

The design of a semantic differential scale for measuring the psychosocial well-being of students

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This article describes the construction and standardisation of a semantic differential scale for measuring and quantifying the psychosocial well-being of students. The respondents rate the following aspects of their childhood years: emotional support while growing up, socio-economic background, whether they grew up in an environment conducive to learning, and the presence of depression in the family. Regarding the students' current life situation, the scale measures the degree of relationship and economic problems experienced by the students, the presence of depression, and concerns regarding HIV and AIDS.

Die ontwerp van 'n semanties differensiële skaal om die psigososiale welstand van studente te meet

Hierdie artikel beskryf die konstruksie en standaardisering van 'n semanties differensiële skaal wat die psigososiale welstand van studente meet en kwantifiseer. Die respondente beoordeel die volgende aspekte rakende hul kinderdae: emosionele ondersteuning, sosio-ekonomiese agtergrond, die teenwoordigheid van 'n leerstimulerende omgewing en die voorkoms van depressie in die gesin. Wat die studente se huidige lewensomstandighede betref, meet die skaal die voorkoms van verhoudings- en ekonomiese probleme, die voorkoms van depressie, en die vrees vir die opdoen van MIV.

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When researching determinants of success and non-completion in higher education, the quantitative researcher must take several extraneous or confounding variables into account. One such variable is the psychosocial well-being of the student which is synonymous with the level of psychosocial stress experienced by the student.

The term psychosocial well-being pertains to the social and emotional circumstances under which the adult student was raised and which continue to affect academic potential. Logically, “psycho” relates to psychological factors which construe our emotional and social well-being and “socio” relates to “social”. Although a great deal of research is conducted on the construct, few authors define it since the meaning of the term is regarded as discipline-specific common knowledge.

Because the student’s psychosocial background stressors affect academic achievement (*cf* Alva & De Los Reyes 1999: 343, Joubert 2011: 166, Roos 2012: 189), it is essential to quantitatively investigate academic achievement in order to account for the effect such stressors have on the student’s academic achievement.

One of the major features of quantitative design is control over confounding variables (Polit & Beck 2008: 750). When attempting quantitative research in education, experimental designs with randomisation and control of extraneous variables are, to a large extent, impossible to accomplish for practical reasons (McMillan & Schumacher 2006: 118). Researchers are left with no option but to build extraneous variables into the design. According to Kerlinger (1986: 288):

An extraneous variable can be controlled by building it into the research design as an attribute variable, thus achieving control and yielding additional research information about the effect of the variable on the dependent variable and about its possible interaction with other independent variables.

McMillan & Schumacher (2006: 118) and Polit & Beck (2008: 750) also maintain this principle. This article aims to report on the design and standardisation of a scale which measures the psychosocial background stressors of students or their psychosocial well-being. As such, research regarding academic achievement can investigate

the effect of psychosocial background stressors on the dependent variable.

1. Psychosocial well-being: the construct

The construct “psychosocial well-being” should not be construed as being merely an umbrella term. The body of research encapsulating this term is vast, and different definitions apply. The term is used to describe the presence or absence of life stressors in the life of an individual or an individual’s emotional well-being. Coleman (2001: 602) and Alva & De Los Reyes (1999: 343) describe psychosocial background stressors as “life events that cause stress”. When viewed as a construct, psychosocial well-being contains several dimensions which may depict the presence or absence of emotional well-being. Berkhout *et al* (2010: 103) refer to the absence of psychosocial well-being as influenced by negative life events, environmental issues and deficiencies, familial and interpersonal stress, inadequate social support, and inadequate personal resources.

Measuring psychosocial well-being amounts to measuring the psychological and social environmental conditions in which the student was raised and under which s/he developed and which currently influence his/her life. These conditions include the many elements relating to socio-economic background as well as family structure and communication. The following are examples: presence or absence of emotional stability in the home; level of warmth and nurturing of the child by the parents or guardians; economic status of the family; presence or absence of substance abuse and family violence, and the extent to which parents foster an environment conducive to learning. The presence of depression in either parents or the child is either primarily or secondarily detrimental to the child’s well-being. As far as the student’s current life situation is concerned, factors such as the degree of relationship and economic problems experienced by the student, the presence of depression, and concerns regarding HIV and AIDS affect academic achievement.

According to Kleinman and Cohen (Comer 1998: 101), the basic premise from which this scale was developed is equivalent to that of sociocultural theorists who state that all behaviour is shaped by social forces. This would imply that psychosocial background

factors are important moderators of behaviour and thus of success and non-completion in higher education (Robbins *et al* 2004: 263). Dysfunction in families leads to stress and impaired development in children. Such dysfunction is often accompanied by other negative background factors such as economic problems, family violence, alcohol and other drug abuse, lack of parental interest in the child's development, or neglect of the child. These conditions affect learning either directly or indirectly. Akhatar & Niazi (2011: 956) posit that all environmental activities will affect learning.

2. Conditions for scale construction

The scale had to comply with some important requirements. First, it had to be short because, if used as an instrument to control psychosocial background factors as a confounding variable, it would be used in conjunction with other measuring instruments. Too many or long questionnaires also lead to response fatigue among respondents. Secondly, the scale would have to be a summative rating scale to accommodate data analysis. Thirdly, the scale would have to be constructed as a homogeneous or unidimensional scale in order to effect standardisation by means of item analysis, as indicated by the classical measurement theory (Nunnally 1970: 437; Kline 1999: 275).

Because the scale was meant to measure the psychosocial background factors of students in higher education, it was important to include a section to measure the student's current life situation and childhood situation. This consequently implies that adulthood is deemed to be another point on the continuum of development from infancy to adulthood. Therefore, as we research success and non-completion of the student in higher education, we need to consider the student in his/her entirety as a human being and the impact which life events have had on his/her psyche from childhood to the present.

The most relevant psychosocial background factors that currently affect students' learning capacity are socio-economic conditions, dating relationship status, family relationship problems, and the presence or absence of depression. Concerns regarding HIV status have become a contemporary deterrent to academic performance. Sexually active students often have to deal with the fear and anxiety of contracting HIV. Yet they abstain from taking the test for fear of

and anxiety about a positive status (*cf* Meiberg *et al* 2008: 50, Katjavivi & Otaala 2003: 14, Chilisa *et al* 2001: 8).

3. Method of scale construction

The objective of this questionnaire was to isolate and measure background variables which are associated with academic attainment and which together form the construct psychosocial, the premise being that these factors collectively affect the general well-being of the child/adult and therefore academic achievement.

The scale was constructed and evaluated according to the model of classical measurement theory outlined by Nunnally in 1978 and endorsed by Bernstein in 1996 and by Nunnally & Bernstein in 1999. The method of standardising a test by means of item analysis may be applied on condition that the scale items are homogeneous. This is obvious in the case of psychosocial background stressors. As far as the correctness of determining the reliability of a scale with item analysis is concerned, Nunally (1970: 437) states that:

In the construction of most types of psychological measures, factor analysis of an item pool should be considered only as a last resort, after efforts to hypothesise homogeneous scales have led to naught.

There is a great deal of controversy regarding the value of classical measurement theory. Gerbong & Anderson (1988: 186) state that confirmatory factor analysis provides “a stricter” interpretation of unidimensionality than Cronbach’s *alpha* which is used in classical measurement theory. However, Dowing (2003: 739) indicates that classical measurement theory is predominantly used as a measurement model in medical research. The construction of the scale was completed precisely according to the outline provided by Nunnally in 1970 and 1978.

Constructing the scale involved the following steps: determining the scale dimensions for constructing the item pool; deciding on the anchors to be used; choosing the number of scale steps; choosing the direction of scale items (positive and/or negative); writing statements for the item-pool, and standardising the test.

3.1 Scale dimensions

The following dimensions are identified regarding the content domain ‘psychosocial background’ of both the developing child and the adult student.

3.1.1 Childhood years

- Emotional support

Growing up in an environment with emotional support is an important determinant of academic success for both the learner and the student (Beyers 2001: 59, Roman *et al* 2008: 130). Elliot *et al* (2006: 170) report that “... warmth and a positive affective climate are a prerequisite for high self-esteem, academic and social competence and better mental health”. Emotional support within a family outweighs the negative influence of poor socio-economic conditions (Beyers 2001: 59, Dass-Brailsford 2005: 584). By contrast, emotional neglect negatively influences academic attainment (Polonko 2006: 260). Emotional support or “family cohesion” (Chow 2007: 483) does not necessarily imply that a child should be raised by his/her own parents. Extended families or fostering can create this needed environment of warmth.

- Socio-economic status

Low socio-economic status results in dysfunctional families and affects academic achievement (Akhtar & Niazi 2011: 957). Financial problems lead to stress and discord among parents and/or family members and create a climate of uncertainty and anxiety in the family.¹ Children are ashamed of not having similar material possessions as their peers, and the concern for their parents’ problems affects their self-esteem and emotional health.

Elliot *et al* (2007: 280) state that effective parenting is difficult in disadvantaged high-poverty neighbourhoods. Apart from the shame, a bad neighbourhood encourages drugs, violence and criminal behaviour. The general atmosphere of poverty and defeat is not conducive to aspirations of success and accomplishment for either the learner or the student.

1 Cf Khan 2002: 1, Dass-Brailsford 2005: 584, Kanyongo *et al* 2006: 638, Chow 2007: 490, Kamper & Mampuru 2007: 44.

- Environment conducive to learning

Research indicates that parental involvement in academic activities as well as an environment conducive to learning exert a positive influence on academic achievement (Nickerson & Kritsonis 2006: 3, *Family.JRank.org*: 1). According to literature, this is true for children of all ages. Kanyongo *et al* (2006: 639) found that the home literacy environment is important in predicting reading success among children in Zimbabwe.

Ishitani (2003: 434) and Dass-Brailford (2005: 584) assert that first-generation students had higher attrition rates than students whose parents both attended college. First-generation students were more likely to have lower critical thinking abilities, less academic support from families, and were less confident. Ishitani (2003: 433) found that students whose fathers attended college had an academic advantage over those whose fathers did not attend college. Chow (2007: 493.) found that the father's occupation is significantly related to academic achievement among university students. There are few explanations regarding the psychosocial mechanisms that cause these differences. Khan (2002: 6) indicates that first-generation students are more likely to come from lower socio-economic background than students whose parents had some experience of college.

Witkow & Fuligni (2010: 531) indicate that students who receive social support are more likely to enter university than those who do not have social support. In support of this argument, Yosuf *et al* (2011: 54) claim that lack of parental support produces academic problems in Iranian students at university level. The lack of psychosocial well-being is thus perpetuated among families.

- Depression

Depression in the parents or family of learners and students is often associated with low socio-economic status (Lagerberg *et al* 2005: 340, Khan *et al* 2009: 205). Because depression has a strong hereditary component, the child suffers its negative influence primarily and secondarily. Depressed parents' functioning is impaired, thus indirectly influencing their relationship with the child. Regarding the direct influence of depression on the child, literature indicates that depression affects self-esteem and self-concept, and consequently academic achievement. (Ashitani *et al* 2007: 995, Huang *et al* 2007:

380). According to research done by Heiligstein & Guenther (1996: 6), depression causes academic impairment caused by feelings of inadequacy, distress, and disinterest in school. They argue that depression causes loss of physical and social well-being and that it interferes with the cognitive processes of learning. There is a reciprocal interplay of depression and academic impairment as low academic achievement exacerbates depression.

Chan *et al* (2010: 1) did a meta-analysis of 27 studies regarding the relationship between depression and academic achievement. Results indicate significant inverse correlations between depression and academic achievement. Yeh *et al* (2007: 380) found that there was a high level of depression and anxiety among medical students with poor academic performance.

According to Elliot *et al* (2006: 168), family dysfunction – conflict, divorce and mental health problems such as depression – have consistently been linked to negative developmental outcomes for children. Because depression is often associated with alcohol abuse, it must be considered as a mitigating circumstance in child abuse and therefore has the potential to disrupt the healthy development of children. Alcohol abuse affects child development as it limits the quality of effective parenting.

3.1.2 The present psychosocial situation

As indicated earlier, the psychosocial background of the child extends to that of the adult student. This implies that we are not freed from our life burdens because we have entered adulthood. The scale was designed to measure the following current life situation of the adult student.

- Financial situation

According to Winn (2002: 445), “... changes in the social and economic context of higher education” have some students with demanding family and employment commitments which they have to integrate with their academic responsibilities. It is discipline-specific common knowledge that financial burdens affect success and non-completion in higher education. Alnabahan *et al* (2001: 595) mention the financial situation of the student as one of the key predictors of academic achievement.

- Relationship with significant other (dating relationship/love life)

Sizk (2007: 18) reports that relationship problems among students account for much of the depression among students who visit counselling centres for support. According to a study by Chow (2007: 490), a successful relationship with a significant other has an effect on academic achievement as it creates a more positive self-image. The phenomenon is, however, more complex than this assertion because broken relationships usually cause temporary depression which may last long enough to impair academic endeavours.

- Relationship with family members

Roman & Fenollar (2008: 130) explain that family support positively influences academic achievement due to its positive impact on self-esteem. Family support for the adult student amounts to the feeling that s/he is loved, valued and esteemed by family members. The family is said to be a critical force in the student's life; this is more important and direct than the influence of lecturers. Alnabhan *et al* (2001: 593) report that a "lack of family support" correlates with low academic achievement.

- Depression

Heiligstein & Guenther (1996: 1-10) report that the presence of depression in adult learners can precipitate academic underachievement. Missed time from class due to the illness decreases academic activity and increases social problems. Sizk (2007: 17) reports a high incidence of depression among students in higher education caused by several factors including adjustment issues, living independently, changes in social and sexual identity, and academic pressure.

- HIV and AIDS

Fear and anxiety regarding the possibility of having contracted HIV put students in double jeopardy: they fear both the disease and the test. Anxiety prevents students from engaging successfully with their studies (Meiberg *et al* 2008: 50, Katjavivi & Otaala 2003: 14, Chilisa *et al* 2001: 8). Anecdotal support highlights the fact that HIV-testing facilities on campuses are fully booked during examination time when academic pressure combined with the fear of having a positive HIV status become too much to bear.

3.2 Anchors – bipolar descriptors

The test was constructed as a semantic differential Likert-type rating scale using bipolar descriptors as anchors. Measuring the psychosocial background factors of participants amounts to measuring their feelings towards their own background, in particular, their attitudes towards and perceptions of their own life and life events. Therefore, questions were formulated to determine the participants' perceptions of their psychosocial environments rather than their actual environments. According to Nunnally's (1970: 438) classical measurement theory, "... the semantic differential is a very flexible approach to obtaining measures of attitudes and other sentiments".

3.3 Number of scale steps

Research indicates that a high number of scale steps in scales designed by means of item analysis increase reliability and have the advantage of being used in parametric analysis. Nunnally and Kerlinger advise the use of even numbers of scale steps as it rules out the possibility of the error of central tendency (Nunnally 1970: 425, Kerlinger 1986: 495). Consequently, it was decided to construct a six-point scale. The number of scale steps would not be so high as to cause response fatigue but sufficiently high to be regarded as an interval scale (Turner 1993: 738, Bernstein 1996: 1).

3.4 Direction of the items

Scale constructors normally advocate the use of an equal number of positive and negative statements in scale construction because this rules out response bias. However, because this scale would be used by English second language students, it was decided to make all statements positive in order to facilitate understanding of statements.

3.5 Writing of an item pool

The scale was constructed in two parts. The first section poses 13 questions regarding the childhood years and specifically questions regarding the following dimensions: emotional support, socio-economic situation, environment conducive to learning, and depression. The second part of the questionnaire asks 5 questions regarding the present life situation of the student. Each question

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concerns financial situation, love life, relationship with family members, depression, and concern regarding HIV and AIDS.

The following items were selected for the item pool:

Childhood years

Emotional support

1. While growing up I experienced

Love and support	1	2	3	4	5	6	Abuse and neglect
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2. I grew up being

Part of a family	1	2	3	4	5	6	Missing family love
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3. The people in my family were

Caring towards each other	1	2	3	4	5	6	Often fighting and arguing
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Socio-economic situation

4. Regarding money we were

Comfortable	1	2	3	4	5	6	In distress
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5. The house we lived in was

Big enough	1	2	3	4	5	6	Crowded
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6. The neighbourhood we lived in was

Respectable	1	2	3	4	5	6	Not well regarded
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Environment conducive to learning

7. The occupation of one or both of my parents or guardian filled me with

Admiration	1	2	3	4	5	6	Disapproval
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8. In my family the opportunity to learn something new was regarded as

Important	1	2	3	4	5	6	Not important
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9. My parents/ guardian made sure that I had the opportunity to experience books, magazines, dictionaries, TV and videos

Often	1	2	3	4	5	6	Never
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10. Regarding my further education my parents/ guardian

Had high expectations	1	2	3	4	5	6	Were not concerned about my future
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Childhood years

Depression

11. When I was growing up I felt depressed and down

Seldom	1	2	3	4	5	6	Often
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12. As a teenager I felt that life was not worth living

Seldom	1	2	3	4	5	6	Often
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13. Depression, anger or drinking was experienced by one of my blood relatives

Seldom	1	2	3	4	5	6	Often
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14. I would rate my childhood as

Happy	1	2	3	4	5	6	Unhappy
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Present situation

15. My financial situation worries me

Disagree	1	2	3	4	5	6	Agree
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16. My love life is disappointing or non-existent

Disagree	1	2	3	4	5	6	Agree
----------	---	---	---	---	---	---	-------

17. My family members cause me to worry

Disagree	1	2	3	4	5	6	Agree
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18. I often feel depressed

Disagree	1	2	3	4	5	6	Agree
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19. I worry that I might contract HIV or AIDS

Disagree	1	2	3	4	5	6	Agree
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3.6 Standardisation

Item analysis involves a pilot test of the questionnaire after which the Cronbach's *alpha* is computed. The first step is to add the scores and to calculate the Cronbach's *alpha* which is a measure of the internal consistency of a scale and indicates whether the "... test item score demonstrate(s) proportional association with the total test score" (Maas 1998: 173). The scale should be piloted using at least 5 respondents for each question or statement. The value of the Cronbach's *alpha* should be at least 0.7 for a scale to be reliable (Cohen

et al 2007: 506). According to Nunnally, the items may be accepted if the Cronbach's *alpha* of the final scale is sufficiently high. Nunnally (1970: 437) recommends 0.8 as the cut-off point. This is supported by Field (2000: 668).

4. Pilot study

The 19-item questionnaire was piloted among 476 first-year accounting students at the University of the Free State. This constituted a convenience sample. Participants consisted of both genders and different races. The profile of the sample is reflected in the tables below.

4.1 Results

4.1.1 Descriptive statistics of the sample

In a biographic section of the questionnaire respondents in the sample were asked to report their gender and ethnicity. These descriptive statistics are reported below.

Table 1: Gender of the sample

Gender	Frequency	Percentage	Cumulative frequency	Cumulative percentage
Female	291	61.13	291	61.13
Male	182	38.24	476	99.37

The sample consisted of 182 males and 291 females. Three respondents did not state their gender, as is indicated by the cumulative percentage of 99.37.

Table 2: Ethnicity of the sample

Ethnicity	Frequency	Percentage	Cumulative frequency	Cumulative percentage
0	6	1.26	6	1.26
Black	346	72.69	352	73.95
Coloured	32	6.72	384	80.67
Asian	7	1.46	391	82.14
White	85	17.86	476	100.00

Regarding ethnicity, there were 346 black students, 85 white students, 32 coloured and seven Asian students. Six respondents did not indicate their ethnicity.

4.1.2 Cronbach's coefficient *alpha*

Table 4 indicates a sufficiently high Cronbach's coefficient *alpha*.

Table 4: Cronbach's coefficient *alpha*

Cronbach's coefficient <i>alpha</i>	
Variables	Alpha
Raw	0.877467
Standardised	0.890871

The value of this statistic is 0.877 for calculation using raw data and 0.89 for standardised calculation of the data. Neither one of these two methods is regarded as superior to the other. It is evident that the Psychosocial Well-being Scale has sufficient internal consistency and thus reliability.

4.1.3 Cronbach's coefficient *alpha* with deleted variable

In Table 3 the raw and standardised *alpha* values for each question over all respondents are reported with deleted variable. The raw *alphas* are calculated from the pilot study data set with simple correlations. The standardised *alphas* are calculated by means of analysis of variance. The analysis of Cronbach's coefficient *alpha* with deleted variables implies that the test's total *alpha* is calculated as each variable is removed from the equation, indicating the effect the item has on the total *alpha*. Ideally the scale's *alpha* value should not increase when a particular item is deleted. Individual *alpha* values should not differ radically from the total *alpha* (0.88).

Table 3: Cronbach's coefficient *alpha* with deleted variables

Cronbach's coefficient <i>alpha</i> with deleted variable				
Deleted variable	Raw variables		Standardised variables	
	Correlation with total	<i>Alpha</i>	Correlation with total	<i>Alpha</i>
q1	0.594229	0.869549	0.632643	0.881785

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Cronbach's coefficient <i>alpha</i> with deleted variable				
Deleted variable	Raw variables		Standardised variables	
	Correlation with total	<i>Alpha</i>	Correlation with total	<i>Alpha</i>
q2	0.581768	0.869235	0.618156	0.882250
q3	0.584701	0.868642	0.605628	0.882652
q4	0.542377	0.869640	0.537137	0.884831
q5	0.522128	0.870461	0.530978	0.885026
q6	0.450869	0.872870	0.445301	0.887712
q7	0.498926	0.871242	0.504100	0.885873
q8	0.526600	0.871150	0.559333	0.884127
q9	0.569025	0.869983	0.593285	0.883046
q10	0.504974	0.872077	0.533793	0.884937
q11	0.598279	0.867446	0.592935	0.883057
q12	0.588694	0.867759	0.586098	0.883276
q13	0.428153	0.874454	0.423498	0.888389
q14	0.700377	0.865237	0.716684	0.879061
q15	0.491934	0.872460	0.472166	0.886874
q16	0.216216	0.885565	0.199812	0.895185
q17	0.545615	0.869391	0.532998	0.884962
q18	0.589251	0.867599	0.565999	0.883916
q19	0.186393	0.882939	0.181219	0.895737

It is evident that there are no items in the scale with dissimilar alphas, indicating that there are no items which negatively affect the internal consistency or reliability of the scale and that the scale can be used with confidence.

5. Validity

It should be evident that the questions are substantiated by the theory pertaining to psychosocial background factors of learners and students, and therefore can claim content as well as face validity (Maas 1998: 11).

6. Conclusion

The scale is well supported by theory on psychosocial stressors and well-being, indicating its validity. Cronbach's *alpha*, raw and standardised, of all questions suffice to indicate internal consistency and therefore reliability of the questionnaire. It was not regarded as necessary to change the questionnaire and pilot it again. The studies by Roos (2012) and Joubert (2012) demonstrate that the scale is able to measure and statistically isolate psychosocial well-being as a determinant of academic achievement. The scale will serve as a measure of the confounding variable psychosocial well-being when research regarding success and non-completion of students is conducted.

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