.05: 2 tailed.
The sum of opposing bi-cultural pressures (PTA plus PAA) was also significantly correlated to CONFLICT (rho=0.704; p=0.01) which conforms to theoretical expectation that the subscale of CONFLICT may indeed represent the consequence of opposing pressures for (PTA) and against (PAA) acculturation; and confirms the inclusion of this subscale as a valid component of the content domain of acculturative stress.

Using a score of 25 as a threshold for establishing positive scores on the MASI-R (see section 4.2.3 for calculation of threshold score), subjects who scored positively on their total MASI-R score also scored significantly higher median scores than those scoring negatively on total MASI-R score, in terms of PTA (PTA=9.0 and 2.0 respectively; Mann-Whitney U=849.500; p<0.001); PAA (PAA=16.0 and 1.0 respectively; Mann-Whitney U=232.500; p<0.001) and CONFLICT (CON=11.00 and 0.0; Mann-Whitney U=258.00; p=0.004), supporting suggestions that the content of these subscales may adequately reflect the domain of acculturative stress in this sample and the inclusion of CONFLICT as a valid component of the construct of acculturative stress, as represented by the MASI-R. These findings and considerations suggest that the 34 items of the MASI-R demonstrated adequate content validity as a measure of acculturative stress in the sample under study and that the proposed subscales may adequately represent the ‘push and pull’ of opposing bicultural pressures and the potential consequences of this conflict as cultural identity confusion.

4.2.3 Predictive Validity

Following DeVellis (1991), the General Health Questionnaire-12 (GHQ-12: Goldberg, 1992) was selected as an alternative index of stress and ‘gold standard’ to evaluate the predictive validity of the MASI-R. Cronbach’s coefficient Alpha for the General Health Questionnaire-12 (GHQ-12) was computed at Alpha=0.88 which, following DeVellis, 1991, indicates ‘very good reliability’.
Quantitative analysis also demonstrated that all dimensions of the MASI-R were significantly associated with recent psychological stress on the GHQ-12; MASI-R (\(\rho=0.386; p=0.01\)), PTA (\(\rho=0.291; p=0.01\)), PAA (\(\rho=0.336; p=0.01\)), and CONFLICT (\(\rho=0.309; p=0.01\)) (Appendix 11); although, as was demonstrated in the original MASI, correlations were low (Rodriguez et al., 2002). Joiner and Walker (2002) also found that while scores on the Social Attitudinal Familial and Environmental Acculturative Stress Scale (SAFE: Padilla et al., 1985) correlated significantly with specific symptoms of anxiety and depression, there was a more moderate correlation between acculturative stress (as measured by the SAFE) and general life stress. This raises important questions as to the discriminant validity of measures of general life stress as correlates of acculturative stress and suggests that, like other specific measures of acculturative stress such as the SAFE, the MASI-R may reflect only that portion of the individual’s general life stress that may be attributable to acculturative issues. Joiner and Walker (2002) concluded that ‘acculturative stress is not isomorphic with general life stress’ and that a calculation of ‘hit rates’ (actual cases of stress) may more provide a more reliable predictive index than correlation coefficients.

Logistic regression was thus calculated between subjects who indicted a positive score on the GHQ-12 (‘cases’ of psychological stress) who also indicated a positive score on the MASI-R (‘cases’ of acculturative stress). A threshold score of 15 was selected as a cut-point for positive scores on the GHQ-12 as a score of 15 or above may be seen as indicative of psychological distress (see section 3.4.1.4). Logistic regression demonstrated that positive GHQ-12 scores significantly predicted positive scores on the MASI-R (\(p=0.008\)); where subjects scoring positively on the GHQ-12 were significantly more likely (COR=3.103; 95%; CI=1.35-7.12) to also score positively on the MASI-R. These findings suggest that the GHQ-12 predicted an adequate percentage of ‘cases’ of acculturative stress and may provide a significant predictive index of acculturative stress. These findings also suggest that, while overall GHQ-12 scores were weakly correlated with MASI-R scores in this sample, the predictive ability of the GHQ-12 became more significant at higher levels of acculturative stress (positive MASI-R scores or ‘cases’ of acculturative stress).
At a cut-point of 25, positive MASI-R scores also predicted positive scores on the GHQ-12 with a Positive Predictive Value of 65%, suggesting that the majority of subjects who experienced acculturative stress, also recorded significant psychological distress. At this cut-point (25) the Specificity of the MASI-R was also calculated at 90.7%, suggesting that most subjects who did not score positively on the GHQ-12, also scored low on the MASI-R (true negatives). Conversely, Sensitivity of the MASI-R for predicting positive GHQ-12 scores was calculated at 24.1%, suggesting that only a minority of subjects who were psychologically distressed (positive GHQ-12) also demonstrated a positive MASI-R score (true positives). These findings demonstrate that while most subjects who experience acculturative stress, also score positively on an alternative index of stress (GHQ-12), only a minority of those scoring positively on this index of general stress, attribute this stress to acculturative issues; supporting earlier suggestion that while the MASI-R may provide a valid index of stress, only a portion of general life stress may be attributed to this acculturative stress.

The current research also indicated that only 29 subjects (15.5% of the sample) scored positively on the MASI-R, suggesting that only particular individuals, under particular conditions, may be at risk for high levels of acculturative stress. Rodriguez et al., (2002) concluded that ‘although acculturative stress appears to operate at relatively low levels and makes a relatively small contribution to distress and dysfunction when compared to other sources of stress, it nevertheless contributes to the complexity of the psychological profile of acculturating individuals’. Comments made by respondents in the Focus Groups also suggested that the level of acculturative stress experienced by acculturating individuals may depend on the particular multicultural context in which they are acculturating.

The above findings also supported the decision to establish the threshold score for the MASI-R at 25 as the Positive Predictive value (65%) was highest at this score, without further compromising the Sensitivity. Specificity was also maximized at this threshold score (90.7%).
4.2.4 Construct Validity

Cross-cultural studies have historically been criticized for their confusion of cross-cultural terminology such as race, ethnicity and culture, where these terms are frequently used interchangeably without providing clear definitions of these constructs; and assume culture and ethnicity from physical racial characteristics (Price-Williams, 1979). In modifying the original MASI, the current research replaced references to Mexican and American cultures with references to a ‘black’ or ‘white’ community or ‘ways of doing things’. Following Price-Williams (1979), the MASI-R could thus also be criticized in terms of the ‘cultural-racial’ axis which assumes that race and culture are equivalent and that ‘blackness’ or ‘whiteness’ somehow constitutes a collective that is reified as some kind of cultural entity’ (Swartz, 2001).

The current research attempted, however, to express particular, local difficulties and to translate this into meaningful analysis. The article written by local black schoolgirls in KwaZulu-Natal (Section 2.5), articulated problems experienced by ‘black’ schoolgirls in multicultural schools, particularly with regard to their contact with ‘white’ teachers and peers whose behavioral and value expectations were seen to ‘clash’ with those of their ‘black’ parents and community. Respondents in the Focus Groups also expressed these difficulties as a clash between ‘black’ and ‘white’ groupings; and included all ‘black’ Africans as ‘the in group’ (‘us blacks’), versus a similarly inclusive ‘white’ out-group. This black ‘in-group’ also appeared to represent membership of a particular ethno-cultural group that was defined in terms of particular values, behaviors, characteristics and dress code; suggesting that black and white South African adolescents may be polarized into distinctive ethno-cultural groupings. This may be an unfortunate consequence of apartheid, but nevertheless suggested that the conflicts experienced by the girls within this research context, represented a clash between ethno-cultural groupings. Helms (1990) also proposes that during the process of racial identification, black people in America are differentially influenced by two different cultures: Afro-American and ‘white’-American cultures; supporting suggestions that pressures expressed by the subjects in this
research sample may reflect the pressures of opposing ethno-cultural groupings as they struggle to develop an ethno-cultural identity within the new South Africa. Focus Groups also suggested that conflicts with the white ‘out group’ largely centered around issues and conflicts typical of the individualism-collectivism dimension, which has been equated with western versus non-western cultural conflicts (Bochner, 1994); suggesting that this clash between ethno-cultural groupings may represent a clash between western and non-western cultural values and expectations. This assumption may well be criticized for using ‘white’ and ‘western’ as interchangeable terms and concepts but, once again, appeared to represent the practical reality of subjects in the sample; and may well be justified within the context of the ‘new’ South Africa where official integration is in its first generation, and particularly in the province of KwaZulu-Natal, where ‘black’ (negro) physical racial characteristics may still be roughly equated with a ‘Zulu’, non-western culture of origin and KwaZulu-Natal is seen as the kingdom of Zulu nation. The current research thus decided to operationalize items in the MASI-R, in terms that the subjects articulated, rather than use academically contrived and politically correct constructs which may not be relevant in the experience of these learners.

In an attempt to overcome any limitations associated with the use of these generalizations, the current research attempted to use a sample that was as culturally homogenous as possible. KwaZulu-Natal was, therefore, selected as a location for study because the majority of black residents in this area are of Zulu cultural origins. Following Phinney (1990), subjects were also requested to designate themselves (self-identification) and their parents to a cultural group. Following Phinney, this question was not structured into forced-choice answers, but was left entirely open to subjective interpretation. Responses were then categorized into cultural categories to contextualize items of the MASI-R within a broader construct of acculturation. Frequencies of responses (Appendix 8) indicated that subjects designated themselves (81.8%) and their parents (86.6%) as belonging to the Zulu or other ‘black’ African cultures; while only 4.3% designated themselves and 1.6% designated their parents as Western; and 8.6% described themselves and 3.7% described their parents as a Mixed (Western/African) cultural category.
These findings support suggestions that the majority of adolescents in this sample were first-generation individuals of ‘black’ African culture of origin, who were acculturating within a western environment; also suggesting that opposing ethno-cultural pressures, as operationalized by the MASI-R, may well reflect a valid construct of western acculturation within the rapidly changing landscape of black South African adolescents.

The process of validation therefore computed quantitative relationships between the MASI-R and self-designated cultural orientation and language, as alternative indices of acculturation and construct validity. Contemporary models of acculturation (Berry, 1997; Ward et al., 2003) also describe several personal and situational factors which, following these authors, may be theoretically expected to influence the process of acculturation and acculturative stress. Relationships were thus computed between the MASI-R and various demographic data as a proxy for these factors and another potential source of construct validation. These variables included Number of Years in a Multicultural school; Grade; The Presence of Parents and The Nature of Intercultural Contact (Schools A-E).

**4.2.4.1 Cultural Orientation**

Berry’s (1997) strategies of acculturation are based on core questions which reflect personal attitudes and value choices regarding identification with ‘own’ and ‘other’ cultural groups. Following Berry, self-identification with a non-western culture of origin in the current research sample (Other African or Zulu) could, therefore, be reasonably equated with a separatist acculturative position; while self-designation as ‘Western’ could be reasonably equated with assimilation. Those subjects who designated themselves as a ‘Mixed’ cultural category may also be reasonably equated with an integrated position; while those who did not know their cultural identity (‘I Don’t Know’) could be seen as culturally confused and marginalized. Traditionally research has associated marginalization with the highest levels of stress and has identified integration as the most adaptive position. Separation has been associated with greater stress than
assimilation, depending on the context (Berry, 1997; Berry & Annis, 1994). Most acculturation research has, however, been conducted in immigrant groups where assimilation generally represents identification with the dominant majority host population, which may well be less stressful than maintaining identification with a minority culture of origin. In the current, black, South African context, separation would mean continued identification with an indigenous, majority population group, which could be seen as adaptive in this context. Naidoo and Mahabeer (2006) found that black South Africans, particularly males, tended to favor separation, which was significantly, positively correlated with a preference for ‘own’ culture. These authors concluded that ‘it is reasonable to expect that previously oppressed groups would want to assert their cultural identity in post-apartheid South Africa’.

Conversely, assimilation with western culture could place westernized subjects in a position of ‘culture clash’ (Lake et al., 2000) with the majority population group and heightened acculturative stress (Nguyen et al., 1999). Sheer numbers of people in the group of origin Berry (2002) and ethnic density of the neighborhood (Garcia and Lega, 1979, cited from Phinney, 1990) may also increase the possibility of, or the preference for, cultural maintenance. These considerations suggest that research findings which are based on immigrant samples may not be appropriately extrapolated to the current research sample and that theoretical expectations may need to be modified for the South African context.

Quantitative validation analyses in the current research sample (Appendix 9; Figure 2) demonstrated that acculturative stress, as measured by the median total MASI-R score (including PTA, PAA and CONFLICT) was lowest in subjects who identified with non-western groups (Zulu=5.0; Other African=6.0); increased in those designating themselves as Western (Western=10.0); peaked in those who did not know their cultural orientation (I Don’t Know’=18.0) and then decreased in those with a Mixed (Western/African=11.5) cultural orientation. Those who did not know their culture (‘I Don’t Know’) also scored the highest median score for PAA (Median=11.0) and CONFLICT (Median=4.0). Those who identified with
Zulu and Other African cultures scored the lowest median scores on CONFLICT (Median=0.0), (Appendix 9, Figure 2).

Following Berry (1997), these trends (Figure 2) suggest that an acculturative strategy of assimilation with western culture was associated with higher levels of overall acculturative stress than a strategy of separation, which was associated with the lowest levels of acculturative stress. These findings are not consistent with traditional expectations in minority immigrant samples, but could be theoretically expected within the South African context where assimilation with western culture could place subjects in a position of ‘culture clash’ with the majority population group. These findings are also consistent with some studies which have found that assimilation
may predict psychological stress (Ward et al., 1999) while a strong and supportive identification with culture of origin may provide some protection from the negative effects of acculturation and acculturative stress (Mena et al., 1987; Ward & Kennedy, 1994).

These trends (Figure 2) also suggest that marginalized subjects (‘I Don’t Know’) were associated with the highest levels of acculturative stress, which is consistent with traditional expectations that marginalization may be the most stressful acculturative position. In contrast to traditional expectations, however, subjects adopting an integrated position were associated with the second highest level of acculturative stress, suggesting that while stress associated with marginalization may have been attenuated by the adoption of an integrated position, this strategy continued to be associated with acculturative stress in the current research context. This finding is consistent with a few studies in immigrant populations which have found that integration may be associated with symptoms of psychological stress. Ward and Rana-Deuba (1999) demonstrated that strong identification with culture of origin was associated with lower psychological distress while strong identification with the host culture was linked to fewer social difficulties. Assimilation was predictive of psychological stress, separation was predictive of psychosomatic stress and integration was predictive of overall stress. Strategies of assimilation and rejection (separation) also appeared to be equally stressful and associated with symptoms of dysfunctional eating in a sample of black South African college women (Marais et al., 2003); although integration was associated with a reduction of stress in this study. These considerations suggest that while an integrationist strategy may have been less stressful for this more mature sample, the adolescent sample of the current research study may well have found integration as stressful as assimilation. A strategy of separation may, therefore, have been the least stressful option for the majority of adolescents in the current research sample. These considerations are further supported by findings in the current sample which indicate that while only 14.8% of subjects who identified with Zulu culture (separation) scored positively on the MASI-R (threshold score of 25), 37.5% of subjects who identified with Western culture (assimilation) scored positively. This level of stress appeared only partially attenuated by an integrated strategy (Mixed=25% positive MASI-R
scores), while 33.3% of those who remained marginalized (‘I Don’t Know’) also continued to score positively on the MASI-R. An integrated acculturative position cannot therefore presume that subjects are able to comfortably translate this bi-cultural position into the practical everyday aspects of their lives (Sam & Oppedal, 2002), such that bicultural conflict is resolved and acculturative stress minimized. Respondents in the Focus Groups also highlighted that pressures to assimilate to ‘white’ culture often occurred in conjunction with direct pressures against this assimilation. For many, this resulted in difficulty maintaining bicultural expectations and they complained that they needed to “become two different people at two different venues and you just can’t seem to adjust to it”. For others, this clash of cultural expectations mediated conflict with parents, cultural identity confusion and feelings of marginality.

Szabo and Le Grange (2001) argued that the new South Africa has yet to find an adequate, integrated identity, with which ‘new’ South Africans could identify; suggesting that many young black South Africans may be unable to effectively integrate these opposing cultural scripts into a coherent integrated cultural identity. Indeed, many subjects battled to find a word that encompassed a unified identity in response to the question regarding self-designated cultural orientation. Many asked for guidance but were told to simply try to think of what their culture might be; failing that, to write ‘I don’t know’ or leave it blank. Some offered ‘Black American’ or ‘Multi’ or ‘Rainbow Kid’ or ‘Modern Black’ as a solution to this dilemma, while others simply said ‘I Don’t Know’ and others left it blank.

Following the bicultural construct of acculturative stress as outlined by the original MASI (Rodriguez et al., 2002) the MASI-R was constructed to measure acculturative stress that may be experienced in response to opposing pressures to assimilate to the ‘new’ (white-western) culture and to maintain traditional cultural (non-western) orientations. Subjects in the current research sample were requested to identify whether they had experienced specific stressors associated with these opposing pressures and then to rate their level of stress in response to each item. The factors of Pressures to Acculturate (PTA) and Pressures against Acculturation (PAA) may thus be
seen as indices of stress in response to these bi-cultural acculturative pressures. Following this construct of acculturative stress, it may be theoretically expected that ‘non-westernized’ subjects experience greater pressures toward acculturation (PTA) from the ‘new’ culture, than westernized (assimilated) subjects; while pressures against acculturation (PAA) may be seen as a consequence of acculturation; such that westernized subjects may experience greater levels of PAA than non-westernized subjects.

Cultural categories were then condensed into broader groupings, namely Westernized (Western plus Mixed), Non-westernized (Other African plus Zulu) and the marginalized group of subjects who were unable to designate themselves to any cultural category (‘I Don’t Know’ plus missing/blank responses). Quantitative findings of this validation process confirmed theoretical expectation, namely that the Westernized category scored a higher median score on Pressure Against Acculturation (PAA; Median=5.00) than the Non-Westernized category (Median=2.00) who scored a higher median score on Pressure to Acculturate (PTA; Median =3.00) than Westernized (Median=1.0) (Appendix 9, Figure 3); suggesting that the constructs of opposing pressures towards (PTA) and against acculturation (PAA) as measured by in the MASI-R, may well represent valid components of the construct of acculturative stress in the current research context (Appendix 9; Figure 3).

Following Rodriguez et al (2002), the conflicting pressures of PTA and PAA may be expected to result in conflict and acculturative stress, until an adaptive strategy is found (Berry, 1997). In an attempt to capture this conflict, the current study constructed an additional subscale that was designed to reflect cultural identity conflict (CONFLICT). After categories were clustered into broader groups, quantitative findings from the current research sample, demonstrated significant differences between cultural categories in level of CONFLICT (Kruskal Wallis Chi-square= 6.77; p=0.034) with the marginalized category (‘I Don’t Know’) scoring the highest median score (Median=3.5) and Non-westernized scoring zero (Median=0.0) (Appendix 9; Figure 3). Marginalized subjects (‘I Don’t Know’) also scored a higher median score on total
MASI-R (Median=13.00) than subjects who identified with the Westernized (Median=10.5) and Non-Westernized categories (Median=6.00), (Appendix 9; Figure 3). Trends identified by quantitative analyses also indicated that marginalized subjects (‘I Don’t Know’) scored a higher median score on total MASI-R (Median=13.00) than subjects who identified with the Westernized (Median=10.5) and Non-Westernized categories (Median=6.00), (Appendix 9; Figure 3).

**Figure 3**: Median scores on Total MASI-R, and subscale scores on PTA, PAA, & CONFLICT across cultural categories of non-westernized, westernized and ‘I Don’t Know’.
These findings are consistent with other research which has identified continuing bi-cultural pressures with cultural identity conflict and stress (Sodowsky & Lai, 1997; Keifer, 1974; Sue & Sue, 1990). Berry et al., (1998) also noted that failure to integrate opposing cultural pressures may result in cultural identity confusion and chronic acculturative stress; suggesting that the category of ‘I Don’t Know’ (marginalized) and the subscale of CONFLICT may well be measuring the same latent variable and that cultural identity confusion may well be a consequence of these conflicting pressures of PTA and PAA.

These considerations also support the inclusion of CONFLICT as a valid component of acculturative stress and addition to the MASI-R, and suggest that the MASI-R may provide a valid construct of acculturative stress in the current South African research context. These findings also confirm previous suggestions that young black South Africans may find it difficult to establish an integrated cultural identity within the new South Africa and may continue to experience cultural identity confusion, and a sense of marginalization. Subjects in the Focus Groups also noted that; “its confusing- because you are never yourself-you have to be one thing at school and another at home-like you have to split yourself up—and you have to become two different people- and have two different identities”.

4.2.4.2 Language

Rodriguez et al., (2002) note that language factors typically account for the majority of variance in acculturation scales, suggesting that language is of primary significance in the acculturation process. Following these authors, subjects in the current study were thus also asked to designate themselves and their parents to a language group as a proxy for culture and another index of acculturation. Frequencies indicated that only 11.8% of subjects designated themselves and 1.6% designated their parents as speaking primarily English; while 41.20% of subjects designated themselves and 84.5% designated their parents as speaking Zulu or another ‘black’ African language. Designation of parents’ language as English (1.6%) concurs exactly with designation of
Western parent culture (1.6%), suggesting that language may provide a valid proxy for culture in this parent group and supporting suggestions that approximately 98.4% of the adolescents in this sample were first-generation, acculturating individuals of non-western, ‘black’ ethno-cultural origins. Naidoo and Mahabeer (2006) also found that only 1.6% of a sample of black South African students in KwaZulu-Natal, designated English as their home language.

Self-designated language indicated that 11.8% of this adolescent sample designated themselves as primarily English-speaking and 42.2% designated themselves as fully bilingual; while only 4.3% designated themselves as Western culture and 8.6% as Mixed Western/African culture. This finding is not surprising since four out of the five schools sampled were English-medium schools and all learners are required to be fully conversant in English. This finding is also consistent with Ward et al., (2003) who suggests that language competency may precede cultural identity in acculturating individuals and supports suggestions that adolescents in this sample were in the process of acculturation to a western culture.

Following Rodriguez et al., (2002), it may be theoretically expected that those speaking African languages may report greater levels of PTA than those speaking English, who may be expected to report greater levels of PAA and CONFLICT. Consistent with theoretical expectation, quantitative analyses in the current study sample, demonstrated significant differences between language groups in Pressure against Acculturation (PAA), (Kruskal Wallis Chi-square=10.449; p=0.015) where those speaking English scored a significantly higher median score (PAA; Median=8.0) than those speaking Zulu (PAA; Median=2.0), Other African languages (PAA; Median=1.5) or Mixed English/Zulu (PAA; Median=2.0) (Appendix 9; Figure 4).
Scores on PTA were less consistent as, while Other African languages predictably scored the highest median score on PTA (Median=4.0); English-speaking (Median=3.0) and Zulu-speaking (Median=3.0) groups scored equally on this factor (Appendix 9; Figure 4). All schools sampled were officially English-medium, and apart from School A, all subjects were highly articulate in English; suggesting that widespread English competency may have mitigated any differences in Pressures towards Acculturation (PTA) in both these two groups.
Trends identified in this study sample (Figure 4) also demonstrated increasing median scores for total MASI-R, from Zulu (Median=6.0); Other African languages (Median=9.0) to English (Median=15.0); which decreased in the Mixed language category (Median=5.0), which also scored lowest median on PTA (Median=2.0), PAA (Median=2.0) and CONFLICT (Median=0.0). Those speaking English also scored the highest median for CONFLICT (Median=3.5), while other language groups scored zero on CONFLICT (Median=0.0), (Appendix 9; Figure 4). These scores suggest that acculturative stress, particularly PAA and CONFLICT increased with use of language that was different from Zulu, but was attenuated by the adoption of a fully bilingual (Mixed-language) category. This finding is supported by the percentage of subjects who scored positively on the MASI-R which demonstrated a trend of increasing acculturative stress from Other African (0%) to Zulu (12.3%) and English (31.8%) which was attenuated by full bilingualism (Mixed Zulu/English=15.3%).

These findings contrast with traditional expectations in immigrant samples, where acculturative stress is expected to diminish with increasing assimilation; but may be seen as consistent with expectation in a majority, indigenous population undergoing westernization, where predominant use of English may well be associated with resistance from the majority Zulu-speaking population group and cultural identity confusion (CONFLICT). Respondents in the Focus Groups also suggested that the use of English was a source of resistance by the black community (PAA) and conflict for the subjects in the sample. Subjects complained that if they use an English word around Zulu family members they are criticized -“it’s a crime- and like they say she is turning white”. Conversely if they speak Zulu around white teachers or classmates they are accused of being cheeky.

Quantitative analyses in this study sample also demonstrated that full bilingualism was associated with the lowest total MASI-R scores of all language groups in the current research sample. Ward et al., (2003) distinguish between socio-cultural and psychological dimensions of acculturation where the former may include social and language competency, which may be seen
as necessary and desirable; while the latter includes psychological adjustment around cultural orientation, loyalty and identity. Following Ward et al., (2003) fully bilingual language competency may well have been seen as an acceptable social skill and therefore not associated with acculturative stress in this community; although the adoption of an integrated cultural orientation (Mixed) may have been associated with increased resistance from the black community (PAA) conflict (CONFLICT) and acculturative stress (MASI-R). Subjects in the Focus Groups in multicultural schools also explained that they have to accommodate to the company that they are in. “We have to be aware of our surroundings and switch from one culture and language to another – as a sign of respect; supporting suggestions that complete bilingualism, with the ability to ‘switch’ language from one context to another may have been the most adaptive strategy in this group.

4.2.4.3 Duration of Multicultural Contact

Following Rodriguez et al’s., (2002) construct of acculturative stress, it may be expected that acculturative stress could be particularly pertinent in a multicultural context in South Africa, where black subjects may experience pressures towards assimilation with white western school peers and educational systems (PTA) and resistance to this assimilation by the black community (PAA). Focus Groups also suggested that acculturative conflicts and stress may be particularly important in multicultural schools, while other, more general stressors were more pertinent in the uni-cultural school. Trends demonstrated by the current research sample indeed indicated that subjects who had any (ANY) number of years experience in a multicultural school scored a higher percentage of positive MASI-R scores (17.1%) than those subjects who had no experience (NONE=4.0%), (Appendix 10).

Rodriguez et al., (2002) argue that acculturation is an ongoing process where duration of intercultural contact may be associated with different levels of PTA and PAA. During the early phases of contact, the individual may be expected to experience more pressure to acculturate
(PTA), while later stages of contact and later generations, who may be more assimilated, may be expected to encounter more pressure against acculturation (PAA). Rodriguez et al., (2002) indeed found that overall levels of acculturative stress increased with duration of residence (intercultural contact), but unexpectedly found that pressures to acculturate (PTA) were equally experienced across duration of contact, and even across generations. Conversely, pressures against acculturation (PAA) predictably increased with duration and generation of contact. Rodriguez et al., concluded that immigrants to the USA may continue to feel different from mainstream society and experience equal pressure to acculturate across duration and generation of contact; while pressures against acculturation may only be experienced by those who have become more strongly identified with mainstream culture.

Consistent with Rodriguez et al., (2002), quantitative findings from the current sample, demonstrated that total MASI-R scores were significantly, although weakly, correlated with increasing years in a multicultural school (rho=0.181; p=0.05; Appendix 11). In contrast to these researchers, analyses in the current study, found that while PTA increased significantly with increasing number of years in a multicultural school (rho=0.274; p=0.05). Pressures against Acculturation (PAA) did not increase significantly. Increasing levels of PTA may be understood in terms of the historical context (ecological dimension) of apartheid South Africa, which fostered the discrimination of black population groups and suggests that black adolescents females could indeed continue to feel unaccepted by ‘whites’ and pressurized to assimilate, throughout their adolescence and attendance at a multicultural school. This is consistent with comments made in the Focus Groups. “No matter how far you go as a black person, there is always going to be that thing like, no but you are black”. Consistent levels of PAA may also be understood within the socio-political history of South Africa, where ethno-cultural groupings were kept apart by segregationist policies and may have fostered resistance to any assimilation to ‘white’ western ways of doing things, particularly by parents. Comments made in the Focus Groups support this argument. “They (parents) are still on the apartheid thing”. “My dad won’t come to school
functions because he says he will be surrounded by whites and after all he fought for all those years over apartheid, why must he live their way?"

Quantitative findings from the current research sample also demonstrated significant increases in the median number of years in a multicultural school (Kruskal-Wallis Chi-square=7.880, p=0.049) for different languages groups, which indicated a sequence of Other African languages, Zulu, Mixed Zulu/English, and then English, with increasing median number of years at a multicultural school. Trends demonstrated a similar sequence of differences in cultural orientation which changed from Zulu to Western, to ‘I Don’t Know”, Other African and then Mixed with increasing median number of years in a multicultural school. Although these trends represent a cross-section of scores across different language and cultural categories, they could suggest a temporal pattern of scores over different stages of the acculturation process. Language trends could thus suggest an increasing use of English with increasing duration of contact; which would be consistent with a westernizing population. Cultural trends could thus also suggest a temporal sequence of initial identification with Western culture, followed by cultural identity confusion (I Don’t Know); immersion into an Áfrican identity and finally, the adoption of a Mixed (integrated) cultural identity. This pattern would be consistent with Helms’ (1990) stages of racial identity where black-Americans are seen to initially idealize and over-identify with ‘white’ ethno-culture (Western), then experience conflict with this identification (I Don’t Know); and immerse themselves in a ‘Black’ ethnic identity (Other African) until an integrated (Mixed) ethno-cultural identity is established. Berry and Kim (1988) also propose that later stages of acculturation such as conflict and crisis, confront the individual with discrepancies between the demands of their traditional culture and those of the new culture; and the individual feels unable to find an effective resolution. Anxiety and stress is reduced once an integrative adaptive strategy is found. These trends would support the construct of acculturation as measured by the MASI-R, in the current South African research context but future cohort studies would be required to establish the presence of such a temporal sequence of stages.
4.2.4.4 Grade

Phinney (1990) argued that ethnic identity is such a salient feature of personal identity that one can be inferred from the other. Phinney (1989; 2003) also outlined a number of developmental stages in the formation of ethnic identity, including the stage of 'diffusion' where ethnicity is not a salient feature; the stage of ‘awareness’ where experiences with other cultures forces the individual to examine issues of identity; and the stage of acceptance and internalization with the achievement of a clear sense of ethnic identity.

Phinney (1990) noted that a greater number of 15 year olds are in the stage of ‘awareness and than are 13 year-olds and that a coherent sense of ethnic identity is more frequently internalized by older adolescents than by younger high-school students. Following Phinney (1989, 1990), a greater amount of 15-year-olds may be expected to be actively involved in identity search and therefore vulnerable to the potential consequences of acculturative stress.

Quantitative findings obtained by the current sample, demonstrated significant differences between grades for median total MASI-R (Kruskal-Wallis; Chi-square=16.70, p=0.001); PTA (Kruskal-Wallis Chi-square=17.53, p=0.001); PAA (Kruskal-Wallis; Chi-square=9.52, p=0.023) and CONFLICT (Kruskal-Wallis; Chi square=13.41, p=0.004) where median scores for MASI-R, PTA and CONFLICT peaked in Grade 10 (MASI-R=12.0; PTA=3.0; CON=2.0) and median scores in PAA peaked in Grade 12 (PAA=3.5), (Appendix 9; Figure 5).
Median scores on all dimensions of the MASI-R also increased dramatically between Grade 9 and 10, where Grade 9 scored the lowest median scores on total MASI-R (Median=4.0) PTA (Median=1.0) PAA (Median=1.0) and CONFLICT (Median=0.0) while Grade 10 scored highest across grades on total MASI-R (Median=12.0) PTA Median=3.0) and CONFLICT (Median=2.0) (Appendix 9; Figure 5). Grade 10 also scored the highest percentage of positive MASI-R scores (22%) while Grade 9 scored the lowest (8.1%). Grade 11 scored 8.3% and Grade 12 scored 21.2% positive MASI-R scores (Appendix 10).
Demographic data indicated that the median ages of subjects in Grades 9-12 ranged from 14.8 years in Grade 9 to 18 years in Grade 12 (Appendix 8); suggesting that, following Phinney (1990), differential scores across Grades could reflect a developmental progression from the stage of ‘diffusion’ in Grade 9 to the stage of awareness in Grade 10. The median age for Grade 10 was 15 years 8 months, suggesting that the peak of acculturative stress in Grade 10 may indeed represent an adolescent identity crisis that is exacerbated by cultural identity confusion and conflict.

Sam and Berry (1995) noted that adolescents are particularly at risk for acculturative stress as they reach a stage of experimenting with their identities and are simultaneously influenced by peer pressure (PTA) and familial conflict (PAA) over changing attitudes and behavior. Those adolescents who are unable to tolerate the ambiguity of mutually opposing cultural scripts (PTA versus PAA) may be particularly at risk for the development of acculturative stress (Ward et al., 2003). These findings are also consistent with descriptions of identity confusion written by black female learners (see section 2.2.3.6). The authors noted that, although black girls may be fully integrated with their white peers at primary school level, once they graduate to high school there is a trend of increasing awareness of cultural differences and identification with other black learners. They reported that, at the start of secondary school (Grade 8), learners appear unaware of racial differences and there are many multiracial friendships; but as they progress through high school, there is an increasing sense of ‘difference and otherness’ and increasing identification with black peer groups. These authors explained that black females in multicultural schools have to cope with these cultural issues and their impact on the development of identity, in addition to the normal issues of adolescent autonomy and identity formation. Although scores obtained by the different grades represents a cross section of age groups, the peak in MASI-R scores in Grade 10 could suggest a developmental pattern of cultural identity formation that occurs over adolescence and years of attendance in a multicultural school. Future cohort studies would be needed to confirm a developmental pattern of risk.
Phinney (1992) argued that most adolescents develop a clear sense of ethnic identity by early adulthood which, following Berry (2003) may seen as an integrated sense of identification with ‘own’ culture whilst simultaneously accepting and internalizing perceptions of the ‘other’ culture. Following these authors, this integrated (Mixed) cultural identification should also result in the least acculturative stress (Schmitz, 1992). If an adaptive strategy of acculturation is not found the individual is likely to experience chronic acculturative stress and dysfunction (Berry & Annis, 1974).

In the current research sample, Grade 12 also demonstrated a slight peak in acculturative stress with a higher median score on PAA (Median=3.5) than Grade 10 (Median=3.0) and the second highest median score on CONFLICT (Median=1.0); suggesting that most of the subjects in Grade 12 in this study had not developed a clear or integrated sense of ethnic identity and continued to experience pressures against acculturation from their community and some identity confusion. Grade 12 also scored a similar percentage of positive MASI-R scores (21.2%) as Grade 10 (22.0%), (Appendix 10). These findings support other quantitative findings from the current sample which have suggested that westernization may have been associated with continued community resistance and acculturative stress in this sample and that an integrated identity may have been difficult to achieve for these black adolescents in post-apartheid, South Africa. Szabo and Le Grange (2001) argued that while assimilation of ‘white’ or western culture may be desirable for post-apartheid black South Africans within a ‘predominantly white’ school, attempts ‘to rekindle a past African identity while pursuing achievement defined in Western terms, may create considerable internal psychological turmoil ‘ (Szabo and Le Grange). Subjects in Grade 12 are about to leave school and venture into an unknown environment of mainstream, western-orientated society; suggesting a possible increase in these conflicting cultural pressures at this time. It may thus be speculated that black South African adolescents could be facing a ‘no win’ situation that while westernization is essential for success in a western-dominated academic system and workplace, assimilation and integration into this western cultural system comes with continued community resistance and conflict.
4.2.4.5 Presence of Parents

Interestingly, the presence or absence of parents was included to identify variables of family trauma where parents are absent or dead; but revealed unexpectedly significant results where subjects whose mothers were present scored significantly higher median scores on total MASI-R (Median=6.0) than those whose mothers were absent (Median=0.5; Mann-Whitney U=409.00; p=0.040). Those whose mothers were present also scored significantly higher median scores on PAA (Median=2.0) than those whose mothers were absent (Median=0.0; Mann-Whitney U=426.00; p=0.046); supporting suggestions that mothers may indeed mediate and exacerbate acculturative stress (Appendix 9; Figure 6).

![Graph showing median scores on MASI-R, PTA, PAA and CONFLICT for subjects whose mothers were Present and Absent.](image)

**Figure 6:** Median scores on MASI-R, PTA, PAA and CONFLICT for subjects whose mothers were Present and Absent.
Subjects in the Focus Groups also complained about conflict with parents. “We can’t win”. “They (parents) want us to go to a good school and have white friends – so they send us to a white school” but parents then complain if they assimilate ‘white’ ways of doing things.

Subjects whose cultural orientation was discordant with parent culture also scored a higher median on total MASI-R (Median=9.0); PAA (Median=3.0) and CONFLICT (Median=1.0) than those who were concordant with parent culture (MASI-R=6.0; PAA=2.0 and CON=0.0) (Appendix 9). Those subjects whose language was discordant with parental language, also scored a significantly lower median score on PTA (Median=2.0; Mann-Whitney U=3328; p=0.022) and a higher median on CONFLICT (Median=1.0) than those who were concordant with parent language (Medians=3.0 & 0.50 respectively), (Appendix 9); suggesting that acculturative stress may well have been mediated by intergenerational disparity and conflict.

4.2.4.6 Schools

Padilla and Perez (2003) noted that the general circumstances of majority-minority group relationships are of crucial importance in acculturation. Triandis et al., (1986) also found that the more power the group has in its new setting, the less the new group will assimilate to the norms of the larger group. Relative status and power or numerical balance (majority-minority) of the acculturating group may, therefore, also moderate the experience of acculturative stress (Ward et al., 2003). Pettigrew and Tropp (2006) argued that prejudice and discrimination may be weaker in majority status groups than in minority status groups. These considerations suggest that acculturative stress may increase with decreasing black-majority status, within the multicultural school context of the current research sample.

Following these researchers, schools in the research sample were selected to represent decreasing levels of majority black – white learners in order to offer a cross-section of potentially different levels of acculturative stress and to offer a context for validation of the MASI-R.
Following these theoretical expectations, acculturative stress was predicted to increase across schools A (all-black) to E (black-minority), with the lowest levels expected at School A and the highest at School E (See section 3.2).

Qualitative findings from the current research sample demonstrated that although there were no significant differences in total MASI-R scores between schools, mean (Figure 7) and median (Figure 8), MASI-R scores demonstrated a gradually increasing trend across schools A (Median=5.0) with a marked increase in School E (Median=11.0) (Appendix 9). The percentage of positive MASI-R scores also differed markedly across schools with School A scoring the lowest (4.0%) while School E scored the highest (20.8%) percentage of positive MASI-R scores (Appendix 10). These trends are consistent with the above theoretical expectations, suggesting that the MASI-R may adequately reflect the construct of acculturative stress in the current research context (Figures 7 & 8).

![Figure 7: Mean scores for total MASI-R across schools A-E.](image-url)
Following Ward et al., et al., (2003), it may be expected that that Pressures to Acculturate may increase with increasing black-minority status within a multicultural school, where there may be increasing pressures towards assimilation from the ‘white majority’ at school. Conversely, increasing Pressures against Assimilation (PAA) and cultural confusion (CONFLICT) may be expected as these students assimilate and experience resistance from the wider, black majority. These theoretical expectations were also largely supported by quantitative findings demonstrated by the current research sample (Appendix 9 and Figure 8). School A, for example, expectedly scored the lowest median score on total MASI-R (Median=5.0), PTA (Median=1.0) and CONFLICT (Median=0.0) (Appendix 9; and Figure 8). School A is an all-black school that is located in an ‘all-black’ enclave, such that, while learners at this school have access to western culture, they do not necessarily have daily contact with ‘whites’, who may put pressure on them.
to acculturate (PTA) to western culture or experience a ‘clash’ of cultures within the school. Interestingly, this school scored higher than expected in PAA, supporting suggestions that access to westernized influences may have been available to all schools in this study, but that any attempts at westernization by these subjects, may have encountered resistance from the black community. In contrast, School B demonstrated the highest median score on PTA (Median=4.5) which was not theoretically expected in a school where 96% of the learners are black. Consideration of the socio-political history of this school reveals, however, that until recently, School B was an ‘all-white’ school in a traditionally ‘all-white’ area. When many of these girls entered the school, it consisted of a majority of white learners and teachers, who have subsequently left the school, leaving a majority of black learners; many of whom are transported to school from surrounding black townships. Subjects at this school could thus have felt rejected by whites and have been seeking affirmation from white western culture; with increased pressures to assimilate (PTA) into ‘white’ western culture. Many of the parents at this school were unable to speak English; also suggesting that many black families were in the early stages of westernization. Initial stages of acculturation have been associated with increased PTA while later stages may be associated with increased PAA (Berry, 1997); which was notably and expectedly absent (Median=0.0) at school B.

The remaining schools demonstrated a trend of increasing levels of Pressure to acculturate (PTA) across Schools A, C, D and E, which is consistent with theoretical expectation that increasing minority status may be associated with increasing pressures to assimilate (PTA) from the ‘white’ majority at the school. In contrast, Pressures against acculturation (PAA) followed a more erratic pattern across schools with differing majority status; suggesting that level of PAA may have been more influenced by other variables such as level of assimilation, and emanate more from other sources, such as families and community. School E also scored the highest median score on PAA (Median=2.5) and the highest median score on CONFLICT (Median=2.5) across schools. These findings are consistent with theoretical expectation that increased levels of both PTA and PAA may be associated with cultural identity confusion and conflict (CONFLICT) and increased levels
of acculturative stress. This conflict between opposing cultural expectations has also been termed ‘culture clash’ and may be expected at School E, where black learners represented only 13% of the learners in a predominantly ‘white’ school. Following Szabo and Hollands (1997), the ‘impact of acculturation on a young black South African girl entering a formerly ‘whites-only’ school may be akin to the experience of minority groups and immigrants within a western-dominated context. Unlike these minorities, however, black South African learners appear to face a ‘no-win’ situation where, if they assimilate with the ‘white’ majority in the school playground, they face resistance from the wider black-majority community; while if they identify with this black community, they face marginalization or even discrimination in the school playground.

Berry (2003) argued that levels of acculturative stress during intercultural contact may also be influenced by institutional policies which may be enforced by the dominant group. Comments made in the Focus Group at School E suggested that students at this school were expected to conform to the ‘western’ norms of the school or face discrimination; suggesting a policy of forced Assimilation (Pressure-Cooker). “We always have to do it the white way – but whites don’t ever want to do it our way”. This group also expressed feelings of discrimination, and prejudice which have been associated with greater stress (Pernice & Brook, 1996). “They (whites) put us down – make us feel degraded”. Berry et al., (1992) also argues that a policy of forced assimilation may be more stressful than either multiculturalism or voluntary assimilation; suggesting that results at School E may be consistent with theoretical prediction and further support the MASI-R as a valid construct of acculturative stress in this context.

Comments made in the Focus Groups at School E also suggested that subjects may have reacted to this policy with a hostile, separatist acculturative strategy in the school playground; “nothing has really changed in practice” - “races don’t mix much socially at school” and feelings of marginalization and cultural identity confusion. “It is difficult to know where you stand”. 

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In contrast, comments made in the Focus Groups at School D, suggested a policy of voluntary assimilation (Melting Pot), where subjects believed that finding acceptance in a white school was easier than finding acceptance in their families and communities. “At least you can try and put in an effort (at school) and get somewhere”. Subjects in School D may thus have found acceptance in assimilation at school, which could account for their relatively lower score on PTA (Median=2.5) than School E (Median=3.0). School D also scored the second highest median score on PAA (Median=2.0) and CONFLICT (Median=1.0) suggesting that this assimilation was accompanied by increased community and parental resistance (culture clash) and cultural identity conflict. Comments made in the Focus Groups at school D also confirm the importance of PAA at this school; namely, “in the family it is different, you can never win” – “you are never good enough no matter how hard you try” - “its more the blacks that judge us”. They explained that their parents were critical, controlling and judgemental while teachers and white peers at school were more accepting and encouraging. Comments made in these groups also confirmed the presence of cultural identity confusion; “it’s confusing because you have to be one thing at school and another at home” – “like you have to have two different identities”. Conversely, CONFLICT was notably absent in School C, which is not consistent with theoretical expectation, particularly since opposing pressures of PTA and PAA were equally stressful in this school. School C is, however, generally known as the most integrated school in the area, suggesting that learners may have been protected from cultural identity conflict by an adequate multicultural policy. Teachers at school C also informed the researcher that it is fashionable to be ‘Black-American’ at this school, suggesting that many of the learners at this school may have resolved their conflicts by creating a more integrated cultural identity for themselves. Sample scores indeed indicated that the Mixed or integrated cultural identity category in this research sample, was associated with lower median scores on CONFLICT (Mixed; Median=0.5) than assimilation (Western; Median=2.5) and marginalization (‘I Don’t Know’; Median=4.0), supporting suggestions that policies of assimilation, particularly forced assimilation may be associated with greater cultural identity confusion and stress than policies of multiculturalism.
The percentage of positive MASI-R scores also differed markedly between uni-cultural (4%) and multicultural (17.3%) schools, suggesting that the multicultural school context may be particularly associated with acculturative stress in the ‘new’ South African context.

Quantitative findings demonstrated by the current study sample therefore largely support an association between majority-minority status and levels of PTA, PAA, CONFLICT and MASI-R in the current research context, which is consistent with theoretical expectation and suggests that the MASI-R may have provided a valid index of acculturative stress in this context. Quantitative findings from the current study sample also largely support research predictions that patterns of acculturative stress in majority indigenous populations may not be consistent with traditional research findings in minority immigrant groups. Quantitative findings also suggest, however, that minority-majority status may be only one of the many variables that may influence the process and outcome of acculturation and the level of acculturative stress. This finding has important implications for the future of integration in post-apartheid South African schools and the construction of policies that minimize these potential sources of acculturative stress.

4.2.4.7 Overview of the reliability and validity of the MASI-R

Quantitative evaluation of MASI-R in the current research sample (N=187) suggested that the MASI-R, as modified and developed from the MASI (Rodriguez et al., 2002) was sufficiently reliable to be used as a measure of acculturative stress to achieve the main objectives of the current study. The MASI-R used in this study therefore represents all of the originally proposed 34 items and three subscales which were suggested by the Focus Groups and adequately confirmed by alpha scores and factor analysis. Although this instrument appeared adequate for the purposes of this study, it remains in the process of development as a measure of acculturative stress. The MASI-R may thus be seen as overly lengthy, redundant, and containing some items that are too long; and some items that may need to be relocated within the three subscales.
The 34-item MASI-R was thus seen to demonstrate adequate reliability as a measure of acculturative stress in the context under study, but requires future research with a larger sample to refine. Using the 34-item as initially modified, most trends and significant findings demonstrated by quantitative evaluation in the current research sample, were also consistent with theoretical expectation, other research findings or other indices of acculturation, suggesting that the MASI-R may well have provided a valid measure of the construct of acculturative stress in this sample. Those findings that differed from expectation could also be understood within the particular context of this South African sample, where black South Africans represent an indigenous non-western majority population encountering western cultural influences against a socio-political history of apartheid. Following Ward et al., (2003) it may be speculated that the construct of acculturative stress, as measured by the MASI-R may well represent a potentially stressful component of acculturation, which is deeply rooted within the process itself, and which may influence the outcome of successful acculturation. Acculturative stress, as measured by the MASI-R may, therefore, mediate between exposure to westernization and the development of an adaptive acculturative strategy.

Significant findings indicated that duration of multicultural contact was associated with increasing acculturative stress (MASI-R and PTA scores), suggesting that black subjects may have continued to experience increasing pressures towards westernization, throughout their multicultural school contact. A pattern of language change that was significantly associated with increasing number of years in a multicultural school, could also suggest a pattern of gradual westernization, until English was the predominant language spoken; supporting suggestion that black subjects were in the process of westernization. Subjects who spoke predominantly English were also associated with significantly higher scores in PAA; suggesting that while these subjects experienced increasing pressures to westernize (PTA) they also experienced significant resistance to this westernization, from the black community (PAA). The sum of these opposing pressures (PTA plus PAA) was also significantly correlated with level of CONFLICT, suggesting that CONFLICT may have indeed been associated with opposing bicultural pressures and supporting
the inclusion of PTA, PAA and CONFLICT as valid components of the construct of acculturative stress. Subjects who did not know their cultural orientation (‘I Don’t Know’) demonstrated significantly higher scores on CONFLICT, suggesting that subjects who were confused and marginalized were most at risk for cultural identity conflict and acculturative stress; and confirming the inclusion of the subscale of CONFLICT as a valid component of the construct of acculturative stress as represented by the MASI-R.

Grade 10’s were also found to score significantly higher than other grades in MASI-R, PTA and CONFLICT, suggesting that 15-year-old adolescents may have been particularly vulnerable for acculturative stress associated with opposing bi-cultural scripts. Subjects whose mothers were present also scored significantly higher levels of PAA than those whose mothers were absent; suggesting that mothers may have been resistant to westernization and mediated the process of acculturative stress in these subjects. Those subjects who were discordant with parental language scored significantly lower on PTA than those who were concordant with parental language suggesting that intergenerational disparities and conflicting cultural expectations may also have mediated this process. Adolescents of that age are also more likely to be involved in a search for identity and may be particularly vulnerable for identity confusion when faced with opposing cultural scripts. These findings are consistent with the construct of bi-cultural acculturative stress as formulated by Berry (1997) and Rodriguez et al., (2002), suggesting that the MASI-R may provide an adequate measure of acculturative stress in this research context.

As a bi-dimensional model that focuses on the effects of opposing (black – white) intercultural pressures on the individual, the MASI-R fails to accommodate the many different dimensions of acculturation and potential sources of acculturative stress that may occur in the multicultural and transitional context of South Africa. The MASI-R, for example, fails to accommodate a third dimension such as the genesis of a new, integrated group. Self-designated culture revealed that 8.6% of the sample designated themselves to an integrated ethno-cultural grouping such a ‘Rainbow Kid’; ‘Modern Black’, ‘Black-American” and ‘Multi”, suggesting that a new, more
integrated group may indeed be evolving in South Africa. Obviously excluded are the many different South African subgroups that make up this ‘Rainbow nation’ such as Indian and Mixed-Race groupings; which represent other contexts of intercultural contact and potential for acculturative stress. Focus Groups at School A complained about stress experienced in an ‘Indian-dominated’ school, supporting suggestions that acculturative stress may not be limited to ‘black and white’ contact but may occur between other ethno-cultural groups.

The MASI-R also fails to capture the many ecological dimensions of acculturation that are occurring in the rapidly modernizing landscape of South Africa such as urbanization and industrialization; where there may be opposing pressures between rural versus urban and traditional versus modern and other sources of potential acculturative stress. Focus Groups also indicated conflict between modern, urban adolescent subjects and traditional, rural parents. The MASI-R thus also fails to identify acculturative stress that may be associated with the rapidly modernizing experience of many South Africans, undergoing rapid social transition.

4.3 The Eating Attitudes Test-26 (EAT26)

Quantitative evaluation of the EAT26 in the current research sample, demonstrated a Cronbach’s coefficient Alpha for the Eating Attitudes Test 26 (Garner, Olmsted, Bohr & Garfinkel, 1982) as Alpha=0.88, which, following DeVellis (1991) indicates a ‘very good’ reliability and suggests that the EAT26 demonstrated adequate internal consistency in the current research sample. Alpha coefficients for each school also suggested adequate internal consistency in each of the different school settings, namely; School A (Alpha=0.84); School B (Alpha=0.75); School C (Alpha=0.90); School D (Alpha=0.89); and School E (Alpha=0.85). The EAT26 has been found to demonstrate an alpha co-efficient of Alpha=0.74 in an urban black South African adolescent female population (Szabo & Allwood, 2004a) and an alpha coefficient of Alpha=0.61 in a rural black South African adolescent female sample where the EAT26 was translated into Zulu (Szabo & Allwood, 2004b).
Cronbach’s coefficient alpha for each of the 26 items was above $\alpha=0.87$ suggesting that the 26 items of the EAT26 may consistently measure the same latent variable. Cronbach’s coefficient alpha for each subscale was less consistent and was calculated at Dieting ($\alpha=0.819$) Bulimia ($\alpha=0.575$) and Oral Control ($\alpha=0.606$). Following DeVellis (1991) the latter two coefficients may be described, respectively, as ‘poor’ and ‘minimally acceptable’ reliability; while the alpha coefficient for Dieting could be described as ‘very good’ (DeVellis, 1991); suggesting that while the test as a whole may have been adequately reliable, test items may not follow traditionally western factors in the South African context. Nasser (1994b) also demonstrated low reliability coefficients for the subscales of Bulimia (Cronbach’s $\alpha = 0.3$) and Oral Control (Cronbach’s $\alpha = 0.5$) in a non-western population while a 4-factor structure was indicated as more appropriate than the three-factor structure in a sample of Asian girls in Britain (Mumford et al, 1991). These factors included Dieting, Social Pressure, Food-Preoccupation and Vomiting.

Item 24 (I enjoy trying new rich foods) is a ‘reversed’ item, which may be used to check the reliability of subject responses. This item was negatively correlated with Dieting (Cronbach’s $\alpha= -0.02449$) and Bulimia (Cronbach’s $\alpha= -0.34015$) and very poorly correlated with Oral Control ($\alpha= 0.08343$), suggesting that this item may not have been reliably subsumed under any factor in the transcultural context of this study. Item 24 was also the only item that was negatively correlated with the set of 26 test items ($\alpha= -0.07$); suggesting that negative scoring items may not be reliably utilized within the South African context. If item 24 was excluded, the alpha for Bulimia would improve to $\alpha=0.729$ and if item 18 (I have self control around food) was excluded, the Alpha coefficient for Oral Control would improve to $\alpha=0.615$; suggesting that the reliability of these factors may have been compromised by particular items. In spite of poor alpha coefficients for Bulimia and Oral Control, intercorrelations between median scores for each subscale and the total EAT26; and between median scores on each subscale, were significant (Table 2 below; and Appendix 1: Sample); suggesting that these subscales may indeed have measured a common latent variable and that EAT26, as a whole, may have been adequately reliable in the current research sample.
Table 2: Spearman’s correlation Coefficients between median scores on the EAT26, Dieting, Bulimia, Oral Control (OC) Body Image Criteria (BIC) and the GHQ-12.

<table>
<thead>
<tr>
<th></th>
<th>EAT26</th>
<th>Dieting</th>
<th>Bulimia</th>
<th>OC</th>
<th>BIC</th>
<th>GHQ-12</th>
</tr>
</thead>
<tbody>
<tr>
<td>EAT26</td>
<td>1.000</td>
<td>0.921**</td>
<td>0.575**</td>
<td>0.606**</td>
<td>0.609**</td>
<td>0.478**</td>
</tr>
<tr>
<td>Dieting</td>
<td>0.921**</td>
<td>1.000</td>
<td>0.395**</td>
<td>0.381**</td>
<td>0.681**</td>
<td>0.457**</td>
</tr>
<tr>
<td>Bulimia</td>
<td>0.575**</td>
<td>0.395**</td>
<td>1.000</td>
<td>0.212**</td>
<td>0.287**</td>
<td>0.337**</td>
</tr>
<tr>
<td>OC</td>
<td>0.606**</td>
<td>0.381**</td>
<td>0.212**</td>
<td>1.000</td>
<td>0.163*</td>
<td>0.181*</td>
</tr>
<tr>
<td>BIC</td>
<td>0.609**</td>
<td>0.681**</td>
<td>0.287**</td>
<td>0.163*</td>
<td>1.000</td>
<td>0.576**</td>
</tr>
<tr>
<td>GHQ-12</td>
<td>0.478**</td>
<td>0.457**</td>
<td>0.337**</td>
<td>0.181*</td>
<td>0.576**</td>
<td>1.000</td>
</tr>
</tbody>
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** Correlation Coefficient is significant at the 0.01 level (2-tailed).
* Correlation Coefficient is significant at the 0.05 level (2-tailed).

Subjects scoring positively on the EAT26 (20 or above) also scored a significantly higher median on the subscales of Dieting (D=19.00; Mann-Whitney U=50.50; p<0.001); Bulimia (B=5.50; Mann-Whitney U= 1244.50; p<0.001) and Oral Control (OC=4.00; Mann-Whitney U= 1741.50; p=0.001) than subjects scoring negatively on the EAT26; endorsing suggestions that the EAT26 may have provided an adequately reliable measure of these factors and an adequately valid measure of these dysfunctional eating attitudes and behaviors, in the current research sample.

A forced three-factor analysis with orthogonal transformation also revealed three (N=3) factors which accounted for 44% of the variance (N=6.04%, 2.8% and 2.61% respectively) and eigen values of 7.36, 2.33 and 1.85 respectively. Factor One contained 8 items from the subscale of Dieting (items=8/13); Factor Two contained 3 items from the subscale of Oral Control (items=3/7); and Factor 3 contained 3 items from Bulimia (items=3/6). Five items failed to load onto any factor <0.50. These findings were consistent with those found by Szabo et al., (2004) in a sample of black South African female adolescents, where the EAT26 revealed three (N=3)
factors which corresponded to Dieting (N=8/13 items); Bulimia (N=3/6 items) and Oral Control (N=3/7 items), and accounted for 31% of the total variance. Factor analysis of the EAT26 in a sample of white female adolescents (Szabo et al., 2004), revealed three factors which corresponded to Dieting (N=11/13 items); Bulimia (N=5/6 items) and Oral Control (N=6/7 items); suggesting that white South African samples may perform in a more ‘typical’ pattern than black South Africans. Similarities in the item/factor loadings between the current study and those of Szabo et al.’s., (2004) black adolescent sample, also suggest a pattern that may be particular to black South African adolescents and appears worthy of future investigation. In the current study, item 13 (I think about having fat on my body); item 6 (I am aware of the calorie content of foods that I eat); item 16 (I eat diet foods) and item 24 (I enjoy trying new rich foods) failed to load onto any factor >0.5; suggesting that this pattern could be associated with differences regarding body image and availability of ‘diet’ and ‘rich’ foods (Le Grange et al., 2004); which questions the validity of the EAT26 in the transcultural, South African, context. Nasser (1994b) also found that items 6, 16, and 24 failed to load onto their respective subscales at >0.5 (namely 0.23, 0.42, -0.05 respectively) in a non-western population. Conversely, item 25 (I have the urge/need to vomit after meals) correlated adequately with Dieting (Alpha=0.65312) yet poorly with Bulimia (Alpha=0.09413) within the current research context, suggesting that purging may well be an important form of weight control in the absence of ‘diet’ foods.

Lee and Katzman (2002) note that eating disorders may not be accompanied by weight or ‘fat’ concerns in non-western populations, and that these eating disordered subjects may score low on the EAT, which endorses ‘fat phobia’ as a cardinal symptom. Lee et al., (2002) also advise caution about using the EAT in non-western contexts. Nakai et al., (1998) found that 41.6% of eastern anorexics and 29.8% of bulimics scored atypically low on the EAT26. Following Lee and Katzman (2002), the current research attempted to enhance the validity of the EAT26 by verbally clarifying instructions during the administration of the EAT26 and alerting subjects to respond affirmatively to relevant items, only if this response was due to issues of weight concern or control as opposed to traditional practices of purging, inadequate food resources or illness.
Despite these concerns, however, scores obtained by the current research sample, demonstrated significant correlations between Body Image Criteria (items 1-4 on the EDDS) which were designed to evaluate weight and shape concerns, and scores on the EAT26 (rho=0.609; p=0.01) and the GHQ-12 (rho=0.576; p=0.01) (Table 2, pg. 189 and Appendix 11: Sample), suggesting that body image concerns were indeed associated with significant stress and dysfunctional eating attitudes and behaviors (EAT26 scores) in the current research sample. Median scores on Body Image Criteria were also, positively, although, weakly, significantly correlated with Body Mass Index (rho=0.170; p=0.05); suggesting that heavier subjects may have experienced distress associated with body image (Appendix 11: Sample).

These findings endorse the presence of weight concerns or ‘fat phobia’ in the current, black South African research sample, and the EAT26 as a sufficiently valid measure of dysfunctional eating attitudes and behaviors in this sample, as a whole. Comments made in the Focus Groups also suggested that these subjects did indeed experience widespread pressures towards thinness and that body image concerns were a major source of stress in their lives, particularly in multicultural schools. Analysis of the different schools, however, demonstrated that while body image concerns may have been significant in the sample as a whole, these concerns may not have been similarly experienced by all young black females, across the different research settings.

School A (all-black) obtained a significantly lower median score on Body Image Criteria (BIC=7.0; Appendix 9) than other schools and only one subject scored positively on the EAT-26 (4%; Appendix 10). There were also no significant correlations between median scores on Body Image (BIC), the total EAT26 or the GHQ-12 at this school, (Appendix 11: School A), suggesting that body image concerns may not have been a significant focus or associated with distress at School A and that weight concerns may not be similarly experienced by all black female adolescents, across different South African settings. Future research using the EAT26 thus needs to continue to implement caution in this regard and to identify patterns of weight concern that may be experienced in different South African contexts.
Le Grange et al., (2004) argued that questions about eating that are formulated in affluent western contexts may yield misleading responses in the black South African population; many of whom still live in relatively deprived circumstances. ‘Diet foods’ are as expensive as ‘rich’ foods, suggesting that these may be unavailable to a large section of the population and that the ‘luxury’ of counting calories may not be pertinent in this group. Le Grange et al., (2006) reported inflated EAT26 scores in a predominantly black school in a low socio-economic township in South Africa and concluded that these EAT26 scores were not reliable as their affirmative responses reflected inadequate food resources and poverty rather than issues of weight concern. These findings contrast with those demonstrated by the current sample where School A was also located in an ‘all-black’, low socio-economic area, yet scored the lowest percentage of positive EAT26 scores across schools. Respondents in the Focus Groups also indicated that School A was the only school likely to have learners who suffered from inadequate food resources; suggesting that low scores on the EAT26 may indeed have reflected a relative absence of EAT-positive scores at this school. Verbal instructions used in the current research context may have improved the overall reliability and validity of the EAT26 in this regard.

Scores obtained by the current sample, also demonstrated that Body Mass Index was significantly, negatively correlated with Oral Control; suggesting that weight loss was generally associated with control around food, as opposed to inadequate food resources (Appendix 11: Sample). These considerations suggest that the EAT26 may have provided an adequately valid measure of dysfunctional eating attitudes and behaviors, as defined by the typically western criteria of body image, weight concerns and restrictive eating reflected by the EAT 26; but that these concerns may not have been consistently experienced in different settings across the South African research context. Thus while the EAT26 may have provided an adequately valid indication of typically western patterns of dysfunctional eating attitudes and behavior for the sample as a whole, sample findings regarding the EAT26 may not, therefore, be reliably generalized to all subpopulations within this context (School A=4% positive EAT26 scores).
Le Grange et al., (2004) noted difficulties in the trans-cultural validity of the EAT26 in the South African context, and stressed the importance of a two-stage approach in research on eating disorders. Quantitative analyses thus also attempted to statistically evaluate the validity of the EAT26 as an index of risk for eating disorder in this context, by comparing scores on the EAT26 with the presence of eating disorder, as defined by the Eating Disorders Diagnostic Scale (EDDS), as a proxy for a follow-up clinical interview. A positive score on the EAT26 (a score of 20 or above on the EAT26) is seen to indicate a ‘high risk’ for eating disorder (Buddeburg-Fischer et al., 1996).

Using a score of 20 as the cut-point, sample scores demonstrated that forty six subjects (N=46; 24.5 % of the sample) were EAT-positive and were classified as ‘at risk’ for eating disorder. Fifty six subjects (N=56; 29.9% of the sample) scored between 10 and 19, which may be classified as a low risk for developing an eating disorder; and eighty five subjects (N=85; 45.4% of the sample) scored under 10, which may be seen as no risk (Buddeburg-Fischer et al., 1996).

Scores obtained by the current research sample demonstrated that subjects scoring positively on the EAT26 also scored a significantly higher percentage of eating disorder (32.6%) as defined by the EDDS, than those scoring negatively on the EAT26 (N=7.8%; Pearson Chi Square=17.831; p<0.001), suggesting that the EAT26 may have been adequately predictive of eating disorder in this sample.

Logistic regression also confirmed that EAT-positive subjects were more likely (Crude Odds Ratio=5.718; 95%; CI=2.39-13.66; p<0.001) to have an eating disorder on the EDDS, than those scoring negatively on the EAT26; endorsing findings that the EAT26 may have been adequately predictive of eating disorder in this sample as a whole. The validity of the EAT26, as an index of risk for eating disorder, was also evaluated by calculating the Positive Predictive Value, Negative Predictive Value, Sensitivity and Specificity of the EAT26 against ‘cases’ of eating disorder identified by the EDDS (Table 3) in the current research sample.
<table>
<thead>
<tr>
<th></th>
<th>Eating disorders</th>
<th>Total</th>
<th></th>
</tr>
</thead>
</table>
|       | Negative | Positive | Negative
| High EAT score | Count | 130 | 11 | 141 |
|       | % within High EAT score | 92.2% | 7.8% | 100.0% |
|       | % within Eating disorders | 80.7% | 42.3% | 75.4% |
| Positive | Count | 31 | 15 | 46 |
|       | % within High EAT score | 67.4% | 32.6% | 100.0% |
|       | % within Eating disorders | 19.3% | 57.7% | 24.6% |
| Total | Count | 161 | 26 | 187 |
|       | % within High EAT score | 86.1% | 13.9% | 100.0% |
|       | % within Eating disorders | 100.0% | 100.0% | 100.0% |

**Table 3: Cross-tabulation between positive and negative scores on the EAT26 & EDDS.**

Following Parikh, Mathai, Parikh et al., (2008), scores demonstrated in Table 3 indicate that fifteen (N=15) subjects were correctly diagnosed as positive by the EAT26 and as eating disordered on the EDDS, (true positives); thirty one (N=31) subjects were predicted as positive on the EAT26, but did not qualify for an eating disorder on the EDDS (false positives); eleven (N=11) subjects scored negatively on the EAT26, but did qualify for an eating disorder on EDDS (false negatives); and one hundred an thirty (N=130) subjects were negative on both the EAT26 and the EDDS (true negatives).

Positive Predictive Value (PPV) calculates the percentage of EAT-positive subjects who also indicated an eating disorder, (Parikh et al., 2008). The current sample demonstrated that fifteen (N=15) subjects out of the 46 EAT-positive subjects qualified for an eating disorder, indicating a Positive Predictive Value of the EAT26 for eating disorders at 32.6% (Figure 9). These scores demonstrate that thirty one (N=31) of the forty six (N=46) subjects who were EAT-positive (67.4%) did not qualify for an eating disorder (Figure 9).
Figure 9: Relationship between positive and negative scores on the EAT26 and eating disorders on the EDDS.

Negative Predictive Value (NPV) calculates the percentage of subjects who scored negatively on the EAT26 (N=141) and who were also negative for eating disorder (N=130), which indicated a NPV of 92.2% in this sample (Figure 9). Conversely, 7.8% of subjects testing negative on the EAT26, scored positively for eating disorder (Figure 9). Nunes et al., (2005) have reported Positive Predictive Values (PPV) for the EAT26 that range from 4% to 55%. These authors note that low predictive values are not an uncommon finding in studies using the EAT26; particularly in adolescents, where most cases of dysfunctional eating attitudes and behaviors, do not lead to disorder, but are brief and self-limiting and only about 25% of those scoring positively on the EAT26 will develop disorder (Patton, Johnson-Sabine & Wood et al., 1990).
Predictive values may also vary in association with scores on the EAT26, which tend to vary over time, particularly in adolescent samples (Patton et al., 1990), suggesting that ‘the significance of a given score on the EAT26, at a particular point in time should not be overestimated’ (Szabo & Allwood, 2004). The PPV of 32.6% for the EAT26 obtained by the current research sample may thus be described as an average and fairly typical index of risk in an adolescent population; although it indicated the presence of a relatively large ‘pool’ of subjects who reported dysfunctional eating attitudes and behaviors, without endorsing a clinical eating disorder, as defined by the EDDS (false positive). Nunes et al., (2005) demonstrated a Positive Predictive Value of the EAT26 for eating disorder at only 14% in their sample of Brazilian women. The authors speculated that the high rate of false positives in their sample may have reflected a culture of thinness and dietary practices that have become particularly common in Brazil and may have increased the possibility of affirmative answers on the EAT26, in the absence of disorder.

Similarly, severity of symptoms and thus ‘cases ’of eating disorder may wax and wane over time (Fairburn & Harrison, 2003; cited from Vetrone, Cuzzolaro, Antonozzi and Garfinkel, 2006), depending upon the context, experience, age and body weight of subjects, which may influence the predictive value at any given point in time. These considerations endorse the view that dysfunctional eating attitudes and behaviors may require additional risk factors in order to progress to a clinical eating disorder and that the EAT26 may only identify a risk factor within a multi-factorial etiological profile of eating disorder; where only a small proportion of EAT-positive females go to develop an eating disorder. The index of risk for eating disorder demonstrated by the EAT26 in the current research sample may, therefore, have conformed to theoretical expectations and provided a sufficiently valid measure of dysfunctional eating attitudes and behaviors in the current adolescent research sample, as a whole.
Nunes, Camey, Olinto et al., (2005) reported that the EAT26 also demonstrates variable ability to predict eating disorder across different cultures and contexts; particularly in non-western contexts. The Positive Predictive Value of the EAT26 in the current research sample was, indeed, extremely variable between the different schools evaluated, where PPV was calculated at School A=0%; School B=33.3%, School C=25%; School D= 55% and School E=33.3%. These findings suggest that while the EAT26 may have been adequately predictive of eating disorder for the sample as a whole, the EAT26 may not have provided a reliable or valid index of risk for eating disorder across all subpopulations represented in the sample. School A was the only ‘all-black’ school, suggesting that the predictive value of the EAT26 may depend upon daily contact with western cultural influences. Woodside (2005) also noted that when placed in a western environment, eastern anorexics frequently ‘acculturate’ towards a more western symptom profile. Using the EAT40, Nasser (1986) demonstrated a PPV of 55% for the presence of eating disorder on follow-up interview, in a sample of Arabic students attending a London University. Conversely, none of the EAT-positive students at Cairo University qualified for an eating disorder on follow-up interview, suggesting a PPV of 0%; and endorsing the view that the Predictive Value of the EAT26 may be particularly low in non-western environments. These considerations suggest that while, the EAT26 may have been adequately predictive of eating disorder in the sample as a whole, this instrument may need to be applied with caution to sub-populations within the South African context; which may demonstrate different patterns of risk.

The Negative Predictive Value (92.2%) obtained by the current sample demonstrated that a negative score on the EAT26 was more highly predictive of the absence of disorder than a positive score predicted the presence of disorder (PPV=32.6%); which also questions the practical utility of the EAT26 as an adequate screening instrument across all contexts in South Africa. Vetrone et al., (2006) calculated a NPV of 93.2% for the EAT40, in their sample of Italian female adolescents and noted that most two-stage studies only conduct a follow-up clinical interview on positive scorers on the EAT26, such that there is limited comparative data on negative scorers for discussion.
Sensitivity calculates the percentage of cases of eating disorder that were correctly diagnosed by the EAT26, namely the probability that subjects with an eating disorder were also positive on the EAT26. Fifteen (N=15) out of a total of twenty six (N=26) eating disorders in this sample, were EAT-positive indicating a Sensitivity of 57.7%. Specificity calculates the percentage of subjects who did not qualify for an eating disorder and were correctly diagnosed as negative on the EAT26; namely the probability that subjects without an eating disorder were also negative on the EAT26. One hundred and sixty one (N=161) subjects did not qualify for an eating disorder on the EDDS, of which one hundred and forty one (N= 141) were negative on the EAT26, indicating a Specificity of 80.7% in this current research sample.

Nunes et al., (2005) report a range of Sensitivity for the EAT26 from 28% to 100% and Specificity that ranges from 89% to 97% and concluded that the EAT26 is generally a fairly weak screening instrument for eating disorder, with low Sensitivity and Positive Predictive value. Nasser (1986) demonstrated a Sensitivity of 100% and Specificity of 89% for the EAT40 in predicting eating disorder, in a sample of Arabic students attending a London university. Sensitivity and Specificity were not, however, calculated in the Cairo group as only those scoring positively on the EAT40 were interviewed for the presence of eating disorder. Following these authors, the Specificity of the EAT26 in the current sample may be seen as slightly below average, and, while the Sensitivity may be seen as average, it still leaves eleven (N=11) eating disorders (42.3% of eating disorders) undiagnosed by this screening test (false negatives). This indicates that a large percentage of eating disordered subjects in the current sample scored unexpectedly low on the EAT26 and endorses the view that the EAT26 may not provide an adequate screening instrument in all South African contexts.

Examination of the false negatives demonstrated in the current research sample, revealed that five (N=5) of these eleven (N=11) false negatives scored negatively on items indicating vomiting in the EAT26 and yet scored positively in items indicating vomiting in the EDDS; two (N=2) cases where diagnosed as Binge-eating Disorder (BED); two 2 (N=2) scored 19 on the EAT26,
thereby just missing the cut-off score; and 2 (N=2) could not be explained by any methodological limitation. Investigation of all the test scores revealed that a total of twenty three (N=23) of the total number (N=187) subjects in the study sample, were discordant between the EAT26 and the EDDS on items about vomiting, where twenty one (N=21) responded negatively on the EAT26 and positively on the EDDS. Subjects had been verbally instructed to answer affirmatively for vomiting or other dysfunctional eating behaviors, only if they engaged in these practices as a means of weight control in both scales. They should, thus, have been clear as to the intention of these questions. Zulu-speaking subjects also had Zulu-language questionnaires which were also fully explained by the Zulu research assistant. It is therefore unlikely that these discrepancies could have been due to language misunderstandings, but could have been due to lack of reliability in completing the scales. The EDDS asks for specific numbers of occasions in which the subject has used various eating disturbances, thereby preventing a relative answer and probably providing a more reliable indication of disorder in this sample. Many subjects also responded with number 1 (never) on the EAT26 scale and then qualified this as several times on the EDDS, suggesting that they may have interpreted the score of 1 on the EAT26 as an affirmative response, and yet answered easily and honestly regarding the specific number of times they vomited, on the EDDS. One can only conclude that subjects failed to respond accurately to the relative scoring of the EAT26, where 1 stands for NEVER and there is no zero rating.

Self-report scales such as the EAT26 also depend upon the subject’s level of awareness and insight into the presence of particular symptoms and the honest reporting of these symptoms. Subjects seemed able to answer the specific questions of the EDDS honestly, suggesting that many subjects may not have demonstrated the level of awareness needed to respond to the EAT26 more reliably; thereby compromising the reliability and validity of EAT26 scores obtained by a number of subjects in this sample.
School A scored the lowest EAT26 scores, yet scored an average percentage of eating disorders across schools (12%); and not one of these eating disorders where EAT-positive (Sensitivity = 0%). School A also scored lowest on all risk factors measured in the study. Low scores on the GHQ-12 were unexpected at this school which is situated in a low socio-economic area where subjects experienced significant social and family stressors. It is possible that with this degree of daily stress, these subjects may have become ‘desensitized’ to stress and may have answered negatively, yet relatively, to items in the GHQ-12 such as ‘are you constantly under strain’ – ‘more than usual?’ They may also have answered relative items on the EAT26 in a similarly negative manner.

Following Lee et al., (1998), low scores on the EAT may also be expected in non-western environments and eating disorders may be missed by western screening instruments that rely on fat phobia as a cardinal symptom. The EDDS required that subjects score greater than 4 on 2 (Anorexia Nervosa), and 1 (Bulimia Nervosa) of the 4 items that directly relate to body image concerns (Body Image Criteria) as a prerequisite for diagnosis of eating disorder, although remaining items focus on specific symptoms of anorexia and bulimia nervosa and binge-eating disorder. A lack of body image concerns could not, therefore, have accounted for the eleven (N=11) cases of eating disorder that were unaccounted for by the EAT26. It could, however, have been possible that some of these cases suffered sufficient weight concern to qualify for a diagnosis of Bulimia Nervosa on the EDDS, but were not sufficiently distressed about their body-weight and shape to also score positively on the EAT26, where items focus largely on fear of fatness, drive for thinness and restrictive eating. Indeed, two (N=2) of these eleven (N=11) cases where diagnosed as Binge-eating Disorder (BED), which does not require body image concerns to qualify for a diagnosis on the EDDS, and may not be identified by the EAT26.

Sensitivity was also highly variable between schools, where, while none of the three eating disordered subjects at School A, were EAT-positive (Sensitivity=0%), Sensitivity of the EAT26 was calculated at; School B=100%, School D=62.5%, School E=66.6% and School C=60%,
suggesting that some subjects in the current research sample, particularly at School A, may have exhibited eating disorders that did not conform to a typically “western” etiological pathway, from typically western dysfunctional eating attitudes and behaviors, to clinical eating disorder. These findings are consistent with hypotheses generated in the Focus Groups which suggested that while typical western pressures towards thinness were common in most schools, also confirmed the existence of forms of eating disorder that may not follow traditional etiological pathways.

Quantitative findings in the current research sample thus cast doubt on the clinical utility of the ‘traditionally western’ EAT26, as a screening instrument across all South African sub-populations and suggest caution for research studies that use positive scores on the EAT26 as a proxy for eating disorder within this context.

### 4.3.1 Overview of the Reliability and Validity of the EAT26

Quantitative evaluation of the EAT26 suggested that a proportion (24.5%) of subjects in the current research sample (N=187) suffered from the typically western dysfunctional eating attitudes and behaviors that are reflected by positive scores on the EAT26. Positive scores on the EAT26 were also significantly correlated with body image concerns (Body Image Criteria on the EDDS) Dieting, Bulimia and Oral Control, supporting suggestions that the EAT26 may have provided a sufficiently valid measure of western patterns of dysfunctional eating attitudes and behaviors in the study sample as a whole.

Examination of specific contexts (schools) within the current research setting, however, demonstrated, that western patterns of dysfunctional eating attitudes and behaviors, as reflected by the EAT26, may not have been consistently experienced across all settings within the current research context; (School A=4% positive EAT scores), suggesting that sample scores on the EAT26 may not be reliably generalized to all subpopulations within the South African context.
The accuracy of the EAT26 in predicting eating disorder on the EDDS was also inconsistent across all contexts within the research sample; suggesting that while the EAT26 may have provided an adequately reliable and valid index of risk for eating disorder, for the sample as a whole, this may not be generalized to all subpopulations within the South African context. Quantitative evaluation also demonstrated that while overall reliability coefficients were adequate, particular items of the EAT26 may not have been reliably completed by some subjects and that the relative nature of the items may be problematic in the South African context.

A large percentage of eating disorders (42.3%) on the EDDS also remained undiagnosed by the EAT26 (false negatives), suggesting that a substantial proportion of eating disordered subjects may not have followed typically western etiological pathways and patterns of risk; and were missed by the EAT26. Widespread dysfunctional eating patterns (EDNOS) were also identified across the research sample, suggesting that the dysfunctional eating attitudes and behaviors, as measured by the EAT26 may only have represented a proportion of the range of dysfunctional eating that occurred in the study sample (see Section 4.4).

This poses a serious limitation for the EAT26 as a screening instrument or proxy for eating disorder in the South African context; and suggests that dysfunctional eating attitudes and behaviors, as measured by the EAT26 may only capture dysfunctional eating patterns, as defined by western diagnostic systems and etiological pathways, which leave other forms of dysfunctional eating unacknowledged and unaccounted.

Objectives of this study sought to identify relationships between acculturative stress and dysfunctional eating attitudes and behaviors, as identified by the EAT26. Following caution regarding trans-cultural difficulties associated with the EAT26, the current research study did not rely on the EAT26 as a proxy for eating disorder and utilized a two-stage approach to achieve its objectives.
The EAT26 may thus have provided a sufficiently valid and reliable index of dysfunctional eating attitudes and behaviors to fulfill research objectives, although results of the current study need to be clarified in terms of a relationship between acculturative stress and typically western patterns of dysfunctional eating attitudes and behaviors, as defined by the EAT26. Adequacy of the EAT26 as a valid measure of these western dysfunctional eating attitudes and behaviors in the current study, may have been improved by verbal instructions given during administration of the EAT26; suggesting that future research may need to provide this additional instruction to research subjects in South Africa.

Future research in South Africa thus requires a two-stage approach to clarify the predictive adequacy of the EAT26 in the particular context under study. Such research may also identify possible etiological patterns and pathways of eating dysfunction that may lead to eating disorder in these particular South African settings; and suggest possible modifications to the Eating Attitudes Test-26 for use in South Africa.

4.4 Eating Disorders Diagnostic Scale (EDDS)

Quantitative evaluation of the reliability of the Eating Disorders Diagnostic Scale (EDDS; Stice Telch & Rizvi, 2000) indicated a Cronbach’s coefficient at Alpha=0.815, in the current research sample; which following DeVellis (1991), indicates a ‘very good reliability’. In the original construction of the EDDS, Cronbach’s alpha coefficient for the symptom composite yielded an internal consistency of Alpha=0.91 in the full sample and Alpha=0.81 for the retest sample.

In the original construction of the EDDS, validity was examined by testing whether subjects who were identified as eating disordered by the EDDS, showed the expected elevations on other validated measures of eating disturbances, compared with EDDS-identified individuals without eating disorders. Eating disordered and non-eating disordered groups were compared using analysis of variance. As predicted, the eating-disordered groups showed expected elevations or
decrements in dietary restraint, weight and shape concerns, eating and weight preoccupations and rituals, cognitive restraint, hunger, and dis-inhibition on the validated measures of eating pathology.

To date, the author is unaware of any other studies which have used the EDDS in South Africa and therefore unaware of any other indication of reliability or validity in this context. Quantitative validation in the current research sample, however, demonstrated that eating disordered subjects scored a significantly higher median on total EAT26 (p<0.001); and subscales of Dieting (p<0.001); Bulimia (p<0.001) and Oral Control (p=0.014) than subjects who did not qualify for an eating disorder; suggesting that the EDDS may have adequately reflected traditionally ‘western’ paradigms and constructs of eating disorder in this research context.

Following diagnostic criteria outlined by the EDDS, the quantitative analyses in the current research sample, revealed severely dysfunctional eating behaviors across all schools, namely: regular fasting (N=105; 56%); binge- eating (N=64; 34.2%); self-induced vomiting (N=41; 22%) purging with laxatives (N=43; 23%) and regular compensatory exercise (N=107; 57%). Frequencies ranged from 1-14 times a week on each behavior. Of these dysfunctional eating behaviors, twenty six subjects (N=26; 13.9%) qualified for an eating disorder including bulimia nervosa (N=22; 11.7%) and binge-eating disorder (N=4; 2.1%). One subject scored a BMI of 17.4 but failed to qualify for a diagnosis of anorexia nervosa on body image criteria or amenorrhea, indicating, no cases of anorexia nervosa in the study sample. Findings from the EDDS therefore indicated widespread and clinically relevant dysfunctional eating attitudes and behaviors.

In the original construction of the EDDS, level of agreement on diagnoses between the structured clinical interviews and the EDDS was 99% for anorexia nervosa, 96% for bulimia nervosa and 93% for binge-eating disorder. In spite of these levels of agreement, EDDS criteria for the diagnosis of bulimia nervosa differs from DSM-IV-R (APA, 1994) criteria in that the EDDS requires 8 or greater incidents of compensatory behavior a week (purging, fasting, or exercising)
while the DSM-IV-R requires only 2 incidents per week. Subjects could thus have failed to endorse sufficient compensatory behaviors to qualify for a diagnosis of bulimia nervosa, following EDDS criteria, but may well have received a diagnosis in a clinical interview; suggesting that the EDDS may have underestimated the prevalence of bulimia nervosa in this sample.

Many subjects also evidenced very risky weight control practices, yet failed to qualify for any diagnosis on EDDS, which makes no provision for a diagnosis of Eating Disorder Not Otherwise Specified (EDNOS). EDNOS is thought to be up to five times more common in adolescent girls than other categories of eating disorder and fifty percent (50%) of all eating disorders may be diagnosed as EDNOS by the DSM-IV-R (APA, 1994), (Fairburn, 2007). Fairburn (2007) concluded that EDNOS should be viewed as clinically relevant as the other categories and worthy of the same degree of attention and treatment. Several girls in the sample vomited and took laxatives up to 14 times a week; which is certainly worthy of intervention, yet was not considered worthy of a clinical category by the EDDS. Following Fairburn (2007), these dysfunctional eating behaviors have clinical and theoretical relevance that is worthy of attention and may clarify patterns of dysfunctional eating within this South African context.

In an attempt not to lose these dysfunctional practices from analysis, the current research study grouped these dysfunctional eating patterns into subtypes defined by the researcher as EDNOS which included:

**EDNOS A:** Subjects who scored 8 or more compensatory behaviors per week without achieving full criteria for binge eating, but with full score for Body Image Criteria (items 1-4) on the EDDS. There were twenty three subjects (N=23; 12.2% of the sample) in this category, twelve (N=12) of whom were EAT-positive.
EDNOS B: Subjects who scored on all criteria for binge eating and body image necessary for bulimia nervosa and scored more than 2 compensatory behaviors per week; but failed to achieve the 8 or more compensatory behaviors necessary for a diagnosis of bulimia nervosa on the EDDS. These subjects may, therefore, have received a diagnosis of bulimia nervosa in a clinical interview. There were eight subjects (N=8; 4.2% of the sample) who scored in this category. Four (N=4) of these subjects were EAT-positive.

EDNOS C: Subjects who scored the same criteria as EDNOSA or EDNOSB, but without achieving full criteria on Body Image Criteria. Fourteen subjects (N=14; 7.4% of the sample) scored in this category. Six (N=6) of these subjects were EAT-positive. School A scored the highest percentage of EDNOSC, with (N=6) 25% of the sample qualifying for this category.

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<th>EDNOS</th>
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<td>School A</td>
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<td>B</td>
<td>7 (44%)</td>
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<td>3(3%)</td>
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<td>10</td>
<td>18 (36%)</td>
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Table 4: Categories of EDNOS, EDNOS A, EDNOS B and EDNOS C, as defined by this study, Median Body Image Criteria (BIC), percentage positive EAT26 scores, and percentage eating disorder on EDDS, for the sample, each school and each Grade.
A total of forty five (N=45) subjects in the current research sample, were categorized in terms of the above subtypes of EDNOS. This indicates that, in addition to those subjects diagnosed with an eating disorder, a further 24% of the total sample exhibited dysfunctional eating patterns (EDNOS) that were worthy of clinical attention; but remained undiagnosed by the EDDS. These findings suggest that the EDDS may have underestimated the number of potential ‘cases’ of eating disorder in the current study and, in so doing, compromised the ability of the EAT26 to accurately predict disorder.

Vetrone et al., (2006) found that the inclusion of a category of Eating Disorders Not Otherwise Specified (EDNOS) increased the PPV of the EAT40 to 24% in their Italian female adolescent population, and concluded that a two-stage approach may underestimate the prevalence of eating disorders, especially EDNOS. These findings suggest that many more EAT-positive subjects in the current sample may have qualified for a diagnosis of eating disorder, if the Eating Disorders Diagnostic Scale had included a category of EDNOS and that the PPV may have been increased with the inclusion of this category. These considerations also support the view that incident cases of eating disorder may arise from the EDNOS population (Drewnoski, 1988) and return to a diagnosis of EDNOS when they no longer meet diagnostic criteria for a full-blown eating disorder.

Indeed, following Vetrone, et al., (2006), if these categories of EDNOS were regarded as cases of eating disorder, the Positive Predictive Value of the EAT26 in the current study would have improved to 78.2%. Vetrone et al., (2006) obtained a Sensitivity of 35.5% in their Italian sample, with the inclusion of EDNOS as ‘cases’ of eating disorder. These authors found very few studies which considered the Sensitivity of the EAT and proposed that the problem of false negatives has generally been unappreciated. They suggest that false negatives may also be due to the tendency to deny illness in self-report scales, and the possibility that not all eating-disordered individuals demonstrate high levels of fat phobia or drive for thinness.
Interestingly, of the thirty one (N=31) subjects who scored positively on the EAT26 but did not qualify for an eating disorder on the EDDS (false positives), twenty one (N=21; 67.7%) qualified in the category of EDNOS as defined by this study, thereby supporting the reliability and validity of the EAT26 as an index of dysfunctional eating attitudes and behaviors in the sample as a whole. Moreover, of these thirty one (N=31) false positive subjects, twelve (N=12; 38.7%) qualified for EDNOS A and four (N=4: 12.9%) qualified for EDNOS B, which suggested that a large proportion of the category of EDNOS exhibited dysfunctional eating attitudes and behaviors that were accompanied by western weight and shape concerns.

These findings further support the reliability and validity of the EAT26 as a measure of typically western dysfunctional eating attitudes and behaviors and, following Drewnowski (2005), suggest that EDNOS may have represented a range of dysfunctional eating patterns which may or may not, have progressed to typically western, clinical disorder; and that the majority of eating disorders in this sample, may indeed have emerged from this population of EDNOS.

The above findings and considerations also, however, suggest that some potential cases of eating disorder may have been missed by the typically western application of the EDDS, which requires that the subject experiences body weight or shape concerns to qualify for an eating disorder (Lee & Katzman, 2002). The current research study attempted to overcome this limitation by including the category of EDNOS C which, it was hoped, would capture those subjects who may have qualified for an eating disorder, if they had qualified on body image criteria. Indeed 14 (N=14) of the forty five (N=45) subjects in the category of EDNOS (37.8% of the category of EDNOS as defined by this study), were classified as EDNOS C, which displayed symptoms of EDNOS without qualifying on Body Image Criteria. Consistent with expectation, the majority of these subjects (N=8; 57% of EDNOS C) were not detected by the EAT26; thereby supporting indications that a proportion of subjects manifested dysfunctional patterns of eating that did not conform to traditionally western etiological patterns of eating disorder. Investigation also revealed one case (N=1) of EDNOS C that would have qualified for a diagnosis of bulimia nervosa.
if she had qualified on Body Image Criteria; suggesting that possibly deserving subjects, may well may be missed as a case of eating disorder by the EDDS in the South African context. If this subject had been considered as an eating disorder, the percentage of eating disordered subjects in this sample would have risen to 14.4%. Using a ‘broader’ definition of eating disorder that does not require body image concerns, Keel and Klump, (2003) also found that a greater number of eating disorders may be identified, across history and in countries which have no contact with western values of thinness.

Further analysis indicated that the proportion of subjects diagnosed as EDNOS C was not evenly distributed across the different contexts (schools) within the research setting. Twenty-five percent (24%) of the subjects at School A qualified for the category of EDNOS C, while Schools B, D and E only qualified for a few cases of EDNOS C. A third of the total number of cases of EDNOS (36%) were also scored by School A, which also scored the lowest percentage of positive EAT26 scores (4%) and the lowest median score on Body Image Criteria (Median=7.00) across schools, yet indicated an average percentage of eating disorder (12%); supporting suggestion that a large number of subjects in this school may have demonstrated forms of clinically relevant, dysfunctional eating behaviors that did not demonstrate typically ‘western’ body image concerns or represent typical etiological pathways to eating disorder.

In contrast to the above findings, only 4% of subjects at School E and 12.5% of subjects at School D qualified for EDNOS. School D also qualified for the second highest percentage of EAT-positive scores (28.1%) and the highest score on Body Image Criteria (Median=20.5) and eating disorder (25%) across schools; suggesting that a greater proportion of dysfunctional eating behaviors at this school may have been organized into typically western etiological patterns and diagnostic categories of eating disorder; thereby endorsing a ‘westernization’ of eating disorder. Following Woodside (2005), these findings and considerations suggest that pathological patterns of dysfunctional eating may be wide-spread across South African settings and that these eating disturbances may ‘acculturate’ towards more western patterns, as subjects come into more daily
contact with westernization. These findings and considerations also endorse suggestions that diagnostic categories outlined by the EDDS may only detect those patterns of eating dysfunction which follow typically western diagnostic categories and may underestimate the presence of clinically relevant eating disorder in the South African context.

Validity coefficients for the EAT26 also indicated that eleven cases of eating disorder (N=11; 42.6% of eating disorders) were not predicted by the EAT26 (see section 4.3); two (N=2) of which qualified for a diagnosis of binge-eating disorder (BED), which was included as a category of eating disorder by the EDDS, although this category is still considered a sub-category of EDNOS by the DSM-IV-R (APA, 1994) and may not be predicted by the EAT26. Analysis revealed that most subjects, who engaged in binge-eating, also practiced a few compensatory behaviors per week, which precluded them from a diagnosis of BED on the EDDS. Quantitative analysis therefore demonstrated only four cases (N=4) of BED; only two (N=2) of which were identified by the EAT26. These findings suggest that the inclusion of BED as a category of eating disorder on the EDDS, may have overestimated cases of eating disorder, compared to other diagnostic systems and that the presence of BED, as a case of eating disorder, may also have compromised the predictive ability of the EAT26 in terms of the number of cases that were not identified by the EAT26 (false negatives).

Patterns of dysfunctional eating identified by the EDDS in the current study thus suggest that established western diagnostic categories failed to adequately capture the range of clinically relevant eating patterns that presented in the current South African research context. Future research thus needs to clarify potential 'non-western' forms of eating disorder in South Africa and establish realistic norms and prevalence rates in this context.
4.4.1 Overview of the Reliability and Validity of the EDDS.

Objectives of this research also sought to identify relationships between acculturative stress and the presence of eating disorders. The Eating Disorders Diagnostic Scale (EDDS) was used as a proxy for clinical interview, to identify the presence of eating disorders, in the study sample (N=187). Reliability and validation coefficients suggest that the EDDS may have provided an adequately reliable and valid index for the presence of Anorexia and Bulimia Nervosa and Binge-eating disorder in the current research sample as a whole. Evaluation also suggested that the specific nature of the EDDS items may be more reliable in the current South African research context, than the relative scoring system of the EAT26.

The EDDS criteria used for the diagnosis of eating disorders in this study, may, however, have differed slightly from other diagnostic systems used in a clinical interview. The EDDS criteria for Bulimia Nervosa could be regarded as stricter than those generally used in a clinical interview. Conversely, while Binge-eating Disorder was included as a separate diagnostic category, the EDDS failed to include other forms of EDNOS as defined in the DSM IV-R (APA, 1994). This may be seen as a major limitation of the EDDS and may have resulted in an underestimation of some eating disorders while overestimating others; in relation to rates of eating disorder that may have been identified by a clinical interview. The EDDS criteria used in the current study have thus been specifically identified and made available to the reader for independent scrutiny and cross-research comparison.

Like most instruments devised in the west, categories of eating disorder, as defined by the EDDS, also did not capture the range of different forms of eating dysfunction that may be found in non-western contexts. Fortunately the EDDS records specific incidents of each symptom of dysfunctional eating, which offers research the flexibility to organize these symptoms into a range of different categories, based upon a number of different criteria. Different or ‘non-western’ symptom patterns, may therefore not be lost, but may be identified and explored by the
researcher and thereby contribute towards our understanding of different or non-western forms of disorder. The current research attempted to orchestrate this and constructed three categories of EDNOS that were defined by the researcher. The inclusion of this category of EDNOS indeed identified widespread patterns of eating dysfunction, that did not follow traditionally western diagnostic patterns of disorder; suggesting that the EDDS may provide a more reliable screening instrument than the EAT26 in the South African context and has the potential to identify different patterns of dysfunctional eating and contribute towards our general understanding of the etiology of these disorders.