

Chapter Six

Interpreting the results

6.1 INTRODUCTION

This chapter interprets the empirical results reported in Chapter 5 in the light of the preceding literature review (Chapters 2 and 3, and section 4.4.3 of Chapter 4). The theory under consideration is Antonovsky's work on the sense of coherence (SOC). Additional theories which help to inform the discussion include those dealing with personality, stress and coping, cross-cultural issues, and disability.

6.2 SOME CONCLUSIONS FROM THE LITERATURE REVIEW

6.2.1 A multi-faceted construct with a single measurement index

Section 4.4.3 addressed the question of why Antonovsky developed a theory which posits that SOC is a multi-faceted construct, yet he simultaneously developed a measuring scale that yields a single score. In addition, he developed three subscales for the SOC Scale, but stipulated that the subscale scores should not be considered as valid or reliable indices of the components which they purport to measure (Antonovsky, 1987, 1993). This somewhat contradictory approach appears to lead to some confusion in terms of interpreting SOC scores.

For example, it can be seen from Table 5.6 that in the current research the manageability subscale had questionable reliability, while the meaningfulness and comprehensibility subscales had stronger psychometric qualities (i.e. the latter two subscales accounted for most of the variance in SOC scores). Should other researchers also find problems with the manageability subscale, it may be necessary to review the SOC construct, and either to devise a more reliable

manageability subscale, or to do away with this component and subscale altogether. In the latter case it may prove simplest to refer to “sense of meaningfulness” and “sense of comprehensibility” (cf. Carver, 1989). Alternatively, a new term would be needed to account for the combined effect of meaningfulness and comprehensibility, and this term would be required to differentiate the construct from the original definition of SOC (which includes manageability).

However, it does appear from the current research that manageability may still be a useful and valid enough component of SOC. With further development, the manageability subscale could probably be rendered suitable for populations in contexts such as South Africa. Section 7.4.5 describes the specific problems which the current researcher encountered with the manageability subscale, and offers some recommendations for this subscale’s refinement.

The current research investigated both the subscale (component) scores as well as the composite index of SOC. It was possible, therefore, to consider the issues which Carver (1989) highlights with regard to multi-faceted constructs that are measured by a single index (see 4.4.3). Sections 6.3.3 and 6.3.4 in this chapter report on these empirical investigations into the SOC Scale’s construction.

6.2.2 Cross-cultural issues in empirical measurement

According to Fisher (2004), statistical standardisation can be used to highlight either group or individual differences, depending on the technique used. Fisher warns against the indiscriminate use of standardisation with cross-cultural studies, and suggests that researchers who do standardise should explain their reasons for doing so. In the present research, no standardisation was carried out for cultural factors.

Response bias is also likely to pose problems in cross-cultural research; this topic is discussed in 6.3.6 below.

The results of the current study may be compared with the results obtained in SOC research that has been conducted with other cultural groups worldwide (see Table 6.1). Comparisons between the scores of the subgroups used in the current research are also informative (see 5.3.1). However, there was no matching between these groups, and random selection was not used. For these reasons, only theoretical speculations may be made, and the conclusions which are based on the empirical results should be regarded as being relevant specifically to the current samples.

6.3 CONCLUSIONS BASED ON THE EMPIRICAL RESULTS

Chapter 1 indicated that the current research is broadly concerned with how reliable and valid the SOC Scale is when used in a South African context. The specific research questions were:

1. What is the internal consistency (reliability) of the SOC Scale-29 for the current samples?
2. What means, standard deviations, and score ranges are obtained?
3. What is the best factor solution for the data? (This is an aspect of validity).
4. What are the psychometric properties of the subscale and item scores?
5. Does any relationship emerge between SOC and PSS scores? (A negative correlation would indicate convergent validity for the SOC Scale).

6.3.1 Summary statistics and t-tests for the SOC Scale

Table 6.1 below presents the results of various SOC studies that have been reported in South Africa and worldwide. The results of the current study are given in bold print. It may be noted from the table that African and Asian populations are somewhat under-represented, and that most SOC testing appears to have taken place with westernised (including Israeli) samples.

Table 6.1: SOC Scale-29 scores from various sources, with the results of the current study in bold

SAMPLE	N	MEAN	SD	Source
Israeli army officer trainees—II	338	160.4	16.7	Antonovsky, 1987
Israeli army officer trainees—III	228	159.0	17.2	Antonovsky, 1987
Israeli army officer trainees—I	117	158.7	17.0	Antonovsky, 1987
SA semi-governmental middle managers, 97% men	200	156.7	16.0	Cilliers & Coetzee, 2003
Severely injured accident victims	112	155.3	20.7	Schnyder, Büchi, Morgeli et al., 1999
Swedish hi-risk childhood, 41-56	148	152.6	22.0	Antonovsky, 1993
Kibbutz fathers (controls)	67	152.5	14.5	Antonovsky, 1993
Israeli retirees, men, age 65	428	152.2	22.8	Antonovsky, 1993
Kibbutz men, age 65	130	152.2	22.8	Antonovsky, 1993
SA non-professional trauma counsellors	130	151.5	19.8	Ortlepp & Friedman, 2001
Israeli health workers	33	151.4	17.5	Antonovsky, 1987
Kibbutz mothers (controls)	67	151.0	15.3	Antonovsky, 1993
Swedish population	145	151.0		Languis u. Björvell, 1993 (in Sack et al. 1997)
Israeli medical students at entry	93	150.2	16.5	Antonovsky, 1993
Finnish grped (sic), adult men	340	150.2	21.9	Antonovsky, 1993
Edmonton health workers	108	148.6	17.2	Antonovsky, 1987
Kibbutz fathers, disabled children	67	146.3	19.4	Antonovsky, 1993
Finnish grped (sic), adult women	329	146.1	22.7	Antonovsky, 1993
Nordic occupational health workers	30	146.1	19.9	Antonovsky, 1987
Kibbutz women, age 60	130	145.7	20.2	Antonovsky, 1993
Israeli retirees, women, age 60	368	145.0	23.4	Antonovsky, 1993
Czech controls in cancer study	153	145.0	-	Antonovsky, 1993
Rheumatoid arthritis patients	89	144.1	27.9	Schnyder, Büchi, Morgeli et al., 1999
US non-patients (students & social service employees); 57% women	276	142.4	21.9	Frenz, Carey, & Jorgenssen, 1993
SA disabled self-help-centre residents; 71% men (94% white)	17	142.3	28.32	current study
SA undergraduate students	-	140.21	20.36	Wissing, de Waal & de Beer, 1992; in Mlonzi & Strümpfer, 1998.
Kibbutz mothers, disabled children	67	140.1	22.6	Antonovsky, 1993
US psychology undergraduates	59	139.7	20.9	Antonovsky, 1987
US male patients, Vets, 55+	240	139.6	36.4	Antonovsky, 1993
Finnish univ. students, 52% women	117	138.6	23.1	Antonovsky, 1993
New Zealand chronic pain, 78% women	107	138.6	14.9	Antonovsky, 1993
27 South African studies (mostly white & urban samples)	3979	137		Strümpfer & Wissing, 1998 (in Thekiso, 1999)
Israeli Jewish national sample	297	136.5	19.8	Antonovsky, 1993

Table 6.1: SOC Scale-29 scores from various sources (continued)

Government employees	270	135.9	21.4	Rothmann, Jackson, & Kruger, 2003
SA disabled people, traditional home; 63% women (95% white)	19	134.5	31.9	current study
Anglo-American psychology undergraduates (mean age 20)	102	134.5	21.6	Bowman, 1996
Native American psychology undergraduates (mean age 31)	81	134.4	24.6	Bowman, 1996
SA uniformed police personnel, NW Province	287	133.6	24.5	Rothmann & van Rensburg, 2002
US undergraduates—I	336	133.1	20.1	Antonovsky, 1987
US production workers, 76% women	111	133.0	26.5	Antonovsky, 1993
Married polyclinic patients (Germany)	186	132.7	29.5	Sack, Künsebeck, & Lamprecht, 1997
US undergraduates—II	308	132.4	22	Antonovsky, 1987
COMPOSITE SAMPLE (undergraduates and people with physical disabilities), SA	169	132.2	21.03	current study
SA disabled college students, 60% men (96% black)	67	132.2	17.6	current study
SA undergraduates, Univ. of Western Cape (64% female, mostly black)	126	131.9	15.4	Mlonzi & Strümpfer, 1998
Israeli cerebral palsy, 18-33	34	131.1	0.8	Antonovsky, 1993
SA undergraduate students, 72% women (multi-racial group)	66	130.2	17.9	current study
US undergraduates, 68% women	307	129.5	24.5	Antonovsky, 1993
Divorced / widowed polyclinic patients (Germany)	61	122.1	25.01	Sack, Künsebeck, & Lamprecht, 1997
SA rural Tswana group	738	121.9	20.2	Thekiso, 1999
Czech cancer patients	17	117.0		Antonovsky, 1993
US psychotherapy & psychiatric patients, 58% women	98	115.9	25.0	Frenz, Carey, & Jorgensen, 1993
Unmarried polyclinic patients (Germany)	211	114.3	28.07	Sack, Künsebeck, & Lamprecht, 1997

Mean scores

In the current research, both the mean SOC scores and the SDs for the disabled sample, the undergraduate sample, and the composite sample were consistent with those reported elsewhere. Antonovsky (1993) reported average mean SOC scores ranging from 117 to 152.6 (across 26 studies worldwide). The average of all the SOC means shown in Table 6.1, excluding those from the current study, is 141.2.

As noted in Table 5.1. and section 5.3.1 in Chapter 5, the mean SOC score for the composite sample in the current study was 132. For the disabled participants, the college group obtained the lowest mean SOC score, while self-help centre residents achieved the highest mean score. The undergraduates achieved a typical mean for this kind of population, which was somewhat on the low side (Antonovsky, 1993).

In South Africa, Strümpfer and Wissing found a mean SOC score of 137 for 27 studies conducted with mostly “white, multicultural and urban samples” (Thekiso, 1999, p. 70), and Thekiso reported a mean of 121.9 for rural Tswana people, using a translated version of the SOC Scale. Mlonzi and Strümpfer (1998) reported a mean of 131.9 ($SD = 15.4$, $\alpha = 0.74$) for black South African undergraduates.

No statistical difference emerged between the mean SOC scores of the various subgroups. The t-test also did not find any statistically significant difference between mean SOC scores for undergraduates, on the one hand, and the entire disabled sample on the other (see 5.3.1). In terms of the impact of demographic variables, the effects of age, gender, language and type of disability on SOC were examined (see 5.5). These variables are discussed in the following paragraphs.

In section 4.3.4 it was mentioned that both undergraduates and chronically ill or disabled people tend to achieve relatively low SOC scores, albeit possibly for different reasons. The results obtained in the current research confirmed this tendency for the undergraduates and for the college students with disabilities. For the remainder of the disabled sample, scores appeared to be average (rather than low average).

However, on casual inspection the mean SOC score for the self-help residential subgroup appeared to be quite high, and this invited some speculation as to the possible reasons. The culture in the self-help centres

appeared to be one of psychologically strong individuals working together in order to survive. Running the centres is a huge challenge requiring creativity, effort and optimism. Stringent criteria ensure that only the most psychologically robust individuals are accepted into these homes (personal communication with the residents, 2004 and 2005). People with stronger SOC may be attracted to this situation, since they are more likely to approach challenges rather than avoiding them (Antonovsky, 1987), while weaker-SOC individuals may either be turned away or may find traditional residential care a more attractive option, since it does not require such a proactive, confident outlook.

The self-help residents were, on average, older than both the college and university students, although they were similar in age to the other residential disabled participants. Thus, age cannot be ruled out as a contributing factor in the self-help group's high score. In addition, most self-help residents were men. Antonovsky (1987) suggested that males may tend to have a stronger SOC, since traditionally men have been socially privileged.

There is also an outside possibility that the relatively high SOC scores of the self-help group actually may have been partly a result of many of these residents having been severely injured at the onset of their disabilities. Bonnano (2004) and other authors suggest that extreme trauma can result in positive psychological growth, which might translate as a strong SOC. The possibility of positive growth following trauma was discussed in section 3.3.7 of Chapter 3. However, Schnyder, Büchi, Sensky, and Klaghofer (2000) suggest the opposite—namely, that SOC may be permanently decreased as a result of being severely injured (see 3.3.7).

Having said all of this, it must be remembered that although the self-help group's SOC score appears on casual inspection to be substantially higher than the other subgroups' scores, statistical testing (which takes into

account the size of the samples and their variances) showed that this difference was not, in fact, particularly remarkable. There was roughly a 22% to 27% probability that this high mean score occurred through measurement error or random influence.

Precise information regarding the ages of the sample groups was not available, because the pre-determined age categories differed across the subgroups (see Appendices C and D). The limited information that was available indicated that the mean and median ages of the undergraduates fell in the category “18 to 21 years”, while those of the disabled students fell in the category of “18 to 30 years”.

Informal observation at the research sites confirmed that the disabled college participants were mostly quite a lot older than 21. This would mean that the disabled college students were generally older than the undergraduates, but still mostly under thirty. By the time the data analyses for the current study had been completed in mid-2005, the college for disabled students—which had existed for about twenty years—had closed down. (This fact became evident in mid-2005 after attempts to locate the college or its previous staff members failed, and was confirmed via personal communication with personnel at the Association for the Physically Disabled in January 2006). It was therefore impossible to gain more precise information about the ages and educational levels of the participants in this subgroup.

Using the limited available data, the current research did not confirm the trend predicted by Antonovsky’s (1987) theory, which was that people below the age of about thirty tend to obtain lower SOC scores (see 5.5.3 for results of age analysis). However, the research design was not longitudinal, and thus did not allow for a thorough investigation of this hypothesis. A longitudinal design would have enabled a comparison between the SOC score of each individual at different ages or life stages,

for example at twenty years of age and again at thirty. It is possible that the fairly low SOC scores obtained by the composite group in the current research do partly reflect the influence of age, as 67% of all participants were under thirty years.

The gender ratios were different in the two sample groups (i.e. people with disabilities and undergraduates). The university group included substantially more women than men, while the disabled group comprised men and women in almost equal numbers but did include slightly more men (see 4.2.3). As reported in section 5.5.1, no significant differences were found in terms of gender for the composite sample. Females did not attain lower SOC scores, as may be expected from the theory (Antonovsky, 1987).

It is possible that gender relations have changed enough in the two decades since the SOC Scale was devised that women today are generally more confident and socially empowered, and that this reflects in more equal SOC scores between the genders. Alternatively, SOC score may be subject to an interaction effect regarding gender and other factors (e.g. socio-economic status or occupation) which was not operative in the current research, presumably because the other factors were operating at insignificant levels. For example, it appeared that few of the women who participated in the current study were employed in a formal or full-time capacity, since they were either attending college or university full-time, or they were prevented by their disabilities from securing formal or full-time employment.

Type of disability (e.g. chronic illness versus partial paralysis) also appeared not to influence SOC scores in the current research (see 5.5.2). However, speculative data interpretation did suggest a possibility that the severity or intensity of a disability may affect an individual's SOC score.

This possibility is discussed at various points in the remainder of this section.

Among the university undergraduate sample, home language exerted no apparent influence on SOC score (see 5.5.1). Language variables may be expected to correlate to some extent with culture and worldview (see 1.5.1 and 2.4.3). Cultural differences, it has already been suggested, possibly do contribute to SOC score such that membership of a traditionally non-Western culture may be associated with a lower SOC score.

However, for the university group, level of education might have played a more important role than either home language or cultural background in determining both one's current worldview and one's SOC strength. The same would probably not have been true for the disabled participants, few of whom had been educated to tertiary level, and whose home language and cultural background would therefore be more likely than education to influence worldview.

If all participants had been asked to indicate both their language and their educational level, a different picture may have emerged, whereby SOC scores may have been shown to vary according to these two variables. In the current study participants were not asked to state their educational level, and it was also not possible to examine language and cultural variables in depth. Thus, the relationships between language and/or educational variables on the one hand and SOC on the other remain a question for further research. Based on the results of the current study, conclusions regarding these relationships can only be speculative.

Standard deviations

Antonovsky (1993) reported an average SD of 20.5 for 19 studies conducted worldwide, with a range of 0.8 to 36.4. The average SD for all results reported in Table 6.1 (a total of 44 studies excluding the results of

the current study) is 20.92. Mlonzi and Strümpfer (1998) reported a SD of 15.4 for their SOC research with black South African undergraduates. The SD for the composite sample in the current research was 21.03 (see Table 5.1), which is very similar to other reported results.

In the current study, the standard deviation was highest for the residential disabled participants (30.1 for the combined residential group). This high degree of variance indicates either that the scale was more sensitive to individual personality differences within this population, or that the group was in fact unusually heterogeneous in terms of personality and SOC. The disabled college group and the undergraduate groups had SDs that were characteristic of more homogenous groups and were also more in line with other reported SDs (see Table 6.1.). Thekiso (1999) reported a SD of 20.2 for his Tswana sample, which is similar to the SD (21.03) obtained with the current composite sample.

Statistically, there was a significant difference in variance between the sample subgroups used in the current research (see 5.3.1). As just indicated, the disabled residential sample appeared to be less homogenous than the other groups. It is possible, however, that this impression does not reflect the true situation. Observation of participants at each site indicated that a large number of the undergraduates, and effectively all of the disabled college students, were from traditional African cultures. Probably, a wide variety of African languages and backgrounds (e.g. diverse tribes) was represented in these two groups. In the case of the undergraduate sample, this diversity was noted to extend to Asian influences. A relative insensitivity of the SOC Scale to African (and Asian) cultural and linguistic backgrounds could have resulted in the lower SDs of the college and undergraduate groups. Thus, the apparent homogeneity of the college and university groups should not necessarily be interpreted at face value (Anastasi, 1982; Owen, 1992).

However, an alternative explanation focuses on why the SD of the residential group was so much higher than the SDs of the other groups, rather than on why the SDs for the college and undergraduate groups were slightly lower than average. It is possible that the residential sample included people with more severe disabilities, which had resulted in their institutionalisation. For this group, the variable of “disability” might have exerted more impact on SOC score than it did in the undergraduate or disabled college samples, where physical disabilities either were not present or were not as severe.

This alternative explanation does, perhaps, seem more plausible, given that it is the SD of the residential group (particularly in the traditional setting) that is noticeably higher than average. The SDs of the other groups (college and undergraduate) do not differ as much from the average reported SDs in other studies (see Table 6.1).

In addition, the statistical similarity in the scores of the college and university groups suggests that cultural factors, which were presumably *not* equally shared within these two groups, may not have been all that important in determining SOC. Student status, which members of the two groups *did* share, was thus perhaps more likely to account for the similarity in scores. Disability factors also seem not to have been important in determining SOC, since one group (college) comprised people with disabilities and the other (undergraduate) did not.

However, as already mentioned, the disabled college students were, in general, not extremely severely disabled. For example, all of the college participants managed to complete the written questionnaires unassisted, which was not the case for the residential disabled sample. Thus the possible effect of disability on SOC score may not have been particularly strong in the college group’s results.

It should be noted, furthermore, that the college and university groups' data were not statistically comparable, as the groups had not been matched for variables such as socio-economic status, gender and age. For this reason, the ideas and possibilities presented here regarding the differences and similarities in the SOC scores of the subgroups should be regarded as speculative only.

6.3.2 Reliability indices

Section 4.41 in Chapter 4 reports on Cronbach's α scores which have been obtained by other researchers using the SOC Scale, and this information will not be repeated here. For the composite sample (undergraduates plus disabled people) in the current research, Cronbach's alpha (α) was 0.81 (see Table 5.6), which is an acceptable alpha score (see 4.3.2). However, on examining Cronbach's α for each subgroup, it became evident that, within the disabled sample, the residential subgroup contributed disproportionately to the scale's overall α , while the college subgroup had a notably low α . The undergraduate sample had an acceptable α .

The college sample's low α score indicates that the SOC Scale did not demonstrate good internal consistency with this group. In other words, the item scores did not correspond in a meaningful pattern, and items which were theoretically related to each other did not demonstrate this relationship empirically. There is thus a good chance that fluctuations in the college group's scores were not due to personal differences so much as to random factors, or to systematic measurement errors (the latter of which may be associated with cultural influences—see 3.4.2).

On further investigation it was found that the poor α score for the college group was mostly due to the comprehensibility subscale, since the removal of this subscale increased the SOC Scale's α to a far more acceptable level (0.73 from 0.65, rounded). This point is discussed further in section 6.3.3.

6.3.3 Validity of the SOC Scale

The validity of the SOC Scale is a recurrent theme throughout this thesis. This section attempts to integrate the various issues and results that are mentioned elsewhere. The focus here is primarily on content validity, and thus, less directly, on construct validity as well.

For the purposes of the current research, SOC Scale items were added, removed, or modified (see 4.4.1). The scale itself was also tentatively restructured (see 5.10). These alterations imply a criticism of the original scale's content validity and an attempt to improve it. The main criticism regarding the SOC Scale's content validity stems from the brevity of the meaningfulness subscale.

Antonovsky (1987) suggested that meaningfulness is the most important SOC component, yet this particular subscale appears to be inadequate since it is shorter than the other two subscales. The content of some of the meaningfulness items was also in question (see 4.4.1; also "*Factor 1: Meaningfulness*" in this section). The current research attempted to investigate the meaningfulness subscale more fully, and to suggest possible improvements. These are presented in section 7.4.3.

During the course of the research it became clear that the content validity of the manageability subscale was also in question (see 5.6.3). Unlike with the meaningfulness subscale, this had not been apparent from the outset, but became obvious during data analysis, specifically the factor analyses and tests for subscale reliability.

The content validity of the comprehensibility subscale appeared to be satisfactory, except when used with the disabled college group (see 5.6.3). Although it is possible to speculate on the reasons why this subscale performed so poorly with this particular subgroup (see 6.3.4), no definite conclusions were reached in this regard. In general, based on the results for the composite sample in the current study, the comprehensibility subscale was accepted as satisfactory, although suggestions were made for its possible improvement (see 7.4.4).

The content of the items in the SOC Scale should reflect the construct of SOC, and the purpose of the SOC Scale is to measure an individual's SOC. The three subscales should therefore reflect and measure the components of meaningfulness, comprehensibility and manageability (Antonovsky, 1987), and the overall scale should measure overall SOC. Items belonging to the meaningfulness subscale, for example, should tap whether (or how) a person experiences or views his or her life as being meaningful. Meaningfulness items should *not* tap the person's sense of life as being comprehensible or manageable. Inspection of the items suggests whether or not this principle has been rigorously applied. Empirical results provide further information regarding the content validity of items, the three subscales, and the entire SOC Scale.

Factor analysis, in particular, provides a statistical tool for assessing construct validity (see 4.3.3). Most research on the SOC Scale to date indicates that SOC score is best treated as a unitary measure, and that the three subscale scores do not separate out satisfactorily during factor analysis (see 3.3.1). Antonovsky himself advocated the use of a single total score; however, he also suggested that more research was needed into the factor structure of the SOC scale (Antonovsky, 1987, 1993).

Individual factor analyses for the various sample subgroups indicated that for some items, the loadings or the valences (positive or negative) differed markedly between subgroups. These items are shown in Table 6.2 on the following page. Only loadings of $\geq |0.30|$ are reported.

Some of the subgroup differences cancelled out during the final factor analysis with the composite sample. This fact obscured the tendency of the disabled college group to obtain high negative loadings on several items, in the absence of the same pattern occurring with other groups. In general, these items loaded negatively on the first factor, indicating that, for the college group, numerous items appeared to have relevance for the meaningfulness component, but often in an inverse (negative) direction. Thus a higher score on the item in question would

be associated with a weaker sense of SOC, and lower scores would be associated with stronger SOC (Antonovsky, 1987).

Table 6.2: Item loadings which showed discrepancies between the subgroups

Item	Disabled college group (A)	Undergraduate and residential disabled groups (B)	Composite sample (A + B)
1	–0.31 on factor 3	0.64 on factor 3	no high loadings
10	–0.69 on factor 1	0.72 on factor 2	0.52 on factor 2
15	–0.54 on factor 1	0.65 on factor 2	0.57 on factor 2
17	–0.44 on factor 1	0.79 on factor 2	0.58 on factor 2
19	–0.32 on factor 1 0.32 on factor 2	0.57 on factor 2 0.45 on factor 3	0.66 on factor 2
21	–0.44 on factor 1	0.56 on factor 2	0.53 on factor 2
26	0.43 on factor 2	0.43 on factor 3	no high loadings
28	–0.30 on factor 1 0.31 on factor 2	0.60 on factor 1 0.34 on factor 2	0.43 on factor 2

In contrast, for the undergraduate and residential disabled groups, the same items were relevant to comprehensibility, and the loadings were positive rather than negative. It is not clear why these subgroup differences existed.

The inverse relationships that were frequently noted for the college group’s factor analysis (see Table 6.2) are not in line with Antonovsky’s (1987) theory. The SOC Scale and its subscales were designed so that, for all items without exception, a higher item score should contribute to a stronger SOC. (In the case of reverse-scored items, this would apply after the reverse scoring had been effected). The discrepancies observed in the college group’s results suggest that the ways in which Antonovsky conceptualised and then operationalised the constructs of meaningfulness, comprehensibility and manageability do not have universal application. Events which he felt “should” indicate a lower sense of meaningfulness (or comprehensibility, etc.) may actually be experienced by certain population groups as particularly meaningful, while events which would to

him have indicated a strong sense of comprehensibility (or meaningfulness, etc.) may actually, for those groups, appear completely unintelligible.

As indicated throughout this thesis, such issues relate to construct validity (see 4.3.3). The fact that some of the items in question achieved quite high negative loadings for the college group, as well as the fact that the unexpected negative loadings occurred fairly frequently for this group, suggests that the results were not merely due to chance, but that a systematic confound (such as cultural influence) was probably operating.

One possible explanation which arose through inspection of the factor analyses was to name the factors obtained for the college group as follows: Factor 1 = optimistic interest; Factor 2 = familiarity and self-trust; Factor 3 = the social self. It was unnecessary to rename the factors for the undergraduates and disabled residential groups, because the factor patterns of these subgroups had a good fit with the theory, and thus the labels of “meaningfulness”, “comprehensibility” and “manageability” could be used. However, for the latter subgroups, Factor 1 (meaningfulness) could have been seen to include “optimistic interest”, while Factor 2 (comprehensibility) could have included “familiarity and self-trust”, and Factor 3 (manageability) could have included “the social self”. In general, for all of the subgroups, “optimistic interest” was felt to be very close to “meaningfulness”, which was the most salient factor.

Using the SOC Scale with a Tswana population, Thekiso (1999) requested three factors, which together explained only 23.8% of the variance. He found that Factor 1 represented either comprehensibility or “clarity vs. confusion”. Factors 2 and 3 were comprised of meaningfulness and manageability items in equal measure, and he identified these as “liveliness/pleasure vs. boredom”, and “uncertainty vs. certainty/hope” respectively.

It appears that there may be some similarity between Thekiso’s factors and the alternatives suggested above for the current research. For example, the current

researcher's "optimistic interest" could be similar to Thekiso's "liveliness/pleasure vs. boredom", and these could both resemble Antonovsky's "meaningfulness". Similarly, the current researcher's "familiarity and self-trust" may resemble Thekiso's "clarity vs. confusion", and both may resemble Antonovsky's "comprehensibility". However, there is less apparent congruence between the current researcher's "the social self", Thekiso's "uncertainty vs. certainty/hope", and Antonovsky's "manageability" constructs.

Section 5.8.3 in Chapter 5 indicates that for the composite sample in the current study, a single-factor solution for the SOC Scale accounted for relatively little of the variance (16.7%). Thus the three-factor solution—which explained 33.4% of the variance—was preferable. A three-factor solution also fits better with the theory, which states that SOC comprises three components.

The results of the three-factor solution with Antonovsky's original SOC Scale are reported in section 5.8.2 and discussed in the following paragraphs. Many items failed to load on the three factors as would be expected in terms of the subscales indicate by Antonovsky's (1987) theory. No attempt is made to explain why items which did not load highly on any of the three factors did not do so. The focus is on those items which did load at $\geq |0.35|$, but not on the expected factor.

Factor 1: meaningfulness

The first factor (see 5.8.2 and Table 5.8) appeared to represent meaningfulness. The empirically observed salience of this factor fits very well with the theory. Antonovsky (1987) identified meaningfulness as the most important component in terms of motivating an individual into effortful coping (see 3.3.1). However, four items designed to measure manageability (items 13, 20, 23 and 27) also loaded on this factor. Of these, items 13, 20 and 27 all appear to contain a "transcendent" reference, in the sense that if problems cannot be solved they may be transcended.

Item 13 asks: “What best describes how you see life: One can always find a solution to painful things in life. / There is no solution to painful things in life.” The word “solution” is somewhat ambiguous here. It may refer to the practical level, in which case the item would tap manageability. But it may also refer to an existential or spiritual level, such that if no practical solution can be found, there is always the solution of accepting the painful facts, or even somehow finding meaning in them (e.g. Frankl, 1984).

Item 27 is very similar, due to the use of the word “overcoming”, which, like the word “solution”, is ambiguous in the current context. This item reads: “When you think of difficulties you are likely to face in important aspects of your life, do you have the feeling that: You will always succeed in overcoming the difficulties. / You won’t succeed in overcoming the difficulties”. Items 13 and 27 both had very high loadings on the first factor, which suggests that they tapped participants’ sense of meaningfulness rather than manageability.

Item 20 asks about one’s ability to sustain a positive affective-cognitive state (“When you do something that gives you a good feeling: It’s certain that you’ll go on feeling good. / It’s certain that something will happen to spoil the feeling.”) This item refers to the skill of emotional self-management. However, it may also reflect one’s ability to sustain a sense of meaning regarding the things one feels good about doing. In this case, it would be measuring meaningfulness rather than manageability.

Item 23, on the other hand, probably taps a more social sense of meaningfulness (“Do you think that there will always be people whom you’ll be able to count on in the future? You’re certain there will be. / You doubt there will be”). It is possible that for many people, particularly those whose self-definition depends largely on relationships with other people (see 2.4.2), imagining a future where one cannot depend on others would evoke feelings of meaningless, while imagining a future where

others are seen as dependable may feel meaningful. This sense of social meaningfulness may become more salient than a sense of manageability when envisioning the future.

In addition, it is possible that participants perceive a difference between controlling others and relying on them. Being able to control other people may increase one's sense of manageability, whereas a feeling that one will truly be able to depend on the goodness of others may increase one's sense of meaningfulness. Item 23 does not seem to differentiate between these two situations and the feelings that are likely to accompany each of them, and Antonovsky's classification of the item under the manageability component suggests that he himself did not perceive this possible difference.

There is thus an ambiguous quality to items 13, 20, 23 and 27, such that both manageability and meaningfulness appear to be tapped. The psychological or social emphases of these items suggest that one's ability to transcend problems or to find meaning in them is at least as important as one's ability to manage a more practical demand, or the perception of having enough material resources to do so.

Section 7.4.3 in Chapter 7 presents some conclusions and recommendations regarding the possible modification of the meaningfulness subscale.

Factor 2: comprehensibility

The second factor appeared to represent comprehensibility (see 5.8.2 and table 5.8). Again the results fitted very well with the theory, since Antonovsky (1987) stated that comprehensibility is the second most important component. Two meaningfulness items (8 and 28) and one manageability item (item 29) also loaded on this factor, but quite weakly.

Item 8 asks about one's goals and purpose in life ("Until now your life has had: No clear goals or purpose at all. / Very clear goals and purpose"). While life purpose obviously does relate to meaningfulness (see 2.2.4), one must first *comprehend* one's life before setting goals or identifying one's life purpose. In essence, the setting of goals implies an ability to create order out of chaos. However, it may be hypothesised that the ordering of chaos underlies both meaningfulness and comprehensibility (e.g. Lustig, Rosenthal, Strauser, & Haynes, 2000, ¶ 27). If so, the loading of item 8 on both the meaningfulness and the comprehensibility factors (Factors 1 and 2 respectively) becomes explainable.

Item 28, on the other hand, directly refers to a sense of meaningfulness: "How often do you have the feeling that there's little meaning in the things you do in your daily life? Very often. / Very seldom or never". Despite this overt reference to meaning, for the composite sample, item 28 loaded rather weakly on the second factor (comprehensibility), and did not load on the first factor (meaningfulness). (See Table 5.8.) This empirical finding suggests that, for most participants in the current study, the way in which they comprehended their daily lives was more important than, or preceded, a sense of meaning in their daily lives. Given the item's direct reference to a sense of meaning, it may have been expected that item 28 would have loaded quite strongly on Factor 1 (the presumed meaningfulness factor) in addition to loading moderately on Factor 2. It was not clear why this did not occur.

It must, however, be noted that the subgroups showed different patterns of loadings, as shown in Table 6.2. When the disabled college group was excluded from data analysis, the loading for item 28 was as expected according to the theory. That is, it loaded on Factor 1 (meaningfulness), with a weak loading on Factor 2 (comprehensibility). But the input from the disabled college participants cannot, and should not, be ignored simply because it does not fit neatly with the theory. The college group was

included in the current study precisely so that problems such as this might be identified; in addition, the college group formed an integral part of the composite sample throughout all of the data analyses.

Although it is currently not possible to suggest reasons for why the loading for item 28 differed so vastly for the various subgroups, the empirically observed discrepancy regarding this item does seem to indicate some conceptual conflation between the comprehensibility and meaningfulness components. This aspect of the SOC Scale could be better researched with other South African samples in the future.

Item 29 reads “How often do you have feelings that you’re not sure you can keep under control?” Ostensibly this is a manageability item, but it loads on Factor 2. Had it been worded “How often do you have feelings that you cannot keep under control?” it may have loaded more strongly on Factor 3, since it then would have referred directly to one’s ability to manage one’s emotions. It is possible that the phrase “you’re not sure” introduces an element of introspection or contemplation, which results in this item emerging as a comprehensibility item.

It is also plausible that the phrase “under control” in item 29 evokes something of an intellectualised response. Antonovsky (1987) wrote of the importance of balancing the intellect (left brain) and the emotions (right brain), and item 29 may allude to one’s ability to keep this kind of balance. In a balanced state or “self-controlled” state, the emotions should be congruent with the intellect. The intellect is likely to be associated with the comprehensibility component, rather than with the manageability component. This may account for item 29’s loading on Factor 2.

Item 1, which Antonovsky designed as a comprehensibility item, reads: “When you talk to people do you have the feeling that they don’t understand you? Never have this feeling. / Always have this feeling”.

This item did not achieve high loadings on any factor for the composite sample. However, when the disabled college students were excluded from the analysis, item 1 did achieve a high loading, but it did so on Factor 3 (manageability) rather than on Factor 2 (comprehensibility). These discrepancies are shown in Table 6.2. In general, the empirical results for item 1 and its modifications, items 30 and 39, suggest that being able to make oneself understood, or feeling that one is indeed understood, relates more to manageability than to comprehensibility. This point is discussed in section 6.4.2.

The wording of Antonovsky's item 1 may be appropriate for participants who live in an environment that is relatively homogenous culturally and linguistically. It may be less appropriate for participants living in a multi-cultural country such as South Africa. In a multi-cultural setting, there are likely to be at least some occasions where one is genuinely not understood by other people because of cultural and language barriers. Thus, one's "feeling that they don't understand" might reflect a realistic awareness or assessment that one's behaviour and/or language are not being understood by one's audience, rather than a psychological tendency to feel misunderstood by all and sundry.

Item 10, which is classified as a comprehensibility item, demonstrated a problematic pattern of loading on two factors. (Item 10 reads: "In the past ten years your life has been: Full of changes without your knowing what will happen next. / Completely consistent and clear.") For the composite group, item 10 loaded negatively but somewhat weakly on Factor 1 (meaningfulness), and loaded positively and more strongly on Factor 2 (comprehensibility).

The fact that item 10 loaded more strongly on Factor 2 is congruent with the theory. When the disabled college group's data were excluded, the item achieved a very high loading on Factor 2 (see Table 6.2). However,

the results for the disabled college group, and hence also for the composite sample, confirm that there probably is a conceptual problem with this item. In addition, the item loaded strongly and negatively on Factor 1 for the college group, and it is not clear why the valence should have been negative. The implication of a negative loading on Factor 1 is that the more change one has experienced in the past decade, and the less one has been able to anticipate what would happen next, the more meaningful one feels life to have been.

The contradictory patterns of loadings for item 10 confirm that there is probably a conceptual problem regarding this item, which Antonovsky (1987) himself indicated was probably the case (see 3.4.1).

Chapter 7 (section 7.4.4) suggests possibilities for a comprehensibility subscale that would take into account cultural worldviews which differ from the so-called Western worldview. This might provide more effective measurement when the SOC Scale is used with participants who differ significantly from the populations on which the scale was normed (e.g. less westernised, less educated, less affluent, or less able-bodied).

Factor 3: manageability

The third factor included *manageability* items (see 5.8.2 and Table 5.8), with the exception of item 5, which reads: “Are you surprised by the behaviour of people whom you thought you knew well? Never / Always”. This item, while classified under the comprehensibility subscale by Antonovsky (1987), may arguably also relate to manageability. Item 5 seems to imply that the more one comprehends the behaviour of others, the less one is surprised by this behaviour. Surprises, in this context, would apparently refer to inconsistent, unexpected behaviour on the part of others. The positive or negative nature or impact of such behaviour is not directly indicated by the wording of the item.

It is probably accurate to say that most people act inconsistently at least some of the time. Should one accept this as a general rule or philosophy about the nature of human beings, one might perhaps not only comprehend the behaviour of others better, but one may also, and as a result, actually find life more manageable. Effectively, by “expecting the unexpected”, one is less likely to be thrown off balance by other people’s behaviour.

It thus seems possible that, in terms of the SOC Scale’s scoring system, Antonovsky intended the response of “Always” to item 5 to translate as “Yes, I am constantly being surprised by people, and I don’t *comprehend* either their behaviour or the reasons for the surprises”. In contrast, he may have intended a “Never” response to translate as “No, I am never surprised by other people, because I *comprehend* that people do often behave in unexpected ways”. However, if one expects the unexpected, one is also better prepared to deal with sudden changes and unexpected demands. Thus not only is a comprehensibility function operating, but a manageability function as well. This description may explain why item 5 loaded strongly and positively on the manageability factor (Factor 3), while not loading on either of the other two factors.

Another way of explaining item 5’s loading pattern is to view the understanding of human behaviour as more than merely a cognitive matter. Understanding the behaviour of those close to oneself implies emotional maturity and life experience as well. If this kind of understanding was predominantly cognitive or intellectual, item 5 may have loaded on the comprehensibility factor. Given that understanding the behaviour of one’s fellow human being is a much more intuitive and practical type of insight, it seems reasonable that item 5 would load on the manageability factor instead. None of the subgroups in the current study demonstrated a different pattern of loading for item 5. This finding suggests that the non-cognitive nature of such understanding is consistent across diverse populations.

It was shown earlier that four items (see “*Factor 1: meaningfulness*” in this section) designed to measure manageability loaded on the meaningfulness factor instead. It was suggested that all of these items tapped a primarily psychological sense of manageability, rather than a practical sense thereof, and therefore actually tapped meaningfulness. By Antonovsky’s (1987) definition, manageability implies having access to sufficient GRRs (generalised resistance resources) to outweigh a demand. Psychological resources are only one type of GRR; there are also financial, medical, material, physiological, social, cultural, and spiritual GRRs (see 3.3.2). Chapter 7 (section 7.4.5) suggests possibilities for a manageability subscale that would represent a greater variety in types of GRRs, rather than placing so much emphasis on psychological resources. This would possibly enhance the measurement of the manageability component.

6.3.4 Subscale scores

This section first examines the contributions of the three subscales to the overall SOC Scale’s alpha score. Thereafter, the intrascale alphas (i.e. the internal consistency or reliability of each subscale) are discussed.

As already indicated, despite Antonovsky’s (1987) claim that meaningfulness is the most important component in determining SOC, due to its motivational power, the meaningfulness subscale is the shortest of the three SOC Scale subscales. Antonovsky did not design the SOC Scale so that the subscales would yield important or valid data in their own right (see 3.3.1), and perhaps as a result he apparently did not consider it important how many items each subscale contains. However, the implications of unequal scales is that the shorter subscale would carry less weight in the total score. Also, summing the items of each subscale would not yield three comparable scores.

However, later researchers have taken up Antonovsky’s (1987,1993) suggestion that further research was needed into the factor structure of the SOC Scale. He

had also suggested that the scale may need to be modified as a result of such research (ibid.). It appears critical for the validity of the SOC Scale that the meaningfulness subscale should be lengthened, since this subscale purportedly taps the most important component of SOC. Should it be possible to develop an SOC Scale that yields three useful, valid and comparable subscale scores in addition to the total score, this would obviously be ideal (Antonovsky, 1993; cf. Carver, 1989).

Table 5.6 in Chapter 5 presents Cronbach's alpha relating to each subscale. It is apparent that the comprehensibility subscale was problematic for use with the disabled college students (the overall SOC Scale α increased from 0.65 to 0.73 when the comprehensibility subscale was excluded). Neither of the other subscales lowered the alpha for the college group, and none of the subscales posed similar problems with any other subgroup. The reason for the comprehensibility subscale's poor performance with the college group is a matter for speculation, but it is possible that this group represented a worldview that was quite different from that of the other groups. Essentially all of the participants in the college group were black, and were not first-language English speakers. Prior to entering the college they had received a high school rather than university education, and not necessarily to matriculation level (see 4.2.3). Their views were thus likely to represent a greater degree of influence from traditional African worldviews than was the case for other subgroups.

It is also plausible that one's sense of the world as comprehensible might be undermined by disability. This may occur, for example, if one consistently found oneself not being rewarded for doing those things which required the most effort. Examples might include navigating a stairway, cutting one's food, or washing oneself. For disabled people these "simple" tasks often pose the biggest (and often impossible) challenges, but their mastery brings few social rewards. However, all of the disabled participants would have been facing this potentially confusing scenario, not just the college group.

It may even be possible that being both disabled and not from a westernised or educated background might have an interaction effect in terms of lowering one's sense of life as comprehensible. However, it should be kept in mind that Antonovsky's definition and measurement of comprehensibility are not necessarily the only or most accurate ones. The college students may in fact have had their own perfectly adequate ways of viewing life as comprehensible, but cultural and language differences (in addition to differences in physical ability) may have caused them to score poorly on the comprehensibility subscale. As indicated in 6.3.3. above, this is an issue of content validity. If such discrepancies exists at a conceptual level, it would render the SOC Scale less sensitive to true individual, personality fluctuations regarding the comprehensibility component.

In other words, it is not necessarily the case that comprehensibility existed at a lower level for the college group simply because they obtained lower scores on the SOC Scale. It may be that these participants genuinely felt life to be less comprehensible than did members of the other subgroups. But it may also be the case that, for this group, comprehensibility took on a qualitatively different form from that defined by the SOC Scale. This would not render the comprehensibility construct itself useless or irrelevant, but it would require revision of the way in which the construct is operationalised. The different worldviews of various population groups would need to be taken more into account when selecting items for the comprehensibility subscale.

A second important source of information about the performance of each subscale in the current context is the intrascale alphas for the subscales. Table 5.7 presents the intrascale alphas for the three subscales. It is evident that all three subscales achieved an unacceptably low Cronbach's α with the disabled college sample (< 0.60 in each case). Despite this, the mean total SOC Score attained a slightly more acceptable α score (0.65, rounded). The low subscale reliability indices meant that items which were intended to measure the same construct, and which should thus have co-varied, did not do so for this particular group, and that the

internal consistency of the subscales was inadequate. The internal consistency of the entire SOC Scale was slightly more acceptable.

For the undergraduate group, the manageability subscale's α score was also unacceptably low. In general, the manageability subscale was problematic, since it attained an acceptable Cronbach's α only with the residential disabled group. The α score for this subscale for the composite group was 0.62, which is notably low (see 4.3.2). Thus the manageability subscale was unreliable for use with the current samples, and there appeared to be a problem with this subscale at the conceptual level (i.e. concerning the definition and operationalisation or quantification of the construct).

For the composite sample, the meaningfulness subscale achieved the highest internal consistency of all the subscales, but α was still not particularly high (and was unacceptable by some standards; see 4.3.2). Intrascale reliabilities for the comprehensibility subscale were acceptable for research purposes, for all subgroups excluding the college group. The comprehensibility and meaningfulness subscales were thus considered generally adequate for use with the South African populations represented in the current research, but with the recommendation that modifications to the subscales be considered (see 7.4).

Lustig et al. (2000) report Cronbach's alpha for the subscales as follows: 0.81 for comprehensibility, 0.84 for manageability, and 0.85 for meaningfulness. Their sample consisted of 89 university students with disabilities (68% between eighteen and 25 years old; 95% Caucasian; 57% female; 46% with a learning disability or attention-deficit disorder, and 18% with mobility-related disabilities). These figures are more in line with what is generally expected for established scales that are reputed to be reliable and valid. In comparison, the subscale reliabilities in the current study seemed fairly poor, which suggests that there were problems with the scale's validity and reliability for the South African samples under consideration.

The residential disabled subgroup appeared to be the most similar to the populations on which Antonovsky standardised the SOC Scale, since this group consistently achieved the highest alpha scores, indicating that the scale was most reliable when used with this group. The SOC Scale's validity was also better with the residential disabled group, as indicated by the fact that, for this group (in combination with the undergraduate group) items loaded in a manner that was far more congruent with the theory (see Table 6.2). The meaningfulness and comprehensibility subscales both had high alphas, and even the manageability subscale, which in the current study has been shown to be generally problematic, attained a fairly acceptable α score with the residential disabled group.

A possible reason for the residential disabled group's apparent similarity to Antonovsky's original samples is that it was the most uniformly westernised group, with two black participants and 34 whites (see 4.2.3). Informal observation and conversation at the site indicated that, without any apparent exceptions, all respondents were from Judeo-Christian backgrounds (mostly Christian). Conversations also revealed that many, if not most, participants had obtained at least a matriculation (Standard 10 or Grade 12) level of education. Thus, worldviews associated with Judeo-Christian, westernised, and literate or educated cultures were strongly represented. The same cannot be said with certainty of the other subgroups. In particular, the disabled college group probably did not represent these three conditions.

6.3.5 General comments based on the empirical data

It appears that, for the SOC Scale, the reliability, mean scores and variances obtained in the current research are similar to those reported for westernised groups. They are also similar to other South African results. However, it is interesting to note that the undergraduates in the current research attained considerably lower SOC scores than another group of South African undergraduates who participated in a study conducted by Wissing et al. (in Thekiso, 1999). The latter group's mean score was 140, while the undergraduates in the current research attained a mean score of 130 (see Table 6.1).

It is also interesting to note that in terms of Antonovsky's theory, the disabled college group students who participated in the current research would be expected to have achieved lower SOC scores. This would be due to their low socio-economic status, their being disabled, and their relatively low level of education (Antonovsky, 1987). These factors would, according to the theory, imply less access to GRRs, with a resultant lower SOC (see 3.3.6). However, the mean SOC score for the college group was not significantly different, in statistical terms, from the mean scores achieved by the other sample subgroups in the current study. What was evident, instead, was that the SOC Scale and its three subscales attained notably lower reliability indices when used with the college group (see Table 5.6 and section 5.6.3). In addition, the validity of the subscales and the overall scale for use with the college group was questionable (see Table 6.2 and section 6.3.3).

From the current data only, it is impossible to understand with certainty all of the reasons for the factor patterns discussed in this section. It is normal for the factor structure of an established scale to differ from one cultural context to another, with more accent on one or another factor according to the specific culture (Fisher, 2004; Paunonen & Ashton, 1998; Thekiso, 1999). This does not necessarily mean that the scale in question is less applicable to diverse groups (see 3.4.2). However, in the present study this scenario is complicated by the fact that the factor structure of the SOC Scale was already unclear, even when the scale was used with the original, westernised samples on which it was normed.

As mentioned in Chapter 3 (section 3.3.1), Antonovsky's items were designed according to five facets, only one of which represents the components of meaningfulness, comprehensibility and manageability. It is likely that the other four facets contain enough extra information to make a factor analysis which is based only on the component facet quite limiting or confusing. Antonovsky (1987, p. 87) states that "The very design of the questionnaire items precluded three separate subscales with low intercorrelations". However, he did indicate

which component is supposed to be represented in which item. This theory provides the basis for linking the components with an empirical factor analysis of the three SOC subscales.

The empirical results did fit very well with Antonovsky's theory regarding the relative importance of each component. The subscale which accounted for the most variance in SOC score was meaningfulness, which was posited by Antonovsky to be the most important component. This was followed by comprehensibility and then manageability, and in both cases this matches Antonovsky's (1987,1993) theory (see 3.3.1).

6.3.6 Relationship between SOC and PSS scores

For the undergraduate group, conditions for administering the PSS were not ideal because the research was conducted a week or two before the university's mid-year examinations. Students may thus have been under more stress than usual, and this may have elevated their PSS scores. SOC scores would be less likely to be affected by exam stress since the SOC Scale is designed to tap enduring personality dispositions; in contrast, the PSS measures current perceived stress (each item of the PSS begins with the phrase "in the last month") (Antonovsky, 1987; Cohen, Tamarack, & Mermelstein, 1983; see Appendix B for the PSS).

While statistical tests found no significant difference in mean SOC scores between the subgroups, this was not the case with PSS scores. A significant difference was found between the PSS scores of the undergraduate versus disabled samples (see 5.3.2 and 5.9). It would appear that the reason for this difference was primarily the exam stress faced by the undergraduate group. Regardless of personality factors such as SOC, this group realistically did face a fairly immediate stressor that the disabled group did not face. The fact that the undergraduates had higher PSS scores indicates that, as a group, they perceived more stress facing them at the time the research was conducted.

The disabled college group also faced the prospect of exams at the end of the year, but these were not as formal or stringent as university exams. In addition, the college exams were several weeks away at the time the research was conducted, rather than a fortnight away as for the undergraduates.

However, the relationship between SOC and PSS scores may be slightly more complicated than it appears. In terms of Antonovsky's (1987) theory, the effect of SOC is most evident in the face of stress. Thus, undergraduate participants with a strong SOC may not have shown the same increase in perceived stress as those with a weaker SOC. This possibility was not assessed empirically.

Section 5.7 (Chapter 5) indicates that a significant inverse correlation was found between SOC and PSS scores, for all sample groups. These correlations are in the expected direction, and indicate that individuals with a strong SOC perceived their lives as being less stressful, while weak-SOC individuals perceived greater stress. This finding provides evidence for the construct validity of the SOC Scale, and confirms Antonovsky's theory. It is also in line with several other studies that have found an inverse correlation either between SOC and PSS scores, or between SOC scores and other measures of negative affect or psychological and physical symptoms (see 3.3.9 and 3.5).

The residential disabled group obtained the highest correlation between SOC and PSS scores, followed by the undergraduate group and lastly the disabled college group. Possible reasons for the low correlation in SOC and PSS scores for the college group include the fact that perceptions of stress are subject to cultural determinants (see 2.5.4).

Thekiso (1999) had extremely poor results when using the PSS with a rural Tswana population, and concluded that the dimensions of stress which are tapped by the PSS are probably too westernised to have been meaningful to his sample. The same problem may have occurred in the current study. The high correlations obtained by the residential disabled group, coupled with the low correlations for

the college group, seem to replicate Thekiso's findings, albeit with less intensity. It has been shown that, in the current research, the residential disabled group was the most uniformly westernised (see 6.3.4). Thus, the SOC and PSS scores for this group could be expected to be the most similar to previously reported results. In contrast, the college group was the least westernised group, and on this basis the scores for this group could be expected to differ the most from previously reported results and norms.

Bowman's (1996) study of SOC in Native Americans and Anglo-Americans yielded a similar result in terms of the correlation between SOC scores and other related measures. Like the residential disabled sample in the current study, her Anglo-American sample obtained a much stronger correlation than did the Native Americans, whose results were more similar to those of the disabled college group in the current study (see 3.4.2).

6.3.7 Response bias

Van Herk and Poortinga (2004) state that extreme choice and acquiescence bias are the two most serious response biases affecting survey research (see 3.4.2). Antonovsky (1993) indicates that extreme choice may be a frequent problem with the SOC Scale, and this tendency was in fact evident in the current research. The format of the SOC Scale precludes acquiescence bias.

About seventeen participants (10.1% of the total 169 participants) in the current study used extreme choice. All were from the disabled group except one (i.e. 15.5% of the disabled group, $n = 103$, used extreme response). Several of these participants began by using a normal response pattern, but after a few items reverted to extreme response, or began with extreme response and reverted to a more normal pattern for the final few items. Another common pattern was to use only the end-points and the exact mid-point (i.e. selecting only points 1, 7 or 4 of the 7-point response scale).

Edwards and Besseling (2001), in their study of rural South African workers, found the same problem with a scale that used 6-point responses. They suggest two likely reasons for the extreme responses: firstly, that respondents really did feel this strongly; and secondly, that they “are not well educated and tend to think in simple, dichotomous terms, and are thus vulnerable to [this] kind of response set” (Edwards & Besseling, 2001, p. 66).

Owen (1992), writing about intelligence tests, states that individuals with low socio-economic status may find psychometric tests unfamiliar or feel that they are unimportant, and that these attitudes contribute to the poor performance typically attained by these participants on such tests. He states that research findings show that children of low socio-economic status complete the tests more quickly and choose more random answers. This type of approach would be congruent with the extreme response style, and may have been operating in the current study.

Antonovsky (1993, p. 727) suggests that, for the SOC Scale, extreme response may be lessened by including “clearer instructions, a trial example, or insertion of a middle anchoring phrase”. The current researcher endorses these suggestions. In particular, a trial example of an item or a demonstration to participants, presented prior to their beginning to answer the questionnaire, may be useful.

6.4 CONCLUSIONS REGARDING THE MODIFIED SCALE

6.4.1 Psychometric properties and factor structure of the SOC Scale-23

Antonovsky (1974, p. 249) writes that “Any set of questions is a nonrandom sample from the universe of possible questions... The best that one can do, I think, is, on the basis of familiarity with the culture and history of one’s population, select items...”. Although he was referring to the construction of new scales, the same principle applies when one attempts to modify an existing scale.

The current suggestions for modifications to the SOC Scale came about through familiarity with South African cultures and conditions, logical reasoning, and

examination and manipulation of the empirical data. The modified SOC Scale-23 scale accounted for 7.6% more variance than did the SOC Scale-29, and had a reliability index (Cronbach's alpha) of 0.824 against 0.805 (rounded) for the original scale. These figures indicated that the modifications probably were useful in a South African context.

Cronbach's α for the SOC Scale-23 with the disabled college group was substantially higher (0.75) than that of the original scale (0.65), and would be considered acceptable for research purpose by most standards (see 4.3.2). Given that the college group's results were consistently problematic using the original scale, the results with the modified scale constitute a substantial improvement. The modified scale was thus definitely more suitable than the original scale for use with the disabled college participants, while it detracted only minimally from the reliability coefficients of the other sample subgroups (≤ 0.02 in all cases except for the undergraduate group on the meaningfulness subscale; see Table 5.11). Most importantly, the modifications did not reduce any alpha scores to an unacceptable level.

In addition, a method of clarifying the factor structure emerged during the current research. Initially, a substantial overlap between the three subscales and the three theoretical components was identified, and in an attempt to refine the subscales, several items were examined and were then reclassified under a different component (subscale). This process allowed for the emergence of three meaningful subscale scores, in addition to the more commonly-used total SOC score.

The meaningfulness subscale had been lengthened so that this was now the longest subscale of the three. This was done in accordance with Antonovsky's (1987) theory that meaningfulness is the most important component in determining SOC.

In terms of subscale correlations, Tables 5.5 and 5.12 in Chapter 5 present Pearson's r for the original SOC Scale as well as for the modified SOC Scale-23. For the original scale (composite sample), the only correlation that was ideal occurred between the manageability and comprehensibility subscales. The correlation between the meaningfulness and manageability subscales was too high, while it was somewhat too low between meaningfulness and comprehensibility (see 5.6.3).

Frenz et al. (1993) report subscale intercorrelations ranging from 0.52 to 0.72 (too high). Antonovsky (1993), reporting on Israeli data, cited intercorrelations ranging between 0.45 and 0.62 (also somewhat high). Antonovsky indicated that he was aware that the SOC subscale correlations tend to be too high when he stated that "It would indeed be a contribution were separate measures of the components to be developed, with relatively low intercorrelations" (Antonovsky, 1993, p. 732). Unfortunately, most SOC studies do not report the subscale correlations. For example, it would have been informative to compare the current results with those obtained by Bowman in her study of Native American versus Anglo-American undergraduates (see 3.4.2).

In contrast to the above reported subscale intercorrelations, the modified SOC Scale-23 developed in the current research yielded a picture that was highly acceptable for all subscale correlations. Pearson's r for the three subscales, for the composite sample, ranged from 0.37 and 0.42 (see Table 5.12).

It may be concluded that, for use with groups that share key characteristics with those of the college students with disabilities who participated in the current research (e.g. disabled, non-tertiary educated, of low socio-economic status, and "less" westernised), a modified SOC scale, such as the SOC Scale-23, may provide a superior measurement instrument.

6.4.2 Individual items

Section 6.3.3. of this chapter above reports on the findings regarding the individual items of Antonovsky's original scale. This section discusses those items (whether original, or new additions or modifications) which were included in the SOC Scale-23.

Factor 1: meaningfulness

The first factor represented the meaningfulness subscale. The empirical salience of this factor, as demonstrated using the data from the original SOC Scale-29, was retained. The salience of Factor 1, which was assumed to represent meaningfulness, is congruent with the theory (see Table 5.10). Items 7, 11, 14, 16 and 22 were classified as meaningfulness items by Antonovsky (1987), and were retained as such on the basis of their contributions to the validity and reliability of the modified meaningfulness subscale as well as the entire SOC Scale. In addition, items 13, 20, 23 and 27 were reclassified as meaningfulness items (whereas Antonovsky had listed them as manageability items; see 6.3.3).

Items 41 and 42 were added to the meaningfulness subscale. Item 41 reads: "When unexpected problems happen, you: Always handle them very well. / Always handle them very badly." Although item 41 was initially included as a manageability item (see Table 4.1), during empirical analysis it emerged as a meaningfulness item. However, its loading on Factor 1 was not particularly high.

It is possible that people generate a sense of meaningfulness based on how much effort they put into handling challenging situations, rather than evaluating the sense of manageability regarding those situations themselves, or the actual outcome. This would be congruent with Folkman and Lazarus's (1984) theory about coping (see 2.6.1). It would also explain why item 41 emerged as a meaningfulness rather than manageability item.

Item 42 reads: “When you very much want to learn something that is new and difficult to learn, you: Keep on trying, no matter how much time and effort it takes to learn it. / Give up fairly soon and move onto something that is more within your abilities.” This item was originally intended to measure either meaningfulness or manageability, or both. It probably emerged as a meaningfulness item because it relates to a person’s ability to motivate him- or herself. Antonovsky (1987) stated that meaningfulness is the most important component of SOC precisely because of its motivational influence (see 2.2.4 and 3.3.1).

Factor 2: comprehensibility

The second factor of the modified SOC Scale-23 represented the comprehensibility subscale. Antonovsky designed items 12, 15, 17, 19 and 24 as comprehensibility items, and they were retained as such on the basis of their psychometric performances. However, it may be noted that, for the disabled college group and using the original 29-item scale, items 15 and 19 loaded negatively on Factor 1 rather than positively on Factor 2; see Table 6.2.

Item 28, supposedly a meaningfulness item, was included in the comprehensibility subscale based on its loading on Factor 2 (see Table 5.10 and section 6.3.3, page 175).

Item 17 was identified by Antonovsky (1993) as having a possible conceptual problem, and in the current study it demonstrated borderline statistical acceptability. This item reads: “Your life in the future will probably be: Full of changes without your knowing what will happen next. / Completely consistent and clear.” Presumably it was designed to measure preference for change versus stability, with a preference for stability being associated with stronger SOC. The contentious nature of this idea has already been discussed (see 3.4.1, p. 75).

For the original SOC Scale-29, the undergraduate and residential disabled groups did achieve a loading on Factor 2 for item 17 (see Table 6.2). This result indicates that, for participants in these groups, higher SOC score was associated with a preference for stability. For the college group, item 17 loaded negatively on Factor 1, which suggests that participants in this group found change to be a meaningful aspect of life, and that preference for change was associated with higher SOC scores. This preference for change would be more in line with Kobasa's theory of hardiness than Antonovsky's theory of SOC (see 3.4.1, p. 74; cf. also the discussion about item 10 presented under "*Factor 2: comprehensibility*" in 6.3.3).

For the current composite sample, these subgroup differences cancelled out so that it appeared that people's ideas about their future were not particularly relevant to their sense of comprehensibility. Thus it appeared that views about the future, or views about change and particularly the uncertainty of change, did not exert much impact on overall SOC.

It is also possible that younger participants were not particularly future-oriented, which is to be expected in developmental or lifespan terms. Given the large number of participants under the age of thirty in the current study, this tendency could have affected the overall results.

Item 1, which Antonovsky designed as a comprehensibility item, was discussed in 6.3.3 above. It was shown that in a multi-cultural setting this item may relate more to manageability (specifically, to one's ability to make oneself understood) than to one's sense of comprehensibility. Items 30 and 39 were included in the current research in an attempt to clarify this potential confusion regarding item 1. Item 30 reads: "How well do you understand the culture, behaviour and conversations of the people around you? You understand them very well./ You are often confused by these things." This item probably relates both to comprehensibility and to

manageability (see Table 4.1). Item 39 reads: “Do you feel that the people around you don’t understand your culture and language? Very often feel this way. / Seldom or never feel this way.” This item would probably relate more to manageability than to comprehensibility.

When the modified SOC Scale-23 scale was devised using the composite sample, item 30 was found to contribute well enough to the scale’s validity and reliability to be retained. However, it loaded on Factor 3 (manageability) rather than on Factor 2 (comprehensibility), and is discussed in the following section on comprehensibility. The performances of items 1 and 39 did not warrant their inclusion in the final modified scale.

Item 45 was added to the comprehensibility subscale, since it contributed to the validity and reliability of both the subscale and the entire scale. This item reads: “Do you find it difficult to solve problems, make plans, learn new things, or make decisions? These things are very difficult for you./ These things are quite easy for you.” This item reflects one’s intellectual (or mentally creative) ability in a fairly straightforward manner. The empirical results confirm that this item does indeed seem to tap these aspects, which in turn would impact on one’s sense of comprehensibility.

Factor 3: manageability

The third and final factor of the three-factor solution for the SOC Scale-23 represented the manageability subscale. Antonovsky designed items 6 and 25 as manageability items, and they were retained as such on the basis of their performances. Item 5 was added to the subscale because of its high loading on Factor 3 (see Table 5.8).

Items 5 and 6 had both elicited a surprising number of comments from the residential disabled group, along the lines of “Oh yes, it really takes an illness [or accident] to show you whether someone is a friend or not.”

Item 5 reads: “Are you surprised by the behaviour of people whom you thought you knew well?”, while item 6 reads: “Has it happened that people whom you counted on have disappointed you?” Low mean scores for these two items for all disabled subgroups seemed to reflect the participants’ sense of disappointment in other people.

Initially, it seemed plausible that these perceptions could have been an accurate assessment of social reality, given the stigmatisation and/or isolation faced by many disabled people (Goldblum, 2005; Hahn, 1984). However, the mean score for item 6 was equally low for the undergraduate group, without any obvious or similar explanation. The original standard deviations for items 5 and 6 for all subgroups were unremarkable, although on the low side (see Table 5.7). This finding suggests that items 5 and 6 were not particularly good at distinguishing between strong- and weak-SOC individuals. In addition, and more importantly, both of these items had contributed very little to the reliability of the SOC Scale-29.

However, as the more poorly-performing items were removed in the process of modifying the SOC Scale, items 5 and 6 both proved worthwhile to retain. This was an interesting and unexpected finding, and was a reminder of the sometimes unexpected behaviour of statistical entities. For the final modified SOC Scale-23, items 5 and 6 both loaded on the third factor (manageability). This was all the more noteworthy since items loading on this factor were few and far between. Their contributions to the scale’s reliability index did, however, remain poor.

New items 30 and 35 were also retained in the manageability subscale of the SOC Scale-23 because they achieved relatively high loadings on the third factor. The development and wording of item 30 is discussed in the preceding paragraphs (see “*Factor 2: comprehensibility*” above). It appears from the empirical findings regarding item 30 (and the related

items 1 and 39) that one's ability to understand others may be more important in building SOC than is one's sense of being understood by others. This could have interesting implications in a multi-cultural or multi-language society.

Item 35 was a modification of item 29. Item 35 reads: "Are you in control of your thoughts, moods, behaviour and feelings? You are always in full in control of yourself. / You often feel you are going to lose control of yourself". The speculative quality of the original wording—which in the current study may have resulted in item 29 emerging as a comprehensibility item instead of the intended manageability—was removed in item 35. (See 6.3.3, "*Factor 2: comprehensibility*" above, for a discussion of this point). This very slight modification of item 29 into item 35 appears to have resulted in item 35 tapping manageability as was intended (see Table 4.1).

6.4.3 Conclusion regarding the modified scale

Although the current results might be applicable only or mostly within South African contexts, the findings may be of interest to psychological researchers worldwide, who are attempting to understand the factor structure of the SOC Scale and the ways in which the three SOC components relate. In addition, the current study suggests that it could be useful to look at reclassifying those items which do appear to measure SOC effectively, but which do so by measuring components other than those which they were designed by Antonovsky (1987) to measure.