

SPLIT HALF RELIABILITY OF MODIFIED HAND TEST

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ABSTRACT

Objective: To establish psychometrics of main study entitled "Adaptation, Modification and Development of Norms of Hand Test in Pakistan."

Study Design: Cross sectional study.

Place and duration of the study: Government College University, Lahore, from Jan 2017 to Jun 2017.

Material and Methods: Modified version of Hand Test consisting of fourteen stimuli were administered to a sample of 500 participants which were selected from various cities of Pakistan. Participants were bifurcated into 350 normal, 50 maladjusted, neurotic and psychotic each age ranged from 11 to 80 years with (M=34.44 ± SD=17.34). In the present study, four new stimuli were adapted through a pilot study comprising 100 participants (50 normal and 50 psychotics) on the criteria of stimulus ability to generate responses in more scoring categories as well as varied range of responses. These four stimuli were divided into two groups, group one consisted of stimulus 1,3,5,7,9,11 and 13 whereas group two consisted of stimulus 2, 4, 6, 8, 10, 12 and 14.

Results: Cronbach alpha was computed for the entire sample as well as for the above-mentioned groups. It remained moderate for combined scoring categories as overall for interpersonal as r=0.39, environmental as r=25, maladjustive as r=36 and withdrawal as r=54 Cronbach alpha remained high for other scoring categories and groups including action for neurotic=0.86, crippled for maladjusted r=65, direction for normal r=62, aggression for psychotic r=60, bizarre for maladjusted, psychotic and overall r=72, 0.84 and 0.83 respectively.

Conclusion: Modified version of Hand Test provided promising results in terms of split half reliability and discrimination across categories of sample.

Keywords: Environmental, Interpersonal, Maladjustive, Split Half Reliability, Withdrawal.

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INTRODUCTION

Hand test was developed by Wagner (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 amongst clinicians and researchers because it possesses the capacity to measure various aspects of human personality and behaviour. Despite being projective test, it offers objectivity in terms of well-defined quantitative scoring categories. Hand test has four major domains which are interpersonal, environmental, maladjustive and withdrawal (Jessica 2010; Anjum and Batool, 2017); their brief description is as follows:

INTERPERSONAL

It refers to relationships with other individuals and are considered as action tendencies rather than imaginary or fantasy. It 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".

Communication: Responses includes providing information to another person, for example, "making speech", "giving under-

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standing to other or something", "giving lectures", "a deaf person talking with hands", "a sign language".

Exhibition: It involves displaying or exhibiting oneself to get attention or approval, appreciation of others or introducing some special character of hand, for example, "showing one's muscles", "an engagement ring", "rasam e hina going on", "bride is showing off her dress", "dancer with graceful movement".

Direction: Responses involve directing, influencing or domineering the action of other people, for example, "a policeman hand giving direction to stop" "order by a father or teacher to a child to obey", "an officer hand giving direction to subordinate to do something", "an umpire giving out".

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".

ENVIRONMENTAL

This type of generalized responses involve 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.

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", "trying to get something" "trying to catch a ball".

Action: This category of responses involves an attitude to utilize constructively, manipulate, acquire an object or goal e.g. "picking up something", "writing or holding a pen or pencil", "throwing or catching a ball", "making something", "putting salt in curry", "washing", "knitting".

Passive: The responses involve an attitude of inappropriate or deliberate withdrawn 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 have been further dividing into three sub categories.

Tension: Responses involve that in spite exerting energy, the goal remains unachievable or little is 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", "clenching fingers or hands to remain refrain from saying something wrong", stretching or tensing one's hand or fingers".

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".

Fear: This type of responses involves when a hand is threatened with pain, injury, death or incapacitation to examinee or with whom he identifies, for example, 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 categories.

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 finger/hand".

Bizarre: Responses involve reflection of pathological thinking pattern, it may contain 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".

Fail: When the person is unable to give any scoreable response, a fail response is counted during the scoring summary but not in sum. (Naeem, 1979, Wagner, 1983, Zehra, 1989; Jessica, 2010) Modification process was initiated with selection of initially ten stimuli. Out of ten stimuli which were opted by a panel of professionals and pilot study 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 a sample of 100 participants (50 normal and 50 psychotic), number of 10 participants 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 responses, 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 its habitants." Kline in 1986 persuaded that new projective techniques should have specific percept which means that stimulus should measure specific aspects of personality rather

than general and should 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. An investigation was carried out by Wendler and Zachary (1983) on a total of 65 protocols of normal, mentally retarded and maniac depressive. Kappa coefficient for sub and main scoring categories ranged from 0.45 to 1 with overall reliability of

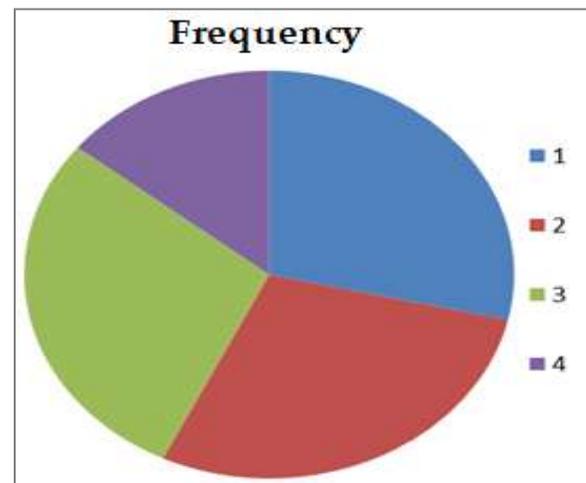


Figure: Distribution of sample (Age-wise).

1=11 to 20 Years = 29%, 2=21 to 40 Years= 29%, 3=41 to 60 Years=29%, 4=61 Years and above=14%.

0.69. Communication produced lowest kappa i.e. 0.45 and highest kappa was found in failure and exhibition as 1 each whereas for the main categories it remained 0.92 for interpersonal, 0.75 for environmental, 0.83 for maladjustive and 0.71 for withdrawal. The overall kappa for the combined category remained as 0.81.

Since the instrument was modified with adaptation of new stimuli, present study was carried out to establish psychometric properties.

MATERIAL AND METHODS

The sample consisted of 500 participants divided into four groups i.e. 350 normal with equal number of males and females, their age ranging from 10 to 80 years with the mean age of 36.97 ± 18.59 . The second group consisted of 50 participants i.e. 43 males and seven females, age ranged from 20 to 50 years with mean age of

20.18 ± 10.75. These participants had adjustment problems at home and educational institutions as reported by their teachers and administrative staff. The third group consisted of neurotics and were divided into three sub group's i.e. neurotic anxiety, obsessive compulsive and phobic with equal number of males and females their age

and were inpatients and outpatients. Cross sectional research design was implied. 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 was translated

Table-I: Demographics Sample and Gender. Normal (n=30), Maladjusted (n=30), Neurotic (n=30) and Psychotic (n=50).

Sample	n	Gender		Age Range	Mean	SD
		Male	Female			
Normal	350	175	175	11 to 80 years	36.97	18.59
Maladjusted	50	43	07	12 to 50 years	20.18	10.75
Neurotic	50	26	24	11 to 56 years	33.10	10.51
Psychotic	50	25	25	15 to 57 years	32.28	10.69

Table-II: Split Half Reliability (n=500) and Group Wise Normal (n=350) Maladjusted, Neurotic and Psychotic (n=50) each for Modified Hand test.

Category	Normal	Maladjusted	Neurotics	Psychotics	Overall
Interpersonal	0.30	0.28	0.30	0.42	0.39
Affection	0.26	0.39	0.45	0.48	0.36
Dependence	0.08	-0.39	0.33	0.20	0.11
Communication	0.50	0.73	0.52	0.22	0.52
Exhibition	-0.06	-0.04	-0.12	0.30	0.28
Direction	0.62	0.58	-0.40	0.52	0.59
Aggression	0.37	0.43	0.32	0.60	0.48
Environmental	0.41	0.26	0.43	0.21	0.25
Acquisition	0.47	0	-0.05	0	0.05
Active	0.48	0.39	0.86	0.37	0.34
Passive	0.29	0.38	0.49	0.26	0.38
Maladjustive	0.35	0.33	0.43	0.15	0.36
Tension	0.35	0.34	0.44	0.08	0.42
Crippled	0.28	0.65	0.45	0.16	0.13
Fear	0.41	0	0.21	0.22	0.53
Withdrawal	0.33	0.69	0.14	0.72	0.54
Descriptive	0.19	0.84	0.37	0.48	0.33
Bizarre	0.44	0.72	0	0.84	0.83
Failure	0.36	0.50	0.04	0.83	0.46
Overall	0.36	0.39	0.33	0.40	0.42

ranged from 11 to 56 years with mean age of 33.10 ± 10.51. The fourth group consisted of 50 psychotic patients with equal number of males and females. Their age ranged from 15 to 57 years with mean age of 32.28 ± 10.69 (table-I). The third and fourth group of participants were diagnosed either by psychiatrists or clinical psychologists

into urdu by a panel of expert using back translation method. Only psychotic subjects were offered with the example of hand shake to take advantage of testing the limits procedure (Wechsler, 1981) and prompt was 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 failure. Spearman brown correlation analysis (Cronbach alpha) was computed on statistical package for social sciences (SPSS 22) to determine split half reliability for the entire sample as well as for various groups. Split half reliability was computed on entire sample of 500 participants while comparing stimulus into odd and even items where first set of stimuli consisted of stimulus one, three, five, seven, nine, eleven and thirteen and second set of stimuli consisted of stimulus two, four, six, eight, ten, twelve and fourteen.

RESULTS

Table-I show distribution of sample across various groups, gender and age ranges. Table-II shows split half reliabilities of normal, maladjusted, neurotic, psychotic and overall. Barker (2002) suggested ranges of low, moderate and high reliability up to 0.29, 0.69 and 0.70 and above. Cronbach alpha for Interpersonal domain for the overall sample remained moderate 0.39. Whereas, among groups it also remained moderate for Psychotic group $r=0.42$ followed by normal and neurotic $r=0.30$ and low for maladjusted group $r=0.28$.

- Cronbach alpha for variables of affection remained moderate for psychotic as $r=0.48$, neurotic $r=0.45$, maladjustment as $r=0.39$ and $r=0.36$ for overall sample where as it remains low for normal group sample with $r=0.26$.
- Cronbach alpha for dependence variable remained low for normal category with $r=0.08$ and negative for maladjusted group with $r=-0.39$.
- Cronbach alpha for communication variable remained high for maladjusted as $r=0.73$ followed by $r=0.52$ for neurotic and for normal group $r=0.50$ respectively.
- Cronbach alpha for direction variable remained moderate as $r=0.62$ for normal followed by overall as $r=0.59$ and $r=0.58$ for maladjusted group respectively.
- Cronbach alpha for variable of aggression remained moderate as $r=0.60$ for psychotic followed by overall as $r=0.48$ and $r=0.43$ for maladjusted group respectively.
- Cronbach alpha for main domain of environmental remained moderate as $r=0.43$ and $r=0.41$ for neurotic and normal respectively. It remained low for psychotic as $r=0.21$ and maladjusted as $r=0.26$.
- Cronbach alpha for acquisition variable remained moderate for Normal as $r=0.47$ and negative for neurotic as $r=-0.05$ and could not be computed for maladjusted and psychotic groups.
- Cronbach alpha for variable of action remained high as 0.86 for neurotic and moderate for normal as $r=0.48$ and $r=0.39$ for maladjusted and psychotic as $r=0.37$.
- Cronbach alpha for passive remained moderate as $r=0.49$ for neurotic and moderate as 0.38 both for overall and maladjusted and low for normal as $r=0.29$.
- Cronbach alpha for main domain of maladjusted group remained moderate as $r=0.43$, $r=0.36$, $r=0.35$, and $r=0.33$ for neurotic, overall, normal and maladjusted respectively where as it remained low as 0.15 for psychotic group.
- Cronbach alpha for tension variable of maladjusted remained moderate as $r=0.44$, 0.35, and 0.34 for neurotic, overall, normal and maladjusted groups respectively where as it is low as $r=0.08$ for psychotic group.
- Cronbach alpha for crippled variable remained as high for maladjusted as $r=0.65$, moderate for neurotics as $r=0.45$, low as $r=0.28$, 0.16 and $r=0.13$ for normal, psychotics and overall respectively.
- Cronbach alpha for variable of fear remained moderate for overall $r=0.53$ and $r=0.41$ for normal, low for psychotics and neurotic as $r=0.22$ and $r=0.21$ respectively.

- Cronbach alpha for main domain of withdrawal remained high for psychotics and maladjusted as $r=0.72$ and $r=0.69$ respectively. Whereas it remained moderate for overall as $r=0.54$, and low for normal and neurotics as $r=0.33$ and $r=0.14$ respectively.
- Cronbach alpha for description variable remained high for maladjusted as 0.84, moderate for psychotics, neurotics and overall as $r=0.48$, 0.37 and 0.33 respectively.
- Cronbach alpha for bizarre variable remained high for psychotics, overall and maladjusted as $r=0.84$, 0.83 and 0.72 respectively.
- Cronbach alpha for failure variable remained high for psychotics as $r=0.83$ where as it remained low for normal as $r=0.36$.
- Cronbach alpha for overall combined categories remained moderate as $r=0.42$ for psychotic as $r=0.40$, maladjusted as $r=0.39$, normal as $r=0.36$ and neurotics as $r=0.39$ respectively.

DISCUSSION

Split half reliability (internal consistency) was determined (while implying cronbach alphas). These set of stimuli were compared along main domain of hand test i.e. Interpersonal, environmental, maladjustive and withdrawal as well as their sub categories along with types of sample.

Normal Group

Cronbach alpha remained as 0.50, 0.62, 0.48, 0.47 for communication, direction, acquisition and action respectively and it is in line with previous findings done by its author. Normal participants are expected to gain high score in interpersonal and environmental domains.

Maladjusted Group

Cronbach alpha for interpersonal remained low, 26 for maladjusted group which depicted that they have problems of adjustment due to poor interpersonal skills. This group obtained higher score in descriptive, bizarre, withdrawal, crippled and communication as 0.84, 0.72 0.69

and 0.73 respectively. The cluster suggested manipulating trend in order to avoid any responsibility and not to be assessed properly. Cronbach alpha was not computed for variable of fear for this group and is perhaps in contradiction to previous findings of the author on this aspect as he suggested the cluster of description, fear and failure for conduct disorders. However, two traits of description and failure are present, it is assumed that fear may be present especially after performing the act which may not be allowed according to the societal norms.

Neurotic Group

Cronbach alpha remained negative for acquisition, -05, for exhibition -21 and direction -40. It remained high for action 0.86, this indicates their low motivation to perform better because of inner weaknesses and external pressure of the environmental. Their higher score in action category if combined analysed with low score in interpersonal category. Thirteen depicted that they are engaged and performing their activities without gaining strength from other persons and they are mostly devoid of interpersonal skills.

Psychotic Group

The higher cronbach alpha for bizarre, failure and overall withdrawal category 0.84, 0.83 and 0.72 are depicting the type of lower energy level and may be engaged in delusional thoughts they also depicted that they have little expression to perform any active role in the society this is supported as no Cronbach alpha was computed for acquisition and low score in dependence and communication categories are indicated by their poor interpersonal skills.

Overall

Cronbach alpha remained moderate for interpersonal 0.42 and higher 0.72 for withdrawal however it remains low for environmental 0.21 and maladjustive as 0.15. Cronbach alpha was higher for bizarre 0.84 followed by failure 0.83 and 0.60 for aggression. It remained low for fear 0.21, passive 0.26, dependence 0.20 and communication, 22 respectively. It is to highlight that cronbach alpha remained low for these

variables where participants got less score. Results are in line with the literature. Wagner (1981) conducted an internal consistency study with almost similar results. Wagner, and his colleagues, (1981) conducted another study while comparing odd and even stimulus against pathology score, initial reaction time and main categories of hand test for two administrations, the average correlation computed was 0.69 for first and 0.64 for the second administration, correlation coefficient ranged from 0.42 to 0.85 where as in the present study the Cronbach alpha computed ranged from 0.15 to 0.83.

CONCLUSION

Cronbach alpha computed for split half reliability of modified hand test displayed moderate results overall and low and high for different variables for different categories of sample. It was supported by previous literature which indicated the promising psychometric property of modified hand test.

LIMITATION OF STUDY

Split half reliability in a sense is half coefficient of entire test (Anastasi, 1997). Moreover, heterogenous nature of sample may have contributed to conclude such results.

RECOMMENDATION

It is recommended that future reliability

studies like split half on modified version of hand test may be computed on homogenous sample and prior to that stimulus pull will be required to be determine before distributing them into odd and even items.

CONFLICT OF INTEREST

This study has no conflict of interest to declare by any author.

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