The International Journal of Indian Psychology
ISSN 2348-5396 (Online) | ISSN: 2349-3429 (Print)
Volume 12, Issue 3, July- September, 2024
DIP: 18.01.037.20241203, DOI: 10.25215/1203.037
https://www.ijip.in

Research Paper

Exploring the Relevance of Psychological Testing in Indian Armed Forces. A Validity Assessment of Cognitrone and Determination Test

Priya Sahu[1], Dr. Reetesh Riku[2]*

ABSTRACT

The current study discusses two Major Domains of Concentration and Reactive Stress Tolerance in Athletic spaces, particularly in *Armed Forces.* The goal is to establish a theoretical and scientific ground for the necessity of cognitive ability assessment in such spaces; and a sub investigation into the convergent validity of *Cognitrone Assessment* and *Determination Test* of the *Vienna Testing System*, to propose potential relevant ways to enhance training methods within the Armed Forces. The study followed a Purposive Sampling, Followed by a sample size of 16 Male individuals between the age group of 21-27 years. From The Force One, Armed Force Unit. Spearmen rho Correlation statistical method was performed using the SPSS tool to assess the Convergent validity between both the tests. The findings of the current study stated a positive correlation between both the test scores which supports our Hypothesis. Furthermore, use of the CogniPlus Training Module has been promoted for Military Personnel Training. The study can be used as groundwork for future studies in the area, as evidence and research remains minimal.

Keywords: *Concentration, Reactive Stress Tolerance, Cognitrone, DT, CogniPlus, Vienna Testing System and Indian Armed Forces*

Most people agree that the best indicator of work effectiveness is a person's cognitive ability (Schmidt and Hunter, 1998). The terms cognitive ability describe a person's capacity for pattern recognition, information processing, and issue analysis. Knowing how to access memory, analyze information, apply reason, and execute analysis will benefit you during the recruiting process and much beyond, regardless of whether you are changing careers or looking for a new job. According to Gottfredson (1997), *cognitive ability is a general mental capacity that includes reasoning, planning, problem solving, abstract thought, understanding complicated ideas, and experience-based learning.* Researchers in the empirical domains of brain science have shown a significant deal of interest in the theories of brain function that cognitive science has produced. Whether cognitive processes—like language and visual processing, for instance—are independent modules or how much they rely on one another is a basic topic (Goel 2007).

[1]Masters in Clinical Psychology, Federation of Indian Psychology Pvt. Ltd. Rohini, Delhi
[2]Sports Psychologist, Institutional Affiliation: Federation of Indian Psychology Pvt. Ltd. Rohini, Delhi
*Corresponding Author

Received: June 06, 2024; Revision Received: July 20, 2024; Accepted: July 24, 2024

There are four major cognitive abilities, Attention, Memory, Logical Reasoning, Auditory and visual processes. These are indicators of a person's mental ability which can help in assessment for career prospects. Cognitive capacity and job performance are related, according to meta-analytic reviews and primary research (Ispas et al., 2010; Ones et al., 2012). Similarly Cognitive ability impacts job performance through job knowledge acquisition; high cognitive ability individuals are better equipped to acquire the knowledge needed to perform their jobs at the highest levels (Borman et al., 1991, 1993). Carroll (1993) developed The Three-Strata Model, which is arguably the most complete taxonomy for cognitive capacities. Specific and limited talents make up the first stratum; group factors and broad abilities comprise the second; and general intelligence, org, makes up the third.

With regards to our current study, we discuss two Major Domains: Concentration and Reactive Stress Tolerance in Athletic spaces, particularly in *Armed Forces.* To establish a theoretical and scientific ground for the necessity of cognitive ability assessment in such spaces; and a sub investigation into the convergent validity of Cognitrone Assessment and Determination Test. Many elements affect an individual's performance; some, like knowledge, are related to the task's content, while others, like concentration, are process-related. For all tasks requiring the conscious perception and processing of information, concentration is a prerequisite (Westhoff & Hagemeister, 2005).

"Intentional, non-automated coordination of actions and their controlled execution" is how Westhoff und Hagemeister (2005) defines concentration. By providing this definition, the writers highlight various facets of the idea and set it apart from others. One reason is that focused working is purposeful, as opposed to automated procedures, It could be carried out unintentionally, without conscious effort, and in between other tasks. For example, this involves automatic responses to outside inputs, such as processing intense stimuli (such as pain, loud noises, etc.). They also stress the importance of carrying out "action parts." People who are working intently must be in charge of and coordinating these components. Thus, the ability of concentration is understood as deliberate, controlled, and necessary for coordinating partial actions, including the bundling of cognitive resources for the demands of the moment (Westhoff & Hagemeister, 2005, S. 20).

On the Other hand, Stress tolerance is the capacity to remain calm and collected in the face of adversity. Positivity in stress tolerance is the capacity to maintain composure in the face of intense feelings of hopelessness and powerlessness. Any internal or external factor that interferes with a person's ability to function normally is referred to as a stressor. A wide range of hostile or occupational stressors can indicate threats to a person's life or well-being and trigger a complex series of highly coordinated reactions within the physiological system (Atkinson & Hilgard 2009).

Workplace stress has an impact on the worker as well as the surrounding environment. When jawans work long hours in dangerous environments, expect or unexpected emergencies, or work in unfavorable circumstances, their physical and mental well-being is constantly subjected to traumatic experiences on both a psychological and physical level. There were indicators that the paramilitary forces in India were suffering from the detrimental effects of work-related stress on their physical and mental well-being. According to a 2012 IIM, Ahmedabad study on "emotional intelligence and occupational stress in BSF and CRPF," these paramilitary troops are overworked which is contributing to discontent

within the ranks. For the very reason it becomes important to assess and simultaneously work on interventions to improve stress tolerance levels in Armed professionals.

Simultaneously Reactive stress tolerance pertains to the capacity to respond appropriately and promptly in stressful situations. It is a specific instance of ability to react. The ability to withstand stress and minimize its negative effects on one's abilities and mental state is known as stress tolerance. (Schrott, 2003). It refers to the resilience in circumstances where the capacity for reaction is necessary, or the extent to which the capacity for reaction can be maintained in the face of stressors.

Objective

The goal of this study is to evaluate the convergent validity of the Cognitrone Assessment and the Determination Test from the Vienna Testing System, and propose potential relevant ways to enhance training methods within the Armed Forces.

Sampling & Participants

The study followed a Purposive Sampling Technique, Followed by a sample size of 16 Male individuals between the age group of 21-27 years. From The Force One, Armed Force Unit.

Selected Variables

Reactive Stress Tolerance and Ability to Concentrate.

Measures

Cognitrone Assessment

The Cognitrone (COG) test, developed by Gernot Schuhfried, is a measure to assess concentration ability of a person. The test comprises eight forms with different presentations and stimulus materials, where respondents evaluate correlations between a comparison figure and four reference figures using a response panel or computer keyboard.

- Reliability estimates range from $\alpha = 0.85$ to $\alpha = 0.99$ across test forms, with a reported retest reliability of $r = 0.82$ for one form.
- Construct validity is supported by correlation analyses and confirmatory factor analyses, while criterion validity is evidenced by studies in traffic psychology and safety.
- Normative data cover representative samples by age and gender, with additional norms for specific groups like drivers with conspicuous behavior, Swedish adults, job seekers, young soccer players, and schoolchildren.

Determination Test

The Determination test (DT), developed by G. Schuhfried, is designed to gauge reactive stress tolerance and the ability to react under complex stimulus conditions. Grounded in the CHC model, the test assesses secondary factors of reaction and decision speed, specifically targeting choice reactions amidst stress-inducing time pressure scenarios. Respondents navigate sequential optical and acoustic stimuli by pressing corresponding buttons, with stimulus presentation modes varying across Adaptive, Action, and Reaction Modes.

- Reliability analysis indicates high internal consistency across all test forms, with retest reliability ranging from 0.90 to 0.98 for select forms.

- Construct validity is supported by alignment with theoretical item universes and correlation analyses with other CHC model tests, while criterion validity is established through correlation analyses across diverse fields.
- Normative data, including representative samples and country-specific norms, provide comprehensive benchmarks for interpretation across demographic groups and contexts.

Procedure

Each participant's informed consent was obtained. The two assessments were conducted consecutively. Before the test was given to any participants, a thorough test introduction and appropriate instructions were distributed. During a quick demo test, all participants were introduced to the computer testing module. The test does not require any prior computer skills to be completed. Every step was carefully explained to the participants, and their consent was obtained before the test began. A quiet, disturbance-free atmosphere was upheld under the administration. Additionally, it was properly verified that each participant was at ease and in good physical condition to do the test. In case there were any issues, administrative guides were available during the test. But no such circumstance occurred.

RESULT AND ANALYSIS

Cognitrone Assessment S4 and the Determination Test S1 from the Vienna Testing System were used for the current study. The study followed a Purposive Sampling Technique, Followed by a sample size of 16 Male individuals between the age group of 21-27 years. From The Force One, Armed Force Unit. Spearmen rho Correlation statistical method was performed using the SPSS tool to assess the Convergent validity between both the tests.

Hypothesis: There will be a positive correlation between Cognitrone and Determination Test scores.

Null Hypothesis: There will Not be a Positive Correlation between Cognitrone and Determination Test scores.

Table 1 Spearmen rho Correlation scores for Cognitrone and Determination Test.

	Cognitrone Assessment
Determination Test (DT) Spearmen rho	0.88
N	32

Table 1 represents the result for the correlation study. The score of 0.88 suggest a strong positive correlation, i.e. convergent validity is found between both the tests.

DISCUSSION

The findings of the current study stated a positive correlation between both the test scores which supports our Hypothesis. With this we can establish a strong convergent validity between both the test which lays the groundwork for our further discussion on using COG and DT for professional assessment and to plan Training Modalities in Armed Forces.

Upon thorough research no similar study was found that explored these themes in relation to military training or assessment tools in India. But similar to this It has been demonstrated

that athletes competing at different levels have different levels of reactive stress tolerance. Higher level taekwondo practitioners were found to be more resilient to reactive stress than lower-level practitioners, According to studies conducted by Sadowski, Gierczuk, Miller, Cieśliński, & Buszta (2012) and Rowiński & Dmitriyev (2012), fencers at a higher level were also found to be more resilient to reactive stress than non-fencers (Patócs et al., 2016).

Athletes share a similar rigor of practice and training as Armed professionals, both may not be compared but there happens to be a decent level of similarity amongst their attributes and athletic discipline. The military needs people who can perform difficult duties in demanding situations, are psychologically tough, and are physically fit. The ability of military personnel to think clearly is essential to the accomplishment of mission objectives. Cognitive abilities play a seminal role for Military personnels.

A variety of mental talents, such as attention, memory, reasoning, and problem-solving techniques are included in cognitive performance with the additional factors of stress tolerance and resilience. In battle scenarios, the capacity to concentrate and analyze information under extreme stressful environments to make wise decisions is very essential. Errors or delays in decision-making might result in catastrophic mission failure, casualties, or even death. Therefore, the cognitive abilities of military personnel have a direct bearing on operational readiness, mission success, and personnel safety.

Military operations are frequently carried out in stressful situations. In these kinds of situations, having the capacity to make fast and precise decisions is essential. When making decisions, military personnel's cognitive skills are extremely important. Making wise decisions requires having the capacity to prioritize tasks, process information, and recognise hazards. Furthermore, in high-stress situations, the capacity to retain situational awareness and adjust to changing conditions is essential. Thus, cognitive training programmes are required to sustain operational performance and enhance decision-making abilities (Soma Tech, 2023).

Testing tools such as COG and DT proves to be extremely essential for recruitment purposes to refine individuals and find best fit for particular job roles. According to a study on Benefit of Mental Skills Training (MST) on Performance and Stress Response in Military Personnel, It was found that the core elements of stress regulation ingrained in any MST programme may improve performance and cognitive function during times of elevated stress (Jensen et al., 2020).

Research on Enhancing Mental Readiness in Military Personnel states that training for mental preparedness takes an integrated strategy, including behavioral, cognitive, and emotional control concepts into realistic military simulations. The incorporation of these concepts and instruments into appropriate training programmes promotes the reflective utilization of mental preparedness reactions, analogous to how technical skills develop into reflective practices in military environments (McCreary and Thompson, 2006).

Computerized Training equipment such as *Cogniplus*, can be of crucial and eminent help. Cogniplus is a Cognitive Training Programme created by Schuhfried, contrary to the Vienna Test System (VTS), provides a variety of computer-based cognitive training exercises. Its goal is to improve cognitive capacities such as *executive functioning, memory, attention, and perception.* A variety of activities catered to particular cognitive domains can be found in

Cogniplus. These activities are designed to test and enhance various cognitive functions, frequently adjusting to each person's ability to provide the right amount of difficulty. These courses may cover stress reduction strategies, physical activity, and computer-based cognitive training.

Additionally, cognitive training can improve one's capacity to remain situationally alert, act quickly, and adjust to changing conditions. For this reason, cognitive training is essential to preserving operational readiness and peak cognitive function (Soma Tech, 2023). According to a Comparative Study between Brain Training and CogniPlus (*both are cognitive training tools*) on Cognitive skills, the findings indicate that "*Cogniplus*" outperforms "Brain train" in terms of enhancing visual cognitive abilities (Hajihiedary et.al 2020). CogniPlus can be used to assess various dimensions, research in the area of neuroscience and trauma injuries have also found the tool to be very efficient (Westerhof E. et al, 2017). Exploring its efficiency for military personnel training can lead to seminal results.

On the other hand mindfulness-based therapies have also shown to be particularly successful in building cognitive resilience. As a concrete example, Jha and colleagues state that while military personnel experience declines in their working memory and attentional capacity during the extremely stressful pre-deployment phase, those participating in mindfulness-based practice as part of an 8-week training programme seem to be resistant to these effects, with some even showing improvements in working memory and attention (Jha et al., 2010, 2015, 2017). Research on the psychological training of military troops for contemporary conflict has many promising directions that go much beyond the examples provided. Given its significance in military operations, more research on strategies to strengthen cognitive resilience that are based on the previously mentioned theoretical models is suggested.

CONCLUSION

Although the current study followed a small sample size but the results state a strong positive correlation which supports our discussion, the current study can be used as a base for future studies in this area, as evidence and research in the area remains minimal. The present study represents an initial exploration into the subject matter. It serves as a foundational step in shedding light on this relatively unexplored area within the Armed Forces. A bigger sample size may be used to strengthen the results and assumptions. While the findings offer concrete preliminary insights, future research with larger and more diverse samples can lead to more unique findings. Exploring the training modules and efficiency of Cogniplus for further research is also recommended. By delving deeper into these elements, scholars can offer insightful observations that support the development of tactics to improve military professional training and performance.

REFERENCES

Borman, W. C. (1991). Job behavior, performance, and effectiveness.

Borman, W. C., & Motowidlo, S. M. (1993). Expanding the criterion domain to include elements of contextual performance https://digitalcommons.usf.edu/psy_facpub/1111

Carroll, J. B. (1993). Human cognitive abilities: A survey of factor-analytic studies. Cambridge: Cambridge University Press.

Gierczuk, D., Bujak, Z., Rowiński, J., & Dmitriyev, A. (2012). Selected Coordination Motor Abilities in Elite Wrestlers and Taekwon-Do Competitors. Polish Journal of Sport and Tourism, 19(4), 230-234. https://doi.org/10.2478/v10197-012-0022-1

Goel, Vinod (2007). "Anatomy of deductive reasoning". Trends in Cognitive Sciences.

Gottfredson, L. S. (1997). Why g matters: The complexity of everyday life. Intelligence, 24(1), 79-132. https://doi.org/10.1016/S0160-2896(97)90014-3

Hajiheidary, F., Ahmadi, M. S., Ashayeri, H., & Estaki, M. (2020, December). Comparison of the effectiveness of cognitive rehabilitation programs of Brain training and Cogni Plus on cognitive skills of students with Attention Deficit Hyperactivity Disorder. In 2020 International Serious Games Symposium (ISGS) (pp. 26-32). IEEE. doi: 10.110 9/ISGS51981.2020.9375349.

Ispas, D., & Borman, W. C. (2015). Personnel selection, psychology of.

Jensen, A. E., Bernards, J. R., Jameson, J. T., Johnson, D. C., & Kelly, K. R. (2020). The benefit of mental skills training on performance and stress response in military personnel. Frontiers in psychology, 10, 2964. https://doi.org/10.3389/fpsyg.2019.029 64

Jha, A. P., Morrison, A. B., Dainer-Best, J., Parker, S., Rostrup, N., and Stanley, E. A. (2015). Minds "At attention": mindfulness training curbs attentional lapses in military cohorts. PLoS One 10: e0116889. doi: 10.1371/journal.pone.0116889

Jha, A. P., Morrison, A. B., Parker, S. C., and Stanley, E. A. (2017a). Practice is protective: mindfulness training promotes cognitive resilience in highstress cohorts. Mindfulness 8, 46–58. doi: 10.1007/s12671-015-0465-9

Jha, A. P., Stanley, E. A., Kiyonaga, A., Wong, L., and Gelfand, L. (2010). Examining the protective effects of mindfulness training on working memory capacity and affective experience. Emotion 10, 54–64. doi: 10.1037/ a0018438

Nolen-Hoeksema, S., Fredrickson, B. L., Loftus, G. R., & Wagenaar, W. A. (2009). Atkinson & Hilgard's introduction to psychology. Cengage Learning EMEA.

Ones, D. S., & Dilchert, S. (2012). Environmental sustainability at work: A call to action. Industrial and Organizational Psychology, 5(4), 444-466. https://doi.org/10.1111/j.17 54-9434.2012.01478.x

Patócs, Á., Melia, L., Kovács, S., Fózer-Selmeci, B., Révész, L., & Tóth, L. (2016). Reactive Stress Tolerance and Personality Characteristics of Hungarian Elite Fencers. Cognition, Brain, Behavior, 20(3), 171-184. https://www.researchgate.net/ publication/308780721_Reactive_Stress_Toleranc_And_Personality_Characteristics _Of_Hungarian_Elite_Fencers

Sadowski, J., Gierczuk, D., Miller, J., Cieśliński, I., & Buszta, M. (2012). Success factors in male WTF taekwondo juniors. J Combat Sports Martial Arts, 1, 47-51.

Schmidt, F. L., & Hunter, J. E. (1998). The validity and utility of selection methods in personnel psychology: Practical and theoretical implications of 85 years of research findings. Psychological bulletin, 124(2), 262. https://psycnet.apa.org/doi/10.1037/ 0033-2909.124.2.262

Schwarz-Friesel, Monika (2012). "On the status of external evidence in the theories of cognitive linguistics". Language Sciences. https://doi.org/10.1016/j.langsci.2012.04.0 07

The Importance of Cognitive Performance in the Military: A Critical Component of Mission Success, Soma Technology. (2023, May 24) https://www.linkedin.com/pulse/importa nce-cognitive-performance-military-critical/

Thompson, M. M., & McCreary, D. R. (2006). Enhancing mental readiness in military personnel. Military life: The psychology of serving in peace and combat, 2, 54-79. https://apps.dtic.mil/sti/citations/ADA472674

Westerhof-Evers, H. J., Visser-Keizer, A. C., Fasotti, L., Schönherr, M. C., Vink, M., van der Naalt, J., & Spikman, J. M. (2017). Effectiveness of a treatment for impairments in social cognition and emotion regulation (T-ScEmo) after traumatic brain injury: a

randomized controlled trial. The Journal of head trauma rehabilitation, 32(5), 296-307. DOI:10.1097/HTR.0000000000000332

Westhoff, K. & Hagemeister, C. (2005). Konzentrationsdiagnostik. Lengerich: Pabst Science Publishers.

Acknowledgment

The author(s) appreciates all those who participated in the study and helped to facilitate the research process.

Conflict of Interest

The author(s) declared no conflict of interest.

How to cite this article: Sahu, P. & Riku, R. (2024). Exploring the Relevance of Psychological Testing in Indian Armed Forces. A Validity Assessment of Cognitrone and Determination Test. *International Journal of Indian Psychology*, *12*(3), 407-414. DIP:18.01 .037.20241203, DOI:10.25215/1203.037