

The Trait-Self Description (T-SD) Inventory: Research in Four Countries
Fariya Syed
Personnel Production section, Director Human Resources Research and Evaluation
Canadian Forces
National Defence Headquarters
Major-General George R. Pearkes Building
101 Colonel By Drive
Ottawa, Ontario Canada
K1A 0K2

There are a variety of criteria used in the selection of personnel. One such criterion is personality. This paper will describe a measure of personality used internationally in the selection of military personnel, The Trait-Self Description (T-SD) Inventory. In an attempt to bring together international research findings on the T-SD, information on the inventory was gathered from the US, UK, Canada and Australia. This paper will briefly describe the Big Five model of personality which the T-SD is based on. The development of the T-SD through collaboration between the US and UK will also be discussed along with an overview of the research conducted on the T-SD in each of the four countries. Finally, the difficulty in comparing international research findings on the T-SD will be discussed.

Big Five Model of Personality

The Trait Self-Description Inventory is a personality measure based on the Big Five Model of personality. The Big Five model describes personality as comprised of five primary factors or dimensions. These factors consist of Openness to Experience, Conscientiousness, Extraversion, Agreeableness, and Neuroticism (Bhat 1999; Watkins, 1998).

The Openness factor of the Big Five personality dimensions is considered the intellectual domain of personality (Abram & Elshaw, 1997). It is the most controversial factor as some see it as reflecting cultural and artistic domains while others see it as encompassing creativity, intellectual interest and unconventional values (McCrae & John, 1992). High scores on the Openness factor describe those who are cultured, curious and imaginative while low scores are associated with being conventional, practical and having narrowed interests (McCrae & John, 1992).

The Conscientiousness factor is referred to as the organizational domain of personality. This factor focuses on differences in motivation and persistence (Abram & Elshaw, 1997). Individuals who score high on Conscientiousness can be described as responsible, organized and neat. Low scores on Conscientiousness are associated with individuals who are easygoing, avoid schedules, and are unreliable (Watkins, 1998).

Extraversion is described as the social domain of personality and is related to energy and enthusiasm when interacting with people (Abram & Elshaw, 1997; Watkins, 1998). High scores on Extraversion describe individuals who are outgoing, sociable and assertive. Low scores describe shy, timid, reserved or withdrawn individuals (Watkins, 1998).

Agreeableness is referred to as the moral domain of personality that is related to styles of interpersonal interaction (Abram & Elshaw, 1997). High scores on Agreeableness are associated with individuals who are trusting, cooperative and tolerant. Those who score low on Agreeableness can be described as cold, competitive and antagonistic (Watkins, 1998).

Neuroticism is the emotional domain of personality. (Abram & Elshaw, 1997). Neuroticism reflects how we react emotionally to distressing experiences. High scores on Neuroticism describe insecure, depressed and touchy individuals while low scores describe even-tempered, calm and resilient individuals (Watkins, 1998).

Development of the T-SD

Tupes and Christal were amongst the first researchers to identify the Big Five personality factors or dimensions (Watkins, 1998). Through their research they produced a measure of the Big Five personality factors entitled the Air Force Self-Description Inventory (AFSDI) (Christal, 1994; Watkins, 1998). The AFSDI is a computer-administered measure that was developed for selection for the US Air Force (USAF). The T-SD is a paper and pencil version of the AFSDI. Armstrong Laboratories of Texas, the University of Plymouth and the UK Defence Research Agency collaborated to refine the T-SD and test it on military populations in both the US and UK (Collis, 1997).

The T-SD is divided into two sections. The first is comprised of 64 trait names where individual are asked, "how characteristic the trait is of him/herself as compared with other individuals of the same sex and approximate age" (Christal, 1994, p. 194). The second section of the T-SD contains 99 behavioural statements in which "subjects are asked to indicate the extent to which they agree or disagree with the statement" (Christal, 1994, p.194). Sections of the T-SD and items in each section are presented in random order. The T-SD measures a personality profile based on the Big Five personality factors as well as 22 sub-composite or facet scores that have been developed within the five factors (see Appendix A).

International Research on the T-SD

The T-SD has been evaluated for use in military selection in the US, UK, Australia and Canada. This paper briefly summarizes the research conducted on the T-SD in each of these countries.

US

As mentioned earlier, the T-SD is a paper and pencil version of the AFSDI, a personality measure developed by Tupes and Christal for use in selection of USAF personnel. Extensive research has been conducted by the US and UK, to refine the inventory. The results of research conducted on the T-SD have consistently demonstrated it is a good measure of the Big Five personality factors (Christal, 1994). Christal (1994) summarized research findings regarding the AFSDI stating, "the defined factors are robust having survived numerous cross-validation studies" (p.206). Three studies on US personnel evaluating the properties of the AFSDI verified the factor structure of the inventory in both the computerized and paper and pencil version (T-SD) (Collis, 1996). Results also indicated Officer and Enlisted personnel had similar score distributions for factor and facet scores (Collis, 1996). Further findings indicated the AFSDI had good test- retest reliability (0.60 to 0.82 for one year and 0.53 to 0.72 for two years). Some evidence for a link between personality measured by the AFSDI and job performance has been found (Christal, Barucky, Driskill & Collis, 1997). The benefit of further replication of these has been identified (Christal et al., 1997).

UK

The T-SD is used in Officer selection for the Royal Navy (RN) in the UK. The version of the T-SD used in the UK is entitled the OCEAN Inventory (Collis, 1997). The OCEAN is identical to the T-SD other than a few differences in language and spelling to make it more appropriate for a British population (Collis, 1997; Collis & Elshaw, 1998). For example, references to 'High School' in the T-SD were changed to 'Secondary School' in the OCEAN (Hampson, Vincent & Jacobs, 1997).

The UK collaborated with the US to refine the T-SD. Together they conducted a "major developmental testing programme to test and select items that show consistent factor loadings across five domains" (Collis, 1995, p.12). The initial intent in the UK was to use the T-SD with Officers. It has since been evaluated and modified for use on Army soldier recruits (Hampson et al., 1997).

The T-SD has been assessed in relation to the Admiralty Interview Board (AIB) assessment battery in the UK. The AIB assesses two main areas, academic ability and suitability for Service (in non-academic terms) (Collis, 1995). Although the AIB has proven to be an adequate predictor of training success and compulsory withdrawal, it has been unable to predict Voluntary Withdrawal from Training (VWFT). The T-SD has, therefore, been examined as a tool to predict VWFT. The UK has conducted research assessing potential relationships between personality as measured by the T-SD and performance, VWFT, and leadership potential.

Results have indicated that scores on the T-SD are not related to success at the AIB (Collis, 1995). T-SD scores have, however, been found to be related to performance (Schmit, 1999). Further results have indicated leadership potential is predicted by various factors including personality as measured by the T-SD (Perkins & Corr, undated; Perry, 1999). Personality measured by the T-SD has also offered promise as a predictor of VWFT (Abram & Elshaw, 1997; Schmit, 1997; Elshaw & Abram, 1999). The T-SD has shown promise as a predictor of VWFT and leadership potential. Future research in this area would help confirm these results.

Australia

Research on the T-SD is quite recent in Australia. The T-SD has not yet been implemented in the selection process for the Australian Defence Force (ADF). It is, however, recommended that the T-SD be used as a red flag mechanism by which individuals are referred to a psychologist if they score radically outside population norms on Neuroticism (Cox, 1999a). Norms will be based on US and UK data until sufficient Australian data is available to develop Australian norms (Bhat, 1999, Cox 1999a; Cox, 1999b).

Research conducted in Australia has focussed on examining a potential relationship between personality measured by the T-SD and performance. Results of this research have been mixed. Some findings have indicated a relationship between personality and performance while other findings have not (Watkins, 1998; Bhat, 1999). Furthermore, many of the findings have indicated weak relationships between personality and performance (Watkins, 1998; Bhat, 1999). The two major Australian studies examining a potential relationship between personality measured by the T-SD and performance have followed the same sample (Watkins, 1998; Bhat, 1999). Therefore, it

would be beneficial to conduct future research on different samples. Developing Australian norms when data becomes available would also be beneficial.

Canada

Research in Canada has examined the use of different personality measures in selection of Canadian Forces (CF) personnel. This research has focussed on exploring a potential relationship between personality and both job and training performance (O'Keefe, 1998; 1999a). Evidence has indicated a link between personality measured by the T-SD and performance (O'Keefe, 1998; O'Keefe, 1999a; Jones, Uggerslev, Paquet, Kline & Sulsky 2000a; 2000b). However, other research results has failed to replicate these findings (Schwartz, 1999).

Some of the research conducted on personality in selection has focussed on a specific occupation, the Military Police (MP) (O'Keefe, 1999b). T-SD results for those MPs whose performance was rated above average were used to develop an optimal profile for nine of twelve established critical attributes for MPs (Noonan, 1999; O'Keefe, 1999b). In the past, MP candidates were asked structured interview questions specific to those items on the T-SD on which their scores were above or below the norm. Currently, these questions are asked of all candidates. The T-SD is currently being administered to MP candidates for information purposes. The inventory is being considered for use as a red flag rather than as a means to screen out MP candidates (Tanner, 2001).

Future research on the T-SD in Canada is needed to replicate findings that personality measured by the T-SD is related to performance. Furthermore, some questions have arisen regarding scoring of the T-SD (Jones et al., 2000a; 2000b). Investigations to resolve these issues is currently being conducted (Tanner, 2001).

Summary

The sound psychometric properties of the T-SD reflect that the inventory was created through extensive research conducted in the US and UK. Cross-cultural research findings have consistently proven the T-SD is a reliable and valid measure of the Big Five personality factors. The T-SD was originally created as a non-cognitive predictor of performance for the USAF. Since it's creation, the T-SD has been used with a variety of samples from different countries. Potential relationships between personality measured by the T-SD and a variety of other variables have been investigated. Relationships between personality and performance have been explored in US, Australia and Canada. Research in the UK has expanded on this and investigated the relationship between personality and performance as well as VWFT and leadership potential.

Conclusion

Research examining a relationship between personality and performance has found mixed results. Some findings have produced evidence that personality is related to performance, VWFT and leadership potential. Other findings have not indicated a relationship between personality and performance. There are a variety of potential reasons for these findings. The first is related to the fact that the studies were conducted with different methodologies. Specifically, criterion measures varied both within each country and between different nations. For example, some studies used a criterion of pass/ fail while others used a letter grade. Samples also varied from study to study.

Some samples were comprised of Officers while others included Non-Commissioned Members (NCMs)/soldiers or focussed on a specific military occupation. Furthermore, different studies have focussed on Army, Navy or Air Force. Sample sizes have also varied between studies. These differences in methodologies may explain some of the discrepancies in research findings within each country and between different countries.

Another possible explanation for the discrepancy in research findings is related to the theories underlying the hypotheses of the various studies. For example, hypotheses have varied between studies in that different factors and facets are expected to be related to performance. Furthermore, the T-SD was administered to individuals at different stages of the selection process. Samples in the different countries have also varied as follows: the US has included the USAF, the UK has included Navy Officers and Army soldiers, Australia has included enlisted personnel and Canada has included recruits for the MP population and recruits in general. The various groups examined in each of the countries are in line with the population with which the T-SD is used as well as with the role of the T-SD in the selection process of that country. Findings of the various studies conducted in each country are difficult to compare as the methodologies for each study varies in many ways.

References

- Abram, C. M. & Elshaw, C. C. (1997). Predicting voluntary withdrawal from the Royal Military Academy Sandhurst. *DERA/CHS/HS3/CR97071/1.0*, November 1997. Farnborough, Hampshire: Defence Evaluation and Research Agency.
- Bhat, C. S. (1999). *Does personality influence training success in the Royal Australian Navy?* Unpublished master's thesis, Monash University, Australia.
- Christal, R. E. (1994). *Research and design summary report: Non-cognitive research involving systems of testing and learning*. F33615-91-D-0010. Armstrong Laboratories, Brooks AFB.
- Christal, R. E., Barucky, J. M., Driskill, W. E., & Collis, J. M. (1997). *Informal technical final report. The Air Force Self Description Inventory (AFSDI): A summary of continuing research*. F33615-91-D-0010. Armstrong Laboratories, Brooks AFB.
- Collis, J. M. (1995). The Trait-Self-Description Inventory: Measurement of the "Big Five" personality factors at the Admiralty Interview Board. *DRA/CHS/HS3/CR95050/01*, September 1995. Farnborough, Hampshire: Defence Research Agency.
- Collis, J. M. (1996). The Air Force Self Description Inventory (AFSDI): Comparison of Subject Samples, Test-Retest Reliability And Comparison Of Delivery Mechanisms. In Christal, R. E., Barucky, J. M., Driskill, W. E., & Collis, J. M. (1997). *Informal technical final report. The Air Force Self Description Inventory (AFSDI): A summary of continuing research* (pp. 14-53). F33615-91-D-0010. Armstrong Laboratories, Brooks AFB.
- Collis, J. M. (1997). The OCEAN personality inventory: Administrator's guide and test manual. *DERA/CHS/HS3/CR97072/1.0*, April 1997. Farnborough, Hampshire: Defence Evaluation and Research Agency.
- Cox, K. (1999a). T-SD raw scores and corresponding percentiles. *Psychology Research Group Technical Brief 10/1999*. Canberra: Psychology Research Group.
- Cox, K. (1999b). T-SD data descriptives. *Psychology Research Group Technical Brief 5/1999*. Canberra: Psychology Research Group.
- Elshaw, C. & Abram, M. (1999). Predicting early voluntary wastage in Army officer training. *Journal of Defence Science*, 4(1), 2-8.
- Hampson, A., Vincent, M., & Jacobs, N. (1997) The use of the Trait Self-Description Inventory to predict training wastage in Phase I training. *DERA/CHS/HS3/CR97262/2.0*, December 1997. Farnborough, Hampshire: Defence Evaluation and Research Agency.
- Jones, D., Uggerslev, K., Paquet, S., Kline, T., & Sulsky, L. (2000a). Validation of the Trait-Self Descriptive Inventory facets using basic and advanced MOC course results and self-

reported job performance. *Contractors Report 00-*. Ottawa, Ontario: Director of Human Resource Research and Evaluation.

Jones, D., Uggerslev, K., Paquet, S., Kline, T., & Sulsky, L. (2000b). Validation of the Trait-Self Descriptive Inventory factors using basic and advanced MOC course results and self-reported job performance. *Contractors Report 00-*. Ottawa, Ontario: Director of Human Resource Research and Evaluation.

McCrae R. R. & John, O.P. (1992). An introduction of the five factor model and its' applications. *Journal of Personality*, 60(2), 175-215.

Noonan, L. (1999). PSO processing of applicants for Military Police (MP) 811. *Technical Note 99-1*. Ottawa, Ontario: Director of Human Resource Research and Evaluation.

O'Keefe, D.F. (1998). Investigating the use of occupational personality measures in the Canadian Forces selection system. *Technical Note 98-14*. Ottawa, Ontario: Director of Human Resource Research and Evaluation.

O'Keefe, D.F. (1999a). Investigating the use of occupational personality measures in the Canadian Forces. *41st Annual Conference of the International Military Testing Association, Monterey, CA*, 26-31.

O'Keefe, D.F. (1999b). Development of an optimal profile for Military Police applicants. *Technical Note 99-2*. Ottawa, Ontario: Director of Human Resource Research and Evaluation.

Perkins, A., & Corr, P. J. (undated). Personality/cognitive interactions predict military leadership potential. Goldsmiths College: University of London.

Perry, A. (1999). Intelligence and personality at assessment centres: Examining the relationship between intelligence and personality measures to performance at The Royal Navy's Admiralty Interview Board.

Schmit, V. P. (1997). An initial assessment of motivational and personality measures for RN Officer selection. *DERA/CHS/HS3/CR97027/1.0*, February 1997. Farnborough, Hampshire: Defence Evaluation and Research Agency.

Schwartz, S. (1999). Validation of the Trait-Self Descriptive Inventory against Basic Recruit Training and Basic Officer Training course results. *Technical Note 99-15*. Ottawa, Ontario: Director of Human Resource Research and Evaluation.

Tanner, L.M. (2001). Canadian Forces Provost Marshal: The MPAC Personality Measure Scoring Guide. Ontario: Department of National Defence.

Watkins, J. L. (1998). *Big Five personality dimensions and recruit training outcomes in the Royal Australian Navy: An exploratory study*. Unpublished master's thesis, Monash University, Australia.

Appendix A

T-SD Factor and Corresponding Facet Scales

FACTORS	FACETS
Agreeableness	Warm and Sympathetic Friendly Considerate Cold and Insensitive Helpful
Conscientiousness	Efficient and Dependable Hard Working Organized
Extraversion	Shy and Bashful Talkative Socially Active Assertive Unsociable
Openness	Philosophical Scientific Interest Creative Reflective Cultured
Neuroticism	Nervous and Stressed Out Worrying Irritable Envious and Jealous