

Constructing a South African Hope Measure

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An instrument to assess levels of hope was developed. From a qualitative analysis of what students regarded as hope, items were constructed and a questionnaire was applied to 474 undergraduate social sciences students. The results were calibrated across gender and ethnic groups using item response theory, specifically Rasch analysis. Five unidimensional constructs were identified (goal achievement resources, ineffectuality, future vision, despondency, and self-efficacy) and compared to three instruments namely the Life Orientation Test Revised, Snyder's Adult Dispositional Hope Scale Items and Adult State Hope Scale to find support for construct validity. Adequate item invariance across gender and ethnic groups were found, as well as good item and person separation and item fit.

Key Words. hope, assessment, Rasch model, classical test theory, test development, construct validity

Hope as a construct identified in the current positive psychology movement, is one important indicator of general psychological well-being (Seligman, Steen, Park, & Peterson, 2005). In South Africa positive psychology is slowly gaining ground due to its importance to the psychological well-being of South Africans. It is not difficult to find reasons for this. South Africa is constantly confronted with social and political pressures and challenges from within such as Aids/HIV, crime, and more recently the largest national strike of government employees ever experienced in South Africa. Maree and Maree (2005) found in a qualitative study analysing protocols of students' views of hope in South Africa that the current socio-political environment constantly formed a backdrop against which hope was formulated. It is therefore important to focus on people's psychological resilience, motivation and future vision in order to assist them to survive setbacks but also to enable them to carve out a viable future in a country with much promise. We embarked on this project with a concern for young peoples' level of hope within South Africa. In this article the process of the development of a hope instrument, called "Maree hope orientation measure" or HOME (so called for the sake of convenience), will be discussed.

Hope as Construct and Related Constructs

Hope can be defined as a perception that a desired outcome in the future can be obtained. According to Nunn, Lewin, Walton, and Carr (1996) hope has the elements of temporality, desirability and expectancy. Thus hope is something that lies in the future, it is something that one wants or desires and one expects to obtain it – it certainly cannot be an unrealistic wish with no chance of being realised. If the latter were true of hope then it would have no positive effect on a person's psychological well-being. We will take our cue from Snyder who is one of the leading researchers in hope and who with his colleagues standardised a number of related hope measurement instruments. Snyder et al. (1996) defined hope as a cognitive construct: it is goal directed thinking con-

sisting of agency thoughts and pathway thoughts (Snyder et al., 1991; Snyder, Feldman, Taylor, Schroeder, & Adams, 2000; Snyder, Rand, & Sigmon, 2002). Agency thoughts refer to one's ability to imagine actions and behaviour to reach goals and utilise the energy to do so. Pathway thoughts refer to the ability to find ways or routes to goals. Goal orientation and motivation play an integral part in this model (Snyder et al., 2002). Because Snyder's model is mainly a cognitive one emotions play a reactive role: positive emotions are the result of positive goal attainment and negative emotions the result of failure to attain goals: "...we conclude that that people's perceived lack of progress toward their major goals is the cause for reductions in well-being rather than vice versa" (Snyder et al., 2000, p. 251).

Snyder developed a number of instruments based on his initial Hope Scale (Babyak, Snyder, & Yoshinobu, 1993; Snyder et al., 1991): the Adult Trait Hope Scale, the Adult State Hope Scale, and similar scales for children (Snyder et al., 1996; Snyder et al., 2002). Some of these instruments were used in this study for construct validation and will be discussed below.

One can distinguish between hope as a characteristic of a particular personality and hope as an emotional state at a particular time in person's developmental history. The first is called trait or dispositional hope whilst the second is called state or situational hope (Bryant & Cvengros, 2004). Traits are "stabilities of behaviour and beliefs about our enduring dispositions" (Matthews, Deary, & Whiteman, 2003, p. 77). States, however, are transient moods, conditions and states of mind and the relationship between states and traits is complex: one assumption is that states do in fact correlate with traits despite its assumed instable reliability when measured; others think that states mediate traits and behaviour (Matthews et al., 2003).

Some constructs are related to hope but also differ in important respects such as optimism, expectancy and self-efficacy. Carver and Scheier (2002) defined optimism as expecting good things to happen and pessimism as expecting bad things to happen. Carver and Scheier (2002) developed the Life Orientation

Test (and later the Revised edition, thus LOT-R) to assess the generalised orientation called optimism or pessimism. Their test is based on their conceptually simplified model, namely, assessing current expectancies of future outcomes. We utilised this test for construct validity and the test is discussed below.

The hope model of Snyder et al. (2002) has some commonality with the concept of self-efficacy of Bandura (2006). Maddux (2002) defines self-efficacy as the belief about what a person can do under certain conditions. Thus, goals appear in the definition implicitly; it is not about having goals but because given the conditions, such as having a goal, that the person believes that he or she can obtain it. Self-efficacy is thus close to agency thoughts which focus on one's ability to reach certain goals.

Expanding the Model of Hope

It is possible to question the cognitive model of Snyder given the line of our discussion above. In Snyder's model one has a strong focus on goal achievement but the question then is whether there is a difference between goal orientation and achievement and hope? If I set goals for job performance for the next year does this involve hope? Having goals and working towards them need not require hopefulness. We think that hope involves goals as part of its structure but they can be vague or concrete, realistic or less so but in addition hope involves or recruits other dimensions. For instance, other hope measurement instruments assume a number of sub-dimensions. Nunn et al. (1996) developed their hope scale called HOPES (Hunter Opinions and Personal Expectations Scale) from a number of conceptual descriptions of hope which included seven domains, namely, mastery or control, meaning and purpose of life, perceived future interpersonal support, perceived future self-worth, planning (investing in the future), motivation and sense drive, and reality appreciation. After they have examined the HOPES in conjunction with a number of related instruments on a number of samples, their revised instrument consisted of two dimensions, namely, a hope scale and a despair scale, which can be added to form a global personal hope (GPH) scale.

Our own study provided a number of dimensions (Maree & Maree, 2005): the study involving 71 post graduate psychology students who were asked to write a paragraph about their personal hopes and what it means to be hopeful or not within South Africa. Themes were identified in the protocols by means of content analysis. The themes were used to devise a rating scale to score the protocols. A number of interesting areas were uncovered. First, the *outcome* of hope can be classified as the improvement of a state of affairs (e.g., improvement of health), realisation of goals (e.g., obtaining a good job) or occurrence of specific events or things (e.g., passing a particular exam). Hope can stand in contrast to a current situation or past experiences which usually were distressing or negative in some sense. Thus hope can enable perseverance, provides anchoring and gives direction. It enables one to survive and keep on going despite circumstances. In a real sense hope gives meaning.

Hope also has different *levels of expression*, namely, emotional, cognitive and spiritual. On an emotional level hope is associated with positive feelings such as optimism, feeling motivated and having a desire for something. On a cognitive level, hope was expressed as a belief, expectation and a fact (as knowing that something will happen). On a spiritual level hope was expressed as faith in God to provide certain goals.

The *nature* of hope was indicated along a number of dimensions which range from more or less of a particular dimension:

temporality (lying closer to the present or farther into the future), tangibility (ranging from less to more concrete), tentativeness (ranging from uncertain to certain), realisability, personal focus (ranging from an inward to an outward focus), valence (less or more positive), efficacy (the extent to which a person is specific about actions to be taken) and tenacity (enabling and motivating survival and perseverance).

Certain principles of hope were also expressed in the students' protocols. These principles were beliefs based on the following: (a) optimism that events will turn out well in any case; (b) on possibility which means that anything is possible and thus there is a chance that things will turn out as hoped for; (c) on experience which is based on past experience that no matter what happened things turn out for the better; finally (d) on the belief that there is a plan or design with one's life. The belief that (e) hard work, skills, talent and knowledge almost ensures goal attainment or realisation of hope was expressed.

In both personal focussed hoped and hope within South Africa, external and internally grounded reasons were cited for why one should be hopeful. For instance, some alluded to them being optimistic, glad to be alive and so on whilst others cited reasons such as the wonderful country they live in, the shining sun and so on.

These aspects we found were similar to Benzein and Saveman's (1998) concept analysis of hope that identified the following critical attributes of hope: a future orientation, positive expectation, intentionality, activity, realism, goal-setting, and a focus on the self and/or others. Hope obviously has a forward looking element and not so much a past reflective dimension, otherwise one would have a construct such as longing or nostalgia. The future orientation of hope is accentuated by contrasting it to past or present circumstances: for instance, one hopes the future to be better than the past. Hope furthermore, bespeaks of a positive orientation although hope can be negative in the sense of hoping that bad things do not happen. Hope's intentionality lies in the fact that it is always aimed at something: one always hopes for something or some event. This is related to hope as goal-setting because the content of particular hopes can be goals as is explicated by Snyder. Hope as activity refers to the same structure of hope that Snyder indicated: it involves actions aimed at reaching goals. An important aspect of hope which distinguishes it from a mere wish or longing is realism. Hope is attainable as opposed to a wish which is unrealistic. To give a brief example: saying "I wish I were rich" expresses something different from "I hope to be rich one day". The latter elicits a different response than the former, namely, "how are you going to achieve your goal?" as opposed to "I can understand that you feel like that!" Lastly, the focus of hope is on the betterment of one's own situation and/or on the situations of others. These themes guided the construction of a questionnaire aimed at measuring levels of hope.

Using the Rasch Model

The Rasch model as opposed to Classical Test Theory (CTT) was used to develop the instrument. CTT operates on a number of assumptions which essentially rely on a view of reliability gleaned from a definition of what a true score is, thus it is also known as True Score Theory (TST) (Smith, Conrad, Chang, & Piazza, 2002). Following below is a discussion of a number of problems with CTT. The Rasch measurement model is related to Item Response Theory (IRT) although the basis of the two probability models differs. The Rasch model departs from the primacy of the model to which the data must be fit

(Andrich, 2004, p. 145; Stone, 2004, p. 215); any changes to be made should be to the data, for instance, removing outliers and other noise. Item Response theory assumes the primacy of the data and the aim is to find a model that fits the data (Andrich, 2004, p. 145). The Rasch model, which is similar to the one parameter IRT model, is preferred in this study because it has some advantages over the IRT model such as allowing interval level of measurement to be established (Stone, 2004). This characteristic is required for unbiased comparison between groups and is extremely suitable for multi-cultural situations such as we have in South Africa.

Problems with CTT

In CTT (a) the values of item parameters (such as item difficulty and item discrimination) depend on the characteristics of a particular sample (Wright & Masters, 1982; Wright & Stone, 1979). This practically means that reliability and other estimates will change each time a different sample is used (Smith et al., 2002). A simple example will suffice. If we evaluate a group of students not proficient in mathematics the average score for a test, say with 30 items, will be low. A substantial number of items will correspondingly be incorrectly answered by a large portion of students. As we know, the difficulty value of a particular item is that portion of persons that answered the item correctly. Thus low difficulty values will be obtained and if we take this value at face value without considering the sample characteristics we can incorrectly argue that certain items are difficult *per se*. However, administering the same test to a group of students proficient in maths for whatever reason, the difficulty estimates of the items will become higher (i.e., indicating easy items). Thus we have item Y with two different difficulty estimates, e.g., 0.4 (difficult) and 0.8 (easy) and the question is which value is an objective reflection of item difficulty? It is impossible to tell, given that the measurement instrument's characteristics are dependent on the sample's characteristics.

A second related problem is that of (b) what a test says about a person's ability or in the case of our HOME test, how much of a particular (hopeful) characteristic a person has. Let us turn the argument above around: if we estimate the math ability of person X (who in this case is proficient in mathematics) with test A consisting of easy items and a test B consisting of items with very difficult items, what estimate of person ability will we obtain? The person will probably obtain 100% on test A supposedly indicating a high proficiency in maths whilst on test B she obtains 50% showing average maths ability. The question then is which score is a true reflection of her math ability? Test A is too easy and determining ability that lies on a continuum higher than 100% cannot be done. The situation is similar to using a bathroom scale that can only measure up to 40 kg. Most people require a bathroom scale measuring higher values. An (psychological) instrument is needed that has values across the relevant continuum in order to obtain an accurate estimate of a person's ability. Item difficulties need to be spaced from easy to hard so that an estimate of ability can be obtained. Thus, along with the problem of test characteristics that depend on sample characteristics discussed above, one can see that instruments developed within the CTT model suffers from a fundamental test-sample dependency.

The problems above translate to instruments that cannot be used on different groups, and persons that cannot be tested with similar tests: both situations yield different test characteristics and person ability scores. The CTT model presents serious difficulties for person measurement (cf. Wright & Masters, 1982,

p. 34). If instruments are neither transportable nor objective in the senses discussed above, how can reliable and sensible comparisons between groups be made? One would struggle to determine whether score differences between groups are due to instrument problems or real differences in person characteristics. The CTT model thus seriously bedevils cross-cultural research or other group comparisons.

Two further, but related, aspects form part of test development practices not necessarily restricted to CTT. The (c) linearity of the scoring system, namely, the spacing between scores, and (d) spacing between anchors in a rating scale. The linearity of the scoring system implies that the scale should be interval and not merely ordinal (Wright & Masters, 1982, pp. 8-9). An interval scale implies equal spacing between intervals so that the distance between scores are the same throughout the continuum of the scale. The linearity of the scale based on interval measurement contributes to proper comparisons if we can separate the estimates of ability and item parameters.

Rating scales can compound the problem of linearity especially if one regards the ordinal estimates on an item level as duly transformed to an interval scale when adding the ordinal counts on items (Smith et al., 2002). A usual practice in measurement is to use rating scales with, for instance, four or five anchors (always agree, sometimes agree, unsure, sometimes disagree, always disagree), adding a value to each anchor (0, 1, 2, 3, 4), and then to add all the scores of the items to obtain a range of scores from a minimum (1 times the number of items) to a maximum (5 times the number of items). This range, for example, from 0 to 40 for 10 items, is regarded and then used as an interval scale. To use a simple example: the 5 anchors are clearly ordinal and the distances between the scores can vary greatly between persons because of differential understanding of the meaning of the anchors, poorly described anchors and so on (Smith, Wakely, De Kruijff, & Swartz, 2003). For instance, the distance between 0 and 1 can be small whilst the distance between 3 and 4 can be large (Wright & Mok, 2004, p. 3). Thus, if the distances (intervals) between the anchors vary between items, it is obvious that just adding item scores leads to unequal intervals in the total score. We cannot assume that the total score ends up as an interval scale; it too is ordinal.

How the Rasch Model Contributes to Measurement

The Rasch model allows for item characteristics to be estimated independently from sample characteristics (Smith et al., 2002). The same applies to person ability which can be estimated independently of item characteristics. This characteristic of the Rasch model is called parameter separation (Bond & Fox, 2001, p. 203; Wright & Masters, 1982, p. 57). Measures or true interval scores are constructed when calibrating person ability scores and item scores: item location and person ability are converted to log odds or logits which is an interval measurement unit that is invariant across the continuum of a variable (Linacre, 1991). A logit of 0 indicates the average score. Positive logits indicate more of a characteristic whilst a negative score indicates less. Because item calibrations and person ability scores are both indicated in logits they can be compared directly to determine the person-item distribution. Related to the linearity of the scale and parameter separation is the characteristic of parameter invariance which assumes that within the Rasch model item and person parameters are "... invariant, within measurement error, across different tasks, time, groups, or contexts" (Smith, 2004b, p. 109). Parameter separation yields test free and sample free measurement (Schumacker,

2004, p. 231). Given parameter invariance and scale linearity we can reliably compare groups. However, we need to demonstrate parameter invariance which is discussed below.

For our purposes item difficulty will be indicated by δ . Although rating scales do not have right or wrong answers and item difficulty cannot be determined, we will retain the term "item difficulty" because in the Rasch model if a person has less of a particular characteristic it will be more difficult to endorse a particular item constructed to assess high levels of that characteristic. Person ability or characteristic scores will be indicated by β .

Method

Participants and Setting

A total of 474 undergraduate psychology students were assessed during 2006. The following table provides a cross tabulation of gender and race (Table 1).

Instruments

The instruments that were applied were the LOT-R, Snyder's adult trait and state scales (which we shall call HOPE scales) and the constructed Hope Orientation Measure (HOME).

LOT-R (Life Orientation Test-Revised; Carver & Scheier, 2002).

The Life Orientation Test Revised (LOT-R; Carver & Scheier, 2002) was used to assess generalised optimism and pessimism. Their revised test (LOT-R) consists of six items with good internal consistency (ranging from high 0.70 to low 0.80) (Carver & Scheier, 2002, p. 232). The test was employed in this study to evaluate the construct validity of the HOME instrument. An example of an item is "In uncertain times, I usually expect the best" (Carver & Scheier, 2002). Carver and Scheier's (2002) 5-point scale ranging from strongly agree to strongly disagree was replaced with our 4-point scale in order to include the items within our test (see below). Three items for the optimism orientation and three from the pessimism orientation were used. Three fillers were also included.

Trait and State Hope Scales (HOPE)

Snyder's Adult Trait Hope Scale (ATHS) and the Adult State Hope Scale (ASHS) were utilised in the study for construct validity (Snyder et al., 2002). An example of a pathway thought expressed as a trait item is "I can think of many ways to get out of a jam" while the following is an example for the state test: "If I should find myself in a jam, I could think of many ways to get out of it". Agency thoughts are represented by the following two items, first trait then state: "I energetically pursue my goals" and "At the present time, I am energetically pursuing my goals." Although Snyder et al. (2002) use an 8 point scale, (definitely

false, mostly false, somewhat false, slightly false, slightly true, somewhat true, mostly true and definitely true) we have reduced it to a four point scale (see below) in order to include the items (3 items for the state pathway and agency scales each and 4 items for the trait pathway and agency scales each) at various points in our test. The Snyder Hope scales were extensively researched and good construct and reliability information were obtained (Snyder et al., 1991; Snyder et al., 1996).

Maree Hope Orientation Measure (HOME)

To iterate what was said above: our instrument was developed by means of the themes and principles identified by Maree and Maree (2005). The themes such as situational hope, trait-state, the grounding of hope, goals, agency-pathway, concrete hopes, and contrast with the current situation were taken as starting point and items were generated. Items were revised a number of times and the themes refined. Item responses were graded as definitely false, mostly false, mostly true and definitely true. The respondent had to apply the responses to a set of 80 items which included the 14 items from the Snyder HOPE scales and 6 from the LOT-R. The three fillers from the LOT-R were also included (which were discarded in the calibration and scoring phase). A total of 57 self-constructed items were used for the Hope Orientation Measure (HOME). Items were answered on a multiple choice optical mark reader sheet for ease of scoring. Respondents had to return both the answer sheet and test.

Procedure

Assessment sessions were arranged with students in first, second and third year classes. The participants were informed that research was conducted and aimed at investigating the relationship between goal orientation and achievement, amongst others, academic achievement. They were also informed that their participation was voluntary and they need not participate. The concept of hope was deliberately not discussed or mentioned although the research team explained future orientation and goals with the respondents. The samples were also informed that their goal orientation scores would be made available which was done so by means of student number lists with the scores of the five hope factors and six LOT-R and HOPE scales. An explanation of the procedure, explication of constructs and the scoring format were also provided. The same information was available on the web for the students' perusal. The data was collected at the beginning of classes with the permission of lecturers and took approximately 20 minutes to complete. The various classes were assessed over a period of three to four months in 2006.

Data Analysis and Instrument Development

All 80 items were calibrated using the Rasch model. The LOT-R and two Hope scales with their sub-dimensions were

Table 1. Breakdown of Sample According to Gender and Race

		Race				Total
		WHITE	COLOURED	INDIAN	BLACK	
Gender	MALE	82	3	1	22	108
	FEMALE	259	5	7	95	366
Total		341	8	8	117	474

each calibrated separately. Thus, the original scoring method for the LOT-R and HOPE scales (adding particular item raw scores together) were not used. In order to compare groups we avoided using raw scores due to the assumption that they are not linear and not parameter invariant.

Before the HOME was calibrated, five factors were identified using Varimax rotation with Principle Component Analysis (PCA) (see also Smith et al., 2002) for an example of a similar process using first factor analysis followed by Rasch analysis). The results are provided below. A PCA was deemed necessary because one of the important requirements for constructing a measure is that the items form a unidimensional construct (Wright & Masters, 1982). Unidimensionality means that items contribute from less of a characteristic to more of the characteristic along one dimension. The dimensionality of each factor was evaluated with item fit (cf. Smith, 2004a). Item fit into the Rasch model is indicated by a mean-square (MS) index which is a Chi-square divided by its degrees of freedom and range from 0 to infinity (Linacre, 2002). A mean-square of 1 indicates a good fit, lower than one over-fitting and larger than 1 poorer fit. Infit indicates fit closer to an item or person's score whilst outfit indicates noise. Items with infit (or outfit, although we emphasise infit) mean-square values between 0.70 and 1.2 were accepted as fitting the Rasch model for a particular dimension (Wright, Linacre, Gustafson, & Martin-Löf, 1994). Smith et al. (2002) provide guidelines for the evaluation of the functioning of the rating scale categories.

Item stability or item parameter invariance was evaluated by centering the items of each factor or dimension on 0 then plotting the item difficulties (δ) of two groups against each other. Because each item has an associated measurement error estimate in the Rasch model (as do the person estimates) it is possible to construct 95 % confidence limits (see Bond & Fox, 2001). If item parameters are invariant across groups then the plot of δ_x and δ_y ought to form a straight line. In practice though, items lying within the 95 % control lines can be assumed to stable across groups whilst those lying outside the control lines need to be examined.

Construct validity were assessed by means of correlating the HOME factors with the various HOPE scales and the LOT-R. The partial correlations between each HOME factor and the different scales were determined. In each instance the effect of the other HOME factors were controlled for. The assumption is that, given the similarity between the different scales and items, the overlapping variance between the different variables ought to be substantial. Partial correlation provides the opportunity to eliminate overlapping variance and determine unique variance of one variable explained by the other variables.

Results

In the following section the results are provided of the item groupings into factors, the psychometric characteristics of the various tests, the construct validity of the HOME test, the differences between groups and the relationship between test scores and academic achievement.

The Sample

The sample consisted of students in Human Sciences spread almost equally between first to third year. All took at least Psychology as a first second or third year subject. The distribution of students with respect to gender and ethnicity can be seen in Table 2.

Hope Orientation Measure (HOME) Factors

The first step was to identify items that could be grouped into sensible factors or dimensions. Although the assumption of the Rasch model is that items fall along a unidimensional construct (Stone, 2004), our assumption from the start was to construct more than one dimension related to hope given the themes that were identified in the previous Maree and Maree (2005) study. The principle component analysis indicated five interpretable factors, although a scree-plot showed a large first component. From Table 3 it can be seen that the first component before rotation explained almost 23 % of the variance in the data. Upon rotation a large percentage variance (15 %) still remained although the rest of the extracted variance was spread relatively equally between the last 4 components.

The dimensionality of each component was evaluated by means of item fit. Three items had an infit MS of 1.5 to 1.6 and if these are removed the percentage of variance explained by the dimension increased to 53 %. It was decided that the MS values were not too extreme and the increase in explained variance was small for the items to be removed for the pilot phase. Additional support for retaining the items was found in the high item-total correlation of these items. Factors two and three each had one item with an outfit of 1.6, factor 4 none, and factor five one of 1.3.

The interpretation of the factors was based on (a) the items having the highest loadings on the initial PCA, and (b) the arrangement of Rasch item difficulty (δ). The items most difficult or hardest to endorse and those easiest to endorse gave clues as to the theme of a dimension. Our interpretation is provided in Table 4. The interpretation of what a high score and low score means is based on the arrangement of items along the continuum of the measure based on their difficulty values (δ) (Stone, 2004). The usefulness of the Rasch model to construct mean-

Table 2. Distribution by Gender and Ethnicity

		Gender		Female	Total	
		Male	Female			
		Count	Table N %	Count	Count	Table N %
Ethnic group	White	82	17.3%	258	340	71.9%
	Coloured	3	.6%	5	8	1.7%
	Indian	1	.2%	7	8	1.7%
	Black	22	4.7%	95	117	24.7%
	Total	108	22.8%	365	473	100.0%

Table 3. Explained Variance for the Principle Component Analysis of the HOME instrument

Component	Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	12.969	22.752	22.752	8.258	14.488	14.488
2	2.566	4.502	27.254	3.645	6.395	20.883
3	2.325	4.079	31.333	3.614	6.341	27.223
4	2.000	3.508	34.842	3.124	5.481	32.705
5	1.845	3.237	38.079	3.063	5.374	38.079

Table 4. Description of HOME Factors

Factor	Label	Description	Score	Score description
Factor 1	Goal achievement resources	Indicates a belief in one's ability to find ways to solve problems and achieve goals, positive outlook, and inner resources.	High score	High level of inner resources i.e., high levels of optimism, positive outlook and a strong belief in one's own ability to find specific ways to achieve goals
			Low score	Low level of inner resources to find ways to achieve goals, tend to be influenced by external events, cannot cope.
Factor 2	Ineffectuality	Tendency to avoid responsibility, not taking action, easily influenced to change goals, easily negatively influenced by events, doubts own ability to be effective This construct seems dispositional.	High score	Lack of ineffectuality. A high score does imply self-efficacy or high self-motivation
			Low score	Not taking responsibility to act, easily influenced by outside forces, low belief in own ability
Factor 3	Future vision	Optimistic outlook based on the belief that the future holds promise and the goals will be reached. This construct seems dispositional.	High score	Strong belief in positive future, clear goals and ability to envisage positive future
			Low score	Low optimism, not able to envisage positive future and have clear goals
Factor 4	Despondency	Tendency to be despondent: reflects current state of mind, thus state dimension	High score	Absence of despondency, feelings of hopelessness and feelings of being at the mercy of outside forces
			Low score	Feelings of despondency, depression, pessimistic outlook
Factor 5	Agency	Ability to focus and act. Reflects current situation, thus state dimension	High score	Currently able to formulate goals and work towards them
			Low score	Unable to focus and work towards goals currently

Table 5. Instrument Characteristics

Test	Item separation	Person separation	Cronbach Alpha	Number of items
Hope Trait Agency Scale	2.36	0.99	0.65	4
Hope Trait Pathway Scale	5.72	0.90	0.73	4
Hope State Agency Scale	3.50	1.13	0.70	3
Hope State Pathway Scale	1.01	0.68	0.60	3
LOT-R Optimism	11.97	0.91	0.64	3
LOT-R Pessimism	0.00	0.97	0.68	3
Factor 1 Goal achievement resources	7.12	2.63	0.91	23
Factor 2 Ineffectuality	3.96	1.56	0.80	11
Factor 3 Future vision	6.52	0.60	0.74	10
Factor 4 Despondency	13.98	1.37	0.74	6
Factor 5 Agency	17.05	1.15	0.65	7

ingful measures is illustrated quite well with this approach (Wright & Stone, 1979).

Instrument Characteristics

The psychometric properties of the instruments are reported in Table 5. The LOT-R and Hope trait and state instruments had internal consistency estimates ranging from 0.60 to 0.73. Given the small number of items in each the low reliability estimates are not surprising, although it is better than expected for the few items. For comparison purposes the estimated Cronbach Alpha's of the five HOME factors are also reported. These range from 0.65 for the last factor to 0.91 for the first factor. The item and person separation indices are also reported for each test. The separation indices indicate how well the items and persons are spread out across the continuum of a dimension. The separation index ranges from 0 to infinity and indicates the number of levels the instrument can identify from the sample (Wright, 1996). A low item separation index indicates that items have similar difficulty values and thus cluster together. The aim of a proper dimension is to have ability (β) and difficulty (δ) estimates across the continuum of a variable. One would thus like to be able to measure persons with high and low ability equally accurately – of course the measurement precision depends on the purpose of the test. The LOT-R Optimism test has an item separation of approximately 12 which means that the items are spread widely apart. This means that it covers a wide range of abilities but lacks precision for the large gaps between item difficulties. In contrast an estimate of LOT-R Pessimism was not possible due to the close proximity of item difficulties (0.09, -0.02, -0.07) which was almost a logit of 0 in each case.

The five HOME-factors have an item separation index from 4 to 17. In sum, the internal consistency estimates are adequate and item separation indices are adequate although the Hope State Pathway Scale and LOT-R Pessimism have small item separation values.

Item Stability

To demonstrate the transportability of the test and thus its ability to compare groups the items must be stable with regard to the parameter δ , i.e., be able to maintain their relative ordering irrespective of which group they are calibrated on.

Figure 1 and Figure 2 provides a graphic illustration of item parameter stability across ethnic group (we have chosen the

two largest groups, namely, Black and White) and gender. The number of items lying outside the confidence limits for ethnic group is: for factor 1 = 7, factor 2 = 4, factor 3 = 4, factor 4 = 0 and factor 5 = 1. For gender the number of items is: factor 1 = 4, factor 2 = 4, factor 3 = 2, factor 4 = 2 and factor 5 = 1.

Construct Validity

Construct validity were assessed by means of correlating the HOME factors with the various HOPE scales and the LOT-R. Table 6 shows the partial correlations between each HOME factor and the different scales.

Factor 1 which was labelled "Goal achievement resources" did not correlate highly with LOT-R pessimism but did with the state scales and highest (< 0.6) with the trait scales. The generic nature of factor 1 is thus apparent from its overlap with pathway and agency in both the state and trait scales and with LOT-R optimism ($p \leq 0.001$ in each case) (Table 6). Factor 2 (Ineffectuality) correlates with pessimism (because the items were scored in one direction, a high score on pessimism indicates absence of pessimism), and with Hope State Pathway.

Factor 3 or Future vision correlates slightly with pessimism (or absence of pessimism in this instance). Interestingly it does not correlate with LOT-R optimism. Factor 4 or despondency correlates highly with pessimism (thus lack of despondency means lack of pessimism), optimism (lack of despondency means high optimism), and with State Agency (thus both are dependent on the situation).

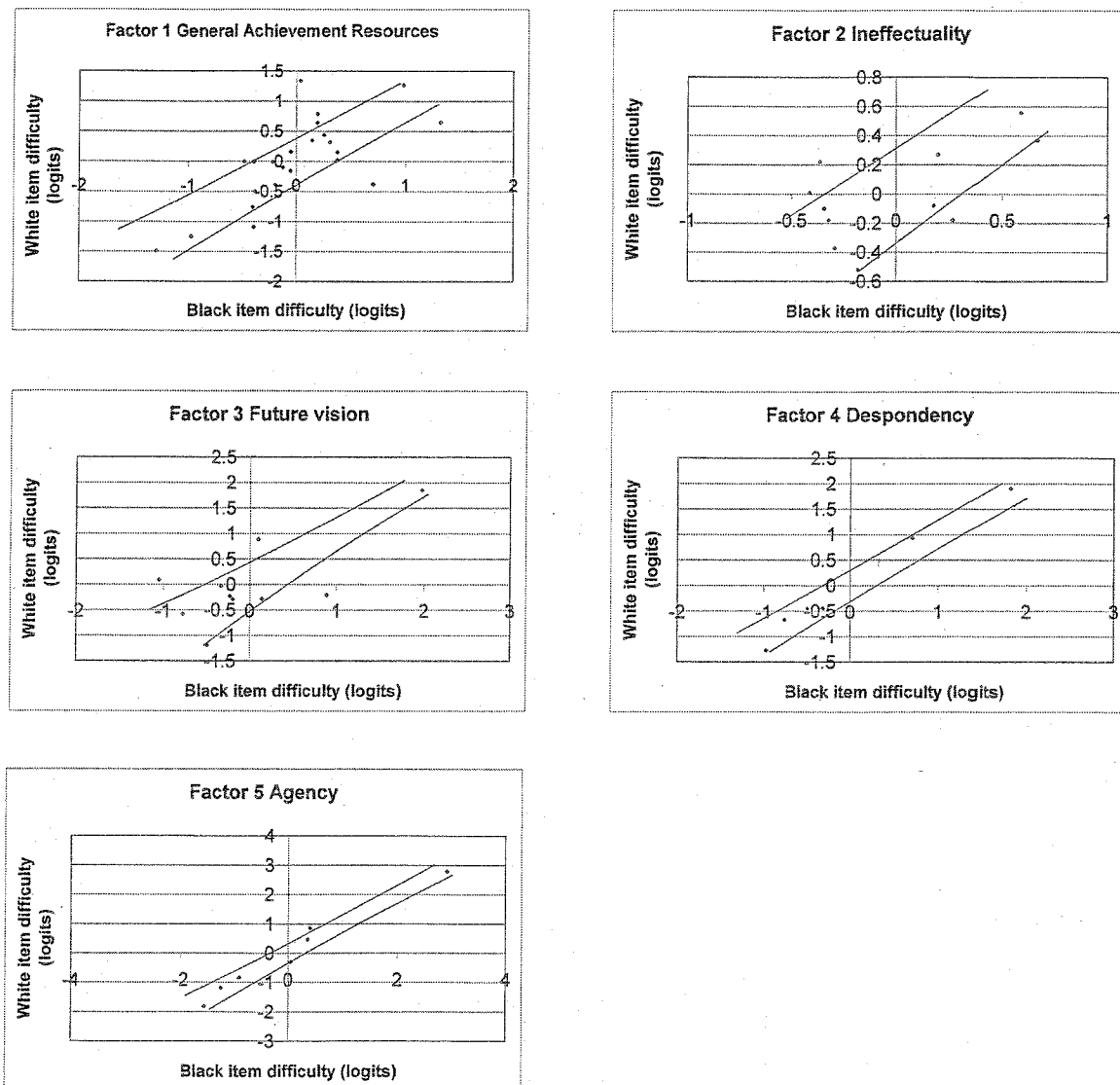
Finally, factor 5 or agency correlates highly with Hope State agency and not with the other scales.

Discussion

The aim of constructing a measure with which one can assess hope and examine some contributing dimensions of hope was to some extent achieved in the study. The instrument development process took its cue from cognitive models such as that of Snyder and an empirical study involving protocols on hope was understood by a sample of post graduate students (Maree & Maree, 2005). The themes guided us in writing items for an instrument assessing hope and dimensions of hope such as agency, pathway and optimism.

A factor analysis yielded five factors, the first of which was a general factor incorporating pathway, agency, optimism and

Figure 1. Item Stability: Ethnic Group Comparison

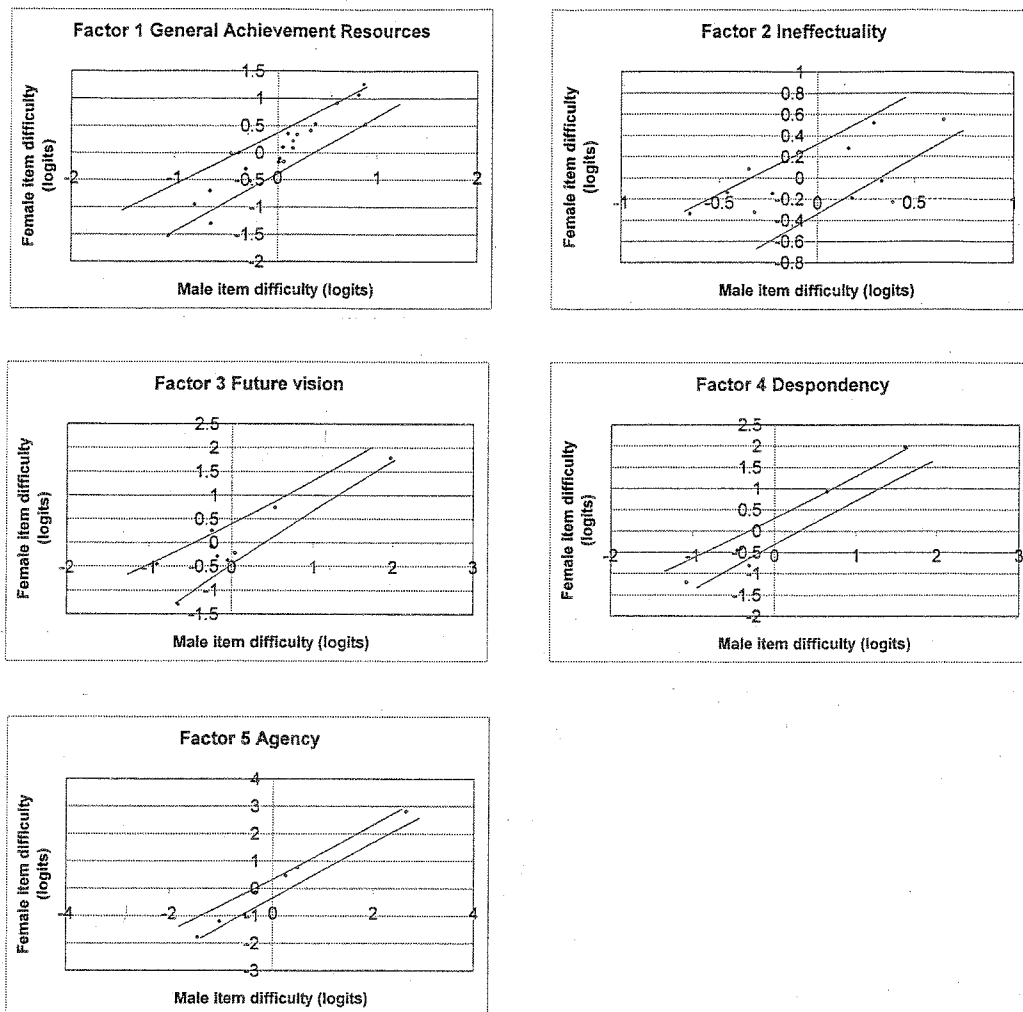


general resilience items. This general factor reflects a mix of themes usually addressed as sub-dimensions with other instruments. Factor 2 or Ineffectuality seems to be a dispositional dimension which reflects a person's belief about his/her inability act, take responsibility and generally have feelings of self-doubt. Factor 3 shows an optimistic view of the future. Factor 4 is Despondency which reflects a person's current state of mind with respect to despondent feelings or lack thereof. Factor 4 indicates agency or the belief that goals can be achieved by doing something. We fully realize that the labelling of factors depend on the way that the items were grouped by the PCA and subsequent Rasch item calibration. We are also aware that labelling is a matter of interpretation that depends on our current understanding of the various constructs but even though the in-

terpretation might change in future we, for the moment, take our current understanding as starting point for subsequent refining of the instrument. The predictive validity analysis provided further clues for the understanding of the current factors.

A partial correlation analysis was done on the factors and the Hope and LOT-R instruments (Table 6). In each case a factor was correlated with each HOPE and LOT-R scores with the effect of the remaining factors partialled out (cf. Howell, 2002). The Pearson correlation between the HOME factors and HOPE/LOT-R scores was inflated due to overlapping variance. The partial correlation yielded that variance between a HOME factor and a HOPE/LOT-R score with the effect of the other HOME factors remaining constant. This exercise provided additional possibilities for the interpretation of the HOME factors.

Figure 2. Item Stability: Gender Comparisons



Factor 1 (Goal achievement resources) is explained by overlapping variance in all the HOPE/LOT-R variables except LOT-R pessimism. The most variance (38 %) was explained by Hope Trait Path and Agency respectively. This is probably an indication that the factor taps dispositional attributes more than state attributes. However, it seems to be a factor measuring a general hope or goal orientation with both elements of agency and pathway thoughts.

Factor 2 (Ineffectuality) correlated with none of the HOPE/LOT-R scores (except slightly with LOT Pessimism) which probably shows that we had identified a unique construct that relates to a negative outlook. It seems as if this factor expresses the opposite of self-efficacy. A low score indicates self-doubt, inability to achieve, thinking negatively about oneself and one's surroundings. It does not express pessimism i.e., the belief that bad things will happen but rather the belief that one cannot deal with problems. A high score, as is the case with

LOT-R Pessimism expresses lack of self-doubt. It is thus not a bipolar construct.

Factor 3 (Future vision) which we interpreted as a trait or dispositional characteristic relates to no other score except with LOT-R Pessimism – however only 3 % of variance in LOT-R Pessimism is explained by factor 3. Absence of pessimism relates slightly to this relatively unique Future vision factor.

Factor 4 or Despondency had a significant overlap with LOT-R Pessimism and to a lesser degree LOT-R Optimism which confirms the nature of this construct. A high score or lack of despondency correlates with a lack of pessimism (LOT-R Pessimism), and with a slight optimistic inclination in LOT-R Optimism. Despondency is not the expectation that bad things will happen as with pessimism but a situational feeling of hopelessness. The correlation between LOT-R Pessimism and HOME Despondency shows that the despondent person tends to feel pessimistic or that the pessimist harbours despondent feelings.

Table 6. Partial Correlations Between Factors and Variables

Control Variables	Variables		LOT-R Pessimism	LOT-R Optimism	State Path	State Agency	Trait Path	Trait Agency
Factor 2, Factor 3, Factor 4, Factor 5	Factor 1 Goal achievement resources	Correlation*	0.034	0.423	0.487	0.338	0.619	0.619
		% Variance**	0.00	0.18	0.24	0.11	0.38	0.38
		P***	0.459	0.001	0.001	0.001	0.001	0.001
Factor 1, Factor 3, Factor 4, Factor 5	Factor 2 Ineffectuality	Correlation	0.151	0.011	0.11	0.008	0.085	0.085
		% Variance	0.02	0.00	0.01	0.00	0.01	0.01
		P	0.001	0.807	0.017	0.869	0.066	0.066
Factor 1, Factor 2, Factor 4, Factor 5	Factor 3 Future vision	Correlation	0.161	0.077	0.048	0.087	0.038	0.038
		% Variance	0.03	0.01	0.00	0.01	0.00	0.00
		P	0.001	0.095	0.297	0.059	0.405	0.405
Factor 1, Factor 2, Factor 3, Factor 5	Factor 4 Despondency	Correlation	0.373	0.242	0.064	0.121	0.059	0.059
		% Variance	0.14	0.06	0.00	0.01	0.00	0.00
		P	0.001	0.001	0.163	0.008	0.199	0.199
Factor 1, Factor 2, Factor 3, Factor 4	Factor 5 Agency	Correlation	-0.036	-0.056	-0.006	0.445	-0.031	-0.031
		% Variance	0.00	0.00	0.00	0.20	0.00	0.00
		P	0.435	0.227	0.904	0.001	0.507	0.507

* Partial correlation

** Percentage variance explained with variables in column 1 partialled out, thus r^2

*** Significance, two-tailed for 471 df.

Factor 5 or Agency explained 20 % of the variance in HOPE State Agency and agrees with our interpretation of the factor as tapping a state rather than trait. Thus, the situational ability to energize oneself is important in this factor especially if the current circumstances are experienced as difficult.

Conclusion

A hope orientated instrument was successfully constructed given its psychometric properties within the Rasch model. The relationship between the five factors or dimensions and between the factors and other related constructs need to be investigated in order to determine how hope is constructed. It is clear that hope is not a unidimensional construct but that sub-dimensions contribute to constituting hope.

References

- Andrich, D. (2004). Controversy and the Rasch model: a characteristic of incompatible paradigms? In E. V. Smith & R. M. Smith (Eds.), *Introduction to Rasch measurement: theory, models and applications* (pp. 143-166). Maple Grove, Minnesota: JAM Press.
- Babyak, M. A., Snyder, C. R., & Yoshinobu, L. (1993). Psychometric properties of the hope scale: a confirmatory factor analysis. *Journal of Research in Personality*, 27, 154-169.
- Bandura, A. (2006). Towards a psychology of human agency. *Perspectives on Psychological Science*, 1(2), 164-180.
- Benzein, E., & Saveman, B. I. (1998). One step towards the understanding of hope: a concept analysis. *International Journal of Nursing Studies*, 35, 332-329.
- Bond, T. G., & Fox, C. M. (2001). *Applying the Rasch model: fundamental measurement in the human sciences*. Mahwah N.J.: Lawrence Erlbaum.
- Bryant, F. D., & Cvengros, J. A. (2004). Distinguishing hope and optimism: Two sides of a coin, or two separate coins? *Journal of Social and Clinical Psychology*, 23, 273-302.
- Carver, C. S., & Scheier, M. F. (2002). Optimism. In C. R. Snyder & S. J. Lopez (Eds.), *Handbook of positive psychology* (pp. 231-243). Oxford: Oxford University Press.
- Howell, D. C. (2002). *Statistical methods for psychology* (5 ed.). Pacific Grove, CA: Duxbury.
- Linacre, J. M. (1991). *A user's guide to Winsteps Ministep: Rasch-model computer programs*. Chicago IL: Winsteps.
- Linacre, J. M. (2002). What do infit and outfit mean-square and standardized mean? *Rasch Measurement Transactions*, 16(2), 878.
- Maddux, J. E. (2002). Self-efficacy: the power of believing you can. In C. R. Snyder & S. J. Lopez (Eds.), *Handbook of positive psychology* (pp. 277-287). Oxford: Oxford University Press.
- Maree, D. J. F., & Maree, M. (2005). *Assessment of hope-the process of constructing a gender-sensitive scale for hope within a South African context*. Paper presented at the Hope: Probing the boundaries conference, Prague, Czech Republic, 8-10 August, 2005.
- Matthews, G., Deary, I. J., & Whiteman, M. C. (2003). *Personality traits* (2nd ed.). Cambridge, U.K.; New York: Cambridge University Press.
- Nunn, K. P., Lewin, T. J., Walton, J. M., & Carr, V. J. (1996). The construction and characteristics of an instrument to mea-

- sure personal hopefulness. *Psychological Medicine*, 26, 531-546.
- Schumacker, R. E. (2004). Rasch measurement: the dichotomous model. In E. V. Smith & R. M. Smith (Eds.), *Introduction to Rasch measurement: theory, models and applications* (pp. 226-257). Maple Grove, Minnesota: JAM Press.
- Seligman, M. E. P., Steen, T. A., Park, N., & Peterson, C. (2005). Positive psychology progress: empirical validation of interventions. *American Psychologist*, 60(5), 410-421.
- Smith, E. V. (2004a). Detecting and evaluating the impact of multidimensionality using item fit statistics and principal component analysis of residuals. In E. V. Smith & R. M. Smith (Eds.), *Introduction to Rasch measurement: theory, models and applications* (pp. 575-600). Maple Grove, Minnesota: JAM Press.
- Smith, E. V. (2004b). Evidence for the reliability of measures and validity of measure interpretation: a Rasch measurement perspective. In E. V. Smith & R. M. Smith (Eds.), *Introduction to Rasch measurement: theory, models and applications* (pp. 93-122). Maple Grove, Minnesota: JAM Press.
- Smith, E. V., Conrad, K. M., Chang, K., & Piazza, J. (2002). An introduction to Rasch measurement for scale development and person assessment. *Journal of Nursing Measurement*, 10(3), 189-206.
- Smith, E. V., Wakely, M. B., De Kruif, R. E. L., & Swartz, C. W. (2003). Optimizing rating scales for self-efficacy (and other) research. *Educational and Psychological Measurement*, 63(3), 369-391.
- Snyder, C. R., Feldman, D. B., Taylor, J. D., Schroeder, L. L., & Adams, V. H. (2000). The roles of hopeful thinking in preventing problems and enhancing strengths. *Applied and Preventive Psychology*, 9, 249-270.
- Snyder, C. R., Harris, C., Anderson, J. R., Holleran, S. A., Irving, L. M., Sigmon, S. T., et al. (1991). The will and the ways: development and validation of an individual-differences measure of hope. *Journal of Personality and Social Psychology*, 60, 570-585.
- Snyder, C. R., Rand, K. L., & Sigmon, D. R. (2002). Hope theory: a member of the positive psychology family. In *Handbook of positive psychology* (pp. 257-276). Oxford: Oxford University Press.
- Snyder, C. R., Sympson, S. C., Ybasco, F. C., Borders, T. F., Babyak, M. A., & Higgins, R. L. (1996). Development and validation of the State Hope Scale. *Journal of Personality and Social Psychology*, 70, 321-335.
- Stone, M. H. (2004). Substantive scale construction. In E. V. Smith & R. M. Smith (Eds.), *Introduction to Rasch measurement: theory, models and applications* (pp. 201-225). Maple Grove, Minnesota: JAM Press.
- Wright, B. D. (1996). Reliability and separation. *Rasch Measurement Transactions*, 9(4), 472.
- Wright, B. D., Linacre, M., Gustafson, J., & Martin-Löf, P. (1994). Reasonable mean-square fit values. *Rasch Measurement Transactions*, 8(3), 370.
- Wright, B. D., & Masters, G. N. (1982). *Rating scale analysis*. Chicago: Mesa.
- Wright, B. D., & Mok, M. M. C. (2004). An overview of the family of Rasch measurement models. In E. V. Smith & R. M. Smith (Eds.), *Introduction to Rasch measurement: theory, models and applications* (pp. 1-24). Maple Grove, Minnesota: JAM Press.
- Wright, B. D., & Stone, M. H. (1979). *Best Test Design*. Chicago: Mesa Press.