

Developments in the Neurosciences and the Nature of Persons

Course Number: Psychology 438

Institution: Redeemer College, Ancaster ON, Canada

Instructor: Wayne D. Norman

Course Description

This course examines selected recent developments in the neurosciences which may influence the traditional Christian understanding of the nature of persons. At times Christians have displayed the “ostrich syndrome” regarding developments in the sciences, choosing to ignore difficult theories and empirical findings rather than engaging them in open discussion. Honest Christian scholarship does not avoid difficult questions but rather attempts to evaluate scientific evidence from an informed perspective. At the same time, these questions must be addressed with some theological understanding. Bringing together good scientific and theological evaluation, while not easy, is a primary aim of this course. To accomplish this we will examine primary source literature in the neurosciences along with secondary source critiques of that literature. In order to better understand various theologies of the person, as represented by the Orthodox, Reformed Protestant, and Roman Catholic traditions, we will consult representatives and readings from these traditions.

Traditional understandings of the person, based in part on the Judeo-Christian heritage include the following. Persons are conscious, and in fact self-conscious, they are agents, meaning that they make choices based in part on held values and act on the basis of those choices. They believe their actions to be free in some sense and that they should be held responsible for such actions. Lastly, they possess a unity and continuity of self. Recent developments in the neurosciences challenge us to think carefully about these characteristics. We need to critically evaluate just what we as Christians believe about persons and why.

The consistent theme running through this course is a call to reexamine our understanding of who we are as physical, mental and spiritual beings. When body, mind and soul are reified as distinct entities there is a tendency to also compartmentalize causes and effects on those entities. Degenerative diseases, for example, are believed to affect the brain but not the spiritual aspects of our lives. Sin, on the other hand, is conceived as spiritual. Pointing to physical and psychological factors is believed to diminish the importance of sin in explaining the actions. Linkages between the physical and mental are now widely accepted in psychology. In this course we will examine evidence for extending those linkages to include the spiritual.

The neuroscientific issues chosen and the associated theological questions raised include the following: (1) Changes in brain states may be associated with changes in spiritual or religious experiences. Such brain states may be induced by degenerative diseases as

Alzheimer's, by seizure activity, especially in the temporal lobes of the cerebral hemispheres, by drugs and even by near-death experiences. Associated religious experiences may include mystical experiences, reported spiritual conversion or even a decreased sense of spirituality. What do we make of the elderly individual suffering from Alzheimer's disease who may experience of loss of Christian commitment? Has this person lost his or her faith? And what about the person with temporal lobe epilepsy who reports a heightened sense of spirituality following seizure episodes? Are our religious experiences nothing more than specific patterns of activity in selected brain regions? (2) Surgical operations that physically separate the left and right cerebral hemispheres of the brain produce changes in the behavior and experience of those patients that raise questions about unity of consciousness and the self. Do these split-brain operations really produce two minds within one body? Do they reveal a dual consciousness that in fact is inherent to all of us? Other theories, proposing a modularity of mind break up the unity of self into even more pieces. Mind and self become convenient terms for describing the combined action of a multitude of low-level processing units. (3) Neural and neurohormonal influences during the prenatal and perinatal periods influence the development of systems associated with our sexuality. Do such influences also affect gender identity and sexual preference in adulthood? If so, in what sense are the choices we make in this realm a product of free choice, biologic and genetic influence, and personal experiences? Should we hold individuals morally accountable for their sexual preference? In what sense should we speak of sin in this area? (4) In the midst of research suggesting bottom-up influences on our actions (i.e., genetic and hormonal factors in determining sexual preference or decreases in spirituality as a function of deterioration in brain processes) the field of psychoneuroimmunology directs our attention to top-down influences on behavior. The beliefs and attitudes we hold do have an effect on physiological systems that in turn influence our immune system and health. Do the findings from psychoneuroimmunology provide a counterbalance to the reductive explanations so prevalent in the neurosciences? Do they provide a means for reintroducing the concept of agency in psychology? Do they preclude supernatural explanations for issues related to healing? What do such findings mean for our understanding of mind-brain relationships?

Course Requirements

Term essay (topic to be approved by instructor) 35%

Final exam (take-home) 20%

Critical Book Review 20%

Participation 25%

Course Assignments

Education is at its best when students are actively engaged with the material rather than being passive receptacles for facts. As a seminar course, students are expected to read

assigned material and to be prepared to discuss that material in class. In addition, this course will make use of the panel discussion format. For each neuroscience topic the first session will consist of lecture material presented by the instructor. Then a panel of students (size to be determined by overall enrolment in the course) will organize, prepare and lead the discussion on that topic. Each panel member will present a 15-20 minute talk on some aspect of the topic. The instructor will function as moderator for the session, introducing the issues and coordinating discussion at the conclusion of the presentations. Panel members will prepare a list of assigned readings which the instructor will assign to selected class members. The following class meeting will be devoted to a general discussion of the readings and previous presentations. Student participation connected with the panel discussions will be graded. As a minimal level of participation, each student must submit to the instructor a question for the panel on the class meeting following the panel's presentation.

In the term essay students are expected to develop, from one of the four main topic areas, a thesis statement to be researched. Using primary and secondary sources, the essay will critically examine evidence in support of the thesis. The essay must address both the neuroscience and the theological issues associated with the problem. Essays should be approximately 15 pages in length. All essay topics must be approved by the instructor.

Each student will read a book on a topic approved by the instructor and write a critical review. The format for the review will be discussed in class.

The final exam will be of the take-home essay variety.

Course Schedule

Sept 6 & 11

(1) Brief survey of the neuroscience topics to be addressed and the Christian theological positions to be examined

(2) General introduction to neuroanatomy and neurophysiology and methodological considerations in the neurosciences

Clayton, Philip (2000). Neuroscience, the person, and God: An emergentist account. *Zygon*, 35(3), 613-652.

Hasker, W. (1987). Brains and persons. In H. Heie & D.L. Wolfe (eds.) *The reality of Christian learning: strategies for faith-discipline integration*. Grand Rapids, MI: Eerdmans Publishing Company.

Jeeves, M.A. (1997). Millennial psychology (chp 1) and Learning from the past (chp 2). In M.A. Jeeves, *Psychology and Christianity: partners in understanding human nature*. Grand Rapids, MI: Baker Book House.

Jones, D.G. (1987). The human brain and the meaning of humanness. In H. Heie & D.L. Wolfe (eds.) *The reality of Christian learning: strategies for faith-discipline integration*. Grand Rapids, MI: Eerdmans Publishing Company.

MacKay, D.M. (1988). Brain research and human responsibility. In M. Tinker (ed.) *The open mind and other essays: Donald M. MacKay*. Leicester, England: InterVarsity Press.

McBrien, R.P. "Roman Catholicism" In Mircea Eliade (ed.) *The Encyclopedia of Religion*, pp.429-445.

Ware, Kallistos. "Eastern Christianity" In Mircea Eliade (ed.) *The Encyclopedia of Religion*, pp. 558-576.

Gillett, G.R. (1985). Brain, mind, and soul. *Zygon*, 20, 425-434.

Jones, D.G. (1981). The human brain and the human person. In D.G. Jones, *Our fragile brains*. Leicester, England: InterVarsity Press.

MacKay, D.M. (1988). Persons and things. In M. Tinker (ed.) *The open mind and other essays: Donald M. MacKay*. Leicester, England: InterVarsity Press.

MacKay, D.M. (1990). *Behind the eye*. V. MacKay (ed.) Oxford: Blackwell Publisher.

Sept 13 & 18

An examination of the mind-brain relationship with an emphasis on historical developments and implications for modern neuroscience

Cooper, J.W. (1989). *Body, soul, and life everlasting: biblical anthropology and the monism-dualism debate*. Grand Rapids, MI: Eerdmans Publishing Company.

Jeeves, M.A. (1997). The mind:brain link (chp 3). In M.A. Jeeves, *Psychology and Christianity: partners in understanding human nature*. Grand Rapids, MI: Baker Book House.

Jones, S.L. (1988). Mind-brain relationship. In D.G. Benner (ed.) *Psychology and religion*. Grand Rapids, MI: Baker Book House.

MacKay, D.M. (1980). *Brains, machines and persons*. Grand Rapids, MI: Eerdmans Publishing Company.

Searle, J. (1984). The mind-body problem. In J. Searle, *Minds, brains and science*. Cambridge, MA: Harvard University Press.

Churchland, P.M. (1995). *Engine of reason, the seat of the soul: a philosophical journey into the brain*. Cambridge, MA: MIT Press.

Damasio, A. (1994). *Descartes' error: emotion, reason and the human brain*. New York: Grosset/Putnam.

Penrose, R. (1989). *The emperor's new mind: concerning computers, minds and the laws of physics*. New York: Oxford University Press.

Swinburne, R. (1986). *The evolution of the soul*. Oxford: Clarendon Press.

Vande Kemp, H. (1982). The tension between psychology and theology: the etymological roots. *Journal of Psychology and Theology*, 10, 105-112.

Sept 20 & 25

General introduction to the concept of persons in Western thought

Evans, C.S. (1984). Personhood. In D.G. Benner (ed.) *Psychology and religion*. Grand Rapids, MI: Baker Book House.

Barbour, Ian, G. (1999). "Neuroscience, artificial intelligence, and human nature: theological and philosophical reflections" in *Neuroscience and the Person*. Russell, R.J., Murphy, N., Meyering, T.C., & Arbib, M.A. (eds.), Vatican Observatory Publications, pp. 249-280.

Happel, S. (1999). "The soul and neuroscience: possibilities for divine action" in *Neuroscience and the Person*. Russell, R.J., Murphy, N., Meyering, T.C., & Arbib, M.A. (eds.), Vatican Observatory Publications, pp. 281-304.

Jeeves, M.A. (in press). Human nature: Biblical portraits (chp 6). In M.A. Jeeves, *Psychology and Christianity: partners in understanding human nature*. Grand Rapids, MI: Baker Book House.

Kirwan, W.T. (1988). Biblical anthropology. In D.G. Benner (ed.) *Psychology and religion*. Grand Rapids, MI: Baker Book House.

Evans, S.S. (1989). *Wisdom and humanness in psychology: prospects for a Christian approach*. Grand Rapids, MI: Baker Book House.

Evans, C.S. (1982). *Preserving the person: a look at the human sciences*. Grand Rapids, MI: Baker Book House.

Moss, E. (1989). *Seeing man whole*. Sussex: The Book Guild Ltd.

Smith, R.G. (1969). *The whole man: studies in Christian anthropology*. Philadelphia: The Westminster Press.

Van Leeuwen, M.S. (1985). *The person in psychology: a contemporary Christian appraisal*. Grand Rapids, MI: Eerdmans Publishing Company.

Sept 27 - Oct 11

The relationship between brain states and religious experiences: temporal lobe epilepsy, conversion experiences, near-death experiences, neural degenerative diseases

The Utility of a Neuropsychology of Religious Experience [online]
bhidalgo.tripod.com/litreview.htm

Brown, W.S. & Caetano, C. (1992) Conversion, cognition and neuropsychology. In H.N. Malony & S. Southard (eds.) *Handbook of conversion*. Birmingham, AL: Religious Education Press.

Jeeves, M.A. (1997). Neural processes, psychological states and spiritual awareness - illustrative case studies (chp 4). In M.A. Jeeves, *Psychology and Christianity: partners in understanding human nature*. Grand Rapids, MI: Baker Book House.

Knight, R.G. (1992). *The neuropsychology of degenerative brain diseases*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Persinger, M.A. (1984). People who report religious experiences may also display enhanced temporal lobe signs. *Perceptual and Motor Skills*, 58, 163-197.

Tucker, D.M., Novelly, R.A. & Walker, P.J. (1987). Hyperreligiosity in temporal lobe epilepsy: redefining the relationship. *Journal of Nervous and Mental Disease*, 175, 181-184.

Bear D.M. (1979). The temporal lobes: an approach to the study of organic changes. In M.D. Gazzaniga (ed.) *Handbook of behavioral neurobiology*, vol 2 *Neuropsychology*. New York: Plenum Press.

Hart, S. & Semple, J.M. (1991). *Neuropsychology and the dementias*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Persinger, M.A. (1983). Religious and mystical experiences as artifacts of temporal lobe function: a general hypothesis. *Perceptual and Motor Skills*, 57, 1225-1262.

Persinger, M.A. (1984). Propensity to report paranormal experiences is correlated with temporal lobe signs. *Perceptual and Motor Skills*, 59, 583-586.

Philipchalk, R.P. (1988). Physiological psychology. In R.P. Philipchalk. *Psychology and Christianity: an introduction to controversial issues*. Lanham, MD: University Press of America.

Weaver, G.D. (1986). Senile dementia and a resurrection theology. *Theology Today*, 42, 444-456.

Oct 16 - 30

The implications of commissurotomy and brain modularity theories for dual consciousness and unity and continuity of self

Evans, C.S. (1986). The self in contemporary psychology. In S.L. Jones (ed.) *Psychology and the Christian faith: an introductory reader*. Grand Rapids, MI: Baker Book House.

Jeeves, M.A. (1997). "Consciousness now": a contemporary issue (chp 10) and A case study: consciousness explained?: same data: different interpretations (chp 11). In M.A. Jeeves, *Psychology and Christianity: partners in understanding human nature*. Grand Rapids, MI: Baker Book House.

MacKay, D.M. (1978). Selves and brains. *Neuroscience*, 3, 599-606.

Natsoulas, T. (1995). Consciousness and commissurotomy: VI. Evidence for normal dual consciousness? *Journal of Mind and Behavior*, 16, 181-206.

Natsoulas, T. (1993). Consciousness and commissurotomy: V. Concerning an hypothesis of normal dual consciousness. *Journal of Mind and Behavior*, 14, 179-202.

Norman, W.D. (1996). *Collaborative engagement: common sense reflections on the mystery of the double brain*. Redeemer College Inaugural Series. Redeemer College.

Pinel, J.P.J. (1993). Lateralization, language, and the split brain. In J.P.J. Pinel *Biopsychology*. (2nd ed.) Boston: Allyn & Bacon.

Radden, J. (1996). *Divided minds and successive selves: ethical issues in disorders of identity and personality*. Cambridge, MA: MIT Press.

Springer, S.P. & Deutsch, G. (1993). The human split brain: surgical separation of the hemispheres (chp 2). In S.P. Springer & G. Deutsch, *Left brain, right brain*. New York: W.H. Freeman & Company.

Nov 1 - 13

Neural and neurohormonal influences on sexual orientation

Bancroft, J. (1994). Homosexual orientation. *British Journal of Psychiatry*, 164, 437-460.

Court, J.H. (1984). Homosexuality: a scientific and Christian perspective. In M.A. Jeeves (ed.) *Behavioural sciences: a Christian perspective*. Leicester, England: InterVarsity Press.

Jones, S.L. & Workman, D.E. (1989). Homosexuality: the behavioral sciences and the church. *Journal of Psychology and Theology*, 17, 213-225.

Money, J. (1987). Sin, sickness or status? Homosexual gender identity and psychoneuroendocrinology. *American Psychologist*, 42, 384-399.

Swaab, D.F., Gooren, L.G. & Hofman, M.A. (1995). Brain research, gender, and sexual orientation. Special issue: Sex, cell, and same-sex desire: the biology of sexual preference: II. *Journal of Homosexuality*, 28, 283-301.

Bailey, M.J. & Pillard, R.C. (1991). A genetic study of male sexual orientation. *Archives of General Psychiatry*, 48, 1089-1096.

Byrne, W. & Parsons, B. (1993). Human sexual orientation: the biologic theories reappraised. *Archive of General Psychiatry*, 50, 228-239.

Ellis, L. & Ames, M.A. (1987). Neurohormonal functioning and sexual orientation: a theory of homosexuality-heterosexuality. *Psychological Bulletin*, 101, 233-258.

Erhardt, A.A., Meyer-Bahlburg, H.F.L., Rosen, L.R., Feldman, J.F., Veridiano, N.P., Zimmerman, I. & McEwen, B.S. (1985). Sexual orientation after prenatal exposure to exogenous estrogens. *Archives of Sexual Behavior*, 14, 57-77.

Hart, P.P. (1984). Eros: sexuality and spirituality. *Journal of Psychology and Christianity*, 3, 69-74.

Jeeves, M.A. (1997). The behaviour:brain link (chp 5). In M.A. Jeeves, *Psychology and Christianity: partners in understanding human nature*. Grand Rapids, MI: Baker Book House.

Jones, S.L. (1988). Sexuality. In D.G. Benner (ed.) *Psychology and religion*. Grand Rapids, MI: Baker Book House.

LeVay, S. (1991). A difference in hypothalamic structure between heterosexual and homosexual men. *Science*, 253, 1034-1037.

Pinel, J.P.J. (1993). Hormones and sex. In J.P.J. Pinel, *Biopsychology*. (2nd ed.) Boston: Allyn & Bacon.

Jones, S.L. & Yarhouse, M.A. (2000). "The Use, misuse, and abuse of science in the ecclesiastical homosexuality debates" in *Homosexuality, Science, and the "Plain Sense" of Scripture*. Balch, D.L. (ed.), Wm B. Eerdmans: Grand Rapids, MI, pp. 73-124.

Nov 15 - 27

The role of psychoneuroimmunology in reductive explanations of behavior

Ader, R., Cohen, N. & Felton, D. (1995). Psychoneuroimmunology: interactions between the nervous system and the immune system. *Lancet*, 345, 99-103.

Jankovic, B.D. (1991). Neuro-immune network: basic structural and functional correlates. *Acta Neurologica*, 13, 305-314.

Solomon, G.F. (1993). Whither psychoneuroimmunology? A new era of immunology of psychosomatic medicine and of neuroscience. *Brain, Behavior & Immunology*, 7, 352-366.

Nov 29 - Dec 6

Project Presentations & Reflections on the road ahead

Jeeves, M.A. (1997). The way ahead: beyond perspectivalism? (chp 13). In M.A. Jeeves, *Psychology and Christianity: partners in understanding human nature*. Grand Rapids, MI: Baker Book House.