# Psychology and the Three Cultures

## Psychology and the Three Cultures:

History, Perspectives and Portraits

Ву

Rosalyn M. King

Cambridge Scholars Publishing



Psychology and the Three Cultures: History, Perspectives and Portraits

By Rosalyn M. King

This book first published 2018

Cambridge Scholars Publishing

Lady Stephenson Library, Newcastle upon Tyne, NE6 2PA, UK

British Library Cataloguing in Publication Data A catalogue record for this book is available from the British Library

Copyright © 2018 by Rosalyn M. King

All rights for this book reserved. No part of this book may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior permission of the copyright owner.

ISBN (10): 1-5275-0774-2 ISBN (13): 978-1-5275-0774-6

#### TABLE OF CONTENTS

List of Illustrationsxiv
Endorsementsxv
Acknowledgementsxvii
Prefacexix
Part I: Psychology and the Three Cultures— Nexus between Science, the Humanities and Social Sciences
Chapter One2
Introduction, Background and Hierarchy
The Controversy: Cultural Tensions and Separation
Psychology as a Separate Science
Psychology's Recognition as a Science
Uniqueness of the Discipline: Interdisciplinary and Global
Contributions and Collaborations with Other Disciplines
No Set Paradigm and Use of Multiple Methodological
Approaches
Purpose of Book
Part II: Historical Evolution of Psychology and its Interdisciplinary Focus
Chapter Two
Early Egypt and Greece
Egyptian Scholars — Prolific Writers
Hermes Trismegistus—The All is Mind—The Universe is Mental

Early Greece and Greek Cities in Italy
Greek Scholars
Homer—Applied Psychology
Sophocles—Dramaturgy
Thales—Nature of Matter and Immortality of the Soul
Heraclitus—Nature of Knowledge, Logos and Sense Perception
Empedocles – Sensation, Perception and Evolutionary Theory
Alcmaeon—Brain as Seat of Consciousness: Intelligence, Immortality
and Sense Perception
Pythagoras—Metempsychosis and the Transmigration of the Soul
Democritus—Atomist Theory of Mind and Universe
Hippocrates—Mind-Body Connection and the Four Humors
Socrates—Logic, Ethics, Moral Goodness and Self-Knowledge
Plato—Duality of the Psyche, Sense Perception, Ethics and Love
Aristotle—Philosophical Psychology, Metaphysics, Ethics
and the Psyche
Theophrastus—Physiological and Personality Psychology,
Botany and Interdisciplinary Studies
Herophilus—Neuroscience, Physiology and Anatomy
Erasistratus—Experimental Psychology
Galen—Four Temperaments, Anatomy and Physiology
Summary of Egyptian and Greek Contributions
Chapter Three46
The Patristic Period and the Church Fathers
Contributions of the Theologians
Origen—Compatibility of Philosophy, Science and Christianity
Plotinus—Forms of Mental Activity, Meditation and Reflection
St. Augustine-Redefinition of Psychology and Incorporation of
Christian Doctrines
St. Thomas Aquinas—Integration of Psychology, Philosophy
and Theology
Peter of Spain—Integration of Psychology, Theology
and Medicine
Summary of the Contributions of the Church Fathers

Psychology	and	the	Three	Cultures

Chapter Four61
The Renaissance and Early Modern Period
The Renaissance
René Descartes—Rationalistic and Mechanistic Views of Mind
Gottfried Leibniz—Nature of Mind
Modern Period and the New Science
Sir Francis Bacon—Natural Philosophy, Scientific Methodology,
Applied Science and Science of Mind
Summary of the Renaissance and Modern Periods
Chapter Five
Great Britain and the Scottish Realists
The British Empiricists
Sir Isaac Newton—Sensation and Vision
Thomas Hobbes—Human Nature and Social Conduct
John Locke—Human Understanding and Ideas
George Berkeley—Mentalism, Ideas, Sensation and Perception
James and John Stuart Mills—Sensation and Ideas,
Science of Human Nature and Mental Chemistry
Julien Offray de La Mettrie-Mind, Brain and Body Connection
The Scottish Realists—Return to the Individual
Thomas Reid — Faculties of Mind
Thomas Brown—Philosophy of Human Mind
Chapter Six
Germany: Idealists, Neuroscience, Psychophysics
and Experimental Psychology
The German Idealists
Immanuel Kant—Reason and Judgment
Johann Friedrich Herbart—Science of Experience, Metaphysics and Mathematics
Physiology, Neuroscience, Psychophysics and Experimental
Psychology
Johannes Muller—Physiology

Charles Bell, and François Magendie—Sensory vs. Motor Nerves
Franz Joseph Gall – Phrenology
Pierre Flourens—Brain Anatomy
Paul Broca—Brain and Language
Herman Von Helmholtz—Sensation, Color Vision, Pitch and
Space Perception
Gustav Fechner—Psychophysics, Experimental Psychology and
Aesthetics
Wilhelm Wundt-Introspection, Content and Experimental
Psychology
Chapter Seven
Evolution Theory, Differential Psychology
and 20th Century Psychology
Theory of Evolution
Charles Darwin—Human and Animal Origins
Differential Psychology
Sir Francis Galton—Hereditary Genius and Study
and Measurement of Individual Differences
Historical Evolution to an Integrated Psychology
in the 20th Century
French Psychology (Late 18th to Early 19th Century)
Functionalism in America (19th Century)
An Integrated Psychological Hub Science
Part III: Integrated Perspectives from Select Subfields
Chapter Eight
Evolutionary and Comparative Psychology
Evolutionary Psychology and Integrated Fields
Comparative Psychology and Integrated Fields

Psychology and the Three Cultures	ix
-----------------------------------	----

1	٦	

Chapter Nine116	6
The Cognitive and Developmental Sciences	
Overview of the Cognitive Sciences	
Developmental Psychological Science across the Lifespan	
Chapter Ten	3
Psychology, Quantum Physics and Energy Medicine	
Psychology and Quantum Physics	
Energy Medicine — Veritable and Putative	
Integrative Medicine – A Definition	
Veritable Energy Medicine	
Putative Energy Medicine	
Other Therapies	
Part IV: Portraits—Psychological Scientists	
using Integrated Approaches	
Chapter Eleven148	8
Carl Jung—Visionary Genius in Psychological Science	
Interdisciplinary Integration and Understanding of Human	
Nature	
Overview of Life and Work	
Jung's Red Book	
Jung and Religion	
The Human Psyche and Religion	
Knowledge of Western and Eastern Religions	
Toward a Psychology of Religion	
Jung and Gnosticism	
The Nag Hammadi Texts, Human Consciousness and	
Gnostic Psychology	
Jung and the Occult: Spiritualism, The Collective Unconscious	
and Mythology	
The Psychogenesis of Spiritualism	
The Primitive Psyche versus the Civilized Psyche	
The Role of Dreams, Mental Illness and Psychogenic Diseases	,

The Soul versus the Spirit
The Collective Unconscious
Jung and Alchemical Studies
The Alchemical Processes of the Human Psyche
Alchemy and Analytical Psychology
Jung on Psychology, Literature and Art
The Psychology of Creativity
Chapter Twelve
William James – Pioneer in American Psychological Science
Overview of Life and Work
Great Paths Cross
Background and Training Led to an Integrated Psychology
Courses Taught across Disciplines
The Writings of William James
First American Textbook—The Principles of Psychology
Conceptual and Scientific Framework for the Field of
Psychology
Theoretical Foundation
Topics of Discussion
Influence and Impact
The Emotions
Emotions Based on Physiology
Emotions, Affect, Cognition and Expression
Transpersonal Pioneer in Consciousness Studies
Evolution of Models of Consciousness
Core Components of Consciousness
Exploration of the Subconscious and Psychopathology
Threshold of Consciousness
Hypnosis and Consciousness
Cosmology and Consciousness
James' Influence on the Future of Consciousness Studies
Contributions to Educational Psychology

Talks to Teachers

James on Higher Education

James on Art and Literature
James and Phenomenology
The Importance of Understanding the Human Experience
Trends Used by James
James on the Science of Happiness—Precursor to Positive
Psychology
Science, Psychology and Religion:
The Varieties of Religious Experience
The Study and Science of Religion
The Gifford Lectures and the Varieties of Religious
Experience
A Personal Religion
Faith—The Reality of the Unseen
The Religion of Healthy-Mindedness
The Sick Soul
Saintliness
Implications of the Varieties of the Religious Experience
Mystical States of Consciousness
On Morals and Ethics
James on Moral Beliefs
Influence on Contemporary Psychology
Chapter Thirteen
Stanislav Grof—Psychology of the Future
and a New 21st Century Paradigm
Overview of Life and Work
Background
Contributions
Books by Stanislav Grof
Parallels to Carl Jung and William James
Moving Away from the Freudian Paradigm
Founder of Transpersonal Psychology
Non-Ordinary and Holotropic States of Consciousness
Holotropic States of Consciousness
Holotropic Practice and Shamanism

Holotropic States in Historical Versus Modern Day
Psychotherapy and Psychohistory
LSD Studies and Psychedelic Research
The Paradigm Shift from Psychedelics to Holotropic Breathwork
The Importance of Breath, Music, Bodywork and Art
Therapeutic and Healing Effects of Holotropic Breathwork
Cartography of the Human Psyche—Biographical, Perinatal and
Transpersonal Domains
Postnatal Biography
Systems of Condensed Experiences (COEX Systems)
The Perinatal Level of the Unconscious
The Transpersonal Domain of the Psyche
Emotional and Psychosomatic Disorders
The Nature, Function and Architecture of Emotional and
Psychosomatic Disorders
Grof's Typology of Mental Disorders Linked to Birth Trauma
Consciousness and Art
The Link between Science, Religion and Spirituality
Spiritual Emergencies
The Experience of Dying and Death
The Roots of Human Violence
Implications and New Paradigms for the Future
Conclusions
Part V: Implications and Future Directions for Psychology
Chapter Fourteen 274
Summary, Implications and Future Directions
Summary of Key Findings
Three Cultures: Controversy and Tension
Psychology as a Separate Science
Recognition as a Science
Paradigm, Methodology and Scope
Historical Evolution and Interdisciplinary Focus

Portraits of Scientists Using Integrated Approaches Noted Parallels between Jung, James and Grof

Analyses

Implications and Future Directions

Perspectives: Schools and Subfields Embracing Integrated

Conclusions	
References	289
Appendices	
Appendix A	302
Appendix BSample of Disciplines and Careers in Psychology	321

#### LIST OF ILLUSTRATIONS

1.1	Hierarchy of the Three Cultures11
7.1	Historical Contributions to an Integrated Psychology 104
8.1	Evolutionary Psychology and its Interdisciplinary Focus 112
8.2	Overview of Comparative Psychology
9.1	Overview of the Cognitive Sciences
9.2	Overview of Developmental Psychological Science 132
10.1	Overview of Quantum Physics and
	Quantum Psychology
10.2	Overview of Energy Medicine and Energy Psychology 145
13.1	Overview of Perinatal Matrices
13.2	Grof's Typology of Mental Disorders Linked
	to Birth Trauma

#### **ENDORSEMENTS**

In Psychology and the Three Cultures: History, Perspectives and Portraits, Professor Rosalyn M. King focuses on the history of psychology from a multidisciplinary perspective. She presents a very comprehensive and scholarly treatment of psychology over time and thinkers. Moreover, she demonstrates well how psychology as a science has drawn from the natural sciences, the arts and humanities, and religion. Professor King states that, "Psychology as a scientific discipline is a hub science—one that connects to virtually all the social, behavioral and natural sciences; and, to arts, literature and the humanities." Her authored book is replete with critical knowledge and diverse thoughts of psychology from ancient history to the present. I highly recommend Psychology and the Three Cultures: History, Perspectives and Portraits as a textbook for a history of psychology course or a course in History and Systems of Psychology.

#### Frederick D. Harper, PhD

Professor Emeritus of Counseling Psychology, School of Education, Howard University

Editor-in-Chief Emeritus, The Journal of Negro Education Co-editor, International Journal for the Advancement of Counseling

This book is a must-read for scholars across all areas of the academy. In arguing for the essential unity of the arts, the sciences, and the social sciences under the aegis of psychology, King offers an original and compelling analysis of the complex history of the discipline. Above and beyond that, she powerfully illustrates the interdisciplinary nature of psychology, and she creatively connects recent developments in the field

with developments in the sciences as well as spirituality. As King underscores throughout the book, psychology plays a special role as the point of intersection between nature and culture, both ancient and modern.

#### John Jacobs, PhD

Chair, Department of World Languages,
Montclair Kimberley Academy Upper School, Montclair, New Jersey
Forthcoming Books: An Introduction to Silius Italicus and
the Punica; and, The Reception of Silius Italicus and the Punica,
(Bloomsbury).

As an historian, I am always pleased to encounter studies that skillfully draw on the past to inform contemporary scholarly inquiry. In her analysis of Psychology and the Three Cultures: History Perspectives and Portraits, Dr. Rosalyn M. King takes the reader on an intellectual journey through space, time, and lands in the fascinating and complex world of psychological science. Few scholars have so elegantly approached the history of the broad and far-reaching discipline of psychology. In this ambitious study, King has demonstrated the way in which psychology has evolved, and presented a convincing case both for its relation to and its distinction from other disciplines. While this study is a valuable and formidable intellectual history of the evolution of the study of psychology, it is also a long-overdue homage to the multi-faceted and scientific nature of this often-misunderstood discipline. I recommend this book to any scholar, student, or life-long learner as a source for understanding the way the study of human nature has evolved and, perhaps more importantly, as a guide for further inquiry on this subject.

#### Heather R. Parker, PhD

Associate Dean and Associate Professor of History, School of Arts and Sciences, Saint Leo University, Saint Leo, Florida

#### **ACKNOWLEDGEMENTS**

This book has been a long time in the making since 2009 when I presented on the topic at Oxford University. The manuscript was near completion at that time, or so I thought. It has been revised and expanded to a manuscript that I am proud of.

There were many obstacles confronted over the last eight years—mainly family crises that took me away from having the clarity and energy to complete the book and slowed my pace tremendously. I lost my sister to cancer in 2012; and, she had battled the disease even before my first presentation on the topic. In 2014, my mother became very ill and made her transition at the end of 2016 in December. It was difficult for me to move forward, but I kept plugging away slowly when I could.

I sincerely thank my publisher and staff for all the support, encouragement and motivation provided. They endured my countless extensions and never gave up on me. That is greatly appreciated. It has been a pleasure to work with them for the second time.

To my professional colleagues who gave input on this manuscript and provided comments, suggestions and reviews, I sincerely thank you. I know it is difficult to take time for another colleague when our own schedules are so filled with teaching, research, service and other commitments.

To my family members and especially my immediate family who are now all on the other side, except for one living brother, I sincerely thank you for providing me with love, support, moral principles, and a solid foundation of development, allowing me to be where I am today. I hope you all keep rooting for me and supporting me from the other side. To my father: Morris Charles King, Sr.; my mother: Marie King Koon; my sisters: Priscilla King Seals and Renee King; my aunt; Mable King Martin; and my grandmother: Rosa L. King, I hope I can be your living legacy on this

side. To my living brother, Morris Charles King, Jr., I hope the rest of your days are fulfilling, productive, and long.

To my friends and colleagues who have been so supportive and understanding when I have not had time to spend quality time with you, I thank you for your encouragement. To my students who have been anticipating the publishing of this book and asked about its status repeatedly, it has finally arrived.

To all others, who in any way have supported me on this journey, I sincerely thank you all! I hope the book has meaning and significance.

Rosalyn M. King

#### **PREFACE**

This book was initiated by an invitation from the 2009 Oxford Round Table calling for proposals on the topic: The Three Cultures: Reconciliation of Science, Humanities/Arts and Religion. The call referenced the Cambridge physicist, C.P. Snow, who identified in his seminal book, The Two Cultures, the intellectual schism between the humanities/arts and the sciences. They also spoke of a third culture that has emerged with great vigor—the social sciences and the culture of spirituality. The Round Table called for the presentation of papers and discussion of the differences, dissonance and similarities among the three cultures.

In my response to the call, I claimed that psychology already represented the three cultures. I then attempted, as now, to illustrate how psychology represented the three cultures due to its unique evolutionary history and interdisciplinary beginnings and contributions to the academy. Psychology was originally housed in field of philosophy and known as mental philosophy. Philosopher-scientists and those contributing to the evolution of the field were largely interdisciplinary generalists, and had many areas of expertise and represented many disciplines, including philosophy, the natural sciences of biology, medicine, physics, math, anatomy and more; along with the humanities, art, and the fine arts. Theology has contributed much to the evolution of the field of psychology, beginning with the Patristic period, where the contributions of the Church Fathers were pivotal to shaping the field of psychology. The social sciences are the last component of the disciplines to emerge, and where psychology is erroneously housed in most institutions today (at least the psychological sciences pertaining to anything other than the social should be housed elsewhere).

xx Preface

All the disciplines evolving from the field of philosophy are a blend that comprises psychological science, and over the decades, has contributed much to its identification and evolution as a separate hub science. Psychology is a composite, drawing from these cultures to understand human and animal nature and behavior. It could be no other way.

Few individuals and institutions understand psychology as a discipline. The discipline has been viewed as that mystical science, sometimes called pseudoscience or a pop culture, and only known for its most subjective applied side—therapeutic practice. Because many professionals have not explored the history of psychology, many teach psychology as a field and subject that seems very narrow—and that only seems to represent the deficits and social aspects of human nature—psychopathology, substance abuse, criminal behavior and deviance, the social life, to name a few. Further, many institutions label psychology as a social science and house the discipline under the social sciences. There are a few institutions in America, and perhaps across the world, who place psychology in the natural sciences or in their own separate department of the behavioral sciences. This could be the subject of another research study.

This book explores the vast field known as *psychological science*. It examines the extent of integration of the three cultures in the field of psychology—from ancient Egypt and Greece to the present time. This author attempts to trace the evolution of psychology and the contributions made by many scientists with multidisciplinary backgrounds, to the formal field of psychological science as known today. The book attempts to illustrate the integration of the three cultures and perspectives from science, the humanities, the social sciences, the arts and religion.

Therefore, in this book, a historical analysis is shown as psychology evolves from Ancient Egypt to the modern time. Highlights are made of the major contributions of philosopherscientists from a global perspective as psychology was clarified and defined over the centuries. Thus, the book begins with this historical evolution of the progression of the development of the field of psychology.

Some of the select subfields that embrace the interdisciplinary thrust are presented and discussed to show the reader how these subfields moved across disciplines to understand and assess human and animal nature. A sample of the fields represented in this book include evolutionary psychology, developmental science, comparative psychology, the cognitive sciences, quantum physics and quantum psychology and energy medicine. These disciplines, as well as others, use an integrated interdisciplinary approach. Concept models as illustrations accompany the discussion of each subfield to facilitate a quick cognitive grasp of this fact.

Portraits of select psychological scientists who used this integration and interdisciplinary thrust, perhaps more than others in their work and practice, are also featured in this book. Portraits of three renowned psychological scientists are presented: *Carl Jung, William James*, and *Stanislav Grof*.

Psychology has an intriguing past and a very promising future. A true psychological scholar could never get bored in the discipline because there are so many aspects of the field and of the human psyche to explore. Many unanswered questions remain. Further, psychological scientists can readily move from one subfield to another, now with the many subareas of specialization. For those scientists that have delved deep and tread paths where others dare to go, have made significant contributions to understanding the true nature of the field of psychological science. Largely, it seems that these individuals have interdisciplinary backgrounds and training as portrayed by the scientists featured in this book.

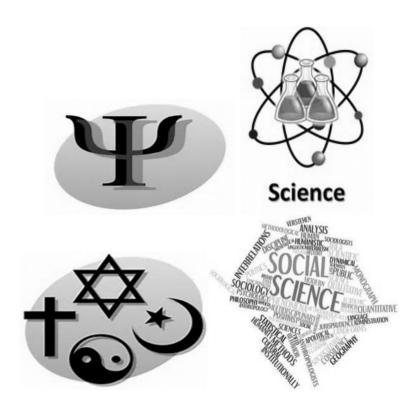
This author has always been intrigued and fascinated by the breadth, depth and scope of the field of psychology. The content of xxii Preface

psychology is so complex and useful that many cannot even fathom its true nature. Psychology goes beyond the scope of everyday life, but also is at the center of everyday life and all events in life—from love to war, to self-destruction—all driven by the psyche which is the very core of psychological science in all its varying aspects. However, psychological science also goes beyond the realm of the known into the deeper realms of the unknown and things that cannot be seen.

What is the psychology of the future? How will it advance? New paradigms are being advanced with empirical evidence, and inroads are being made toward understanding the biology and brain-body connection to the human psyche. There is clearer understanding about the nature of development and the nature of mental illness, better therapeutic strategies and the need for the identification and development of the spiritual self. These are exciting times in the field of psychology, with much promise as we look to the future for a better understanding of the mind-body connection, the nature of the human psyche and a comparative analysis as well as the relationships of higher and lower order human and animal forms.

#### PART I

# PSYCHOLOGY AND THE THREE CULTURES—NEXUS BETWEEN SCIENCE, THE HUMANITIES AND SOCIAL SCIENCES



#### CHAPTER ONE

### INTRODUCTION, BACKGROUND AND HIERARCHY

#### The Controversy: Cultural Tensions and Separation

In 1959, C.P. Snow of Cambridge University in his famous lecture and book, *The Two Cultures*, discussed the tension and breakdown of communication between the natural sciences and the arts and humanities. He indicated that this breakdown and the tension was a major hindrance to solving the world's problems. Further, Snow claimed that the quality of education around the world was on the decline and that few trained scientists were well versed in other subjects that might broaden their perspectives. For example, per Snow, few scientists, when asked, had ever read any literary works by such writers as Charles Dickens and others. At the same time, Snow indicated that even fewer artists knew science. Thus, it was Snow's conclusion that most disciplines sort of stay within their realm, with a specific focus, and never talk to each other or consider perspectives outside of their own discipline. Snow asserted that the academic cultures do not meet. He states:

For constantly I felt I was moving among two groups—comparable in intelligence, identical in race, not grossly different in social origin, earning about the same incomes, who had almost ceased to communicate at all, who in intellectual, moral and psychological climate had so little in common that instead of going from Burlington House or South Kensington to Chelsea, one might have crossed an ocean. (Snow, 1959, 1998, p. 2)

Some years later when asked to reflect on his lecture and book, Snow indicated that he could also observe that a third culture was emerging—that of the Social Sciences.

In 2009, fifty years later, Jerome Kagan responds directly to Snow's work with the release of his book, *The Three Cultures: Natural Sciences, Social Sciences, and the Humanities in the 21st Century.* He reflects on Snow's observations and begins to take a critical look at the two cultures he originally described. He also describes the third culture, generally termed *the social sciences* which comprise the fields of *sociology, anthropology, political science, economics* and *psychology.* Kagan examines the assumptions, vocabulary, and contributions of each of these cultures. More importantly, he provides an important overview of the contributions and accomplishments of each culture, but he also points to the current tensions that exist between them.

Per Kagan, the three cultures take different perspectives and approaches on the meaning of truth. He speaks more specifically about the differences between the natural sciences and the social sciences. For example, natural scientists use their skills to solve difficult problems, but they tend to deny intuition and are empirically grounded, and many would dismiss considering anything spiritual.

The youngest culture, the social sciences, wants to understand a phenomenon or problem. Kagan is quick to point out though, that some of the social sciences or some of the professionals representing them, are more closely aligned with the natural sciences, particularly the field of psychology. They prefer to study qualities with biological origins or correlates. There are others in the social sciences who are more interested in the characteristics that are established and changed by social conditions (Kagan, 2009). The focus and direction of the social sciences include the use of theoretical syntheses, often based on historical or ethnographic

evidence, or the use of empirical facts that can be measured or replicated.

The major approach of study also is different among the cultures, per Kagan. Social scientists too often begin their work by assuming the validity of an 'a priori' idea, and design their studies to affirm the utility of that concept. They test ideas and theories. Natural scientists are more often motivated by a desire to understand a puzzling or unexpected observation. The humanities are primarily archival and textual.

Social Scientists also have difficulty finding funding, and this significantly affects their ability to perfect their methodology or to explore new and better approaches. The absence of major methodological progress in the social sciences has frustrated those trying to answer fundamental questions on topics such as the relationship between brain states and psychological events, the nature of the relation between schematic and semantic representations, and the variation in personal histories that create a family of phenotypes in persons with a similar biology. Kagan believes that it is imperative that social scientists improve their ability to quantify perceptual and semantic networks, emotions, intentions, values and the depth of identification with gender, class, ethnic, religious, or national categories to answer these and other questions (p. 219).

Kagan also examines the role of several other disciplines including Linguistics, Political Science, Economics, Psychology and the Humanities. He indicates that Linguistics as a field uses a principal methodology to investigate the origin of language and how language changes over time. Kagan believes that one critical issue related to the field of Linguistics centers on the degree to which the abilities to perceive, comprehend, and to speak a language reside in more general competencies exploited in several domains, or whether there is an additional specialized set of talents unique to language (p. 160). Further, he claims that a controversial

question that has not been addressed thoroughly centers around the origins of the world's languages and the reasons for the changes occurring over time (p. 164).

As for the Political Sciences, Kagan believes that the discipline lacks the incorporation and understanding of ethics in their analyses. These professionals take the stance that 1) political science is an ethically neutral empirical science; 2) it has a formal model of rational choice; or 3) some portray the old school of thought and are following the ethics of ancient philosophers.

In Kagan's view, Economics and Psychology are the most intellectually ambitious social sciences because both strive to explain broad areas of human variation. Although the formal mathematical models make economists appear like physicists, these mathematical equations purporting to describe a set of facts do not explain how or why the events occurred. This author's interpretation of Kagan leads to the conclusion that economists and physicists need behavioral scientists in their midst.

As confirmed by Kagan, many economists want to eliminate each person's psychology and their cognitive constructions of the concepts in their equations. Oftentimes, economists fail to see or include the human aspects into their models, and many mathematical models are not leading to substantial progress. Kagan cites Wasily Leontief, Nobel Laureate in economics, and Harvard economist Greg Makiw:

Too large a proportion of recent mathematical economics are mere concoctions as imprecise as the initial assumptions they rest on, which allow the authors to lose sight of the complexities and interdependencies of the real world in a maze of pretensions and unhelpful symbols. (p. 187)

Kagan recommends that economists should take historians and biologists, not physicists, as the models to emulate. He indicates that there is not one example of a biologist making a major contribution to the understanding of a phenomenon without gathering or having access to a rich corpus of evidence. However, there are some newly trained economists who are collaborating with psychologists to create a new field of "behavioral economics." The advantage of this work is that it focuses on the psychology of the agent and acknowledges the specific context in which a choice is made.

The Humanities—philosophers, scholars of literature and historians—differ from natural and social scientists, per Kagan. Most of these individuals work alone, are not highly dependent on grant support from government agencies and rely primarily on semantic texts as a source of evidence. Kagan adds historians to this group rather than to the social sciences because he believes that the current discipline largely relies on semantic texts.

Novelists, poets, playwrights, painters and composers, for Kagan, belong to a special category because many are not associated with an academic institution, and their creative products are intended to serve aesthetic motives, rather than scientific demands for a close correspondence between an idea and an observation.

From Kagan's analysis, the humanities have lost a great deal of authority and status over the centuries previously enjoyed at a prior time in history when they commanded more respect than they do now. This is largely because professors of philosophy and theology are no longer in the forefront, as they were when they superseded the small cohort of natural philosophers. After its fragmentation, there was a shift in focus, and the humanities began to study categories of people, such as women, Muslims, Hispanics, gays, and so forth, rather than categories of ideas. Consequently, there has been a growing loss of confidence in the field.

Kagan cites three major reasons for this loss of confidence in the humanities: 1) its changing membership including the addition of women and minorities to the professoriate; 2) the use of imagination and translation to film from written text and the corresponding addition to higher education curricular programs in "film studies;" and 3) when postmodern critics argued that anyone could write a history, biography, or novel, often citing the rationale of T.S. Eliot who was asked the question, "What does a poet need to know?" and he replied, "Poetry." "Natural scientists policed their members more effectively by maintaining strict rules as to who could call themselves physicists, chemists, or biologists" (Kagan, 2009, p. 227). Further, scientists, social scientists and neuroscientists have begun to move into humanists' territory.

There also is a different premise operating among contemporary humanists. Traditional humanists such as *Plato, Dante, Bacon, Hume, Kant* and others thought they were communicating profound insights about human nature that should be incorporated into ethical positions, political actions or daily rituals. However, "a large number of contemporary humanists fear that they would be classified as narrow-minded bigots if they suggested that anyone ought to think or act in a particular way" (Kagan, 2009, p. 231).

Kagan does, however, leave us with the positive contributions of the professionals in the humanities:

They remind the society of its contradictions, articulate salient emotional states, detect changing cultural premises, confront their culture's deepest moral dilemmas, and document the unpredictable events that punctuate a life or historical era. The books, poems, plays, and films that contain these ideas help the public find a balance between the benevolent and self-destructive consequences of their illusions so that hopefully each can create an ideal worthy of effort. (p. 231)

As for the current tensions among the three cultures, Kagan concludes that C.P. Snow would not have to alter any of his conclusions from 1959; and currently, there exists an even wider gulf between the natural sciences and the humanities. Therefore, the status hierarchy among the intellectual disciplines remains as it was fifty years ago. Kagan describes the chasm:

Physics is the sun and mathematics is its core. That is why the sculpture of Einstein, not Darwin, graces the grounds of the National Academy of Sciences building in Washington, DC. Chemistry and biology are the near planets and, in increasingly distant orbits, lie economics, linguistics, psychology, anthropology, sociology and political science Even though history and philosophy lie in appreciably more distant orbits, they are not completely free of this force field. Historians are celebrated if they weave their narratives around quantified events, such as the economic output of antebellum plantations, or posit a biological contribution to the variation in national economies. At the far edge of this hypothetical universe are the arts and literature. (pp. 245-46)

When members of art and literature use knowledge from the three cultures, only then do they make progress in their work. Kagan cites examples of how 16th century artist Albrecht Dürer used Galen's theory of the body humors and advances in the geometry of vision to paint the *Four Apostles*. The author of *Frankenstein*, published in 1816, was inspired by the widely discussed research of Luigi Galvani, who suggested that muscle movements were mediated by electricity. Vincent Van Gogh used scientific knowledge and purposely incorporated some of the discoveries of physiologists studying color vision. "Hence, a mind lies at the center of the relations between brain processes and the psychological responses to an artistic product" (p. 249).

In addition to the above examples provided by Kagan, one can also cite other artists such as M.C. Escher and Salvador Dali, who mastered the principles of perception to create ambiguous images in their paintings. Escher used mathematical principles and tessellations in art. Multidisciplinary scholar Leonardo da Vinci blended art, science, mathematical principles (using geometric proportions) and more to compose his paintings. He was also an author and storyteller, writing fables like those of Aesop. Scholars C.S. Lewis and J.R. Tolkien crossed interdisciplinary boundaries in creating their trilogies, The Chronicles of Narnia and The Lord of the Rings.