Humans are regarded as the most social animal, which explains the thriving of the human species and enchanting social lives.\(^1\) Human social brains have a ‘theory of mind’, which is a capability of attributing mental states to other persons and predicting others’ desires and beliefs.\(^2\) The neurosciences normally concentrate on the adult brain and mind including their declining states. Methodologically there can really only be one empirical target: the brain of an individual; in practice, of a mature adult human. Thus the neuroscientific account may underestimate the infant, child and youth ages together with socio-cultural and unconscious influences. In contrast, traditional Christian thinking views human persons before birth,\(^3\) across a lifetime which includes their souls and the life hereafter.

This chapter considers a wider existential perspective, convinced that scientific-social studies can inform the Christian understanding of persons. Attention is to given society, language, the young brain/mind and also the phenomena of dreams. The first section, ‘A Whole Life’, visits some areas that can diversify the scientific and philosophical accounts of brain and mind: infant and youth development, language acquisition, the young brain and mind, the young soul, and a view of life as vocation. The second section proposes an additional area which is harmonious with a Catholic outlook: dreaming.

**A WHOLE LIFE**

*Society and Culture*

Cognitive neuroscience has progressed chiefly with studies of the individual brain but until recently has been less interested in the subject’s relationships with others

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1. Uta Frith and Chris Frith, “The social brain: allowing humans to boldly go where no other species has been,” *Philosophical Transactions of the Royal Society B* Vol.365 No.1537 (12 January 2010), pp.165-176
2. Frith & Frith, *The social brain*, p.165
and social situations. The question can be asked, “would a rose by another name smell as sweet?” and one answer is ‘no’ from a social viewpoint. If a person believed the rose was another flower, the smell differs. Emotion is context-dependent.

Moreover, functional neuroimaging has demonstrated individual variations in brain activity in the experience of emotions like sadness, without genetic effects.

Similarly, emotions and the brain feature in a phenomenon known as rapid facial reaction (RFR) as emotional facial mimicry. People who see a smiling face usually smile, as the muscles causing the raising of cheeks increase in activity. The view of an angry face causes a scowl when the muscles causing the movement of eyebrows usually respond. Generally adults will mimic facial expressions within 1000 milliseconds, however, adults with autism spectrum disorder (ASD) fail to do this. Such RFR and interpersonal matching are connected with the development of social-emotional skills. Responses to angry, happy, fear and sad facial expressions can be studied in relation to mimicry and emotional responsiveness to specific emotions during childhood.

Sociologically, a distinctively human characteristic is dependence on emotions to form social bonds and multifaceted cultures. Emotions are envisaged by sociologists as the “glue” holding people together, producing commitments to vast social and cultural structures. Interestingly, in the social sciences and sociology, there is a growing trend towards ‘nature’ and biology. However, crude biological determinism is not accepted but there is openness to nature and culture where a more

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wholistic, co-constructionist approach recognises that modern humans are mostly the product of ‘social facts’, but behaviour is also affected by evolutionary factors.10

Social psychology looked to variable circumstances and was regarded as anti-reductionist.11 Whereas, psychobiology avoided mentalist and functional ideas and stressed neural correlates and physiological mechanisms. Then ‘social neuroscience’ was used in 1992 to associate the biological and social.12 There is important research focused on self-processes including emotion regulation, self-reference, and attitude processes, and on the ways in which humans make sense of other people via mirror neurons, theory of mind, or empathy.13

The newer sub-speciality of social neuroscience is also known as the neurobiology of social behaviour.14 Social neuroscience is linked with social cognition, development, collective behaviour, and human uniqueness. There are conceptual challenges and the rapid pace of research which leaves little time to reflect on the questions.15 Robotics and artificial intelligence are interested in the social too.16

Social animals depend on communication for survival and need cognitive capabilities to monitor others’ behaviour and adapt to competitive and cooperative signals. It is thought that there are evolved brain areas dedicated to processing social communications: the ‘social brain’.17 The relative size of the brain or neocortex in a

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12 Berntson & Cacioppo, Multilevel Analyses and Reductionism, pp.107-120
15 Adolphs, Conceptual Challenges, p.752

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species is correlated with its social bond coalitions or the size of its social network. Comparative investigations support an important role for social interactions in the cognitive evolution in primates, other mammals and birds.\textsuperscript{18}

In a related field, cultural neuroscience studies cultural variation in genomic, neural and psychological processes as a way to express the two-way relationships and their emergent properties.\textsuperscript{19} Two questions are, “how do cultural traits (e.g. values, beliefs, practices) shape neurobiology (e.g. genetic and neural processes) and behavior and how do neurobiological mechanisms (e.g. genetic and neural processes) facilitate the emergence and transmission of cultural traits?”\textsuperscript{20}

There are also some limitations to this approach. Some believe that cultural neuroscience approaches ‘culture’ in a non-neutral even political manner.\textsuperscript{21} For example, mind-body thinking occurs cross-culturally.\textsuperscript{22} Reasoning about the autonomy of mental and biological function reaches beyond Western populations. A study found significant cross-cultural parallels across two samples with regard to where the line between “you” and “body” lies. Person-body dualism may not be a default view but where there are cross-cultural similarities for dualistic notions of ‘person’ and ‘body’, this may not be wholly culturally transmitted.\textsuperscript{23}

In addition, there is cultural and scientific significance in comparisons between apes and humans.\textsuperscript{24} But human features shared with an ape may not necessarily be enlightened by examining its ape manifestation. One view is that, lacking a reasonable presumption that the feature is homologous between human and ape, that


\textsuperscript{20} Chiao et.al., \textit{Theory and methods.} p.356.

\textsuperscript{21} Marina Martínez Mateo et.al., “Concerns about cultural neurosciences: A critical analysis,” \textit{Neuroscience & Biobehavioral Reviews} Vol.36 No.1 (January 2012), pp.152-161

\textsuperscript{22} Emma Cohen et.al., “Cross-Cultural Similarities and Differences in Person-Body Reasoning: Experimental Evidence From the United Kingdom and Brazilian Amazon,” \textit{Cognitive Science} Vol.35 No.7 (September/October 2011), pp.1282-1304

\textsuperscript{23} Cohen et.al., \textit{Cross-Cultural.} p.1299.

is, the feature may be generated by passive heredity in the lineage from an ancestral form, then it can only have meaning as a metaphor.\textsuperscript{25}

But the “social brain” hypothesis has its challenges. It does not account for grade shifts, where some lineages demonstrate high socio-cognitive abilities with much smaller brains, e.g. most outstandingly, fish.\textsuperscript{26} Some see low empirical support for functional similarities between the social brains of nonhuman and human animals. A confusing element is that different species have traditionally been studied by various methods. Single cell recordings are the main method in monkeys while functional brain imaging is mainly used in humans.\textsuperscript{27}

Hence, there is a great deal of empirical research which shows the importance of the social in human lives. Next we examine another significant dimension, namely what comes early in life and before the fully-fledged adult understanding of person: language.

\textit{Acquiring Language}

The processes of acquiring language are complex. From birth to two years old, there is incredible development in the human cortex with maturing, overgrowth and pruning of synapses within specific brain areas and layers.\textsuperscript{28} The newborn “who is totally dependent on caregivers for survival, turns into a walking, talking, thinking, self-aware being.”\textsuperscript{29} Before children speak meaningfully, they amass much auditory knowledge.\textsuperscript{30} Spectral and temporal cues in speech must be processed in the range of tens of milliseconds. But in the first months of life, the auditory system especially of the cortex continues maturing. It appears astonishing how efficiently infants begin linking sounds with the contextual information that surrounds them, and processing

\textsuperscript{25} Marks, \textit{The Scientific and Cultural Meaning}, p.47
\textsuperscript{26} van Schaik, Isler & Burkart, \textit{Explaining brain size}, p.277
\textsuperscript{27} de Gelder & Partan, \textit{The neural basis}, p.642.
\textsuperscript{29} Trainor, \textit{Event-Related Potential (ERP) Measures in Auditory Development Research}, p.69
the dynamic spectral and/or temporal changes in auditory input indispensable for acquiring language.31

A much-debated question is, “how do young babies discover the finite set of phonetic units of their native language from the infinitely varying stream of sounds and sights around them?”32 A recent study used functional near infrared spectroscopy (fNIRS) to examine the neural networks and tissue that support early phonetic processing capacity in young bilingual babies as compared to monolingual babies. Under 6 months babies have a capacity to discriminate all of the world languages’ phonetic contrasts, Native and Non-Native (foreign language) phonetic contrasts not heard before. But by 10-12 months, babies lose the ‘universal’ capability.33

One idea is that the unique human skill of linguistic communication is determined by ‘linguistic’ genes and expressed in neurons to form domain-specific linguistic centres in the brain. Linguistic communication is defined as “the ability to produce a practically infinite number of meaningful messages using a finite number of lexical items.”34 Only humans are capable of producing a practically infinite number of messages using a finite number of lexical items (syntax of language). Not even chimpanzees, with their very agile hands and skills of mimicry, can form the simplest sentences in the way that deaf individuals with sign language.35 Despite their cognitive abilities, none of the higher apes have learned a grammatical system comparable to human languages.36

Some researchers think it is unlikely that pre- and postnatal auditory environments alone are adequate to produce this complicated organisation in a few weeks.37 The human infant’s brain capacities depend on brain circuits being close to that of adults.

31 Ortiz-Mantilla, Hämäläinen & Benasich, Time course of ERP generators, p.3275
32 Indeed, “after nearly a half century of research, it is now understood that this process is monumentally important to discovering the ‘building blocks’ of human language.” L.A.Petitto et.al., “The “Perceptual Wedge Hypothesis” as the basis for bilingual babies’ phonetic processing advantage: New insights from fNIRS brain imaging,” Brain and Language Vol.121 No.2 (May 2012), pp.130-143 (p.130).
33 Petitto et.al., The Perceptual Wedge Hypothesis, p.131
35 Arshavsky, Two functions of early language experience, p.328.
36 Jacques Mehler, Marina Nespor and Marcela Peña, “What Infants Know and What They have to Learn about Language,” European Review Vol.16 No.4 (October 2008), 429-444
In humans, the functional properties in superior temporal regions and their links to remote areas could be vital for learning language. This implies a sturdy genetic bias for speech processing.

Listeners have to concurrently extract separate kinds of information to recognise linguistic units, their positions in a sequence, the relationships between them; then bind these altogether. It has been demonstrated that newborns have such fundamental abilities. A study of newborns found that their brains can encode relational and sequential information in language structure, integrating them into a coherent structural pattern. Human infants already possess several of the perceptual and combinatorial capabilities needed for efficient language acquisition at birth.

Babies learn at many levels: phonetic, lexical, syntactic but it is also more than computation. Nine month old American infants were exposed to native Mandarin Chinese speakers over twelve experimental sessions. Later the infants experienced the same foreign-language speakers and content through audio or audiovisual means. One study tested whether phonetic learning occurs merely by hearing a language. The results showed that between 9 and 10 months old, infants learnt a foreign language phonetically from a live person, but not prerecorded sources. What does a live person offer that a DVD does not? It was suggested that specific social cues may be decisive. A living human produces interpersonal social cues that draws infant attention and motivates learning.

A captivating phenomenon is infants’ facility to generalise structural regularities onto sentences they have not heard before, going beyond the received input. This indicates proficient learning, perceptual and processing capabilities. In the auditory domain, newborn infants are sensitive to particular input configurations. From a

39 Gervain, Berent & Werker, Binding at Birth, p.573
41 Kuhl, Tsao & Liu, Foreign-language experience in infancy, p.9100
neurodevelopmental viewpoint, the newborn brain is not undifferentiated, instead it has some of the functional specialisations typical of the mature brain.43

A complementary but different approach to language acquisition concentrates on perceptual and memory functions that limit how serially presented materials e.g. speech utterances are processed. Initially non-linguistic mechanisms were recruited by the language faculty; these now constrain the types of regularities language learners can acquire from their input.44

This early phase of life which features acquiring language is significant to communication and cognitive development, and is enabled by the growing brain. Such maturing continues beyond infancy.

The Young Brain and Mind
Contemporary science and other fields are increasingly studying childhood, teenagers, youth and young adulthood.45 Beyond infancy there are continuing changes in the brain over the lifespan: cortical volume,46 white matter maturation47 including during adolescence.48 The plasticity of the brain means that there can be modifications to brain structure, generally grey matter volume following learning experiences.49

For centuries, scientists have investigated the anatomical and physiological grounds for intellectual ability. Brain imaging studies of intellectual ability have generally employed large-scale measures, such as total brain volume or regional grey or white

43 Gervain, et.al, The neonate brain, p.14227
47 Lars T.Westlye et.al., “Life-Span Changes of the Human Brain White Matter: Diffusion Tensor Imaging (DTI) and Volumetry,” Cerebral Cortex Vol.20 No.9 (September 2010), pp.2055-2068
49 Anthony J.Kravnick et.al., “Gray matter volume changes following reading intervention in dyslexic children,” NeuroImage Vol.57 No.3 (1 August 2011), pp.733-741. In some cases there are increases in gray matter density within one week after onset of training. (p.734)
matter volumes (by lobe).\textsuperscript{50} Cortical thinning in portions of the prefrontal cortex may be another measure; these support higher intellectual abilities.

In anatomic studies, connectivity can involve a physical link between brain areas which share common developmental trajectories. In brain function, connectivity describes the relationship between differing parts of the brain that are active concurrently in a task.\textsuperscript{51} The notion of the ‘journey as well as the destination’ exemplifies the dynamic nature of brain and cognitive development in children, and the critical phase of structural and functional neural development during adolescence.\textsuperscript{52}

Functional brain development in adolescence also extends to social cognition. It is noted how a number of developmental neuroimaging studies of social cognition have been undertaken by various laboratories across the globe. There is noticeable consistency with respect to the direction of change in medial prefrontal cortex (mPFC) activity. Why mPFC activity decreases between adolescence and adulthood during mentalising tasks is not yet understood. But two non-mutually exclusive explanations have been proposed. First, a possibility is that the cognitive strategy for mentalising changes between adolescence and adulthood. Second, a possibility that the functional change with age is caused by neuroanatomical changes at this time.\textsuperscript{53}

Adolescence is a period of rising psychiatric illnesses like mood and anxiety disorders, psychosis, eating disorders, personality disorders and substance abuse. The pathophysiology of these disorders is thought to be due to irregularities of the neurobiological, maturational changes that occurs normally in the adolescent brain.\textsuperscript{54} This theme is conceptualised as ‘moving parts get broken’.\textsuperscript{55} There are considerable

\textsuperscript{51} Jay N.Giedd and Judith L.Rapoport, “Structural MRI of Pediatric Brain Development: What Have We Learned and Where Are We Going?,” \textit{Neuron} Vol.67 No.5 (9 September 2010), pp.728-734.
\textsuperscript{52} Giedd and Rapoport, \textit{Structural MRI}, p.733
\textsuperscript{55} Paus, Keshavan & Giedd, \textit{Why do many psychiatric disorders}, p.954. Some research uses animal models, for example, Brian Bingham et.al., “Early Adolescence as a Critical Window During Which Social Stress Distinctly Alters Behavior and Brain Norepinephrine Activity,” \textit{Neuropsychopharmacology} Vol.36 No.4 (March 2011), pp.896-909
changes during adolescence to neural systems that subserve higher cognitive functions, interpersonal relationships, cognitive control of emotions, and risk-versus-reward appraisal and motivation. When suboptimal in timing or scale, these changes increase the risk of addictive, affective and cognitive disorders.  

There is increasing relevance of neurosciences to youth justice, e.g. in 2005 the United States Supreme Court banned the death penalty for offenders under the age of 18 years. The Court held that while the execution of juveniles was once thought acceptable in American society, a national consensus had emerged that they lack the biological, emotional, and maturity needed to be fully culpable for violent acts committed. New brain imaging evidence suggests that the adolescent brain is not as well developed as the adult brain.

The neuroscientific model is viewed as the first new ‘grand theory’ of adolescence in the last 50 years. It holds that early adolescence is marked by a striking rise in appetitive drive that stays comparatively unchecked until self-regulatory systems mature. This is thought as uncannily to be like the basic Freudian model of adolescence, by substituting ‘appetitive drive’ to ‘libido’ and ‘self-regulatory systems’ to ‘ego development’.

Together with their brains, the minds and mental health of young people are a concern. One of the greatest paradoxes is that “while material well-being and physical health have dramatically improved, the mental health of young people in transition from childhood to adulthood has been steadily declining, and this from a

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56 Paus, Keshavan & Giedd, Why do many psychiatric disorders, p.954.
60 Steinberg, A behavioral scientist, p.162.
low base.”62 Others look to modern Western culture contributing to a crisis of meaning with various symptoms. The most ominous is the increase of teenagers with slight or nil eagerness for the passage into adulthood,63 and the sureness of previous generations to gain independence, a job, marriage and family, is not universally seen.

Critical Comment
These neuroscientific studies need careful reading.64 Data exists in an atmosphere of contested discourses. The leading discourse understands the teenage years as a distinct phase, dissimilar from childhood and adulthood, and inherently troublesome.65 Another discourse highlights the essential continuity between young and old, the cultural constructions of youth/adolescence. There is empirical evidence that teenagers are mostly happy, well adjusted, are in good relationships with parents and other adults, and are optimistic about their futures.66

Adolescence can be situated between ‘natural’ physiological puberty and the adult status, a ‘cultural’ construct, as well as a universal stage in human development.67 It is explained how there is a need for a period of preparation between infant dependency and full social insertion, marked by conflicts and crisis, determined by nature. However, there has been research in social sciences on the variability and plasticity of adolescence, arguing that it is a social construction determined by culture.68

Social and biomedical research follows two main trends: the neurobiology of the teen brain and cultural studies about the ‘digital generation’. A proposed socio-cultural framework starts with the term adolescence, derived from the Latin adolescere, ‘to develop towards maturity’ and ‘to grow’ as in the individual aspect of transition into adult life. The start of adolescence is associated with puberty, from the Latin pubertas, meaning ‘the virile age’ of male and female sexual maturity. ‘Youth’ then

65 This discourse is over one hundred years old. Sercombe, The Gift and the Trap, pp.42-43
66 Sercombe, The Gift and the Trap, p.43
68 Feixa, Past and present, p.1635
is the collective aspect of these changes, which today is a long period of psychosocial moratoria.\textsuperscript{69}

Five models of adolescence have been identified: \textit{puber} from the primitive stateless societies; \textit{ephebe} from ancient states; \textit{young boy} or \textit{young girl} from pre-industrial rural societies; \textit{teenager} from the first industrialisation process and \textit{young people} from post-industrial societies. In the 2010s, youth as time of training and leisure is beginning to not make sense when the passing rites are supplanted by impasse rites: transition stages become intransitive stages. The young reside with their parents after their thirties, they enter the labour world at a discontinuous pace, they require lifelong training, they delay reproduction and invent new youth cultures that are trans-generational. Could it be the death of adolescence?\textsuperscript{70}

Some see no reliable social scientific data to support the idea of the ‘adolescent brain’ that all young people, by virtue of the ‘adolescent brains’ or otherwise, are ‘different’, ‘risk-takers’ ‘anti-social’ ‘irrational’ or ‘immoral’.\textsuperscript{71} This is similar to prejudice in the notions of the ‘female brain’, the ‘Jewish brain’, the ‘Negro brain,’ used to account for these groups and their apparent problems. Young people have opportunities to learn through experience. If ‘teenage brain’ claims are serious, then policy ideas would include the need to increase the age of compulsory schooling to, say, 23 or 25; the same with the voting age; increasing the age of sexual consent and legal liability. It would also mean keeping young people in the Children’s Court until they are 23 or 25 and increasing the age at which they can legally drink to 23 or 25.\textsuperscript{72}

Another approach is that in adolescence there emerges the ability to create four kinds of coherence in the life story: temporal sequencing, cultural concept of biography, causal coherence, and thematic coherence. These are the cognitive tools needed for autobiographical reasoning and life narratives.\textsuperscript{73} During grade school, temporal sequencing of distant experiences starts to develop, then a cultural concept of biography is acquired by about age ten. Other studies show the emergence of an

\textsuperscript{69} Feixa, \textit{Past and present}, p.1635
\textsuperscript{70} Feixa, \textit{Past and present}, p. 1641
\textsuperscript{72} Bessant, \textit{Hard wired for risk}, p.358
integrated person-concept in early adolescence, able to be used to integrate various episodes, resulting therefore in causal coherence. There is data for the emergence in mid- to late adolescence of biographical concepts of how individuals change because of to life experiences while still being the same individual.74

But not all the young are healthy. There is research for example, on the young who have suffered head trauma and traumatic brain injury (TBI).75 TBI is recognised to be the principal cause of neurological disability in childhood; 1 in 30 children suffering a TBI before the age of 16 years and incidence reported vary between 100–300 per 100,000 per year for children and young adults.76 It ranges from concussion to persistent vegetative state, with mild TBI affecting children’s neuropsychological and neurobehavioural functioning such as cognitive, academic and social difficulties. Moderate to severe TBI children have an elevated risk of having negative sequelae.77

Many children too are profoundly and irreversibly neurologically damaged.78 Children who will “never be able to speak, to walk, to sit up, or to feed themselves. Sometimes they are blind or deaf. Their intellectual abilities are extremely limited, often so much so that they have never been able to recognize their own parents. The cause of their condition is often anoxic brain injury or head trauma, or perhaps, less commonly, a genetic condition with neurological effects.”79

On this, some have turned to Wittgenstein’s Philosophical Investigations, ‘My attitude towards him is an attitude towards a soul. I am not of the opinion that he has a soul’.80 The thought is to treat a severely neurologically damaged child as a person – “or, in Wittgenstein’s more apt phrase, as a ‘soul’ – [it] involves taking up a certain

74 Habermas & Bluck, Getting a Life, p.761
76 Byard, Fine & Reed, Taking a developmental and systemic perspective, p.165
77 Byard, Fine & Reed, Taking a developmental and systemic perspective, pp.165-166
79 Elliott, Attitudes, Souls, and Persons, p.16
80 PI § 178
attitude toward him.”’

‘Attitude’ means an implicit outlook, e.g. accorded respect, addressed with a name rather than a number. As with adult brain decline, considered in an earlier chapter, the atypical young brain raises questions of identity, dignity and the embodied soul of a person; in this case, a person who may have many more years of life, in contrast to the elderly and those close to death.

The above discussion focused on the young brain and mind, yet human beings have a spiritual side and this is explored below in the young soul.

**Soul of the Young**

Families, education systems and society strive to prepare young people for this-life and Christians especially look also to the next-life. This preparation can involve a sense of vocation and the traditional notion of saving one’s soul. Some contemporary empirical research reflects such spiritual interests, providing further scope for engagement with Christian thinking.

Children have spiritual experiences, report near-death experiences, and dream ‘divine dreams’. Faith begins in children, and grows through adolescence. Usually, adolescence is a sensitive period for spiritual development, conversion and religious commitment. Religion means institutionalised, formal structures, and belonging to groups which search for the sacred as a shared experience. Spirituality is often characterised as a relationship of transcendence with a higher being.

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81 Elliott, *Attitudes, Souls, and Persons*, p.17
84 Deborah Court, “What Happens to Children's Faith in the Zone of Proximal Development, and What Can Religious Educators Do about It?,” *Religious Education* Vol.105 No.5 (October-December 2010), pp.491-503
frequently more experiential and meaningful. Spirituality is also relevant for adolescents with developmental disabilities.\(^\text{87}\)

A sensitive period in relation to adolescence is “a span of time that is optimal for developing a certain skill, capacity, or behavior.”\(^\text{88}\) In this sensitive period, an individual is mostly susceptible to environmental factors that advance those capabilities, as when learning a second language, which is optimally before puberty. Cognitive, neurological and intrapersonal developments may render adolescents more likely to explore religious and spiritual ideals and experiences.\(^\text{89}\) While prefrontal cortex immaturity and intense emotions could explain adolescent risk taking and problem behaviours, these same features could also make adolescents more likely to engage in spiritual experiences, which may be a positive behaviour that fosters well-being in some.

Clearly studies about spirituality, personal beliefs, the sense of the divine, and related areas show that adolescents have spiritual interests.\(^\text{90}\) In studies of Generation Y (born 1981-1995) spirituality has been identified as important.\(^\text{91}\) A person’s spirituality is understood as “a way of life - a view of the world and a set of values and practices.”\(^\text{92}\) It may be derived from ‘New Age’ spirituality; traditional world religion; a blend of both; or a wholly secular view.

\(^{86}\) That is, spirituality in this relationship sense usually extends beyond formal religious services and affiliation, to have closer meaning for the person . Magaldi-Dopman & Park-Taylor, Sacred Adolescence, p.383  
\(^{88}\) Good & Willoughby, Adolescence as a Sensitive Period, p.32  
\(^{89}\) Good & Willoughby, Adolescence as a Sensitive Period, p.36  
The notion of spirituality varies among researchers, and not all of these are of equal significance to adolescents. Some look to a pluralist concept since spirituality is an attribute of all human beings, a more open and pluralistic over exclusive interpretations of distinct religious traditions. Experiences of suffering also find meaning in the spiritual journeys for the young.

Three dimensions of spirituality that emerged from a study of adolescents’ understanding of spirituality were, “a transcendent perspective, a sense of meaning and purpose and a connection with the inner self. A clear connection was found between the three dimensions of spirituality and resilience.” Spirituality nurtured resilience by offering a sense of comfort and security via a relationship with higher power, the chance for more self-awareness and self-efficacy through connections with the inner self and a sense of coherence, purpose and optimism due to a belief that everything happens for a reason.

A study in the United Kingdom identified several soul/spirit relationships: there were 177 male students and 208 female; 173 students described themselves as Christian, 104, as Muslim, 104 as having no religion, 3 as Pagan and 1 as Rastafarian. Strict inclusion (e.g. ‘the spirit is your soul’), Function (e.g. the spirit guides your actions), Cause/effect (e.g. the spirit makes us human), Spatial (e.g. the spirit is inside), Sequence (e.g. ‘the spirit lives on after you die’). A summation of spirit/spirituality as primarily about holding beliefs, of pertaining to ‘eternal spirit’, is that “after death the spirit goes on to a new life in a new place that may be heaven or hell. Its destiny reflects the quality of the life lived and is decided by God.”

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95 Mary Raftopoulos and Glen Bates, “It’s that knowing that you are not alone’: the role of spirituality in adolescent resilience,” International Journal of Children’s Spirituality Vol.16 No.2 (May 2011), pp.151-167 (p.163)
96 Raftopoulos and Bates, It’s that knowing, p.163
98 Wintersgill, Teenagers’ perceptions of spirituality, p.374
Research has also examined the school and its teachers, both significant influences on the spiritual development of children and teenagers. In Catholic and other Christian churches, faith and religious identity are grounded in belonging to the religious community but there is a drift of young people with close family connections away from the worshipping community. Young people are encouraged towards Christian discipleship, conversion and the universal call to holiness, and union with the Triune God: continual transformation is the final goal of promoting Christian spirituality in adolescents. Spirituality grows best through religious experiences.

In summary, although the above scientific studies measure variables associated with spirituality, they do not directly measure the soul. However, as noted, in the Catholic tradition the soul is united with the body as a living human being. From this perspective the development and care needed by the young brain and mind is also needed by the young soul. Consequently, the soul of the young needs development and care, just as the young brain and mind.

**Time, Life and Vocation**

Another way to gain a richer existential perspective of the human person is to look at the whole of life, which is oriented to a life beyond this life. Longitudinal studies investigate matters over time. Developmental neuroscience, for example, examines changes in the brain, and physical and cultural environment influences on behaviour; while behaviour modifies the brain and the environment. This system of brain, behaviour, and environment, is constant and none of the elements are reducible to another in individual lives. This self-regulation involves concepts of ontogeny, maturation and senescence; and the operations of age-graded brain mechanisms due to neurochemical, neuroanatomical, and neuronal functions.

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103 Lindenberger, Li and Bäckman, *Delineating brain–behaviour*, p.713.
For example, diffusion tenor imaging (DTI) tractography has been used to study brain development in a large group of 103 healthy subjects with 221 scans from childhood to young adulthood (5–32 years), analysing within-subject diffusion parameter changes over 1–6 year intervals. It found evidence for continued white matter ‘wiring’ development after adolescence.\textsuperscript{104}

In other research the notion of clinical staging is contrasted to conventional diagnostic practice.\textsuperscript{105} The difference is that staging defines at a specific point in time the extent of progress of a disorder, and where a person presently is along that continuum. Early and milder clinical phenomena are differentiated from what is associated with illness extension, progression and chronicity. A staging framework is relevant to adolescence and early adulthood when most adult-type disorders first emerge.

Theories about lifelong human development include ‘agency within structures’ to ‘biocultural co-constructivism’. The theoretical consensus is that development is formed and constrained by interplays between biological, psychological, sociological, demographical, and other factors.\textsuperscript{106}

Besides neurological approaches, there are some others. Lifespan psychology’s central notion is that development entails constant adaptation to evolving individual and environmental situations. One idea of life-span development psychology is “the study of constancy and change in behavior throughout the life course (ontogenesis), from conception to death. The goal is to obtain knowledge about general principles of life-long development, about interindividual differences and similarities in development, as well as about the degree and conditions of individual plasticity or modifiability of development.”\textsuperscript{107}

\textsuperscript{105} Patrick D.McGorry, “Staging in Neuropsychiatry: A Heuristic Model for Understanding, Prevention and Treatment,” \textit{Neurotoxicity Research} Vol.18 Nos.3-4 (November 2010), pp.244-255
\textsuperscript{107} Cf. the influential German psychologist Paul Baltes (1939-2006), Paul B.Baltes, “Theoretical Propositions of Life-Span Developmental Psychology: On the Dynamics Between Growth and Decline,” \textit{Developmental Psychology} Vol.23 No.5 (September 1987), pp.611–626 (p.611)
Alternately, life course sociology focuses on the opportunities and restraints imposed by social structures: interactions between individual, family and historical times. Major questions include whether social forces are determinants in the construction and reproduction of inequalities; similarly, how extensive is the capacity of individuals to act independently, to make their own choices and master their own life trajectories.108

Lifespan psychologists typically attend to individual resources and the self-regulatory processes used to select, optimise, and compensate; to change developmental goals, and control development.109 Lifespan psychology and life-course sociology may differ on the issue of self-regulation, or linked lives. The latter is where an individual’s life is influenced by and bound to the situation, needs, and choices of others.110

Another line of research centres on the German notion of Sehnsucht or life longings.111 Life longings are “emotionally rich mental representations of ideal, if not utopian, alternative states and expressions of life.”112

It is thought that human personality develops in three aspects:

- behaviour and dispositional traits: the person as actor
- striving, characteristic goals and motives: the person as agent
- narrating and integrative life stories: the person as author.

It is pointed out that “human beings begin life as social actors. By mid-childhood, they have become social agents. It is not until adolescence or young adulthood, however, that they become self-authors in society.”113

108 Oris et.al., Linked Lives, p.1.;
109 Oris et.al., Linked Lives, p.1
112 Kotter-Grühn et.al., What is it we, p.428.
It is no longer current to think that the individual moves through clearly-defined stages of personality development.\citation{114} There is a more continuous course of development, according to temperament and trait models with few or moments of sudden change or expected epochs of transition.

However, there is sufficient direction and structure for identifying developmental milestones to gauge progress. Five developmental milestones are:

- age 2,
- the transition to adolescence,
- emerging adulthood,
- midlife,
- and old age.\citation{115}

\textit{A Christian interpretation}

‘Life as a gift’ is a theme also found in Christian bioethics,\citation{116} health care,\citation{117} even literature.\citation{118} Benedict XVI has spoken of “the astonishing experience of gift” where gratuitousness is variedly apparent in people’s lives. The human being is “made for gift, which expresses and makes present his transcendent dimension.”\citation{119} Life is “a joyful task to be accomplished in a spirit of solidarity.”\citation{120}

A vocational culture sees life as vocation. The “culture of vocation” was first spoken about by John Paul II in the Message for the XXX World Day of Prayer for vocations (8 September 1992).\citation{121} Father Pascual Chávez Villanueva explains that in
the course of their lives, Christians understand the significance of life, enlightened by faith and a search for the meaning of life. Vocation involves a ‘call’ and is fundamental to a person’s fulfilment.\textsuperscript{122} Chávez cautions that this extends beyond the satisfaction of an individual’s needs before all else. Each life is unique and part of a network of interdependent relationships which leads to an ethic of responsibility and commitment.\textsuperscript{123} The moral dimensions can lead towards the Transcendent since in persons there is found something that is mysterious, unconditional and immaterial.\textsuperscript{124} In infinite mystery, Christ can satisfy. Life and salvation depend on personal choices made and the values pursued (Mark 8:35-36).

Some attitudes which give life a vocational culture are:

- The use of reason and contemplation to search gradually for meaning in the immediate, the medium term and particularly the ultimate purpose of things.\textsuperscript{125}
- Acceptance of limitations, openness to transcendence beyond the human, welcoming mystery and the sacred in objective and subjective aspects. This requires the use of intelligence, the exercise of will, to seeking the hearts’ desires in relationships and undertaking various enterprises.
- An ‘ethical’ mentality enlightened by a values and moral conscience, able to direct oneself towards the good, centred on the person.
- A planning mentality to assist where a lack of meaning results in indifference about the future. Without a sense of history, there are no goals which are attractive enough to pursue.
- Commitment to solidarity, which responds to problems such as underdevelopment, hunger and exploitation through aid and voluntary service. This culture of solidarity is often weakened or marginalised by powerful socio-economic factors which overlook the interdependence of humanity.\textsuperscript{126}

None of the research referred to in this chapter contradicts this Christian

\textsuperscript{122} Chávez, \textit{Come and see}, p.17.
\textsuperscript{123} This transcends any subjective view of life which places the individual at the centre but invites self-giving in interpersonal relationships. Chávez, \textit{Come and see}, p.18
\textsuperscript{124} Chávez, \textit{Come and see}, p.19. These imply respect, selflessness, love, the promotion of moral and spiritual values
\textsuperscript{125} Chávez, \textit{Come and see}, pp.22-23
\textsuperscript{126} Chávez, \textit{Come and see}, p.24. Individuals are only themselves when accepting responsibility for the destiny of all human beings in a spirit of solidarity.
interpretation of the human life. As noted previously, scientific research informs and adds to the Christian understanding. And it is reasonable to claim that the two approaches are fundamentally complementary.

All the research thus far occurs with conscious subjects. This next section proposes further areas which reaches far into the mind and brain and takes places usually in the other states of consciousness.

DREAMS

Dreams are associated with the soul as the human unconscious,127 and a traditional way of accessing divine realities.128 Others dreams include problem-solving dreams,129 and dreams confused with reality (‘waking dreams’).130 Dreams are one of several sleep-related experiences or nocturnal altered-consciousness phenomena.131 Sleep-related experiences can be situated within clinical factors like traumatic and life stress, psychological distress, altered-consciousness tendencies, e.g. dissociation.132

Human sleep happens in stages:133 stages 1 and 2 sleep (light sleep), stages 3 and 4 (slow wave sleep: SWS), and rapid eye movement (REM) sleep. REM sleep is

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130 George Christos, Memory and Dreams: The Creative Human Mind (Sydney: University of New South Wales Press, 2003), pp.105-155
131 Dalena van der Kloet et.al., “Fragmented Sleep, Fragmented Mind: The Role of Sleep in Dissociative Symptoms,” Perspectives on Psychological Science Vol.7 No.2 (March 2012), pp.159-175
characterized by rapid eye movement (REM). As sleep stages progresses, there is a subjective loss of self-awareness. Sleep research involves the body, brain and is complex. During REM sleep self-awareness partially and transiently reappears, mostly in relation to dreams.

Dreaming is part of human sleep, and the ability to recall a dream also depends on sleep. The consolidation of newly acquired information in memory benefits from sleep. One study found almost complete disappearance of dream recall after a recovery night subsequent to one night of sleep deprivation. Interpretative hypotheses proposed include retrieval failure, lower accessibility of dream contents and lower effectiveness of declarative memory.

The adaptive role of rapid eye movement (REM) sleep appears to be a complete mystery. Some argue that sleep and its phases of REM and non-REM sleep has a biological function, an adaptation which builds, restores and conserves; whereas dreaming is a nonadaptation. In evolutionary biology a nonadaptation is a concomitant of a trait selected for and also there are no other independent modifications or positive selections active on the trait. For example, the human chin, the colour of bones, and the sound of a heart beating are nonadaptations. and epiphenomenal which accompanies sleep serendipitously.

The study of dreams in philosophy of mind and cognitive sciences is recent. But despite the fascination of dreams for modern Western culture, the story of the discovery of REM (rapid eye movement) sleep, and the exploration of the psychophysiology of dreaming, there is little influence in mainstream philosophy of

135 Kubota et.al., Dorsolateral prefrontal, p.88
138 De Gennaro et.al., Recovery sleep, p.298
139 Jerome M.Siegel, “REM sleep: A biological and psychological paradox,” Sleep Medicine Reviews Vol.15 No.3 (June 2011), pp.139-142.
141 Flanagan, Dreaming Souls, p.115
mind. Although epistemologists still use dreaming to focus concerns about scepticism, the psychology of dreams remained until recently a marginal subject in philosophy and the cognitive sciences alike.  

Dreams in early literature, the arts, and philosophy, were considered religious, mythic or messages from the gods. Much later came the psychoanalytic dream theories and the unconscious; then with brain studies and sleep laboratories, other theories developed. Dreams may seem bizarre but neurophysiology and concepts of logic can be applied to understand them.

Reviewing scientific studies of dreams is difficult as dream data comes only via reports. It is hard to experiment with dreams hence it is a challenge to make predictions. Neuronal activity, brain development and brain damage are linked to dream forms retrospectively, instead of dream content of specific dreams. For example, subjects awakened from other phases of sleep, particularly but not exclusively during REM sleep, report full-fledged dreams with vivid, sensorimotor hallucinatory experiences in a narrative structure. The dreamer is conscious (has vivid experiences), is distant from the environment (asleep), but somehow the brain is creating a story containing actors, scenarios, and producing hallucinatory images.

S. Freud and C. C. Jung both famously studied dreams, though later diverged in their thinking. One account suggests that Freud’s methods were those of the left brain, time sequences, cause and effect, and logic; whereas Jung’s methods were those of the right brain. While Freud’s system also turned to right brain phenomena such as emotions, his interpretation of such phenomena used a left brain approach. By

143 Sutton, *Dreaming*, p.522
144 Laura Palagini and Nicholas Rosenlicht. “Sleep, dreaming, and mental health: A review of historical and neurobiological perspectives,” *Sleep Medicine Reviews* Vol.15 No.3 (June 2011): pp.179-186. Attention turned from psychology and subjective dream content as the prevailing model of dream analysis, to neurobiology as dreaming became linked with the physiology of REM sleep and NREM sleep.
145 Palagini & Rosenlicht, *Sleep, dreaming, and mental health*, p.183
148 Nir & Tononi, *Dreaming and the brain*, p.88
contrast, Jung concentrated more closely on right-brain controlled phenomena and its expressions such as mystery, myth, and relations of the self to Source (God).  

Whatever their differences, the psychoanalytic and depth psychology traditions respectively assign an important role to the unconscious.

Freud’s ideas have been extended and re-interpreted. In the Jungian tradition dreams are used in spiritual guidance, for symbols and archetypes. Moreover, American and French literature has discussed experiments, questionnaire studies and ‘neurocognitive-like’ theories of the dreaming process.

The behaviorist school of psychology denied the validity of mental phenomena in scientific investigation. It used a phenomenological description of the characteristics of dreams instead of the dream symbols or meaning for a certain dreamer. In cognitive science, the term ‘phenomenological’ refers to systematic study of the qualitative characteristics of mental experience, in contrast to symbolic or interpretative methods aiming to decipher hidden meanings in the manifest content of dreams which psychoanalysis aims at.

Contemporary theories of dreaming include theories of neuroscientific psychoanalyst M. Solms. Dreaming here is mostly dissimilar to waking consciousness, as apparent (manifest) features of dreams are bizarre, e.g. incongruous characters and plots, nonsensical changes in time and place. Dreams function to preserve sleep in unconscious needs. Individual dreams contain meaningful information about the dreamer but are deficient when explaining dreams shared by all people, e.g., teeth

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150 Barnum, Why Freud and Jung Can’t Speak, p.357
155 Schwartz, A Historical Loop, pp.57-58
156 Oliver H.Turnbull and Mark Solms, “Awareness, Desire, and False Beliefs: Freud in the Light of Modern Neuropsychology,” Cortex Vol.43 No.8 (2007), pp.1083-1090,
falling out. Some claim that there are stable neuropsychological grounds for many of Freud’s ideas, which were first proposed firstly from clinical observations, including dreams.  

Many of these ideas are opposed by sleep scientist J.A.Hobson, who is strongly opposed to any revival of psychoanalysis. He comments that Freud was wrong and so are “misguided neo-Freudians”, those who desperately try to save Freudian psychoanalysis from speculative philosophy.  

There are also the neurocognitive ideas from psychologist G.W.Domhoff for whom dreams are a faithful mirror of waking life as they are coherent, and have internally plausible narrative sequences over the typical illogical sequences of bizarre images. This is seen in content analysis which demonstrates continuity between dream content and waking life. Domhoff even describes dreams as “an fMRI of the mind at night. They are the quintessential cognitive simulation because they are experienced as real while they are happening.”  

Philosophical issues include questions about identity and self. For example, are dreams experienced while asleep or are they made up upon waking? And, can humans be immoral during dreaming? Similarly, one can note that dreaming is what comes from an automatic system which undertakes functions like sleep and sleep-cycling: were these selected for a conscious system designed for consciousness functions in wakefulness?

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160 G.William Domhoff, “Dream Content is Continuous with Waking Thought, Based on Preoccupations, Concerns, and Interests,” Sleep Medicine Clinics Vol.5 No.2 (June 2010), pp.203–215.  
161 Domhoff, Dream Content, p.214.  
162 Cf. Xiaoqiang Han, “A Butterfly Dream in a Brain in a Vat,” Philosophy Vol.38 No.1 (January 2010), pp.157-167. For example, “If one falls into sleep and has a dream, one ceases to be thinking. That is, while the dreamer is indeed the cause of his dream, he is not the subject of dreaming in the way he is the subject of thinking when he is awake.” (p.165)  
163 Flanagan, Dreaming Souls, p.163
For one writer in this area, we are “dreaming souls” and the brain “is the seat of the soul whether we are asleep or awake.”¹⁶⁴ For others, ‘soul’ appears to imply a non-transcendental entity that survives death. It is wondered whether God is revealed in dreams, and if the dream world constitutes its own universe; what is the source of the dream: is it outside of the self, is it God, other minds or spirits?¹⁶⁵

It has been claimed that the spiritual content of dreams can be identified and measured.¹⁶⁶ Dreams have meaning in relation to conscious religious life.¹⁶⁷ In one study, religious believers and agnostics were asked about God speaking to them in a dream and commanding them to do either an enjoyable activity like travel the world, or dislikeable, e.g. self-sacrifice.¹⁶⁸ The results were that people from various cultures believe that dreams offer meaningful insight into the self and the world, although not all dreams hold similar meaning and insights. Dreams inconsistent with existing desires and beliefs are less likely to influence daytime life.¹⁶⁹ In another study, if a dream was perceived as sacred: divine or of the transcendent, the more valuable it was in relation to a stressor in life.¹⁷⁰

**Critical Analysis**

The scholarship of the sciences, social sciences, depth psychology and social-developmental psychology, all illuminate a view of life across time. These scientific approaches counter the individualist emphasis of neuroscience by employing a more

¹⁶⁴ Flanagan, *Dreaming Souls*, p.195
¹⁶⁶ Stanley Krippner, Christophe Jaeger and Laura Faith, “Identifying and Utilizing Spiritual Content in Dream Reports,” *Dreaming* Vol.11 No.3 (September 2001), pp.127-147. The authors point out, “as there has been little rigorous research on the content of spiritual dreams, this research study was designed to answer the following question: ‘Can the spiritual content of dream reports be identified and measured?’” (p.130). This is answered positively, using the Casto Spirituality Scoring System
¹⁶⁷ Kelly Bulkeley, “The Religious Content of Dreams: A New Scientific Foundation,” *Pastoral Psychology* Vol.58 No.2 (April 2009), pp.93-106. In this paper Bulkeley analyses two long-term dream journals. The dream contents were quantitatively studied for age, personality, gender, culture and so forth and firm associations were found between such factors and the contents of dreams.
¹⁷⁰ Russell E. Phillips and Kenneth I.Pargament, “The Sanctification of Dreams: Prevalence and Implications,” *Dreaming* Vol.12 No.3 (September 2002), pp.141-153. Sanctification is defined as “the perception of an object as having spiritual significance and character. This construct is viewed from a psychospiritual perspective rather than a traditional theological point of view.” (p.142)
narrative and communitarian outlook. The soul of the young and young minds draws our attention back to social realities away from the brain. The temporal dimension of a human life “personalises” the vast time in evolution to an individual inter-relating within a society and culture.

The social elements needs not be opposed to individualist methods. In the previous chapter we saw the tension between scientific evolutionary psychology which sought to undermine the supposedly incorrect social science and cultural portrait of human nature (as blank slate). Likewise above, the differences between lifespan psychology and lifecourse sociology highlight differing vantage points of study. But there is little dispute about the importance of society and culture for humans who are social beings. It is language which connects social beings.

Turning to language, in the traditional Christian view, the soul and intellect are traditionally involved with human language. In St.Augustine, for example, language is situated within life, desire, God, and silence. In stillness, the tumults of the flesh and of earth, even the soul cries, “if any could hear, (...) ‘we made not ourselves, but He made us that abideth for ever’.” That is, human language is situated among the things of this world; it is as “hushed” so that the Word may speak.

Augustine explained how language can be understood in terms of a three-level Platonist hierarchy of God, soul and body. In the moment of intellectual vision, the soul inwardly touches the eternity of divine Truth. This descends to a lower level when it imprints its traces on the soul's memory, which Augustine later calls verbum interius. Next it is brought down to the lowest level when it is manifested in words reachable to the body’s senses.

P.Cary argues that this commanding view of the experience of understanding has been influential in the West for centuries, resulting in the separation of thought and

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172 Confessions IX, 10, 25. Pollina, Syntax, Confession, and Creation, p.S101
173 Pollina, Syntax, Confession, and Creation, p.S102
174 For the Christian Neoplatonist, the inner word is higher and closer to God than sensible, bodily things, including the words of language. Phillip Cary, “The Inner Word Prior to Language: Augustine as Platonist Alternative to Gadamerian Hermeneutics,” Philosophy Today Vol.55 No.2 (May 2011), pp.192-198
language. It led many to think that at the centre of the hearts or minds of human beings the divine may be experienced in ways too deep for words. Cary thinks this interpretation of experience, and that of the divine, is a mistake, “but it is certainly not a trivial one…It is an epochal and innovative approach to semiotics that has led to the conviction, still widely taken for granted today, that language is merely an inadequate outward expression or sign of a deeper, more inward, pre-verbal experience.”

Tommaso also portrays humans as rational and with immaterial intellects, differentiated from other animals. For him, language-use is the leading manifestation of the principle of rationality and many Thomists view it as a distinctive property of human beings. But there is disagreement among scholars about the common notion that language-use solely reveals important things about the intellect. There are linguistic functions undertaken by the inner senses, e.g. the cogitative power.

One analysis finds several senses of ‘word’ (verbum) in Tommaso. The ‘word of the heart’ is proper to the intellect: the concept, intention, or ratio formed by the intellect.

The ‘interior word’ is proper to the imagination: the image of the ‘vocal word’ formed by the imagination when people speak to themselves.

The ‘vocal word’ is proper to the voice for expression yet to the auditory faculty for apprehension: spoken out in human utterances.

The ‘written word’ is proper to vision or tactility, e.g., Braille.

The Thomistic tradition understands verbum mentis as that by which an object is known, not that which is known, or that which is in the mind and expressed differently in different languages.

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175 Cary, The Inner Word, p.197
177 De Haan, Linguistic Apprehension, p.180
178 De Haan, Linguistic Apprehension, p.184.
179 The species of the object of perception or cognition is grasped through the verbum mentis. David Vessey, “Gadamer, Augustine, Aquinas, and Hermeneutic Universality,” Philosophy Today Vol.55 No.2 (May 2011), pp.158-165 (p.161)
This chapter’s cited neurolinguistic studies of language acquisition continue to fascinate researchers about how humans acquire language and communicate by speech. These empirical accounts coherently report results from investigations of brain and mind, without any reference to the soul. What is missing however is the subjective dimension, the person who uses language to communicate intelligibly. Including the spiritual principle, as the Catholic tradition does, would help unite the personal aspect of language and speech with the objective findings.

On the matter of time, evolution works during time and history. God works through time too but also transcends time. The Christian liturgy recounts a story but also makes it present. Eschatology upends any possessiveness of time and place, because humans live between two times: the otherness of the past which returns, and openness to a present which proceeds to an unknown future. Time is always “the most mysterious and enigmatic of all God's gifts. Yet gift it remains.”

The traditional Catholic account of the human body and soul can further provide a wholistic counterbalance to reductionist tendencies in neuroscience; and is interested in neuroscience’s study human development, and the whole of life. A broader view of the human person is closer to the discourse level of magisterium: life, unity of soul/body, heart, and spirituality.

The ideas of Tommaso, for example, may help us to exercise caution in our reliance on empirical scientific studies, which have to use reductive methods. This chapter enlarges the traditional way of explaining body and soul. His thinking is less reductive, while empirical science has to use reductive methods. Yet the sciences may be perceived as needing caution in interpretation, e.g. sleep research may empty out the subjective audio-visual content of sleep, where a person’s sleep is an object of study and the sleeper is not dreamer.

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182 Barnes, Time, p.16.
The spiritual tradition of the Catholic Church also emphasises the heart, in the biblical sense of the depths of one’s being, where the person decides for or against God.\textsuperscript{183} This is the realm of the soul and dreams could be thought of as that part of human nature which is open to divine influence. Dreams in this sense have been called ‘personal scriptures’ since the events, characters and symbols are unique to the individual.\textsuperscript{184} Some see a profound link with the sacred, gained through insights not in the conscious mind but unconsciously via dreaming. This is regarded as a move toward wholeness or salvation.

The Judeo-Christian scriptures show God communicating in symbolic language through visions and dreams. For many, the dream content is not random but a gift from God, revealing or fostering moves towards wholeness.\textsuperscript{185} Indeed the bible contains a long history of sleep and dreams,\textsuperscript{186} sent by God for particular revelations or events. In the Book of Genesis, Adam’s rib is removed to create Eve through a deep sleep (Genesis 2:21).\textsuperscript{187} Some dreams are nightmares. Job has problems sleeping due to pain, and he also has nightmares: “When I think, ‘My bed will comfort me, my couch will share my sorrow,’ you frighten me with dreams and terrify me with visions” (Job 7:13, 14).\textsuperscript{188} The Gospel of Matthew describes the dreams of Joseph and Pilate’s wife.\textsuperscript{189}

In Christian spirituality dreams are one way the Lord helps people on the path to spiritual maturity.\textsuperscript{190} Dreams can prompt attention to the mystery that is God, to offer spiritual consolation, encourage ‘pray-ers’ to be listeners, and teach people to trust in

\begin{footnotesize}
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\item \textsuperscript{183} Catechism of the Catholic Church, no.368; p.94
\item \textsuperscript{185} Mueller, Dreams and Spiritual Direction, p.16
\item \textsuperscript{186} Sonia Ancoli-Israel, “‘Sleep Is Not Tangible’ or What the Hebrew Tradition Has to Say About Sleep,” Psychosomatic Medicine Vol.63 No.5 (September/October 2001), pp.778-787
\item \textsuperscript{187} Ancoli-Israel, Sleep Is Not Tangible, p.779. Ancoli-Israel thinks that “this reference to sleep suggests that sleep represents different levels of consciousness, including that level of consciousness (or unconsciousness) achieved with anesthesia.” (p.779)
\item \textsuperscript{188} Ancoli-Israel, Sleep Is Not Tangible, p.785
\item \textsuperscript{189} Robert Jeffery, “And Finally...Dreaming,” The Expository Times Vol.121 No.12 (September 2010), p.636. Jeffery points out that “it is only in St Matthew’s Gospel that there is an emphasis on dreams. Not only does Joseph have meaningful dreams, but so does Pilate’s wife. Joseph’s name is significant. He is a descendant of King David, thus, in Matthew’s eyes, enabling Jesus to be called the son of David. This Joseph is also a dreamer.” (p.636)
\item \textsuperscript{190} Jennifer Constantine Jackson, “Dreams in Prayer and Discernment,” Review for Religious Vol.66 No.1 (2007), pp.19-29. Jackson traces the history and cites authors such as John A.Sanford and Morton Kelsey and its relevance to Iganitian spiritual direction.
\end{itemize}
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the Lord. This contrasts the observation that many presume the notion of finding religious meaning or reality in dreams is a fallacy from the Dark Ages. This misapprehension diverges from the biblical tradition. Fathers of the Church for instance Saint Gregory Nazianzen and more recently the Italian Saint Giovanni Bosco, Anglican minister and author of the hymn “Amazing Grace”, John Newton who left slave trade, and Carmelite nun Saint Thérèse of Lisieux. Although this religious understanding of dreams is not fully supported by scientific studies, neither is it contradicted by them. And, as noted above, at least some studies suggest the traditional view contains some real insights into the nature of the human person.

Conclusions
Judging by the body of scholarship, there is greater research interest in the social, cultural and the linguistic aspects of life. The ability to see the developing human brain and to track changes to structure and function is a rather recent phenomenon especially in the last 15 years. Currently there are 1.2 billion people who are 10-19 years year old and there has been historically a shortage of data and analyses on adolescents.

These are significant areas which affect the mind/soul of a person and his or her life, situated in an interpersonal existential perspective. Some points of contact which may open dialogue between religious and scientific views are: dreams and the soul with attention to the subjective experience rather than experimental sleep research; acquiring language as a socio-neurocognitive phase of development which could include how language about God is discovered; and how a maturing brain and mind is essential for a young person’s body and soul. Just as the body grows from infant to

191 Jackson, Dreams in Prayer, pp.26-28. The exploration of dreams in prayer can be “unique expressions of the life of the Spirit in the church...at the same time, we continue to be called to greater participation in the life of Christ.” (p.28)
194 Kelsey, Foreword: The Dream as Religious Experience, pp.xix-xxx
adult, so too the mind matures and the brain changes, but brain deficits and mental disabilities do not deprive individuals of their transcendent dignity even in the young.

The psychophysical unity of the person means that the soul is part of that growth process. The sciences can provide the lead in this discussion, and may also learn from the development of the young in faith. John Paul II says that the hope of a better world is reborn with every new generation, so long as they are given the benefit of an adequate education drawing its inspiration from the Gospel.

An apposite image for the proposed dialogue might be the journey. Ancient Egyptian beliefs concerning the journey of the soul after death are well known. Later, Philo wrote about journey of the soul through the incorporeal and corporeal worlds; this involved personal responsibility for decisions and actions of the individual. In the Patristic period there are images of progressive union with the Divine, including a journey of prayer and the sacramental elements.

The medieval ‘Age of Faith’ had hopes and fears about the Other World but also notions about pathways. There were allegories of the way traversed in this life, for example about homo viator [traveller or wayfarer ‘man’] and peregrinus in terris

199 John Paul II, “Message of His Holiness John Paul II for the beginning of the 23rd General Chapter,” in SDB, Educating Young People, nos.311-314, pp.175-177 (p.175)
200 Apart from the ancient Greek philosophers such as Plato, see too Andrew Robinson, “Jean-François Champollion and ancient Egyptian embalming,” The Lancet Vol.379 No.9828 (12-18 May 2012), pp.1782-1783
202 Kristina Robb-Dover, “Gregory of Nyssa's 'Perpetual Progress',' Theology Today Vol.65 No.2 (July 2008), pp. 213-225
Popular traditions mention the bridge to the Other World, the ladder, a boat-trip, even a journey on horseback, and the vehicle of the cart.\textsuperscript{205}

The journey theme is suited to the development of faith.\textsuperscript{206} Modern use of archetypes, myths, symbols are applicable to the questing and journey motif.\textsuperscript{207} If scientific and social studies can be view the human life across time in a journey, then a there are good prospects for dialogue.

\textbf{Part II Retrospective}

Part II has explored five areas of neuroscience and associated subjects that can contribute new insights on the soul. Yet, while neuroscientific methods cannot be ignored as a powerful account of the brain’s involvement in all aspects of human living, it has been subject to philosophical analysis and critique by Bennett and Hacker and others. The science is sound; however dualist errors have been identified in neuroscience’s philosophical claims, e.g. speaking about the brain as if it were a person.

Close scrutiny is also required when neuroscience investigates spiritual and religious experiences. Some neuroscientists interpret their findings in such ways to eliminate any need for a soul. Others, however, have concluded that people really have experienced a reality beyond themselves.

Brain experiments about embodied religious experience are fascinating, nevertheless the brain cannot be depended upon when it, or the body, start to degenerate. Head trauma and neurological diseases cause damage to the brain and frequently results in troubled minds, maybe ‘lost souls’ as it were.

On the other hand, since souls are united to bodies, it is important to consider the evolutionary background to the physical nature of human beings. Comparative

\textsuperscript{204} Dinzelbacher, \textit{The Way to the Other World}, p.70
\textsuperscript{205} Dinzelbacher, \textit{The Way to the Other World}, pp.76-79
studies with other animals, and evolutionary psychology, are valid and important ways of studying human persons. They firmly anchor the mind and brain in nature and time.

Having a temporal vision of body-soul is foundational to understanding human beings over their lifetimes. A more wholistic existential outlook can be gained by examining society, language, and the young brain/mind and soul.

Returning to Part I, on Catholic teachings and thought about the soul, a number of relevant points can be made. The experimental methods equip neuroscience to be a physicalist discipline, untroubled by any peripheral issues about the soul except for those neuroscientists who choose to enter into metaphysical territory. Some make claims of denial of the soul, yet others make affirmative remarks.

The traditional Catholic view is that the human body shares in the dignity of "the image of God": it is a human body precisely because it is animated by a spiritual soul. Accordingly the tradition ought to be keenly interested in the brain and how it might relate to the soul, particularly when Catholic teachings are expressed in largely philosophical concepts and language, not born out of the neuroscientific age. As noted in Part I, there are conferences and writings which strive to enter into such dialogue.

Part of the Catholic contribution is its respect for the dignity of the person. It can question the centrality of the healthy brain and show how a Christian community champions supportive care for all human beings, including those with neurodegenerative conditions. This stems from the Catholic belief in the transcendence of human souls. This furnishes a new factor of uniqueness in the human spiritual nature. Human dignity is another reasonably uncontentious area for mutual discussion with scientists.

Two other emerging interfaces for dialogue are identity and journey. Given the philosophical tensions between a biological “brain view” and a psychological “continuity view,” the spiritual principle in human beings, united with the body in

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208 *Catechism of the Catholic Church*, no.364; p.93
health and sickness, is a valid basis to discuss self and identity questions. Secondly, the metaphor or image of the journey could unify ideas about human life from the stages which include language acquisition, to the developing brain, mind, and soul into adulthood.

In the next part we present an updated Catholic understanding of the soul in light of modern science and related philosophy.