

Assessment Scale For Trainee Self-concept In The Portuguese Navy: Psychometric Properties

Ana Frade^{a*}, Feliciano H. Veiga^b

* Corresponding author: Ana Frade, anafrade_1982@hotmail.com

^a*PhD Graduated, Av. Quinta da Amizade, lote 121 3Dt. 2910-265, Setúbal, Portugal, anafrade_1982@hotmail.com

^bProfessor Dr, Universidade de Lisboa, Instituto de Educação, Alameda da Universidade 1649-013, Lisboa, Portugal, flveiga@ie.ul.pt

Abstract

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In this study the Assessment Scale for Trainee Self-concept in the Portuguese Navy (ASTSC-PN) was adapted to the military context. The psychometric properties are presented and the results from the factor analysis displayed, which highlighted five significant dimensions: interpersonal relationships, competence, satisfaction, self-acceptance, and risk acceptance, with an item distribution coherent with the Teacher Self-concept Evaluation Scale (Veiga, Gonçalves, Caldeira, & Zuniga, 2006). The sample involved 149 trainees of the Training Course for Petty Officers 1st Class of the Portuguese Navy, ages ranging from 25 to 36, mostly of male gender. When studying external validity the scale factors appeared correlated, as expected, with other variables of commitment with training tasks, assessed with Assessment Scale for Trainee Engagement in the Portuguese Navy (ASTE-PN) and Utrecht Work Engagement Scale (UWES), and with other variables of learning motivation, assessed with Learning Motivation Scale (LMS). The results suggest that the adapted version presents good psychometric qualities, which makes it useful in research and intervention, in psychology and education within a military context.

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1. Introduction

Self-concept is viewed as “the perception individuals have of themselves as they are and in relation to others” (Veiga, 2012, p. 20), and this self-evaluations affects each aspect of emotions, thinking, interest, motivation and human behaviour (Belo, Faria, & Almeida, 1998; Epstein, 1973; Gecas, 1982; Rawat, 2011; Veiga, 2012; Wigfield & Karpathian, 1991). Rawat (2011) defends that “our self-evaluation affects every significant aspect of our emotions, thinking, feeling, motivation or behaviour” (p. 122). Other authors (Byrne, 1984; Cokley & Patel, 2007; Faria, 2002; Faria & Fontaine, 1990; Lent,



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Brown & Gore, 1997; Marsh & Hattie, 1996; Shavelson, Hubner, & Stanton, 1976) define it as the set of attitudes, feelings and self-knowledge about one's own capacities, competence, appearance and social acceptability. In this perspective, the theme of self-concept as a central element of personality (Burns, 1979; Marsh & Hattie, 1996) is fundamental to understand how the individuals organize their actions, inhibiting them or playing them, according to their self-concept whether it is negative or positive (Faria & Fontaine, 1990, 1992). This, therefore, can be considered an essential factor to ponder while theorizing about human behaviour and personality (Burns, 1979; Marsh & Hattie, 1996).

It manifests through a dynamic system of subject definition that roots itself in the observations and interpretations that subjects make about their own behaviour, the beliefs created about themselves through interaction with others, the comparisons made between themselves and the instituted patterns, the temporal validation of their own evolution, and the cultural referential of their context of belonging (Baron & Gaziano, 1991; Neto, 1998).

Due to what precedes, the interest of studying self-concept fundamentals itself in its action as a mediating variable of cognitions, motivations, behaviours and affections of individuals. However, given the multidimensionality (Byrne & Shavelson, 1996; Marsh, 1990) of the construct, using general measures for self-concept, which encompass different sides, won't be the most adequate way to investigate the self-perception of the subject at work. Attending specifically to the professional self-concept, it is conceptualized as a conscious, evolving, self-descriptive and evaluative construct (Ireson & Hallam, 2008; Nogueira, 2002; Pinto, 2003; Veiga, 2012), which allows the self-evaluation of the subject in context of work (Souza & Puente-Palacios, 2011). Villa and Calvete (2001) assume it as "made up of self-schemata relating to the various facets of oneself as regards to professional activity". Costa (1996) defines professional self-concept as "the perception subjects have of themselves in relation to the work (chores) that they execute", implying the self-perception of their chores, the organization where they work, and other matters of importance in a work situation (Tamayo & Abbad, 2006). The professional self-concept arises underpinned in the social and cultural phenomenon, in other words, it is affected by the professional norms allowing itself to be called a professional socialization phenomenon (Arthur & Randle, 2007). According to Costa (1996) and Souza and Puente-Palacios (2011), self-concept should be considered according to relative individual perceptions: professional fulfilment – self-perceptions of subjects regarding their aspirations and ideals achieved through the execution of work, as well as the self-perception of their role and status in the organization; competence – self-perceptions of subjects concerning the confidence in their capacities to perform the work; and health – self-perceptions of subjects about their satisfaction (Siqueira & Gomide Jr., 2004) with work experiences.

In what concerns the military context, it presents many peculiarities when compared to other working contexts. One of the most important functions of military personnel is the preparation and execution of combat operations, as they always have to act under extreme conditions when called upon, with imminent risk of sacrificing their own lives. Few organizations call for this level of commitment and potential sacrifice from their members (LeBouef, 2013). According to LeBouef (2013) "leadership in the military services must be built around a distinctive self-concept. It is the core of what makes military leadership special" (p. 771). Hence, the necessity to conceptualize the military professional

self-concept, considering it the perception that the military have of themselves in relation with the work they execute (Frade, 2015).

Though there is vast literature on self-concept (Veiga, 2012), when revising the literature considering the existence of evaluation instruments for professional self-concept in several working groups, it reveals itself little. Moreover, no instrument there was found to assess training self-concept in military context. Therefore, given the lack of proper instruments, the work was conducted based on the adaptation of the Teacher Self-concept Evaluation Scale (Veiga et al., 2006) to the military professional context, hereby creating an instrument to assess self-concept in trainees from the Training Course for Petty Officers 1st Class of the Portuguese Navy. This instrument was called Assessment Scale for Trainee Self-concept in the Portuguese Navy (ASTSC-PN). The adaptation process produced the data and the methodology presented here.

2. Research methods

The study is presented below starting with sample subjects, followed procedures and the instrument details.

2.1. Subjects

This study considered a representative heterogeneous and non-probability sample of 149 trainees from the Training Course for Petty Officers 1st Class which started in 2011 and 2012. This course is composed of seventeen specialties such as: radar operator, machinist's mate, torpedo man's mate, mess management specialist, artilleryman, electrician's mate, mechanical automobile driver, ship's serviceman, gunner's mate, marine, clerk, operations specialist, electromechanical technician, driver and services.

The sample consists of adults, ages ranging from 25 to 38 of both genders, but mostly male (92,6%). 53,7% of the trainees left the residence area to join the Portuguese Navy and 45% maintained the same residence area. 20,8% of the trainees live in the barracks because their residence area is located over 120 km.

2.2. Procedure

The course directors were asked for permission to conduct the survey after research approval by the Chief of Staff of the Portuguese Navy. According to the availability of the trainers accompanying the process and without prejudice to the training, the data were collected immediately after classes, inside the classrooms. The trainees were told that cooperation was voluntary and anonymity was ensured. The survey's objectives were explained and some particularities of the questionnaire clarified.

2.3. Instruments

Since the analysed literature demonstrated a lack of instruments for the assessment of self-concept adapted to the complexity of the military population – namely trainees attending the Training Course

for Petty Officers 1st Class – the instrument here presented was based on the work of Veiga and colleagues (2006) regarding the Teacher Self-concept Evaluation Scale (TSCES).

TSCES is of a self-descriptive nature and its purpose is to evaluate the professional self-concept of teachers in several dimensions: competence (e.g., “I feel very competent in my profession”), relationship with the trainees (e.g., “I feel secure of the way I relate to my trainees”), relationship with colleagues (e.g., “I feel integrated in the relationship with my colleagues”), satisfaction (e.g., “I feel frustrated at work”), acceptance of the risks and initiatives (e.g., “change doesn’t disturb me”) and self-acceptance (e.g., “I feel good about myself, even if I’m not perfect”). This instrument was built with 33 items, 26 of which revealed a positive self-concept (direct items) and 7 pointed out a negative self-concept (diverse items), with answers in a Likert scale of agreement, from 1 (completely disagree) to 6 (completely agree). The alpha coefficient for TSCES was .89, with the following values per factor: .85 (competence), .77 (relationship with colleagues), .74 (relationship with trainees), .67 (satisfaction), .74 (acceptance of initiatives), .70 (self-acceptance) (Veiga et al., 2006).

Due to the fact that TSCES was directed toward teachers and the population of the present study is the students, some expressions and terms were substituted. Therefore, the term "students" was replaced by “colleagues”. Expressions such as “I think, in general, that I’m a good teacher” were replaced by “I think I’m good in what I do”, or “I am known for being an efficient teacher” was replaced by “I am known for being an efficient professional”. In the original scale some items were related to the relationship with the students and the relationship with colleagues. In the adapted scale of the present study, the items regarding the relationship with students were altered allowing the adaptation to the relationship with colleagues. This way, all items of the original scale were included, with the proper adaptations, originating the ASTSC-PN.

For the response options, a 6-point Likert scale was chosen, where the trainees classify themselves according to their degree of agreement, choosing an answer for each of the items from disagree entirely (1) to agree entirely (6).

With such a scale, the survey was pilot tested on 21 sample trainees to check if any interpretation issue would arise from the test. Throughout the collected material a few corrections were made and from then on the instrument was considered ready for application.

3. Results

Before the statistical analysis of the results, an inversion of the numeric values of the inverse items (5, 11, 15, 17, 23, 28, 32) was conducted. The statistical analysis that follows studies the internal and external validity of the results.

3.1. Internal validity

For internal validity, we used the procedure "Reliability" from the SPSS – version 21. Initially the factorial analyses of main components was made according to the original scale, in other words, with the identification of seven factors, two of which revealed little expressiveness. Items 6, 11, 20, 27, 30, 31, 32 e 33 were excluded from the analysis because they were not considered to blend into the factor

significance onto which they loaded. A new exploratory analysis of item distribution by factors was performed, with the identification of five factors and without indication of the number of factors. In both cases, the factor analysis of the results to the principal components followed by “varimax” rotation presented five significant dimensions, classified according to the original scale: interpersonal relationship (RIP), competence (COM), satisfaction (SAT), self-acceptance (ATA) and acceptance of risks and initiatives (ARI) –, with the adequate integration of each item in the signification given to each factor. A general dimension was also considered – total self-concept (ACT) – from adding the scores obtained in each dimension. (see Table 1).

Table 1. Results from factor analysis

Items		Factor
Interpersonal Relationship		1
2	I feel integrated in the relationship with my colleagues.	.608
4	I feel secure of the way I relate to my colleagues.	.706
8	I like the relationships I establish with other people at work.	.652
10	My colleagues trust me completely.	.742
14	I feel cherished by other people.	.627
16	I like the relationships I have with my colleagues.	.721
22	My colleagues cherish me.	.787
26	I feel I am well accepted by other people.	.646
Competence		2
1	I feel competent in my profession.	.801
7	I think I am good at what I do.	.744
13	I have the competencies to perform the chores that I am responsible for.	.430
19	I believe in my own competences.	.553
25	I feel confident about my own capacities.	.504
Satisfaction		3
5	I feel frustrated at work.	.628
17	My work does not satisfy me.	.735
23	If it was possible I would change my profession.	.807
28	I want to change my profession.	.787
Self-acceptance		4
12	I feel good about myself, even if I'm not perfect.	.690
18	I know what I am capable of doing.	.466
24	I learn from my own mistakes.	.701
29	I think I am always learning.	.574
Acceptance of Risks and Initiatives		5
3	I like to think about new projects.	.311
9	Change doesn't disturb me.	.616
15	I have difficulties in taking initiative.	.407
21	I like to take risks.	.775

The total percentage of explained variance was 68,51%. The interpersonal relationship factor explained 45.3% of the total variance (“initial total eigenvalue” = 11.3), the competence factor explained 8.2% of the total variance (“initial total eigenvalue” = 2.0), the satisfaction factor explained 5.1% of the total variance (“initial total eigenvalue” = 1.4), the self-acceptance factor explained 5.0% of the total variance (“initial total eigenvalue” = 1.2), and the acceptance of risks and initiatives factor explained 4.5% of the total variance (“initial total eigenvalue” = 1.1).

The factorial structure of ASTSC-PN revealed and confirmed important dimensions with the following meaning: Interpersonal Relationship – referring to the perception of the quality of interpersonal relationships established with colleagues and other elements of the community, as well as

the quality of security and integration in the relationship with others; Competence – referring to the perception that the students have about their competence, which includes the trust feeling of the subjects as professionals, possessing the necessary qualities to complete the chores they are responsible for, as well as feeling capable of solving problems that might come up during the execution of their functions; Satisfaction – allusive to the self-evaluations related to work and exercised functions, including the affective and emotional component of the individual experiences or beliefs; Self-acceptance – related to the feeling of self-understanding and capacity to recognize their own abilities and difficulties; Acceptance of Risks and Initiatives – referring to the capacity of the subjects to put effort and face the consequential risks of their own choices, hence an orientation to proximity/promotion is positively related with the cognition, motivation and behavior, on the other hand an orientation towards avoidance/prevention is negatively related with these results.

The semantic congruency of the factors or scale dimensions is not safe from reconsiderations and, in later studies, may still be subject of greater attention.

In Table 2, high positive correlations were found among every dimension of self-concept. In general, it may be said that five dimensions assess the related facets of self-concept.

Table 2. Correlations among ASTSC-PN dimensions

	RIP	COM	SAT	ATA	ARI	ACT
RIP	1.000					
COM	.752**	1.000				
SAT	.476**	.503**	1.000			
ATA	.690**	.787**	.498**	1.000		
ARI	.609**	.553**	.541**	.537**	1.000	
ACT	.877**	.866**	.752**	.819**	.760**	1.000

** p < .01

Table 3 shows the coefficients of internal consistency (“alpha” homogeneity indexes) obtained in the several factors, in the general sample.

Table 3. Coefficients of scale and factor internal consistency

Factors	Cronbach's Alpha	No. of items
Interpersonal Relationship	.923	8
Competence	.888	5
Satisfaction	.811	4
Self-acceptance	.781	4
Acceptance of Risks and Initiatives	.621	4
Total Self-concept	.935	25

As observed, the “alpha” index values in the interpersonal relationship factor and in total engagement – resulting from the sum of scores obtained in each dimension of the ASTSC-PN – are high, above 0.92, which suggests very good consistency and coherence of the items. In the competence and satisfaction dimensions, the alpha index value is higher than .81, which reveals a good internal consistency of both factors. The alpha index in the self-evaluation dimension is situated above .78, indicating a reasonable internal consistency. In the acceptance of risks and initiatives dimension, the alpha value is above .62, revealing a weak internal consistency of the item.

3.2. External validity

To analyse the external validity, the relation between the results in the ASTSC-PN and the scoring on variables specific to engagement in training tasks assessed with the Assessment Scale for Trainee Engagement in the Portuguese Navy (ASTE-PN) (Frade, 2015; Frade & Veiga, 2014a) was considered regarding the Utrecht Work Engagement Scale (UWES) (Schaufeli, Salanova, González-Romá, & Bakker, 2002), and with other variables of learning motivation, assessed with Learning Motivation Scale (LMS) (Frade, 2015; Frade & Veiga, 2014b). In Table 4, 5 and 6 the correlation coefficients found are represented, as well as their levels of statistical significance.

Table 4. Correlation coefficients between ASTSC-PN and UWES results

	Dedication and Vigour	Absorption	Total Engagement
RIP	.445**	.328**	.437**
COM	.390**	.299**	.387**
SAT	.464**	.349**	.449**
ATA	.425**	.323**	.418**
ARI	.507**	.432**	.512**
ACT	.529**	.399**	.520**

* p < .05; ** p < .01; *** p < .001

Table 5. Correlation coefficients between ASTSC-PN and ASTE-PN results

	Cognitive Engagement	Affective Engagement	Behavioural Engagement	Total Engagement
RIP	.577**	.426**	.533**	.588**
COM	.596**	.436**	.555**	.600**
SAT	.409**	.520**	.620**	.576**
ATA	.612**	.424**	.625**	.619**
ARI	.414**	.444**	.521**	.496**
CT	.622**	.543**	.670**	.699**

* p < .05; ** p < .01; *** p < .001

Table 6. Correlation coefficients between ASTSC-PN and LMS results

	Learning goal	Performance-approach goal	Performance-avoidance goal	Total Motivation
RIP	.576**	.129	.348**	.581**
COM	.593**	.248**	.354**	.656**
SAT	.569**	-.086	.415**	.475**
ATA	.647**	.164	.355**	.629**
ARI	.601**	.122	.262**	.529**
ACT	.692**	.079	.461**	.673**

* p < .05; ** p < .01; *** p < .001

The obtained coefficients in Tables 4 and 5 correspond to a positive correlation between self-concept and engagement. The positive and significant correlation between self-concept and engagement has been underlined by several authors (Bandura, 1997; Shunk & Mullen, 2012; Woolfolk, Hughes & Walkup, 2008), namely to a level of competence perception, self-acceptance and acceptance of risks related with persistency and effort put.

The significant and positive correlations obtained at the level of the self-concept dimensions related to cognitive engagement, dedication and vigour and to absorption corroborate the investigations which indicate that students with higher self-concept are more frequently part of cognitive activities as a process of information, mental representation, learning resources control, information recovery and the

application of self-regulated strategies (Cross & Markus, 1994; Rodríguez et al., 2004; Thomas et al., 1993).

The significant and positive correlations between the self-concept dimensions and the dedication and vigour, absorption and affective engagement dimensions are understood through positive affections, i.e., students with higher self-concept will have a bigger access to positive emotional states (Cross & Markus, 1994), will have more interest for the subjects (Marsh, Byrne, & Yeung, 1999) and a higher satisfaction in the performance of chores (Irwing, 1996).

The positive and significant correlations between self-concept and behavioral involvement, dedication and vigour and absorption are also proved by studies of Marsh & Yeung (1997), which narrate the logic between academic self-concept and the selection of activities, and by studies of Oyserman, Bybee, Terry & Hart-Johnson (2004) which confirm that students with a positive self-concept participate more in class and dedicate more time to the execution of activities, achieving better scores.

Having in consideration Table 6, it is verifiable the positive and significant correlations between self-concept and the learning goal, equally approved in the studies of Castillo, Balaguer and Duda (2003), which point to a direct relation between the learning goal and the academic satisfaction, and in the studies of Anderman, Anderman and Griesinger, (1999), in which an adequate academic self-concept relates in a positive and significant way with the orientation for learning. Anderman and colleagues (1999) also found significant and positive correlations, but in a minor measure, with a performance goal, such as stated in Table 6 concerning the correlations of self-concept dimensions with the performance-avoidance goal. The possible justification could reside in the establishment of self-protecting strategies, such as the “defensive pessimism” and “impairment” phenomenon (García & Pintrich, 1994; Martin, Marsh & Debus, 2001; Rhodewalt & Tragakis, 2002; Rodríguez et al., 2004), through which students avoid putting effort, completing chores, establishing high expectations of success and utilizing cognitive and learning self-regulation strategies, as a way of justifying bad results, avoiding the negative self-perception and protecting, therefore, their self-esteem.

Only the positive and significant correlations are detected among the self-concept and performance-proximity goal dimensions, to a level of competence. These results are coherent with the logic that one student that feels competent is likely to develop a conduct oriented to success, as he believes he will achieve success. International investigations corroborate these results (Elliot & Church, 1997; Pintrich, 2000; Valle et al., 2006).

4. Conclusions

The creation of the ASTSC-PN was a consequence of the need to assess the professional self-concept of trainees in military context, together with the scarceness of instruments to assess this construct under such a specific context.

The ASTSC-PN achieved good levels of validity and reliability, coherent with the results of the original version (Veiga et al, 2006). Through Cronbach’s alpha it was determined that interpersonal relationship and total self-concept scales present a very good internal consistency, the competence and satisfaction scales present a reasonable internal consistency and the acceptance of risks and initiatives

scale reveal a weak internal consistency. Considering the findings, reshaping the constitutive items of this last scale is suggested, in order to optimize the direction of the underlying construct's evaluation and increase its reliability.

It is concluded that the ASTSC-PN presents sufficient internal consistency and adequate validity of the construct to explore the military self-concept in a penta-factorial structure and it is considered that this evaluation instrument may contribute to a higher comprehension and more profound knowledge of the influence of each dimension on motivation and trainees engagement.

Considering the preceding, ASTSC-PN may be considered useful and adequate to assess the professional self-concept, especially military personnel. Nonetheless, the conduction of future studies is suggested with result analysis under sociodemographic variables. These studies will allow the deepening of knowledge of the external validity of the scale, and increase the knowledge of self-concept multidimensionality, incidence and its factors.

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