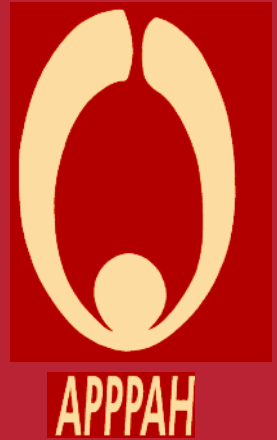


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JOURNAL OF PRENATAL AND PERINATAL PSYCHOLOGY AND HEALTH publishes findings from the cutting edge of the rapidly growing science of prenatal and perinatal psychology and health. The journal, published quarterly since 1986, is dedicated to the in-depth exploration of the psychological dimension of human reproduction and pregnancy and the mental and emotional development of the unborn and newborn child. It is intended to provide a forum for the many disciplines involved such as psychology, psychiatry, midwifery, nursing, obstetrics, prenatal education, perinatology, pediatrics, law and ethology. The journal also deals with the numerous ethical and legal dilemmas which are emerging as society re-evaluates its attitudes toward adoption and abortion or strives to establish moral positions on hightech obstetrics and third-party conception. The opinions expressed in articles and claims made in advertisements are those of the authors and advertisers, respectively, and do not imply endorsements by APPPAH or the printer, Allen Press, Inc.

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Editorial

It is my privilege and pleasure to begin my tenure as your editor-in-chief with this edition of JOPPPAH. But first, I must thank Dr. B.J. Lyman for her support and guidance. That support and guidance continues during this transition, as she is staying on as Associate Editor for an undetermined period of time. On behalf of the Journal staff and our readers, I want to express deep gratitude for Dr. Lyman's 8 years of exemplary service as editor-in-chief of this Journal.

In this edition of the journal, Simon House brings us an in-depth look at the nature of the brain, from both nutritional and emotional perspectives, in the context of evolution and the life-cycle. His article begins with a look at the development of humankind, laying the foundation for current nutritional needs of the brain, particularly during conception and gestation. This wide-ranging treatise gives us much food for thought, beginning with our origins in the primordial seas and culminating in recommendations for enhancing the future of our species. In his words, "Reorientation this time will be in the light of transgenerational epigenetics, the sustaining of lifecycle health, and towards the origins and enhancement of every new life."

The research team of Drs. Francesca Dabrassi, Antonio Imbasciati, and Anna Maria Della Vedova from the University of Brescia in Italy, brings us research on the importance of social support during pregnancy, confirming our intuitive knowledge that, "low levels of support during the prenatal period are associated with low levels of prenatal attachment and high levels of depression. This could have harmful effects on the pregnancy outcome or on the development of the child."

From the University of Saskatchewan in Canada and the research team of Erin McKillop, MEd, Stephanie Martin, PhD, Angela Bowen, PhD, and Nazeem Muhajarine, PhD. comes a well-designed and executed study of the lived experience and meaning of pregnancy for women with mild to moderate depression

In the book review section, Catherine Fraser shares a beautiful review of Harriette Hartigan's book, *Brought to Earth by Birth.*
Jeane Rhodes, PhD

Nurture of the Brain, Nutritional & Emotional, in the Context of Evolution and the Lifecycle

Simon House, MA

Abstract: Controlled trials reveal that, from before conception, nutrient deficits and toxins affect sperm, ovum, and maternal stores, lastingly impairing a child's health and abilities. Deficits, toxins, and stress can inhibit structure and function, and be linked to autism or reduced self-control, possibly with violent tendencies. From the beginning, epigenetic settings are mostly set early for directing development according to current environment. Many are operative in the brain. Nutritional diversion from our evolutionary path, too sudden for genetic adaptation, is resulting in pandemics including mental disorders, cardiovascular problems, obesity, and diabetes. Understanding and practice of nutritional and emotional nurture round the lifecycle helps to fulfill genetic potential. Tracing from the Big Bang, the emergence of elements, nutrients, and cells, providing for the diversity of evolving life, we can see ourselves in context and the biosphere's and our own mutual needs. Vital to both to meet prime needs is a further agricultural revolution, this time of estuary and ocean beds. This article presents the scientific basis for urgent action in this area.

Key Words: Nutrient, emotion, conception, development, brain, evolution, biochemistry, environment, epigenetics

INTRODUCTION

Understanding our origins and our conception

This article is about the changing interactions between the human brain and the biosphere. Over billions of years the biosphere evolved the human brain, which is now powerful and populous enough to cause drastic changes to the biosphere that in turn affect further brain development.

I find it exciting to retrace our own evolution back to our physical origins, through the formation of the elements composing us, to the

The Rev Simon H House MA (Cambridge UK, Natural Sciences and Theology) is a scientific writer and editor. He serves on the board of ISPPM and is Chair of the McCarrison Society for Nutrition and Health. Mail to: 22 Stanley Street, Southsea, Portsmouth, PO5 2DS UK Email: shhouse@ntlworld.com. This article is based upon a powerpoint presentation at the APPPAH Congress, 2009, Asilomar, CA.

Big Bang. This provides a picture of how, from this singularity, the complexity of atoms, molecules, cells, and potential nutrients built up into the remarkable organism we are today. It helps us to discern the factors that have been so important in becoming who we are – those elements so important to our sight, hearing, and touch, to our sensitivity and love – from factors militating against our physical and mental health, against our very spirituality and ability to live in social peace for their effects on us could be as catastrophic as climate change.

The annual cost to the USA of mental ill health and other brain related disorders, is over \$100 billion, to which has to be added the cost of work lost. The impression is an overall cost of over \$500 billion. (MEPS, 2005; Kingsbury, 2008) For Europe, including work lost, the overall cost has risen over 500 billion Euros. “Together with the restriction of the present study to the most prevalent brain disorders, this leads to the conclusion, that the true economic cost of disorders of the brain is substantially higher than our estimate of 386 billion Euros, perhaps in the range 500–700 billion Euros (up to \$1 trillion). This is for fewer than 500 million Europeans, of whom over a quarter are “living with a brain disorder” (Andlin-Sobocki, Jonsson, Wittchen, & Olesen, 2005).

There is good news: our rapidly increasing know-how to attune our lifestyle to the mutual benefit of the biosphere and ourselves. Authorities are beginning to grasp the potential of caring for human lives at their beginning. Hillary Clinton spoke out in her keynote address at the annual conference of CARE in 2010, saying:

Nutrition plays the most critical role in a person’s life during a narrow window of time – the 1,000 days that begin at the start of a pregnancy and continue through the second year of life, (which) can help determine whether a child will experience enough brain development to go to school and hold a job as an adult...The science of nutrition points to a strategy. If we target that brief critical period we can accomplish several things at once. We can save lives, we can help children start life on a better path, and we can bolster economic development and learning down the road.

Nurture requires informed nutritional as well as emotional understanding. The effects of changes from our hunter-gatherers’ waterside lifestyle on reproduction have only recently been recognized. These have been aggravated in the last century by excessively profit-driven intensive farming and food-marketing, particularly to children,

and are affecting brain development right up to adulthood. Through experience and understanding children need to learn to make sound choices.

Absolutely key is provision of the right environment, parental and ecological (House 2008). This delicate interaction between the brain and the biosphere needs our full attention. Essential to survival and health of the whole, let alone ourselves, is a third agricultural revolution, this time of the oceans. It will entail protection of rivers and seas from run-off of farm fertilizers and slurry, which need to be recycled to reduce the soil's serious loss of minerals. These measures are vital to sustain and develop the bio-resources at the root of our evolution, on which our life and biodiversity still depend today.

CREATION OF: NUTRIENTS - LIFE - PEOPLE

The build-up of – elements – molecules – cells

We can trace our evolution back by stages, through organisms, nutrients, and elements, to the Big Bang nearly 15 billion years ago. This sets us in perspective and provides insights into environmental factors in our development and health.

Following the Big Bang, among the first 8 elements to form seem to have been hydrogen, oxygen, and carbon – the basic chemical elements of organic life (Gem, 2006). Light elements were being synthesized into heavier ones, including the heavy metals. When there were enough heavy elements, gravitational forces began binding them into rocks and planets including, in the last 5 billion years, planet earth.

Earth's gravity and temperatures have allowed atoms to assemble into molecules; such as oxygen (O₂), carbon dioxide (CO₂), and water (H₂O), the ocean, and subsequently into "fatty acids," carbon chains of various length with hydrogen and oxygen attachments. In the last 4 billion years these chains began to include other elements, forming amino-acids and proteins, including celebrated DNA, the spiral ladder or double helix, basic to reproduction.

More complex molecules were assembling and amounting to cell structures, some with a highly significant innovation, within the last 3 billion years has been the process of photosynthesis, due to chlorophyll present in phytoplankton and blue-green algae. These were converting carbon dioxide back into oxygen, which, in turn, led to two molecules most significant to higher life-forms, omega-3 fatty acids, or marine oils, docosahexaenoic and eicosapentaenoic acids (DHA & EPA), vital

resources for our eyes, brains, and much else, as will be described.

These tiny phytoplankton and algae were also producing oxygen, apparently raising oxygen levels even to the extent of poisoning themselves. But soon to evolve were mitochondria which use oxygen for energy, burning it back to carbon dioxide.

Evolution was interrupted by ice-ages, the deepest being 2 billion years ago. But between 550 and 150 million years ago creative temperatures yielded a prolific swell in complexity and variety, most creatively where the assembly of nutrients was richest. In evidence, on Britain's Welsh coast "The Cambrian explosion" saw the sudden evolution of shell-bearing creatures, then vertebrates, fish, amphibians, reptiles, and mammals, as they in turn were forming a greater and greater pool of nutrients. Vitamins, in evidence by 350 million years ago, fulfilled a need on land, which lacked some marine nutrients. As plants and animals became more diverse and complex, so together they contributed to an increasing confluence of nutrients, greatest at the land/water interface. Here the confluence of omega-3-rich oils from the marine food-chain with omega-6 oils, concentrated in the seeds of the flowering plants, provided for the placenta, hence mammals some 200 million years ago. Hugely significant, the placenta enhanced nutrition early in development particularly of the brain and retina, also dependent on omegas-3 and -6, along with heart, nervous, and other systems with electronic function.

So we need still need to build up body-stores of the most important nutrients, minerals and vitamins, and omega-3s (DHA & EPA), which means appropriate fish or algae. The estuary shores were the evolutionary cradle of mammalian life, and later of the human brain. They offered shellfish that pregnant women could pick up for themselves.

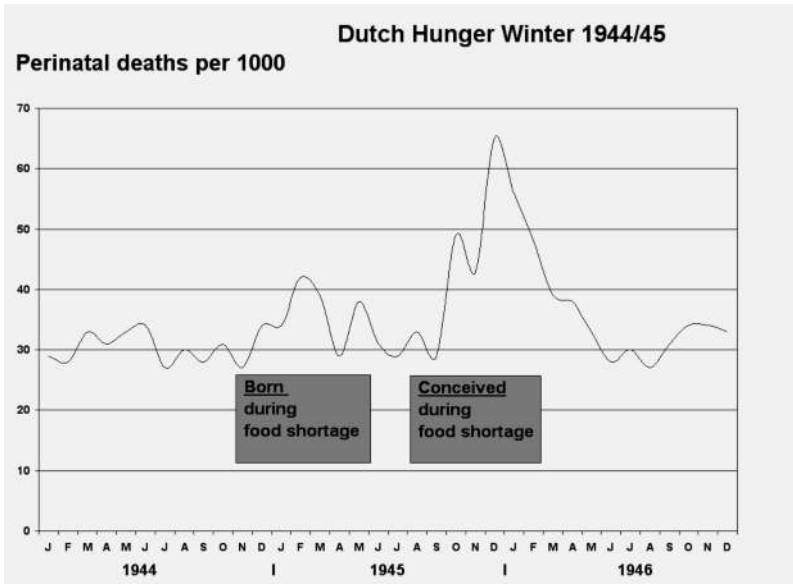
For animals on the savannah enlargement would be of either the brain or the body, there not being enough omega-3 for both. But those who remained by water, or in it, taking advantage of its foods, could enlarge both brain and body, so the only ones to succeed in this important enlargement of both brain and body were our hominid ancestors and the marine mammals. Even now, aquatic foods benefit our physical and mental development and health, as shown by a much wider variety of studies than the many references below.

Some 500 generations ago perhaps pressure on shore sites, perhaps just developing skills, caused *Homo sapiens* to move away from waterside hunting and gathering, away even from the easy and particularly nutritious prey of the beach, rivers, and lakes towards herding animals and cultivating plants. Our omega-3 to omega-6 ratio,

especially affecting the vulnerable phase of reproduction. Omega-3 supply is vital to cell-membranes throughout our bodies.

As well as having our entire evolution so powerfully affected by environmental conditions, our parents' nutrition from months *before conception* affects us individually (Ridgway & House, 2006; House, 2010). The first demonstration of this was in World War II, the Dutch hunger winter of 1944/1945, a controlled study confirming that nutrition *before conception* affected a child more powerfully than nutrition status *during pregnancy*, (see Figure 1) with effects even on the grandchildren (Stein, Susser, Saenger & Marolla, 1975). This confirmed the wisdom of farmers who, for generations, kept their best fields and feeds for the run-up to the mating season.

Figure 1
Perinatal mortality in part of wartime Holland related to the Dutch "hunger winter."
Perinatal morbidity followed a similar pattern.



The worst morbidity and mortality came when starvation struck just before **conception**.

Source: Stein 1975; House 2000.

OVUM, SPERM, AND TRANSGENERATIONAL EFFECTS

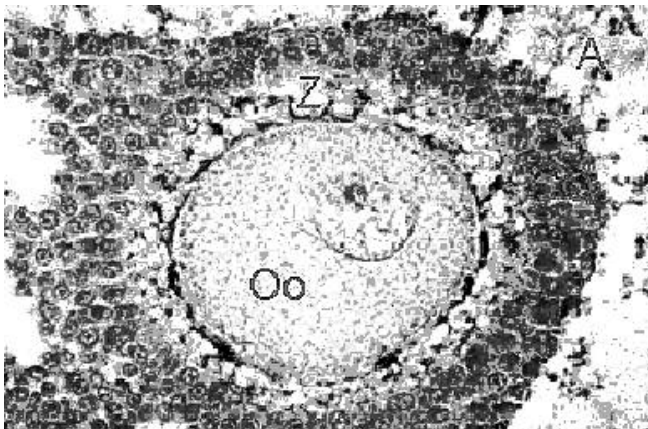
Nurture of sperm and ovum and developing child

The first stage of high vulnerability is during genesis of the sperm and the ovum-to-be (the oocyte). Testes and ovary already existed in the mother as a fetus within the grandmother, being subject to her environment. In the mature male, sperm genesis and storage covers some months, and is vulnerable to nutrient deficits, nicotine, alcohol, drugs, and other toxins, increasingly so during the last days before ejaculation and fertilization.

An oocyte, which has lain dormant since forming in the fetus, resumes development 7 weeks before ovulation again becoming vulnerable to environment. Especially in the 2 weeks before ovulation it has to accumulate food stores for its journey before and following fertilization. Its surrounding follicle also must develop well since this becomes the gland for hormones to sustain a good pregnancy (see Figure 2). Developmental flaws can result from chromosome damage, or too slow formation of molecules and cells – environmental and genetic factors combined. At fertilization vulnerability peaks, as ovum opens to sperm and sperm opens its contents to ovum, until the combination is sealed within this first cell of the new human being, the zygote.

Figure 2

The developing ovum surrounded by food-store cells, pale, and darker follicle, which needs to develop well as the corpus luteum, to provide its pregnancy-sustaining hormone.



The fertilized ovum, its cells multiplying, travels on its eight-day journey down the fallopian tube. It is reliant on the food-stores built up before ovulation to implant in the womb-wall. A full complement of nutrients is vital.

In the early weeks cells rapidly divide and multiply. The many types of molecules to build up the cells are transcribed by the genes. In stem-cells, epigenetic switches (epi = on) respond to cell position to direct the type of cell they should become: liver, eye, bone, or whatever. In each subsequent generation cells' epigenetic switches respond according to specific position within the developing organ. At this stage of organogenesis vulnerability to malformation is high, at 3 weeks notoriously high as the 'neural plate' curls, requiring enough B vitamins particularly, minerals and omega-3 oils to complete the seal of the neural tube within a time-limit.

Epigenetic switches are also responding to the mother's state as affected by her environment – indicating the kind of world out there to prepare for. By 8 weeks the embryo has organically reached basic completion and is now called a fetus. Yet throughout the entire lifecycle the individual is affected by environment. Some factors affect structure directly. Others affect gene-settings with continuing effects. Adverse factors such as toxins, lack of nutrients, or excessive stress hormones, can cause inappropriate changes to switches that are on some genes, rendering a gene active or inactive. A few of these switch-changes have been shown to be transmitted down the generations. (Lipton, 2001; Pembrey et al., 2006; Pembrey, 2006; Monk, 1995; Gomez-Pinilla, 2006). See also below, Epigenetics – environmental effects.

Impairments at one stage cannot be made up later. "Catch-up growth" is imperfect. The mother needs good reserves, to cope with the fetus/infant's increasing size and growth-rate, and a restorative time of some 3 years for her own health, and for this and any subsequent child. The gains to be made by pre-pregnancy care are exemplified by the research, most notably, of Andrew Czeizel and the convincing practical record of *Foresight Preconception Care* (n.d.), a British group attending to couples, most seeking help with reproductive problems.

Preconception nutrition trials – against problems

Andrew Czeizel's Hungarian trial (Czeizel, 1993, 1995, 2000) involved some 4000 women, half as control group (supplemented only copper, manganese, and vitamin C). Supplementation from before conception, or as early as possible, included for the trial group: double-

strength folic acid and other B vitamins, vitamins C, D, & E, and minerals including zinc, magnesium, and manganese. The result was an absence of neural tube disorders for the trial group, against 6 in his control. Cardiovascular disorders were down to 10, against 20 in the control. Overall problems were halved. Though the incidence of neural tube disorders was too small to indicate complete prevention, the results are strongly indicative and compatible with other studies such as the Medical Research Council's (MRC Vitamin Group, 1991).

There were significant correlations of birthweight with nutrients: B vitamins ranging from 0.150 to 0.200; minerals ranging from 0.180 to 0.250 (Doyle, Crawford, Wynn, & Wynn, 1990). Czeizel's levels for B vitamins were closer to the French recommended "Apports Nutritionels Conseilles" (ANC) (Roche, personal communication; Dupin, Abraham & Giachetti, 1992), than the lower American, or much lower English Levels.

Attention provided early enough can prevent many problems. Many mothers HIV+ are underweight and suffer premature delivery. They and their babies particularly benefit from good nutrition, (Brenna, 2006).

NURTURE FROM BEFORE CONCEPTION

Responding to problems with nutrition and clearing of toxins and disease

Foresight Preconception Care discourages attempts to conceive until the health status of both partners has been established as soundly as possible (Barnes, 2009; Glenville, 2006; House, 2000). Both parents are checked for nutrition, toxins – including smoking, alcohol and drugs – and infections, often unsuspected. Blood, sweat, and semen are analyzed, and hair and nail cuttings for steadier, less short-term readings. They then see to the appropriate diet, supplements, and/or medication (Barnes 2009). Despite a high percentage of couples with difficulties, conception success rates have been around 80%, with resultant babies at a remarkably high level of health.

Further vital gains can be made thanks to new extensive research in essential fatty acids (EFA) and their paramount importance in gestation onwards – see the section below titled, *The brain in embryo and fetus*. Still further gains in bearing healthy children would be expected from assured emotional nurture and appropriate birthing method (Odent, 1986; Verny & Weintraub, 2002).

Alternative response to infertility

In vitro fertilization (IVF) is an arduous procedure with much greater discomfort, hassle, and expense. Its problems, reflected in a published survey (Rajkhowa, McConnell & Thomas, 2006), include the hazards of multiple births and low birthweight with its associated problems. Not surprisingly *Foresight's* more natural approach, described above, tackles most of the problems at root, and is evidently safer and more successful. There is surely every advantage in first allowing the full opportunity to attain sound health and nutrition status, and then a reasonable time before conceiving. Not all problems can be resolved by *Foresight's* approach, for instance a blocked fallopian tube or chromosomal abnormality. Various problems can call for artificial insemination or the spectacular technology of IVF. Although there is no standardized measure, *Foresight's* success for healthy babies seems to be some 3 times as high as IVF, at a fraction of its price and hassle. Sometimes couples attending IVF have gone on to *Foresight*, which seems to have doubled the success rate of IVF alone.

British television and press have been exclaiming: "IVF is big business, and doctors can get very rich" (Panorama, 2006; Bunting, 2007; Kennedy, Kingsland, Rutherford, Hamilton, & Ledger, 2006). Establishing nutritional and emotional nurture seems wiser, and this takes time. Not all IVF clinics seem to deal routinely first with these problems, without which can it be wise to conceive a baby? Once health is achieved, medical opinion allows 2 years for conception, before considering a further process. So these are important questions for an IVF clinic. Are couples first cleared of the problems mentioned? What proportion of couples is left still without a child? What proportion of couples has a child with problems that might have been avoided? (Min, Breheny, MacLachlan, & Healy, 2004; Davies, Wang, & Norman, 2004; Bradley & Bennett, 1995). These questions are particularly valuable when there are satisfactory options. At least these will all be wanted children.

Well before conception is the most valuable time for informed care, not only for the health of sperm and ovum, but to establish the mother's nutrition status for the specific stage-by-stage demands of the developing child, and emotional stability throughout. This gives the optimum chance of natural conception, and of successful IVF should that be required.

EPIGENETICS – ENVIRONMENTAL EFFECTS

Biochemistry and epigenetics

The term epigenetics refers to changes in phenotype (appearance), or gene expression, caused by mechanisms other than changes in the underlying DNA sequence (*epi* = on). These changes may remain through cell divisions for the remainder of the cell's life and may also last for multiple generations. However, there is no change in the underlying DNA sequence of the organism; instead, non-genetic factors cause the organism's genes to express themselves differently (Wikipedia)

Genes are inactivated commonly by an added methyl group (a carbon atom with 3 hydrogens), or, conversely, activated by its removal. Such changes, brought about by nutritional or hormonal factors, can modify the development of the organism without changing the basic gene-sequence. Changes can be passed on to subsequent generations although they remain reversible.

Epigenetic change can affect a cell's genome (genetic material) any time in the lifecycle, though the earlier in life the greater the possibility and the greater its effect, since cells replicated will be likewise changed. The value is in fine-tuning the new organism to parental environment, although such changes can also give rise to problems. The grandmother is "reading" the environment for her grandchild – and until fertilization grandfather too (Golubovsky & Manton, 2005; Mill et al., 2008; Pembrey et al., 2006).

Genomic imprinting

Reproduction involves major epigenetic changes both in the genome of the developing oocyte, and in the spermatid genome on fertilization. Genomic imprinting (quite distinct from psychological imprinting) is a series of processes whereby the embryo is established with certain gene settings from the father and others from the mother. These are complete by a week after implantation, although epigenetic changes due to environment continue.

In the female the oocyte is beginning to form in early gestation (ie, within the grandmother), when there is genome-wide demethylation/activation of genes. Not until adolescence will each oocyte in maturing be epigenetically maternalized "imprinted" according to the mother's current state. Only after fertilization is there demethylation/activation of the spermatid genome (Golubovsky & Manton, 2005), the genes being set as active or silent according to

parent of origin, whether they are the maternal or paternal allele. A majority of paternal alleles remain activated and a majority of maternal alleles are inactivated (Keverne, 2007).

Rarely, such changes can give rise to problems; generally they are valuable in fine-tuning the new organism to parental environment (Badyaev & Uller, 2009).

From completion of imprinting, the new individual's gene-switches will, until birth, remain subject to their environment within the body, as influenced by the mother and her environmental state – her security or alarm, emotions/hormones, her nutrition/metabolism, and toxins (House, 2007). As a person matures, susceptibility to epigenetic changes tends to reduce.

Research articles are coming out fast on the relevance of epigenetic settings to many disorders, including: autism, psychosis, schizophrenia, Alzheimer's disease and cancer; the process of ageing; and transgenerational effects. Environmental factors shown to be changing settings include nutrition, medicines, and toxins. Surprisingly epigenetics studies in human vaccination against infectious diseases are not apparent.

For many psychiatrists and scientists the objectivity of epigenetics will carry far more conviction than direct clinical experience of patients. Not until the late 1980s was the existence of child abuse accepted by most major training schools. Not until 1999 did a London Maudsley Hospital Psychiatrist declare on television that psychiatrists would now have to recognize dissociative identity disorder because brain-scans research at Harvard had proved its existence (Sinason, 2002). Until even more recently, even psychotherapists have been reluctant to accept the conviction of Frank Lake, cell-biologist as well as psychiatrist, of the major psychological maternal-fetal impacts during conception and the first trimester.

Epigenetics came into the spotlight in 2001 due to completion of the Human Genome Project which had caused general surprise. Instead of the 150,000 genes expected, to account for wide human variations, there was a mere quarter the number. A few pioneers, however, were not surprised, notably the authors of *The Driving Force/Nutrition and Evolution*, Michael A Crawford and David E Marsh (1989/1995), who describe how evolution has been driven by nutrition, as powerful as any environmental condition. Contrary to the neo-Darwinists, they point out that Darwin himself, in *The Origin of Species*, relates the theory of natural selection to "the two great laws – Unity of Type and Conditions of Existence," i.e. consistency of a species and environmental conditions (Crawford & Marsh, 1995; Darwin,

1859). Of these two great laws, Darwin declares (concluding Chapter 6), "... the law of the Conditions of Existence is the higher law; as it includes, through the inheritance of former variations and adaptations, that of Unity of Type." Epigenetics, we can now recognize, is part of this law.

Understanding these epigenetic processes is vital in protecting new generations against adverse changes (Boulet, Parker & Atrash, 2006; Gillman et al., 2007).

BRAIN NUTRITION IN EMBRYO AND FETUS

Nutrients stage-by-stage

The brain is beginning to be distinct in the early weeks of pregnancy. Modern brain-scans can follow the brain's structure through development. At about 3 weeks when the embryo is a disc curling into a tube, under-nutrition can slow formation of DNA leaving vertical sealing of the tube incomplete. This can lead to spina-bifida or cleft-palate, with possible effects in the brain area. Horizontal demarcations are also appearing, at least for the spine (see Figure 3). Traceable to these early weeks are inadequate connections between brain regions, leaving a lack of emotional awareness or social sense as in disorders such as ADHD and autism, despite "islands" of cerebral brilliance (Rodier, Ingram, Tisdale, & Romano, 1996; Rodier, 2000; Shiota & Hill, 2009). Similarly, as brain activity scans reveal, behavioural problems can be due to inadequate signaling between the rational mind and the emotional and motor regions. There may be less awareness of feelings or failure to control spontaneous reactions, possibly violence.

Figure 3. The neural tube at about 3 weeks, showing early lateral definitions in the spinal area – Carnegie stage 10.



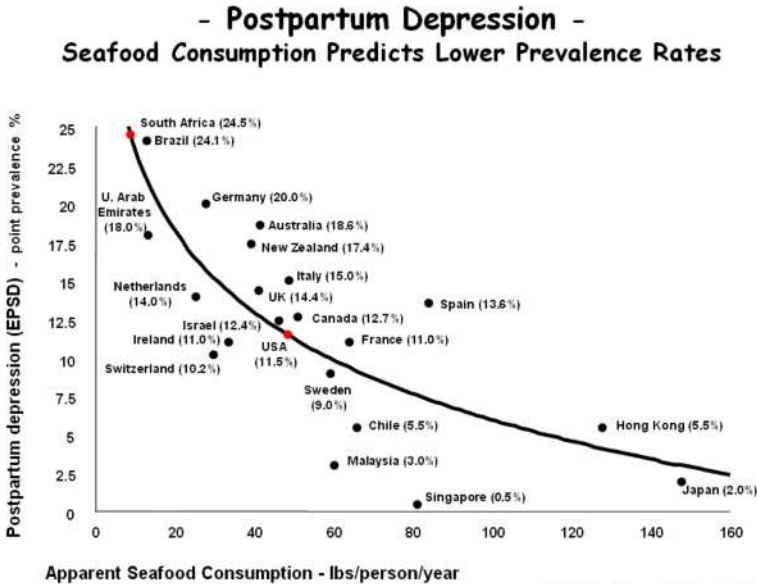
Source: Hill, 2009.

During the third trimester the brain, already large, grows at double-speed, making huge demands on the mother's supplies. If these are short, the fetus robs the mother's own cells, even for instance her brain, of DHA, which should form over 10% of the brain. Deprived of this DHA the mother will be prone to depression and her child's development prejudiced. The cross-nations study in Figure 4 shows the close correlation of postnatal depression with low seafood consumption (Hibbeln, 2001).

The demands of the third trimester and breastfeeding mean that, from before conception, the mother's diet, possibly supplemented, should ensure supply of omega-3 oils, including specifically docosahexaenoic (DHA), eicosapentaenoic (EPA) acids, and also omega-6 arachidonic acid (AA). Supply of these is essential since humans can make little, and not to optimal levels, particularly in early life. They are important to the placenta's development, which begins in the early weeks, and on which so much depends to maximize benefit from the nutrients, especially if these are scarce (Crawford, Costeloe et al., 1990; Leaf, Leighfield, Costeloe & Crawford, 1992). Omega-3s are more likely to reduce risk of cleft-lip/palate than are multivitamins/minerals (Laasonen et al., 2006; Erkkila, Isotalo, Pulkkinen & Haapanen, 2005).

The brain should consist of well over 10% of DHA, which is vital also to the development of blood-vessels and retina. EPA is important to function of the brain, which by the third trimester is already large and growing rapidly, a major drain on the mother's supply. DHA & EPA also reduce prematurity of birth and low birthweight (Crawford, Doyle, Williams & Drury, 1989; Phylactos, Leaf, Costeloe & Crawford, 1995; Olsen et al., 1992). Higher levels in gestation and infancy of these two omega-3s predict sharper brain and eye acuity in children at ages of one week to eight years, and reduced incidence of brain, eye and heart problems (Hart, Boylan, Carroll, Musick, & Lampe, 2003; Lucas, Morley, Cole, Lister, & Leeson-Payne, 1992; McNamara, & Carlson, 2006; Agostoni, Trojan, Bellu, Riva, & Giovanni, 1995; Birch, Garfield, Hoffman, Uauy, & Birch, 2000; Birch, Garfield, Casteneda, Hughbanks-Wheaton, Uauy, & Hoffman, 2007; Birch, Hoffman, Uauy, & Birch, 1998).

Figure 4: Postnatal depression correlating with apparent seafood consumption, implying that, where seafood consumption is lowest, rates of postnatal depression are some ten times as high.



Source: Hibbeln, 2001

Recommendations to increase intake of fish and fish-oils have raised concerns over levels of methyl-mercury in fish. In 2004 two US Federal Government agencies jointly advised women, in relation to pregnancy, to restrict their overall consumption of seafood to 340g (two helpings) per week to avoid fetal exposure to trace amounts of neurotoxins. But two reports of the Avon Longitudinal Study of Parents and Children (ALSPAC) involving nearly 12,000 pregnant women, found that *less than* 340g per week of seafood during pregnancy was associated with their children's *poorer neurological development*; with the lowest quartile for verbal intelligence quotient (IQ); and with poorer scores for fine motor, communication, and social development and behavior (Hibbeln et al., 2007; Myers & Davidson, 2007). These results are despite risks of methyl-mercury, which seem to have been exaggerated, and not as great as risks of omega-3 deficiency, or even eating less than 340g of fish a week, as implied by many research studies.

DHA's only major sources are fish and seafood including phytoplankton and micro-algae – and breast milk, dependent on the mother's diet. Vegetarians' DHA levels are normally less than half those of omnivores (Neuringer & Connor, 1986; Sanders & Reddy, 1992). Appropriate micro-algae provide an alternative vegetable source.

At our recent McCarrison committee I was joking that we should introduce dolphin dairies, for omega-3-rich milk, free of saturated fats. After all, a hunter-gatherer no doubt once joked about catching a cow and milking it! It evoked the interesting response that, in the 1990s, someone had promoted the idea of whale-milking!

BRAIN NUTRITION IN CHILD AND ADOLESCENT

Brain-body competition in adolescence

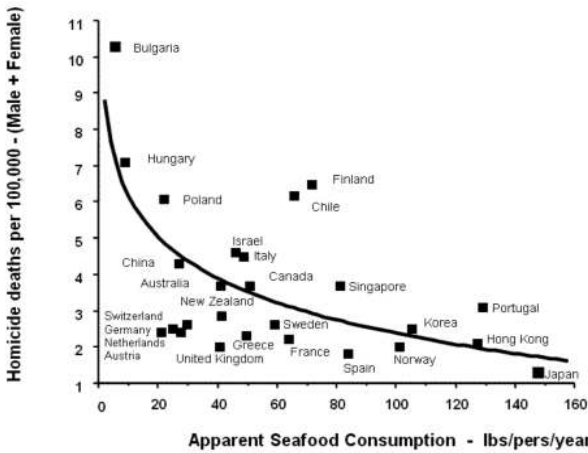
The fetal brain, weighing about 350g at birth, triples in size by 20 years, needing large quantities of DHA particularly. At 3 to 5 years, the neocortex is being “wired-up” to become the new, more powerful, seat of consciousness, relegating previous memory in the limbic system to the unconscious, leaving birth memories normally beyond conscious recall. Around puberty the brain is being pruned and redeveloped according to current use. When late adolescence arrives, the rapid growth of the large male body can detract from the brain's supply of DHA, one reason why this should be the peak stage for violent crime. In a fully controlled trial, supplementing omega-3s DHA & EPA, omega-6s, and minerals and vitamins to late-adolescent male prisoners, there was a reduction in violent behaviour of one-third within two weeks. This was sustained for the 9 months of the trial (Gesch, Hammond, Hampson, Eves, & Crowder, 2002). Here is a further way to be “tough on the causes of crime,” but, of course, the earlier the start the better. Since violence is but the tip of the iceberg of depression and mental/emotional problems, we have new ways to tackle these too.

Nations with *low* levels of seafood consumption have rates of homicide several times as high as those with *high* consumption of seafood (see Figure 5), with depression rates some 50 times as high. We urgently need to return more closely to our evolutionary DHA-rich waterside diet of fish and shellfish, without which our brain could not have evolved to its present size. Part of the problem is that our increasingly land-based diet is far higher in omega-6s, which displace omega-3s because they use the same enzymes in molecule-building. In

the last 400 generations our omega-3 to omega-6 ratio has fallen to a tenth. It seriously needs increasing. Important to their health and mental acuity, hunter-gatherers were well exercised, as were their prey. And those wild meats had some 10 times the nutrients/fat ratio of many of today's farm animals.

Figure 5.

Homicide Mortality Rates¹ & Seafood Consumption



World Health Statistics Annual 1995, WHO, Geneva Switzerland Hibbeln, JR - In press World Rev Nutr Diet, 8/00

Source: Hibbeln, 2001.

Schoolchildren seem to be benefiting from school meals and/or supplementation, according to general indications. One helpful study has been the Oxford-Durham fully controlled study in children with developmental coordination disorder (Richardson & Montgomery, 2005). A major breakthrough in Britain has been due to the hard practical work in schools of celebrity chef Jamie Oliver.

EDUCATION IN NURTURE & ECOLOGY

For the human brain a sound environment is vital

Drastic effects on our own basic physiology are being caused by our failure to respect soils, crops, and animals, our ocean beds, rivers, and

fish. Our ruthless manipulation of the food-chain (as in marketing, particularly to children) is critically affecting ourselves. Our sweet tooth and love of colors, in evolution, would have incited us to hunt and climb for the rare advantage of health-giving honey and colorful fruits; our savory taste would have us persist in the search for then scarce salts with minerals. These tastes are today manipulated by highly colored sweets and drinks and salty foods, cheaply weight-boosted with sucrose and salt. At least the English Government is now pressing for children to have 5 fruits and vegetables a day and plenty of exercise. The Mayor of New York is attempting to reduce consumption of salt, sugar, and saturated fat.

At last we are acknowledging the research needed. If our environmental base is to sustain us, we have to sustain our environment. In Europe minerals in soils have dropped by 72% over 52 years, North American by 85% (see Table 2: UNCED 1992).

We used to replenish soil by growing "green compost" crops such as clover, or by rotation of crops, applying manure or seaweed, or leaving land fallow. Now that replenishment is usually limited to chemical fertilizers, essentials other than nitrogen, phosphorus, and potassium can get neglected. Even applied nitrogen can have adverse effects (Stockdale, 1992).

A few examples can indicate the importance of minerals, which is partly that they are as essential as some vitamins. Damage can come from deficits of either. Folate (folic acid) requirement in pregnancy is now widely recognized, yet people generally are still below the optimal level. Folate, vitamin B9, is needed in DNA synthesis with other vitamins, particularly of the B group. Zinc is essential to DNA synthesis. Magnesium transfers energy for cell-building: deficiency before mating can damage germ-cells, male or female. Phosphorus is used in cell-replication. Selenium is relevant to breast-milk, and to mood-effects. By binding with mercury, selenium also provides some protection against mercury accumulation from amalgam tooth-fillings, mercury-preserved injections, or pollutants (Guvenc et al., 1995; Rayman, 2002). Finland's high rate of cardiovascular disorders fell over some decades of spreading selenium on its fields with other fertilizers.

Although we need a highly complex range of nutrients, many vitamins, minerals, and essential oils are ready-assembled by nature in fruit, vegetables, meat, fish, and seaweeds. Some of these nutrients serve also as antioxidants. Particularly rich are reproductive cells: seeds, nuts, roes and so on.

Table 2
Earth Summit Mineral Depletion Analysis – % Drop 1939-1991.

Minerals % drop in SOILS:		Minerals % drop in FOODS			
Continent	Soil	Mineral	Fruit	Veg †	Meats
North America	85	Sodium	29	49	30
South America	75	Potassium	19	16	16
Europe	72	* Magnesium	16	24	10
Asia	76	* Calcium	16	46	41
Africa	74	Iron	24	27	54
Australia	55	* Copper	20	76	24
		* Zinc	27	(59)†	n/a
* see Table 1.Minerals . †(from 1978 only).					

The 3rd agricultural revolution

It so happens that 2 of our planet's greatest needs could have one solution in common. The need for dietary fish has been strongly emphasized. The danger of global warming from excessive carbon dioxide is commonly recognized. Behind both lie phytoplankton and blue-green algae, and the process of photosynthesis, which we know reduces carbon dioxide from the atmosphere. We think of it usually in terms of plants and trees. But more photosynthesis takes place in this way in the oceans than on land. Some phytoplankton, and also shellfish, such as oysters, even lock carbon permanently into their shells. The oxygen released is vital to production of DHA and EPA, so essential in quantity to fish and the human brain. DHA's importance to every cell in our bodies lies in its flexibility as a molecule. Its greatest importance is its exceptional electron tunneling effect in brain, retina, heart, and wherever electronic control is most significant.

Biochemistry of emotions – and epigenetics of hormone levels

Even in the 20th century, Freud, Rank, Winnicott, and Janov were among those who perceived psychological scarring as coming from gestation and birth, Lake even from conception. Evidence long

remained merely anecdotal, but molecular understanding of hormones (Pert, 1998), brain-scans, and epigenetics have provided molecular and structural evidence of how violent behaviour can arise from early psychological and physical conditions. These provide objective evidence of the lasting environmental effects on a person, common-ground for effects of nutrition and emotions on physical and mental development. Bliss, stress, and shock are molecules traveling through the bloodstream, acting on receptors at nerve synapses, biochemically affecting genes. A gene may be inactivated by adding a methyl group to the gene or removal of an acetyl group from the histone core; and vice-versa.

How Frank Lake would have welcomed the discovery of epigenetic mechanisms! – which could well be the way a mother's emotions may impact as early as conception (House, 1999; Lake, 1981).

Lake, the psychiatrist, wrote (1981), "Affliction in its worst forms strikes in the first three months after conception. . . Any . . . damaging experiences are now accessible to consciousness without undue difficulty" (p.15-16). There had been so many accounts of periconceptional memory – Sadger (1941) and Mott (1965); Seaborn-Jones then Swartley & Maurice (*Self & Society*, 1977 & 1978, in House 1999); Fodor (1949) and Peerbolte (1954), all cited in Ridgway & House (2006). Having seen most of these, Lake regretted his own slowness in accepting his patients' evidence that they were indeed experiencing primal memory, impressed before connections in the brain had formed. Lake, the scientist, in thirteen years of microscope work with amoebae and other single-celled organisms, had found that single cells could learn discriminating reactions. He also quoted embryologist Richard Dryden's evidence that the cytoplasm of the fertilized egg contains information essential to at least the early stages of development, there being several sites where cytoplasmic information could be stored (Dryden, 1978).

Further corroboration with Lake's conviction came from Curt Sandman's study following the 1994 Californian earthquake. His survey showed that mothers more advanced in pregnancy were shocked **less** than those in the first trimester, who suffered significantly more premature births (Glynn, Wadhwa, Dunkel-Schetter, Checz-Demet, & Sandman, 2001). This is explicable by the gradual build-up in the second and third trimesters of the shock-repressant corticotropin-releasing-hormone (CRH) (Glynn, Wadhwa & Sandman, 2000). This rise, and the fact that cortisol can set the fetus to a higher stress level, can explain how after 9/11 children who had then been in the third trimester turned out to be the more stressed

(Yehuda et al., 2005). Similarly, the combination of stress-effects from forceps delivery with early separation from parent, correlate with a four-fold risk of criminal violence by the age of 18 (Raine, Brennan & Mednick, 1994).

Pert's (1998) work substantiated Michel Odent's findings that in the first hour from birth mother and child are flooded with endorphins and oxytocin, "love hormones," bringing bliss to mother and child, essential to this dramatic transition in their bonding. The power of well-sustained bonding is wonderfully highlighted by the case of a premature twin who lay dying. Born 12 weeks prematurely in Massachusetts, 2 lb Brielle was slipping away. Nurse Gayle Kasparian recalled a practice used in some parts of Europe of "double-bedding" twins. She put Kyrie into Brielle's incubator. Their tiny hands explored each other's face. Within minutes, Brielle's blood-oxygen level was the best since the day she was born. In due time, they were back home, healthy, and happy – and sharing a cot (Wanodysari, 2005)

Though her study of twins, Alessandra Piontelli (1992) portrays the power of the closest bonds in a child's life, and the continuum of prenatal and postnatal life: "The most striking pre- and post-natal continuity for *Marisa* and *Beatrice* was that they constantly hit each other when in the womb and have continued to do so throughout their infancy and early childhood." Whereas, *Luca* and *Alice*, when they were a year old, would stroke each other's head through the living-room curtain, just as they had in the womb through the membrane (Piontelli, 1992).

IN CONCLUSION

Medical perspective from the beginning of a life

Understanding the genesis of new life in terms of the interactions between the genes and the nutrients from soil, sea and air, as well as the biochemicals of emotions, is changing our medical perspective. Before long, medical training will surely become rooted in the biochemistry and epigenetics of nutrition and hormones. As the origins of health and disease become clearer, medicine will refocus towards beginnings. It was, after all, only when doctors realized how different was a child's physiology from an adult's that pediatricians came into being. Reorientation this time will be in the light of lifecycle and transgenerational epigenetics, towards the origins new life; not just the genes but to the initial molecules – life's very building blocks, drawn from seas, soils, and atmosphere. So we have to protect the

regeneration of plant, animal, and human life by controlling pollutants and recycling nutritional constituents.

Lifecycle preparation for fertilization and conception, the peak of vulnerability

All round the lifecycle we and our offspring are susceptible to our current environment, primarily our food, air and relationships.

A person's nutrition and health status at any time can be affecting any child that they may beget or bear in the future, with possible effects on subsequent generations too. Everyone needs to become aware of this as young as possible. It is of not only personal and family importance, but national and global too. The relatively low cost of generating healthy people can save the far higher financial costs of illness, depression, crime and even war, let alone their immeasurable human cost. The prime need long-term is for universal education in lifestyle, beginning young. The world is at last waking up to this:

The concept of fetal programming is an area that is now under rigorous investigation in many laboratories throughout the world. We need to engender a fascination in all segments of society, not just pregnant women, about life in the womb. CONCLUSION: Everyone needs to understand that improving the condition of the fetus will have personal, social, and economic benefits. The time has come to realize that, in a sense, it is not just women who are pregnant but it is the family and the whole of society" (Nathanielsz et al., 2003, abstract).

As people come to understand the most significant interactions between ourselves and the biosphere, and particularly the lifelong effects of nutrition and emotions relating to reproduction and development of their offspring, we have the greatest chance of raising healthy generations that are capable of building a peaceful society.

Epigenetics could be our most powerful technological insight in contending with the current crises in mental ill health and climate change, highlighting biochemically the dependence of long-term human health on the biosphere. The cradle of earth's biosystems has been the estuarial and inshore sea-beds and their photosynthetic systems, basic to marine life and to the human food chain. The wider oceans are vital to all life, inland waters too. The demise of aquatic life threatens not only the collapse of fisheries but also aggravated climate change.

Our latest warning is that of the Philippines' coral reefs only 5%

remain healthy. The fight is on to restore the coastal sea beds of their thousands of islands. How can we reverse the drastic trend in brain and other disorders as well as the environment? Draconian steps have necessarily begun, to cut the industrial pollution destroying our biosystem, and to build sound systems of marine agriculture. In various seas coral replanting has begun. Since 1991, in China's Sungo Bay they have been regulating and filtering pollution with seaweed and shellfish. Japan's Okayama Prefecture is marine ranching among its islands, creating artificial reef and rock habitats (EAS, 2009). Such measures are essential if only to meet the human brain's prime need for the marine source of omega-3 oil DHA, which is greatest during gestation and brain development (U.S. DHSS, 2009). Healing fertile marine regions is basic to restoring human brain health in today's mental health pandemic.

We need to move into a new agricultural and aquacultural age, if only to sustain the brain. Safeguarding the recycling of every essential in life is the only route to survival. Abraham Lincoln, with the German chemist Justus von Liebig, reckoned to overcome malnutrition globally, by recycling minerals in the form of fossilized bones and feces from eons ago. In recycling they were on the right track, but they were simplistic; artificial fertilizers contain too few of the essentials, not always in the right form, leaving serious deficits. Current waste must be recycled appropriately to land or to sea to keep essential nutrients in circulation. Our future depends on re-establishing the quality of our fields and of sea-beds. Recently we have caused 400 ocean dead-spots through fertilizer and slurry run-off and sewage. We are destroying our aquatic stocks with minerals that should return to the land. Disposals of all kinds must be carefully placed, so as not to destroy the environment but to redevelop it. A splendid example is the strategic sinking of a US carrier and other obsolete vessels, to specific sea-bed sites to harbor marine plant and fish life.

Our growing awareness of epigenetic mechanisms and genomic imprinting is helping to raise scientific sensitivity in steering a way through today's artificial conditions, to safeguard the human lifecycle, in reverence of our evolution and health and wonders of our planet.

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Maternity Social Support

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ABSTRACT: Most literature suggests the importance of social support during the pregnancy. This research utilized the Spearman's rho coefficient, which was calculated between the Maternity Social Support Scale (MSSS) score and the Center for Epidemiologic Studies Depression Scale (CES-D) score, as well as Prenatal Attachment Inventory (PAI) score. The results confirm that during the pregnancy a high social support level is associated with a low depression level and a high social support level is associated with a high prenatal attachment level. Therefore, these results are significant, especially for maternity wellbeing promotion programmes.

KEY WORDS: Maternity social support, Pregnancy, Prenatal Attachment, Depression, Psychosocial factors.

INTRODUCTION

Since the 1970s some epidemiological contributions have highlighted the importance of social relationships and social support on health maintenance (Caplan, 1974; Cassel, 1976). Several reviews illustrate the effects of support and social networks in areas like coronary disease, cancer, HIV, depression and senile dementia, chronic disease in the elderly, and in families with a disabled member. In addition to these conditions pregnancy has been investigated, showing that a lack of social support constitutes an important risk factor for maternal well-being during pregnancy and has adverse effects on the outcomes of the pregnancy (Kitamura, Sugawara, Sugawara, Toda, & Shima, 1996; Elsenbruch, et al., 2006).

Maternity is a period of significant life change requiring major

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psychological adjustment (Da Costa, Larouche, Dritsa, & Brender, 1999). One important risk factor affecting maternal wellbeing during and after the pregnancy is the lack of, or a low level of, social support. From a welfare point of view, the hospital period has become shorter, resulting in fewer services to sustain women in the postpartum period, while from a family welfare point of view, women today often live far from their families and frequently have to face a family break-up, even in this sensitive moment. The lack of a social network able to support the psychic process of maternity could lead to a disturbed parental function (Dabrassi & Imbasciati, 2008).

During pregnancy the woman needs to create a “physical and mental space” for the foetus: this is promoted if she has a good couple relationship and she is supported by a social network (Cardinali & Guidi, 1992). In these conditions she can feel the representations of herself as a mother and her partner as a father, as well as her future child. In particular, the father is considered the first “motherhood facilitating element” (Delassus, 1995) because he is the primary person to sustain the process of the pregnancy in order to facilitate “the unique affectionate relationship which develops between a woman and her foetus” (Müller, 1993, 1996; Della Vedova, 2005) and continues with her child after birth. Some studies have shown that social support is one of the factors that influence the degree of maternal sensitivity (Teti & Gelfand, 1991; Broom, 1994; Goldstein, Diener, & Mangelsdorf, 1996; Kivijarvi, Raiha, Virtanen, Lertola, & Piha, 2004; Shin, Park, & Kim, 2006). The mother needs close relationships and social support in order to face maternity. In every day life a mother benefits from a support network, enabling her to care for her child and sustain the development of the socio-emotional tuning process (Stern, 1995).

Broom (1994) has found that the mother’s perception of her husband’s participation in family life was a significant predictor of maternal sensitivity. Han (2002) also suggested that mothers who received physical and psychological support from someone in the postpartum period showed a higher maternal sensitivity than mothers who did not have any help, although the difference was not statistically significant. Kivijarvi and colleagues (2004) found that mothers who showed higher maternal sensitivity scores experienced less difficulty with their infants and this was associated with more support from their partner and best friends than mothers who showed lower sensitivity scores. Stern (1995) described the peculiar organization of the psychic life a woman faces with the birth of a child, which he termed a “motherhood constellation.” Stern underlined the need of the mother to create and regulate a protective support network

that, we are convinced, is sought beginning from conception. Several studies (Cranley, 1981, 1984; Condon & Corkindale, 1997) showed a positive correlation between the social support perceived and the development of the maternal-fetal attachment, even if the parental role is still not well specified (Della Vedova, 2005).

It is, therefore, important that research studies investigating the factors of protection in maternity concentrate on the levels of emotional and physical support the mother-foetus diade has available (Della Vedova et al., 2007; Imbasciati, Dabrassi, & Cena, 2007).

Webster and colleagues (Webster et al., 2000) noted that, despite there having been a recognition from the scientific community of the role of some psychosocial factors like abuse and low social support on the negative outcomes of pregnancy and the postpartum period (Nuckolls, Cassel, & Kaplan, 1972; Collins, 1993; Wilson, Reid, Midmer, Biringer, Carroll, & Stewart, 1996; Barnet, Joffe, Duggan, Wilson, & Repke, 1996), similar factors are rarely considered in the screenings at the prenatal booking-in visit. Their interest, therefore, has been to develop a new brief instrument, the Maternity Social Support Scale (MSSS), for use in planning preventive prenatal interventions and, thereby, reduce the incidence of postnatal depression. Their results (Webster et al., 2000) revealed that women with low social support in pregnancy were more likely to report poorer health during pregnancy ($p=.006$) and postnatally ($p<.001$), to book later in pregnancy for prenatal care ($p=.000$), to seek medical help more frequently ($p=.004$), and to be more depressed postnatally ($p=.0001$) than well-supported women.

Considering such important results from a preventive point of view, it seemed important and useful to assess: 1) the relationship between the level of social support and the level of depression in the prenatal period, and 2) the relationship between the level of social support and the level of prenatal attachment during pregnancy. We decided to use the Center for Epidemiologic Studies Depression Scale, Italian version CES-D (Fava, 1981), to assess the presence of the depressive symptomatology because we agree with Mosack and Schore (2006) that this last instrument is the most reliable to identify women with depression during pregnancy and the postpartum period. We have also considered the relationship between Maternity Social Support scores (Webster et al., 2000) and prenatal attachment scores measured by the Italian version of the PAI (Della Vedova, Dabrassi, & Imbasciati, 2008).

As social support is correlated to prenatal maternal attachment (Cranley, 1984; Condon & Corkindale, 1997), which is considered a predictor of the early mother-child relationship (Fuller, 1990; Siddiqui

& Hagglof, 2000) and of postpartum depression (Webster et al., 2000), we hypothesize that a high level of social support could be associated to a high level of prenatal attachment and, contemporarily, to a low level of depression.

With this intention we have conducted a cross-sectional survey on a sample of Italian pregnant women.

METHOD

Participants

A sample of 274 pregnant women was recruited from prenatal education classes of two Northern Italian cities: Brescia (S. Orsola Hospital, N=108) and Verona (ULSS20, a district of the public medical service of Verona, N=166). The only criterion for eligibility was that women had to be able to read and to write Italian. The sample is considered "consecutive" because all subjects are chosen on a strict "first come, first chosen" basis, coherent with the definition of the Glossary of methodological terms of the Journal of the American Medical Association. All women agreed to participate in this study; the response rate was 100%. Thirteen subjects were excluded from the analysis due to missing data (listwise deletion procedure). A total of 261 subjects (95.3%) remained in the sample for data analysis. The sample size consisted of adequate subjects for factor analysis according to Nunnally's recommendation (Nunnally & Bernstein, 1994) of 10 scores per variable/item.

The age of the women ranged from 18 to 42 (mean=31.7, std. deviation=4.154 years). The majority of the women (95.4%) were Italian, married (79.7%), had a high school qualification (57.9%) and were employed (38.6%). The majority of the women (60.6%) were between the 28th and the 32nd gestational week (mean=29.52±3.289; range=17-39) and 78.1% were primipara. A high percentage of the women (86.4%) said that the pregnancy was desired and planned (56%), and low risk (97.3%). A few of the women (3.5%) reported having had a previous abortion, 16.5% of the women reported having had a miscarriage. The sociodemographic characteristics and the descriptive data of pregnancy variables are shown in Tables 1 and 2.

The Maternity Social Support Scale, an Italian translation of the MSSS (Webster et al., 2000; Dabrassi, Imbasciati, & Della Vedova, 2009) was developed using a translation-backtranslation procedure (Van der Vijver & Leung, 1997). The MSSS is a self-report scale consisting of 6 Likert-type items, of which two are reverse scored,

Table 1: Sociodemographic characteristics sample

<i>Site of recruitment</i>	<i>BRESCIA</i>	<i>VERONA</i>	<i>TOTAL</i>
	<i>(N=101)</i>	<i>(N=160)</i>	<i>(N=261)</i>
<i>Age</i>			N=258
< 26	8 (7.9%)	8 (5.1%)	16 (15.8%)
26-35	72 (71.3%)	119 (75.8%)	191 (74.0%)
>35	21 (20.8%)	30 (19.1%)	51 (19.8%)
<i>Nationality</i>			N=261
Italian	99 (98.02%)	150 (93.75 %)	249 (95.4%)
Not Italian	2 (1.98%)	10 (6.25%)	12 (4.6%)
<i>Educational level</i>			N=261
Midle School	18 (17.8%)	15 (9.4%)	33 (12.6%)
High School	46 (45.5%)	105 (65.6%)	151 (57.9%)
University	37 (36.6%)	40 (25%)	77 (29.5%)
<i>Occupation</i>			N=259
Unemployed	3 (3%)	11 (7%)	14 (5.4%)
Factory worker	10 (9.9%)	28 (17.7%)	38 (14.7%)
Clerical Worker	40 (39.6%)	60 (38.0%)	100 (38.6%)
Free-lance worker	17 (16.8%)	12 (7.6%)	29 (11.2%)
Part-time worker	3 (3%)	12 (7.6%)	15 (5.8%)
Student	3 (3%)	2 (1.3%)	5 (1.9%)
Other	25 (24.8%)	33 (20.9%)	58 (22.4%)
<i>Marital status</i>			N=261
Married	74 (73.3%)	134 (83.8%)	208 (79.7%)
Cohabitant	18 (17.8%)	20 (12.5%)	38 (14.6%)
Single, with stable relationship	5 (5%)	4 (2.5%)	9 (3.4%)
Single, alone	2 (2%)	1 (0.6%)	3 (1.1%)
Other	2 (2%)	1 (0.6%)	3 (1.1%)
<i>Years of marriage</i>			N=260
Mean (std. deviation)	2.44 (± 2.636)	3.41 (± 3.58)	3.03 (± 3.275)
Range	0-12	0-20	0-20
<i>Years of relationship</i>			N=249
Mean (std. deviation)	8.04 (± 4.306)	8.72 (± 4.788)	8.45 (± 4.602)
Range	0-20	0-25	0-25

NOTE Numbers may not add up to 261 because missing data.

Table 2: Descriptive Data of pregnancy variables

<i>Site of recruitment</i>	BRESCIA (N=101)	VERONA (N=160)	TOTALE (N=261)
<i>Gestational week</i>			N=259
< 24	16 (16.2%)	4 (2.5%)	20 (7.7%)
25-27	22 (22.2%)	22 (13.8%)	44 (17%)
28-32	50 (50.5%)	107 (66.9%)	157 (60.6%)
> 33	13 (12.9%)	27 (16.9%)	40 (15.3%)
<i>Parity</i>			N=260
Primipara	88 (87.1%)	115 (72.3%)	203 (78.1%)
Multipara	13 (12.9%)	44 (27.7%)	57 (21.9%)
<i>Desired pregnancy</i>			N=258
Yes	88 (88%)	135 (85.4%)	223 (86.4%)
No	12 (12%)	23 (14%)	35 (13.6%)
<i>Planned pregnancy</i>			N=259
Yes	57 (56.4%)	88 (55.7%)	145 (56%)
No	44 (43.6%)	70 (44.3%)	114 (44%)
<i>Pregnancy risk</i>			N=256
High	2 (2%)	5 (3.2%)	7 (2.7%)
Low	98 (98%)	151 (96.8%)	249 (97.3%)
<i>Miscarriage</i>			N=260
Yes	15 (14.9%)	28 (7.6%)	43 (16.5%)
No	86 (85.1%)	131 (82.4%)	217 (83.5%)
<i>Abortion</i>			N=260
Yes	5 (5%)	4 (2.5%)	9 (3.5%)
No	96 (95%)	155 (97.5%)	251 (96.5%)

NOTE Numbers may not add up to 261 because missing data.

ranging from 1 (never) to 5 (always). The total score can range from 6 to 30, with higher scores indicating higher levels of maternity social support. Based on results of an unreported pilot study, the authors indicated cut-off points to distinguish the different levels of maternity social support: The subjects obtaining a score inferior to 18 have a low level of support, the subjects obtaining a score between 19 and 24 have a medium level of support and, finally, the subjects obtaining a score superior to 24 have an adequate level of support.

The Center for Epidemiologic Studies Depression Scale, Italian version CES-D (Fava, 1981) is a self-report scale which assesses the depressive symptoms. It consists of 20 Likert-type items ranging from 0 (it has never happened to me or almost) to 3 (it has always happened to me or almost always); 4 items are reverse scored. The total score of the CES-D, which can range from 0 to 30, assesses the depression level; a cut-off of 23 is normally used to discriminate the subjects with a higher risk of depression. The instrument showed a good internal consistency in a non-clinical sample (Cronbach's $\alpha = .85$).

The Prenatal Attachment Inventory, Italian PAI version (Della Vedova, Debrassi, & Imbasciati, 2008) is a self-report scale consisting of 21 Likert-type items ranging from 1 (almost never) to 4 (almost always). Total scores can range from 21 to 84 with higher scores indicating higher levels of prenatal attachment. The Italian version of the instrument showed a good internal consistency (Cronbach's $\alpha = .87$).

The sociodemographic and anamnestic questionnaire investigates age, nationality, level of education, occupation, marital status, years of marriage and years of couple relationship, gestational week, parity, pregnancy risks, desired and planned pregnancy, miscarriage, stillbirth, and abortion.

Procedure

The study was presented to the women participating in childbirth education classes at St. Orsola Hospital (Brescia) and at district 3 of the public medical service (Ulss 20 Verona). The women, who agreed to signing the consent form, filled in the research sheets in the childbirth education classroom in the presence of a psychologist and a midwife. The study was presented to the women on the first day of the childbirth education class so that the answers were not influenced by the information they obtained during the course; the participation in the investigation was voluntary and anonymous. The

time period for data collection was six months.

Data analysis

The analysis was carried-out with the SPSS 14.0 version of Windows. To evaluate the internal consistency of the MSSS scale, Cronbach's Alpha coefficient was calculated. The Kolmogorov-Smirnov test was applied to examine the distribution of the MSSS scores. Kruskal-Wallis and Mann-Whitney tests were used to compare sociodemographic and pregnancy characteristics in the sample concerning recruitment sites. The Mann-Whitney test was used to determine if MSSS scores varied according to the site of recruitment, nationality, parity, desired and planned pregnancy, pregnancy risk, and previous miscarriage. The Kruskal-Wallis test was applied to determine if MSSS scores varied according to the education level, occupation, and marital status. The Spearman's rho coefficient was calculated for the quantitative characteristics, such as women's age, years of marriage and couple relationship, number of previous children, and gestational age.

To evaluate the relationship between the level of social support and the level of depression and between the level of social support and the level of prenatal attachment, the Spearman's rho coefficient was also calculated between the MSSS score and the CES-D score as well as the PAI score.

RESULTS

The mean MSSS score was 25.93 (std. deviation=2.849); scores ranged from 15 to 30 (possible range = 6 to 30). The values of the MSSS total score were not normally distributed ($z=2.352$, $p=.000$). The internal consistency was calculated by the Cronbach's alpha coefficient, which was .516 (Table 3). Both these results are discussed below in the discussion.

According to the Webster cut-off criterion (Webster et al., 2000), 4 women (1.5%) were classified with a low level of social support, 62 (23.8%) with a medium level, and 195 (74.7%) with an adequate level of social support.

The Mann-Whitney test provided no significant statistical difference with the MSSS score concerning socioanamnestic characteristics of the sample with regards to recruitment sites ($p=.110$), nationality ($p=.238$), desired ($p=.106$) and planned pregnancy ($p=.257$), miscarriage ($p=.051$), pregnancy risk ($p=.825$); while it

showed significant difference with regards to parity ($p=.008$) and abortion ($p=.044$). The Kruskal-Wallis test provided no significant statistical difference with the MSSS score due to the marital status ($p=.055$), while there was a difference with regards to the education level ($p=.023$) and occupation ($p=.022$). Moreover, in this sample, the MSSS total score showed no correlation with the women's age ($p=.589$), the years of marriage ($p=.522$) and the years of couple relationship ($p=.335$), or with the number of previous children ($p=.060$) and the gestational week ($p=.056$).

The CES-D and the PAI were correctly completed, respectively, by 211 (80.84%) and 245 (93.87%) women, that obtained a CES-D mean of 11.39 (std. deviation= 7.398) and a PAI mean of 60.73 (std. deviation=9.148). the Cronbach's alpha coefficient was .835 for the CES-D and .866 for the PAI (Table 3). According to the depression cut-off criterion (CES-D) suggested by Fava (33), 15 women (7.1%) showed depressive symptoms.

Finally, the MSSS total score negatively correlated with the total CES-D score ($\rho=-.343$, $p=.000$) and positively with the total PAI score ($\rho=.168$, $p=.028$).

Table 3: Cronbach's alpha Coefficient, mean, std. deviation, median and range of MSSS, PAI and CES-D scores.

	<i>MSSS</i> (<i>N=261</i>)	<i>PAI</i> (<i>N=245</i>)	<i>CES-D</i> (<i>N=211</i>)
Cronbach's α	.516	.866	.835
Mean	25.93	60.73	11.39
Std. Deviation	2.849	9.148	7.398
Range	15-30	37-83	0-40

DISCUSSION

The main purpose of the present study was to assess: 1) the relationship between the level of social support and the level of prenatal attachment, and 2) the relationship between the level of social support and the level of depression, in 261 pregnant women.

MSSS total scores of our sample women were not normally distributed. The high value of the total score indicated that most of the subjects of this study were inclined to have a high level of social support. First of all, this tendency could be tied to the peculiar characteristics of our sample: it mainly consisted of young Italian women, with a good education level and a stable working occupation, mostly married or with a stable relationship, and participating in a prenatal education course. This result is not surprising because other studies found that women recruited from childbirth classrooms were inclined to show the highest response rate with regards to social support perceived as well as other indexes, like the attachment to their foetus (Mercer & Ferketich, 1990; Fuller, Moore, & Lester, 1993; Dabrassi, Della Vedova, & Imbasciati, 2007). It is not clear if this disposition was due to the peculiarity of the characteristics of our recruited sample, which may have been women who really enjoy a positive, supportive situation, or it might have resulted from social desirability influencing the choice of answers.

The tendency to have the highest response scores, in a dimension similar to our dimension, has also been found by another research study (Prezza & Principato, 2002). That study was conducted on a more heterogeneous Italian subject sample than what we had considered (not only pregnant women): The sample was composed of men and women between 18 and 77 years of age, residents in centre-southern Italy, and subjects were contacted in different residential and cultural areas, as well as recreational circles and universities. The authors found that the total score of social support varied with regards to the women's age and marital status; our data did not confirm that result.

Our analysis reveals, in fact, that the level of social support showed statistical significant differences with regards to education level and occupation: women with a higher level of education and that have a clerical or a free-lance job may have more potential sources of social support. The primipara women seem to have more social support than women who have had previous pregnancies. This was true as well for women who had never had an abortion in comparison to those who had. This data confirmed the diffused idea that women who cannot

count on the help of their own partner and who show risk characteristics, also have less support.

A negative correlation emerges from the analysis between the level of social support perceived by the women and the level of depressive symptomatology ($\rho = -.343$) during the pregnancy. This result confirms the negative relationship ($\rho = -.24$) which emerged from the Collins' study (1993) underlining social support, particularly that of the child's father, is to be considered a factor of prevention of possible depression, as has been highlighted by other studies (Cramer, 1999). It also emerges that a good level of social support is connected to a good level of prenatal attachment ($\rho = .168$). This result seems to confirm the idea that a family climate in which there is support among the family members is positively correlated with the maternal attachment to the foetus (Cranley, 1984; Fuller et al., 1993; Condon & Corkindale, 1997; Wilson et al., 2000; Salisbury, Law, LaGasse, & Lester., 2003; Della Vedova, 2005).

Considering the value of the Cronbach's alpha ($\alpha = .516$), the questionnaire doesn't show a good internal consistence; in fact also eliminating item 5, with which the Cronbach's alpha would reach .543, the value would not reach the $\alpha > .70$ threshold, pointed out by the scientific community as an index of good reliability (Nunnally & Bernstein, 1994). A hypothesis could be that the Italian translation is not adequate, but our translation was developed by a translation-backtranslation procedure and so it is more probable that the problem could be due to cultural differences (language, sociocultural context, etc.) between the Italian and Australian population. The two cultures may give different "emotional" meanings to different items, even if they were correctly translated. Despite the six items with clarity in the Italian version (verified with the use of the back-translation procedure), it is possible that these items are considered not very significant by the women of our sample or that they explore such different aspects of social support, that they do not have coherent results among themselves (internal consistency). The last hypothesis could be that the questionnaire has a low level of validity even in the original version. It will be interesting to build an ex-novo questionnaire that is not spoiled initially by these cultural biases and by the structural defects of the scale, based on the above mentioned considerations.

CONCLUSION AND IMPLICATIONS FOR PERINATAL CARE

Social relationships play a central role in shaping the quality of a person's life, particularly on health and wellbeing. Although there is fairly strong evidence that social support is beneficial to wellbeing, it is not always taken into consideration in health research studies. This may be due, partially, to the difficulty of assessing and of operationalizing the social support construct in order to create reliable measuring instruments. As a result, there are sometimes gaps present in the literature. We also had some problems choosing the instrument in our study.

The present research aimed at studying social support in a group of women experiencing a significant life change, i.e. pregnancy, which may increase the importance of social support.

As has emerged from previous studies (Raynor, 2006), our results confirm that low levels of support during the prenatal period are associated with low levels of prenatal attachment and high levels of depression. This could have harmful effects on the pregnancy outcome or on the development of the child. Women for whom social isolation or a low level of support from the child's father or their parents, especially in the case of young mothers, should have available further support from the socio-clinical and professional personnel (Norbeck, DeJoseph, & Smith, 1996). It is, therefore, important to have a reliable indicator to assess maternity social support in clinical interviews and to identify women at-risk. By doing this, it is possible to verify the low level of social support of these subjects in order to plan focused intervention (for instance, insertion in support groups or direct services).

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The Best and Worst Time of My Life: The Lived Experience and Meaning of Pregnancy in Women with Mild to Moderate Depression

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ABSTRACT: The notion that pregnancy can, for some women, be a time of unhappiness and depression has only recently been recognized in media and by the general public. Although researchers and clinicians have begun to study antenatal depression with regards to prevalence, associated factors, and treatment approaches and outcomes, less is known about women's lived experience of this phenomenon. A hermeneutic phenomenological study was conducted with six pregnant women who scored 10, 11, or 12 on the Edinburgh Postnatal Depression Scale, indicating mild to moderate symptoms of depression. Participants were interviewed individually regarding their experiences of depression during pregnancy. Data generated in the form of transcripts were analyzed and five themes emerged: disconnection vs. new connection and/or reconnection; loss of identity vs. new identity; fatigue and illness vs. vitality and wellness; anxiety and insecurity vs. confidence and security; and sadness and hopelessness vs. joy and expectation. The overarching shared meaning of these experiences was ambivalence. Findings provided rich, thick descriptions of the lived experience and meaning of antenatal depression. Future research and implications for counseling practice are discussed.

KEY WORDS: Pregnancy, antenatal depression, qualitative, ambivalence, lived experience, lived meaning.

INTRODUCTION

Pregnancy is often thought of as a joyous time, and for many women it is, but for some women, pregnancy is filled with unhappiness, hopelessness, and depression. Recent media attention has captured the most sensational cases of depression during

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pregnancy and postpartum. In the United States, media frenzy occurred when Andrea Yates drowned her five children in the bathtub (Houston Chronicle, 2006). In Canada, Suzanne Killinger-Johnson threw herself and her baby in front of a moving subway train (Mahar-Sylvestre, 2001). Both cases may have brought some awareness to postpartum depression; however, far more attention was paid to the sensationalized aspects of these cases than to the women's experiences leading up to these incidents.

Though postpartum depression has become a more recognized diagnosis due to recent coverage in media, depression during pregnancy, or antenatal depression, has remained poorly understood among the general population and the health and mental health care systems. Though antenatal depression is not differentiated from other forms of depression in the DSM-IV, it is unique because of the context in which it takes place, and the effects that it can have on the mother and fetus (Stewart, 2005).

Most women who are depressed during pregnancy and/or postpartum face depression in their everyday lives without proper identification and treatment (Marcus, Flynn, Blow, & Barry, 2003). However, researchers and clinicians have now begun to pay attention to antenatal depression as evidenced by reports related to diagnostic issues, prevalence, and factors associated with the condition (e.g., Bowen, Stewart, Baetz, & Muhajarine, 2009; Bennett, Einarson, Taddio, Koren, & Einarson, 2004; Marcus et. al., 2003). Still, the lived experiences of these women have very rarely been studied, leaving their voices unheard. To address this oversight, a hermeneutic phenomenological method was used to answer the following questions: What is the lived experience of pregnancy for women with mild to moderate depression? What is the lived meaning of pregnancy for women with mild to moderate depression?

BACKGROUND

Antenatal depression can be defined as major depressive disorder occurring during pregnancy. If the criteria for the diagnosis of major depressive disorder are met, and the woman is pregnant, her condition would be described as antenatal depression to reflect both the disorder and the context.

Prevalence

Bennett, Einarson, Taddio, Koren, and Einarson's (2004)

systematic review of antenatal depression provided the most comprehensive information to date regarding prevalence. They found that of the 21 articles from around the world that fit the study criteria, prevalence rates of antenatal depression varied greatly. With a confidence interval of 95% average prevalence rates of antenatal depression among the general population of pregnant women were 7.4% in their first trimester, 12.8% in the second trimester, 12.0% in the third trimester.

Associated Risk Factors

Many of the associated risk factors for antenatal depression are related to women's circumstances or surroundings along with something organic in nature. These factors include: (1) relationships, (2) financial situation, (3) educational history, and (4) employment.

Women who are unmarried, recently divorced, or have recently lost an intimate relationship have higher rates of antenatal depression. In Brazil, Lovisi, Lopes, Coutinho, & Patel (2005) researched 230 women in their third trimester comparing demographic, social, and medical information with scores on the Composite International Diagnostic Interview. Analysis revealed that divorced women and women who experienced the loss of an intimate relationship had higher scores on the depression scale. Marcus and associates (2003) found that unmarried women were at greater risk for antenatal depression in their study of 3,472 women.

Poverty and factors generally associated with poverty, such as unemployment and low educational attainment are related to antenatal depression. Rubertsson, Wickberg, Gustavsson, & Radestad (2005) found that unemployment was associated with higher scores on the EPDS in their Swedish sample of 2,430 pregnant women. Marcus and associates (2003) and Lovisi and associates (2005) found that education levels are related to antenatal depression. Lower levels of education were found to be a risk factor for antenatal depression (Marcus, et. al., 2003), while attaining levels of education higher than elementary school were found to be protective against antenatal depression (Lovisi, et. al., 2005).

Experiences of Pregnancy

Studies of pregnancy designed to include the pregnant woman's perspective provided a backdrop for this project. Though these qualitative inquiries are not exploring depression in pregnancy, they offer deeper knowledge about the lived experience of pregnancy among

a variety of populations and circumstances, as well as an examination of women's experiences in contrast to dominant, socially constructed notions of pregnancy and motherhood.

Armstrong and Pooley's (2005) phenomenological study was conducted to explore the lived experience of pregnancy with a focus on experiences of support. Analysis of the interviews conducted with 13 pregnant women revealed six themes: (1) support during pregnancy, including the experience of being supported, lack of support, barriers to support, and ideal support; (2) experience of pregnancy, including positive and negative experiences, mixed feelings about the pregnancy, and spiritual experiences; (3) finding information; (4) changing values; (5) model of care; and, (6) being responsible. Their findings also suggested that support and guidance may improve the women's experience of pregnancy.

Belgaumkar (2001) interviewed six women from Saskatchewan, ranging in age from 15-21 to explore adolescent women's perceptions of social support during pregnancy and post partum. Analysis revealed an overarching theme of the importance of "not being alone." Five interrelated constructs contributed to their feelings of not being alone: (1) social networks; (2) social and personal identities; (3) experiences of support as a give and take process of exchange; (4) conflict as part of social interaction; and, (5) the importance of valuing and feeling valued within their relationships. Belgaumkar's study also acknowledged the importance of the women's own appraisals of social support, rather than relying on a standardized measure of a predetermined definition of social support.

Leichtentritt, Blumenthal, Elyassi, and Rotmensch (2005) conducted 10 focus groups with Israeli women who were hospitalized due to high-risk pregnancy with the intention of understanding the lived experience of hospitalization due to high-risk pregnancy. Analysis yielded five themes: (1) the desire and social pressure to nurture; (2) the personal and social meaning of family; (3) the loss of experiences of childbearing and of normal life activities; (4) the conflict between a woman's needs and the well-being of the fetus; and (5) sources of strength and sources of stress. An overarching theme of ambivalence was found between the feelings and experiences of the women and their perception of social norms and expectations. This research included the context in which the women lived, recognizing how the influence of culture, religion, and gendered norms impact a women's experience of pregnancy. The inclusion of context provides a more critical analysis of the everyday experience of pregnancy because it acknowledges the role societal norms and expectations play in a

woman's experience.

Houvouras (2006) suggested that dominant notions of reproduction that view pregnancy and childbirth simply as physical processes that take place in women's bodies are limited because they ignore the non-physical components of these processes. Houvouras interviewed 15 women about their conceptualizations of childbearing and found that the participants constructed their childbearing experiences as taking place in multiple locations: (1) within the female body; (2) within both the female body and a non-physical realm (e.g., emotional realm) of one or both partners; (3) detached from any particular location; and (4) within both partners bodies. Houvouras's research acknowledged that notions of pregnancy are socially constructed and noted how dominant constructions of pregnancy and childbirth, which are located in a physical realm, ignore women's own constructions of these experiences.

Rudolfsdottir (2000) investigated how healthcare discourses affect the experiences of pregnant women by analyzing medical discourses in handouts and booklets readily available to pregnant women, as well as young women's own accounts of pregnancy and motherhood. Analysis of the healthcare literature revealed four themes which Rudolfsdottir called strategies used for minimizing the agency of pregnant women: (1) the detached body; (2) emphasis on emotional instability; (3) pregnant women and new mothers infantilized; and (4) the fetus as subject. She found a contrast in the women's experiences of pregnancy and childbirth as well as criticism of the literature to which they were exposed. She found that the women who had positive pregnancy and birthing experiences placed themselves centrally in their experience, rather than their bodies, the interventions done, or the fetus as separate from themselves, thus recognizing their own agency. Women who had negative experiences attributed the experience to not being seen as autonomous agents. They felt that they had been treated as patients or children or simply as physical bodies without awareness of what was happening. Rudolfsdottir's research suggested that the removal of a woman's agency had a negative impact on her experiences of pregnancy and childbirth. This illustrates how social discourses can have a negative impact on a seemingly natural experience.

Social Construction of Pregnancy and Motherhood

These studies suggest that, although pregnancy and childbirth are naturally occurring phenomena, they occur within a social context that creates expectations and parameters that are not inherently found in

the experience. These expectations and parameters are the socially constructed elements of an experience. In addition to social constructions of pregnancy and birth, there are constructions of motherhood. Woollett and Boyle (2000) described a social construction of motherhood in their editorial introduction to a special issue on motherhood:

Motherhood is constituted as compulsory, normal, and natural for women, for their adult identities and personal development, and is regulated through binary oppositions in which the warm, caring and `good` mother is contrasted with `bad` mothers, selfish, childless, and career women, and empty and deficient infertile women. (p. 309).

They continue with a description of the appropriate parameters in which motherhood should take place. These parameters include women who are married, heterosexual, economically stable, able-bodied, and are not too young or too old.

After researching the social construction of motherhood, Hays (as cited in Arendell, 2000) coined the term intensive mothering to describe the dominant expectations of motherhood in North America. According to this ideology, mothers are the ideal, preferred caretakers of children. Intensive mothering is expert guided, emotionally absorbing, and labor intensive. Arendell (2000) interprets the mother in this type of mothering as being devoted to the care of others, self-sacrificing, without needs and interests, and the "good" mother. These requirements are based on a social construction of the ideal family, which is comprised of a heterosexual, middle-class couple (Medina & Magnuson, 2009). Thus, women who do not wholly fulfill this role are not good mothers.

A review of the literature identified a substantial body of quantitative research regarding diagnostic issues, prevalence, and associated factors of antenatal depression. Qualitative inquiries have examined the lived experience of pregnancy in general and extraordinary circumstances but have not explored women's lived experience and meaning of pregnancy with depression. Women's perspectives of pregnancy and childbirth in contrast to dominant notions of these experiences, along with analysis of the social construction of motherhood provide a context for inquiries about childbearing.

METHOD

Participants

Six women were recruited for participation in the study. Access to participants was gained through the larger quantitative study, "Feelings in Pregnancy and Motherhood." The criteria used in selection of the six participants were to ensure that the information provided was rich and full in description and free from circumstances which may cause unnecessary distress to the participant. Participants were pregnant; self-identified as having never lost a child; and scored 10, 11, or 12 on the Edinburgh Postnatal Depression Scale, indicating mild to moderate symptoms of depression.

Many depression inventories are inadequate in identifying depression in pre and postnatal women. Items on these scales are closely associated with the somatic features of pregnancy and postpartum (weight gain or loss, fatigue). However, the Edinburgh Postnatal Depression Scale (EPDS) excludes these physical symptoms of pregnancy as indicators of depression. This scale was designed to assess depression specifically in women in the postpartum phase. It identifies depression in postpartum women better than other inventories because of its sensitivities to the physical symptoms of pregnancy (APA, 2000). The EPDS has also been validated in antenatal populations (Murray & Cox, 1990) and across a variety of languages and ethnic populations (e.g., Adouard, Glangeaud-Freudenthal & Golse, 2005; Gausia, Fisher, Algin, & Oosthuisen, 2007; Mazhari & Nakhaee, 2007).

The six women ranged in age from 23 to 33 years old. This was the first pregnancy for four of the participants, the second pregnancy for one participant, and the fourth pregnancy for one participant. One of the pregnancies was unplanned. All of the women were in committed, long-term relationships with the father of their child. Four of the women were married and two were engaged to be married.

Levels of education varied from obtaining a high school diploma being the highest level of education attained for two participants, Bachelor degrees for two participants, and two participants were working on their Master's degrees. Four of the participants were working full-time at the time of the interview and two were employed part-time. The financial status of the participants ranged from less than \$20,000 per year to more than \$60,000 per year.

Four of the participants were living with their partners (and children) full-time. One of the participants lived with her fiancé part-

time, as her fiancé worked away from home. One participant was living alone while her partner was in another province in the Armed Forces. Four of the participants owned their own home.

Data Generation

One interview was conducted with each woman. Interviews ranged in time from 45 minutes to 90 minutes. Interview questions were guided by Max van Manen's lifeworld existentials: corporeality (lived body), relationality (lived relationship), temporality (lived time), and spatiality (lived space). Though van Manen's lifeworld existentials are generally used as an analytical framework (van Manen, 1990), they were used as an exploratory tool in this study. The guided interview was designed to facilitate about the four lifeworld existentials as a way of encouraging the participants to reflect on and express all aspects of their experience. Reflecting on their experience through the lenses of corporeality, relationality, temporality, and spatiality provided a more complete or holistic account of the experience and meaning of pregnancy for the women in this study. Interviews were audio recorded for purposes of transcription and analysis.

Thematic Analysis

Analysis of the transcripts was completed using van Manen's (1990) three approaches to thematic analysis of text. First is the holistic or sententious approach. This approach involves reading larger sections of text and determining broad, overarching themes. The second approach is called the selective or highlighting approach. This approach involves the researcher attending to pieces of text which stand out, or pieces of text, which seem to be repeated, and determining the themes of these important sections of the text. The third approach is called the detailed or line-by-line approach. In this approach the researcher attends to each individual line of the text and pulls specific themes from each line. All three of these approaches were used to create a comprehensive thematic analysis from which an overarching shared meaning and five sub-themes emerged.

RESULTS

Shared Meaning: Ambivalence

“It was the best and worst time of my life.”

All of the women described experiences that seemed dissonant. They described both positive experiences and negative experiences. Of course, human experiences are complex and, therefore, are rarely completely positive or negative, but this seemed more significant than the usual good and bad parts of life. Instead, the positive and negative experiences were connected to each other and became one whole dissonant experience resulting in ambivalence about their experiences.

Further analysis uncovered sub-themes of dissonant experiences. These five themes are distinct enough to stand as categories; however, they are strongly interconnected with each other and with the shared meaning of ambivalence. These themes include: (1) Disconnection versus New Connection and/or Reconnection; (2) Loss of Identity versus Newfound Identity; (3) Fatigue and Illness versus Vitality and Wellness; (4) Anxiety and Insecurity versus Confidence and Security; and (5) Sadness and Hopelessness versus Joy and Expectation.

These dissonant sub-themes are presented and described as a conflict structure (i.e., versus) because these experiences appeared to have a push-pull affect on the participants. The words dissonance and ambivalence, rather than dichotomous or contradictory, are used because the relationship is not only one of conflict, but rather mutual in that the push-pull creates a transformative experience. Thus the experiences of two seemingly separate phenomena become one complex experience.

Theme 1 – Disconnection Versus New Connection and/or Reconnection. All of the participants experienced a sense of disconnection and new connection or renewed connection during their pregnancy, although they varied in who they experienced disconnection or new connection with.

Chloe illustrated this theme when she discussed the disconnection she felt from her parents upon telling them she was pregnant:

So, with my parents, I feel a lot more alienated from them. I feel like they don't, like I don't have their approval or acceptance for it. So that's kind of a barrier, like when I told them, they both just stood there like a deer in the headlights and then we didn't talk

about it again for days. And you know, they live in Ontario and I was there visiting for a week. Like we went just to tell them and it just got kind of dropped and ignored, so that kind of made me feel ashamed about the whole thing. I started questioning myself. So that's kind of made me feel a bit of a separation from them.

Chloe experienced disconnection from her parents when their response was different than she had expected. However, she felt a new connection with her mother as she was about to become a mother herself:

I know it gives me a better understanding of why my mom treated me the way she treated me my whole life. And that was very good. And she was very overprotective and just always really worried about me and I used to get so annoyed by that because I was like, stop worrying about me... But now that I have a daughter, it's terrifying. Like every time I feel a little bit of a twinge or a cramp, I immediately go into that mother mode... And so, now I understand and I don't think I ever understood that capacity to love another person, so I appreciate how much my Mom loves me now because I know how much I love my child and it's not even born yet.

Like Chloe, all of the participants experienced disconnection and connection with various individuals in their lives. Experiences of disconnection often resulted in feelings of loss, lack of support, isolation, and guilt. Connection and reconnection created feelings of support, love, intimacy, and solidarity. Though the new and renewed connections may have created some balance for the negative feelings associated with disconnection, we cannot assume that either of these experiences was dominant in all or any of the participants. The simple fact that each of the participants described both phenomena suggests that disconnection and connection were important experiences in their pregnancies.

Theme 2 – Loss of Identity Versus Newfound Identity. The four participants who were to be mothers for the first time experienced a loss of identity and a newfound identity. The two participants who were already mothers did not talk about this experience and I did not ask them about it as this theme emerged after data was collected. The four participants who were expecting their first child experienced a loss of identity. They had some understanding of how their life was changing with pregnancy and how it was about to change with the

birth of their first child. For some, it was the loss of their roles in their career. For others, the sense of loss was regarding their individuality. However, they also sensed new identities and roles for themselves. The expected new role of mother brought mixed feelings in terms of excitement and overwhelm. Some of the participants described this new role in terms of a fantasy. Some recognized the overwhelming sense of responsibility. Others thought about the kind of mother they would like to be.

Daphne illustrated this theme when discussing the changes in her career path as she was about to become a mother:

All of a sudden it was like, ok it's never going to be just about me anymore. And now I am completely fine with that, but just for that first stage. And then starting to wonder career-wise, and things that I haven't done yet. Ok, I haven't traveled as much as I wanted to maybe. And a promotion came up at work that's going to involve a lot of national travel and I started to think about maybe not... maybe holding off on trying to get pregnant to explore this job for a year or two and see how that went. Then I found out I was pregnant and went, oh ok I guess... and now I'm still going to interview for the job and can still do it, but obviously it is going to change things because I'll only be able to do it for maybe a year instead of two if I'm on mat leave. So I think that too, that was part of me being selfish... because all of a sudden it's real.

The loss of identity and experience of finding a new identity speaks to the significance of the transition these first time expectant mothers were experiencing. The recognition of their new responsibilities, sacrifices, and loss of autonomy brought feelings of discomfort and grief and consequently guilt; however, all of the women were simultaneously experiencing a sense of newfound identity as mothers. Though this was scary and unknown, the women prepared to integrate this new role into their identity by sorting through knowledge gained through their own experiences of being parented, literature, and societal norms.

Theme 3 – Fatigue and Illness Versus Vitality and Wellness. All of the participants experienced exhaustion, fatigue, nausea, and vomiting in their pregnancy. The sheer volume of data gathered regarding these experiences speaks to the significance of them. These experiences played a large role in how the women felt physically and emotionally during their pregnancies. Chloe had an understanding of

the connection between her physical health and her emotional well-being:

Really, really rotten and just constantly felt like I was sick and felt like I had stomach flu for three solid months and didn't want get off the couch and didn't want to go outside...And I think that when you feel that way, like your body is really sick then it makes your mind... it's really hard on your emotional state too.

In contrast, the participants described experiences of wellness and vitality even within their periods of fatigue and illness. For some, this was experienced as a newfound energy. Others noticed changes in their bodies that they felt were symbolic of wellness. Taking better care of their bodies during pregnancy seemed to account for some of this vitality and wellness, but Chloe described this experience as something new, something that she had not experienced previous to becoming pregnant and therefore attributed the experience to pregnancy:

I feel very... I don't know the word. Alive!.. It's the difference of looking at a black and white TV versus a color TV. And I feel that before everything about me was just a black and white TV. You know, it was fine, there was nothing wrong with it, but now it's like everything is so much more vibrant and I feel like my body is this amazing machine that's doing this amazing thing and it's just so much more exciting now. It changes every single day. So that's really exciting.

Though all of the participants experienced fatigue and physical illness, they noticed a new level of energy that they had not experienced before. This energy and wellness was described both in terms of physical wellness (i.e., nail and hair growth, vigor) and psychological wellness (i.e., alertness, receptivity, and zest). The awareness of these changes seemed to also create a sense of awe about their bodies.

Theme 4 – Anxiety and Insecurity Versus Confidence and Security. The participants described feelings of anxiety and insecurity that they attributed to pregnancy; however, they also found that pregnancy brought a new sense of confidence and security. Some of the anxious experiences were about their changing bodies and the resulting insecurities about their relationships. Uncertainty about their own health and the health of their babies also caused anxiety for some of

the women.

Alison talked about the anxiety she felt about her parents' reaction to her unplanned pregnancy:

Yeah just because my image in their minds I still feel like I'm 17 and you know, so the fact that I'm getting married... That's another thing, like whoa, she's getting married while she's... she's so young.

Though Alison was 24 years old when she became pregnant, she described feeling like a pregnant teenager. On one hand, pregnancy made her feel young and insecure, but on the other hand pregnancy became a catalyst for asserting herself about her choices. Alison expressed this new assertiveness when describing an ongoing conflict she has had with her parents about her fiancé being in the army.

Yeah it [pregnancy] has changed it [relationship with her parents]. Umm, pregnancy is / was a truth kind of. Like, no this is the way it's got to be now. Like I don't care what you think of the military or your political views or whatever, you know. That is just the way it's going to be now.

All of the participants experienced forms of anxiety and insecurity related to their pregnancy. For some, it was the changes in their bodies, particularly gaining weight that made them feel insecure about themselves and in their relationships with their partners. For some, the possibility of complications and miscarriage and the uncertainty of what pregnancy would bring created vulnerability and anxiety. However, all of the participants gained a newfound confidence and security. A few of the participants expressed a satisfaction with their growing bodies. Some participants found purpose through being pregnant. An appreciation for their purpose and worth along with a protective feeling for their babies led to confidence and assertiveness in their relationships.

Theme 5 – Sadness and Hopelessness Versus Joy and Expectation.

The women experienced feelings of sadness and hopelessness during their pregnancy. They also felt feelings of joy and expectation about their pregnancy and becoming a mother. All of the participants experienced periods of sadness and hopelessness. All of them attributed some of this to the nausea and vomiting they were experiencing in the pregnancy. They were acutely aware of the connection between their emotions and the physical sensations in

their bodies. They described how feeling nauseous caused feelings of sadness and low mood and how in turn their low mood intensified their feelings of exhaustion. Fallon illustrated this connection between her body and mood:

I just felt down everyday. Felt gross and like what am I doing? You know, this is not fun. You always hear the stories, Oh pregnancy is so much fun and I just love it and you know. I wasn't feeling that. I hated it because I was uncomfortable and I was sick and just not feeling good at all and just feeling so tired and so off from what I used to feel.

Though Fallon experienced low times, which she connected to her physical health, she also experienced joy and anticipation:

I'm excited and I'm full of joy and I'm full of... the anticipation is killing me to know... We aren't finding out what the sex is but on the same token it's like, oh you're in there and I just saw you on the screen and I really want to know what you are. So that's really exciting, but also the suspense of it is exciting too. I've always wanted that where you see the movies where they're in labor and going through wicked pain and then it's a boy or it's a girl at the end... I want to hear that.

Like Fallon, all of the participants experienced joy and expectation in their pregnancies. All of the participants experienced both periods of sadness and hopelessness while experiencing other periods of joy and expectation. The periods of sadness and hopelessness were strongly connected to the experiences of physical illness and fatigue. The periods of joy and expectation came from a variety of sources including, enjoying their belly; the anticipation of giving birth; the fulfillment of dreams; and the completion of family.

DISCUSSION

The findings of this study can be positioned within the existing literature about ambivalence, the social construction of pregnancy and motherhood, antenatal depression, as well as popular notions of pregnancy and depression.

Weigert's (1991) discussion of ambivalence is valuable and pertinent to the current study. He builds upon Merton's theories of how sociological ambivalence is the result of contradictory

expectations. This theory accounts for the social constructs in which a person lives, rather than suggesting that ambivalence is simply a psychological phenomenon as Freud had suggested (Weigert, 1991). Furthermore, he suggests that ambivalence can result from contradictory normative expectations within a role, role set, or status. As such, an individual feels ambivalence when the expectations of their role are not congruent with another role in which they occupy, or when the expectations of their role are not congruent with their emotions.

Ambivalence is sentinel to the current study. Revisiting the discussion of the social construction of motherhood through the lens of normative expectations of a role or role set, illustrates the context in which expectant mothers acquire knowledge of what it means to be a mother. Furthermore, the dominant ideology of intensive mothering creates stricter parameters and greater expectations of what it means to be a “good” mother. Thus, pregnancy is not only a physical transformation of a fetus to a birthed baby, but a transformation from a childless woman to a mother. In making meaning of this transformation, and subscribing to the expectations of motherhood, there is undoubtedly some inner conflict with regards to what must be sacrificed physically, emotionally, psychologically, and logistically resulting in some ambivalence. This is illustrated in the theme loss of identity versus newfound identity. The participants were realizing what they had to give up in order to fulfill their expectations of motherhood. The contradictory experiences created between the normative expectations of motherhood and the symptoms of depression could also result in ambivalence. This was illustrated in the themes sadness and hopelessness versus joy and expectation, as well as anxiety and insecurity versus confidence and security.

Weigert (1991) discussed how ambivalence is often experienced as an undesirable state. He suggested that ambivalence feels uncomfortable because in an individualistic and competitive society, ambivalence is seen as indecision, a sign of a weak ego, or as blurred values. In the current study, the participants made reference to this either in the interview process or after the interview, when I asked them about the process. They shared how their uncertain feelings were things they could not talk about with others. The expectation was that they were filled with joy when they were feeling well, or they were feeling negative when they were sick or had a difficult day. They perceived others’ expectations to be black or white about their experiences. In reality they were feeling contradictory feelings most of the time and felt uncertain, or “wishy-washy” or “like I don’t know how

I'm feeling, so how can I describe it to you?" However, ambivalence could be seen as functional, rather than as weak or undesirable (Weigert, 1991). Ambivalence shows women's ability to identify and perhaps confront issues related to their experiences of pregnancy. Lichtentreit and associates (2005) also suggest a positive side to ambivalence. They suggest that ambivalence is a dialectical concept that can have a calming influence on an individual because of the possibility of positive outcomes. For example, the women in the current study had positive feelings which contradicted their negative feelings in each of the five themes.

When we examine popular notions of the two components of antenatal depression, pregnancy and depression, we gain some clarity around our expectations of these two phenomena. Popular notions of pregnancy include concepts of joy, anticipation, glow, motherhood, calm, and relationships with partner, family, and the unborn child, etc. All of these notions are generally positive and evoke a sense of beauty and goodness. Popular notions of depression tend to be very negative. Concepts like sadness, lethargy, gloom, isolation, uncertainty, loss of identity, and illness evoke a sense of darkness and misery. As such, popular notions of pregnancy and depression, or antenatal depression are dissonant. If we are to assume that a woman with antenatal depression has "symptoms" of both pregnancy and depression, we might assume that she would encounter a very dissonant experience, and thus feel ambivalent about her circumstances. As such, we could tease apart the dissonant themes found in this study to align with pregnancy: connection, newfound identity, vitality and wellness, confidence and security, and joy and expectation; and with depression: disconnection, loss of identity, fatigue and illness, anxiety and insecurity, and sadness and hopelessness. When these themes were experienced simultaneously, dissonance and a resulting ambivalence occurred.

Two qualitative studies about high-risk pregnancy were particularly relevant to the present study. Though these studies were not about antenatal depression, they succeeded in giving voice to pregnant women's experiences. These were particularly relevant in confirming findings of ambivalence.

A qualitative inquiry conducted by Bender (2008) investigated child-bearing decision making in three adolescent women. The study explored the pregnant teens' experiences of deciding to keep the baby, put the baby up for adoption, or abort the baby. The findings indicated a considerable amount of ambivalence in the girls' descriptions. This ambivalence was categorized into three themes: (1) ambivalence about

pregnancy; (2) ambivalence about keeping the child; and (3) ambivalence about motherhood. Though the participants in the study were teens, Bender noted that the participant who experienced the greatest level of ambivalence was the oldest participant at 20 years of age.

Two of the themes in Bender's study paralleled findings in the present study: ambivalence about pregnancy and ambivalence about motherhood. Ambivalence about pregnancy in Bender's (2008) study was illustrated in one participant's comment, "One minute there was great joy . . . and everything extremely bright and happy; then the other minute, it was like everything collapsed." She went on to say: "This is too early for me, I am too young. I think I should have accomplished something more" (p.879). This parallels Daphne's experience of realizing that she had not completed everything in her career that she had intended to complete before becoming pregnant. Ambivalence about motherhood in Bender's (2008) study was expressed in terms about not being ready for the responsibility of motherhood and wanting to remain a teenager. This parallels Alison's experience of feeling like a pregnant teen. She doubted if she was ready for the responsibilities of motherhood. The themes of ambivalence in Bender's study are congruent with some of the themes found in the present study. A phenomenological study conducted by Leichtentritt and associates (2005) explored the experiences of 57 pregnant women who were hospitalized for complications during their pregnancies. The essential theme of their experiences was one of ambivalence:

They feel anxious about and resentful of the situation, only to be filled with hope and confidence in the outcome of this pregnancy. They perceive themselves as being emotionally in yet physically out of the family household. They wish to give birth as soon as possible and at the same time hope to prolong the pregnancy as much as possible for the welfare of the fetus. They define themselves as both sick and healthy, and they attempt to minimize the feeling of risk while seeking and desiring the high level of medical attention demanded by their high-risk condition (p.46).

Though their experience of hospitalization is very different from the participants in the present study, the core themes of ambivalence are congruent.

To summarize, the overarching theme of ambivalence found in the

current study adds to a growing body of research on experiencing ambivalence in pregnancy. The theory of sociological ambivalence could be helpful in further explorations of pregnancy and motherhood. Popular notions of pregnancy, motherhood, and depression illustrate dissonant experiences, which when experienced simultaneously can create ambivalence.

Future Research

Limitations and results of the current study suggest possible future research directions in antenatal depression. First, the homogenous sample of the current study may limit our understanding of antenatal depression. Further qualitative inquiry could investigate the lived experience and lived meaning of pregnancy among women of other ethnic groups, socioeconomic classes, and other age groups could bring a greater understanding of these experiences. Furthermore, qualitative research exploring these experiences in women with more severe symptoms of depression could give the research community deeper insight into the experience and the meanings women attach to their experiences.

The findings of the current study indicate that further research could be completed with a similar population in terms of postpartum reflections on their experiences.

Because pregnancy is a transitional stage in a woman's life, reflection on that stage after moving through it may provide some insight into how the transition affected her as a woman and as a mother.

Implications for Counseling Practice

Counselors need to adopt theories of practice that engage, accept, and are beneficial to pregnant women and mothers. Counselors must be aware of their own biases and belief systems that could impede the counseling process. An awareness of the social construction of motherhood and the expectations created by the dominant ideology of intensive mothering could, at the very least, help counselors acknowledge the expectations their clients carry and, perhaps, help the counselor to be conscious of their own adopted values. Medina and Magnuson (2009) suggest two useful theories to guide counselors who work with mothers: social constructivist theory and feminist therapy.

Social constructivist theory provides a framework where the counselor attempts to understand the meanings a client attaches to her experiences. The counselor encourages the client to explore the

origins of those meanings and evaluate them. The client can then choose to adopt the original meaning with a new understanding, or make new meaning of her experience. In the context of pregnancy and motherhood, the counselor could encourage the client to explore the origins of their beliefs about what makes a good mother. This provides the client with the opportunity to gain deeper insight into her expectations of herself and the expectations she feels are imposed upon her. She can then begin to integrate a new system of meanings if she chooses.

Feminist therapists are concerned with empowering women and helping them have more choices in their lives. The therapist strives to engage the client in an egalitarian and mutual therapeutic relationship. Another strength of feminist therapy is the recognition of a woman's personal life being intertwined with the political sphere. Thus, a woman's presenting problem is rarely seen as pathological, but rather as a best attempt at coping with the constraints of a restrictive and oppressive environment. In the context of pregnancy and motherhood, the feminist therapist would help the client explore the constraints and restrictions she experiences because of the social and political context in which she lives. The therapist would most likely attribute the symptoms of depression to those constraints and restrictions and help the client seek alternatives.

The literature about ambivalence also indicates some therapeutic avenues for pregnant women. Weigert (1991) and Leichtentritt et al (2005) suggested positive views of ambivalence. Ambivalence can be viewed as functional and as a calming influence for individuals experiencing it. Using a strength-based approach, the counselor could plan interventions with the goal of acknowledging the ambivalence and determining the benefit the individual receives from feeling ambivalent. In the context of pregnancy and motherhood, the client could be encouraged to accept the ambivalence experienced during a transitional stage in her life. The client could also view ambivalence as a process of keeping a balanced approach to their feelings and experiences.

The lifeworld existentials were used as an exploratory tool in this study. The participants were able to provide rich descriptions about their experience when reflecting on the questions based on corporeality, relationality, spatiality, and temporality. These questions could be used as an informal assessment with clients in the counseling setting. Asking a client about how her body, relationships, space, and time are experienced during pregnancy would provide her with the opportunity to reflect on her situation in a more holistic way. Her

descriptions of those experiences could provide the counselor with a greater understanding of the client's situation from her own perspective.

This inquiry suggests that as researchers and counseling practitioners, we cannot simply rely on statistical data to assess, diagnose, and treat. The human experience and the social context in which that experience takes place must be acknowledged and validated to better understand, guide and celebrate our clients.

CONCLUSION

In conclusion, this study explored the lived experience and meaning of pregnancy in women with mild to moderate depression. It provided six women with the opportunity to bring their voices to this experience and begin to create an awareness among other women, and health care and human service providers, about the lived phenomenon of antenatal depression. Their experiences revealed a shared meaning of ambivalence; the women described their experience of pregnancy as being the best and worst time in their lives. Five related and interconnected sub-themes further illuminated women's experience of ambivalence during the antenatal period. This study contributes to existing qualitative literature about ambivalence in pregnancy and introduces a qualitative component to the existing literature on antenatal depression.

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Book Reviews

Brought to Earth by Birth. Hartigan, H. (2008) Eugene, OR: Motherbaby Press. 93 pages. ISBN 978-1-890-44642-0

Harriette Hartigan is a photographer and midwife who has passion for the subject of birth. In *Brought to Earth by Birth*, she depicts birth experiences visually through black and white photography and with words describing the mystery and unique relationships that emerge in the process. Her photo essay is depicted with compassion and graciousness. She captures the beauty, the intensity, and the connections to the birth journey with chapters reflecting on pregnancy, labor, birth, and the newborn. The pregnancy spiral embedded in the pages throughout the book could also double for the opening spiral of birth and lens of the camera. One has the sense that Harriette truly respects, and understands as a mother and midwife the mighty work it takes to birth. She also values the photographic image to record and tell a story triggering memories and emotions of the experience.

The book resonates with APPPAH'S belief about the profound importance of connection and relationship. As Hartigan demonstrates, birth is the experience of a lifetime where we face the wonders of creation. Her images express relationships and honor the birth process within – describing connection to self, to other, and to the world. The effort, the required concentration, and the exploration of inner and outer realms are depicted during the intimate moments of birth. Hartigan shows us how this important journey of connection begins with conception, and how it continues to have impact during the birth process and throughout life. In this sense, her photography is purposeful – a visual journal for all to see, review and remember to appreciate the journey. As an artist, Hartigan truly respects, and understands, the mighty work it takes to birth. Her pictures embrace the beauty of pregnancy, connections to place, experience, and to the power of the feminine. The images bring back memories for both those who have delivered, or those who have been delivered.

I appreciated Hartigan's emphasis on the importance of connection, however the photos at the beginning and the end of the book surprised me. In her opening image, I would like to have seen the mother welcome her baby open eyed and at the end of the book I would have liked to see, not just the eyes, but also the connection of baby to other. Hartigan comfortably portrayed male participation in birth and women being supported by their partners. The men seem involved, working, and engaged in honoring the process. Medical imagery is not

obtrusive. Vernix covered infants and the alert newborns are shown in their perfection. Artistic, black and white curves of the belly and stylized figures are depicted and perhaps could have been expanded to be included at the beginning of each chapter. The photographs demonstrate that childbirth is empowering. In Hartigan's images, birth is not just an intellectual experience but also a kinesthetic and emotional one. Her images transmit this directly to the viewer – touching emotions, knowledge and memory.

Hartigan's narrative is interspersed with quotes from well-known people, clients, and herself – capturing the essence of thoughts and allowing the reader the space to explore their own experience.

The strength of the book is the empowering depiction of meeting the task of birth positively. Hartigan helps us remember the gift of life by showing confidence in the process and miracle of our bodies from the beauty of pregnancy, to the trance of labor and welcoming the newborn. The images depict not only the pregnant woman's journey but also the roles of friends and supporters to encourage, touch, and love so that birthing women can do their work throughout conception, pregnancy, labor, and birth.

This is not a how to book on labor and birth. It is a book for medical personnel, nursing, sociology psychology and medical students, midwives, and expectant couples. It will mean different things for different people and allow for personal exploration and reflection of the birth journey, whether our own personal birth story or a recent birth experience. It is a book to be read sequentially.

There is space in the pages that could become a photo journal for pregnant women or couples. It is a gift to expectant couples and those wanting to explore the theme of birth through words and images. Whether in anticipation of giving birth or years later, it is a wonderful book to reflect upon, review and relive experiences.

Through photography and words Hartigan describes and reinforces belief in our capacity to deliver babies – to encounter painful places and trust the body to let go and do what is intended.

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