INTRODUCTION

Behaviours of human beings develop in response to interaction between inherited limitations and environmental factors. Man also inherited a basic temperament from the ancestors perhaps i.e. lively or dull, emotional or unemotional, but the general traits can be changed a good deal by his upbringing and experiences in life. Though many of our special personality traits are due primarily to environment, however, biological factors influence all aspects of our behaviour including the basic temperament, primary reaction tendencies, stress, tolerance and adoptive resources. Thus a wide range of biological conditions such as defective genes, disease, endocrine imbalance, malnutrition, injuries and other such conditions that interfere with normal development and functioning are potential causes of abnormal behaviour.

The heredity not only provides potentialities for development and behaviour typical of the species but also is an important source of individual differences. Since our behaviour is inevitably influenced by our biological inheritance it should hardly be surprising that certain vulnerabilities have their roots in the genetic material of chromosomes. The chromosomal anomalies interfere directly with the normal development of the brain. Others are more subtle defects but they can still render a person susceptible to the most severe of the mental disorders. These subtle influences are transmitted in the genetic code itself, manifesting themselves as metabolic or biochemical irregularities. Psychogenetic or behavioral genetics is a newly rising and challenging field which deals with all types of normal and abnormal behavioral traits in all animals as well as human beings.

The great majority of people show normal behavior with slight deviation in it in certain specific conditions. However a small group of individuals almost in every population deviates from the normal in an unfavorable or pathological direction; included in this small fraction are the individuals marked by limited intelligence, emotional instabilities, personality disorganization and character defects. These abnormal deviants usually classified by the psychiatrists into four main categories
i.e. antisocial personality, mentally defective people, sufferers of psychosis and the sufferers of psychoneurosis.

The etiology of most of these disorders reflects the genetic background; some are chromosomal anomalies while others may be gene mutations. Most among these are abnormal behavioral traits like psychosis and psychoneurosis. Included in psychosis are severe mental disorders that tend to shatter the integration of the personality and disrupts the individuals social relationships. The behavior of psychotic patient is too bizarre, unreasonable and impropriate. It is necessary to supervise them closely, or hospitalize them. Psychotic patients because of their peculiar and unpredictable actions constitute a potential threat to the welfare of others. It is because of these reasons perhaps that the psychotic disorders i.e. schizophrenia and bipolar depression etc. have been the subjects of psychogenetic studies quite commonly as compare to the psychoneurotic disorders, which are minor mental disorders characterize by inner struggles and discordant social relationships.

Psychoneurotic symptoms are anxiety, feeling of inner tension, restlessness, idea of inadequacy, depressed spirits to concentrate or make decisions, memory disturbance, heightened irritability, irrational fear, obsessions, compulsions and inability to enjoy social relations.

The normal person who experiences a sense of emotional shock may be speechless or paralyzed for a few minutes, he/she may faint, feel weak or complains irregular heart action or nausea, soon he regains control on himself and his symptoms disappear following a similar or milder emotional shock. On the other hand a psychoneurotic may suffer for months from loss of voice, paralysis, general exhaustion, cardiac instability etc. A normal individual may be best with temporary anxiety and a feeling of inferiority, but a psychotic may retain this attitude in an exaggerated form. Many individuals have fear of germs and take reasonable precautions to avoid infection but unlike certain psychoneurotics (OCD patients) they do not wash their hands a hundred times a day.
Though the psychoneurotic disorders i.e. anxiety disorders, (OCD, phobia etc.) are most widespread amongst the mental disorders, they produce only mild to moderate illness and therefore these are mostly studied by psychologists not by psychiatrists and psychogeneticists. The other reason perhaps of less researches is that there are no concrete genetic evidences reported for these disorders and also due to the fact that most of these are not following the classical Mendelian inheritance patterns. Therefore these are categorized under the complex genetic disorders, which may involve combined effect of mutations in multiple alleles/genes and a number of environmental influences that generally control their penetrance and expressivity in a given population.

The anxiety disorders are the most common type of psychoneurotic disorders in human population. The study of anxiety disorders poses a challenge because anxiety can be manifested through a variety of phenomena showing subjective sense of increase; a set of behaviour such as avoidance and restlessness or a physiological response originating in the nervous systems, such as increased heart rate, perspiration and muscle tension. These phenomena are not in themselves abnormal but are considered “disorders” when they lead to marked distress or impairment in function. Even the realm of anxiety disorders, the subjective experience of anxiety differs markedly. In Panic Disorder (PD) and Generalized Anxiety Disorder (GAD), the anxiety is unfocused. Phobias and Posttraumatic Stress Disorder (PTSD) involve a fear around by specific identifiable objects or situations and in Obsessive Compulsive Disorder (OCD), anxiety occurs when the patient resists a thought or behaviour.

CLASSIFICATION OF ANXIETY DISORDERS ACCORDING TO DSM-IV-

In 1952 the American Psychiatric Association committee on Nomenclature and statistics, published the first edition of DSM-I i.e. Diagnostic and statistical manual, DSM – II published in 1968 and four editions are published since then.

The psychoneurotic anxiety disorders underwent significant diagnostic revision with the publication of DSM-III (American psychiatric association 1980;
Frances et al 1993, Zal, 1988). As most recent family and twin studies of psychosomatic have employed DSM-III/DSM-IIIR criteria (1987) changes in classification system reflects the evaluation and refinement of definitions and diagnostic criteria for these disorders. This is an ongoing process and other psychiatric nomenclatures such as the international classification of diseases (ICD-9; ICD-10) apply a different classification system, (Torgerson 1986). The fourth edition of Diagnostic and statistical manual of mental disorders (DSM-IV) published in 1994, is the latest most up-to-date classification of mental disorders. The fourth edition correlates with the 10th revision of World Health Organization (WHO’s), International classification of diseases and related health problems (ICD-10) developed in 1992.

According to ICD-10 or DSM-III/IV classification, anxiety disorders comprise panic disorder, generalized anxiety, OCD, phobias, and post-traumatic stress disorder (Domschke et al, 2007).

Basic features of DSM-IV:

DSM-IV attempts to describe what the manifestations of mental disorders are. Specified diagnostic criteria are provided for each mental disorder. Those criteria include a list of features that must be present for diagnosis to be made, thus increasing the validity and reliability of the diagnostic process among clinicians.

DSM-IV systematically describes disorders in terms of its associated features; specific age, culture and gender related features, prevalence, incidence and risk, course complications, predisposing factors, familial pattern and differential diagnosis.

DSM-IV provides explicit rules to be used when information is insufficient (Diagnosis is to be referred by provisional) or the patients clinical symptoms do not meet the full criteria of prototypical category.

DSM-IV is a multi axial system of evaluation that evaluates the patients along several variables and contains five axes. Out of these axis I and II deal with
the entire classification of mental disorders-17 major classifications and more then 300 specific disorders.

The classification of anxiety disorders in DSM-IV and in tenth edition of International Statistical Classification Diseases (ICD-10), is broadly similar.

Heredity has been recognised as a predisposing factor in the development of anxiety disorders since at least 19th century. Although psychodynamic and learning theories remain significant, recent decades have been marked by a growing interest in and focus on genetic contributions to the etiology of anxiety disorders particularly panic disorder (PD). What is currently known about the role of genetics in the etiology of the anxiety adoption disorder is based on data gathered from family and adoption studies. As well as more recent genetic linkage and association studies. All observation rely on the collection of informations about the occurrence of phenotype within pedigree with known pattern of genetic co-variation (Environmental conservation is also controlled in certain designed).

A study using DSM-II-R criteria confirmed that Generalized Anxiety disorder (GAD) were more frequent (19.5%) among the first degree relatives of proband with GAD than among first degree relatives of controls (3.5%). Twin studies showing a high concordance for anxiety disorders between monozygotic twins than dizygotic twin pairs, suggesting that the familial association has genetic cause (Slater and Shield, 1969). A study of a population sample of several twins' pairs confirmed that GAD has genetic cause about 30% with the remaining variance related to environmental factors (Kundler et al 1992. b).

It has been suggested that genetic factors are involved in the pathophysiology of anxiety disorders. A greater risk of developing anxiety disorder in 1st degree relation of patients with PD has been observed in family studies (Crowe et al. 1983; etc.). It supports the hypothesis of genetic contribution to predisposition to panic disorder (PD) as well as other anxieties.

Researchers have investigated specific temperamental factors which affect the development of anxiety disorders in children and adolescents. It is clear that
children have an inherited neurobiological predisposition to increase the physiological activity and anxious symptoms in the context of unfamiliar environments and consequently are more vulnerable to one or more of anxiety disorders.

In an estimate it was found that 20% of healthy children are born with such temperamental bias which is called “behavioural inhibition”. In some recent studies behavioural inhibition was associated with social anxiety disorder in these children whose parents have PD. This evidence suggests that parental PD and childhood behavioural inhibition could be used to identify children at high risk for social anxiety disorder. Certain psychological studies also suggested that “behavioural inhibition children” may be susceptible to anxiety or PTSD after threatening events. However, it is noteworthy to point out that majority of behavioural inhibitions show the importance of other intervening biological and genetic factors i.e. the neurobiological phenotype and genotype associated with temperamental risk factor for anxiety disorder.

**PHOBIA**

The term phobia derived from the Greek word meaning “Fear” or “dread” and is used to cannot an unreasonable and irrational anxiety unwarranted by the degree of realistic danger posed by the situation. A phobia disorder defined clinically as “a persistent and irrational fear of a specific object, activity or situation that results in a compelling desire to avoid the dreaded object, activity and situation (American Psychiatric Association, 1980)”.

Psychopathologists define a phobia as a disrupting fear mediated avoidance, out of proportion to the danger posed by a particular object or situation and indeed recognized by the suffers as groundless. The feared object or situation has a very specific meaning to the person who is suffering from the phobia.
When are fears considered phobias?

Fear is an adaptive human response to danger. It serves a protective purpose, by activating a “fight or flight” response of the sympathetic nervous system. When faced with danger our excess adrenaline prepares us to fight or to flee the physical threat. The fight or flight response includes an increase in heart rate and blood flow to our large muscles, enabling us to react to the emergency.

Blood sugar also increases, providing us with more energy. With our bodies and minds alert and ready for action, we are able to respond quickly and protect ourselves.

Although it is normal and even helpful to experience fear in dangerous situations, with phobias the danger is greatly exaggerated or imagined. Many of the phobic objects or things which would cause discomfort under certain circumstances in a number of people can cause much more intense anxiety in the phobic subjects, that is the fears become a reason for concern when persistent and interfere with the daily functioning of the sufferer, when a fear reaches this end of intensity, it is often identified as a phobia.

Physical symptoms of phobia:

The individual may experience a whole range of physiological responses in the presence of phobic stimuli, including:

- Increased heart rate
- Palpitations
- Perspirations
- Nausea
- Diarrhoea
- Dizziness
- Sensations of choking
- Suffocation etc.
The phobias are reporting at the phobic level in the age of onset by expert in recall of past symptoms. Though the experience of phobia is relatively common and their physical characteristics are generally well understood, there is no real consensus on the neurobiological basis of phobia. Instead there are currently several different models and theories that work to try to understand how and why phobias occur in the human brain. Most hypothesis regarding phobias take different approaches from biological to psychoanalytic to evolutionary.

There are several stimuli that are shared by most phobic people because many phobias with a couple of exception relate more closely to pre-technological societies. Thus, some scientists such as Martin Saligman believe that people are inherently “prepared” to fear certain objects. In other words, our phobias relate closely to the perils of our ancestors, as through natural selection. Other scientists, such as Le Doux (1998) believe that preparedness and the ease of conditioning are the results of certain persisting neurobiological conditions that exist evolutionarily; these conditions are turned on with relative ease.

Most people do not recall having an initial negative interaction or trauma associated with their phobia. Similarly, there are many cases in which patients have without or about never come in contact with their phobic stimulus. For intense many people who have flying phobias have never actually been on a plane. Infact, almost half of all phobic people have never had a painful experience with the object of their fear. In addition, a very small number of stimuli comprise the majority of phobias. In the same way, not all individuals who are presented with a fear inducing stimulus develop phobia.

The most widely accepted classification subdivides phobias into three main types (American psychiatric association 1980).

(i) Agoraphobia

(ii) Specific/simple phobia

(iii) Social phobia.
In the "United State's diagnostic system" the symptoms of agoraphobia can be similar to those of some of specific phobias (heights phobia and other situational phobias) and some types of social phobias. In agoraphobia and specific phobia however, the focus is fear itself, with social phobia on the other hand the person’s focus on how others are perceiving him/her. Patients diagnosed with agoraphobia tend to be more afraid of their own internal physical sensations and similar cues than of the reaction of other persons.

In case of specific phobia, the person fears very specific object or situations, i.e. insects, spiders, blood, needle, water, heights, etc, whereas in agoraphobia, the person generally fears a variety of situations (being outside of the home alone, or travelling on public transportation, inducing a bus, train or automobile for example.

AGORAPHOBIA

Agoraphobia is an anxiety disorder characterised by intense fear related to being in situations from which the escape might be difficult or embarrassing (being on a bus, train or airplane etc.) or in which help might not be available in the event of panic attack or panic symptoms. (Panic is defined as extreme and unreasonable fear and anxiety.)

According to Marks (1969) the most common clinical feature of agoraphobia is a fear of leaving the house alone and to be at a place or situation from where the escape is not easy. Perhaps for this reason this is the most common phobia seen in the psychiatric clinics.

According to the handbook used by mental health professionals to diagnose mental disorders i.e. The diagnostic and statistical manual of mental disorder; IV edition text revision also known as DSM IV TR, patients with agoraphobia are typically afraid of such symptoms as feeling dizzy, having an attack of diarrhoea, fainting or going crazy. Other physiological symptoms are:
(A) SYMPTOMS OF AGORAPHOBIA-

- Trembling
- Breaking out in a sweat
- Heart palpitations,
- Nausea
- Fatigue
- Rapid pulse or breathing rate
- Parasthesia (tingling or “pins and needles” sensations in the hand and feet)
- A sense of impending doom.

(B) The anxiety associated with agoraphobia leads to avoidance of situations that involve:

- Being outside one’s home alone
- Being in crowds
- Being on a bridge
- Travelling by car or public transportation
- Inside tunnels or in a small enclosed room
- In theatres
- Standing in line

The close association in agoraphobia between fear to being outside one’s home and fear of having panic symptoms is reflected in DSM IV-TR classification of two separate disorders: Panic disorder (PD) with agoraphobia, and agoraphobia without PD. PD is essentially characterized by sudden attacks of fear and panic. There may be no known reasons for the occurrence of panic attacks; they are frequently triggered by fear producing events or thoughts, such as driving, or being in a elevator. PD is believed due to an abnormal activation of the body’s hormonal system, causing a sudden “fight or flight” response.

The chief distinction between PD with agoraphobia and agoraphobia without PD is that patients who are diagnosed with PD with agoraphobia meet all criteria for
PD, in agoraphobia without PD, patients are afraid of panic, like symptoms in public places, rather than full blown attacks.

People with agoraphobia appear to suffer from two distinct types of anxiety. Panic and the anticipatory anxiety related to fear of future panic attacks. Patients with agoraphobia are sometimes able to endure being in the situations they fear by "gritting their teeth", or by having a friend or relative accompany them.

**DSM – IV Criteria for Agoraphobia:**

**Note:** Agoraphobia is not a codable disorder. It is discussed at the specific disorder in which Agoraphobia occurs (e.g., Panic disorder with agoraphobia without history of panic disorder).

Anxiety about being in places or situations from which escape might be difficult (or embarrassing) or in which help may not be available in the event of having an unexpected or situationally predisposed panic attack or panic like symptoms. Agoraphobic fears typically involve characteristic clusters of situations that include being outside the home alone; being in crowd or standing in a line; being on a bridge and travelling in a bus, train or automobile.

**Genetic Studies of Agoraphobia:**

The causes of agoraphobia are complex and not completely understood. It has been known for some years that anxiety disorder tend to run in families. Recent researches confirmed earlier hypothesis that there is a genetic component to agoraphobia, and that it can be separated from susceptibility to PD. In 2001, a team of Yale geneticists reported the discovery of a genetic locus on human chromosome 3 that governs a person's risk of developing agoraphobia. PD was found to be associated with two loci: one on human chromosome 1 and the other on chromosome 11q. The researchers concluded that agoraphobia and PD are common; they are both inheritable anxiety disorders that share some, but not all, of their genetic loci for susceptibility.
SPECIFIC (SIMPLE) PHOBIA

Specific phobia is characterized by a selectively circumscribed fear of an object or a situation. These phobias are sometimes referred to as “simple phobias”. The individuals who are exposed to the feared object or situation, experience cognition, physiological arousal patterns, and behavior similar to those experienced in all phobic disorders. It is usually easy for the individual to avoid contact with the phobic object and thus the impairment may be minimal, especially in cases where the likelihood of a confrontation with feared object or situation is low, as in snake phobia. However, individuals with a fear of elevators or heights may show a serious impairment in day to day living as a result of their fear.

DSM-IV Criteria for specific phobia:

A- Mental or persistent fear that is excessive or unreasonable caused by the presence of animals, receiving an injection, seeing blood etc.

B- Exposure to phobic stimulus, almost invariably provokes an immediate anxiety response, which may take the form of a situationally, predisposed panic attack.

Note- In the children this feature may be absent.

C- The phobic situation (s) is avoided, or else endured with intense anxiety or distress.

D- The avoidance anxious anticipation, or distress in the feared situation (s), interferes significantly with the person’s normal routine (occupational or academic functioning or social activities or relationship with others) or there is marked distress about having phobia.

E- In individuals under age 18 years, the duration is at least 6 months.

F- The anxiety panic attacks or phobic avoidance associated with the specific object or situation are to be better accounted for the mental disorders; OCD (e.g. fear of dirt in someone with an obsession, contamination), post
traumatic stress disorder (PTSD) (e.g. Avoidance of stimuli associated with a severe stress etc.), separation anxiety disorder etc.

Several psychogeneticists group the specific phobia according to the nature of the phobic stimuli. Although this classification method is entirely with flaws, it is useful for description purposes. The most commonly recognized categories of circumscribed fear include five types of specific phobia. i.e.

ANIMAL PHOBIA-

Animal phobias are fear caused by an animal and/or insect. These are monosymptomatic and isolated fears, such as fears of lion, cats, dogs, spiders, birds, snake rodents, cockroach etc. Fear of animals appears in preschool children at the age of 3-5 years.

NATURAL ENVIRONMENTAL PHOBIAS-

These phobias or fears are caused by objects and factors found in the nature. Examples include fear of height, fear of storms, fear of water, and fear of darkness etc. The age at onset for these phobias is between 4-14 years.

SITUATIONAL PHOBIAS-

The fears triggered by a specific situation are categorized here. Examples include fears of enclosed places, fear of heights, fear of flying, fear of dentist, fear of open places etc.

BLOOD, INJECTION, INJURY PHOBIA-

This category involves fear of medical procedures i.e. surgical operations and instruments, needles, injections, blood, bleeding wounds, injury etc.

This phobia shows slightly different symptoms from other phobias. When the sufferer confronted with the sight of blood or a needle he/she experiences not only fear but disgust. Like other phobias the phobic shows an initial increase in heart rate and blood pressure. However, unlike other phobias this acceleration is
followed by a quick drop which causes nausea, dizziness and fainting. Although a fear of fainting is common in all specific phobias, blood, injection, injury phobia is the only phobia where actual fainting occurs.

**OTHER TYPES**

Included all those specific phobias that does not fall into one of the first four categories. Examples include fear of choking, fear of illness, fear of death, fear of clowns, etc.

**SOCIAL PHOBIA**

Social phobia is defined by DSM-IV-TR an anxiety disorder characterized by a strong and persistent fear of social or performance situations in which the patient might feel embracement or humiliation. Generalized social phobia according to Trower et al. (1978) refers to a fear of most social interactions combined with fear of most performance situations such as:

- Speaking in public
- Restaurants
- Parties
- Meetings
- Interviews
- Making complaints
- Writing in public
- Interacting with opposite sex, superiors, strangers or aggressive individuals etc.

In some individuals, all these situations elicit anxiety and in others, the fears may be limited to interacting with members of the opposite sex. The common denominator seems to be any situation where the individual believe that he or she is being observed and evaluated.
A number of researchers have indicted that social phobia is associated with fears of negative evaluation (e.g.: making mistake, being criticized, behaving awkwardly or like a fool, sweating, fainting, blushing, speaking poorly, vaunting having trebling head or hands, being rejected, sounding, boring and unintelligent to others). Many observations regarding families of social phobic is that the prevalence of psychiatric disorders higher than in families of normal control.

Marks and Gelder (1966) initially defined social phobia to include “fear of eating, drinking, shaking, speaking writing or vomiting in the presence of other peoples,” the core feature being fear of seeming ridiculous to others.

Social phobia varies in its development and initial presentation. In some young people, the disorder grows out of a long term history of shyness or social inhibition; in others, social phobia becomes apparent following a move to new school or similar development change. An important distraction that needs to be made when discussing social phobia is the difference between this disorder and social inadequacy associated with anxiety. Some individuals experience anxiety in a wide range of social situations as a result of poor social skills. In these cases, anxiety is a reaction to the failure to cope effectively, whereas the socially phobic individual fears only failure. Agras (1969) found a fear of social situations to be prevalent in the general population. Unlike in other phobia, the sexes are more evenly represented in social phobia.

A. In a recent study in relatives of social phobia probands it was found that social phobia, occurring in the absence of other lifetime anxiety disorder diagnoses was associated with an increased risk 16% for social phobia but not for other anxiety disorders.

The onset of social phobias usually occurs shortly after puberty and also very few cases are reported before puberty. The development of social phobia is also influenced by parent-child interactions in a patient’s family of origin; also found that children of parents with major depression whether or not it is comorbid with panic disorders, are at increased risk of developing social phobia. A family pattern
of social phobia however is stronger for the generalized than for the specific or circumscribed subtype.

It is likely that those children of depressed parents may acquire certain attitudes and behaviours from their parents that make them more susceptible to developing social phobia.

Phenomenological features of social phobia (DSM-IV):

These features are ifowingly:

- Reading aloud in front of class.
- Musical or athletic performance.
- Joining in a conversation.
- Speaking to in front of adults and others.
- Ordering food in a restaurant
- Attending parties and dances
- Answering question in class
- Working or playing with other kids
- Asking the teacher for help
- Eating in a cafeteria
- Walking in the hallway
- Attending gym class, etc.

DSM-IV: Diagnostic Criteria for Social Phobia:

A. A marked and persistent fear of one or more social performance situation in which the person is exposed to unfamiliar people to possibly scrutinizing by others, the individual fears that he or she will act in a way. (Or show anxiety symptoms) that will be humiliating or embarrassing.

Note. In children, there must be evidence of capacity for age appropriate social relationship with familiar people and the anxiety must occur in peer settings, not just in interactions with adults.
B. Exposure to the feared social situation almost invariably provokes, anxiety which may take the form of situationally bound or situationally predisposed panic attack.

**Note:** In children, the anxiety may be expressed by crying, tantrums, freezing or shrinking from social situations with unfamiliar people.

C. The person recognizes that the fear is excessive or unreasonable.

**Note:** In children, this feature may be absent.

D. The feared social or performance situation are avoided or else endured with intense anxiety or stress.

E. The avoidance, anxious anticipation or distress in the fear or social performance situation, interferes significantly with the person normal routine, occupation (academic) functioning or social activities or relationship with others; or there is marked distress about having the phobia.

F. In individuals under 18 years, the duration is at least 6 months.

G. The fear or avoidance is not due to the direct physiological effect of a substance (e.g. a drug of abuse, a medication) or a general medical condition, and is not better accounted for by another mental disorder. (E.g. panic disorder with or without agoraphobia, separation anxiety disorder, body dimorphic disorder, a pervasive developmental disorder etc.).

**Social phobia in children or adolescence:**

Social phobia begins in childhood or early adolescence and rarely develops after age 25. As preschoolers, they are shy around strangers and may not speak well
to people outside of the family. More children with social phobia than any one would expect have some mild to moderate speech or language problem. Others are shy and also have some disfiguring medical problems which make them more noticeable.

Although phobias are common and they rarely cause considerable distress or a significant disruption of every day activities, however, if someone has severe form of certain situational phobia, it may impact every area of his/her life, from his/her relationships to his/her occupational functioning. For example if someone has claustrophobia, he/she might turn down a lucrative job offer, if he/she has to ride the elevator to get to the office. If he/she has a fear of height he/she might drive an extra twenty miles in order to avoid a tall bridge, when avoidance of the object activity, or situation that triggers phobia interferes with someone’s normal functioning, the person is said to be the definite sufferer of the disorder and seeks the proper treatment.

The aim of this study is to investigate the genetic and environmental contributions to certain common phobias and to compare our findings with those of contemporary studies.