

Published online: 7-21-2016

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### Recommended Citation

Van Wijk, Charles H. and Dalla Cia, Vittorio (2016) “Covert Coping” in Extreme Environments: Insights from South African Submarines,” *Journal of Human Performance in Extreme Environments*: Vol. 12 : Iss. 2, Article 3.

DOI: 10.7771/2327-2937.1083

Available at: <https://docs.lib.purdue.edu/jhpee/vol12/iss2/3>

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# “Covert Coping” in Extreme Environments: Insights from South African Submarines

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## Abstract

Submariners are a group of people who live and work in enclosed habitats. In this confined environment, they need to balance the emotional needs of individuals with the resources of the group, to ensure effective coping for all. This study explored the mechanisms of maintaining this balance.

Observations and a self-report measure (a modified Brief COPE) were used to describe the coping of submariners during deployment. Findings from the thematic analysis and self-report instrument are briefly described. An apparent contrast between the qualitative observations and quantitative data was noted, and when closely examined reveal two mechanisms whereby submariners managed their individual psychological needs without unbalancing the psychological state of the collective group. These were, firstly, the use of humor and talking nonsense as sublimated—or covert—way of venting emotions, and secondly, the use of rituals such as mealtimes as covert opportunities to provide and receive psychological support.

This study illustrates how groups living in enclosed habitats may use covert mechanisms to cope with emotional needs, in order to maintain the emotional balance in the confined environment.

*Keywords:* Submariners, coping, humor, venting, social support, extreme environments

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## Introduction

Submariners are a group of people who live and work in a hostile physical environment. Within the South African Navy (SAN), submarine duty is considered one of the most challenging and psychologically demanding environments for sailors. The women and men serving on board submarines are exposed to a wide range of potential stressors, which include biological, physical, social, and mental stressors (detailed in Van Wijk, 2003). *Social stressors* include the lack of privacy, very close interaction with crew members with no escape from the close interpersonal environment, and the constant pressure to maintain good interpersonal relations (Van Wijk, 2003).

This is not unique to submarines, and may also apply to people who live and work in other isolated, confined, and often artificially engineered environments, such as spacecraft, weather stations, and polar outposts (Sandal, 2000). There is a considerable body of knowledge regarding coping in extreme environments (Cowings et al., 2007; Sandal, 1998, 2000; Sandal, Endresen, Vaernes, & Ursin, 2003; Steel, 2005); these environments require the development of effective physiological, psychological, and social coping skills (Suedfeld & Steel, 2000). This report specifically concerns the social context in which such coping takes place.

To endure (and even thrive, cf. Suedfeld, 2001) in confined habitats, from which no physical or emotional escape is possible, would require such a group to collectively protect their emotional resources. Onerous emotional demands may seriously tax a group's collective emotional resources, and the group may therefore need to keep the emotive load within manageable levels for long periods. Coping strategies thus need to facilitate adaptive behavior in the interest of both individuals and the group, simultaneously. In a submarine, crew members need to find ways to meet their emotional or psychological needs and facilitate coping—whether it is to express emotions or obtain social support—in ways that will maintain the balance of the emotive load in the submarine.

It is suggested that there are two interpersonal requirements for effective coping in the extreme environment of a confined submarine habitat. The first requirement is to keep the emotive load *on* the group low (e.g. less expression of negative feeling), and the second is to keep the emotive demand *from* the group low (e.g. less active seeking of psychological support). Both are required so as not to exceed the group's available psychological resources. Submariners thus need to

maintain the balance between the emotional needs and resources of the individuals and of the group, in order to maintain the social cohesion critical for their collective wellbeing.

Within a submarine, the larger context may pose additional challenges to achieving this. For example, although social support may act as a buffer against stress (cf. Palinkas, 1990), seeking social support as a coping strategy might not necessarily be encouraged in a military context where interpersonal sensitivity is often deemphasized, and the sharing of personal concerns discouraged (Sandal et al., 2003).

A number of studies investigated coping on submarines specifically. Sandal et al. (2003) reported that problem-focused coping strategies and interpersonal sensitivity were associated with superior coping during submarine missions. Certain personality profiles seemed to cope better with the social demands of the missions, with interpersonal sensitivity suggested as the mechanism to reduce the likelihood of interpersonal tension and increase the tolerance for the constant proximity and contrasting needs of other crew members.

Kimhi (2011) reported that submariners used two main coping strategies, namely positive thinking and optimism, as well as cynicism, humor, and culture of Palavra (meaning “talking nonsense”). In terms of social relationships, submariners were characterized by high social cohesion and the avoidance of conflict, which in turn would support the maintenance of cohesion.

Extensive use of humor among submariners is often reported (Danziger, 2011; Ferguson, 2014), and as indicated, was found to be one of the two main coping strategies used by submariners (Kimhi, 2011). Benevolent humor has been shown to enhance social relationships, reduce conflict, and increase group morale (Kuiper, 2012), and within the submarine environment, the use of humor is recognized as vital to maintaining good relations under stressful conditions.

Submarine crews are also characterized by high social cohesion (Danziger, 2011; Ferguson, 2014; Kimhi, 2011), which offers the social support that may buffer against stress (Palinkas, 1990), and, through multiple other mechanisms (cf. Thoits, 2011), advance wellbeing. In confined spaces, the promotion of social cohesion also needs to be balanced with the need for privacy in such environments.

SAN submariners are characterized by high resilience (Van Wijk, 2008), and presumably have good self-regulating skills, which might make them dispositionally less demanding of the group’s psychological resources. In spite of this, the demands of submarine operations and their associated stresses may require all to draw on the collective psychological resources of the group, to maintain effective coping.

This report reflects on the observation that in order to maintain this balance, and avoid overt demands on and from the group, members need to fulfil their psychological needs through “covert” mechanisms.

## *Background of This Study*

During 2015, two military psychologists embarked on a SAN submarine for duties during an operational exercise. While onboard, their assignment allowed them the opportunity to also record their observations relating to the social dynamics of coping responses and ways of dealing with context-specific issues among the crew. Further, a measure of self-reported coping strategies used over the duration of the deployment was also administered at the end of the deployment.

The aim of this brief report is to explore coping during submarine deployments, and in particular the apparent contrast between the self-reported and observed coping responses of submariners while at sea. This was done with the intent to better understand the social dynamics of coping in a confined space in an extreme environment.

## **Method**

### *Participants*

The submarine crew consisted of 32 volunteers, who all participated in the study. They comprised 5 women (mean age  $29 \pm 5$ ) and 27 men (mean age  $35 \pm 8$ ). Most of the crew members had served in the same submarine for approximately two years.

### *Measures*

#### *Participant observations and interviews*

The two psychologists joined the crew for a separate purpose, but which enabled them to act as onboard observers additional to their assignment. They kept extensive contemporary field notes, which included their observations of verbal interactions of crewmembers, recorded in a research diary. Unstructured interviews were also conducted with 18 crew members to explore the meaning of observed phenomena. The psychologists were known to the submariners, having sailed together previously.

#### *S-COPE*

The Brief COPE (Carver, 1997) records coping responses across 14 domains. It was modified by excluding two domains deemed not applicable to the study context, resulting in a 24-item scale (referred to here as the S-COPE). The crew completed the S-COPE once, on the final day of their deployment, shortly before disembarking from the submarine. The instruction set referred to the “duration of the deployment”.

The domains excluded were substance use and self-blame. The use of any illicit substances is prohibited onboard the submarine, and due to limited privacy would not have gone unnoticed, and thus unlikely to have been a

coping strategy. Further, given the interdependent nature of activities onboard a submarine, the use of self-blame was deemed unlikely, and thus excluded.

### *Ethics*

The study was conducted according to the principles set out in the Declaration of Helsinki of 2013. The submariners were all volunteers, and gave written informed consent that their data could be used. The project was approved in advance by the relevant naval and military health service commands.

### *Data Analysis*

Observations of interactions were contemporaneously recorded in a written journal, together with interview data. These written accounts were subjected to thematic analysis, which was conducted following established guidelines (Braun & Clarke, 2006; Silverman, 2012). This was done while naïve to S-COPE results. S-COPE responses are presented using descriptive statistics, namely frequency of reported use. The apparently contrasting self-reported and observed coping responses only became visible after the initial analysis, and the interpretation of these data was done retrospectively.

## **Results and Discussion**

### *Observations*

The observations recorded related to four main themes:

(1) *Humor, light bantering, talking nonsense.* The regular use of humor was recorded, and even mundane small-talk frequently had a humorous slant to it. Verbal bantering occurred often, but was never caustic (i.e. not corrosive to interpersonal relations).

The use of friendly bantering and talking nonsense as mechanisms of coping with both empty time and social interaction corresponded with previous reports (cf. Kimhi, 2011). The use of humor to enhance social relationships, reduce conflict, and increase group morale (Kuiper, 2012) was clearly visible in the submarine.

(2) *The meaning of mealtimes.* For a specific 48-hour period formal mealtimes were suspended, due to testing of equipment and procedures. However, the observers recorded increased activity in the submarine at mealtimes, even though individuals ate pre-packed rations at different times and spaces over this period. During all the interviews crew members referred to this, and related it to the meaning of food and mealtimes.

Submariners eat three meals a day, which are consumed in the communal spaces onboard. It is often the only time submariners not sharing a watch station will meet one another. Mealtimes thus have important non-nutritional functions, of which three were identified:

Firstly, meals are an important social anchor. It is the opportunity to socialize and connect, and in so doing receive and provide mutual psychological support.

Secondly, mealtimes also serve as important markers to structure the day. In the enclosed submarine habitat, there are two cues employed to orientate individuals' time-of-day: one is through the use of light, and the second through maintaining the fixed schedule of mealtimes (e.g. breakfast in the morning, supper at night, etc.).

Thirdly, in an environment with limited personal comforts, meals are also an important symbol of self-nurture.

(3) *Need for social interaction/connection.* In spite of the confined environment, there seemed a need for social interaction, and submariners created opportunities for this in both their off-time and during their watches. Opportunities for socializing—like mealtimes—were consciously missed when not available.

(4) *Venting.* There was a significant amount of venting (“expressing negative feelings”) recorded by the observers, often in the form of humorous bantering or talking nonsense. This appeared closely related to the first observation, with venting taking place under the guise of humor, and included reference to food, lack of information, and general frustrations (all typical of submarine deployments).

### *S-COPE*

Self-report coping responses using the S-COPE were recorded on termination of the deployment, and are presented in Table 1. Three of the top four, namely positive reframing, acceptance, and humor, have previously been shown to be effective in dealing with setbacks and enhancing personal satisfaction (Stoeber & Janssen, 2011).

The submariners' perceptions around their use of coping responses at times corresponded with the observations by the psychologists, and at times were at odds with them. In other words, what they reported to do, and what they appeared to do, did not always agree. For example, the research diary records did suggest frequent use of humor, but also regular use of venting, in contrast to the 58% S-COPE reported non-use. This apparent contrast led to a re-examination of the qualitative data, which in turn suggested that given the confined space and implications of a heightened emotive load, there was a strong need to manage (i.e. regulate) social and emotional interaction very carefully. This qualitative analysis of the data uncovered two mechanisms whereby submariners managed their individual psychological needs without unbalancing the psychological state of the collective group.

#### *Mechanism 1. The Use of Humor/Talking Nonsense: Venting the Covert Way*

As noted, there was a significant amount of venting (“expression of negative feelings”) recorded by the observers, in contrast to what the participants reported. Qualitative

Table 1  
S-COPE responses by frequency of domain indicators.

Coping domain	Used this a “medium amount”	Used this “only a little”
	or “a lot” (%)	or “not at all” (%)
Self-distraction	77	23
Active coping	77	23
Denial	29	71
Use emotional support	39	61
Use instrumental support	23	77
Behavior disengagement	6	94
Venting	42	58
Positive reframing	81	19
Planning	55	45
Humor	74	26
Acceptance	87	13
Religion	26	74

analysis of the data suggested that a significant amount of venting may have taken place in the course of “talking nonsense”. Much of the light bantering and talking nonsense appeared to be venting-in-disguise, which could be seen as an effective and socially mature way of sublimating<sup>1</sup> strong feelings—thus finding emotional release (by “expressing” emotions) without loading the emotive atmosphere in the submarine.

In an environment where complaining would load the emotive atmosphere in the submarine negatively, and potentially burden the emotional coping resources of others, overt expression of negative personal feelings would not be welcomed by the group. At the same time, feelings remaining unexpressed may be detrimental to the psychological coping of an individual. To maintain the emotive balance in the confined environment, and protect both the individual and the group, venting has to go “underground”. Humor, banter, talking nonsense—all became ways through which to express personal feelings without it being constructed as complaining—thus venting sublimated into interpersonally acceptable small-talk.

In the same submarine context, “blowing off steam” would not be endorsed, especially if directed at a fellow crewmate or if unsettling to crewmembers. However, through humor, covert venting became an effective way of emotional release, and its “undercover” nature allowed the emotive load in the submarine to remain within manageable levels.

Lefcourt, Davidson, Prkachin, and Mills (1997) proposed two forms of coping strategies linked to humor, which has been supported in subsequent studies (Abel, 2002): firstly, using an emotion-focused coping strategy as a defensive measure, by finding humor in a stressful situation and thus reducing negative emotional reactions; secondly, a problem-focused coping strategy using humor

to alter the stressful situation itself. Alternatively, the use of humor has also been described as a mechanism of impression management—where humor may be used to make oneself appear to be coping, rather than used to cope (Moran, 2003). In addition to the above understanding of coping through humor, we propose another: humor employed, not so much to cognitively restructure the appraisal of a situation, but rather as a tactic for letting off steam inoffensively, in other words “sublimated venting”.

### *Mechanism 2. Sharing Support the Covert Way: The Ritual of Mealtimes*

Both receiving and providing social support is a human need that can also be an effective coping skill. However, openly offering and/or seeking psychological support in the task-orientated world of military submarines may not always be considered socially acceptable, and could embarrass those who either need to receive or provide support as part of their own coping process. Further, openly seeking or providing social support would not be allowed in a way that would tax the group’s collective psychological resources, and thus has to be done covertly.

Such coping behaviors again have to go “underground”, and find their expression in the connections and interactions during other opportunities, e.g. mealtimes. Socializing as a coping response was observed to take place during mealtimes and during watch-keeping through light conversations, jokes, and idle small-talk.

Mealtimes in particular became opportunities for covertly providing and receiving psychological support. This allowed for an unspoken form of social sharing, and succeeded in keeping the emotive demand from the group manageable low. The suspension of mealtimes was acutely missed, and from the first missed meal crew members spontaneously created other opportunities for social interaction (e.g. communal card games). Further, formal daily operational debriefings also became covert opportunities of social connections, under the disguise of “work”.

### *Limitations and Future Directions*

There are two main limitations to this study. Firstly, the unique nature of both the group and the context may make the results difficult to replicate. Thus, future research may need to expand similar observational studies to other unique and extreme environments in order to ascertain whether such collective coping strategies also occur in other contexts. Secondly, it is recognized that the role of the psychologists provided some confounds, both in terms of their potential impact on group dynamics as well as potential impact of group dynamics on their observations. While their familiarity with the submarine and the crew may to some extent have ameliorated this, their influence as participant-observers cannot be discounted.

<sup>1</sup> Sublimation refers to expressing a feeling by changing it into a form that is socially acceptable.



Further studies could consider the question whether individuals with these coping styles volunteer for submarine duty, or whether they develop these coping styles in response to the submarine environment.

## Conclusion

In an environment where the overt expression of negative emotions, and the overt seeking of emotional support, might heighten the emotive load on the group, such coping responses need to be expressed covertly. While overt coping strategies have been reported previously, this study reported the use of two specific covert strategies. To appreciate submariners' mechanisms of regulating the emotive atmosphere in the submarine, it may be helpful to understand their use of humor as a form of sublimated venting. It is proposed that covert venting, in the form of humor or talking nonsense, is used to keep the emotive load on the group manageable low. Further, it may be helpful to understand mealtimes as opportunities for covertly providing and receiving psychological support. Formal rituals for socializing (like mealtimes) became covert or unspoken forums for social connection, which in turn is used to keep the emotive demand from the group manageable low.

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