

ASA ANNUAL MEETING
POINT LOMA NAZARENE UNIVERSITY
SUNDAY, JULY 22, 2012

SCIENCE PROFESSORS'
SCIENCE-FAITH PARADIGMS:
HOW WELL DO THEY INTEGRATE?

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The Challenge

“It is increasingly clear that relating Christian faith to the natural sciences is one of the most pressing academic tasks of our day.”

Alister E. McGrath, Biochemist, Theologian, and Reformation Historian, in “Faith and the Natural Sciences,” *CCCU Advance* (2002).

Science–Faith Paradigms

- ▣ “Mental frameworks for relating scientific understanding and Christian theology.”
- ▣ Numerous alternative paradigms have been proposed.

Ian G. Barbour

- ▣ Philosopher of Science, Ph.D. in Physics (Chicago) and B.Div. (Yale).
- ▣ Most prolific writer on the topic over an extended period (1960, '66, '68, '76, '90, '97, '00)
- ▣ Classification schemes varied from 3 to 5 integrative paradigms.
- ▣ Latest iteration consisted of 4 paradigms:
 1. Conflict—Scientific Materialism vs. Biblical Literalism
 2. Independence
 3. Dialogue
 4. Interaction

Arthur Peacocke (1981)

- ▣ Physical Biochemist and Theologian; Dean of Clare College, Cambridge
- ▣ Suggested 8 integrative paradigms.
- ▣ Lacked simplicity and symmetry of later schemes.

Nancey Murphy (1985)

- ▣ Th.D. and Ph.D. in Philosophy of Science; Prof of Christian Philosophy at Fuller Theological Seminary
- ▣ Explicated a five-fold typology for the relation of theology and science.
 - Followed Ian Barbour's earlier suggestion in *Christianity and the Scientist* (1960).
 - Adapted Neo-orthodox theologian H. Richard Niebuhr's (1951) classification scheme for relating *Christ and Culture*.

Richard T. Wright (1989)

- ▣ Ph.D. in Biology (Harvard); Professor *Emeritus* of Biology at Gordon College
- ▣ Wrote *Biology Through the Eyes of Faith*.
- ▣ Had 4 integrative paradigms:
 - Concordism
 - Substitutionism
 - Compartmentalism
 - Complementarism

Richard Bube (1995)

- ▣ Ph.D. in Physics (Princeton) and Prof. *Emeritus* of Materials Science (Stanford)
- ▣ American Scientific Affiliation former officer and editor
- ▣ Capstone work: *Putting It All Together: Seven Patterns for Relating Science and the Christian Faith*
- ▣ Science and Theology should interact.

Richard F. Carlson (2000)

- ▣ M. A. (Fuller); Ph.D. in Physics (Minnesota); Prof. of Physics at University of Redlands
- ▣ Edited *Science and Christianity: Four Views*
- ▣ Rejected all non-integrative paradigms (e.g., Scientific Imperialism)
- ▣ Presented only four viable paradigms:
 1. Creationism
 2. Independence
 3. Qualified Agreement
 4. Partnership

Criteria for a New Theoretical Scheme

- *Parsimony* (economy of explanation)
- *Symmetry* (balance of opposing paradigms)
- *Salience* (inclusion of only the most important and relevant paradigms)

A New Theoretical Scheme

1. Conflict—Theology Over Science
2. Compartmentalism
3. Concordism
4. Complementarism
5. Conflict—Science Over Theology

Developing a Valid and Reliable Science–Faith Paradigm Scale

- ▣ No previous survey instrument existed.
- ▣ Needed to develop the instrument.
- ▣ Followed methodology of Gabel & Wolfe, *Instrument Development in the Affective Domain* (1993).
- ▣ Required establishing sound psychometric properties (validity and reliability).

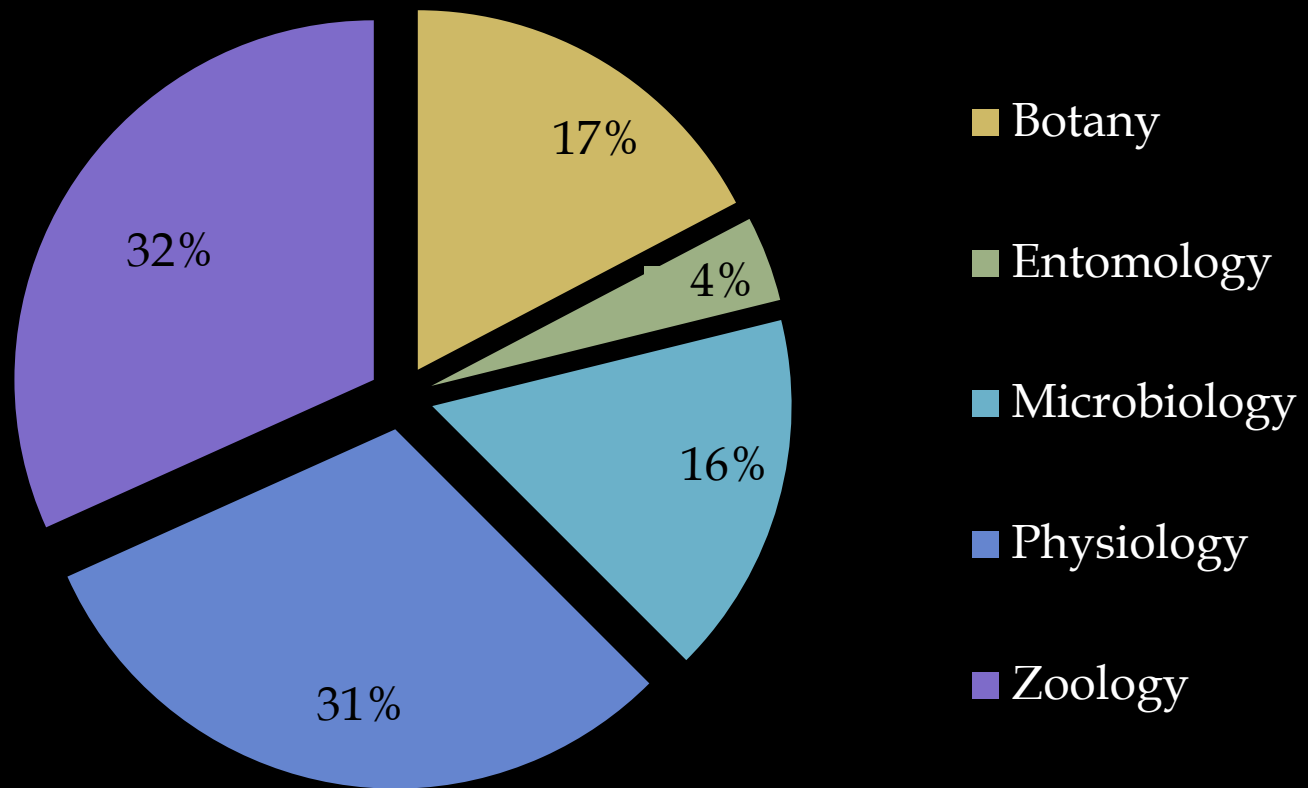
Content Validity

- ▣ Determined by content experts during two rounds of survey item rating exercises.
- ▣ Resulted in 90% agreement on 79 items.

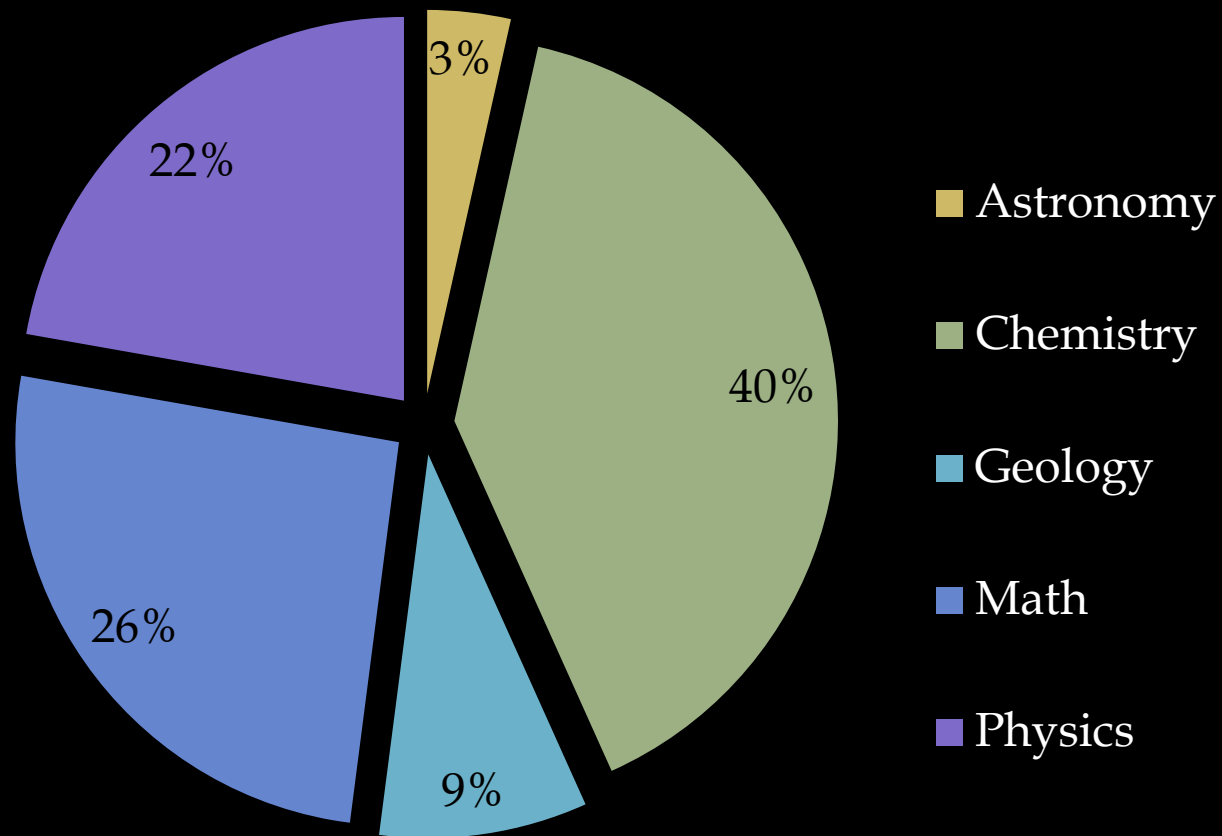
Sample

- ▣ Stratified Random Sample
- ▣ 1500 college & university science professors in the USA
- ▣ 312 useable survey responses

Respondents in the Hard Pure Life Sciences



Respondents in the Hard Pure Nonlife Sciences



Construct Validity

- ▣ Based on factor (PCA) and correlational analyses.
- ▣ Revealed 5 empirical factors corresponding to the 5 theoretical science-faith paradigms.
- ▣ Listed by factor loadings (highest to lowest factor loadings):
 1. Conflict—Science Over Theology
 2. Conflict—Theology Over Science
 3. Compartmentalism
 4. Complementarism
 5. Concordism

Reliability Analysis

- ▣ Measure of internal consistency.
- ▣ Cronbach's Alpha $>.70$ = adequate reliability.
- ▣ Reliabilities for the five factors ranged from .87 to .95.

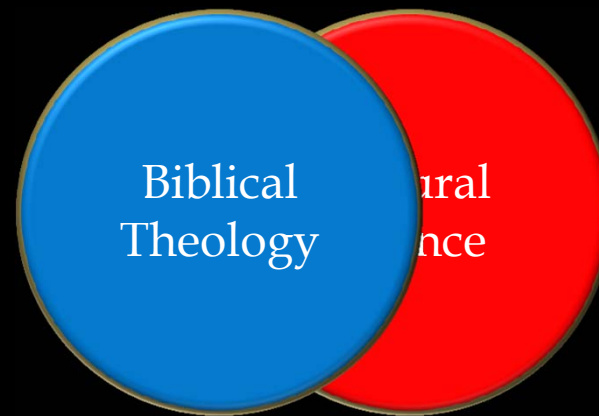
Science–Faith Paradigm Scale

- ▣ Factor analysis and reliability analysis yielded a 50-item scale (SFPS).
- ▣ Has demonstrated ability to identify the science-faith paradigms employed by individual science professors.

Conflict—Theology Over Science

“Theologians Know Best.”

Theology and Science fundamentally conflict with each other in describing reality, and in these conflicts Theology naturally should be accepted as correct.

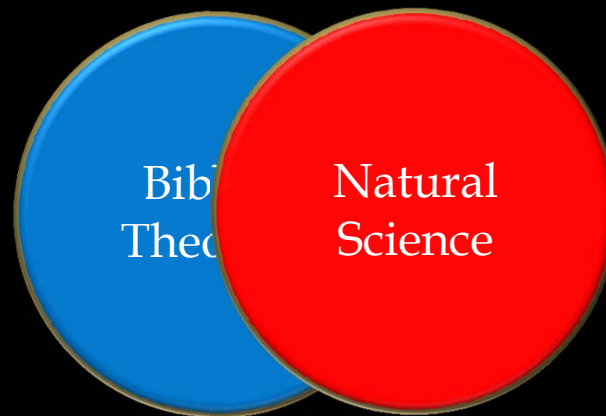


Examples: Ken Ham (*Answers In Genesis*);
Kurt Wise (Paleontology Ph.D. student of Gould)

Conflict—Science Over Theology

“Scientists Know Best.”

Theology and Science fundamentally conflict with each other in describing reality, and in these conflicts Science naturally should be accepted as correct.

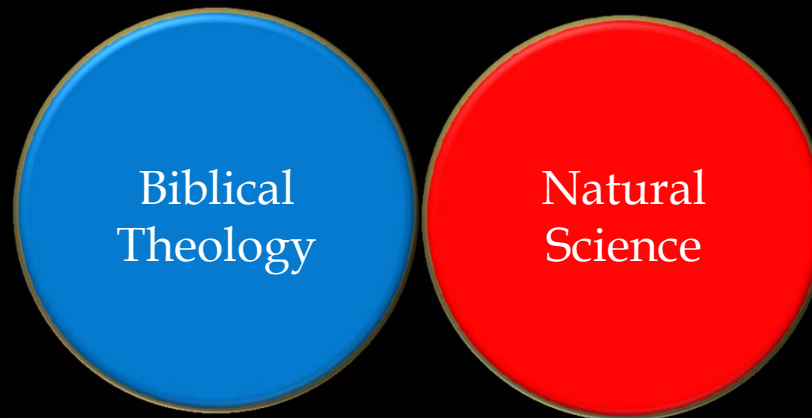


Example: Peter Enns, *The Evolution of Adam* (2012)
Harvard Ph.D. in Near Eastern Languages & Civilization

Compartmentalism (or NOMA)

“They Share No Common Ground.”

Theology and Science describe completely separate realities, and because of this separation there can be neither conflict nor agreement between scientific and theological descriptions of reality.



Example: Stephen Jay Gould, Harvard Paleontologist

Concordism

“They Should Agree.”

Theology and Science describe the same aspects of reality, and an accurate scientific description and an accurate theological description should be consistent, having one-to-one correspondence with each other and with reality, with no disagreement.

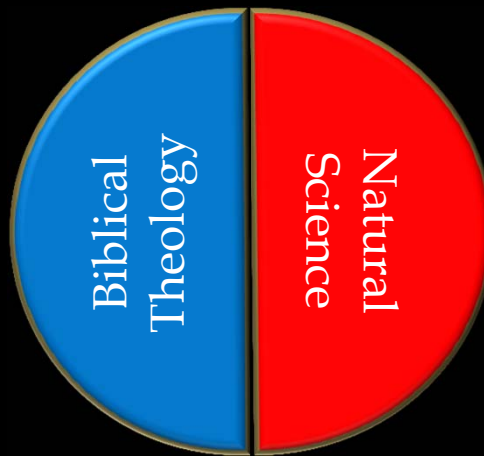


Example: Hugh Ross, *Reasons to Believe*

Complementarism

“Each is Incomplete.”

Theology and Science describe different aspects of reality but, taken together, an accurate scientific description and an accurate theological description should provide a more complete understanding.



Examples: Francis Collins, NIH, *BioLogos*; Denis Lamoureux, *I Love Jesus & I Accept Evolution* (2009)

Science Faculty Who Used No, One, or Two Simultaneous Integrative Paradigms (n=312; 2003)

Integrative Paradigm Used	% (n)
None	46.5% (145)
One Only	42.6% (133)
Two Simultaneous	10.9% (34)
Total	100% (312)

Condition to meet: agreed or strongly agreed with 80% of the items associated with each of the integrative paradigms.

Integrative Paradigms of Science Faculty Employing Only One Integrative Paradigm (n=133)

Integrative Paradigm	% (n)
Complementarism	69.9% (93)
Conflict—Science Over Theology	14.3% (19)
Concordism	8.3% (11)
Compartmentalism	5.3% (7)
Conflict—Theology Over Science	2.2% (3)
Total	100% (133)

Science Faculty Using Two Integrative Paradigms Simultaneously (n=34)

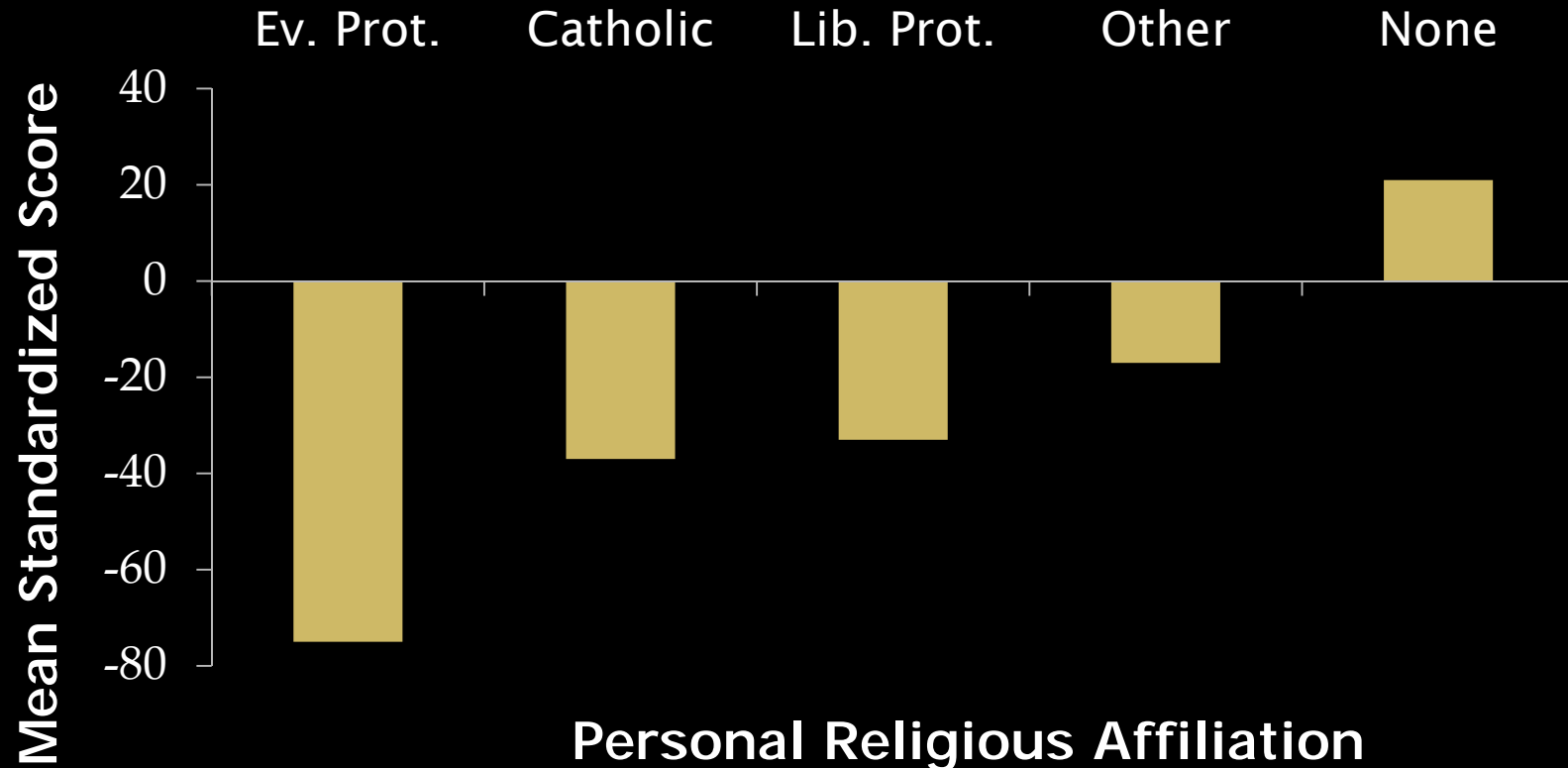
Combined Integrative Paradigm	% (n)
Complementarism AND Concordism	41.2% (14)
Conflict—Science Over Theology AND Compartmentalism	38.2% (13)
Conflict Theology Over Science AND Concordism	14.7% (5)
Compartmentalism AND Complementarism	2.9% (1)
Conflict—Science over Theology AND Complementarism	2.9% (1)
Total	99.9% (34)

What Variables Account for Differences in Paradigms Used?

- ▣ Carnegie Classification? No
- ▣ Public/Private/Religious Type? No
- ▣ Science Discipline? No
- ▣ Faculty Rank? No
- ▣ Gender? No
- ▣ Personal Religious Affiliation? Yes**
- ▣ Personal Religious Commitment? Yes**

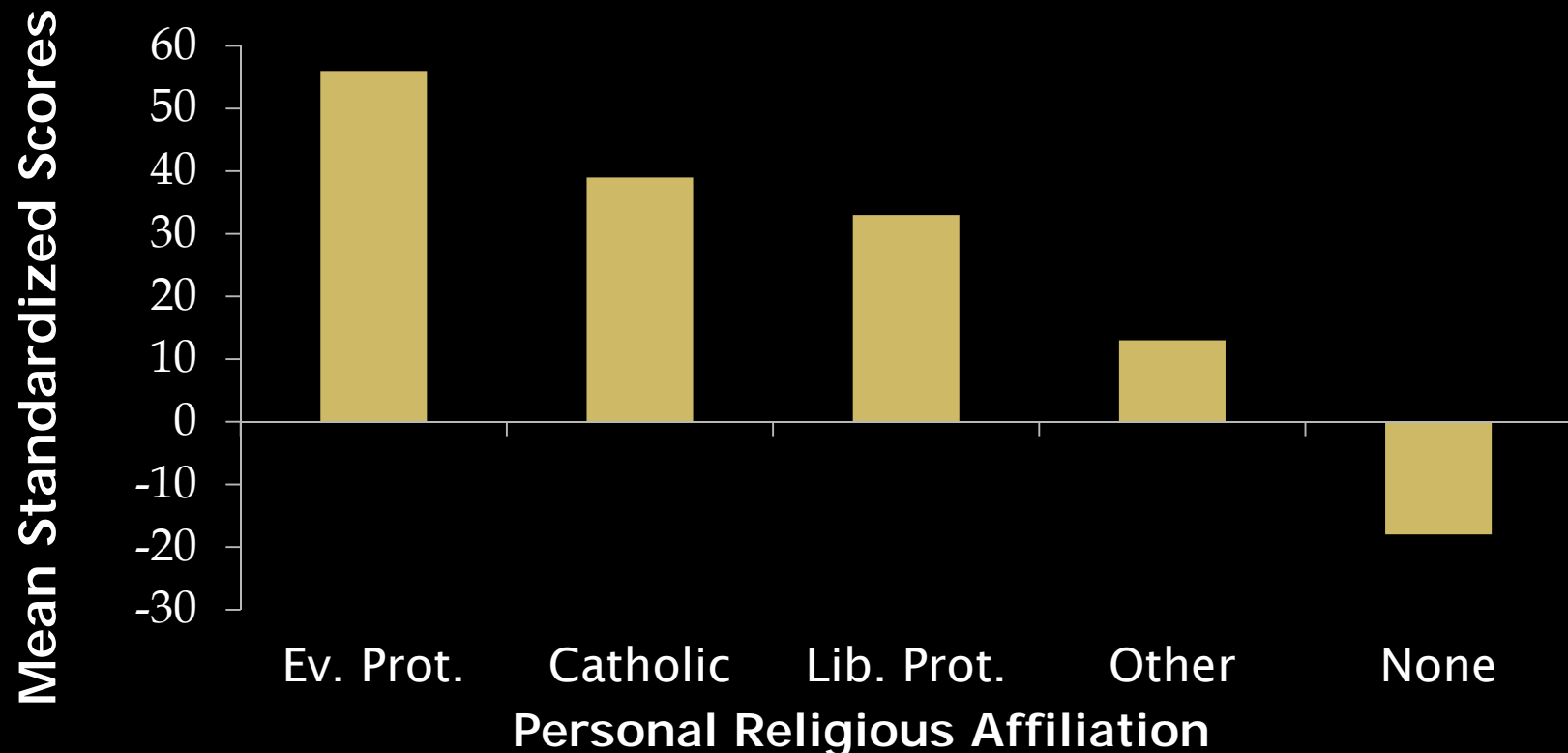
Only Nonreligious Science Faculty Favored Conflict Models

Average Score on "Conflict—Science over Theology" Scale by Religious Affiliation



Religiously-Affiliated Science Faculty More Favorable to Complementarism

Average Score of "Complementarism" Scale
by Religious Affiliation



Dominant Paradigm

- ▣ The most frequently employed integrative paradigm is...

Complementarism.

- ▣ This counters popular thinking promoted by media.

Religion & Science in Conflict?

- ▣ 275 in-depth interviews with natural and social scientists at the top 21 U.S. research universities
- ▣ 15% do see Religion & Science in conflict.
- ▣ 15% said Religion & Science are never in conflict.
- ▣ 70% “develop overlapping and context-specific narratives for negotiating religion-science relationships.”
- ▣ Generally, scientists do not compartmentalize.

Elaine Howard Ecklund, “Scientists Negotiate Boundaries Between Religion and Science,” *Journal for the Scientific Study of Religion* (2011): 50(3): 552-569.

Science Professors' Integrative Challenges

- ▣ 46.5% employed no integrative paradigm.
- ▣ An additional 11% conflated two paradigms.

Science Professors' Growth Opportunities

- ▣ Improve self-awareness. Evaluate reasons why one has chosen a particular paradigm.
- ▣ Need to agree on common nomenclature.
- ▣ Assist faculty in developing teaching approaches to help students become more self-aware.

How Can the SFPS Serve Scientists, Theologians and the Public?

- ▣ Enable them to identify/label the specific science-faith paradigm that they employ.
- ▣ Facilitate an understanding of the diversity of scientific-theological perspectives.
- ▣ Provide tools for engaging the culture in the matters of science and religion.

A Short Form of the *Faith-Science Paradigm Scale*

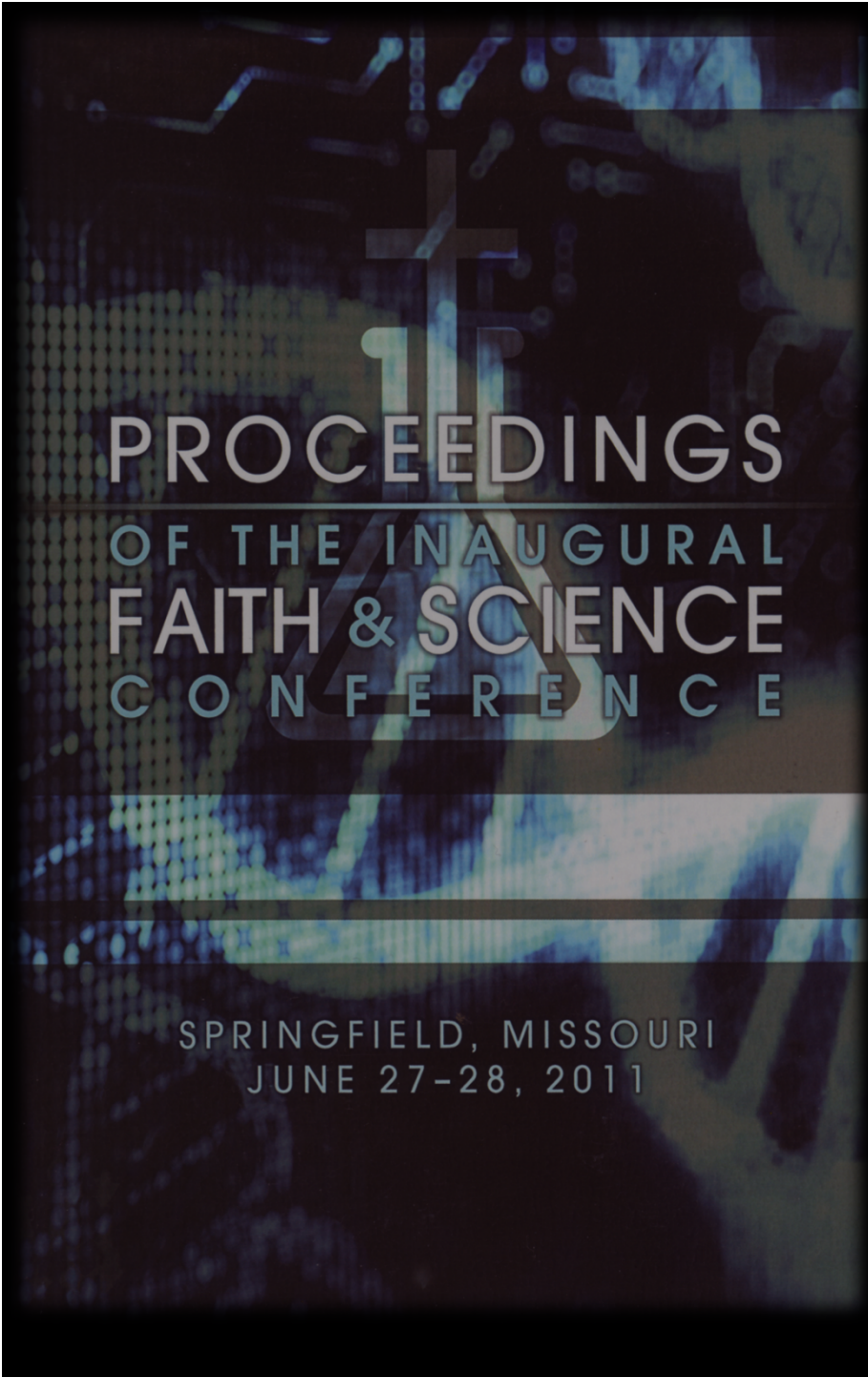
- ▣ Includes demographic questions plus 25 items from the full 50-item SFPS.
- ▣ Consists of the five items having the strongest “loadings” on each of the factors.
- ▣ Further administrations are needed to verify validity and reliability.

Seeking Collaborators

- ▣ Both long and short forms are available.
- ▣ SFPS is available for no charge.
- ▣ We request that users share their data with us.

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PROCEEDINGS
OF THE INAUGURAL
FAITH & SCIENCE
CONFERENCE

SPRINGFIELD, MISSOURI
JUNE 27-28, 2011

2014 Faith &
Science Conference:
Genesis and
Genetics

June 24-26, 2014
Evangel University
Springfield, MO