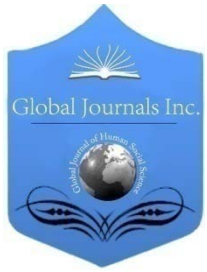
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Sound Apperception Test: Development and Validation

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Abstract- We report the development of Sound Apperception Test (SAT) measuring personality using an alternative, auditory form of projective testing. Sound effects designed to measure four personality dimensions, viz. intellectual functioning; interpersonal adjustment, task orientation and emotional embedded-ness were created. Stimulus analysis was carried out on a randomly drawn sample (n=440). Twenty-four out of the 60 sound effects had more than 75% consensus among expert raters and were retained. Six of the 18 sound effects were common for males and females, and six each were gender-specific. The test-retest reliability for males (n=107) was 0.692–0.765 ($p< 0.01$) and for females (n=69) it was 0.644–0.841 ($p< 0.01$). The validity for males (n=178) was 0.652–0.691 ($p<0.01$) and for females (n=64) it was 0.675–0.71 ($p<0.01$).

Keywords: sound apperception test; tat, sound effect, sat.

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Sound Apperception Test: Development and Validation

Y. K. Nagle [α] & E. Kalpna Rani [σ]

Abstract- We report the development of Sound Apperception Test (SAT) measuring personality using an alternative, auditory form of projective testing. Sound effects designed to measure four personality dimensions, viz. intellectual functioning; interpersonal adjustment, task orientation and emotional embedded-ness were created. Stimulus analysis was carried out on a randomly drawn sample (n=440). Twenty-four out of the 60 sound effects had more than 75% consensus among expert raters and were retained. Six of the 18 sound effects were common for males and females, and six each were gender-specific. The test-retest reliability for males (n=107) was 0.692–0.765 (p< 0.01) and for females (n=69) it was 0.644–0.841 (p< 0.01). The validity for males (n=178) was 0.652–0.691 (p<0.01) and for females (n=64) it was 0.675–0.71 (p<0.01).

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I. Introduction

Projective tests assess the unconscious conflicts, memories, emotions, dominant drives, imagination and perceptual organization of an individual. These tests have a long history, especially in clinical settings. Frank (1939) grouped them into five categories:

Constitutive – for example, the Rorschach Inkblot Test (Rorschach, 1951),

Constructive – for example, the Draw-a-person Test (Goodenough, 1926 & Harris, 1963),

Interpretative – for example, the Thematic Apperception Test (Murray, 1943),

Cathartic – for example, the Rosenzweig Picture-Frustration Test (Rosenzweig, 1948), and

Refractive – for example, the Bender-Gestalt Visual Motor Test (Bender, 1938).

These tests depend almost exclusively on the visual modality, leaving little ground for people who are visually impaired or for the purpose of deriving any input that may stem from the auditory modality. Additionally, the degree of ambiguity which is cardinal in projective content may be better introduced via auditory modality because our perceptual field is more organized around the visual modality.

Projective technique has since relied heavily on eliciting and analyzing misperceptions and appreciations in the one sense modality of vision, but auditory channels seem to have been neglected in the projective psychology. Although the first projective technique was based on the auditory modality – the Word Association Test (Jung, 1910) – very little attempt has been made since then to develop auditory projective tests. Reviews of the research suggest that there is a need for systematic study (Lebo & Bruce, 1960; Breger, 1970). Abramsons (1963) pointed out that since vision inclines to offer more continuing hints of reality checks than audition it seems logical that an auditory technique might provide more opportunity for expression of personalized material.

We developed a Sound Apperception Test, with an aim of identifying auditory stimuli that can elicit information about the personality of the individual, especially intellectual functioning, interpersonal adjustment, coping strategy and emotional embeddedness. The inputs of the present study were drawn primarily from the research carried out by Stone (1950), Wilmer (1951), Alexander (1952) and Braverman (1952) and particularly by Bean (1965).

II. Method

a) Participants

The first data set came from a sample of 440 volunteers (263 male, 177 female) across all geographical locations in India. The mean age of male participants was 21.6 years (range 16–25 years) and of female participants was 22.4 years (range 19–24 years). These participants were all literate (mean education 12.8 years) and were naïve to the purpose of the study at the outset.

b) Generation of sound effects

A preliminary study was conducted to generate sound effects to be used as stimuli for the Sound Apperception Test (SAT) and to examine the effectiveness of these stimuli for assessing intellectual functioning, interpersonal adjustment, task orientation and emotional embeddedness. Some sound effects were recorded live and others were taken from pre-recordings. Recording was done using the technical expertise of All India Radio, Bangalore, India (Appendixes I and II). Sixty sound effects were created and grouped into five sets of twelve; three sets of sound effects each were created for the male and female participants.

Twelve experienced psychologists (professional practitioners) judged the sound effects as potential

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stimuli for assessing personality attributes. These judges had practical experience in personnel selection, clinical work, research and teaching. Following this, the sound effects were modified and restructured. The 24 sound effects that had a higher than 75% consensuses among the judges were selected for the final SAT.

c) Mesure

(a) TAT (Murray, 1943): The Thematic Apperception Test (T.A.T.) of Murray (1943a) consists of 31 pictures of people in different solitary and social situations. There is a specific sequence of cards for girls, women, boys, and men that have, as the central figure, an individual of the same sex and general age group as the individual who is being tested. There are some common cards used for all ages and sexes and one blank card. The individual is asked simply to "make up a story" to each picture. The first half of the stories is considered to be pictures of everyday events; the second group is considered to be more dramatic, more similar to the deeper world of the dream life. In Murray's need-press method of scoring the stories, the psychologist makes an inventory of the numerous "needs" of the hero of each story and an inventory of contrasting requirements or forces from the environment that "press" on the hero. An example is the hero loves a woman, but she hates him. Hence, there is a "need for love or affiliation" met by a "press of hate or rejection." Murray (1938) developed a theory of personality called personology that consists of a large variety of these need-press dichotomies. His system lists needs for abasement, achievement, aggression, acquisition, autonomy, creation, deference, destruction, dominance, intragression, nurturance, passivity, and succorance. His list of presses includes affiliation, aggression, dominance, nurturance, lack, loss, and physical injury. In the present study we have used the first series of the ten picture for males and females they are 1,2,3BM,3GF,4,5,6BM,6GF,7BM, 7GF, 8BM,8GF, 9BM,9GF, and 10.

d) Procedure

The test was conducted in classroom settings with about 15 participants at each session. Participants were given general and specific instructions before the administration of the actual test. The general instructions were:

"You will experience an interesting activity. We are going to present to you some mixed sounds that will give you a chance to think about a situation. I would like you to listen attentively to the sound effects that are presented. Each sound effect will be presented to you for a duration of 30 seconds. While you listen to it, you can broadly makeup your mind about:

a) What might be going on in the situations represented by these sound effects?

b) What must have been going on before this?

c) And what the individual and group are thinking, feeling, and what they will do?

This is a test of your imagination and thinking rather than any particular ability."

The specific instructions were:

"Once the sound effects stop, you have to write down a story around the individual/s and the situational details. Please also note that this is not a test of your language proficiency but it is test of your imagination and hence no story is considered as right or wrong First listen to the sound for 30 seconds, -then write your story taking not more than five minutes time for each story. Then attend to the next sound presented, listen to it carefully, write down the story and so on."

Each sound effect was presented for 30 seconds, and participants were given five minutes for writing the story. Each testing session required approximately one hour to complete. The scoring method for the TAT (based on Murray, 1938 and Bellak, 1973) with miner modification was adopted for analyzing the stories, (Appendix 'A'). In Murray's (1943a) method of scoring the T.A.T., each story is analyzed according to all these needs and presses, each of which receives a weighted score. A hierarchy of the relationship of the needs to each other is also obtained with such concepts of Murray's as need-conflict, need-subsidization, and need-fusion.

III. Analysis and Scoring of Stories

a) Reliability of scoring of SAT

Using pre-set interpretation guides, the investigators assessed the responses to 10 to 15 sounds and scored them. The scores were compared with those of an experienced psychologists' and any differences discussed. After this, investigators assessed responses to 25 to 35 sounds and awarded scores. Coefficients of correlation were computed between the scores of the inexperienced investigators and those of the experienced psychologist, and the means are also noted. Generally, there were almost insignificant differences in the means and the coefficients of reliability were in excess of 0.85. If there were any sizeable differences in means (significant at the 0.01 level of confidence or less) or if there were inter-correlations of less than 0.85, further training was provided to the inexperience assessors.

To assess intra-reporter reliability, about 50 responses were randomly selected and re-scored after two weeks. Reliability coefficients for the SAT were obtained by computing the correlation between these scores. The minimum coefficient for scoring to be considered reliable was 0.90; investigators with satisfactorily high coefficients continued to analyses responses.

Socio-demographic information was used to supplement our inferences. At quantitative analysis,

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scores on four-personality dimensions, viz. intellectual functioning; interpersonal adjustment, task orientation and emotional embedded-ness were produced: each of the stories was converted into scaled scores with a five-point rating scale, wherein '1' represented highest and '5' represented lowest score (appendix C). The conversion was done with a profile chart and analysis sheet to allow comparison at a glance. The qualitative and quantitative analysis methods of Murray (1943), Bellak (1973) and McClelland (1985) were used. Two aspects of the subject's written stories were used for analyzing and interpreting their responses to the sounds: aspects of the story itself and aspects of the characters.

b) Aspects of the story

(a) Relation of story to stimulus materials: Assessors looked at whether the stories distorted what was represented by the sounds, such as by adding or omitting objects or persons.

(b) Form and content: Formal characteristics of story structure and story content reflect the adequacy of accomplishing the storywriter task, whereas content deals with the specific themes that reflect the unique concerns of the storywriter, so the participants were instructed to make up a story containing antecedents, happenings, and outcomes.

Aspects of the characters

Elements related to the characters were considered, and the theme in which the characters are described were noted. The affects, feelings or moods of the characters were analyzed, including irrelevant feelings, aesthetic feelings, sadistic feelings and feelings of guilt or inferiority. Their needs, presses and threats were examined, as well as their values or motivating forces. Their actions, conflicts, interpersonal feelings and relations (especially their attitudes toward parents or authority) were considered. Use of punishment, attribution or blame and patterns of need gratification were examined and attention was paid to defenses, such as fantasy and denial. Inhibition of aggressive or sexual impulses and/or facing interpersonal feelings were also analyzed.

IV. Work Method

The following work method was followed:

a) Investigators began by reading and comprehending the stories and making notes on the Bellak TAT analysis sheet using 10 variables and a five-point rating scale. Thereafter, depending on the nature of the results obtained from the first step, further analysis was carried out, both qualitative and quantitative. The stories were analyzed in terms of situations, attitudes, sequences and on descriptive, interpretative, symbolic and elaborative levels; they were studied with respect to areas such as social relationships, work, sex and defenses. The sequence for functional modes of the ego i.e. sequence of events was analyzed to understand personality dynamics with reference to personality dimensions. The interpretative theme of each story was recorded on analysis sheets using a five-point rating scale.

V. Results

a) Reliability

The test-retest reliability of the SAT was obtained from a sample of 107 males aged 16.5–25 years and 69 females aged 20–24 years. The SAT was administered twice on the same sample with an interval of 15 days and the reliability coefficient of the SAT was obtained separately for the male and female samples for the following factors: intellectual functioning, interpersonal adjustment, task orientation and emotional embedded ness. The test retest reliability ranged from 0.692–0.765 ($p<0.01$) for males and 0.64–0.841 ($p<0.01$) for females.

b) Validity

The content validity of the SAT was determined by the agreement of expert judges that the contents of the situational sound effects were true measures of personality dynamics with reference to personality constructs examined.

However, the purpose of personality testing is to predict real-life correlates of test scores. Consequently, we assessed the concurrent and predictive validities of the SAT for different ages and sexes. The validity of SAT was determined by comparing it with the TAT (Murray, 1943). Correlation coefficients between the SAT and TAT for male candidates for the four dimensions (intellectual functioning, interpersonal adjustment, task orientation and emotional embedded-ness) were statistically significant and ranged from 0.652 to 0.69 ($p<0.01$); for females the range was 0.684 to 0.71 ($p<0.1$).

VI. Discussion

Projective test and objectives start from different premises and accomplish different goals. Writing stories in response to SAT sound effects allows participants to organize and associate with ambiguous and semi-ambiguous material, presumably reflecting implicit motives. McClelland et al. (1989) claimed that these implicit motives are stimulated by the effect connected with an activity. For example, participants with high affiliation scores on TAT stories released dopamine after viewing romantic movies (McClelland, Patel, Stier & Brown, 1987); in contrast, participants with self-attributed affiliation needs did not respond to romantic movies with dopamine release. Objective test responses result from organized cognitive, self-reflective thought processes and have all the advantages and

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disadvantages that follow from that style. More than projective test responses, they can predict present behaviour in specific situations. Long-term behaviour, in contrast, is more efficiently predicted using SAT responses.

The data emerging from the SAT in the form of stories suggests that it is a psychometrically reliable and valid test and is of potential use in identifying emotional disturbances in individuals. Each sound was a unique stimulus. Emotionally disturbed men and women had much more difficulty incorporating characters' feeling into their stories, which were poorly organized, lacked internal logic, revealed inadequate judgment (for example, there were deficiencies in understanding cause–effect relations with respect to actions and outcome, success was achieved by wishful thinking or they were unable to complete the task). The SAT was applicable to a wide range of participants from college-aged adolescents to the elderly, with satisfactory reliability and validity. Of course, no important decisions about clients should be made, at this stage, based only on SAT assessment data, which instead should be supplemented by other standardized tests.

Using only one type of assessment data is always a high-risk proposition. Drawing conclusions uniquely from a test or from behavioral observations or from clients' self-reports entails a significant risk of error. Diagnosis is safer when common themes emerge from different types of assessment. Cross-validation on various samples could be carried out to determine the suitability of any particular test for a specific group of individuals.

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Appendix 'A'

Descriptions of Sound Effects Played to Males (Duration 30 Seconds)

C1 Stream with nightingale in the background
C2 Bottle clinking and pouring of drinks and a female in conversation, crying (semi-structured)
M3 Person coughing and moaning (suffering with pain)
M4 Demolition effects of falling debris and an explosion
C5 Baby crying and telephone bell ringing
M6 Aeroplane passing over head (propeller plane/jet) and horse carriage passing
C7 Ship's siren with passengers embarking and dockside noises in background (semi-structured)
M8 Car speeding, brakes being applying and diesel train passing at speed
C9 Plane takes off and bombing from plane (semi-structured)
M10 Troops marching very nearby
C11 Wedding organ playing and bride being welcomed
M12 Castle doors opening, squeaking and closing

Appendix 'B'

Descriptions Of The Sound Effect Played To Females (Duration 30 Seconds)

F1 Young children playing in playground and ambiguous conversation.
C2 Ship's siren with passengers embarking and dockside noises in background (semi-structured)
F3 Prayer in the temple with bell sound in the background
C4 Plane takes off and bombing from plane
F5 Night effect: car passing in slow speed in the rain
F6 Alarm clock ticking then ringing
F7 Dog barking, door bell ringing, door opening and two gun shots
C8 Baby crying and telephone bell ringing
C9 Wedding organ playing and bride being welcomed
C10 Bottle clinking, pouring of drinks and a female in conversation, crying
F11 Continuous gun shots and a man running in street
C12 Stream with nightingale in the background

Appendix 'C'

Sound Apperception Test Story Analysis Sheet

Name: Age: Race:
Sex: Education: Religion:

Rating On A 5- Point Scale (Highest 1 To Lowest 5)

Theme of the story		FACTOR-I Intellectual functioning					FACTOR- II Interpersonal adjustment					FACTOR-III Task orientation					FACTOR -IV Emotional Embedded-ness				
Sl.No.	Theme	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
1																					
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