# Technology, MGBA and Mind Roles in Personality, Health, and Longevity of Humans

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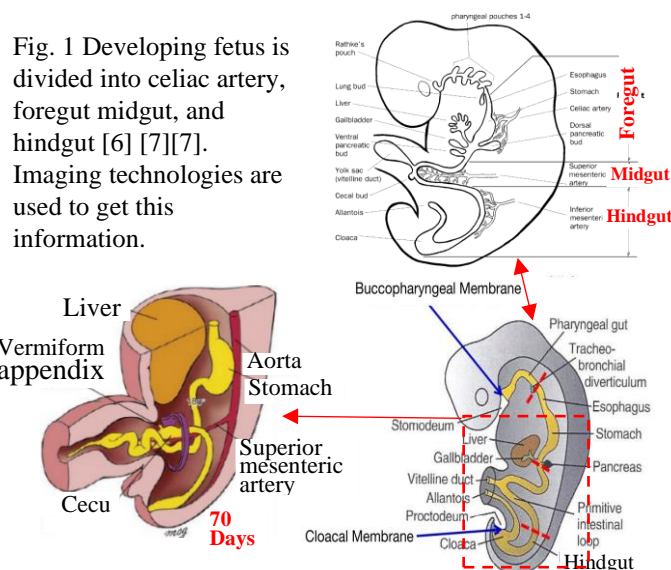Biomedical Engineering, UT Southwestern, Dallas, Texas

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**Abstract:** Using creative approaches, this paper focuses on (i) roles of imaging technologies, MGBA (Microbiome-Gut-Brain-Axis) and mind in personality, human health, and longevity, (ii) why groups led by a human have difference of opinion or fight among themselves, and (iii) why gypsies (led by an ideology and technology) don't fight among themselves and why ants in a colony don't fight. The human personality, quality of life, role/use of new technologies and longevity depend on (a) pre-birth development, (b) post-birth environment & development, (c) early childhood, (d) early education, (d) college and university education, (d) job, and (e) interplay between mind (personality) & brain (survival). This paper identifies reasons why (i) the factors (a) – (e) new technologies are important and (ii) female mind is better in multitasking and male mind in focus. Ideas have been identified that affect some of the factors (a) – (e), role of new imaging technologies and why female mind is better in multitasking male mind in focus. The roles of several new/existing technologies, MGBA and mind in human health, personality and longevity are identified.

## I.     INTRODUCTION

The embryo, after 2 days of conception, has 32 cells, and inner cells become baby's body while outer cells form placenta [1]. Two women's milk is not identical and even one mother's milk is not constant at all time. Brain and body experience fear, stress, trauma and critical incidents [2]. Mind is defined as algorithm based on data generated in MGBA (Microbiome-Gut-Brain-Axis). There is some evidence of microbiome at birth [3] [4][5]. The foregut is supplied blood by the celiac artery, the midgut by the superior mesenteric artery and the hindgut by the inferior mesenteric artery as shown in Fig. 1 [6][7]. Imaging technologies are used to get the information shown in Fig.1.



Fig. 1 Developing fetus is divided into celiac artery, foregut midgut, and hindgut [6] [7][7]. Imaging technologies are used to get this information.

A baby's brain contains the cerebral cortex (Fig. 1) and the frontal and temporal lobes that are responsible for thinking, feeling, and memory. The cerebellum is responsible for directing the body's motor controls and emotions. To keep the body alive the brain stem controls mainly involuntary systems like heartbeat, blood pressure, and breathing. It also controls the digestive process, although hunger cues come from elsewhere. The pituitary gland releases most of the

hormones in the body that direct the metabolism, ovulation, growth, etc. The hypothalamus regulates body temperature, hunger, thirst cues, sleep, and emotions.

As revealed by fMRI (functional-Magnetic-Resonance-Imaging) imaging technology, human brain development starts shortly after conception [8]and it continues, as shown in Fig. 2, emphasizing the brain and body develop together. Thus, data generated in MGBA leads to definition of mind which is an algorithm based on data generated in MGBA [9]. Maternal malnutrition may affect (a) expression of genes for gut homeostasis and (b) alter fetal gut permeability, function, and development. This may have long-term implications for host-microbe interactions, immunity, and offspring gut-brain-axis function. The fetus, brain and body develop simultaneously in the womb.



Fig. 2 Shortly after conception human brain starts developing [8].

Using a very creative approach, this paper focuses on (i) roles of imaging technologies, MGBA and Mind (MGBA Data-based Algorithm) [9]in personality, health and longevity of humans, (ii) why every human is unique including children/adults of the same parents, (iii) why groups led by a human have difference of opinion or fight among themselves, and (iv) why some gypsies (led by an ideology) and ants don't have intra-group fights. The human personality, quality of life and longevity depend on (a) pre-birth development, (b) post-birth environment & development, (c) early childhood, (d) early education, (d) college and university education, (d) job, and (e) interplay between mind (personality) & brain (survival). Ideas have been identified that affect some of the factors (a) – (e) and why female mind is better in multitasking and male mind in focusing as revealed by brain scan technologies used Daniel Amen clinics [10]. How the roles of MGBA and mind affect Quality of Life (QOL) in terms of human health and longevity? QOL can be designed considering the factors (a) – (e) or the stages 1-8 shown in Fig. 3. QOL depends on (i) fetus (mother's QOL), (ii) 0-3 years of childhood, (iii) early education (K-5), (iv) elementary school, (v) middle to high school, (vi) higher education, (vii) profession, and (viii) retirement.

Different ideas have been identified [11][12][13][14][15][16][17]that affect some of the factors (a) – (e) mentioned above and shown in Fig. 3 as 1-8. For example, fetus development [11], effect of maternal malnutrition [12], fathers and social work [13]maternal glucose tolerance [14], conjoined twins [15]pre-birth assessment [16], and effect of maternal anxiety [17]have been studied. Pre-natal brain development is affected by pollution [18]. Mother's diabetes during pregnancy affects fetus diabetes [19]. Link between prenatal and early life stress and asthma development has been studied [20].



Fig. 3 Eight life stages affecting human personality.

## II.  CURRENT APPROACHES

Psychiatry never looks at the organ it treats. Most psychiatrists today look for symptoms by talking with patients. As analogy, neural problems are comparable to chest pains caused by numerous reasons such as heart attacks, heart arrhythmias, pneumonia, ulcers, hepatitis, grief, anxiety, reflux, being hit in the chest, etc. If one gives the same treatment

for chest pain some patients may get better, others may not. So many different things, from chronic stress, relationship problems, financial losses, head injuries, drug abuse, low thyroid, chemical imbalances, genetic tendencies, and grief can lead to depression/anxiety. Consequently, psychiatric medications are controversial; they make some people better and a lot of people worse [7].

Today, useful quantitative techniques are available through Amen Clinic explaining the differences between men and women [10]Early focus on brain scans shows that psychiatric illnesses, such as ADD, anxiety, depression, autism or bipolar disorder, are not isolated disorders [7]. SPECT (Single Photo Emission Computed Tomography) technology research overview in Amen clinic [10][21]is very interesting. Pre-birth protection and the negative role of father was considered. Multiple fetuses become a legal and health issue [22]. Both mother's and fetuses' health are at stake and protecting the fetal brain from maternal stress during pregnancy is important [23]Maternal microbial factors that affect the fetus and subsequent offspring should be protected [24]. To understand and quantify the psychological reasons for a person, one must analyze and understand what happened in 8 stages of human life as shown in Fig 3.

Brain training can improve the attention networks needed for multitasking. Attention network efficiency, sensation seeking, and effortful control might influence the frequency and efficiency of multitasking [25]. The fact that men are better in focusing and women are better at multitasking [26]must be considered in the brought up of the new human while going through eight stages of life.

## III.    EIGHT STAGES OF LIFE

Neurological disorders are medically defined as disorders that affect the brain as well as the nerves found throughout the human body including the spinal cord. The MGBA (Microbiome-Get-Brain-Axis) plays an important role in human neurological health.  This paper (a) reviews research-based data available in the eight stages of life as shown in Fig. 3 and (b) develops a model of why every human is unique. Mind, affecting longevity and quality of life, is an EEG-data-based algorithm at the end of any of these stages and at the end of eight stages.

Why do groups, led by a living being, have differences of opinion or fight among themselves? This is because every human has a unique mind (personality) based on 8 stages of life as shown in Fig. 3. What are the roles of technologies, brain, MGBA, mind, consciousness, and spirituality for a human being? The brain is responsible for survival of species while mind, as MGBA-data-based algorithm, is the leader of everything and anything that a human does. Spirituality has no scientific definition, but it relates to the mind. Consciousness also depends on the mind.

This paper (a) reviews science-based data available in literature about the eight stages of life as shown in Fig. 3, (b) discusses the role of microbiome in diseases, and (c) develops a model of why every human is unique. The 8 stages make every human unique and determine the longevity and quality of life. How to define the mind at any of these stages and near the end of stage 7 is a challenge that this paper addresses.  Stress, diet, and environment affect longevity and quality life of a human being.

**Pre-Birth:** Pre-birth origins of allergy and asthma, and other problems have been identified [27][28]. Pre-birth Stress management has been evaluated using wristbands on mother [29]. The effects of pre-birth happenings are stored in the developing brain of the fetus for stage 1. Pre-natal factors and borderline personality are discussed [30]. The changes in fetus brain can be evaluated during later stages by EEG (Electroencephalogram) measurements as discussed later in this paper.

**Post Birth:** Post birth experiences include hearing, seeing, smelling, tasting, and touching. They are stored in brain development for stage 2. Following a childbirth, 9 - 44% of women experience traumatic condition and 3% develop a post-traumatic stress disorder [31]. These changes in the newborn brain can be evaluated during later stages by EEG. However, the separation of effects of every stage on EEG seems very difficult. The effects of pre- and post-birth components of intergenerational persistence in health and longevity has been studied using adoptees [32]The ethnic studies of childhood education and care have also been conducted [33][34].

**Early Education and Elementary School:** Early education experiences include the environment, people, and positive/negatives experiences. For children, 3–6-year-old, the learning [35]is done by examining the effects of cartoon images in touchscreen media. Learning from comparative ethnographic studies of early childhood education and care is very important [36]. Teachers in trauma care situations subject to traumatic stress and burnout intent to leave education within underserved elementary schools [37]. Oxidative stress and pre-obesity/obesity effects related to inflammation and oxidative stress are important factors [38]. Several other problems related to elementary school environment make this stage very crucial for children's personalities.

**Middle/High School and College:** This stage is extremely crucial for children's personalities as they grow into adulthood. Teacher frustration in a Japanese school [39]is obvious; 0.85 % of teachers took leave of absence due to illness and 65.1 % of them developed mental diseases. Mental health is a significant problem.  What is stress [40][41]and how stress affects the body is shown in Fig. 4; (a) short- and long-term effects and (b) effects on body parts. Stress affects brain, cardiovascular, joints and muscles, immune system, skin, gut, and reproductive system as shown in Fig. 4(b).
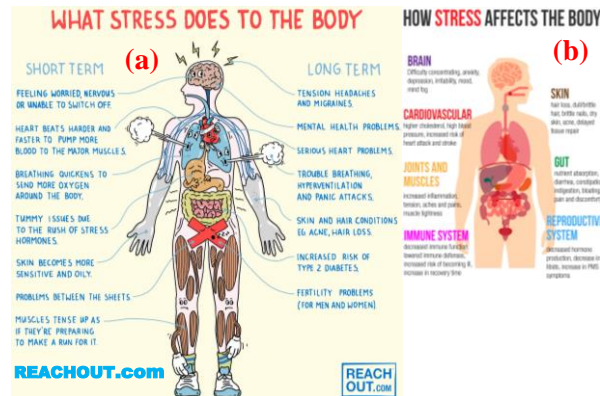


Fig. 4 Effects of stress on the human body;
https://www.greensborochiropractor.net/body-signals-stress/

The author of this paper observed a stress level among female and male student researchers, from a local high school, while doing outreach work in his laboratory during 2000 – 2010 [42]There were female and male high school students in his outreach lab at Michigan State U. When some male students made stereotype comments stating that female students are not good in technology, science and engineering, the female students left author's lab generating stress for all concerned. Dean Aslam contacted the female students and requested them to come back to his lab and work on a K-16 project based only on their own robotic technology ideas. The girls came back and designed a robotic doll using LEGO and programming technologies, shown in Fig. 5, which shows (a) Robotics Invention System (RIS) called RCX and (b) LEGO motors used in their creative design. The latest versions of RIS are called NXT and EV3.

The female students programmed the doll to check water in a flowerpot using sensor technologies on the doll's body and supply water if needed. Their creative project, without anyone telling them what to do and what technology to use, became a role model not only in their school but also in other schools nationwide. The girls' work supports the results of Amen Lab [10][21]showing that while men are better at focusing the women are better in multitasking as their brains are more active even when they are sleeping.



Fig. 5 Robotic doll technology conceived, designed, built, and tested by female high school students.

**Graduation and Work:** For new graduates, there are depression, anxiety, stress, healthy beliefs, and behaviors [43]and stresses and challenges [44]. **Retirement:** Depression during the retirement transition can be handled with the help from friends [45]in addition to other creative ideas. New option during retirement is employment after retirement [46]based on a review paper published in 2019. Can EEG be used to access information stored in the brain during the prior stages to make life better during the stages of work and retirement? This is a very difficult task and will be the subject of future research by the author.

## IV.      WHY FEMALE BRAIN IS MORE ACTIVE?

Early humans in cave environment, as shown in Fig. 6 (a 2-million-year-old cave), were subject to huge stress due to dangers from other animal-like humans and animals that could enter the cave with an open entrance. The main duty of men in the cave life was to go out and focus on an animal and kill it for food for women and men in the cave. The men were also under stress as they could be killed by animals. While the men were out for hunting the females in cave were under extreme stress because other humans could enter the cave and rape them. During this time if an animal enters the cave the women life was in danger.

Other examples of women stress in the cave were that during their periods (menstrual cycles) they were isolated in a corner of the cave by their male partners. There were several other examples of women under extreme stress in these cases. All this made the female brains very active for survival that continues in some form even today as quantified by Amen clinic research [10][21].



Fig. 6 Wonderwerk; 2 million years old cave discovered in South Africa.

## V.      QUANTIFY AND STUDY STRESS AFFECTING PERSONALITY

To quantify and study stress, the difficult part is to collect/record the information stored in the brain during phases 1-8 mainly in Amygdala and Hippocampus. The brain records all the important information of what happens during phases 1 to 8 of human life and if one can access the recorded brain data one can understand why every human, even sisters and brothers, is unique. This can also help understand why there is difference of opinion or fighting (that leads to stress) among groups led by a human. Some living species, such as ants and some humans such as gypsies, not led by a living leader, but led by an ideology, do not fight among themselves. One possibility is to record EEG (electroencephalogram) data [47]. An algorithm of EEG data quantifies the mind [48] It is the mind that differentiates one living specie from another. The EEG data collection is an interesting option to define the mind [49]. When the mind, as the decision maker, does something that generates stress leading to a danger, who helps humans to survive? It is the brain that saves us, but brain cannot control the mind. Thus, a struggle between survival (brain) and decision making (mind) leads to human destiny. The mind is an algorithm based on data generated by humans (interplay between what mind and brain do) during the eight stages. This definition of the mind makes every human unique in decision making.

How to quantify stress/anxiety is a difficult task. One approach that current work is using is to develop a simple algorithm for neural problems including stress, anxiety, empathy, and other such problems. To start research in that direction, a mind-controlled LEGO robot was developed and tested [50]. It is an attention-level algorithm-controlled LEGO robot that is now being ***extended to detect anxiety, stress, empathy, and other neural problems***. Algorithms for attention and meditation levels have already been developed [51]. A simple model of anxiety and stress will be low values of attention and meditation levels. A preliminary Anxiety/Stress (AS) Algorithm (ASA) is given by the following equation:

ASA = Attention x Meditation [52]                    (1)

The lower the value of ASA, the higher the anxiety and stress levels.

**Creative Technology/Hardware to Generate Stress/Anxiety Data:** The current work including the development of creative EEG modules as shown in Fig 7 [49]are unique in the world. FTIMS (Fabric- and Tattoo-embedded Inexpensive Micro Systems) shown in Fig. 7 are being further developed. New technologies were developed to fabricate creative EEG sensors. Fig. 7 also shows how sewing machine is used to get Cu wire electrodes, as shown in Fig. 7(f), fabricated by replacing lower thread in a sowing machine by a Cu wire. Technology for 3D-printed circuit board (Fig. 7 g & h), unique to this research, is used for integrated versions of EEG microsystems. Algorithms for attention and meditation levels have already been developed [51].
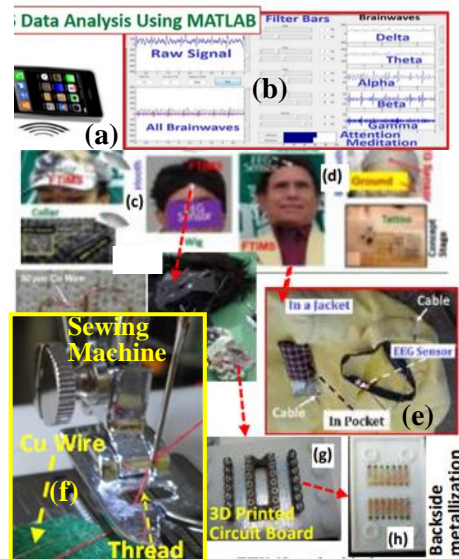


Fig. 7 EEG sensor technologies for embedding systems in a cap, wig, jacket, shirt collar, scarf, or tattoo for data upload to a smartphone (a-d) partly reported earlier [49].

**Initial Use of Creative Modules:** The modules shown in Figs. 8 and 9 have been tested and partly used for self-study of cancer research [52] Fig. 9 shows fabric embedded EEG sensors and wireless microsystems that can be Bluetooth-connected to an android smartphone. These modules will now be used for new research on personality prediction, and partly prediction of what happened in stages 1-8. The belief that adults don't remember what happened before 3.5 years has been negated by new research and infants and young children can and do form memories of early events [53]. New research shows that infants and young children do have memories of time before 3.5 years. Early childhood data is stored in the Amygdala area of the brain. An important aspect of these memories is if these are accessible in later stages through EEG measurements. Whether humans in later stages can access/remember is not as important as accessing the information through EEG studies. Brain weight shows a maximum change in the first year of life. The number of synapses in the Prefrontal cortex increases dramatically during the first 8-24 months.



Fig. 8 Technology of EEG sensor embedded in shirt collar that also contains Bluetooth wireless circuits.

Fig. 9 Technology of EEG sensor in head band (a), shirt collar (b) as shown in Fig. 8, and wig (c).

**Prediction of Algorithms for**

**Depression:** Short-term memory and study style were used for academic achievement predictors [54]. Prediction algorithm for major depression in the general population has been developed [55]. A possible access of memories and stress/anxiety by EEG measurements in later stages will be a useful predictor of personality of a human. Fig. 10 shows brainwaves and algorithms for attention and meditation levels [51]of a human. The ASA (Anxiety/Stress Algorithm) in response to an incidence for different humans will depend on what happened in 8 stages of life making every human unique.
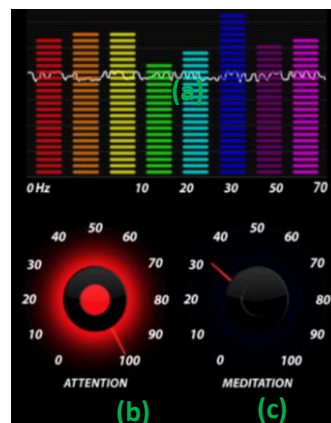


Fig. 10 Brainwaves (a), attention (b) and meditation (c) levels [52].

**Prebirth Happenings:** More profound effects will come from prebirth happenings and mother's state of mind [56]. Such a stress will affect all children's personalities. The differences in children's personalities also result in how the later stages of life, different for all children, are shaped by differences in their educational and professional lives. As for information stored in genes, it is not activated unless DES (diet, environment, and stress) in 8 stages pulls the trigger based on the phrase "genetics loads the gun, but the DES pulls the trigger" [57]. Again, the question is how to use EEG technologies to get information about happenings in the 8 stages of lives.

Smoking of pregnant mother (a) exposes the fetus to thousands of health-threatening chemicals and (b) alterations in brain structure [58]. Single and young women with no previous delivery and low socioeconomic environment are more likely to smoke during pregnancy [59]. The highest smoking rates during pregnancy have been observed among teenagers. The potential harm of smoking during pregnancy, that can extend into adulthood, affects child's psychological development [60]. Systematically evaluate age- and sex-differences in role of nicotine on brain and behavior [61]is very important. The level of *stress, unhealthy diet, and human environment lead to smoking.*

**Effects of Jealousy, Stress and Violence on Longevity of Child and Mother:** Jealousy in children with autism has been investigated [62]. Jealousy is a source of stress, and it shortens human life. Third parties' interference can end friendships [63]. It is unknown how people meet the challenge of maintaining friendships when real or perceived threats from third parties appear.

Violence during pregnancy, affecting the health of the mother and fetus, can lead to several problems including early delivery, abortion, prenatal bleeding, high blood pressure and depression [64]. New technologies need to be developed to study these problems.

This paper considers this important question: Is what happens during pregnancy detectable by EEG during later stages of human development? Can jealousy-based threats and violence be traced by EEG in any of 8 stages? Can EEG data help study personality and longevity? How does mother's jealousy affect the fetus? Research in this paper explores jealousy and other stress factors using EEG data-based algorithms. 'Amygdala and hippocampus dialogue with neocortex during human sleep and wakefulness'[65]. Is this communication always present and be detected by EEG technology? Can it be detected when humans are not sleeping? Can prebirth happenings be detected by EEG in any of the 8 stages? The answers to these questions, currently under development by the author, will be the subject of new research that will be subject of future publications.

## VI.    CONCLUSIONS

Using creative technological approaches, this paper focuses on (i) roles of MGBA and mind in human health and longevity, (ii) why groups led by a human have difference of opinion or fight among themselves, and (iii) why ants and some gypsies don't fight. The human personality, quality of life and longevity depend on (a) pre-birth development, (b) post-birth environment & development, (c) early childhood, (d) early education, (d) college and university education, (d) job, and (e) interplay between mind (personality) & brain (survival). Ideas have been identified that affect some of the factors (a) – (e) and why female mind is better in multitasking and male mind in focus. Further research is needed to answer very creative questions raised in this paper.

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