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Full Length Research Article

RE-CONFIRMATION OF CONCURRENT VALIDITY OF FOCUS FACTOR AS FOUND BY STANDARDIZED COGNITIVE ABILITY TEST

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ABSTRACT

The focus of attention has become a capricious area of research in educational science. It has become a standing concern in the field of academics, sports and life skills. To cater to the need of the day, the in-hand study was taken up to re-emphasize and re-establish the validity of the numerical value of focus factor as assessed by Cognitive Ability Test which is already developed and standardized. The research was carried in and around Chandigarh. The sample consisted of 240 school going students between 7-16 years of age from different schools. Random sampling was followed. The sample was divided into 4 groups according to their age. The Focus factor of all the subjects were found in two different stages, using two varied tests, both of which are developed and standardized scientifically. It was established through results that the Cognitive Ability Test is valid measure to find out the Focus factor of the subjects.

INTRODUCTION

Focus factor refers to the ability to respond discretely to specific visual, auditory or tactile stimuli.Focused attention is the ability to respond discretely to specific visual, auditory or tactile stimuli. In cognitive psychology, there are at least two models which describe how visual attention operates. These models may be considered loosely as metaphors which are used to describe internal processes and to generate hypotheses that are falsifiable. Generally speaking, visual attention is thought to operate as a two-stage process. In the first stage, attention is distributed uniformly over the external visual scene and processing of information is performed in parallel. In the second stage, attention is concentrated to a specific area of the visual scene i.e., it is focused, and processing is performed in a serial fashion. The pioneering research of Lev Vygotsky and Alexander Luria led to the three-part model of neuropsychology defining the working brain as being represented by three co-active processes listed as Attention, Memory, and Activation. Attention is identified as one of the three major co-active processes of the working brain. A.R. Luria published his well-known book The Working Brain in 1973 as a concise adjunct volume to his previous 1962 book Higher Cortical Functions in Man. In this volume, Luria summarized his three-part global theory of the working brain as being composed of three constantly co-active processes which he described as the; Attention system, Mnestic (memory) system, and Cortical activation system. The two books together are considered by Homskaya's account as "among Luria's major works in neuropsychology, most fully reflecting all the aspects (theoretical, clinical, experimental) of this new discipline."The product of the combined research of Vygotsky and Luria have determined a large part of the contemporary understanding and definition of attention as it is understood at the start of the 21st-century. Focus is directing attention in a chosen way at a chosen object. One can focus with a lens to home in on a minuscule particle or a wide expanse or anywhere in between. When one focuseshis mind, he can concentrate on a single object, word, sound or idea, bringing our awareness to that one thing and filtering out distractions. Alternatively, one can open attention to a sequence of events in a process or a process within a system of processes as expansive as the universe. In all cases, there is filtering out of distractions that might take the mind off on a little journey to a place that is not consciously chosen to go. Focus factor has been described within the context of theories of attention, working memory, executive function, and consciousness. Baddeley (1993) proposed that the central

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executive in his model of working memory may function as Norman and Shallice's (1986) Supervisory Attention System, such that it generates higher level schemas that override lower level, automatic, or environmentally generated schemas to achieve internally produced goals. The focus of attention has been a burgeoning area of research in human movement science for the last decade. There is considerable evidence that directing attention externally to the effect of a movement on the environment e.g., focusing on the flight of a ball in golf improves performance compared to focusing internally on bodily movements involved in the execution of the motor skill e.g., focusing on the motion of the arms in a golf swing. The advantage of an external focus of attention over an internal focus has been well documented across a wide variety of skills (Wulf, 2007a; Lohse *et al*., 2012). Furthermore, a number of studies have shown an external focus of attention, induced through instructions and feedback by the experimenter, improves performance relative to uninstructed control conditions (McNevin and Wulf, 2002; Wulf and McNevin, 2003; Wulf *et al*., 2003; Landers *et al*., 2005), and the advantage of focusing externally holds true for recovering/performing motor skills in clinical populations, such as stroke (Fasoli *et al*., 2002) and Parkinson's disease patients (Landers *et al*., 2005; Wulf *et al*., 2009). The psychological construct 'Focus Factor' describes a fundamental component of attention characterized by the subject's readiness to detect rarely and unpredictably occurring signals over prolonged periods of time. Human imaging studies have demonstrated that activation of frontal and parietal cortical areas, mostly in the right hemisphere, are associated with sustained attention performance.The Test of Variables of Attention (T.O.V.A.) objectively measures the key components of attention and self-control, variability (consistency), response time (speed), commissions (impulsivity), and omissions (focus and vigilance). The T.O.V.A. provides information that is not available through self-report or the report of others. It can be used along with subjective measures for a more comprehensive picture of academic, social, and personal performance. The T.O.V.A. uses a USB-connected microswitch that is calibrated to the tester's computer screen, allowing for ±1 millisecond accuracy and avoidance of intrinsic delays in modern computers. Separate tests are administered for visual vs. auditory modes. In the visual version, the T.O.V.A. uses geometric shapes so that language and reading levels do not play a part in the scoring. The T.O.V.A. has two sections, similar to the high and low demand sections discussed above for the IVA. The first section is a "low brainstimulation task" where the targets are infrequently presented. The boring nature of this task pulls for "errors of omission" when the person does not respond to the target. The second half of this test is a "high brain stimulation task" in which targets are frequently presented. This task pulls for "errors of commission" since a person may expect to see a target and impulsively respond. The auditory version of the T.O.V.A. is the same paradigm using two easily recognized tones as the target and non-target stimuli.

Focus Factor Ff

Is an indicator for collective attention or focus & concentration in accomplishing assigned tasks. It is one of the most prominent factors to achieve success. If focus factor is not high, even a high IQ is not beneficial. It is a ratio of accuracy vs. age & time. (Ff below 30 is poor, 30-50 is below avg, 50-75 is avg, 100 is optimum, above 150 is excellent)

Table 1. FocusFactor

Above 150	Excellent
120-150	Very good
90-120	Good
75-90	Above average
50-75	Average
30-50	Below par
Below 30	Poor

MATERIALS AND METHODS

Random sampling was undertaken to select subjects both males as well as females from different schools aging between 7-16 years. The sample was divided into four groups.

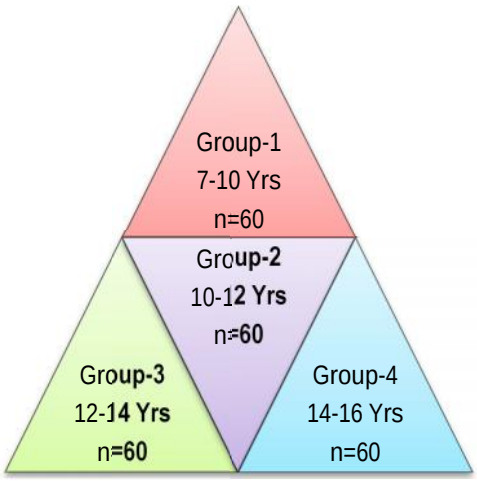

Fig.1. Sampling

Group1: Subject aging between 07-10 Years
Group 2:Subject aging between 10-12 Years
Group 3:Subject aging between 12-14 Years
Group 4:Subject aging between 14-16 Years

Stages of study - The Groups were compared in twostages.

Table 2. Stages of study

	Group-1	Group-2	Group-3	Group-4
Age Range	7-10 Yrs	10-12 Yrs	12-14 Yrs	14-16 Yrs
Day-1: Rapport Building				
Stage-1 Day-2	Ff tested by Test-1	Ff tested by Test-2	Ff tested by Test-1	Ff tested by Test-2
Day-3 & 4: Halt				
Stage-2 Day-5	Ff tested by Test-2	Ff tested by Test-1	Ff tested by Test-2	Ff tested by Test-1

On the first day, rapport was built with the subjects. on the second day, Focus Factor of Group-1 (subjects aging between 7-10 years of age) and Group-3 (subjects aging between 12-14 years of age) was initially found using the Test-1. In contrast, those from Group-2 and Group-4 were given Test-2 to test their FF. A halt was given for next two days, following which, the subjects of Groups 1 and 3 were tested for FF through Test-2, while those from Group 2 and 4 were tested for FF using Test-1. Test 1 here refers to the The Test of Variables of Attention (T.O.V.A.) objectively measures the key components of attention and self-control, variability (consistency), response time (speed), commissions (impulsivity), and omissions (focus and vigilance). The Test 2 refers to the Cognitive Ability Test in question.

Table 3. Statistical tools used for analysis of data

S.No.	Statistical tools	Formula	Purpose
1.	Mean (x)	X = ΣX/N where, X = Variable N = No. of sample	To find out the average scores of variable used in the study.
2	Standard Deviation (S.D.)	0 = √Σ x / N Where X = Deviation from actual mean X = mean. X = variable. N = number of samples.	To find out deviation from the mean scores of the variables.
3.	Standard error of mean (S.E)	S.E = 0/n Where 0 = S.D. n= number of observations	To find out the degree to which the mean is affected by the error of measurement and sampling.
4.	't' test	t = (x1-x2) / S √n1n2/n1+ n2 where x1 = mean of 1st sample x2 = mean of second sample S = combine S.D. n1 = number of observations in 1st sample. n2 = number of observations in 2nd sample	To compare the average score of any two groups or to find out whether the mean of the two samples vary significantly from each other.

Statistical analysis

Once the data was obtained, it was coded, tabulated and analyzed, keeping in mind the objectives of the study. Appropriate statistical tools were used to draw meaningful inferences. The statistical tools used in the present study are given in the table below;

RESULTS AND DISCUSSION

There was statistically insignificant difference traced in the Focus factor of the respondents aging between 7-10 years as assessed through the two tests.

Table 4. Mean, Standard deviation, standard error and t-values of Test-A & Test-B of subjects aging between 7-10 years (n=60)

	Mean	SD	SEM	t-value	Lev of Sig.
Test-A	76	4.5	0.58	1.336	
Test-B	77	3.65	0.47		

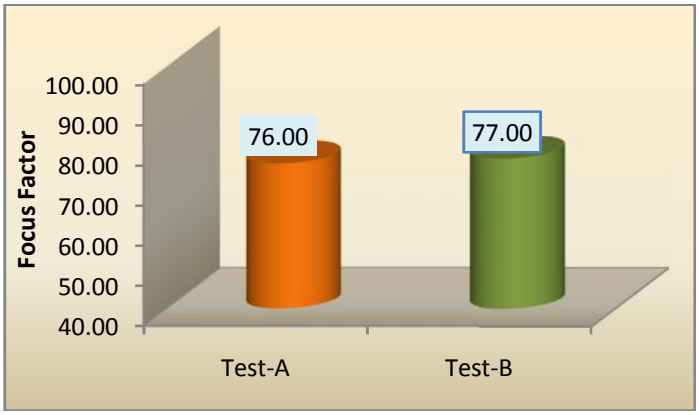

Fig. 2. Mean Difference between Focus Factor of subjects aging 7-10 years, as derived from Test A and Test B

Table 5. M ean, Standard deviation, standard error and t-values of Test-A & Test-B of subjects aging between 10-12 years (n=60)

	Mean	SD	SEM	t-value	Lev of Sig.
Test-A	86	4.59	0.59	1.339	
Test-B	87.1	5.95	0.76		

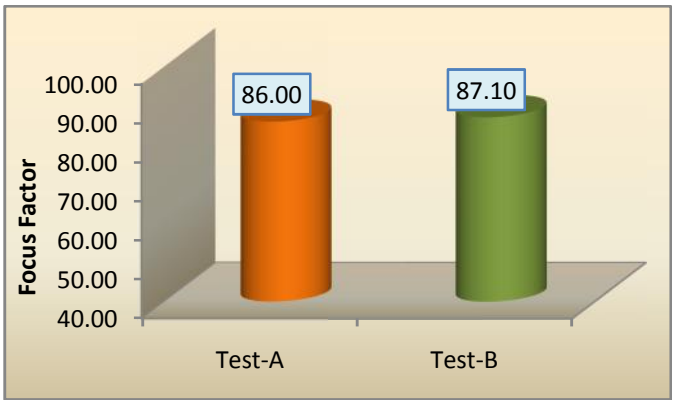

Fig. 3. Mean Difference between Focus Factor of subjects aging 10-12 years, as derived from Test A and Test B

There was a slight difference traced in the Focus factor of the respondents aging between 10-12 years as assessed through the two tests.

Table 6. Mean, Standard deviation, standard error and t-values of Test-A & Test-B of subjects aging between 12-14 years (n=60)

	Mean	SD	SEM	t-value	Lev of Sig.
Test-A	74.95	6.85	0.88	1.569	
Test-B	76.85	6.4	0.82		

There was negligible difference traced in the Focus factor of the respondents aging between 12-14 years as assessed through the two tests.

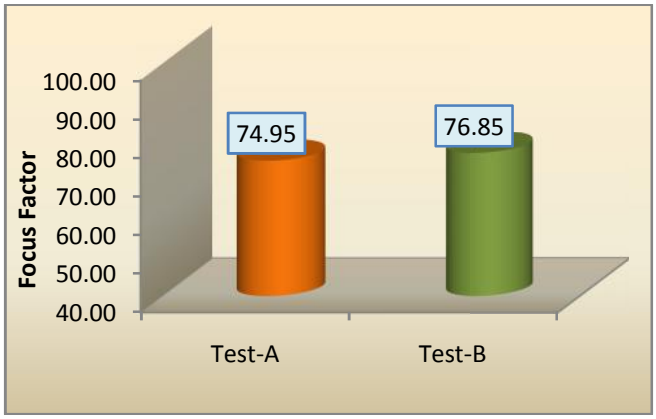

Fig. 4. Mean Difference between Focus Factor of subjects aging 12-14 years, as derived from Test A and Test B

Table 7. Mean, Standard deviation, standard error and t-values of Test-A & Test-B of subjects aging between 14-16 years (n=60)

	Mean	SD	SEM	t-value	Lev of Sig.
Test-A	76.5	4.85	6.85	0.46	
Test-B	77.1	5.4	7.4		

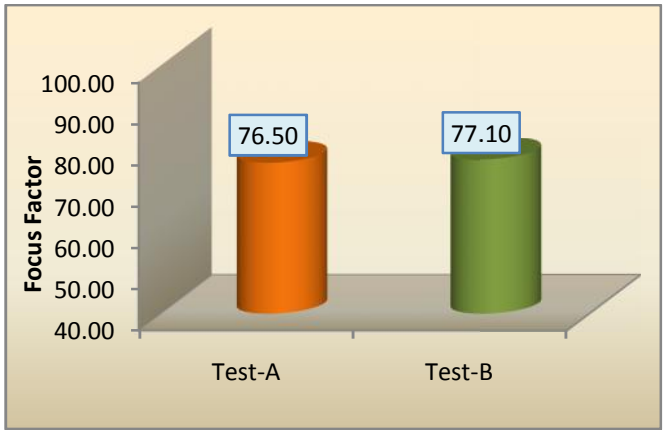

Fig. 5. Mean Difference between Focus Factor of subjects aging 14-16 years, as derived from Test A and Test B

A statistically insignificant difference was notified in the Focus factor of the respondents aging between 14-16 years as assessed through the two tests.

Conclusion

The Focus Factor of all the subjects was found using two different tests, both of which are developed and standardized scientifically. It was established through results that the Cognitive Ability Test is valid measure to find out the Focus Factor of the subjects. Eventually, the concurrent validity of the numerical value of Focus Factor as assessed through the standardized Cognitive Ability Test was re-established.To conclude, Focus Factor of the subjects can be accurately notified with the Cognitive ability test in question. The test is found to be reliable and valid measure of Focus Factor i.e. focused attention of respondents ranging between 7-16 years of age.

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