Chapter - 2
Neonates is an early stage for study and is also an important as well as very delicate stage in the human development. The characteristics of the neonate has been studied and several factors influencing at this stage is also known. This chapter deals with the literature pertaining the factors which influences the neonate and its context with it. The literature and studies related to the factors which are dealt in the present study has been reviewed in detail and for the convenience as well as for ease of understanding, it is presented here under the following main sections

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2.1 NEONATES

2.1.1 Definition

Lexmi (1998) defines neonate, as the period from cutting of umbilical cord up to the falling is known as period of neonate. It is about two weeks. Lexmi also calls the neonate period as the first stage of infancy.

Themes and Variations (1992) calls neonate as the period of human development, which comes after the prenatal period.

According to Anila (1995) neonate refers to the newborn infant and the period of neonate is up to the two weeks after the birth.

2.1.2 General characteristics of neonates

Hurlock (1977) has taken a rather more prosaic but potentially more fruitful approach in describing the newborn under three main headings: appearance, helplessness and individuality.

According to Hurlock (1977) the neonate’s head is about a quarter of the entire body length, compared to the tenth proportion of the average adult. The biggest difference is the cranial region – that is the area above the eyes.
In infants the ratio between the cranium and the face is 8:1, by the adulthood this changes to 1:2.

Prechtl (1992) said white babies typically have blue – gray eyes while non-white babies are brown. Gradually eye colors changes to whatever it will ultimately be. The eyes are almost mature in size, hair colour if there is any to have colour signifies little for it may be replaced by some of a different color and texture.

According to (Hurlock 1977) humans have a longer period of childhood than any other mammal; The extreme helplessness of the new born is evident in five ways; Adults and older children have a well developed regulatory mechanism rather like the thermostat system of central heating, which enables them to maintain a relatively stable level of temperature and chemical composition within the body. (Anila 1995; Hurlock 1977) The mother maintained homeostasis for the fetus but the newborn's central nervous system is not sufficiently developed to allow the baby to take over at once ,the neonate 's pulse will swing from 130 to 150 at birth , dropping to just under 120 a few days later. (Brazelton 1961)
The most marked example of lack of homeostasis is found in the baby's sleep, the newborn will be awake for only about 8 hours a day but the 16 hours sleeping will occur in fitful patterns, which may take two or three months to settle into a routine where by most of the sleep occurs at night. (Brazelton 1964, Bench and Parker 1971) Full control implies voluntary activity - that is, bodily movement occurs only after a conscious wish, neonates move everything in all directions, but not all movement even at this stage is random. (Brazelton 1969) Neonates vary one from another in both their mass activity and specific activity. (Siegal and Lindas 1983)

Self and Horowitz (1979) says communication is an area of some possible controversy. There is no question of a neonate pointing or indicating needs physically but they do cry and to some this is a form of communication. The birth cry is reflexive, a result of air being drawn over the vocal cords but from the first 24 hours onwards crying will occur at a time when the baby is hungry or appears to be in some discomfort. (Siegal and Lindas 1983, Shaffer 1999) Recent research has shown that neonate is probably capable of using sensory apparatus to a far greater extent than was hitherto imagined. (Dunkel-Schetter 1998)
Physiologically the cones in the retina are poorly developed, suggesting that neonates are colour blind, although the rods are better developed their area is limited which suggests a restriction of the visual field, the muscles controlling eye movements are undeveloped and so both eyes do not focus on the same subject. (Paramele 1975) But a neonate will react to light, turning apparently to search for it; within a few hours of birth babies have been observed to sustain gaze despite poor focusing skills, (Shaffer 1999) Within the first few weeks many neonates follow a moving object visually, there is no doubt that the ability to see and distinguish some visual patterns are very much greater than was imagined twenty or more years ago. (Sameroff 1978)

2.1.3 Neonatal Reflexes

According to Brazelton (1979) neonatal reflexes are actions in response to specific stimuli that are present in newborn infants.

According to Hurlock (1977) neonatal reflexes are the reflexes that are present at birth. They are believed to be inborn and have predictable action patterns. Reflexes, more accurately described as unconditioned reflexes, are not learned or developed through experience. (Prechtl and
Normally developing neonates (infants up to about four weeks of age) are expected to respond to specific stimuli with a specific, predictable behavior or action, any variation in, or absence of, response may be a sign of abnormality in development. (Hohmann et al 1988, Horowitz et al 1978) Further testing of the infant is usually recommended when any response to a stimulus differs from the expected norm. Some neonatal reflexes disappear with maturation; other persists into adulthood. (Prechtl and Beintema 1964, Brazelton 1969, Leijon 1982)

Leijon (1982) finds that though the reflex actions are complex, most reflexes can be simplified into four basic steps. In the first step, the stimulus is received by nerve endings involving one of the senses—taste, sight, smell, hearing, or touch. Secondly, the energy created by the stimulus is conducted through the nerves to the central nervous system, next, the impulses generated by the stimulus are transmitted to the nerves that stimulate muscle action finally, the muscles, and sometimes certain glands, respond with an action. The neonatal reflexes are explained by Jhonson (1976) under the following heads.
2.1.3.1 Babinski reflex

The Babinski reflex is characterized by a fanning of all five toes and the stretching forward of the big toe when the bottom of the foot is stroked or tickled. (Jhonson 1976) It is a sign that the infant is neurologically normal. (Hobel et al 1998, Hurlock 1977, Rosenblith 1974) Usually around the age of one this reflex disappears completely. It is replaced with the plantar reflex found in young children and adults; this reflex involves curling of the toes in response to the stroking of the sole of the foot. (Hurlock 1977; Laxmi Devi 1998; Leijon 1982)

2.1.3.2 Blink reflex

The blink reflex is characterized by the involuntary blink of the eyes when an infant is subjected to a bright light, wind, or rapid approach of an object. This involuntary action protects the eyes and is therefore maintained throughout life. (Jhonson 1976, Hurlock 1977)

2.1.3.3 False crawling reflex

When a newborn infant is placed on her stomach, she may begin to flex her arms and legs in a motion that simulates crawling. This action is due to the baby’s natural curled-up position, which gradually changes over the
days following birth. (Brazelton 1969; Hurlock 1977; Laxmi Devi 1998; Leijn 1982; Prechtl and Beintema 1964) After about one week, the infant will be able to lie flat, and the false crawling movements will disappear. (Laxmi 1998)

2.1.3.4 Knee-jerk reflex

The knee-jerk, or patellar reflex, is a sign of a neurologically healthy baby; the neonate’s lower leg and foot involuntarily kick upward or forward when the neonate is tapped on the tendon just below the kneecap. This reflex prevails throughout maturation into adult life. It is checked by applying the stimulus tap to a young child or adult while he or she is in a sitting position. (Hurlock 1977; Jhonson 1976; Laxmi Devi 1998; Leijn 1982) This reflex is so commonly known that the term “knee-jerk” response is an idiom for any reaction that seems to come automatically, with little or no thought.

2.1.3.5 Landau’s reflex

At about three months of age, an infant will begin to display the Landau’s reflex. When she is placed on her stomach face down, she will raise her head and arch her back. This reflex will persist until around the child’s first birthday. Absence of this reflex suggests problems in motor
development (Jhonson 1976). The pediatrician may investigate further to rule out such problems as cerebral palsy and mental retardation. (Hobel et al 1998; Hurlock 1977; Rosenbdith 1974)

2.1.3.6 Moro reflex

Also referred to as Moro’s reflex, the startle reaction, or the embracing reflex, the Moro reflex is characterized by a “grabbing” motion if an infant is subjected to a loud noise or loss of support. (Crow and Crow 1954) The infant’s arms and legs will extend and then come together. The infant’s back will also arch, and the infant may cry. This reflex, like other neonatal reflexes, is the sign of a neurologically normal newborn infant. (Craig 1996) Between the ages of five and seven the child will lose this reflex; if the reflex persists, it is a sign of brain damage, neurological impairment, or motor reflex difficulties. (Hurlock 1997; Chaube 1992)

2.1.3.7 Neck-righting reflex

The stimulus for this reflex, which turns the neonate’s head to one side, is applied when the neonate is lying on his or her back facing upward. (Chauhan 1996) The neonate’s reflex response is to turn his or her shoulders and body in the same direction as the head. This reflex disappears
after a few weeks; if it persists after infancy, it may indicate abnormal
development of the central nervous system. (Hobel et al 1998; Hurlock
1977; Rosendilith 1974)

2.1.3.8 Palmar grasp reflex

The palmar grasp reflex is characterized by the grasping of an object
that is placed crosswise on the palm of a newborn infant, or neonate. Like
the other neonatal reflexes, it is a sign of normal neurological development.
(Hobel et al 1998; Hurlock 1977; Rosenblith 1974) Immediately following
birth, the hand grip of this reflex is strong enough to support the baby’s
weight. Within a few hours, this strength will begin to wane, and the reflex
usually fades completely after three to four months. (Hurlock 1977; Laxmi
1998)

2.1.3.9 Rage reflex

The rage reflex is the newborn infant’s response to having his or her
movements suddenly restrained. The infant responds by strongly resisting
the restraint, developing redness in the face, or crying. Like the other
neonatal reflexes, the rage reflex is a sign of normal neurological
development. This reflex tends to diminish in intensity before six months of age. (Hurlock 1977; Laxmi 1998; Leijon 1982 Prechtl and Beintema 1964)

2.1.3.10 Rooting reflex

When a newborn infant’s cheek is touched or stroked, she will respond automatically by turning her head toward that side and beginning to suck. This is the reflex that allows the newborn to turn toward the mother’s nipple to begin breastfeeding. (Hurlock 1977) Usually during the first six months of life, but sometimes as late as 12 months of age, this reflex disappears. The rooting reflex is the sign of a neurologically normal neonate. (Hobel et al 1998; Hurlock 1977; Rosenblith 1974)

2.1.3.11 Sucking reflex

The sucking reflex occurs when the mouth of the neonate has been stimulated. It is strongest in the first three to five months of life, and is one of the signs of a neurologically healthy infant. (Hobel et al 1998; Hurlock 1977; Rosenblith 1974)

2.1.2.12 Walking reflex

The walking reflex is characterized by stepping motions resembling walking when the newborn infant is held upright with contact between the
feet and a resisting surface. This reflex will disappear within about a week, usually recurs between eleven and sixteen months, and is a sign of a neurologically normal infant. (Hobel et al. 1998; Harlock 1977; Rosendilith 1974; Prechtl and Beintema 1964)

2.1.4 Neonatal Assessments

Assessment of the newborn infant saw considerable growth during the last two decades. Neonatal assessment is done for variety of reasons. When motivated by clinical needs, such assessments are largely used to guide practitioners in assessing the immediate status of the infant and in marking some decisions concerning treatment or special care in the context of a research program, the measured status of the neonate is a source of data (Lobel 1999). Prechtl (1982) Sameroff (1978) and Self and Horowitz (1979) review and critically discuss neonatal screening techniques such as the Apgar (1953) a number of obstetrical complications scales and neurological exams developed by Dubowitz et al., (1970), Prechtl and Bentima (1964) and Parmalee (1975) as well as behavioural assessments for the newborn, such as the Graham – Rosenblith. Behavioural test for neonates (Rosenblith 1974; 1979) and the Brazelton Neonatal Behavioural Assessment Scale (1973). Self and Horowitz (1974) also present an informative chart on the
various motor and reflexive behaviours, physiological characteristics and neurological since that constitute the various neonatal and infant scales, while revealing those items that are common across instruments.

Korner and Thomas (1978) have also developed an interesting visual alertness scale for newborn that was used in determining infant behavioural receptivity to soothing stimulation. These two behaviour – visual alertness (cognitive) and soothability (temperament) were found to be related to the type of stimulation and to exhibit individual differences – despite excellent reliability this has remained an infrequently used research tool. (Johnson 1976)

Graham – Rosenblith predated standardized neurological assessments and these can be regarded as the pioneer in neonatal assessment. Rosenblith (1979) unequivocally states that she did not assume individual predictions would result from these test. In fact, the measures apparently differentiate at risk infants within the normal population and are predictive of functioning at 8 months and at 4 years of some induces (for instance, gross and fine motor, IQ classification and aspects of emotional behaviour). In general at age 4 there was a greater relationship between risk scores and functioning for females than for males (Rosenblith 1979).
Rosenblith (1979) reported that it was the tactile – adaptive subscale, which assesses the defensive responses of the newborn that was the most highly predictive at 4 years.

Brazelton Neonatal behavioural assessment scale (NBAS) includes a wide range of behaviors that are believed to reflect the integrity of neonatal central nervous system. A special strength of the test is that it includes items that are more sophisticated in terms of the infants capacity than those used in standard neurological examinations. (Brazelton 1973)

The typical pediatric exam, for example would assess visual functioning by eliciting the papillary relax and examining nystagmoid movements on rotation. But infant research of the last decades indicates that infants are capable of more complex visual behavior. Sameroff (1978) Neonates for example, can habituate their initial blink and startle responses to a bright light. (Prechtl and Beintema 1964). Complex responses to moving objects such as widening of the pupils and eyelids, facial softening, inhibitions of generalized movements and coordinated tracking movements with the eyes are all within the newborns behavioural repertoire. Further more neonates can attend to the track for lengthy periods particular visual stimuli, such human face. They will search for lights and exhibit stimulus
preferences that can be indexed by the durations of attention. Source of these behaviors are incorporated into the NBAS. Sameroff (1978) concludes that the Brazelton scale is most useful for assessing concurrent functioning of the neonate rather than stable individual differences.

NBAS remains the most comprehensive behavioural assessment tool for the newborn. In addition, norms of healthy preterm infants are emerging (Leijoni and Finstron 1982) as is the relationship between neurological and behavioural functioning on the Brazelton is normal and preterm infants (Leijoin and Finnstron 1982) The NBAS is an attractive scale for those interested in the interactive capacities of the neonate and how neonatal status on such variables may be related to early and subsequent interaction. It has been reported for example that aspects of the NBAS are related to concurrent behaviour exhibited by healthy form infants during feeding interaction (Osofsky and Danzger 1974) and to the amount of cuddling secured by the infants and its Irritability (Horowitz et al 1978).

Among preterm infants those suffering from respiratory difficulties exhibit poor interactive and motor process scores on the NBAS, lower developmental scores on the Bayley at 8 and 12 months as well as poorer face to face interaction. Field (1977)
Greene et al (1983) reported that both term and preterm infants who were ill exhibited lower NBAS orientation and that NBAS orientation was associated with maternal and infant behaviours at 3 months. At risk infants are also heterogeneous group. These infants are characterized by various factors, such as low birth weight or pre-maturity or have been subjected to stressful pre and perinatal experiences, such as anoxia or prolonged labor.

2.1.5 Factors influencing the neonates

In a series of studies, Schneider and co-workers have shown that prenatal stressors adversely affect the motor and mental development of rhesus monkeys (Schneider 1992; Schneider et al., 1992; 1999).

Exposure to mild stress during mid pregnancy, operationalized as three noise bursts over a 10 minute period five times a week, resulted in decreased motor maturity, as evidenced by a delay in learning to self-feed, low muscle tone, inferior balance reactions, a slowed response speed, poorer coordination and a declined attention in the first months of life in comparison to control infants (Schneider, 1992). These effects of a mild stressor could be mimicked by prenatal exposure to adreno corticotropic hormone (ACTH) during a 2-week period (Schneider, 1992). Recently,
Schneider et. al. (1999) showed that these effects were most profound after exposure to stress in early gestation, but could still be found after mid to late gestational stress. The same mild prenatal stressor appeared to have a negative effect on cognition as well. A delay in object permanence was found on a sequence of Piagetian tasks after prenatal stress (Schneider et.al., 1992).

Most human studies on prenatal stress have focused on pregnancy outcome. Stress in pregnancy has been associated with premature delivery and lower birth weight adjusted for gestational age (Dunkel - Schetter, 1998; Copper et al., 1996; Lou et al., 1994; Wadwha et al.1993). In a prospective study, it was even found that prenatal maternal stress was associated with a reduced head circumference (Lou et al., 1994). The effect on fetal head growth may reflect suboptimal brain development and may be a predictor of impaired cognitive development (Hack et al., 1991; Stanley et al., 1989). Retrospective reports indicated that infants of high-anxious pregnant women have lower scores on the mental scale of the Bayley Scales of Infant Development than infants of low anxious women (Davids, 1963) and that stress during pregnancy was associated with delays in early motor development and increased amounts of behavioral problems (Meijer, 1985;
Stott, 1973). We were able to identify one prospective study on the effect of prenatal stress on postnatal development in humans (Van et al. 1998).

In a sample of 70 healthy women state and trait anxiety scores measured in the third trimester of pregnancy were positively correlated with a difficult temperament of the infant at 10 weeks and 7 months after birth. However, no association was found between prenatal general anxiety measures and mental or motor developmental status of the infant at this early age. The present prospective longitudinal study was designed to examine the effects of stress in human pregnancy on both motor and mental development early in life. Late periods of pregnancy include various stress-provoking like life events, secondary appraisal of the pregnancy, pregnancy-related anxiety, neuroticism and stress-mediating factors (coping styles) that contribute to the amount of distress of pregnant women. Previous results also suggested that distress and daily hassles may be relatively unrelated concepts, with different mechanisms underlying the possible effect on birth outcome and later development (Huizink et al., 2000). In another study, it is seen that the existence of pregnancy anxieties which were only partly related to personality characters- 149 prenatal stress and mental and motor
development in infancy and these were regarded as pregnancy-specific stress provoking factors (Huizink et al., 2000).

In 13-16 % of all young children psychosocial adaptation is hampered by mild or severe neuro-developmental disorders, that range from hyperactivity, learning disabilities, language delays and motor abnormalities to autistic spectrum disorders and cerebral palsy (Kirby & Brewster, 1995; Robert et al., 1998; Thompson et al., 1996). Possible harmful effects on the brain during delivery explain only a proportion of these disorders in children's behavior and development (Goodman & Stevenson, 1989; Taylor et al., 2000). Moreover, improved obstetric care during the last decades has not been able to reduce the rate of these neuro-developmental disorders (Casaer, 1993; Hjalmorson et al., 1988; Visser & Narayan, 1996). Animal studies have shown that the prenatal period should not be neglected when one is interested in early determinants of development (Weinstock, 1997). As a result, there is now an increasing recognition of the role played by prenatal factors in the development of subsequent neuro psychiatric impairment, particularly in term born infants.

Interest in prenatal risk factors can be found in various fields of research. First, prenatal influences may affect the general development of
the fetus. Food deprivation (Creasy, 1991), alcohol-intake (Faden et al., 1997), smoking (Cnattingius et al., 1999; Eyler et al., 1998) and drugs during pregnancy (Tuthill et al., 1999) may result in adverse birth outcome, such as preterm birth and low birth weight. Internal factors, like elevated prenatal stress, are likewise associated with premature delivery, and low birth weight. (Dunkel-Schetter, 1998; Copper et al., 1996; Wadhwa et al., 1993).

Second, effects of prenatal influences on physical development have been found, which may result in specific illnesses. For instance, food deprivation during pregnancy has been found to have an effect on health status at adult age (Barker, 1995; Ravelli et al., 1998). The Barker hypothesis states that children with low birth weight, possibly as a result of prenatal food deprivation of the pregnant woman and secondary of the fetus, have an increased risk for diabetes, obesity, high blood pressure and cardiovascular disease at adult age.

After alcohol-intake in pregnancy disturbances of physical development occur, resulting in heart defects, distortions of the joints and minor physical abnormalities (Day & Richardson, 1991; Sokol & Clarren, 1989). Prenatal smoking is associated with increased susceptibility to
eumphysema (Maritz et al., 1993) and abnormal early pulmonary maturity (Lieberman et al., 1992). The use of pharmacological agents during pregnancy may result for instance in deformed limbs (thalidomide) or in an increased risk for abnormalities in the structure of the reproductive organs and for the development of cancers in the vagina or cervix (Seifert and Hoffnung, 1987).

Third, variations in the fetal physiological environment, caused by the aforementioned external factors, appear to have effects on brain development, which may lead to neonatal brain disease or psychopathology later in life. In the field of child neurology, etiological factors for cerebral palsy are sought in the prenatal period, because perinatal complications seemed to explain only part of the occurrence of this brain dysfunction in at term born infants (Bottos et al., 1999; Casaer, 1993; Sugimoto et al., 1995; Truwit et al., 1992). The harmful effects of prenatal exposure to tobacco, alcohol, medication or drugs on human brain development are well established (Ferreiro and Dempsey, 1999). In short, gestational alcohol exposure may result in microcephaly and central nervous system. From postnatal to prenatal determinants of development, malformations (Sokol and Clarren, 1989; Day & Richardson, 1991), disturb neuronal migration
(Day & Richardson, 1991) and reduce neuronal numbers (Pantazis et al., 1998). According to these studies, alcohol exerts its effects on a variety of genes and can modify the composition of the postsynaptic membrane (Ferreiro and Dempsey, 1999) Fetal cell damage and cell loss is found (Slotkin, 1998). Besides the direct effect of alcohol, nicotine and cocaine on fetal brain development, the prenatal exposure to these substances may further interfere with normal brain processes. This may result in later cognitive dysfunction (Fried et al., 1998; Richardson et al., 1995; Frydman, 1996; Naeye and Peters, 1984), behavioral deficits (Weissman et al., 1999; Fergusson et al., 1998; Williams et al., 1998; Olson et al., 1997; Sampson et al., 1997) and even mental retardation (Drews et al., 1996). Exposure to high levels of radiation in pregnancy has also been related to mental retardation (Otake and Schull, 1984). Other prenatal factors linked with later compromised development, in particular schizophrenia and major affective disorders, included malnutrition (Hoek et al., 1998; Susser et al., 1998; Geddes, 1999) and influenza (Machon et al., 1997).

The effects of these external prenatal factors generally result in explicit physical pathology, growth retardation or psychopathology. Internal prenatal factors such as maternal stress may lead to a more subtle disruption
in normal development besides the obvious effects on general fetal development that resulted in preterm birth and lower birth weight. In humans, prenatal stress has been associated with a smaller head circumference of the neonates (Lou et al., 1994). Severe maternal stress in pregnancy has been linked with an increased risk for schizophrenia at adult age for the infants born of these mothers (Van & Selten, 1998). In nonhuman primates, it was found that prenatal stress had long-term effects on behavioral regulation in the offspring that persist into adolescence (Clarke & Schneider, 1997). Offspring of prenatally stressed rats had stronger and prolonged responses of the Hypothalamic-Pituitary-Adrenal (HPA) axis in stressful situations (Weinstock, 1997).

Much interest has been paid to the possible effects of gestational stress in humans on the duration of pregnancy, birth weight, and related measures of obstetric outcome (Pagel et al., 1990; Hedegaard et al., 1993; Copper et al., 1996; Lou et al., 1994). These studies did not only include the effect of psychological stress during pregnancy, but also the effect of physical stress such as chronic exposure to loud noise in the vicinity of an international airport (Schell, 1981) or fatigue associated with occupational working conditions during pregnancy (Landbergis and Hatch, 1996).
Relatively few studies, however, have looked at the influence of prenatal stress on postnatal development in humans, and most of these are limited by the use of retrospective designs, small sample sizes, and/or non-standardized measurements. For example, infants of emotionally disturbed or high anxious pregnant women have been described as restless, irritable, overactive, poor sleepers, and less alert and responsive compared to infants of undisturbed or low anxious women (Ferreira, 1960 and Turner, 1956). Infants of high anxious women further had lower scores on the mental scale of the Bayley Scales of Infant Development than infants of low anxious women (Davids, 1963). In a birth-cohort study of about 1300 children, marital discord and interpersonal tensions during pregnancy produced elevated rates of both physical disease and behavioral problems at later age (Stott & Latchford, 1976).

Furthermore, the prenatal history of severely emotionally disturbed children that were seen in partial hospitalization or in-patient programs revealed exposure above chance level to stressors like unplanned and/or rejected pregnancies, marital discord, and affective problems in the mother (Ward, 1991). Of course, all these reports focused on the influence of maternal personality variables on the postnatal development of the child.
rather than on the influence of prenatal stress. Other retrospective studies reported that specific forms of stress during pregnancy, such as the threat of and exposure to the six-day Arab-Israeli war (Meijer, 1985) and marital discord (Stott, 1973), were associated with delays in early motor development and increased amounts of behavioral problems as excessive clinging, crying, hyperactivity, low frustration threshold and antisocial behavior at age 2-10 years.

Some studies have focused on the relation between prenatal stress and the risk for later severe psychopathology. Severe psychological stress in the pre- and perinatal period was retrospectively linked to a relatively high incidence of attention-deficit hyperactivity disorder (Clements, 1992). In a follow-up study to age 15 of the children born to mothers who faced the death of their spouse during pregnancy, a relatively high incidence of psychiatric disorders was found, when compared to infants that lost their father in the first year of life (Huttunen, 1994). The disorders included schizophrenic episodes, depressive and neurotic symptoms, alcoholism and antisocial behavior. Children born from unwanted pregnancies have also been reported to have increased risk to develop schizophrenia (Myhrman, 1996). In a case-control design and using data from psychiatric case
registers, prenatal stress exposure in the first trimester of pregnancy caused by the German invasion during the second World War in the Netherlands was associated with a small but significantly elevated risk for schizophrenia (Van & Selten, 1998). In a similar design, a slight non-significant increase was found in the incidence of non-affective psychosis following prenatal exposure to stress induced by the Dutch flood disaster of 1953 (Selten et al., 1999).

2.1.6 The Neonate in its Biological Context

The newborn infant's behavioural repertoire is determined by the level of maturity reached by the central nervous system at birth. The degree of this maturity varies greatly in different species. Within a single species, however, the newborn infant's nervous system shows marked differences in biochemical composition, morphological structure and functions in comparisons with later autogenetic stages. (Fries and Makin 1987) During maturation the brain changes its properties according to rigidly programmed timetable until a relatively stable stage is reached in the adult. The sequence of developmental changes may be used as an experimental variable, providing a unique opportunity for the exploration of relationships between
brain structures, physiological changes and observed behaviour (Wayne 1982).

Early brain mechanism and behaviour are the result of evolutionary processes and have to be viewed within the context of the developing organisms natural history. The natural environment of the newborn mammal compresses a particular constellation of visual, auditory olfactory, gustatory and tactile stimuli, (Hehram 1962)

The behavioural repertoire of the newborn of each species is specifically adapted to enable it to survive in the particular environment into which it is born. This means that the range of behaviours that are relevant to the needs of the newborn organism will differ markedly between species, thus making homologies dangerous (Menten 1961).

In the case of the higher primates, the behavioural repertoire is specifically adapted for the job of survival on the body of the mother. In the human organism, parturition occurs when the temperature regulation is imperfect, locomotion is poor and sense organs are not fully functional. The infant therefore requires intensive nursing and care over a prolonged period of time. If he is to survive, this functional repertoire must be exactly
complementary to the parental (and particularly the maternal) repertoire of rearing and nursing behaviours. It is general contention that if studies in neonatal psychophysiology are to avoid biological contrivance they need to proceed from considerations of what the infant does when observed under adequate biological conditions and how he responds to stimuli that occur in his natural environment (Prechtl and Beintena 1964)

2.1.7 Determinants of the Behaviour of the Neonates

The repertoire of the new born infant is the result of a gradual unfolding of behaviour beginning early in intra uterine life (Prechtl & Beintema 1964)

Studies of the human fetus have demonstrated the stereotyped responses to tactile stimulation of the skin in the trigeminal area can be obtained as early as 8 to 10 weeks of gestational age (Hooker 1952). Isolated responses from the hand (Palmar, grasp) are found at 12 to 15 weeks, withdrawal of the leg at 13 weeks, swallowing at 14 weeks and sucking at 24 weeks (Humpmey 1964). Several response patterns occur rather suddenly at particular stage of development, for example, the glabella reflex, the pupil reaction to light, the traction response, the neck righting reflex and head – turning response to diffuse light. The clockwise precision with which these
patterns appear is so characteristic that they may be used to determine gestational age (Robinson 1966).

According to Langreder (1949) human infant possesses at birth a wide behavioural repertoire of motor pattern and responses to stimulation, at least some of which have played an important role in intrauterine environment.

The infant born around the fortieth week of gestation, the conditions in which he had been living change dramatically and he is exposed to a climatically, physiologically and nutritionally novel environment. He is now fully exposed to gravity against which he must achieve at least rudimentary postural adjustment. Moreover he is exposed to a whole range of novel sensory stimuli (Stechler 1964). A further aspect complicating the picture even more is the effect of drugs given to the mothers before or during delivery. There is ample evidence that they may influence the infants brain function and behaviour quite profoundly for the first few days of life (Brazelton 1961, Stechler 1964).

An extension longitudinal study of the effects of the extrauterine adaptation syndrome on nervous function during the first 9 days carried out Beintema (1968) found that many motor pattern such as postural responses,
locomotion and any skin reflexes are significantly weaker in the first 2 or 3 days than in the following days. There is also more inconsistency of response because of the instability of the behavioural state of the infant. If there have been pre or preinatal complication in the history of the infant there may be marked effects on the course of postnatal adaptation (Schinder & Moya 1964). There is good evidence that the nervous system plays an important role in development of homestasis of vital functions after birth conversely, the success or failure of the proper regulation of oxygenation, heart rate, blood pressure, electrolyte metabolism, fluid balance and other autonomic functions affects brain functions (Goddard 1966). Complications during pregnancy or delivery form a more or less high risk for brain disfuntion in the neonate or at least have a disturbing effect on the adaptive processes thus prolonging the state of recovery and physiological imbalance after birth (Beintema 1968).

The manifestation and development of the neonate repertoire is affected by a large number of pre and perinatal factors. Pregnancy complications, maternal drug ingestion, obstetric complication during delivery, the postnatal adaptation syndrome and later the physiological disturbances of the gastrointestinal tract. All these factors may affect the
general well being of the neonate and some at least are directly correlated
with the state of the infants nervous system (Menten 1976).

2.1.8 Evaluation of literature and position of the present study

defined the term Neonate and it refers to the period of two weeks after the
Lindas (1983) Sameroff (1978) gives the characteristics of Neonates which
includes the appearance, helplessness, individuality, mass activity and other
(1976) Crow and Crow (1954) and Rosenblith (1974) have studied on
reflexes and explains the different Neonatal reflexes and how it is a sign of
neurological state of the Neonate. Brazilton (1979) Self and Horowitz
Frinston (1982) have explained various neonatal assessment methods and
discussed neonatal screening techniques which can show the state of the
Neonate from the point of its neurological state and behavioural functioning.

There are several factor influencing the state of Neonates which are
Maternal Stress (Loue et.al., 1994), Prenatal Stress, pregnancy related
anxiety, food deprivation during pregnancy, alcohol intake and harmful effects of prenatal effects of tobacco and other drugs are the factors which can affect the normal brain process and the state of the neonates (Schendieer 1992, Dunkel-scettr 1998, Copper et.al., 1996, Wadwha et.al., 1993, Wayne 1982, Menten 1961, Prechtl and Beintema 1964) have given the Neonates in its biological context. Even though researchers have stressed the importance of neonatal state have studied the characteristics and factors influencing the state. There are no studies comparing the reflexes the neonates with reference to mode of delivery, gestation period and birth weight. Research studies pertaining to this field are almost nil in the Indian context so the investigator felt the need to carry out such a study in the present social context.

2.2 STRESS

2.2.1 Definitions

Themes and variations (1992) defines stress as any circumstances that threaten or are perceived to threaten one will being and that there by tax ones coping ability
Stress occurs when the demands placed upon an individual exceed their ability to cope with that. (Cohen & Williamson 1991)

According to Leonard and Brunel (1995) Stress is the body’s normal response to stimuli or anything that disturbs its natural physical emotional or mental balance.

2.2.2 Maternal Stress

According to Cohen there are a broad range of levels of stress one can endure. Pregnant mothers experience stress from how they will be able to financially support a child that is to be born in several months to how they will bring up their child (Cohen 1991).

Prenatal maternal stress may induce changes in the metabolic environment of the fetus and account for some of the early programming effects on brain development. A problematic issue of the concept of prenatal maternal stress in human pregnancy is the lack of consensus on the definition and operationalization of prenatal stress. Older studies frequently used single questionnaires to assess an aspect of prenatal stress, such as major life events or general anxiety, whereas more recent studies have
focused on prenatal maternal stress as a multidimensional concept.
(Lazarus and Folkman 1984)

2.2.3. Maternal Stress and its effect on child development

Several mechanisms may account for the impact of prenatal maternal stress or dispositional optimism on birth outcome: changes in biochemistry, especially in the neuroendocrine and immune systems (Dunkel-Schetter et al., McEwen, 1998 and changes in behavior.. Early delivery and low birth weight are affected by smoking, alcohol abuse, and elicit drug use (Chomitz, Cheung and Lieberman, 1995; McCormick et al., 1990), behaviors that optimistic pregnant women are likely to avoid but that may be increased under stress (Picone, et.al., 1982). Optimists tend to engage in positive health practices, such as exercising, and they avoid health-impairing activities (Scheier and Carver, 1992). Similarly, stress has been shown to affect health-relevant behaviors that may mediate its adverse impact on birth outcomes (Griffin, et.al., 1993; Krantz, et.al.1985), including smoking and substance use (Bresnahan, et.al., 1992; Conway, et.al., 1981; Hutchins and DiPietro, 1997), eating and sleeping patterns (Krantz et al., 1985), and compliance with therapeutic regimens (Caldwell et al., 1983).
Stress can often lead a person to change their behavior in certain ways. There are some stress-induced behaviors, which can have negative impacts on health, and pregnancy, and then the danger is put on the health of the developing baby as well (Lobel, et.al., 2000).

An investigator using structural equation modeling found no direct relationship between stress or social support factors and low birth weight, but observed an indirect association through the influence of these factors on certain health behaviors. (Sheehan 1998) The model included two sets of stress factors. A group of major life events were combined to describe “family stress,” and factors related to employment status and sources of income were combined to create an “economic stress” variable. The study also used a variable to capture “social support,” which included one pregnancy attitude concept—“ambivalence about pregnancy after 20 weeks gestation.” Each of these three factors was strongly correlated to two deleterious health behaviors, smoking tobacco and consuming alcohol. In turn, health behaviors were directly associated with low birth weight, significantly increasing the likelihood of a negative outcome. (Conway et al 1981)
Two other recent analyses of the effects of major life events on preterm birth reached differing conclusions. An Australian study of women at high biological risk due to previous poor pregnancy outcomes found no significant association between life events and preterm birth. (Honnor, et.al., 1994) In contrast, among Danish women, major life events themselves were not associated with shorter gestation or preterm delivery, but major life events identified as stressful by the women was associated with an increased risk of preterm delivery. (Hedegaard 1994)

Both pregnancy intention and attitudes about pregnancy have been studied as risk factors related to pregnancy outcomes (Bustan and Coker 1997) One suggested mechanism for the effects of these factors on birth outcomes is lifestyle factors, such as increased smoking (Sheehan 1998) alcohol use (Orr 1996) or illicit drug use; (Robins and Mills 1993) these behaviors may be more common among women with unintended pregnancies. (Surveillance report 1999)

A second potential explanation for the increased risk of poor outcomes is that an unplanned or unwanted pregnancy may be a psychological stressor for a pregnant woman. Additionally, her attitudes about the pregnancy (whether she is happy to be pregnant, whether she is
unsure about being pregnant or whether she denies her pregnancy) may also influence her level of perceived stress. (Sheehan 1998)

The risk of very low birth weight appears to be associated with perceived stress during pregnancy, and some factors that might lead to stress, including major life events and pregnancy attitudes, seem to be independent risk factors for low birth weight. Finding that women’s perception of stress during pregnancy is associated with an increased risk of very low birth weight supports earlier research relating stress with low birth weight and preterm delivery. Another study of psychosocial factors and preterm delivery showed that women who report stress during their pregnancies were 1.5 times as likely as those who do not to experience preterm delivery (Dunkel Shcetter 1998) a finding consistent with ours. Further, there may be a biological explanation for the relationship between stress and early birth, in that hormones excreted in response to stress affect uterine activity that may cause premature contractions and delivery. (Hobel, Dunkel, et al., 1998)

The relationship between stress and birth outcomes seen in a study is moderate in size, but is not much smaller than the effect of many biological risk factors for low birth weight. The etiology of both low birth weight and
preterm delivery is complex. No single factor explains most of the variance in the rates of these birth outcomes; instead, many biological, behavioral and social factors work together. (Robert 1998)

Inadequate prenatal care has been found to be a major risk factor for low birth weight. (Brown 1985) In previous studies, perceived stress (Sable and Wilkinson 1999) pregnancy attitudes have been shown to be associated with an increased risk of inadequate prenatal care. It is found that including both stress and pregnancy attitudes and intentions and controlling for the adequacy of prenatal care leaves use of prenatal care no longer statistically significant. The finding of a relationship of stress to very low birth weight appears to be independent of use of prenatal care, although stress may well be a factor that moderates the use of care. (Brown 1985)

Further, low socioeconomic status is a risk factor for low birth weight, (Hughes and Simpson 1995) and taking out a mortgage may indicate higher income. In these data, there is no way to separate a loan from a mortgage, so we are unable to assess whether there may be different effects from incurring other types of debt.
One researcher points out in a recent article that adverse events bring forth a need for support from others, and notes that people seek meaning in adversity and will act to make positive changes in their lives as a result of the event. (Mc Millen 1999). Studies find that women who deliver premature babies have much higher levels of CRH as early as 18 weeks into their pregnancy than women who carried their babies to term. Dunkel and Schelten (1999).

According to Dunkel and Schelten (1999) researchers may begin to believe that CRH works as a 'Clock' to determine the timing of delivery. The belief that mothers' psychological state can influence her unborn baby exists in most societies (Ferriera 1965) some studies have shown that babies of stressed or anxious mothers have a significantly lower average birth weight for gestation age and tend to be born early (Perkin 1993) In one large case control study the magnitude of the effect of stress on birth weight was similar to that found in the offspring of mothers who smoked (Sandman 1993). As low birth weight seems to be associated with health problems in later life for example, hypertension and ischaemic heart disease the effect of stress on birth weight is of concern (Copper 1996).
Ultrasound studies have shown that fetal behaviour is affected by maternal anxiety (Hedegaard 1994). Animal studies have also shown that when the mother is stressed during pregnancy, birth weight is reduced and the behaviours of progeny is permanently affected (Basker 1995). Several reports have established that maternal tobacco smoking during pregnancy adversely affects pre and postnatal growth and increases the risk of fetal mortality (Abel 1980, Butler and Goldstern 1973).

In her research Lobel (1999) found that infants who are born prematurely to mothers under psychological stress tended to have fewer interactions with their parents in the later stage of childhood. Research have shown that pregnant women who were exposed to severe life stressors in their early stages of pregnancy may have an increased risk of having a baby with certain types of birth defects (Hughes and Simpson 1995).

Lecaneut (1996) in his findings shown that maternal stress might influence development of the fetus in the first three months and the last three months of pregnancy. In the study the Danish team examined medical records from thousands of pregnancies those women who experienced severe sudden life stresses in the early stages of pregnancy most often cited was the death of the older child were over eight times more likely to have a
baby with cleft lip and or palate or heart disease and up to four times more likely than non stressed women to have a baby with other birth abnormalities. Birth defects are generally caused by genetic factors or maternal exposure to harmful substances during pregnancy. These research findings indicate that the baby’s response to severe stressors may also play a role in the development of at least types of birth defects (Hughes and Simpson 1995).

2.2.4 Importance of maternal hormones for fetal brain development

Even small variations in the fetal hormonal environment have been shown to exert programming effects on the developing brain. Especially the internal steroid hormones produced by the gonads, the thyroid, and the adrenal glands have been found to exert a great influence on the development of the fetal brain (Collaer and Hines, 1995; Sikich and Todd, 1988). Steroid hormone effects occur at the level of gene transcription, via the actions of intracellular hormone receptors. Other effects occur at the level of the membrane via receptors on the cell surface that produce rapid effects on bioelectrical activity and secondary messenger systems. These hormones are regarded as links between the gene and the environment (McEwen, 1992). Increased or decreased levels of maternal steroid
hormones during pregnancy may be the mediating factors in explaining disruptions in development.

First, products of the gonads, such as androgens, estrogens and progesterone have shown to program the development of the brain and to affect social development of the infant. Higher levels of testosterone were associated with timidity in preschool boys (Marcus et al., 1985) and increased visual-spatial performance in girls at the age of 6 years (Jacklin and Maccoby, 1988). More recent studies (Finegan et al., 1992; Grimshaw et al., 1995) found indications of an effect of gonadal hormones on the cerebral lateralization and of cognitive abilities at 4-year-old girls. Prenatal testosterone levels showed a curvilinear (inverted U-shape) relation to language comprehension and classification abilities, and a linear relation to counting, number facts and block building. Furthermore, girls with higher prenatal testosterone levels were more strongly right-handed and had stronger left-hemisphere speech representation, thus had a greater lateralization of function than girls with lower prenatal testosterone levels.

Second, thyroid hormone levels were found to be critical signals for brain development. The presence of sufficient levels of maternal thyroid hormones during the first 10-12 weeks of gestation is important because only from that
period on does the fetus start to produce its own thyroid hormones. It has been shown that subtle and sub-clinical abnormalities of maternal thyroid status in this early period in pregnancy were associated with a compromised cognitive development at age five years (Pop et al., 1995).

Finally, the adrenal gland produces hormones, like cortisol, that are involved in stress responses. From animal studies it is seen that prenatally stressed rodents and monkeys showed an abnormal reactivity of the Hypothalamic-Pituitary-Adrenal (HPA) axis early and later in life. Also, prenatal exposure to prolonged increased levels of corticosteroids resulted in adverse social and exploratory behavior and motor developmental delays in offspring. Studies of Schneider et al. (1992; 1993; 1997; 1999) showed that prenatal stress (daily exposure to unpredictable noise stimuli) in nonhuman primates was associated with slower motor development, less exploration in a novel environment and more disturbed behavior of the offspring, even in the absence of clear effects on physical development. In short, small variations in maternal hormone levels during gestation may result in developmental problems later in life. Therefore, these variations in maternal hormone levels may be mediating the effect on brain development.
2.2.5 Evaluation of literature and position of the present study

The review of literature shows the definition of stress given by Themes and Variation (1992), Cohen and Williamson (1991) and Leonard and Brunal (1995). The definitions for the stress differed from one another because Themes and Variations (1992) considers the circumstance that threaten or perceived once well being as the stress, whereas Cohen and Williamson (1991), considers stress occurs when the demand placed up on an individual exceeds the ability to cope with that. Leonard and Brunal (1995) considers stress as the bodies normal response to stimuli or anything that disturbs its natural physical, emotional and mental balance. Maternal stress has been defined by Cohen (1991) and Shaffer (1999). Prenatal maternal stress induce changes in the metabolic environmental of the fetus and account for the some of the programming effects on brain development. Dunkel - Shetter et.al., McEwen (1998), Chomitz (1995), Lobel, Hughes and Simpson (1995), Copper (1996) and Hedegaard (1994), states that several mechanism may account for the impact of pre natal maternal stress on birth outcome especially in the neuroendocrine and immune system. Mc
Even (1992), Schneider et.al, (1992; 1993; 1997; 1999) showed the importance of maternal hormones for fetal brain development.

From the review it is evident that there are few studies showing the influence of maternal stress on the neonates with reference to its birth weight, birth outcomes, changes in biochemistry and other behavioural factors. But no study has directly shown the influence of maternal stress on the neonatal responses like the reflexes. Hence an attempt has been made here to study the maternal stress and its relationship with the neonatal reflexes.

2.3. EXPECTATION

2.3.1 Definition

Kelly (1995) has suggested that expectation function as cognitive guidelines to one's behavior.

According to Haller (1968) expectations are the cognitive oriented aspect of goal-directed behavior defined for a person by a "significant other".

Lersch (1972) has defined expectation as the anticipation and actualization in the imagination of coming events in their relation of coming
events in their relation to the objectives of our aspiration. According to Mc Cleand (1972) expectation is the "anticipating target reaction derived from earlier experience.

Welter (1972) has theoretically defined expectancy as the amount, which a percipient is prepared to wager on the occurrence of an event. Expectancy is also the attitude of set of one who expects or is attentive.

Parents prediction of their children's score in specific tests was used as a measure of their expectations psychological prediction, strictly speaking means forecasting the probability of future courses of action on the basis of present and past behaviour (Eyesenck 1972). Expectation is a disorder that profoundly affects a person's social and interpersonal functioning, and it is common among mothers with young children (Murray et al., 1995)

2.3.2. Maternal expectation

According to Lobel (2000) a pregnant woman is called expectant mother not only since she is expecting a baby also because it is the stage of full of expectation for the event which is sure to take place after nine months. The expectations vary from an individual to another with respect to the, birth order of the child to be born socioeconomic level, education

-65-
occupation, marital status and age of the mother. Strong expectation about pregnancy may pose the greatest risk of early delivery.

2.3.3 Classification of maternal expectation

Maternal expectation has been classified as positive and negative. (Yali 1999)

2.3.3.1 Positive expectation

A woman's level of optimism—which is generally defined as having positive expectations—may have a big effect on how anxious she is about her pregnancy. Yali and Lobel (2000) in two studies of the relationships between optimism, perceived control, coping and psychological distress, Brook (2000) found that optimism was associated with less distress, and this relationship was a tendency for optimistic pregnant women, to use coping skills other than avoidance, which includes avoiding people in general, trying not to think about the birth and sleeping to escape problems.

"Optimists were less likely to use avoidance. "And those who did not use this way of coping were protected from distress." (Yali 1999) Optimists were also more likely to believe they have control over the outcome of their pregnancy, and with this sense of control tend to be less distressed. In
addition, optimism had a “powerful” independent effect on emotional distress. (Lobel 2000). These studies reveal that there is power in positive thinking.

Lobel et.al., (2000) found that optimism predicted length of pregnancy and therefore birth weight, less optimistic women delivered earlier and had lower weight babies than their optimistic counterparts after controlling for health behaviors, such as smoking and diet, and medical risks such as diabetes and history of miscarriage.

And when the researchers controlled for optimism, stress no longer predicted birth outcome. Lobel(2000). In contrast, a study published by Dunkel-Schetter et.al., (1999) indicates that optimism predicts birth weight, after controlling for timing of delivery, but that stress is still important, predicting the timing of delivery.

2.3.3.2 Negative expectation

According to Stern et.al., (1999) negative Expectation can have its own effect on child development. Karraker (1998) of West Virginia University, and their colleagues have examined people’s expectations about premature babies and ways those expectations can affect children’s
development over time. Although premature babies are often initially less responsive and socially active than full-term infants, at about nine months, most healthy preemies look no more vulnerable than their full-term peers.

Despite that, in several studies Stern et.al., (1999) found that when mothers, college students, nurses and medical students view a videotape of a 9-month-old baby who is labeled premature, they think less of the infant than if the same infant is labeled full-term and it is found that the infant looks physically less mature, weaker, less sociable, cognitively less competent, and behaviorally less mature, and is less liked—a trend Stern and Karraker (1999) termed it “prematurity stereotyping.” In addition, when given an opportunity to interact with a 5-to-7-month old infant labeled by the researchers as “premature” or “full-term” regardless of its actual status, mothers of both full-term and premature babies treat infants labeled as “premature” more negatively—they hold them and touch them less than babies labeled full-term.

Karraker (1998) also have preliminary data from a pilot study in which they followed mothers and their infants for several years, comparing the degree mothers stereotype their premature babies to the babies’ degree of development. They first rated mothers’ general degree of prematurity
stereotyping, then videotaped them interacting with their infants at 5 months, 9 months and 12 months. When asked which of three toys was most appropriate for their infants, mothers of premature infants consistently chose a more "immature" toy than mothers of full-term infants. In addition, the more negative a mother's score on the prematurity stereotyping scale, the less she interacted with her infant by touching, active play and engagement—what Stern terms "positive parenting. To test the long-term consequences of prematurity stereotyping, the researchers followed up with mothers when their children were 2-and-a-half and 3 years old. (Cummings and Davis, 1994; Murray et al., 1995)

Karraker (1998) found that children showed less cognitive development if their mothers had shown greater levels of prematurity stereotyping when their children were 5 months old. High levels of stereotyping were also related to more protective parenting, while lower levels were related to whether mothers interacted with their babies in a more positive way.
2.3.4 Maternal expectations and its relation with the early child development

Mother's depression is documented to have an effect on early child development from the perinatal period. Even the prenatal depression and expectation of the mother is argued to have both direct and indirect adverse effects on the fetus because of the mother's associated poor health behaviors and the possible physiological effects of depression, and also because of the mother's negative feelings toward the unborn child (Green and Murray, 1994). In the study by Kumar and Robson (1984), previous psychiatric disturbance was associated with prenatal but not with postnatal depression. Postnatal depression is also documented to differ from depression of women in other life stages regarding psychosocial background characteristics but not regarding symptoms (Murray et al., 1995). Postnatal depression is also associated with the prenatal factors. (Kumar and Robson 1984; Murray et al., 1995).

There has been growing interest in both child and adult psychiatry concerning how and how early in the process of development the origins of
psychopathology arise (Cicchetti, 1990). The intergenerational transmission of affective disorders has also gained attention in the literature regarding interaction (Campbell et al., 1995), genetics (Todd et al., 1993), impaired parenting (Warner et al., 1999), and attachment (Teti et al., 1995). The increased risk for psychopathology of high expected depressed mothers' children is well documented, although the reports from studies concerning the depressed mothers' children are diverse and also show adaptive outcomes (Beardslee et al., 1998; Cummings and Davies, 1994). One factor probably contributing to diversity in the findings is the definition and quality of the mother's expectation. In many studies there have been mothers with a clinical history of high expectation (Beardslee et al., 1998). Regarding the consequences of the mother's expectation for a child and for the mother—child interaction, however, it is the mother's symptomatology that counts more than a diagnosis per se (Hammen et al., 1987).

Women with diagnosed high expectation that is in remission may show normal interaction with their children, whereas women with no expectation, if distressed, may display negative perceptions and negative interaction with their children (Conrad and Hammen, 1989). The frequency, duration, and timing of the parental depressive phenomena in relation to the
child's developmental stages are also of significance (Cummings and Davies, 1994).

The severity of the parental disorder does not always correlate directly with the negative nature of child outcome. Rutter (1990) suggested that more severe parental symptoms might support the child's understanding of a parent as "ill" and result in adjustment. Furthermore, severe parental disturbance is more likely to be noticed by others, and external support may be more easily forthcoming for the child. According to Stern (1999) the suggest there is a long-term relationship between early maternal expectations of vulnerability—including prematurity stereotyping—and later child developmental out comes.

Goodman et al. (1993), older children in middle childhood appeared to be more vulnerable than younger children to multiple risk factors associated with parental expectation. There may also be a gender difference in vulnerability: boys are documented to be more affected by maternal expectation than girls, at least in infancy and early childhood (Murray et al., 1996).
It is also possible that boys and girls are in a different way vulnerable to the either intrusive or withdrawn styles of interaction associated with maternal depression (Tronick and Weinberg, 1997). The impact of the mother’s Expectation on an individual child may be modified by a variety of environmental psychological and non-psychological factors. Examples of cumulative risk factors often associated with maternal expectation are marital dissatisfaction, paternal psychopathology, and socioeconomic disadvantage (Dierker et al., 1999; Murray et al., 1996).

2.3.5 Evaluation of literature and position of the present study

Kelly (1995), Haller (1968), Lersch (1972), Welter (1972), McCleand (1972) and Eyesenck (1972) have all defined expectation. Lobel (2000) calls pregnant women as expectant mother not only since she is expecting a baby also because it is the stage of full of expectation for the event which is sure to take place after nine months.

Yali (1999), Brook (2000) and Lobel (2000) gives two types of expectation that is positive and negative. The positive expectation is parallel to the optimist and the negative expectation is pessimisms. Dunkle - Shetter et.al., (1999) indicates that optimism predicts birth weight after controlling
timing of delivery but the stress is still important predicting the timing of delivery. Green and Murray (1994), Cummings and Davis (1994) Stern (1999) suggest that there is a long term relationship between early maternal expectation and later child developmental outcomes.

There are literature pertaining to the expectation of parents towards the child's education but very few literature was found explaining the maternal expectation during the prenatal stage and its relation with the child development. It is clear from the review that there are studies to find out the influence of the maternal expectation on the neonatal reflexes. Indian studies on maternal expectation are also limited. As it has been found from the review that expectation has a long term relationship with child development, through the present study the investigator is trying to find out whether maternal expectation has any remarkable affect on the reflexes of the neonates. Also an attempt is done to compare the maternal expectation of two culture that is of Kerala and Bahrain.
2.4 Gestation period

2.4.1 Definition

The human gestation period—the period of time between conception and labor—is approximately forty weeks (280 days), measured from the first day of the mother’s last menstrual period. (Lobel 2000)

A gestation period of thirty-eight weeks (266 days) is calculated for women who are pregnant by a procedure such as in vitro fertilization or artificial insemination that allows them to know their exact date of conception. (Lewis 1983) The gestational period is divided into three major periods called trimesters, the first trimester last from weeks one through twelve, the second from weeks thirteen through twenty-seven, and the third from weeks twenty-eight to forty. The gestational age of a fetus or newborn infant corresponds to how far along it is in the gestation period, usually measured in weeks and days from the first day of the mother’s last menstrual period. (Greene 1983)
2.4.2 Significance of Gestation period

Knowledge of the gestational age is important in assessing whether or not a pregnancy is progressing normally and also in evaluating the health status of a newborn. (Caldwell, Theisen et al 1983) The gestation period may also be calculated by an ultrasound examination, which is most reliable for this purpose between the eighth and eighteenth weeks of pregnancy, this is the method used by most doctors to determine a woman’s due date and the gestational age of the fetus. (Cohel and Wills 1985) Due dates for women who conceive naturally are only approximations and are precisely accurate for only one pregnancy out of twenty. Even estimations based on an ultrasound examination can be off by ten to fourteen days. (Lewis 1983)

Standard criteria for size, growth, and maturation are available for all infants, whether they are delivered prematurely, at term, or later than term, to determine whether their physical condition is appropriate for their gestational age (AGA). (Copper et al, 1996) For a full-term infant, the length appropriate for gestational age is forty-eight to fifty-three centimeters and the weight is between 2700 and 4000 grams. (Cunningham et al, 1997)
Gestational age is also used as a baseline to identify babies who are at risk because of their small size—small for gestational age (SGA) or small for date (SFD). (Copper et al, 1996, Chomitz et al, 1995, Granau and Whitefield, 1989) No matter how early or late they are delivered, infants are considered small for their gestational age (SGA) if their size and weight at birth are below the tenth percentile of the appropriate range (Hall and Kaufmann 1987). Such infants are at increased risk for numerous health problems, including short stature, certain infections, respiratory problems, and sudden infant death syndrome. (Dunkel – Schetter, 1988)

2.4.3 Gestation period and neonates

Based on the gestation period neonates are classified into three, Preterm, term and post term. (Wilkinson 1990) Preterm neonates are neonates who has less gestation period to the expected (Lewis1998) Term neonates are those neonates who satisfy the gestation period and are appropriate for the gestation period. (Lobel and Dunkel – Schetter 1990) Post Term neonates are those neonates who require more than the normal gestation period for the expected full growth and development and are delivered 280 days of gestation. (Hunt, et al 1977).
2.4.4. Preterm neonates

In the last 15 years research has shown that preterm newborns can feel and express (Azar 1999) A closely related issue that has been little investigated is how preterm newborns deal with painful procedures over days. Because this population often experiences lengthy hospital stays that entail repeated painful procedures, the cumulative effect needs to be examined. (Marce 1999)

Two longitudinal studies indicate that response to stimulus increases over time, Fitzgerald et.al., (1999) found that the flexion reflex threshold of the foot where the heel-sticks were done was lower than the threshold of the other intact foot, suggesting sensitization after repeated experience with painful procedures, Fitzgerald and her colleagues (1999) proposed that, in addition to the local tissue damage caused by the physical insult to the heel, the excitability of the spinal cord might have been altered. Johnson et.al., (1993) tested preterm infants four times over the course of 8 weeks during the stimulus giving procedure and found no significant change in heart rate or oxygen saturation over time to the stick, but did find an increase in facial expressions of stimulus given. Several studies investigating the protracted
impact of early pain have found an increased sensitivity to pain. (Harrington 1996).

Grunau et al (2000) found that preterm neonates had higher somatization scores at 4.5 years of age compared with same-age control children, these results suggest that greater number of painful procedures has not always been associated with increased response. Johnson and Stevens (1992) tested preterm infants at 32 weeks post-conceptional age and found that those who received the highest number of invasive procedures (heel-sticks, venipunctures, chest tube insertion) since birth had fewer facial reactions to the heel-sticks. In a study on the impact of early pain at 18 months of age, extremely low-birth-weight premature toddlers were found to be less sensitive to pain compared with heavier preterm and full-term children, based on parents’ perceptions. (Clarke 1993)

Thomas and colleagues (1999) found that 33- to 35-week-old premature infants learned over the course of 2 weeks to contact a mechanically breathing teddy Bear to receive rhythmic tactile stimulation. Werner and Siqueland (1989) found visual recognition in preterm infants born at 35 weeks gestation and tested at 6.5 days. More recently, preterm newborns born at 31.8 weeks on average, and 10 days old at the time of
testing, were able to discriminate a familiar odor they had been exposed to repeatedly from a novel one. (Rose 1997)

Studies show that medical risk is also an important predictor of birth outcome, especially gestational age at delivery. Non-White ethnicity is an additional predictor of lower birth weight in the United States (NCHS, 1997, 2000), White women rates of low birth weight are higher than in other industrialized countries (NCHS, 1997).

Field (1978) has observed that mothers of preterm infants tend to be more active in face-to-face play than mothers attempting to compensate for their baby's lack of expressions. Cognitive deficits is seen in preterm population in association with hyperactivity learning disabilities, attention deficits and other behaviour problems, even in the absence of gross physical or neurological involvement. Rose and Schimidt (1976) states that preterm neonates differ from full term neonates in their readiness to respond or sensitivity to stimulation and in their magnitude of response, and characterized the preterm as hyper responsive. Rose et.al., (1976) in another study noted a lack of cardiac responding among preterm infants, even they being strong in stimulus Parmelle, et.al., (1976) report that preterm infants have weak reflexive response.
In contrast, Bench and Parker (1971) noted a high base rate of overt activity among the preterm, when the preterm babies were stimulated, the authors found it difficult to judge whether changes in the activity were spontaneous or stimulus specific.

Graham et al., (1956) from their findings reported that full term born who had experienced prenatal injury and higher pain threshold than healthy term new born. Dempsey et al (1979) studied preterm infants using two auditory stimuli (a buzzer and a rattle) presented at a high decibel level and a tactile stimulus comparable to the strongest stimulus and it was found that magnitude of cardiac responding in preterm infants was comparable to that in full term infants, it also implied that with sufficient sensory output the efficient response of preterm babies was the same as in full term babies.

Predictors of development in preterm and full term infants when compared, the cognitive, language and motor development low birth weight infants to that of full term infants, matched on social class, sex, parity and maternal age, when scores were corrected for prematurity only the motor development scores of the preterm appropriate for gestational age group. using a system of demographic, perinatal and reproductive variables, the cognitive, motor and language development of these subjects at 2 years of
age could be predicted with a high degree of accuracy and subjects with delayed development could be detected. Factors important in predicting developmental functioning and delay included socio-economic status, parental educational level, maternal cigarette smoking, number of previous pregnancies and in the preterm infants, birth asphyxia and severity of respiratory distress. This model appears promising for the detection of infants at risk for developmental problems. (Siegal 1982, Linda s et al 1982)

Judy and sigma (1983) studied the developmental lags in pre term infants from one to three years of age – assessment of play, sensorimotor, language and general developmental skills and found that the preterm subjects were significantly delayed in sensorimotor personal-social and gross motor abilities at 22 months beyond that predicted by biological maturity alone, while these deficits were mostly overcome by the 3 years the preterm subjects performed somewhat more poorly on visual information-processing tasks these findings demonstrate that in play, sensorimotor behaviour was clearly related to corrected age rather than postnatal age.

Gekoshi, et.al., (1984) studied early learning and memory in the preterm infant and they used a mobile conjugate reinforcement paradigm to assess differences in the acquisition and long term retention of an apparent
response in 10 young pre term and 10 full term infants of equivalent conventional age to investigate early learning and memory in preterm infants. Subjects received training on two days separated by 24 hours and a long-term retention session, one week later. Results show that full term successfully acquired task in the first session, but preterm did not show any significant increase in response rate from baseline until the 2\textsuperscript{nd} day of training. Both groups showed equivalent levels of immediate retention; however only full term demonstrated reliable long-term retention. Correlation analyses indicated that regardless of term and long term forgetting was related to neonatal measures of development risk. Data are discussed in terms of the similarities with previously reported ontogenetic changes in learning and memory of full term infants.

Forlslund, et al (1985) studied growth and development in preterm infants during the first 18 months. In long-term protective study, 46 unselected preterm infants born before 35 weeks of gestational age were followed up and compared to 26 full term infants. It was found that motor and neurological maturity and language development were delayed in preterms at 18 months which could possible be explained by their lower biological age. 10 preterms showed definite neurological abnormality. At 18
months 2 of these were handicapped one with retrolental fibroplasias and other with cerebral palsy. Five pre-terms had late psychomotor development while 2 were borderline and one was normal. Pre and perinatal risk groups were defined, but development at 18 months was not correlated to degree of risk. There was no correlation between neurological examination at term and later handicap or psychomotor retardation. More illness mostly due to common infections during the first 18 months was observed in the pre term group than in the full term group.

Frodi, et al (1985) studied infants affective responses in the strange situation and effects of prematurity and of quality of attachment- video taped 20 full term (aged 38-42) and 20 pre term aged 30-36 weeks infants and their mothers in the strange situation procedure and determined them into consecutive 15 second intervals, during each of which rating of facial expressions were performed. From these ratings several summary dimensions of affect were derived (eg affective peak and range during 111 episodes, latency and rise time for onset of distress during separation episodes, recovery time during reunions). Term and preterm subjects did not differ from one another in either the security of attachment as their affecting expression and recognition. When groups were combined, patterns of
affective expression were significantly different for subjects classified as insecure- evident, insecure ambivalent and securely attached (group b) as well as for sub groups B1 and B2 subjects compared to sub groups B2 and B4 findings indicate that attachment related affect may reflect an affect continuum that underlies certain mother stranger directed behaviours in the strange situation but that not all aspects of reunion behaviour can be predicted by prior separation reactions.

Ross, and Gail (1985) studied the use of the Bayley scales to characterize abilities of premature infants- administered to Bayley scales of infant development to 46 premature and 46 full term middle class white infants, at 1 yr of age. Although both full term and pre term subjects achieved mental and motor development scores with the average range, full term subjects attained significantly higher scores on both the mental and motor scales. Both groups scored significantly lower on motor than mental functioning, however the difference was significantly greater for premature subjects.

Tacusch, and Supret (1994 ) analyses birth weight, gestational age and in hospital survival for 233 extremely premature infants born at an inner-city hospital for 5 years. Results for gestation specific birth weights and
survival did not differ between inner city Hispanic and American infants born at 24-28 weeks of gestation. For infants born at 23-28 weight at birth increased by approximately 100 g/week gestation. survival rates increased from 15% at 23 weeks to 75% by 28 weeks gestation. Survival in this sample was strongly affected by respiratory distress syndrome, air lack and birth weight. Other maternal, obstetric and neonatal factors had little or no effects on survival in this group of very immature infants.

Quinn and Davitt (1979) in a study of preterm infants suggests that healthy preterm infants tend not to show as severe deficits as those preterm infants who sub stained illness or complication at delivery. Mszntyre and Smith (1974 )studies the effect of gestation age on reactivity of preterm infants and the result indicated that the delirious effects of prematurity generally increases as getational age decreases. Adamson and Brazelton (1976) suggests that a substantial study indicates that the small for gestational age infant has a unique set of problems.

Hunt, et al (1977) studied mental development of preterm infants, during the 1st year of development rates and standard scores were examined for 56 infants and 4 gestational age groups (17-31, 32-34, 35-37 and 38-44 weeks) by repeated measurements on the mental scale of the bayley scales of
infant development. Rates across the 1st year of life could be predicted largely by biological model that assumes equality of development for infants of the same conceptual age, however standard scores based on biological age were evaluated during the early months for the most premature groups, indicating a transient advantage of increased extra uterine life. Scores from 3 to 12 months biological age were slightly within groups, with no special acceleration of the premature.

Rose et al (1978) studied the relationship to prematurity and socio economic background- compared 94 full term middle class, full-term lower class and preterm infants on cross model and visual intramodal functioning. In the cross modal tasks, infants were familiarised either orally or actually, in the intramodal tasks they were familiarised visually. Visual recognition memory was assessed by the paired comparison technique. All three groups demonstrated comparable visual – visual intramodal functions whereas only the full term, middle class group was able to transfer information across modalites. Failure in cross modal transfer was discussed from the perspective of 1. specific deficit in factual sensory processing, 2. a general deficit in rate of information processing 3 a deficit in sensory integration. It
is suggested that cross modal functioning in infants may provide a sensitive index for assessing cognitive deficit in the early years.

Kier and Naylor (1980) studied the effect of prematurity in the development and the results indicate that there are continuing reports of deficits in I.Q, lags in language development academic achievement and perceptual motor difficulties.

2.4.5 Evaluation of literature and position of the present study

Lobel (2000) and Green (1993) defines gestation period as the period of time and consumption and labour which is approximately 40 weeks. Cohen and Wills (1985), Leuiz (1983), Cunningham et.al., (1997), Copper et.al., (1996), Comis et.al., (1995), Hall and Hoffman (1997) discuss the significance of gestation period and it stated that the gestation age is also used as a base line to identify baby’s who are at risk, standard criteria for size, growth and maturation for the infants. The gestation period may be calculated by an ultrasound examination between 8th and 18th week of pregnancy.

Much of the research has been directed towards gaining knowledge of the sensory and perceptual capacities of neonates born of lower gestation
period and examining the comparability of functioning in preterm and full term infants. Review of studies reveal that the overall development of the preterm infants has affected markedly.

Azar (1999), Willkilson (1990) have classified neonates into three as pre-term, term and post term based on the gestation period of the neonates. There are several studies done on premature infants but there are no studies to show the affect of gestation period on the neonatal reflexes. Indian studies on neonatal reflexes with reference to gestation period are very limited. So the present study is undertaken to throw some light on this relatively unexplored area.

2.5 **MODE OF DELIVERY**

2.5.1 Definition

The term Mode of delivery includes both labor (the process of birth) and delivery (the birth itself); it refers to the entire process as an infant makes its way from the womb down the birth canal to the outside world. (Turkington 1999)
2.5.2 Description

Childbirth usually begins spontaneously, following about 280 days after conception, but it may be started by artificial means if the pregnancy continues past 42 weeks gestation. The average length of labor is about 14 hours for a first pregnancy and about eight hours in subsequent pregnancies. However, many women experience a much longer or shorter labor. (Carol 1999) There are different types of mode of delivery which are given below:

2.5.2.1 Normal Delivery

The normal delivery can be described in terms of a series of phases which is termed as labor (Turkinston 1999)

2.5.2.2 Breech presentation

Approximately 4% of babies are in what is called the “breech” position when labor begins. (Johnson 1976) In breech presentation, the baby’s head is not the part pressing against the cervix. (Judy and Sigman 1983) Instead the baby’s bottom or legs are positioned to enter the birth canal instead of the head. (Kelly 1995) An obstetrician may attempt to turn the baby to a head down position using a technique called version (Kier and
Naylor 1988) This is only successful approximately half the time. (Howard 1976, Horowitz 1978)

The risks of vaginal delivery with breech presentation are much higher than with a head first presentation and the mother and attending practitioner will need to weigh the risks and make a decision on whether to deliver via a cesarean section or attempt a vaginal birth. (Hutchins and DiPietro 1977) The extent of the risk depends to a great extent on the type of breech presentation—of which there are three. (Newham 1998) Frank breech (the baby's legs are folded up against its body) is the most common and the safest for vaginal delivery. (Nuckolls et al 1997) The other types: complete breech (in which the baby's legs are crossed under and in front of the body) and footling breech (in which one leg or both legs are positioned to enter the birth canal) are not considered safe to attempt vaginal delivery. (Seltzer 1994)

Even in complete breech, other factors should be met before considering a vaginal birth. (Sandler et al 1981) An ultrasound examination should be done to be sure the baby does not have an unusually large head and that the head is tilted forward (flexed) rather than back (hyper extended). (Schneider 1999) Fetal monitoring and close observation of the progress of
labor are also important. (Pearlberg et al 1995) A slowing of labor or any indication of difficulty in the body passing through the pelvis should be considered an indication that it is safer to consider a cesarean section. (Pearlberg et al 1995)

2.5.2.3 Forceps delivery

If the labor is not progressing as it should or if the baby appears to be in distress, the doctor may opt for a forceps delivery. (Molfese 1989) A forceps is a spoon-shaped device that resembles a set of salad tongs. (Marshal 1983) It is placed around the baby's head so the doctor can pull the baby gently out of the vagina. (Marshal 1990, Lou et al 1994)

Forceps can be used after the cervix is fully dilated, and they might be required if: (Howmann et al 1988) Complications from forceps deliveries can occur, sometimes they may cause nerve damage or temporary bruises to the baby's face, when used by an experienced physician, forceps can save the life of a baby in distress. (Honnor et al 1994, Forlslund 1985)
2.5.2.4 *Vacuum-assisted birth*

This method of helping a baby out of the birth canal was developed as a gentler alternative to forceps. (Fries 1987, Gain et al 1980, Gekoshi et al 1984) Vacuum assisted birth can only be used after the cervix is fully dilated (expanded), and the head of the fetus has begun to descend through the pelvis. (Dubowitz 1970) In this procedure, the doctor uses a device called a vacuum extractor, placing a large rubber or plastic cup against the baby’s head. (Butler et al 1972) A pump creates suction that gently pulls on the cup to gently ease the baby down the birth canal. (Brown 1985) The force of the suction may cause a bruise on the baby’s head, but it fades away in a day or so. (Berg 1994)

The vacuum extractor is not as likely as forceps to injure the mother, and it leaves more room for the baby to pass through the pelvis. (Berg 1994) However, there may be problems in maintaining the suction during the vacuum-assisted birth, so forceps may be a better choice if it is important to remove the baby quickly. (Barker 1995)
2.5.2.5 Cesarean sections

A cesarean section, also called a c-section, is a surgical procedure in which incisions are made through a woman's abdomen and uterus to deliver her baby. (Thomson et al 1977)

Cesarean sections are performed whenever abnormal conditions complicate labor and vaginal delivery, threatening the life or health of the mother or the baby. (Taylor et al 2000) The procedure is performed in the United States on nearly one of every four babies delivered—more than 900,000 babies each year. (Thomson 1976, Taylor 2000) The procedure is used in cases where the mother has had a previous c-section and the area of the incision has been weakened. Dystocia, or difficult labor, is the another common reason for performing a c-section. (Wathwa et al 1983)

2.5.3 Studies related to Mode of Delivery and Neonates

Few studies shows the effect of the mode of delivery on the neonates, mostly the studies are focused on the surgical method, the cesarean delivery and on the normal delivery. (Taylor 2000)
In the studies of Westport, (2001) the incidence of persistent pulmonary hypertension in newborns delivered by cesarean section is nearly five times higher than that observed among babies delivered vaginally, according to a database analysis of deliveries at the Illinois Masonic Medical Center, in Chicago. Among 25,318 deliveries between 1992 and 1999, 4301 were cesareans. The incidence of persistent pulmonary hypertension was 4.0 per 1000 live cesarean births, compared with 0.8 per 1000 live vaginal births. (Levine 1999)

The authors suggest that labor and vaginal delivery, perhaps by physical compression in the birth canal, is advantageous for the pulmonary vascular bed of the neonate. (Turkinston 1999, Angela 1998, Boksa 1998) They advise obstetricians to discuss the increased risk of pulmonary hypertension associated with cesarean section when offering a woman delivery options. (Turkinston 1999). Caesarian babies may be more susceptible to schizophrenia than children born naturally, say Canadian researchers who studied the effects of the operation on rats. The finding raises doubts about the increasing number of Caesarean sections performed for convenience. (Angela 1998)
The finding, announced at a Los Angeles meeting of the Society for Neuroscience, is expected to force doctors and parents to reconsider the increasing numbers of Caesarean sections performed for convenience. (Boksa 1998)

Boksa and Bassem (1996) in Montreal found that rats delivered by Caesarean section appeared normal at birth. However, in later life these rats had an overactive response to dopamine, a neuro-transmitter, and responded less well to repeated tail pinching, a standard test for stress reactions. and the findings indicate that Caesarean-born babies could be more vulnerable to schizophrenia, a disease which has been linked to birth complications and which is believed to involve an overactive dopamine system. Boksa (1998) suggests that the absence of hormonal surges which occur naturally when a baby is born conventionally may increase the risk of schizophrenia in Caesarean births.

Genetic predisposition and environmental factors such as perinatal complications are believed to contribute to the etiology of schizophrenia; a disorder involving enhanced CNS activity. This study used a rat model to test whether genetic factors and a minor birth complication, i.e. Caesarean section (C-section) birth, interact in producing long-term effects on
dopamine-mediated behavior. Compared the effects of vaginal and C-section birth on amphetamine (AMPT)-induced locomotor activity in strains of rats differing in genetic composition. It is concluded that a minor birth complication like C-section can have differing long-term effects on CNS function in the rat, depending on the genetic composition of the individual. (Berger 2000)

Epidemiological evidence indicates a higher incidence of pregnancy and birth complications among individuals who later develop schizophrenia, a disorder linked to alterations in mesolimbic dopamine (DA) function. Two birth complications usually included in these epidemiological studies, and still frequently encountered in the general population, are birth by Caesarean section (C-section) and fetal asphyxia. (Khodar 1997)

Immediately after birth, levels of plasma epinephrine, a hormone known to play a role in neonatal adaptation to extraterine life and protection against hypoxia, were decreased in born by C-section but increased in born by C-section with 15 min added anoxia, in comparison to levels measured in vaginally born controls. These early developmental alterations could contribute to long-term alterations in dopaminergic
parameters observed in born by C-section, with or without added anoxia. (Boksa 1999)

Caesarean section showed a significant increase in the duration of sniffing (Vallian 1997, Milner, Saunders and Hopkin 1998). Allergies There is evidence that Caesarean babies have an increased risk of allergic disease.

Lung function tests were carried out in the first 6 hours of life on 26 babies born by vaginal delivery and 10 born by caesarean section. The babies born by caesarean section had a mean thoracic gas volume of only 19.7 ml/kg body weight compared with 32.7 ml/kg for the babies born vaginally. It was concluded that this is owing to an excess of lung fluid in the babies born by caesarean section (Milner et.al., 1998).

An Indian study by Malhotra, et.al., (1994) studied to determine if cesarean section offers any advantage over delivery for a preterm neonate, the study revealed that although the combined intrapartum and neonatal mortality was significantly higher for vaginal delivery, there was no significant differences when differences when the data was correlated with birth weight or gestation age.
Taffel (1994) concluded in his studies that advanced maternal age is an independent risk factor for cesarean delivery. Many of the characteristics examined in his study are highly related to maternal age; older mothers are more likely to deliver by cesarean regardless of race, parity, marital status, or educational attainment. Amini, et al., (1994) in an eighteen-year study evaluated various trends including gestation age, birth weight, and mode of delivery in an inner city obstetric patient population delivered at a tertiary medical centre. Result revealed that proportion of preterm birth has increased. The proportion of cesarean section deliveries for private patients had declined from 37% in 1975 to 25% in 1992. The proportion of low birth weight infants has increased significantly from 12.7% to 17.3%.

Krause, et al., (1994) in a study of 423 infants concludes that vaginal delivery in breech presentation does not increase early newborn morbidity, if certain personally and equipmently conditions are considered.

Stringer, et al., (1994) studied the effect of mode of delivery on the neonates. The result revealed that the outcome of neonates with gastroschisis is related with mode of delivery. Cibik, et al., (1994) studied 262 neonates to evaluate factors that may influence perinatal outcomes in the very low birth weight infant with breech presentation. The effect of
mode of delivery (vaginal versus cesarean section) was studied. The results revealed that vaginal delivery had higher rates of depression, respiratory distress syndrome and death. Prematurity was the most frequent cause of neonatal death. The neonatal mortality was similar to the total inborn population of neonatal intensive care unit for the same years. Logistic regression analysis revealed that the differences in outcomes between the two groups were primarily related to effects of gestational age, foetal weight and year of delivery. After these factors were adjusted for, the adds of neonatal death for vaginal delivery compared with cesarean delivery were not significantly different.

Brown, et al., (1994) conducted an observational study of consecutive causes of all singleton pregnancies and twin pregnancies with the first fetus presenting in breech delivered at Chicago. Crude perinatal mortality and effect of mode of delivery (cesarean vs vaginal) by weight were compared after correction of non-preventable causes. The result revealed that the very poor perinatal outcomes in breeches are primarily related to factors other than breech presentations. Route of delivery for infants weighing greater or equal to 1500 gms does not influence neonatal outcome, this cesarean section solely for breech presentation does not appear
to be justified. Arrooe and Peitersen (1994) in a study of 80 infants concluded that neither gender, mode of delivery or birth asphyxia were important for survival and sequels. Neonatal complications such as patent ductus arteriosus, septicaemia, necrotizing enterocolitis, pneumothorax and cerebral haemorrhages were significantly related to survival and sequelae.

2.5.3 Evaluation of literature and position of the present study

The review highlights the effects of cesarean section and its disadvantages. Most of the studies are pertaining to medical field and there is a real scarcity in the research studies of mode of delivery and its relation to child development. There are no studies showing the relation between the mode of delivery and the reflexes of the neonates. The present study is undertaken with the aim of throwing some lights on the relatively unexplored field of research.

2.6 Gender

2.6.1 Definition

Gender refers to the attributes, behaviors, personality characteristics, and expectancies associated with a person's biological sex in a given culture; may be based on biology, may be learned, or may represent a combination of biological and cultural determinant. (Alumbagh 2000). Gender Identity refers to the sex with which individuals associate themselves (WHO, 1998)

2.6.2 Gender differences and neonates

There are several empirical studies which have, compared the development of motor skills for boys and girls in the early childhood years, which shows that there is gender difference in the motor development in the
early childhood and late childhood (Judith and Tonya 2000,) Studies which have made gender comparisons for similar and related motor skills for older adults also showed marked differences Yet another study concluded that young boys and older men are superior to young girls and older women in power-dependent skills (Crow and Crow 1954)

There is evidence that early emotional communication in mother-infant dyads tends to be different for boys and girls in correspondence with adults' gender related expressions of autonomy and closeness in relationships (Biringen, Robinson, & Emde, 1994; Robinson, Little & Biringen, 1993)

Rose (1980) studied the relation between cardiac and behavioural responses. The study indicated a sex difference for preterm infants. The difference reflects heightened motoric activation among female preterm infants to all three stimulus intensities the preterm females were as responsive as full term infants to the strongest stimulus and even more so to the weaker stimuli.

Tan (1994) studied the grasp reflex from the right and left hand in human neonates and the study indicates that the development of both
cerebral hemisphere in males but only the right hemisphere in females is
favoured by testosterone, The grasp reflex was studied in relation to serum
free testosterone level in human neonates. In the total and males, the grasp
reflex (especially that from the right hand) significantly increased as
testosterone increased. In the total and females, there was a significant
positive linear correlation between testosterone and the grasp- reflex strength
for the left hand, but not form the right hand, In males, there was a
significant negative correlation between the grasp- reflex strength from the
left hand and testosterone, but not from the right hand; there were no
significant correlation in the females. The right minus left grasp reflex
strength linearly increased with testosterone in females with normal
testosterone level, but linearly decreased in females with high testosterone
levels. The log grasp reflex increased with testosterone in males. It was
concluded that testosterone may be beneficial for the development of the
left-brain in males and the left-brain in females, but may have detrimental
effects on the right brain in males. The growth promoting asymmetric effects
of testosterone on the brain may depend upon genetic organization of the
brain.
2.6.3 Evaluation of literature and position of the present study

Alumbagh (2000) and WHO (1998) has defined gender in different ways. Studies which have made gender difference with respect to neonates are scares. Whereas there are studies which had made gender comparison for similar and motor skills for older adults which showed mark differences also in the early childhood and late childhood. Rose (1980) and Tan (1994) have studied the reflexes of human neonates and found out gender differences.


Causes of the gender differences at the early stages of development are not yet explored. It can be seen that there are no studies comparing the male and female neonates with respect to the reflexes. Indian studies on gender difference in the neonatal stage are rare. The investigator is making an attempt to fill this vaccum by comparing the male and the female neonates with respect to the reflexes they exhibited.
2.7 Birth weight

2.7.1 Definition

Weight of the child at the first 15 or 30 minutes after birth (period of the parturition) is referred as birth weight (Herozog 1989)

Adequate birth weight is defined as equal or greater than 2500 grams, the measurement being taken preferably within the first hours of life, before significant postnatal weight loss has occurred. (WHO 2000)

Average birth weight after a normal pregnancy is 3400g. Low Birth Weight (LBW) means birth weight (BW) less than 2500g. (Psychology online 2003)

2.7.2 Studies related to Birth weight and Neonates

Rose (1980) studied the relation between the gestational age at birth and birth weight of neonates. Results indicated that the neonates with more gestational age were heavier, mature at birth and were more responsive to the stimulus, given. Sung et al (1994) studied maternal, birth weight and racial difference in infant mortality and study evaluates maternal factors, particularly marital status that influence racial differences in infant
mortality. Population based data on 563,730 live births and 7269 infant deaths in Georgia from 1980 to 1985 were examined. The IMR ratio for unmarried compared to married mothers were calculated and adjusted singly for maternal education age and race and infant birth weight. In addition, racial difference in IMR were estimated using stratified analysis on the basis of four factors, infant birth weight, maternal age, marital status, and education. When only normal lightweight infants were considered, the IMR, adjusted for maternal education level was highest for infants born to unmarried black teens (9.5/100 live births), followed by that for infants born to married black teen, unmarried black adults, married black adults, married white teens, married white adults, unmarried white adults, and unmarried white teens.

Berg et al (1994) did a population – based study of 1072 black and white live born infants born in 29 countries in Georgia between April 1986 and March 1988. Less than 17 of these infants were greater than or equal 37 weeks gestation; most were 29-32 weeks (26%) or 25 to 28 weeks (40%); 12% were 22 weeks or less all infants 33 weeks gestation or lesser were found to be growth retarded.
Ernst (2001) in his study revealed that dose-response relationship between maternal smoking rates and low birth weight (potentially associated with lower cognitive ability) and spontaneous abortion is consistently found, whereas long-term developmental and behavioral effects in the offspring are still controversial, perhaps because of the difficulty of separating them from other genetic and environmental factors. Despite the wide variability of experimental paradigms used in animal studies, common physical and behavioral effects of prenatal exposure to nicotine have been observed, including low birth weight, enhanced locomotor activity and cognitive impairment. Finally, disturbances in neuronal path finding, abnormalities in cell proliferation and differentiation, and disruptions in the development of the cholinergic and catecholaminergic systems all have been reported in molecular animal studies of in utero exposure to nicotine.

An unexpected finding is the apparent (though small) protective factor on low birth weight of having a mistimed pregnancy. This finding is not easily explainable, and points to the need for a more informed understanding of the meaning of pregnancy intention, including issues regarding timing. Research on mistimed pregnancy has shown that the extent of mistiming varies widely, that it is often moderate and that serious mistiming occurs
primarily among younger, never-married and poorer women. (Klerman and Pulley 1999). Pregnancy denial was an important factor in the risk of very low birth weight, when compared with either normal birth weight or moderately low birth weight. Women who deny their pregnancies are less likely to seek early prenatal care and are less likely to obtain adequate care once they enter care (Sable and Wilkinson 1999).

A woman who denies her pregnancy not only may be less likely to receive good care, but may also be less likely to make lifestyle changes that would improve the outcome of her pregnancy and such changes include quitting smoking and alcohol consumption, improving her diet and exercise, and reducing stress (Sable and Wilkinson 1999; Lobel 1999). Women who do not recognize their pregnancies would be far less likely to take these measures than those who do (Dunkell and Lobel 1999).

A heavier birth weight translated into better intellectual performance, including better test scores and academic achievement." The researchers suggest that being heavier at birth may relate to a larger head circumference, allowing for a larger brain size. Richards (2001). A report published in the British Medical Journal states that birth weight seems to be linked to how smart and academically successful a person will be, regardless of social
background. The study showed a positive relationship between birth weight and cognitive ability in the 3,900 males and females who were assessed at ages 8, 11, 15 and 26 (Angela 2001).

2.7.3. Evaluation of literature and position of the present study

Birth weight has been defined by Herozog (1989), WHO (2000) and psychology online (2003). Few studies of Rose (1980), Sung et.al., (1994), Ernst (2001), Clerman and Pully (1999) Sable and Wilkinson (1999) Dunkel and Nobel (1999) have done with respect to the neonatal development and prenatal factors. There are no studies showing the relationship between the reflexes of the neonates and the birth weight, hence this study is an attempt to find out the relation between the birth weight and the neonatal reflexes.

2.8 Maternal acceptance

2.8.1 Definition

Maternal acceptance is defined positive take in of the mother after the childbirth to the existing situation, adapting to the change occurred in the life with the birth of the child and adapting the child as itself. (Crockenberg 1987)
2.8.2 Maternal acceptance and its significance in child development

Crockenberg (1987) studied maternal acceptance with reference to the social support mothers received after baby’s birth and infant irritability on angry, punitive maternal behaviour. The main findings were maternal acceptance during childhood was associated with several measures of social support. Family support showed little association with either mother or child variables maternal anger and punitive control was correlated with the behaviours of child.

Crockenberg (1987) finds in his study that when mothers experienced both rejections during childhood and little support from a partner after birth, they were likely to exhibit angry and punitive behaviour towards the child. Infant irritability did not predict maternal behaviour. Angry and punitive mother had infants who were angry and non compliant and who distanced them selves from the mother.

According to attachment theory, mothers’ responsiveness and sensitivity during mother-infant interactions should influence infant attachment security. Mothers' interactions with their babies and the quality
of their care giving will likely to be influenced by maternal psychological characteristics such as mothers' relationship attitudes, depression, acceptance and behaviors such as their discipline strategies (Diana et.al., 2000).

Bowlby (1969) described attachment as a primary need in the human infant. He argued that the development of the attachment system is a function of caregivers, physical presence, but the quality of attachment relationships between infants and caregivers is depended upon the degree to which caregivers serve as a secure base for infants and accept the infant. Mahler, Pine & Bergman, (1975) characterized caregivers’ ability to provide a secure base for their infants as emotional availability. Accordingly, they described the emotionally available caregiver as promoting an atmosphere of “quiet supportiveness” for autonomous play, thus encouraging infants’ exploration. Ainsworth, et.al., (1978) also emphasized caregivers’ emotional availability as an important antecedent factor for infants’ attachment security.

According to Ainsworth et al. (1978) the emotionally available caregiver is accessible and appropriately responsive as well as tuned to the infant’s signals. In addition, caregivers’ emotional availability was
considered important for infants’ affect regulation (Field, 1994; Thompson, 1994) and affect sharing (Emde, 1989). To develop attachment and emotionally availability for the care giver the development of the acceptance towards the child and the situation is a major criterion. (Bergman, 1975)

Until recently, the significance of emotionally available care giving was not assessed directly. Instead, it was implied from evidence on adverse developmental effects of psychological unavailability (Egeland and Erickson, 1987) that emphasized negative features of maternal behavior such as unresponsiveness to infant's distress, detachment, and lack of pleasure during interactions with the child. Psychological unavailability has been associated with a host of negative influences on infant development. Psychologically unavailable mothers were found to present their infants with a difficult pattern of responsiveness (Maltreats et.al, 1989), show a narrow affective range and did not appear to enjoy interacting with their infants (Egeland and Erickson, 1987). In addition, maternal unavailability has been associated with higher prevalence of insecure attachment (Egeland and Erickson, 1987; Rake-Yarrow et.al.,1985). Furthermore, it has been argued that maternal unavailability is even more deleterious to infants' emotional
development than a mother's short-term physical absence (Field, 1994), or even abuse and neglect (Egeland and Erickson, 1987).

Several studies showed the impact of rejection and acceptance experienced by adolescent mothers during their own childhoods, the social support mothers received after baby's birth, and infant irritability on angry, punitive maternal behavior and in addition, links between maternal behaviors and child anger, compliance, confidence, and social withdrawal at age two were investigated. The results showed that maternal acceptance during childhood were associated with several measures of social support, most strongly current mother support (Sheehan, 1998)

Maternal acceptance was associated with mother's anger and punitive control toward her own child, (Steinberg, 1990 ). Mothers experienced both rejection during childhood and little support from a partner after birth, they were likely to exhibit angry and punitive behavior toward the child. (Miller, 1986) Infant irritability did not predict maternal behavior. ( Moon et al., 1993 ) Angry and punitive mothers had infants who were angry and noncompliant and who distanced themselves from the mother. While child irritability, by itself, was unrelated to maternal behavior, maternal anger and
punitive control was more strongly related to child anger and noncompliance. (McAnarney et al., 1990)

Studies investigated the interaction between maternal acceptance, consistency of discipline, and divorce stressors in predicting children's psychological adjustment problems (Borenboin, 1981). Empirical results and theory concerning the associations between divorce, the mothering dimensions of acceptance and consistency of discipline, and adjustment problems, the results showed that acceptance and consistency of discipline will mitigate the effects of divorce stressors on psychological adjustment problems. That is, divorce stressors will have a stronger relation with adjustment problems for children with low acceptance or low consistency of discipline than those with high acceptance or high consistency of discipline (Bridger, 1959). The combination of acceptance and consistency of discipline will interact with divorce stressors such that the relation between divorce stressors and adjustment problems will be stronger for children with low levels of both consistency and acceptance than that for children with high consistency and high acceptance, low acceptance and high consistency, and high acceptance and low consistency of discipline (Bretheron, 1985, Bridger, 1959).
Gender will moderate the interactive effect of consistency of discipline or acceptance on adjustment problems such that the relation between divorce stressors and adjustment problems will be stronger for boys than for girls. (Achenbach, 1985; Cicchetti and Toth, 1991). Few studies examined concurrent and longitudinal associations between parents' acceptance of their preschoolers' control needs and the preschoolers' social behaviour vis-à-vis their parents (Rothbaum et.al., 1988) which focuses on mothers acceptance of children's needs to see themselves as competent, as understanding contingencies, as having choice, and as being worthy of respect. Child social behaviour was assessed at ages two and five, during a home visit, using global ratings of Social Adaptation (Grossman, et.al., 1980). There was a significant correlation between maternal acceptance of control needs assessed when children were two years old and children's adaptation when they were five years old. Greater longitudinal than concurrent effects is consistent with previous parent-child findings. The results support theory linking maternal acceptance of control needs with the development of children's adaptive social behaviour. ( Sandra and Rothbaum 2000 )
2.8.3 Evaluation of literature and position of the present study

Definition for maternal acceptance is given by Crockenberg (1987). Maternal acceptance is a factor which is considered postnatal. No other definition for maternal acceptance with respect to the neonates could be reviewed from the literature.

Very few studies of maternal acceptance and its relation with neonates are reviewed. Maternal acceptance was associated with mothers' anger and pneumatic control towards her own child (Stainberg 1990). Sandra and Rothbaum (2000) Growsman et.al., (1980) Rothbum et.al., (1988) have discussed on mothers' acceptance of children's need to see themselves at competent. The scarcity of studies of maternal acceptance and neonatal reflexes can be seen and therefore the investigator is making an attempt to fill this vacuum.

2.9 Reflexes
2.9.1 Definition

A reflex is a stereotyped response to a stimulus. The term implies a reflection of stimulus excitation by the central nervous system to the effectors. (Verma 1994)
The term reflex is used to designate an involuntary reaction that is rather specific and fixed (Gessel and Ilg 1937).

Reflex action was first discovered by Marshall Hall in 1983. Best and Taylor (1988) defined reflex action as an automatic involuntary and often unconscious action brought about when afferent nerve endings or receptors stimulated. Reflex action is a elementary function discharged by the nervous system. It is important in protective behaviour such as the withdrawal of the limbs from pain and in locomotion and in standing.

Reflex action involves a reaction which is started by the environment which acts as a stimulus, stimulating one of the receptors. Receptor sends impulse to the central nervous system through the chains of nerves. From the nervous system impulses are passed outward through the motor neuron and reach either a muscle or a gland which acts accordingly. The nervous elements involved in carrying out the reflex action constitute a 'reflex arc'. (Brown 1987; Hooker 1952)

Reflexes are somewhat less fixed and specific when they are first exhibited by the newborn child and they become less so with the passage of time. (Langreder 1977)
Reflexes are important for two reasons. The first is that observation of some reflexes provides information concerning the neurological integrity of the newborn. Second some reflexes provide the newborn its first systematic encounter with objects in the environment. (Vanghan1975; Woodruff1978)

2.9.2 Stimulus

A stimuli is defined by verma (1994) as a sudden change in the environment (external or internal) which is strong enough to excite the nerve or muscle or organism as a whole. There are many types of stimulus that may excite the tissues. The most important ones are the following:

1. Mechanical stimuli: When a given tissue is excited by mechanical means such stimuli are known as mechanical stimuli.

2. Physical stimuli, Heat, cold and humidity serve as physical stimuli for the living tissues.

3. Chemical stimuli – various chemicals including acids and bases are referred to as chemical stimuli for the living tissues.

4. Electrical stimuli – Electricity functions as electrical stimuli and it is capable to excite the living tissues.
2.9.3 Reflex Arc

The reflex arc is the nerve chain between a receptor and an effector organ (muscle or gland). The reflexes include the following parts: (1) A receptor – it is a sensory structure which receives the stimuli (2) A afferent or sensory neuron - it passes into the spinal cord by way of a dorsal root of the spinal cord. Its primary function is to convey the impulses received from the reception to the central nervous system (Spinal Cord). It is generally one but sometimes two interneurons may be present. (Lecanuet 1996; Cicchetti and Toth 1991) It simply serves to transmit the impulses from the afferent or sensory neuron to the motor neuron (3) A motor neuron – it is also known as afferent neuron and is situated in the ventral root to the spinal cord. It transmits the impulses to the effector organ – it may be a muscle or gland which responds to impulses received. The reflex arc constitutes the functional unit of the central nervous system. (Verma 1994)

Baltes (1997) states that reflexes are of common occurrence in animals. In higher animals a large number of reflex actions are performed in daily life. They are performed unconsciously therefore they are of simple nature and termed simple reflexes. (Benjamen 1988)
Pavlov (1972) gives two types of reflexes namely unconditioned and
conditioned reflexes. Unconditioned reflexes are inborn because they are a
natural part an animals make up. Conditioned reflexes when a reflex which
does not naturally exist had become a part of the animal behaviour, such a
reflex is said to be conditioned. The Cerebrum controls the conditioned
reflexes (Verma et al., 1994)

2.9.4 Ethological Theory

Ethnology is one of zoology's main contribution to developmental
psychology. Thousands of hours spent observing animals have revealed
important concepts concerning behaviour. (Verma 1994)

2.9.5 Species - Specific Innate Behaviour

Innate behaviors are considered similar to organs of the body in that
both are essentially the same in all members of a species are inherited and
are adaptive (Lorenz 1937) just as physical structure are under genetic
control, so are certain behaviours. Although no physical structure or
behaviours are completely innate because they are always expressed in
particular environment, ethology emphasizes the biological contributions to
behaviours. (Tan, 1994)
Ethologists have identified three types of innate behaviours: (1) Reflexes, (2) Taxes (Spatial orientation), (3) Fixed action pattern. Reflexes are simple responses to stimuli that have long been familiar to psychologists (Varma, 1994). Examples from human infants include grasping a finger placed in the hand, spreading the toes when the bottom of the foot is stroked and turning toward a nipple when it brushes the cheek. Any long-haired parent would agree with Ethologists' interesting observation that infants are particularly likely to grasp hair, especially during feeding. Eibl (1975) speculates that this reflex originally served to facilitate clinging to the mother's fur in animal experiments. Many of these reflexes are quite strong. A premature baby can grasp a clothesline and support his own weight, indicating that this ability is later lost. Less familiar reflexes include coordinated swimming, crawling, and walking movements when the body weight is supported in newborns or young infants.

Taxes, the second type of behaviors, are bodily movements that orient the organism to a particular stimulus. The notion of fixed action pattern is as follows: when the inner readiness to act coincides with the appropriate releasing stimulus situations, then a particular fixed action pattern will run its course almost automatically (Eible 1975).
Ethologists generally agree that a behaviour is innate if it is stereotyped in its form (in an unvarying sequence of actions) actions individuals in a species, present without relevant previous experience that could have allowed it to be learned, universal for the species (is found in all members). Relatively unchanged as a result if experience and learning after it is established. (Stechier 1964)

2.9.6 Bowlby’s Theory

Bowlby's (1969) is credited with bringing ethology to the attention of developmental psychologists. He speaks of attachment behavior as instinctive. However he uses the term instinct in a purposely loose sense. He means that such behaviours are basically innate, have a fairly typical pattern in almost all members of the species and have an adaptive value for the species. At birth and throughout early development, infants have a biological predisposition to maintain proximity to adults of the species in animals other than humans the young often use the mothers odour or the warmth of the nest to keep in contact with her (Bowlby 1969).
2.9.7 Piaget's Cognitive Stages theory

Piaget (1951) gives first developmental period consisting of six stages. In Piaget's view a human starts life with a set of reflexes, a particular physical make up unique to the human species and inherited ways of interacting with the environment of interacting refer to the tendency of thought to be organized and adapted to the environment. The thinking of even an Einstein was these humble beginnings. The infant progresses through six stages in the construction of a sensorimotor system of thought Piaget refers stage as the period of use and modification of reflexes which begins at birth and stays for one month.

According to Piaget (1952) a newborn is a bundle of reflexes 'Wired in' responses that are triggered by particular stimuli. Touch a newborns lips and she suck, prick her foot and her knee flexes, place finger in her hand and she grasps it. As these reflexes are activated a number of times they vary gradually and are modified. The infants adjust themselves slightly in different circumstances. For example the infants mouth must search out the nipple from different angles on different occasions. When Piaget talked
about the infants action structure, he used the term schema or scheme. A schema can be any action pattern for dealing with the environment such as looking grasping setting kicking. As mentioned although infants construct their schemes and later structures through these activities their first schemes consist primarily of in born reflexes.

Reflexes imply a certain passivity. The organism lies inactive until something comes along to stimulate it. Piaget (1951) however showed that even a reflex like sucking quickly becomes part of the human infant's self initiated activity.

2.9.8 Evaluation of literature and position of the present study

The above theories are evaluated to get a general idea regarding them with respect to reflex action to elucidate from it the main aspect involved in reflexes action in neonates.

Lorenz's ethological theory considers reflex as a innate behaviour. Reflex are said as simple responses to stimuli. Bowlby's theory gives importance of neonatal reflexes and regards reflexes as a form for attachment towards parent. In Piaget's theory the first developmental period consists of six stage and Piaget considers, first stage as the stage to use
reflexes. Reflexes in considered as the foundation for cognitive development.

Although these theories gives a general idea regarding neonatal reflexes, they lack in giving information regarding the intensity and factors influencing neonatal reflexes. These interpretation indicates the need for experimental and theoretical advances towards understanding more about neonatal reflexes.

These reflexes have little value for attachment in the human infant, who needs not physical attachment himself to the parent in order to survive of more importance to human newborns and signally mechanisms such as crying, babbling and smiling. Smile present in newborn are the true social or answering smile that emerges weeks later. The infants immature motor system is compensated for by these signaling abilities

2.10 Culture

2.10.1 Definition

Taylor (1993) defined culture as "that complex whole which includes knowledge, belief, art, morals, law, customs, and many other capabilities and habits acquired by [members] of society." Berghahn (1999) states
culture as the system of shared beliefs, values, customs, behaviours, and artifacts that the members of society use to cope with their world and with one another, and that are transmitted from generation to generation through learning.

Bodley (1904) gives the definition of culture under the following subsections:

a) Topical: Culture consists of everything on a list of topics, or categories, such as social organization, religion, or economy

b) Historical: Culture is social heritage, or tradition, that is passed on to future generations

c) Behavioral: Culture is shared, learned human behavior, a way of life

d) Normative: Culture is ideals, values, or rules for living

e) Functional: Culture is the way humans solve problems of adapting to the environment or living together

f) Mental: Culture is a complex of ideas, or learned habits, that
inhibit impulses and distinguish people from animals

g) Structural: Culture consists of patterned and interrelated ideas, symbols, or behaviors

h) Symbolic: Culture is based on arbitrarily assigned meanings that are shared by a society

At present, the term 'culture' generally is used to refer to the entire body of socially inherited past human accomplishments that serves as the resources for the current life of a social group ordinarily thought of as the inhabitants of a country or region (D'Andrade 1996). Although there is evidence of the rudiments of culture in nonhuman species (Tomasello 1999), human beings are unique in their dependence upon the medium of culture and the forms of organism±environment interactions that culture supports to sustain and reproduce themselves. Culture, in all of its early uses, was a noun of process: the tending of something, basically crops or animals' (Williams 1973).

2.10.2 Culture and Child Development

Combining the historical notion of culture as a process of growing things with the modern conception of culture as social inheritance of prior
generations' accomplishments, the study of culture in development can be seen to focus on the way in which biologically immature human beings are incorporated into the cultural 'designs for living' that are their social heritage by more mature humans who have already been enculturated. Although the role of culture begins even before conception, it is sufficient for our purposes to begin with the period of prenatal development and provide examples of culture's role in development through infancy, childhood, and the transition to adulthood referred to in many societies as 'adolescence.' (Taylor 1993; Bergaham 1999)

2.10.3 Culture and Early Childhood

The cultural environment influences the growing fetus both indirectly and directly. In the category of indirect influences, mediated by the mother's physiology, are dietary laws in some societies that limit pregnant women's access to nutrients deemed important to later development (Mead and Newton 1967). In others, the use of substances such as cigarettes and alcohol, or the presence of industrial pollutants, can materially damage the fetus, depending upon such factors as timing and degree of exposure (Cunningham et al. 1997).
An important example of a direct influence of the cultural environment comes from evidence that during the last trimester, despite distortion introduced by filtering through the mother's body, fetuses are capable of hearing the language spoken in the mother's immediate environment (Lecanuet and Schaal 1996). Moreover, when they are born they show a preference for their native language, the sound stream of which is specific to the culture in which it is used (Moon et al. 1993). This universal sensitivity to language and culture-specific preference for one's own language provides the starting point for the crucial process of learning to extract meaning from the sound stream. When babies emerge from the birth canal and the umbilical cord is cut, their automatic supply of oxygen and nutrients comes to an abrupt halt. Following birth, even essential biological processes occur indirectly—they are mediated by culture and other human beings. In order to survive in an environment mediated by culture, the baby must act on the nurturing environment in a qualitatively different way than was true before birth. While the effects of fetal activity in utero are minimal, once the baby is born it begins to make urgent, vocal demands upon its caregivers (Whiting et al., 1986)
Babies become social actors who re-order the social relationship among the people around them. At the same time, babies become cultural objects for the older members of their community; their biological characteristics are interpreted in terms of the community's beliefs to a significant degree. For example, studies which present young infants wearing pink or blue diapers to adults to interact with (pink and blue being the symbolic representations of female and male gender in the society in question) show that the adults interact with them and interpret their behavior in terms of their symbolic gender, not their biological sex (Brown 1993). Regardless of their biological sex, babies dressed in pink diapers are treated in a gentle manner and interpreted as physically pretty and sweet tempered, while babies dressed in blue diapers are bounced vigorously and have 'manly' attributes attributed to them (Rubin et al. 1974).

The role of culture in development manifests itself in a wide variety of ways during infancy. Perhaps the most direct, and certainly universal, influence of culture is in the way it shapes the development of the system of coordination between infant and caretakers known as 'getting on a schedule.' For example, rural Kenyan infants sleep with their mothers and are allowed to nurse on demand. During the day they are strapped to their mothers backs,
where they often nap as their mothers go their daily work rounds. By contrast, the children of urban, middle-class North American parents generally sleep separately from their mothers and must adjust to a parental schedule which is governed by the clock (Super and Harkness 1997). As a consequence, within a few weeks of birth, North American children have begun to bunch their sleeping spells in longer and longer night episodes that approximate the adult pattern. Kipsigis children, by contrast, show comparatively slow development of long sleep spells, and remain more flexible in their sleeping habits even as adults.

Whereas as Bornstein et al. (1991) states the role of contemporaneous constraints in shaping infant development, studies of mother child interactions that incorporate objects indicate the way that cultural beliefs concerning future 'proper' behaviors influence current maternal behaviors. One such study of mothers and their 5-month old infants in Tokyo and New York found that the Japanese mothers were more responsive when their infants responded to them, while US mothers were more responsive when their infants oriented to the objects. At this early age, there was no difference in the infants' behavior at all. But at a later age, the Japanese and US children begin to differ in a manner that matches the differential parental
behaviors observed at 5 months, although their language and play skills are judged to be of equivalent developmental level.

An area of development which has received special attention with respect to the role of cultural factors is the development of emotional attachments between babies and their parents (Crittenden and Clausen 2000). In a wide range of societies it has been observed that between 6 and 9 months of age children begin to display wariness of strangers, a heightened degree of distress when they are separated from their primary caretakers, and a marked tendency to cling to their parents in unfamiliar situations.

2.10.4 Evaluation of literature and position of the present study


From the review it is seen that there is urgent need for increased research on the role of culture in development. At the same time, cross cultural research is hampered by difficult methodological problems such as
those encountered in the study of attachment. Future progress will depend upon the development of more adequate methods to ensure the validity of researchers' conclusions.

The scarcity of literature pertaining to culture and its effect on neonatal stage is seen in the review. This investigation is a cross culture study between Kerala and Bahrain with respect to the neonatal reflexes.