

# 1 Sound Apperception Test: Development and Validation

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## 6 **Abstract**

7 We report the development of Sound Apperception Test (SAT) measuring personality using an  
8 alternative, auditory form of projective testing. Sound effects designed to measure four  
9 personality dimensions, viz. intellectual functioning; interpersonal adjustment, task  
10 orientation and emotional embedded-ness were created. Stimulus analysis was carried out on a  
11 randomly drawn sample (n=440). Twenty-four out of the 60 sound effects had more than 75

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13 **Index terms**— sound apperception test; tat, sound effect, sat.

## 14 **1 I.**

15 Introduction projective tests assess the unconscious conflicts, memories, emotions, dominant drives, imagination  
16 and perceptual organization of an individual. These tests have a long history, especially in clinical settings. Frank  
17 (1939) grouped them into five categories: Constitutive -for example, the Rorschach Inkblot Test (Rorschach,  
18 1951), Constructive -for example, the Draw-a-person Test (Goodenough, 1926& Harris, 1963), Interpretative  
19 -for example, the Thematic Apperception Test (Murray, 1943), Cathartic -for example, the Rosenzweig Picture-  
20 Frustration Test (Rosenzweig, 1948), and Refractive -for example, the Bender-Gestalt Visual Motor Test (Bender,  
21 1938).

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

26 Projective technique has since relied heavily on eliciting and analyzing misperceptions and appreciations in the  
27 one sense modality of vision, but auditory channels seem to have been neglected in the e-mail: yknagle@gmail.com  
28 projective psychology. Although the first projective technique was based on the auditory modality -the Word  
29 Association Test (Jung, 1910) -very little attempt has been made since then to develop auditory projective  
30 tests. Reviews of the research suggest that there is a need for systematic study (Lebo & Bruce, 1960; Breger,  
31 1970). Abramsons (1963) pointed out that since vision inclines to offer more continuing hints of reality checks  
32 than audition it seems logical that an auditory technique might provide more opportunity for expression of  
33 personalized material.

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

## 39 **2 II.**

## 40 **3 Method a) Participants**

41 The first data set came from a sample of 440 volunteers (263 male, 177 female) across all geographical locations  
42 in India. The mean age of male participants was 21.6 years (range 16-25 years) and of female participants was  
43 22.4 years (range 19-24 years). These participants were all literate (mean education 12.8 years) and were naïve  
44 to the purpose of the study at the outset.

## 8 ANALYSIS AND SCORING OF STORIES A) RELIABILITY OF SCORING OF SAT

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### 45 4 b) Generation of sound effects

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

52 Twelve experienced psychologists (professional practitioners) judged the sound effects as potential Year 2015  
53 stimuli for assessing personality attributes. These judges had practical experience in personnel selection, clinical  
54 work, research and teaching. Following this, the sound effects were modified and restructured. The 24 sound  
55 effects that had a higher than 75% consensuses among the judges were selected for the final SAT.

### 56 5 c) Mesure

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

71 In the present study we have used the first series of the ten picture for males and females they are  
72 1,2,3BM,3GF,4,5,6BM,6GF,7BM, 7GF, 8BM,8GF, 9BM,9GF, and 10.

### 73 6 d) Procedure

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

76 "You will experience an interesting activity. We are going to present to you some mixed sounds that will  
77 give you a chance to think about a situation. I would like you to listen attentively to the sound effects that are  
78 presented. Each sound effect will be presented to you for a duration of 30 seconds. ??hile "Once the sound effects  
79 stop, you have to write down a story around the individual/s and the situational details. Please also note that  
80 this is not a test of your language proficiency but it is test of your imagination and hence no story is considered as  
81 right or wrong First listen to the sound for 30 seconds, -then write your story taking not more than five minutes  
82 time for each story. Then attend to the next sound presented, listen to it carefully, write down the story and so  
83 on."

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

## 90 7 III.

### 91 8 Analysis and Scoring of Stories a) Reliability of scoring of 92 SAT

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

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

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

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

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

## 119 **9 Aspects of the characters**

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

## 127 **10 IV.**

## 128 **11 Work Method**

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

137 V.

## 138 **12 Results**

### 139 **13 a) Reliability**

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

### 145 **14 b) Validity**

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

149 However, the purpose of personality testing is to predict real-life correlates of test scores. Consequently, we  
150 assessed the concurrent and predictive validities of the SAT for different ages and sexes. The validity of SAT was  
151 determined by comparing it with the TAT (Murray, 1943). Correlation coefficients between the SAT and TAT for  
152 male candidates for the four dimensions (intellectual functioning, interpersonal adjustment, task orientation and  
153 emotional embeddedness) were statistically significant and ranged from 0.652 to 0.69 ( $p<0.01$ ); for females the  
154 range was 0.684 to 0.71 ( $p<0.1$ ). disadvantages that follow from that style. More than projective test responses,  
155 they can predict present behaviour in specific situations. Long-term behaviour, in contrast, is more efficiently  
156 predicted using SAT responses.

157 **15 VI.**

158 **16 Discussion**

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

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

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