# Sensation-seeking personality traits of navy divers

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**Key words**
Psychology, personality, occupational diving, survey

**Abstract**
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**Objectives:** This study investigated whether the sensation-seeking traits of naval divers differ from those of the general population, naval personnel in general, and sport divers.
**Methods:** A total of 66 South African naval divers, 716 general naval personnel, and 22 sport divers completed the Sensation Seeking Scale, version V. Their scores were further compared with those of other published studies.
**Results:** Naval divers scored the same as the general norm population (US students), higher than the general naval sample on total scores and on the Thrill and Adventure Seeking (TAS) and Experience Seeking subscales, and the same on the Disinhibition (DI) and Boredom Susceptibility (BS) subscales. Naval divers further scored higher than sport divers on the TAS subscale, but lower on the DI and BS subscales.
**Discussion:** Naval divers do not pursue sensation seeking indiscriminately, but are nonetheless characterised as more thrill and adventure seeking than other general navy and civilian diving groups. The study also highlighted the role of national culture when using normative scores for comparisons.

## Introduction

BACKGROUND

Do divers dare to live dangerously? Anecdotally, divers are seen as having unique characteristics, and previous studies into the sensation-seeking or risk-taking personality traits of divers have investigated military divers, occupational divers, and recreational divers.[1–3] The trait of sensation seeking has been defined as "*the need for varied, novel and complex sensations and experiences and the willingness to take physical and social risks for the sake of such experience*".[4] These studies used the Sensation Seeking Scale (SSS), which, apart from the total score, also provides for four subscale scores, namely Thrill and Adventure Seeking (TAS), Experience Seeking (ES), Disinhibition (DI), and Boredom Susceptibility (BS).[5]

Military divers were significantly more thrill and adventure seeking, and significantly less experience seeking and disinhibitory than the published male norm groups at the time.[1] Civilian sport divers, similarly, were significantly more thrill and adventure seeking, and experience seeking, and significantly less susceptible to boredom (with a trend to less disinhibition) when compared with norm groups.[3] Other surveys into the characteristics of divers concluded that "divers tend to gamble, take risk, and seek adventure".[6] While these studies all indicate that divers may have stronger risk-taking tendencies (which is not necessarily synonymous with sensation seeking), they are problematic in that the comparison groups are often the 'general population' (e.g., younger student samples in the above cases).

This suggests that the question as to what extent divers per se are sensation seekers or risk takers, may be relative simply to the extent that they may reflect the environment in which they live or work. In effect, it could be asked how much divers as a group differ from other normative groups they relate to, such as other high-risk sports or other military groupings.

It has also been reported that different groups of high-risk sportsmen (including alpinists, mountain skiers, scuba divers, white-water canoeists, parachutists, hang-glider pilots, and motorcycle racers) all tend to exhibit the same sensation-seeking profile; in other words, they did not differ amongst themselves, but they differed significantly from the general population.[7] While that sample included divers, there were no exclusive diver groups. To achieve a more definitive indication of the sensation-seeking traits of recreational divers, they would need to be compared with other amateur sportsmen who also engage in high-risk sports. The same would apply to comparing commercial divers with other high-risk occupational groups (e.g., pilots).

In the case of navy divers, it could be argued that young people are attracted to the navy in pursuit of adventure, or because they wish to experience new people and places (in line with the old adage of 'join the navy and see the world'). If navy divers then display elevated sensation-seeking tendencies, these may simply be an extension of a navy profile in general, and may not necessarily imply that navy divers are more sensation seeking than other naval groups. Therefore, to understand the sensation-seeking traits of navy divers better, they need to be compared with other groups within the navy.

Further, it is possible that national cultural differences may exist between groups of different countries. Sensation-seeking measures of navy divers from any particular country could thus reflect cultural influences, and would, therefore, need to be compared with scores obtained from

their countrymen (e.g., sport divers from the same cultural background).

PURPOSE OF THIS STUDY

This study uses the SSS to compare a sample of South African Navy (SAN) divers with other related groups. The analysis of the data focuses on four questions:

1 Are SAN divers different from the general population? In other words, is it possible to talk of the sensation-seeking nature of navy divers?
2 Are navy divers different from the general navy? In other words, do their scores reflect something of the diving environment, or simply their military background?
3 Are navy divers different from sport divers? In other words, is sensation seeking common in the diving fraternity?
4 What is the role of national culture in the scores of particular groups across countries?

## Methods

PARTICIPANTS

As mentioned, there were three groups of participants. SAN divers were invited to complete the SSS-V, and they did so anonymously after giving written informed consent. The SSS-V was completed in small groups, and the divers also provided demographic data referring to age, years of service, years qualified as military divers, and gender. Only divers on active diving duty, with at least one year of operational experience post qualification, were included. All the divers invited agreed to participate.

The rest of the navy participants were recruited through visits to their units. All participation was voluntary and occurred after informed consent was given. The general navy sample is representative of the fleet (in the age group 18–35 years) in terms of age, gender, years of naval service, and occupational class, although it excluded any submariners. The groups are described in Table 1.

The SA sport divers were recruited through local diving clubs, and they completed the SSS-V during visits to the clubs. They also provided information regarding their age, academic qualification, years qualified as divers, frequency of diving, and gender.

INSTRUMENT

*Zuckerman's Sensation Seeking Scale* – V was used.[5] It is a self-report questionnaire consisting of 40 forced-choice items. Respondents are asked to choose which of two statements best describes their interests or preferences. It provides a total, and four subscale scores. The scale has good psychometric properties, and is described in detail elsewhere.[5,8] The four subscales were described as follows:[9]

*Thrill and Adventure Seeking* (TAS) items indicate a desire to engage in risky and adventurous activities and sports that provide unusual sensations. The basic theme is summarised in the item "I sometimes like to do things that are a little frightening".

*Experience Seeking* (ES) items represent the seeking of stimulation through the mind and the senses, through music, art, travel and even psychedelic drugs.

*Disinhibition* (DI) items describe the seeking of sensation through drinking, partying, gambling, and sexual variety. It represents a kind of impulsive extraversion empirically associated with psychopathy and hypomania.

*Boredom Susceptibility* (BS) items do not represent a style of sensation seeking as much as an aversion to repetitive experience, whether in work or with other persons, and manifest in restlessness and boredom when such constancy is unavoidable.

**Table 1**
**Description of composition of the South African Navy sample**

| Branch | Description | N | Sex (%) | |
|---|---|---|---|---|
| | | | Male | Female |
| Divers | Qualified naval divers* | 66 | 95 | 5 |
| General navy sample | Sailors representative of fleet† | 716 | 70 | 30 |
| Technical | Mechanical, electrical, radio/radar technicians | 100 | 92 | 8 |
| Protection force | Harbour and naval installation security | 89 | 81 | 19 |
| Catering | Chefs and stewards | 81 | 59 | 41 |
| Communication | Communicators, signalmen | 60 | 47 | 53 |
| Administrative | Personnel and logistical clerks | 96 | 49 | 51 |
| Mine counter-measure | Mine counter-measure sailors | 27 | 93 | 7 |
| Combat officers | Line officers on sea-going vessels | 57 | 86 | 14 |

*does not include any officers
†comprises all the participants from the listed occupational groups, as well as participants in other occupational groups that were not large enough to analyse individually

**Table 2**
**T-score comparisons for South African Navy divers and the general South African Navy sample with a reference norm group[5] (see text for explanation,** *$p < 0.01$)
**(TAS – thrill and adventure seeking; ES – experience seeking; DI – disinhibition; BS – boredom susceptibility)**

| | Total | | TAS | | ES | | DI | | BS | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| Navy divers | 49.83 | 8.64 | 48.98 | 16.31 | 49.52 | 8.03 | 49.88 | 7.60 | 50.48 | 8.30 |
| General navy | 42.26* | 9.09 | 30.35* | 14.04 | 44.51* | 8.53 | 47.80* | 9.49 | 49.42 | 9.46 |

DATA ANALYSIS

To answer the first question, the navy divers were compared with the published norm group, using t-test for single samples.[5] The original norm group were presented using T-scores, and the scores of the present sample were converted to T-scores to allow comparison. T-scores are standardised scores, with a set mean of 50, and a set SD of 10.

To answer the second question, the navy divers were compared with eight other branches of naval occupations, as well as with a "general SAN" sample. To place this within the national cultural context (in answer to the fourth question), the navy sample was further compared with the scores of other military recruits.[2] Differences between the navy diver group and the other naval occupation groupings were analysed using ANOVA, with Tukey's post hoc test.[10] Comparisons with the scores of other previously published groups were analysed using t-test for single samples.

To answer the third question, the navy divers were compared with a group of SA sport divers, using t-test for independent samples. To place this again within the national cultural context, the navy sample was also compared with the scores of USA sport divers.[3] To further explore whether there were differences between professional and amateur divers, the navy divers were also compared with commercial divers.[2] Finally, the scores of the navy divers were compared with published reports of sport and commercial divers using single sample t-tests.

The data analysis comprises of a number of statistical analyses, creating the potential of Type I errors. To counter this, it was decided to use the $p < 0.01$ level to indicate significance.

## Results

GENERAL POPULATION REFERENCE GROUP

Table 2 presents the single sample t-test analysis using T-scores. The referent group norms are published in Zuckerman (1994).[5] There were no significant differences between the scores of the SAN divers and the published norm group. This was unexpected, and led to a comparison of the general navy group's scores with those of the norm group (using the same technique). This revealed that the SA navy had lower scores on all the markers than the norm group (only BS was not significant at $p > 0.01$).

SA NAVY

The navy divers had a mean age of 25.4 (± 5.2) and the mean age of the general navy group was 25.1 (± 4.0). There were

**Table 3**
**Zuckerman's Sensation Seeking Scale – V: means and standard deviations of the South African Navy sample (see text for statistical results)**
**(TAS – thrill and adventure seeking; ES – experience seeking; DI – disinhibition; BS – boredom susceptibility)**

| Branch | N | Total score | | TAS | | ES | | DI | | BS | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| Divers | 66 | 19.08 | 5.67 | 8.91 | 1.25 | 5.02 | 1.89 | 3.29 | 2.63 | 1.91 | 1.77 |
| General navy sample | 716 | 14.35 | 5.39 | 6.00 | 2.70 | 3.92 | 1.75 | 2.71 | 2.11 | 1.71 | 1.55 |
| Technical | 100 | 15.07 | 5.69 | 6.19 | 2.64 | 4.17 | 1.71 | 2.86 | 2.28 | 1.86 | 1.70 |
| Protection force | 89 | 12.85 | 4.46 | 5.34 | 2.51 | 3.44 | 1.57 | 2.81 | 1.77 | 1.28 | 1.26 |
| Catering | 81 | 13.60 | 4.73 | 5.93 | 2.64 | 3.83 | 1.76 | 2.26 | 2.02 | 1.57 | 1.15 |
| Communication | 60 | 12.83 | 5.19 | 5.45 | 2.95 | 4.10 | 1.80 | 1.97 | 2.02 | 1.32 | 1.35 |
| Administrative | 96 | 13.19 | 5.31 | 5.50 | 2.77 | 3.82 | 1.77 | 2.41 | 2.13 | 1.47 | 1.32 |
| Mine counter-measure | 27 | 14.41 | 5.52 | 5.26 | 2.49 | 3.59 | 1.55 | 3.67 | 2.11 | 1.89 | 1.67 |
| Combat officers | 57 | 17.21 | 5.01 | 7.37 | 2.33 | 4.26 | 1.49 | 2.82 | 2.17 | 2.75 | 1.97 |

also no significant age differences across the subgroups. Gender composition differed across all the groups though, and there were fewer women among the divers than in most of the other groups. The scores of the subgroups are presented in Table 3.

There were significant differences in the total SSS scores of the different occupational groups ($F(8,629) = 11.77$; $p < 0.01$). The navy divers' total SSS scores were significantly higher than those of the technical, protection, catering, communications, administrative, and the mine counter-measures branches ($p < 0.01$ for each). In terms of the total score, there was no significant difference between navy divers and combat officers ($p = 0.6$), mostly due to the combat officers' elevated scores on the BS subscale. However, in total, navy divers scored significantly higher on the SSS than the general navy ($t = 6.83$; $p < 0.01$).

The TAS subscale showed significant differences between the different naval branches ($F(8,629) = 16.95$; $p < 0.01$). Navy divers scored significantly higher than sailors from the technical, protection, catering, communications, administrative, and mine counter-measures branches ($p < 0.01$ for each), and tend to score higher than the combat officers branch. The divers also scored significantly higher than the general navy sample ($t = 8.77$; $p < 0.01$).

There were significant differences between the different naval branches on the ES subscale ($F(8,629) = 5.09$; $p < 0.01$). Navy divers scored higher than sailors from the protection, catering, administrative, and mine counter-measures branches ($p < 0.01$ for each), and tended to score higher than the technical branch ($p < 0.05$). They further scored significantly higher than the general navy sample ($t = 4.86$; $p < 0.01$).

With regard to DI scores ($F(8,629) = 3.38$; $p < 001$), navy divers tended to score higher than the communications branch ($p < 0.05$) and the general navy ($t = 2.08$; $p < 0.05$).

On the BS subscale ($F(8,629) = 6.07$; $p < 0.01$), navy divers tended to score lower than the combat officer sample ($p < 0.05$).

OTHER MILITARY REFERENCE GROUPS

The means and standard deviations of the SAN divers and Norwegian military recruits can be found in Table 4.[2] The SAN divers scored higher on TAS ($p < 0.01$), but lower on DI and BS ($p < 0.01$). The Norwegian group may not be such a useful comparison, though, as they differed (by obtaining higher scores) from all the South African navy groups on all the markers ($p < 0.01$).

The study of Biersner and LaRocco (30 military divers, mean age 29.6) used a previous version of the scale (the 72-item SSS-IV), ruling out direct comparisons with US Navy divers.[1] They do, however, present the same trend as the current group of SAN divers (higher in TAS, lower in ES, DI and BS than norm groups).

SPORT DIVERS

The means and standard deviations of the SAN divers and USA sport divers are presented in Table 4. The SAN divers scored higher on TAS ($p < 0.01$), but lower on ES, DI, BS, and total scores ($p < 0.01$ for each).

SAN divers and SA sport divers were also compared (Table 4). While their totals (and ES scores) were comparable, the SAN divers scored significantly higher on TAS ($p < 0.01$), but significantly lower on BS ($p < 0.01$) and had a tendency toward lower scores on DI ($p = 0.051$) than the SA sport divers.

SA sport divers scored significantly lower than USA sport divers for the total score, TAS and ES ($p < 0.01$ for each) of one study, and tend to score lower than USA sport divers on the total score ($p < 0.05$) of another study.[3,11] There were no significant differences for BS and DI (Table 4).

**Table 4**
**Zuckerman's Sensation Seeking Scale – V: means and standard deviations of the South African Navy divers and six comparison groups**
**(TAS – thrill and adventure seeking; ES – experience seeking; DI – disinhibition; BS – boredom susceptibility)**

| | N | Total score | TAS | ES | DI | BS |
|---|---|---|---|---|---|---|
| SAN divers | 66 | 19.08 | 8.91 | 5.02 | 3.29 | 1.91 |
| General navy | 716 | 14.35 | 5.94 | 3.98 | 2.69 | 1.71 |
| Norwegian military recruits | 28 | 20.89 | 6.61 | 4.75 | 5.82 | 3.71 |
| USA sport divers[3] | 30 | 22.5 | 8.5 | 6.1 | 5.1 | 2.7 |
| USA sport divers[11] | 29 | 22 | | | | |
| SA sport divers | 22 | 18.73 | 6.05 | 4.95 | 4.50 | 3.23 |
| European 'risky sportsmen'[12] | 332 | 23.79 | 7.86 | 6.21 | 5.27 | 4.44 |

SA sport divers scored significantly lower than the sample of European 'risky sportsmen' (N = 332, which included mountaineers, skiers, scuba divers, white-water canoeists, parachutists, hang-glider pilots, and motorcycle racers) on the total score ($p < 0.01$), TAS ($p < 0.01$), and ES ($p < 0.01$), and tended to score lower on BS ($p < 0.05$) (Table 4).[12]

COMMERCIAL DIVERS

When compared with a small sample (N = 5) of Norwegian North Sea divers, the SAN divers tended to be more thrill- and adventure-seeking orientated, have the same inclination in terms of experience seeking, and have lower tendencies towards disinhibition and boredom susceptibility, and total sensation-seeking behaviour.[2]

## Discussion

ARE SOUTH AFRICAN NAVY DIVERS DIFFERENT?

When compared with the general population, the SAN diver sample did not have a markedly different profile. However, as the SA naval group scored lower than the general norm population (USA students), and Norwegian military recruits, the lack of a 'navy diver profile' could be due to cultural differences. Their scores may need to be compared with a general (non-navy) SA population to establish whether they do indeed ascribe to a separate profile.

Elevated scores in respect of thrill- and adventure-seeking indicators seem typical of military diving. Within the SA context, the elevated thrill and adventure seeking is indicative of the diving context, and not merely a reflection of the military environment. The increased thrill- and adventure-seeking tendencies of SAN divers follow the military diving samples of other countries (who show higher thrill and adventure seeking, but lower experience seeking, disinhibition, and boredom susceptibility). The same trends appear when they are compared with US and SA sport divers, and with commercial divers. The military diving profile (in contrast to that of civilian sport and commercial diving) may thus have a tendency to look as follows: typically higher thrill- and adventure-seeking traits, with lower tendencies of experience seeking, disinhibition and boredom susceptibility.

IS SENSATION SEEKING A PARTICULAR TRAIT OF THE MILITARY CONTEXT?

Sensation seeking per se does not appear to be a strong indicator of SA servicemen and women. The SA Navy produced low disinhibition and susceptibility-to-boredom scores, which decreased their total sensation-seeking scores. This may be a function of the military itself. It is an organisation with strict environmental controls, in the form of the rules and regulations of the military, which discourage less socially acceptable forms of sensation seeking. Alternatively, the military norms of this culture may deem certain activities (like the use of alcohol) as totally acceptable, thereby reducing the need to engage in less socially acceptable activities when seeking new sensations. The significantly lower scores as compared with those of the Norwegian recruits may be a function of cultural differences.

IS SENSATION SEEKING A PARTICULAR TRAIT OF THE DIVING FRATERNITY?

All published samples of divers report elevated TAS scores compared with their controls, and sometimes report elevated total scores as well.[3,10,13] However, ES, DI, and BS scores are seldom significantly raised, and even decreased at times. This suggests that divers enjoy the thrill- and adventure-seeking aspects of sensation seeking, but seem less interested in the other forms of sensation seeking. The dangerous nature of diving may account for some of the lower disinhibition and boredom susceptibility scores: the careful planning required for high-risk activities (like diving) might attract individuals who are less inclined to disinhibitory activities, while the painstaking preparation that is necessary would lead to the natural attrition of individuals who are high in boredom susceptibility.

In conclusion, divers per se are not automatically high sensation seekers. Rather, navy divers are more thrill and adventure seeking than other navy groups and other diving groups, and high thrill and adventure seeking could therefore be seen as inherent to naval diving.

DOES NATIONAL CULTURE PLAY ANY ROLE?

This study highlighted the role of culture in comparing scores. The general navy sample scored lower than the general population (USA students) and Norwegian military recruits. SA sport divers further scored lower than US sport divers, and also lower than a sample of Europeans engaged in risky sports.

It could be argued that the SA naval sample was older, and had more responsibilities than the student sample (e.g., family commitments, work responsibilities). However, it is proposed that cultural background would also have played a significant role in the different scores. For example, in SA society, many young people join the military for its career prospects, and not in search of adventure. Many SA servicemen and women are further the primary caretakers of large, extended families, and may be averse to taking risks that may jeopardise their income or ability to fulfil their social responsibilities.

Differences between other international samples were previously demonstrated, and were attributed to differences in national culture.[14] Others ascribed cross-cultural differences between, for example, American and Arabic subjects, to their respective socialisation experiences, and suggested that the activities in the SSS may not be suitable

for all cultural or national groups.[15] It was further reported that non-Western cultures scored lower on the total and subscale scores than Western countries.[16] This emphasises the need for national samples for norm groups, in order to compare results in a meaningful way.

Do divers dare to live dangerously? They do prefer to engage in thrill- and adventure-seeking activities, which is particularly true for navy divers. However, due to the risky nature of their profession or sport (and possibly their training to recognise it), they tend to prefer less disinhibitory activities, and those who persevere in diving furthermore seem less susceptible to boredom.

**References**


1 Biersner RJ, LaRocco JM. Personality characteristics of US Navy divers. *J Occup Psychol*. 1983; 56: 329-34.
2 Breivik G. Personality and sensation seeking in risk sport: a summary; unpublished data, 1991. In: Zuckerman M, editor. *Behavioural expressions and biosocial bases of sensation seeking*. New York: Cambridge University Press; 1994. p. 164-5.
3 Taylor DMcD, O'Toole KS, Auble TE, Ryan CM, Sherman DR. Sensation seeking personality traits of recreational divers. *SPUMS J*. 2001; 31: 25-8.
4 Zuckerman M. *Sensation seeking: beyond the optimal level of arousal*. Hillside, NJ: Erlbaum; 1979.
5 Zuckerman M. *Behavioural expressions and biosocial bases of sensation seeking*. New York: Cambridge University Press; 1994.
6 Nevo B, Breitstein S. *Psychological and behavioural aspects of diving*. Flagstaff, AZ: Best Publishing Company; 1999.
7 Goma-i-Freixanet M. Personality profile of subjects engaged in high physical risk sports. *Pers Individ Differ*. 1991; 12: 1087-93.
8 Roberti JW, Storch EA, Bravata E. Further psychometric support for the Sensation Seeking Scale-Form V. *J Pers Assess*. 2003; 81: 291-2.
9 Zuckerman M. Sensation seeking and sports. *Pers Individ Differ*. 1993; 4: 285-93.
10 Howell DC. *Statistical methods of psychology*, 4th edition. Belmont, CA: Wadsworth Publishing Company; 1997.
11 Heyman SR, Rose KG. Psychological variables affecting SCUBA performance. In: Nadeau CH, Halliwell WR, Newell KM, Roberts GC, editors. *Psychology of motor behaviour and sport*. Champaign, IL: Human Kinetics Press; 1979. p. 180-8.
12 Goma-i-Freixanet M. Prosocial and antisocial aspects of personality. *Pers Individ Differ*. 1995; 19: 125-34.
13 Bacon J. Sensation seeking levels for members of high-risk organisations. Unpublished manuscript; 1974. In: Zuckerman M. Sensation seeking and sports. *Pers Individ Differ*. 1993; 4: 285-93.
14 Zuckerman M, Eysenck S, Eysenck. Sensation seeking in England and America: Cross-cultural, age, and sex comparisons. *J Consult Clin Psychol*. 1978; 46: 139-49.
15 Torki M. Dimensions of Sensation Seeking Scale Form VI: A cross cultural comparison. *Percept Mot Skills*. 1993; 76: 567-70.
16 Wang W, Wu Y-X, Peng Z-G, Lu S-W, Yu L, et al. Test of sensation seeking in a Chinese sample. *Pers Individ Differ*. 2000; 28: 169-79.



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