

**CORROBORATIVE PSYCHOPHYSIOLOGICAL  
INDICES RELATED TO PROJECTIVE ANALYSIS  
OF EMOTIONALITY**

**By**

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**CERTIFICATE**

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**CORROBORATIVE PSYCHOPHYSIOLOGICAL  
INDICES RELATED TO PROJECTIVE ANALYSIS  
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**ABSTRACT**

The present study was undertaken with an objective to determine the corroborative psychophysiological indices related to projective analysis of emotionality. Twenty six (n=26) male students of Universiti Sains Malaysia in the age ranging from 19 to 23 years volunteered as participants, who were subjected to evaluation of Psychobiological measures of tonic and phasic skin conductance activity, along with BRUMS self-report measures of mood states and projective analyses of emotionality by employing Rorschach Ink-Blot Test. Findings indicated corroborative relationships between differential psychobiological and mood states measures in predicting inner core emotionality. Dispositional emotional characteristics such as - excitability, resilience and constriction as well as tonic and phasic components of skin conductance activity were found aptly predicted by differential extents of transient facilitative, inhibitive, positive as well as negative mood state measures and faster orienting latency, which have provided us with a framework of corroborative emotional make-up.

# **HUBUNGAN NYATA DI ANTARA INDEX PSYCHOPHYSIOLOGICAL DENGAN ANALISIS PROJEKTIF EMOSI**

## **ABSTRAK**

Penyelidikan ini di lakukan dibawah objektif untuk mengenalpasti hubungan nyata di antara index psychophysiological dengan analisis projektif emosi. Penyelidikan ini melibatkan 26 pelajar lelaki Universiti Sains Malaysia yang berumur dalam lingkungan 19-23 tahun.. yang tertakluk kepada penilaian langkah Psychobiological tonik dan aktiviti konduktans kulit phasic, bersama-sama dengan BRUMS-langkah laporan diri perasaan dan analisis projektif emosionaliti dengan menggunakan Ujian Rorschach. Kajian menunjukkan hubungan yang nyata antara pembezaan psychobiologikal dan perasaan langkah dalam meramalkan emosionaliti teras dalaman. Ciri-ciri emosi kecenderungan seperti daya tahan, mudah terangsang, dan penyempitan serta yang tonik dan komponen phasic yang aktiviti konduktans kulit dijumpai tepat yang diramalkan oleh perbezaan takat memudahcarakan fana, inhibitive, positif serta langkah-langkah negatif perasaan dan cepat menyesuaikan kependaman, yang menyediakan kami dengan rangka kerja nyata emosi make-up.

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# **CHAPTER 1**

## **INTRODUCTION**

Twentieth century life-style is characterized by over-whelming pressure for success and time-constraints. Never-ending pressure for achievements and result-oriented life-style coupled with heightened level of aspiration and continuous strives for success putting today's urban life particularly in budding generation under over-whelming stress resulting in high-strung emotionality.

Numerous studies have suggested that, children and young-adult individuals with emotional problems often come from families where there are disturbed family set-ups; work-pressure; strained relationships, which make the child emotionally insecure and anxious (Biswas et al. 1998). Highest rate of emotional disorders and problems of identification of the children with their parents, are evident in nuclear families (Douvan and Adelson, 1966; Saha et al. 1998; Saha & Saha, 1998 and Biswas et al. 1998). Previous researches done by the present authors also evidenced prevalence of heightened emotionality, inattentiveness in majority of the urban families characterized by the nuclear formation of the families (Biswas et al. 1998; Chakrabarti et al. 2001; Saha et al. 1998; Saha & Saha, 1998 & 2004). The most equipped efforts by the physical health healers do not yield permanent results as the chief reason behind the ailments rest upon the poor mental health itself. On the other hand, psychotherapeutic approaches along with behaviour modifications, cognitive psychotherapy, biofeedback etc are not always suitable to the children, for they may not have adequate cognitive clarity and maturity required for that (Saha et al. 2005). All these misleading preoccupations and the social stigma concerning psychological

and psychophysiological disorders and the conventional processes of therapeutic interventions give rise to question of option for an alternative source of intervention.

Thus optimal evaluation of emotional crises became most pertinent issue of concern. In psychology, projective evaluation is done, which appears like a personality test designed to let a person respond to ambiguous stimuli, presumably revealing hidden emotions and internal conflicts (Cordon, 2005; Meyer, Gregory Kurtz, John ,2006). This is different from an "objective test" in which responses are analyzed according to a universal standard (for example, a multiple choice exam). The responses to projective tests are content analyzed for meaning rather than being based on presuppositions about meaning, as is the case with objective tests.

These tests are used frequently, but if not followed rigorous methodology, scientific evidence may sometimes become debated. There have been many empirical studies based on projective tests (including the use of standardized norms and samples), particularly more established tests. Projective tests have their origins in psychoanalytic psychology, which argues that humans have conscious and unconscious attitudes and motivations that are beyond or hidden from conscious awareness.

The best known and most frequently used projective test is the Rorschach inkblot test, in which a subject is shown a series of ten irregular but symmetrical inkblots, and asked to explain what they see. The subject's responses are then analyzed in various ways, noting not only what was said, but the time taken to respond, which aspect of the drawing was focused on, and how single responses compared to other responses for the same drawing. For example, if someone consistently sees the images as threatening and frightening, the tester might infer that the subject may suffer from paranoia.

There are many factors that can influence on the athlete performance. One of the reason weather the athlete's performance is good or bad is depend on his or her mental toughness or more specifically depend on his psychology. Sport psychology is one of the factors that can enhance in sport performances. This is because the psychology can be the main part to the athletes if there is a high pressure in the particular games.

Over the past several years, both coaches and athletes have started to realize that strength, speed and other athletic skills are not sufficient for the production of championship athletes. Athletic performance has three parts: physical preparation, technical skill, and psychological readiness. This model suggests that if any of the above areas are neglected, athletic performance will decline. However, psychological preparation is the component that is most often neglected by athletes and coaches alike.

The coaches also need to take about the athlete's personality. The personality test also known as a projective test is very important because it designed to let a person respond to suspicious stimuli, presumably revealing hidden emotion and internal conflicts. So, it is importance to coaches and psychologist to take notes about the personality test. The player can perform better performance if they visualize the skill or situation earlier.

People's ability to influence their own psychological states has been given the term mental control (Wegner & Pennebaker, 1993). Mental control involves the deliberate use of strategies to change or maintain thoughts, feelings, or actions (Totterdell & Leach, 2001). Concentration and focus can be increased by controlling the mental state. The use of mental control strategies is now seen as an influential contributor to successful competitive performance in sport. A few studies have shown that mental training programmers in individual sports

(Patrick & Hrycaiko, 1998; Terry, Mayer, & Howe, 1998) and team sports (Bakker & Kayser, 1994; Bull, 1995; Savoy, 1997) can lead to improved sports performance.

Coping with stressful competitive situations is considered as natural ability of the players, yet without effective stress management skills the effect of stress on the emotional response and performance consequences for the player may be severe (Eubank & Gilbourne, 2003). Researches on stress process, as viewed in the Sport Psychology literatures, has mostly been dealt with the apprehensive feelings and negative expectancies in the players, which are commonly considered as aspects of anxiety.

Mood has been found to be one variable to also predict performance. Vast amount of evidence suggest that poor performance is associated with failure to get into an appropriate mood. In sport psychology, the investigation of relationships between mood and performance has been a major focus of research (Lowther and Lane, 2002). Mood measures assessed shortly before competition has been found to predict performance outcome in a number of different sports. The Brunel Mood Scale is a 24-item measure of mood which assesses anger, confusion, depression, fatigue, tension and vigor (Fazackerley et.al, 2003). It is suggested that the effectiveness of mood in predicting performance would depend on the type and duration of the sport, the relative homogeneity of the participants' skill and the performance marker (S. K. Wong et.al 2006). But very little research investigate the antecedents of mood and how athletes deal with intense mood states that might impair performance. Mood is proposed to be a more effective predictor of performance in sports of a short duration, when the sport involves open skills, and when performance is assessed through a self-reference criterion (Beedie, et al., 2000). Since mood is an important predictor of performance, the ability to control mood would be a useful psychological tool for any athlete (Stevens and Lane, 2001).

The galvanic skin response (GSR) is a simple, useful and reproducible method of capturing the autonomic nerve response as a parameter of the sweat gland function. Physically GSR is a change in the electrical properties of the skin in response to different kinds of stimuli. Any stimulus capable of an arousal effect can evoke the response and the amplitude of the response is more dependent on the surprise effect of the stimulus than on the physical stimulus strength. In measurements, changes in the voltage measured from the surface of the skin are recorded. In history, GSR is also known as or closely related to, the sympathetic skin response (SSR) and skin conductance response (SCR). Most of the GSR studies in last decades are concerned with the normal values of response amplitude and latency

The Rorschach is properly classified as a projective test, but it will be easier to understand it if we refer to it as a personality test. Most people are familiar with the questionnaire type of personality tests which appears sometimes in popular magazines, where questions are to be answered with one word, either yes or no. Such tests deal with the presence or absence of certain personality traits in the person answering the question, and the score of questions answered in a specific way can be compared with a sample normal group which has also taken the test. In this manner the subject can determine whether he is like or unlike the so-called normal group which originally took the test. The faults in such tests, usually known as objective tests, deal with the opportunity for deceit, either deliberately or unconsciously, the inability to express all aspects of a personality trait when only a yes or no answer can be given, and the assumption that the sample group with which comparison is made is a normal group. The projective type of personality tests, on the other hand, deals with material which cannot be distorted, allows for complete

descriptions of personality and its interaction, and permits comparison of the individual in terms of his specific socio-economic status in the community.

The Rorschach test, also known as the Inkblot test, consists of ten white cards, 7" by 9", on each of which is printed an inkblot. The person taking the test states what the inkblot seems to resemble as he is handed the cards one by one. Inkblot pictures of animals, people, flowers, in fact every conceivable kind of object and some which seem to be creations of imagination as well as of the world about us, are seen.

The research done by Rorschach (Rocchach, 1942) and his followers and students shows that the images selected and the manner of visualizing them are unique to the personality of the individual person who takes the test. By means of Rorschach's technique these images can be scored objectively and interpreted to furnish a picture of the individual's psychological tendencies in his relationships to himself and to others in his social environment.

### **1.1 Hypotheses:**

No relation between the psychophysiological and projective indices of emotionality in the participants is expected.

### **1.2 General Objective:**

i) To identify the relationship between different psychophysiological indices of emotionality related to projective analysis of emotionality observed in the young adult athletes.

### **1.3 Specific objectives:**

- i) To identify the relationship between the autonomic indices of emotionality corroborative projective analysis of emotionality, if any, amongst the young active male students of the School of Health Sciences.
- ii) To see the relationship between the basal skin conductance indices and emotionality evaluated by the mood scale, if any, amongst the young active male students of the School of Health Sciences.
- iii) To justify the relationship between the skin conductance orienting reflex indices and emotionality evaluated by projective and mood analysis, if any, amongst the young active male students of the School of Health Sciences.

## **CHAPTER 2**

### **LITERATURE REVIEW**

The survey of literatures gives an impression that the studies conducted may broadly be divided into 1) those consent the effect of projective test of psychological variables 2) those consent the effects of projective test and psychophysiological variables

#### **2.1 PSYCHOPHYSIOLOGICAL AND EMOTIONALITY**

Present study tested the hypothesis that the palmar galvanic skin response (GSR) involves the sweat gland and an epidermal component each responding preferentially according to the demands of the behavioral situation. Their relative contributions were determined by comparison of simultaneous GSR's from areas with high vs low concentrations of sweat glands and with direct measurement of vapor production as well. Stimuli were tones and lights which were either alerting signals or execution signals for a perceptual or a motor (reaction time) task.

The population unexpectedly showed greater relative sweat response to the alerting signal for the reaction time task than to the associated execution signal (71 out of 94 S's). Individual subjects, but not the population as a whole, differentiated significantly between alerting and execution signals for the perceptual task. It is straightforward to assume that physical exercise promotes cerebral blood flow (CBF) that could affect electroencephalographic (EEG) as well as electrodermal (EDA) or skin conductance measures (Dustman et al., 1990a; Dustman et al., 1990b).

Findings of the previous studies are in agreement with and extend previous reports that found increased alpha power for high-fit relative to low-fit subjects (Dustman et al., 1985, 1990b) and studies that assessed EEG and Sc activity before and after exercise in a variety of subject sport-populations (Boutcher & Landers, 1988; Farmer et al., 1978; Hatfield et al., 1984; Kamp & Troost, 1978; Petruzzello & Landers, 1994; Wiese et al., 1983).

Available research findings though suggest that EEG measures as well as skin conductance and other physiological measures such as HR, ECG measures etc. can identify potential changes in muscle activities leading towards both high and low performance, training can optimally enhance in performance, efficacy of other biofeedback training systems (such as, HR, ECG, Sc and EMG biofeedback) in enhancing performance of any specific sport-skill remains inconclusive (Saha et al. 2009).

Cacioppo et al. (1993, 2000) provide a wide range of links between physiological features and emotional states as anger increases diastolic blood pressure to the greatest degree, followed by fear, sadness, and happiness. Anger is further distinguished from fear by larger increases in blood pulse volume. Anger appears to act more on the vasculature and less on the heart than does fear.

Gross & Levenson (1995, 1997) study to find most effective films to elicit discrete emotions, amusement, anger, contentment, disgust, fear, and neutrality. Amusement, neutrality, and sadness were elicited by showing films. Skin conductance, inter-beat interval, pulse transit times and respiratory activation were measured inter-beat interval increased for all three states, the

least for neutrality and skin conductance increased after the amusement film decreased after the neutral film and stayed the same after the sadness film.

## **2.2 SELF-REPORT AND EMOTIONALITY**

Lowtherm and Lane (2002) studied on male soccer team in England to investigate relationships between pre-competition group cohesion, mood, and performance in the team. Eight games were played and data were analyzed on a game-by-game basis. Regarding mood, it was assessed using the 24-item Brunel Mood Scale (Terry et al., 1999). The Brunel Mood Scale assesses anger, confusion, depression, fatigue, tension, and vigor. Anger items include "bad-tempered" and "angry", confusion items include "mixed-up" and "uncertain", depression items include "depressed" and "downhearted", fatigue items include "worn out" and "tired", tension items include "worried" and "anxious", and vigor items include "lively" and "energetic". Items are rated on a 5-point scale anchored by 0 ("not at all") to 4 ("extremely").

Recent research has suggested mood is an effective predictor of performance when mood is assessed shortly before competition and when performance is assessed using self-referenced measures similar to the measure used in the present study (Beedie et al., 2000; Lane & Chappell, 2001). Post-competition, participants rated the quality of performance on a two-item scale. Results indicated that GEQ scores related to Vigor, lending support to the notion that being part of a cohesive team is associated with positive mood states. Depressed mood was shown to be associated with a poor perception of performance.

Recent research has found that individuals use strategies such as talking to people as strategies to improve mood (Stevens & Lane, 2001). The confidence in, and perceived difficulty of self-set goals has also been found to influence mood (Brehm, 1999; Lane, 2001; Locke & Latham, 1990).

Findings from the previous studies supported the validity of the Brunel Mood Scale (Terry et al., 1999; Terry et al., in press). Terry, et al. (1999) validated the Brunel Mood Scale over a series of stages in which each stage acted as a check on the previous. Participants were 345 water-skiers (age range 16 to 39 years, men:  $n = 311$ , women  $n = 34$ ). Competitors ranged in level from novice to elite water-skiers. The purpose of the present study was to investigate the factorial validity of the Brunel Mood Scale which measures anger, confusion, depression, fatigue, tension, and vigor for water-skiers. (Richie Fazackerley, Andrew M. Lane, and Craig Mahoney, 2002)

Some earlier research has found behaviorally expressive (Cole et al., 1996) and aggressive children (Pitts, 1997; Williams et al., 2003) to exhibit increased HR reactivity, and extends the current literature by demonstrating this relationship with children's self-report of their emotion regulation abilities.

### **2.3 PROJECTIVE ANALYSIS AND EMOTIONALITY**

The interpretation of a Rorschach record is a complex process. It requires a wealth of knowledge concerning personality dynamics generally as well as considerable experience with the Rorschach method specifically. Proficiency as a Rorschach administrator can be gained within a few months. However, even those who are able and qualified to become Rorschach interpreters usually remain in a "learning stage" for a number of years (Klopfer &

Davidson 1962). Systems for Rorschach scoring generally include a concept of "determinants": these are the factors that contribute to establish the similarity between the inkblot and the subject's content response about it, and they can represent certain basic experiential-perceptual attitudes, showing aspects of the way a subject perceives the world. Rorschach's original work used only form, color and movement; currently, another major determinant considered is shading (Schachtel 2001) which was inadvertently introduced by poor printing of the inkblots (which originally featured uniform saturation), and subsequently recognized as significant by Rorschach himself (Aronow & Reznikoff 1976).

Research by psychologists Loren and Jean Chapman showed that at least some of the apparent validity of the Rorschach was due to an illusion (Sutherland 2001). The Chapmans surveyed 32 experienced testers about their use of the Rorschach to diagnose homosexuality. The testers reported that homosexual men had shown the five signs more frequently than heterosexuals (Plous 1993)

## **Chapter 3**

### **METHODOLOGY**

#### **SECTION - A**

##### **General Methodology**

In this present study, assessment of the existing psychological make-up of the participant was attempted in 3 ways: subjective experiences of present mood states of participant were assessed using self report indices. Again, objective assessment of their capacity to regulate arousal was also done. This was done, for the reason that, the participants might face problem in revealing their inner state of psychological crises, accurately enough through self reports, and to eradicate this problem, it was felt necessary to judge the inner psychobiological status of the participant, indirectly through psychophysiological assessment. It was postulated that changes in psychological make-up of the participant as could be revealed through subjective self report (BRUMS Scale), would be corollary to that obtain on the objective physiological assessment, such as Skin Conductance Resistance (GSR). Apart from that, projective test, such as, Rorschach Ink- Blot Test was used to assess the personality make-up of the participant. Detailed description of the scale, projective test and objective measure done are the following:

##### **3.1 Brunel Mood Scale (Terry et al. 1999)**

Mood was assessed using the 24-item Brunel Mood Scale (Terry et al. 1999). The Brunel Mood Scale serves as a brief measure of mood states which contains 24 simple Rorschach test mood descriptors of anger, confusion, depression, fatigue, tension and vigour. The response were

attached on a 5-point scale (0 = not at all, 1 = a little, 2 = moderately, 3 = quite a bit, 4 = extremely). The time frame used is "How you feel right now".

### **3.2 Rorschach Ink-Blot Test**

The Rorschach Ink-Blot Test is a psychological test in which subjects' perceptions of inkblots are recorded and then analyzed using psychological interpretation, complex algorithms, or both. Some psychologists use this test to examine a person's personality characteristics and emotional functioning. It has been employed to detect underlying thought disorder, especially in cases where patients are reluctant to describe their thinking processes openly (Gacano & Meloy, 1994). The test is named after its creator, Swiss psychologist Hermann Rorschach.

Although the Exner Scoring System (developed since the 1960s) claims to have addressed and often refuted many criticisms of the original testing system with an extensive body of research (Exner, 2002) some researchers continue to raise questions. The areas of dispute include the objectivity of testers, inter-rater reliability, the verifiability and general validity of the test, bias of the test's pathology scales towards greater numbers of responses, the limited number of psychological conditions which it accurately diagnoses, the inability to replicate the test's norms, its use in court-ordered evaluations, and the proliferation of the ten inkblot images, potentially invalidating the test for those who have been exposed to them (Lilienfeld, 2001).

#### **3.2.1 Method**

The tester and subject typically sit next to each other at a table, with the tester slightly behind the subject. This is to facilitate a "relaxed but controlled atmosphere". There are ten official inkblots, each printed on a separate white card, approximately 18x24 cm in size. Each of the blots has near

perfect bilateral symmetry. Five inkblots are of black ink, two are of black and red ink and three are multicolored, on a white background. After the test subject has seen and responded to all of the inkblots (*free association* phase), the tester then presents them again one at a time in a set sequence for the subject to study: the subject is asked to note where he sees what he originally saw and what makes it look like that (*inquiry* phase). The subject is usually asked to hold the cards and may rotate them. Whether the cards are rotated, and other related factors such as whether permission to rotate them is asked, may expose personality traits and normally contributes to the assessment (Weiner, 2003) As the subject is examining the inkblots, the psychologist writes down everything the subject says or does, no matter how trivial. Analysis of responses is recorded by the test administrator using a tabulation and scoring sheet and, if required, a separate location chart (Klopfer & Davidson, 1962)

The general goal of the test is to provide personal and subjective –bias – free data about cognition and personality variables such as motivations, cognitive operations, affectivity, and personal/interpersonal perceptions, related to inner unconscious core of emotionality, on which the participant has no control at all, and hence s/he cannot modify or manipulate the outcome of the analyses. The underlying assumption is that an individual will class external stimuli based on person-specific perceptual sets, and including needs, base motives, conflicts, and that this clustering process is representative of the process used in real-life situations (Groth & Mamat, 2003) Methods of interpretation differ. Rorschach scoring systems have been described as a system of pegs on which to hang one's knowledge of personality ( Mons, 1950) The most widely used method in the United States is based on the work of Exner.

Administration of the test to a group of subjects, by means of projected images, has also occasionally been performed, but mainly for research rather than diagnostic purposes ( Klopfer & Davidson 1962 ).

### **3.2.2 Features or categories**

The interpretation of the Rorschach test is not based primarily on the contents of the response, i.e., *what* the individual sees in the inkblot (the *content*). In fact, the contents of the response are only a comparatively small portion of a broader cluster of variables that are used to interpret the Rorschach data: for instance, information is provided by the time taken before providing a response for a card can be significant (taking a long time can indicate "shock" on the card)(Weiner, 2003) as well as by any comments the subject may make in addition to providing a direct response (Weiner, 2003).

In particular, information about *determinants* (the aspects of the inkblots that triggered the response, such as form and color) and *location* (which details of the inkblots triggered the response) is often considered more important than content, although there is contrasting evidence (Eysenck, 2004,1998) "Popularity" and "originality" of responses can also be considered as basic dimensions in the analysis(Groth-Mamat, 2003)

### **3.2.3 Content**

Content is classified in terms of "human", "nature", "animal", "abstract", etc., as well as for statistical popularity (or, conversely, originality)(Pelto, 1996)

More than any other feature in the test, content response can be controlled consciously by the subject, and may be elicited by very disparate factors, which makes it difficult to use content alone to draw any conclusions about the subject's personality; with certain individuals, content responses may potentially be interpreted directly, and some information can at times be obtained by analyzing thematic trends in the whole set of content responses (which is only feasible when several responses are available), but in general content cannot be analyzed outside of the context of the entire test record (Schachtel, 2001)

### **3.2.4 Location**

The basis for the response is usually the whole inkblot, a detail (either a commonly or an uncommonly selected one), or the negative space around or within the inkblot (Goldman, 2000).

### **3.2.5 Determinants**

Systems for Rorschach scoring generally include a concept of "determinants": these are the factors that contribute to establish the similarity between the inkblot and the subject's content response about it, and they can represent certain basic experiential-perceptual attitudes, showing aspects of the way a subject perceives the world. Rorschach's original work used only *form*, *color* and *movement*; currently, another major determinant considered is *shading* (Schachtel, 2001) which was inadvertently introduced by poor printing of the inkblots (which originally featured uniform saturation), and subsequently recognized as significant by Rorschach himself






Form is the most common determinant, and is related to intellectual processes; color responses often provide direct insight into emotional life. Shading and movement have been considered more ambiguously, both in definition and interpretation: Rorschach originally disregarded






shading (which was originally not even present on the cards, being a result of the print process) (Schachtel, 2001) and he considered movement as only actual experiencing of motion, while others have widened the scope of this determinant, taking it to mean that the subject sees something "going on".

More than one determinant can contribute to the formation of the subject's percept, and fusion of two determinants is taken into account, while also assessing which of the two constituted the primary contributor (e.g. "form-color" implies a more refined control of impulse than "color-form"). It is, indeed, from the relation and balance among determinants that personality can be most readily inferred.

Below are the ten inkblots of the Rorschach test printed in Rorschach's *Rorschach Test – Psychodiagnostic Plates*, together with the most frequent responses for either the whole image or the most prominent details according to various authors.

## Rorschach Ink-Blot Test

Cards	Comments	Interpreters	Popular responses
	<p>When seeing <b>card I</b>, subjects often inquire on how they should proceed, and questions on what they are allowed to do with the card (e.g. turning it) are not very significant. Being the first card, it can provide clues about how subjects tackle a new and stressful task. It is not, however, a card that is usually difficult for the subject to handle, having readily available popular responses.</p>	<p><b>Beck:</b></p> <p><b>Piotrowski:</b></p> <p><b>Dana (France):</b></p>	<p><b>bat, butterfly, moth</b></p> <p><b>bat (53%), butterfly (29%)</b></p> <p><b>butterfly (39%)</b></p>
	<p>The red details of <b>card II</b> are often seen as blood, and are the most distinctive features. Responses to them can provide indications about how a subject is likely to manage feelings of anger or physical harm. This card can induce a variety of sexual responses.</p>	<p><b>Beck:</b></p> <p><b>Piotrowski:</b></p> <p><b>Dana (France):</b></p>	<p><b>two humans</b></p> <p><b>four-legged animal (34%, gray parts)</b></p> <p><b>animal: dog, elephant, bear (50%, gray)</b></p>
	<p><b>Card III</b> is typically perceived to contain two humans involved in some interaction, and may provide information about how the subject relates with other people (specifically, response latency may reveal struggling social interactions).</p>	<p><b>Beck:</b></p> <p><b>Piotrowski:</b></p> <p><b>Dana (France):</b></p>	<p><b>two humans (gray)</b></p> <p><b>human figures (72%, gray)</b></p> <p><b>human (76%, gray)</b></p>
	<p><b>Card IV</b> is notable for its dark color and its shading (posing difficulties for depressed subjects), and is generally perceived as a big and sometimes threatening figure; compounded with the common impression of the subject being in an inferior position ("looking up") to it, this serves to elicit a sense of authority. The human or animal content seen in the card is almost invariably classified as male rather than female, and the qualities expressed by the subject may indicate attitudes toward men and authority. Because of this <b>Card IV</b> is often called "The Father Card".</p>	<p><b>Beck:</b></p> <p><b>Piotrowski:</b></p> <p><b>Dana (France):</b></p>	<p><b>animal hide, skin, rug</b></p> <p><b>animal skin, skin rug (41%)</b></p> <p><b>animal skin (46%)</b></p>
	<p><b>Card V</b> is an easily elaborated card that is not usually perceived as threatening, and typically instigates a "change of pace" in the test, after the previous more challenging cards. Containing few features that generate concerns or complicate the elaboration, it is the easiest blot to generate a good quality response about.</p>	<p><b>Beck:</b></p> <p><b>Piotrowski:</b></p> <p><b>Dana (France):</b></p>	<p><b>bat, butterfly, moth</b></p> <p><b>butterfly (48%), bat (40%)</b></p> <p><b>butterfly (48%), bat (46%)</b></p>

	<p>Texture is the dominant characteristic of <b>card VI</b>, which often elicits association related to interpersonal closeness; it is specifically a "sex card", its likely sexual percepts being reported more frequently than in any other card, even though other cards have a greater variety of commonly seen sexual contents.</p>	<p><b>Beck:</b></p>	<p>animal hide, skin, rug</p>
		<p><b>Piotrowski:</b></p>	<p>animal skin, skin rug (41%)</p>
		<p><b>Dana (France) :</b></p>	<p>animal skin (46%)</p>
	<p><b>Card VII</b> can be associated with femininity (the human figures commonly seeing in it being described as women or children), and function as a "mother card", where difficulties in responding may be related to concerns with the female figures in the subject's life. The center detail is relatively often (though not popularly) identified as a vagina, which make this card also relate to feminine sexuality in particular.</p>	<p><b>Beck:</b></p>	<p>human heads or faces (top)</p>
		<p><b>Piotrowski:</b></p>	<p>heads of women or children (27%, top)</p>
		<p><b>Dana (France) :</b></p>	<p>human head (46%, top)</p>
	<p>People often express relief about <b>card VIII</b>, which lets them relax and respond effectively. Similar to card V, it represents a "change of pace"; however, the card introduces new elaboration difficulties, being complex and the first multi-colored card in the set. Therefore, people who find processing complex situations or emotional stimuli distressing or difficult may be uncomfortable with this card.</p>	<p><b>Beck:</b></p>	<p>animal: not cat or dog (pink)</p>
		<p><b>Piotrowski:</b></p>	<p>four-legged animal (94%, pink)</p>
		<p><b>Dana (France) :</b></p>	<p>four-legged animal (93%, pink)</p>
	<p>Characteristic of <b>card IX</b> is indistinct form and diffuse, muted chromatic features, creating a general vagueness. There is only one popular response, and it is the least frequent of all cards. Having difficulty with processing this card may indicate trouble dealing with unstructured data, but aside from this there are few particular "pulls" typical of this card.</p>	<p><b>Beck:</b></p>	<p>human (orange)</p>
		<p><b>Piotrowski:</b></p>	<p>None</p>
		<p><b>Dana (France) :</b></p>	<p>None</p>
	<p><b>Card X</b> is structurally similar to card VIII, but its uncertainty and complexity are reminiscent of card IX: people who find it difficult to deal with many concurrent stimuli may not particularly like this otherwise pleasant card. Being the last card, it may provide an opportunity for the subject to "sign out" by indicating what they feel their situation is like, or what they desire to know.</p>	<p><b>Beck:</b></p>	<p>crab, lobster, spider (blue)</p>
		<p><b>Piotrowski:</b></p>	<p>crab, spider (37%, blue), rabbit head (31%, light green), caterpillars, worms, snakes (28%, deep green)</p>
		<p><b>Dana (France) :</b></p>	<p></p>

### **3.3 Galvanic Skin Resistance ( UDYOG 2001)**

Although verbatim report of the subject regarding his own affective components cannot be ignored in the field of psychological research but it has been noted by previous researchers (Spielberger, 1972; McEwan and Daving, 1983) that sometimes participant fails to perceive his or her own feelings accurately, such as participants who had perceived themselves in the heightened state of anxiety was found to be in a very low state on physiological measures or vice versa. This discrepancy presents us from generalization of the findings obtained in a given experiment, based on either of the measures. Furthermore, psychological measures can describe individual's state of adaptation to its environment and adaptive process itself. The measures focus on:

- 1) The degree of alertness with which the individual controls his adaptive tasks.
- 2) The degree of stress which one experiences in the process of adaptation.
- 3) The individual difference in the manner in which the stress is experienced and resolved.
- 4) the temporary or permanent damage that may result in stress and so on.

Moreover cultural inhibition can be overcome by employing these psychophysiological measures.

Of all the measure for detecting Autonomic Nervous System (ANS) arousal, skin conductance, its response characteristics and response habituation have been employed widely in different part of the globe (Chattopadhyay et.al., 1985, 1995; Lader and Wing 1966; Bell et.al.,1975; Kellar and Saraganian, 1980; Steptoe et.al. 1993; and Mondal and Banerjee, 1994). In the present study, skin resistance has been taken as index of ANS arousal and the method employed for measuring arousal have been detailed in the following pages.

## **I) Skin Resistance (SR)**

### **Introduction:**

In spite of the intensive use of the measure of the electrical resistance of the skin in many psychological and psychophysiological experiments, until the 1960s no general agreement was reached on methods, or where any standard equipment was readily available. In 1962, Lader and Montague showed that the skin resistance levels of the PGR are wholly dependent on the sweat gland activity. From this, physiological approach to the accurate and artifact free measurement of the skin resistance was attempted by Lader and Wing (1966). The basic principle underlying this approach is based on Ohm's Law, which states that  $V = I \cdot R$ , where  $I$  is constant and  $V$  is proportionate to  $R$  (where  $V$ =voltage,  $I$ = current and  $R$ = resistance). If  $I$  is kept constant, a constant current is passed through the particular via two electrodes and the voltage engendered across the skin is recorded. In the present study, the technique adopted by Lader and Wing (1966) was followed, a brief description of which is given below.

### **3.3.1 Location of Electrodes:**

The anatomical region from which SR is measured is of great importance. The most convenient site to record it would be the area of the hand having highest density of the sweat gland. Kuno (1956) in this connection reported that the area of a maximum density occurs on the palmar aspects of the distal phalanges of the digits. In the present experiment unilateral measurement of the skin resistance using the Galvanic Skin Resistance (GSR) was made and for this, the right thumb was chosen as the 'active' skin resistance site, as it presents a more extensive and flatter surface than the fingers. The site of the inactive electrode is immaterial

(Lader and Wing, 1966) and the lateral surface of the right arm about 10 cm, above lateral epicondyle of the humerus was used.

### **3.3.2 Electrode:**

It is essential in any resistance measuring device to pass a current through the resistance. But this causes polarization artifacts the use of a tetrapolar electrode system can obviate this difficulty. In this system, the measuring current is passed through the two ends of the resistor and polarization potentials build up at these two sites. The voltage engendered across the resistor is measured through two separate wires thus bypassing the polarization potentials. In the present experiment, to obviate polarization difficulties, double element lead electrodes were used. The 'active' electrode consisted of two lead elements a central disc of 5 mm, diameter, and a surrounding annulus of internal diameter of 8 mm and external diameter of 14 mm. the two elements were mounted in a perplex holder. The inactive electrode was also similar, but larger. The central lead disc measured 8 mm in diameter, and annulus was of 11 mm internal diameter and 23 mm external diameter. The electrode had a removable polythene flange which provides a space for the electrode jelly. Neither the dimension, nor the shape of the electrode is essential, provided both the elements of each electrode are in good contact with the jelly.

### **3.3.3 Procedure for Recording Skin Resistance.**

The experimental procedure used for the recording of SR was essential the same as that described by Lader and Wing (1966) and subsequently was employed several times before (Chattopadhyay et.al.1995). The electrodes were sanded bright and were filled electrode with electrode jelly. The appropriate area of the right arm was abraded and the inactive electrode was applied and held in position with an adjustment rubber strap. The right arm was wired dry and

the active electrode was positioned on it and secured with adhesive tape. Both the electrodes were plugged in the skin resistance instruments was calibrated. After this, the instrument was switched on and a constant current of  $14 \mu \text{ am/cm}^2$  was passed through the electrodes and voltage across the subject was balanced. The sensitivity was increased usually to 25 or 50 kilo ohms full scale deflection.

Readjustments were necessary during recording session if the subject's SR in their side of the body altered much in either direction or if the sensitivity was found to be inappropriate to the size of the responses. The speed of the GSR paper was 1.5 mm/ seconds.

#### **3.3.4 Experimental Condition and Procedure:**

On arrival the nature of the experiment was explained to each participant and any procedural question was answered. Participant were prepared ( i.e. placement of electrodes, etc.) for the experiment in a room adjacent to the experimental room.

The experiment took place in a small quite room and external noise was excluded as far as practicable. Room temperature was favorable for recording this type of physiological parameter (Lader and Wing, 1966). The participant was asked to sit in a comfortable chair provided with arm rest. The SR instrument was kept behind the participant chair, so that it is not visible to the participant.

At the beginning a few minutes recording was taken as a trial so as to observe the actual nature of the traces. Any artefacts were traced and eliminated.

Then the final recording of the data stated. Recording of the aforesaid physiological measure in resting condition was done for 10 minutes in order to get the base level readings of the participant.

### **3.3.5 Precaution:**

- 1) Pilot investigations were run regard to the required instrument to determine artifacts, if any, associated with the recordings. If however, artifacts were found to be present, necessary steps were taken to eliminate these.
- 2) Participants were not allowed to take tea or coffee during of for last two hours prior to the experiment.
- 3) The thumbs of the participants used for recording the SR were clearly inspected and in case of any cut on it, recording was not done.
- 4) Inspection was also made to see whether the participant's hands were in comfortable position.
- 5) Room temperature where the experiment was conducted, was such that which is considered favorable (Lader and Wing, 1966; Chattopadhyay and Biswas, 1983; Dasgupta, 1984; Mallick 1984) for this type of experiment.
- 6) Necessary arrangements were made so that the participants could feel comfortable and relaxed in the experimental room.

### **3.3.6 Analysis of Recordings:**

The most common units for the background are raw resistance units ( K ohms), the reciprocal there of, conductance (micro mhos), or log conductance (log micro mhos). The psychogalvanic