

Internal Consistency Reliability of Modified Hand Test

Fayyaz Ahmed Anjum¹, Dr Iffat Batool², Muhammad Umar Fayyaz³

¹PhD Scholar at Government College University, Lahore, Pakistan

²Assistant Professor at Government College University, Lahore, Pakistan

³Behavior Therapist at ASAS International School, Islamabad, Pakistan

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ABSTRACT

The present study aims to determine Internal Consistency of Modified Hand Test. 500 participants were recruited from various cities of Pakistan. Sample included 270 Males and 230 female's age ranged from 11 to 80 years with mean age of 34.44 and SD 17.34. Participants were further bifurcated into four groups which included normal 350, maladjusted 50 neurotics/ anxiety related disorders, 50 and psychotics 50. Purposive sampling technique was used. Scoring booklet was translated into Urdu (native language of people of Pakistan) using back translation method containing fourteen stimuli. Instructions were individually administered. A pilot study was carried out to select four new stimuli based upon their ability to generate responses in more scoring categories. Internal consistency came out for interpersonal with environment r (.43), maladjustive r (-.18) and withdrawal r (-.39), environment with withdrawal r (-.26) at .01 level significance. Similarly, each main domain has statistically significant positive relationship at .01 level that is Interpersonal with affection r (.53), direction r (.39), aggression r (.38) and dependence r (.35), environment with action r (.91), passive r (.22) and acquisition r (.20), maladjustive with crippled r (.74), tension r (.60) and fear r (.20), withdrawal with description r (.68), fail r (.56) and bizarre r (.51).

KEYWORDS: Internal Consistency, Normal, Maladjusted, Neurotics, Psychotics

INTRODUCTION

A person's personality attributes are numerous and personality is described as constellation of enduring traits [14]. Some of these traits assist a person to deal effectively with his environment while the others may create hindrance. There are psychological measures tests which claim to measure the entire personality like Rorschach [8] and Thematic Apperception Test [5], however the present measure of personality Hand Test is a broad based instrument which measures Interpersonal, Environment, Maladjustive and Withdrawal. It also measures specific aspect of personality like acting out and pathology scores. A person who attain more score in healthy personality traits of interpersonal and environment like affection, dependence, communication, action and acquisition indicates better adjustment. Contrary to this more score in maladjustive domain reflects problems in dealing with the people and environment and more score in withdrawal is an indication of serious problems. Hand Test was developed by Wagner in 1962 and new norms for children and adolescents were introduced in 1983. Hand Test has gained reputation of projective and diagnostic measure and became popular among clinicians and researchers because it possesses the capacity to measure various aspects of human personality and behaviour [11]. Despite being projective test, it also offers objectivity in terms of well-defined quantitative scoring categories as subjectivity in terms of interpreting test responses was a major criticism on projective techniques [1], [7]. Hand Test has four major domains that is interpersonal, environmental, maladjustive and withdrawal their brief description is as follows:

Interpersonal

Interpersonal refers to relationships with other individuals and are considered as action tendencies rather than imaginary or fantasy, interpersonal is divided into six sub categories

- Affection: This is reflected by inter change of affection, pleasure or friendship feelings for example "patting at the back", "friendly waiving of hands", "khuda hafiz", "paternal affectionate hand", "hi", "comforting", "helping.
- Dependence: Response involves an expression of a wants of dependence, help or aid. For example "request for assistance", "praying dua", "asking for lift", "asking forgiveness from a person or God Almighty", "begging", "receiving money", "child reaching out for mother's frock".

*Corresponding Author: Fayyaz Ahmed Anjum, PhD Scholar at Government College University, Lahore, Pakistan. Email: Fayyaz_ahmed_66@yahoo.com Contact: +923314092976

- c. Communication: Responses include providing information to other person. For example “making speech”, “giving understanding to other or something”, “giving lectures”, “a deaf person talking with hands”, “a sign language”.
- d. Exhibition: It involves displaying or exhibiting oneself in order to get attention or approval, appreciation of others or introducing some special character of hand. For example “showing one’s muscles”, “ring of engagement”, “rasam e hina going on”, “bride is showing off dress”, “dancer with graceful movement”.
- e. Direction: Responses involves directing, influencing or domineering the action of other people. For example “a policeman hand directing to stop”, “order by a father or teacher a child to obey”, “an officer hand giving direction to subordinate to do something”, “an umpire giving out”.
- f. Aggression: responses involve giving or inflicting pain, injury, hostility or insulting others. For example “slapping someone”, “preparing a punch”, “thappar”, “fight with others”, “ready for boxing in a ring”, “fist for fight” etc.

Environmental

This type of generalized response involves a person to contact with impersonal world that he is in grip with the environment in particular fashion, these human contact are consider important for wellbeing or survival. There are three types of such responses.

- a. Acquisition: Responses involve an effort to achieve a goal but the action is yet to be completed, some tension and strain is accompanied. For example “reaching for something into high wall or shelf”, “making an effort to get something” “trying to grip something”.
- b. Action: This category of responses involves an attitude to utilize constructively, manipulate, and acquire an object or goal. For example “picking up something”, “writing or holding a pen or pencil”, “throwing or catching a ball”, “making something”, “putting salt in curry”, “washing”, “knitting”.
- c. Passive: The responses involve an attitude of inappropriate or deliberate withdrawal of energy from environment or an attitude of rest and relaxation. For example “hands of a sleeping person”, “just in rest position”, “a thinker’s hand”, “hand on a table”, “loose hand near chair arms”.

Maladjustive

These responses involve a person inability to deal effectively with the environment (for which he or she is partially aware) either due to his/her inner weakness or external environmental restriction, obstructions and reflect subject’s apprehensions or distress due to failure in achieving desired goal. This category of responses has been further dividing into three sub categories.

- a. Tension: Response involve that in spite exerting energy, the goal remains unachievable or little has been achieved, a feeling of unrest, strain or malaise is expressed. It is also explained when energy is exerted to support oneself against the gravity of environment. For example “a fist clinched in anger”, “holding something tightly”, “clutching fingers or hands to remain refrain from saying something wrong”, stretching or tensing one’s hand or fingers”.
- b. Crippled: Responses involve in which hand is unable to perform an act due to incapacitation injury dead, disfigured sickness. For example “hand of a dead person”, “hand of patient”, “an injured hand”, “there is a wound or skin disease”, “it is bleeding”.
- c. Fear: This type of responses involve when a hand is threatened with pain, injury, death or incapacitation to examinee or with whom he identifies e.g. “do not move forward, there is a danger ahead”, “may be something will happen like bomb blast, road accident or fire”, “fear of unknown”, “hands of a teacher or father giving warning” or “ready to hit”.

Withdrawal

This type of responses involve inability to or abandonment to perform appropriate or meaningful action, this type of response is further categorized into three sub groups.

- a. Description: Responses involve just acknowledging the presence of a hand the examinee is not willing to say something about the performance of a hand for example “just hand”, “left or right hand”, “hand in upward or downward position”, “a palm or finger”, “two or five fingers”, “open or closed fingers/hands”.
- b. Bizarre: Responses involve reflection of pathological thinking pattern, it may be containing hallucinatory or delusional content. The individual incorporates bizarre idiosyncratic or morbid content and is an indication of serious disturbance, sometimes it is so morbid that

the image is not perceived as hand. For example “trying to get a feel”, “a crocodile looking”, “looking at a distance”, “dead hand”, “skull”, “skeleton”, “heart”, “duck”, “banana”.

- c. Fail: When the person is unable to give any scoreable response, a fail response is counted during the scoring summary but not in sum total. [2]; [6]; [4]; [9]

Modification process was initiated with selection of initially ten stimuli. Out of these ten stimuli which were opted by a panel of experts, while believing that the adapted stimuli are generally used by people of Pakistan as a non-verbal cues to support their communication, four new stimuli were adapted after pilot study on sample of 100 participants (50 normal and 50 psychotic). Ten subjects for one stimulus (Riaz, 2008) Stimuli were selected on the criteria of their capacity to generate responses in more number of scoring categories and varied range of response, hence the modified version of Hand Test would measure cultural input in addition to retaining its projective character “no single test can be entirely culture free and its results are based on norms of that population which are prone to favour to its inhabitants.” [1]. [3] persuaded that new projective techniques should have specific percept that stimulus should measure specific aspects of personality rather than general and should also measure some defence mechanisms and they should be relatively unstructured.

Only few studies have been carried out in west to determine internal consistency reliability of original Hand Test since its inception in 1962.

An investigation was carried out by [12] on a total of 65 protocols of normal, mentally retarded and maniac depressive participants. Kappa coefficient for sub and main scoring categories ranged from .45 to 1 with overall .69 reliability coefficient where communication produced lowest kappa i.e. .45 and highest kappa was found in failure and exhibition as 1 each whereas for the combined categories it remained .92 for interpersonal, .75 for environmental, .83 for maladjustive and .71 for withdrawal. The overall kappa for the combined category remained as .81. The second part of the study consisted of agreement between two scorers which remained as 72% for the 15 sub categories and 87% for the combined scoring categories. Low agreement was found where responses were given in fewer numbers. For example exhibition where percentage of agreement for combined scoring categories remained from 78 to 96%. Disagreement was found in combined categories rather than sub categories.

High percentage of agreement was also found amongst three scorers on 100 Hand Test protocols while determining internal consistency reliability [11].

Rationale

Modification of Hand Test was initiated to adapt a set of four new stimuli possessing cultural significance and present study has been conducted to establish psychometric properties of Modified Hand Test.

METHOD

Sample

The sample of present study consisted of 500 participants which has been further divided into four groups, that is 350 normal with equal number of males and females, their age ranging from 10 to 80 years with the mean age of 37.01 and (SD) 18.6. The second group consisted of 50 participants consisting of 42 males and eight females' age ranging from 11 to 46 years with mean age of 20.43 and SD (10.8), these participants have adjustment problems at home and educational institutions as reported by their teachers and administrative staff. The third group consisted of neurotic/anxiety related disorder participants and have three sub groups i.e. generalized neurotic anxiety, obsessive compulsive and phobic with equal number of males and females, age ranged from 11 to 45 years, mean age 33.10 and SD (10.51). The fourth group consisted of 50 psychotic patients with equal number of males and females age ranging from 15 to 57 years, mean age 32.28 SD (10.69). They were further divided into schizophrenic, depressed and bipolar disorder. The third and fourth group of participants were diagnosed either by psychiatrists or clinical psychologists.

Procedure

Purposive sampling technique was used to recruit participants. The instrument was administered individually in accordance with standardized procedures in Urdu (native language of participants). The scoring booklet of Hand test was translated using translation guidelines given by [10]. Only psychotic participants were offered with the example of Hand shake to take advantage of testing the limits procedure [13] and prompt was also offered only in the beginning but was not followed later. After an interval of 100 seconds the new stimulus was presented and in case response is not offered it is scored as fail. Permission to use Hand Test and its adaptation was obtained from its publishers Western Psychological Services, prior data collection, participants were approached and informed about the purpose of the study. Permission was sought from heads of respective schools, colleges and hospitals for data collection. Ethical standards like written informed consent and confidentiality was also observed, participants were provided with the information such as researcher will own

the data created during the research format and data will be stored for a period of five years. Copies of consent forms were kept with the raw data. Participants were provided assurance that the data will be used only for the research purpose. All personal information were encoded. Participants were assigned a reference number and the data was stored against the reference number/code rather than against their names. Pearson correlation was computed to determine internal consistency for the entire sample. The instrument was modified and four new stimuli(out of ten) possessing the capacity to evoke responses in more scoring categories were adapted after conducting pilot study of 50 normal and 50 psychotic participants.

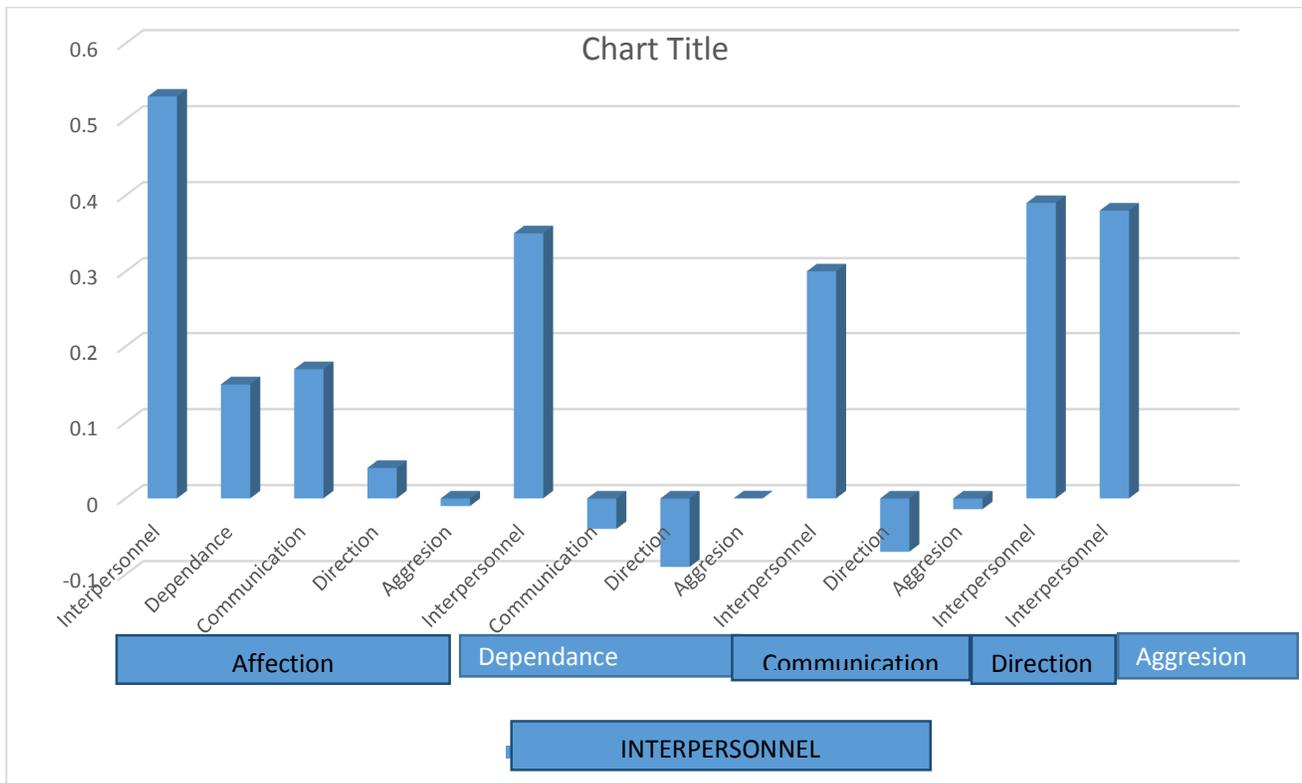
RESULTS

Pearson product moment correlation was computed to determine internal consistency relationship of main domain of interpersonal, environment, maladjustive and withdrawal with their sub categories. Correlation remained moderate to high for these variables. It was found as negative for those variables which do not have relationship theoretically. For example aggression and affection are antagonistic to each other similarly negative correlation was found for variable of exhibition and fear where participants got relatively lesser scored as compared to others. The description has been appended below.

Table 1: Correlation amongst variables of modified Hand Test for Interpersonal Category, Internal Consistency reliability (N=500)

	1	2	3	4	5	6	7	M	SD
Affection	--	0.15**	-0.17**	-0.06	0.04	-0.01	0.53**	2.16	1.43
Dependence		--	-0.04	-0.01	-0.09*	-0.00	0.35**	1.16	0.87
Communication			--	-0.07	-0.14**	-0.23**	0.30**	1.87	1.43
Exhibition				--	-0.03	-0.04	0.01	0.08	0.34
Direction					--	0.00	0.39**	1.23	1.23
Aggression						--	0.38**	1.39	1.32
Interpersonal							--	7.90	2.52

Note: $p < .05$, $p < .01$ **



Pearson Product Moment Correlation was run to find the correlation among variables of Modified Hand Test. Significant positive relationship was found between Affection and Dependence ($r = .15$, $p < .01$),

Affection and Interpersonal ($r=.54, p < .01$), Dependence and Interpersonal ($r= .36, p < .05$, two tailed), Communication and Interpersonal ($r=.30, p= .01$), Direction and Interpersonal ($r= .39, p < .01$) and between Aggression and Interpersonal ($r= .38, p < .01$)

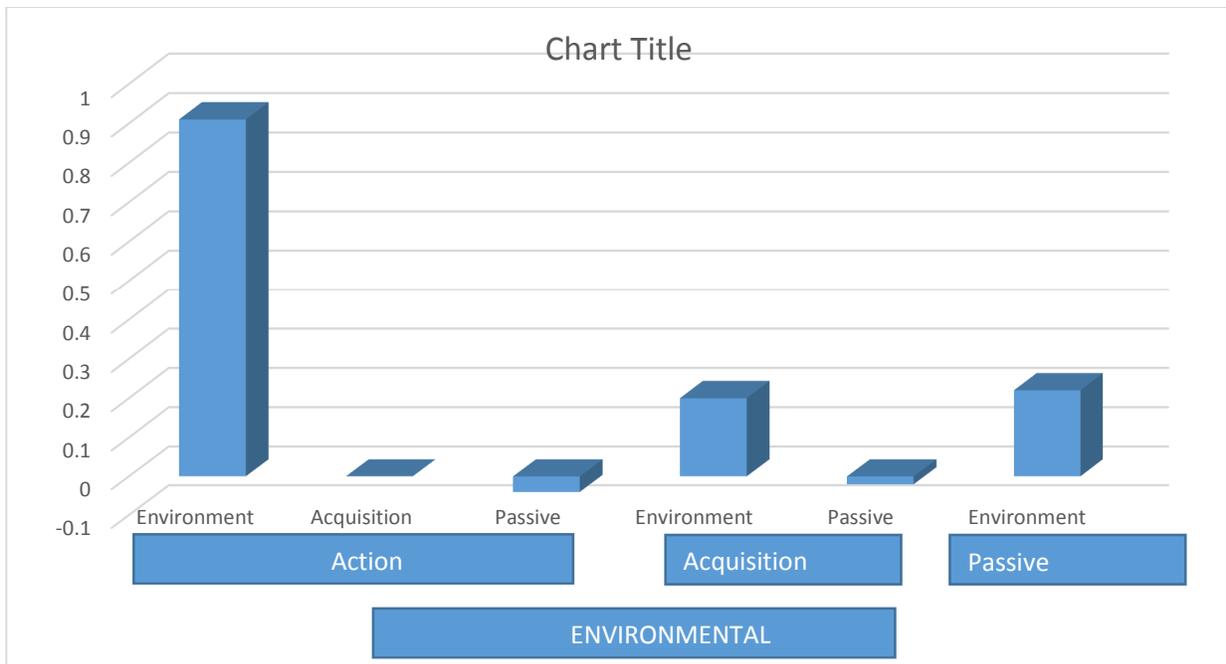
Significant negative relationship was found between Affection and Communication ($r= .17, p < .01$), Dependence and Direction ($r= -.09, p < .05$, two tailed), Communication and Direction ($r= -.14, p < .01$) and between Communication and Aggression ($r= -.23, p < .01$.)

Non-significant positive relationship was found between Affection and Direction ($r=.04$), Exhibition and Interpersonal ($r=.01$) and between Direction and Aggression ($r=0.00$).Non-significant negative relationship was found between Affection and Communication ($r=-.06$), Affection and Direction ($r= -.01$), Dependence and Communication ($r=-.04$), Dependence and Exhibition ($r=-.01$), Dependence and Aggression ($r=-0.00$), Communication and Exhibition ($r=-0.07$), Exhibition and Direction ($r=-0.03$), Exhibition and Aggression ($r=-0.04$)

Table 2: Correlation among variables of modified Hand Test for Environmental Category, Internal consistency reliability (N=500)

	1	2	3	4	M	SD
Action	--	-0.00	-0.04	0.91**	3.56	2.14
Acquisition		--	-0.02	0.20**	0.16	0.49
Passive			--	0.22**	0.32	0.62
Environment				--	4.06	2.29

Note: $p < .01$ **



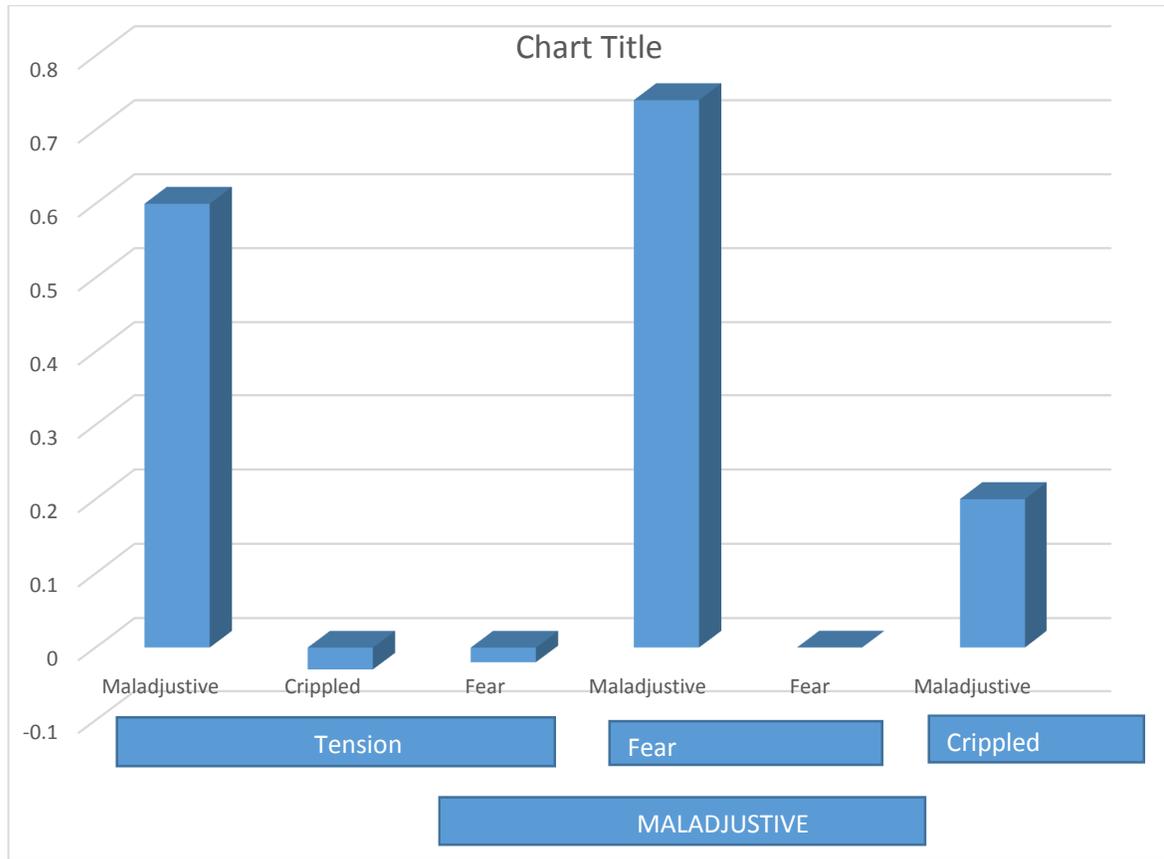
Significant positive relationship was found between Action and Environmental ($r=.91, p= <.01$), Acquisition and Environment ($r=.20, p < .01$, two tailed) and between Passive and Environmental ($r=.22, p < .01$).

Non-significant negative relationship was found between Action and Acquisition ($r=-0.00$), Action and Passive ($r=-0.04$) and between Acquisition and Passive ($r=0.02$).

Table 3: Correlation among variables of modified Hand Test for Maladjustment Category, Internal consistency reliability (N=500)

	1	2	3	4	M	SD
Tension	--	-0.03	-0.02	0.60**	0.41	0.73
Crippled		--	0.00	0.74**	0.54	0.89
Fear			--	0.20**	0.05	0.25
Maladjustive				--	0.99	1.51

Note: $p < .01$ **



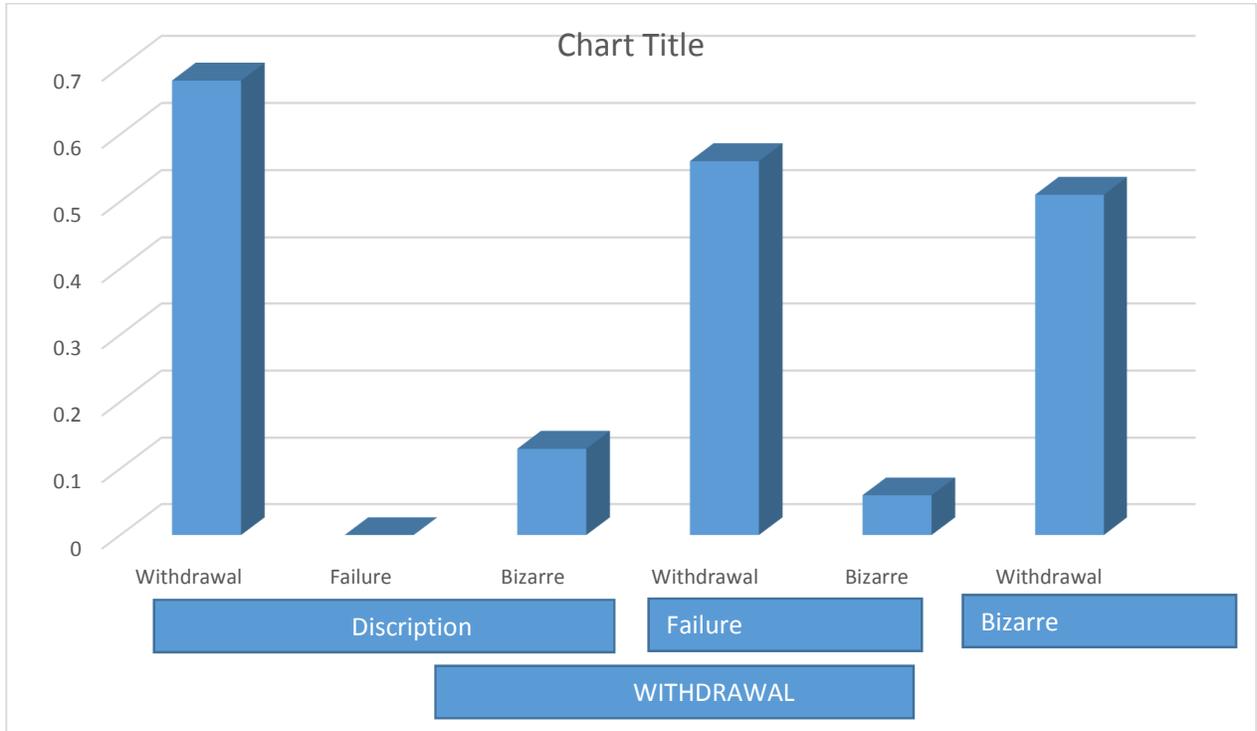
Significant positive relationship was found between Tension and Maladjustive ($r=.60, p < .01$), Crippled and Maladjustive ($r=.74, p < .01$) and between Fear and Maladjustive ($r=.20, p < .01$).

Non-Significant positive relationship was found between Crippled and Fear ($r=0.00$). Non-Significant negative relationship was found between Tension and Crippled ($r=-0.03$) and between Tension and Fear ($r=-0.02$).

Table 4: Correlation among variables of modified Hand Test for Withdrawal Category, Internal consistency reliability (N=500)

	1	2	3	4	M	SD
Description	--	0.00	0.13**	0.68**	0.71	1.25
Fail		--	0.06	0.56**	0.57	1.01
Bizarre			--	0.51**	0.15	0.92
Withdrawal				--	1.44	1.92

Note: $p < .01$ **



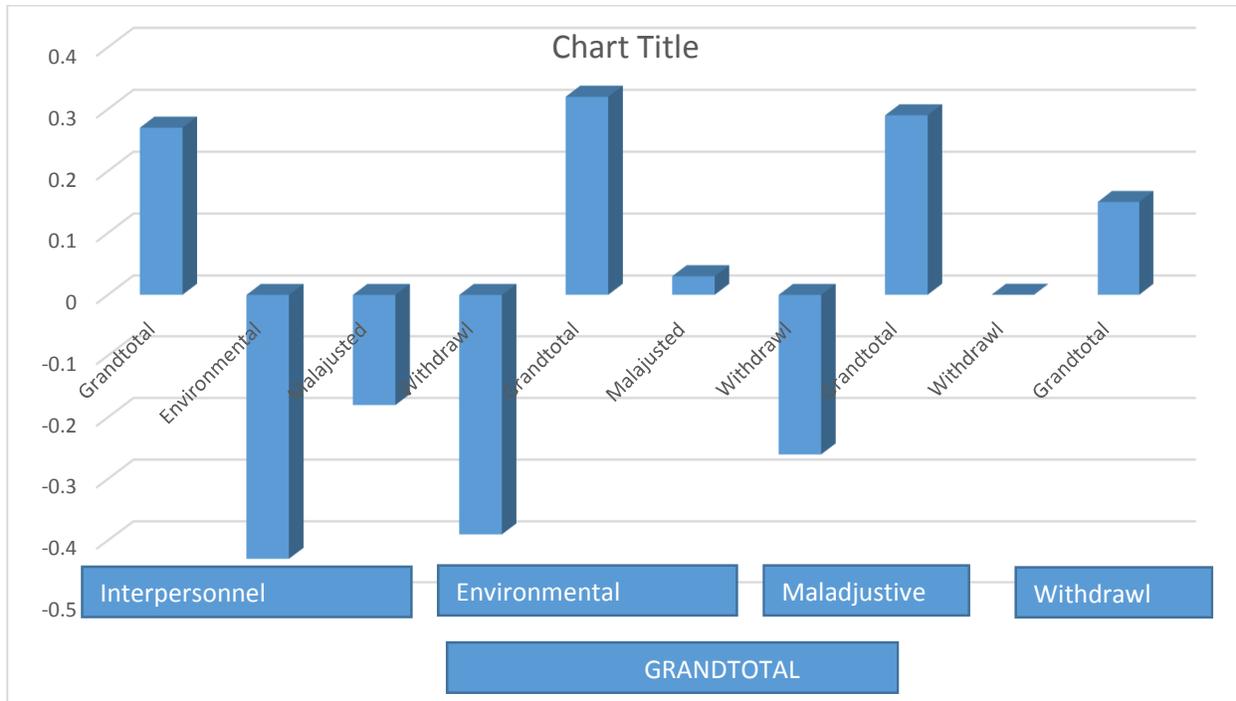
Significant positive relationship was found between Description and Bizarre ($r=.13, p <.01$), Description and Withdrawal ($r=.69, p <.01$), Fail and Withdrawal ($r=.56, p <.01$) and between Bizarre and Withdrawal ($r=.51, p <.01$).

Non-Significant positive relationship was found between Description and Fail ($r=0.00$) and between Fail and Bizarre ($r=0.06$).

Table 5: Correlation among main categories of Modified Hand Test for overall sample (N=500), Internal Consistency reliability (500)

	1	2	3	4	5	M	SD
Interpersonal	--	-0.43**	-0.18**	-0.39**	0.27**	7.90	2.52
Environment		--	0.03	-0.26**	0.32**	4.05	2.29
Maladjustive			--	-0.00	0.29**	0.99	1.15
Withdrawal				--	0.15**	1.44	1.92
Grand Total					--	14.35	1.92

**Correlation is significant at the 0.01 level (2-tailed)



Significant negative relationship was found between Interpersonal and Environmental ($r=-.43$, $p < .01$), Interpersonal and Maladjustive ($r=-.18$, $p < .01$), Interpersonal and Withdrawal ($r=-.39$, $p < .01$), Environmental and Withdrawal ($r=-.26$, $p < .01$). Significant positive relationship was found between Interpersonal and Grand Total ($r=.27$, $p < .01$), between Environment and Grand Total ($r=.32$, $p < .01$), Maladjustive and Grand Total ($r=.29$, $P < .01$) and Withdrawal and Grand Total ($r=.15$, $p < .01$).

Non-Significant positive relationship was found between Environmental and Maladjustive ($r=0.03$). Non-Significant negative relationship was found between Maladjustive and Withdrawal (-0.00).

Limitations

The entire structure of Hand Test has been distributed unevenly because there are six sub-domains in main domain of Interpersonal whereas all the other main domains like Environmental, Maladjustive and Withdrawal have three sub-domains.

In the present study effort have been made to establish relationship (internal consistency) among different variables of Hand Test only instead of checking its consistency among variables in different time period.

Recommendations

Efforts may be made to enhance the structure of Modified Hand Test to incorporate certain other variables in major domains of Environmental, Maladjustive and Withdrawal to have equal number of attributes in all the main domains of Hand Test.

Internal consistency of Modified Hand Test may be determined across time period in addition to their inter connectedness.

Internal consistency of different variables may be established upon different heterogeneous as well as homogenous samples.

DISCUSSION

Correlation computed for interpersonal and its subcategories revealed statistical significant results for affection, dependence, communication, direction and aggression with .53, .35, .30, .39 and .38 respectively at .001 level. This depicted that internal consistency of Modified Hand Test for Interpersonal domain has strong linkage of main category of Interpersonal with almost all categories. Sub category of affection has statistically significant relationship with dependence which is .15 and statistical significant negative relationship with communication as -.17 at .001 level and negative with exhibition and aggression. Sub category of communication has statistically significant negative relationship with direction as -.14 aggression-.23 at .001 level. Similarly, main domain of environmental has statistically significant relationship as .91, .20 and .22 with

action, acquisition and passive at .001 level and is an evidence of high internal consistency whereas both subcategories of action and acquisition have negative relationship with passive sub category. This was expected because people who engaged in actions and who make efforts to achieve goals rarely remain idle or passive. Main category of maladjustive has statistically significant relationship as .60, .54 and .20 for variables of tension crippled and fear respectively, again this kind of relationship is a proof of strong linkage of construct of maladjustive with its subcategories. Withdrawal main category has also statistically significant positive relationship with its subcategories as .68, .56 and .51 for description, fail and bizarre at .001 level. Subcategory of description has statistically significant positive relationship with bizarre i.e. .13 at .001 level. When we focus on the nature of relationship of main categories of Modified Hand Test, interpersonal has statistically significant negative relationship with environment, as -.43, maladjustive as .18 and withdrawal as .27 at .001 level. Whereas environmental also has statistically negative relationship with withdrawal as .26 at .001 level. This result is in contradiction with previous study carried out by [11] whereby interpersonal and environmental had been concluded as characteristics of normality whereas maladjustive for neurotic and withdrawal as psychotic. On the other hand, all the four main categories have statistically positive relationship with total score as .27 for interpersonal, .32 for environment, .29 for maladjustive and .15 for withdrawal at .001 level. All these results are proof of high internal consistency, well-defined and elaborative construct of Hand test. However, the possible reasons of negative relationship between interpersonal and environmental in the present may be because of heterogeneous nature of the sample.

Conclusion

The result of present study is encouraging that in spite adapted additional stimulus and heterogeneous nature of sample, moderate to high correlation for main domains and relationship of sub categories with each other provided an evidence for internal consistency of Modified Hand Test.

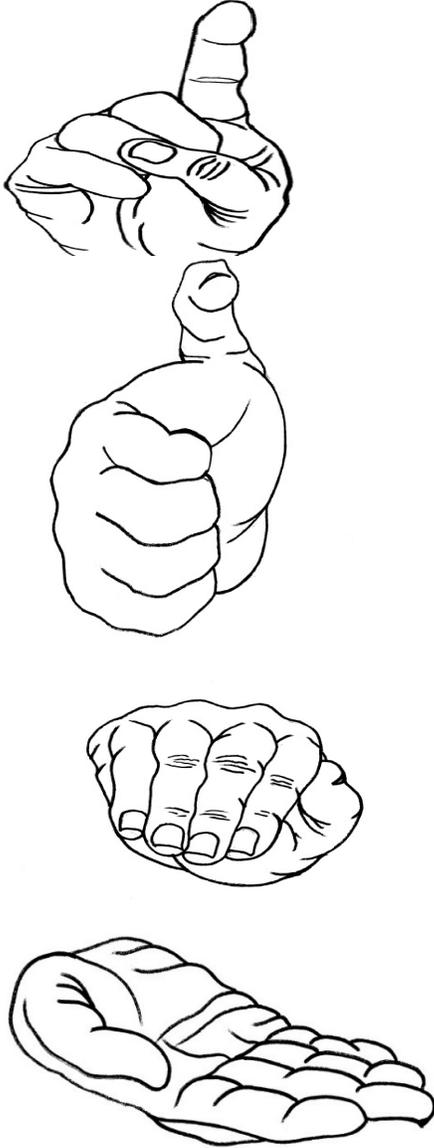
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Appendix A
(Additional Hand Patterns)

Additional Hand Patterns

A set of adapted stimuli of modified version of Hand Test.



These were placed in the sequence of stimulus 10 to 13 whereas stimulus fourteen last stimulus is same which was at stimulus 10 which an invitation to imagination.