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Intelligence and Religious and Political Differences Among Members of the U.S. Academic Elite

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Abstract

Many studies have found inverse correlations between intelligence and religiosity, intelligence and political conservatism, and intelligence and political extremism. Other studies have found that academics tend to be significantly less religious and more liberal than the general population. In this article, we argue that interdisciplinary differences in religiosity and political perspective among academics are predicted by interdisciplinary differences in intelligence between academics. Once personality factors correlating with religiosity have been substantially controlled for, physicists, who have higher average intelligence, are less religious than are social scientists, who have lower average intelligence. Physical scientists are also less politically extreme than are social scientists.

Many studies have found inverse correlations between either intelligence and religiosity or proxies for intelligence and religiosity (Beit-Hallahmi and Argyle 1997; Howells 1928; Kanazawa 2010; Lewis, Ritchie, and Bates 2012; Lynn, Harvey, and Nyborg 2009; Lynn and Vanhanen 2012; Meisenberg et al. 2012; Sinclair 1928), intelligence and extreme political conservatism (Deary, Batty, and Gales 2008; Kanazawa 2010; Kemmelmeier 2008; Rindermann, Flores-Mendoza, and Woodley 2012), and intelligence and political extremism (e.g., Meisenberg and Williams 2008). Other studies have found that academics tend to be significantly less religious (Bello 1954; Ecklund and Scheitle 2007; Gross and Simmons 2009; Larsen and Witham 1998; H. C. Lehman and Witty 1931; Leuba 1916; Roe 1953) and relatively more politically liberal (Carnegie Foundation 1984; Gross and Simmons 2009; Rothman, Lichter, and Nevitte 2005) than the general population of the country in which they reside. However, there has been no research attempting to understand the reasons for religious and political differences between academic disciplines in terms of differences in intelligence.

The research on academic interdisciplinary political differences in the United States indicates that, in general, scholars in the humanities and social sciences are more liberal than are natural scientists (Rothman, Lichter and Nevitte 2005), although there are some exceptions; for example, relatively low liberalism has been found among business studies scholars (Rothman, Lichter, and Nevitte 2005). Overall, natural scientists are the most politically moderate, while social scientists and humanities scholars are the least politically moderate (see Rothman, Lichter and Nevitte 2005). The evidence with regard to religiosity is mixed. Using a wide sample of U.S. universities and community colleges, Gross and Simmons (2009) found that some applied scientists (e.g., mechanical engineers) are more religious than are some social scientists (e.g., psychologists). Other research found that life scientists attend church more often than social scientists do (Ladd, Lipset, and Trow 1978), and in two smaller U.S. university samples comparing natural scientists and social scientists, the former were found to be more religiously involved (E. C. Lehman and Shriver 1968; Thalheimer 1973). However, drawing only on academics at elite U.S. universities, Ecklund and Scheitle (2007) found rather different results. Physicists were consistently and significantly less religious on all measures than were political scientists. The general pattern was that natural scientists were less religious than were social scientists, though only the differences between physicists and political scientists were statistically significant. In this article, we show that interdisciplinary differences in intelligence can explain these superficially anomalous findings.

METHOD

In determining whether there is a correlation between intelligence and religiosity, it is necessary first to define the terms. The definition of intelligence that we use here is "the ability to reason, plan, solve problems, think abstractly, comprehend complex ideas, learn quickly, and learn from experience" (Gottfredson 1997: 13). We use IQ (intelligence quotient), a score that can be derived from a number of standardized tests, as a measure of intelligence. These tests measure linguistic, verbal, and spatial reasoning. Ability in each of these subsections positively correlates with ability in the other subsections (for discussion, see Lynn and Vanhanen 2012).

In this study, we focus on the concept of intelligence and draw on IQ data. The meaning of the term *intelligence* and the validity and reliability of IQ tests have been subject to criticism. For instance, Howard Gardner (1983) has proposed that there are different kinds of intelligence, such as emotional intelligence. However, these can alternatively be considered personality traits rather than forms of intelligence. Criticisms have also been leveled against IQ tests (e.g., Gould 1981; Jencks 1992). However, IQ tests have been found to have high predictive validity for school achievement (Jensen 1979), the results correlate with objective measures such as simple reaction times (Jensen 1979), and individuals who perform at an above-average level on linguistic tasks also perform well on spatial and mathematical tasks (Kanazawa 2012). Therefore IQ tests appear to be reliable measures of intelligence as defined above.

We define religion in the lexical sense as a belief in one or more controlling gods or spirits and a spiritual realm, and we define religiosity as the quality of being religious. We appreciate that others (e.g., Boyer 2001) have advocated a broader definition that encompasses ideologies, but because the research on which we are drawing separates religion and ideology we will also do so.

In making our case, we will draw on studies documenting interdisciplinary differences in intelligence among academics at Cambridge University and compare them to the studies on interdisciplinary differences in academic religiosity and political extremism.

There are difficulties with using these data: Some studies had relatively small samples; studies were conducted up to forty years apart; the studies were conducted in the United Kingdom, Belgium, and the United States, so cultural differences are to be expected; and any comparison involves drawing on research conducted by others. However, these are the only data that we have, so from a pragmatic perspective (James 1907), we must use them. Moreover, although some samples are small, the assorted studies point in the same direction, and the broad conclusion to which this study leads (that intelligence is inversely correlated with

religiosity and political extremism) is in line with a very large number of studies (for the most recent meta-analysis, see Zuckerman, Silberman, and Hall 2013).

The material falls into four parts: interdisciplinary academic differences in intelligence, interdisciplinary academic differences in personality profile, interdisciplinary academic differences in religiosity, and interdisciplinary academic differences in political persuasion.

MATERIALS

Interdisciplinary Academic Differences in Intelligence

We are aware of only two studies that specifically look at interdisciplinary differences in IQ among practicing academics, those of Roe (1953) and Gibson and Light (1967). Table 1 lists the relevant findings of these studies.

Table 1: Interdisciplinary Differences in IQ Among Academics

Study	***N***	**Findings**	**Comments**
Roe (1953)	64 "eminent American scientists"	Psychologists: 163 (verbal) 141 (spatial) 162 (mathematical) Average: 155 Anthropologists: 165 (verbal) 135 (spatial) 142 (mathematical) Average: 147 Biologists: 162 (verbal) 137 (spatial) 165 (mathematical) Average: 154 Experimental physicists: 154 (verbal) 141 (spatial) Average: 147 (of two tests) Theoretical physicists: 168 (verbal) 149 (spatial) Average: 158 (of two tests)	Small sample. Ages not stated. Discipline members selected in different ways (e.g., psychologists by recommendation from a few "eminent psychologists" but others more randomly). Roe created a special test for all of them, seeing it as "impertinent" (Simonton 2002: 150) to have them take a standard one. Physicists did not have to take the math test because it was "too easy for them." (Simonton 2002: 150). This means that we can only estimate the physicists' IQs.

Study	*N*	Findings	Comments
Gibson and Light (1967)	148 academics at Cambridge University	Social scientists: 121.8 Agricultural scientists: 121.6 Mathematicians, biochemists, and chemists: 130.0 Biologists: 126.1 Medicine: 127.0 Physicists: 127.7	Small sample. Male only. Age range: 25–34 years. Used the Weschler Adult Intelligence Test. Study does not state whether subjects have Ph.D.s but merely that they are academic staff. Considerable range overlap in IQ (e.g., 112–132 for social scientists and 112–136 for physicists). Scientists not ranked "eminent," as in Roe's study, but working at Cambridge University implies a certain degree of eminence (Simonton 2002) and it is possible (though not detailed in the study) that they have higher IQs than average among Ph.D. holders. It is also possible, though not documented, that average IQ of Cambridge academics have increased since 1967, owing to increased competition to work there.

The results of Gibson and Light (1967) are more reliable than those of Roe (1953) because Gibson and Light obtained their results more systematically and administered the same test, the Wechsler Adult Intelligence Test (WAIS), to each member of the sample. Gibson and Light's sample was also larger that Roe's. Many of the differences found by Gibson and Light were statistically significant. For example, social scientists had significantly (0.01 confidence level) lower IQ scores than did mathematicians, biochemists, chemists, and physicists.

There are more recent data for undergraduate students from the United States (Educational Testing Services 2012), but we cannot be sure about the relative percentages of students in each subject who go on to enter Ph.D. programs, are awarded Ph.D.s, or become academics; therefore Gibson and Light's (1967) data are more helpful. Even so, the research on U.S. undergraduates replicates the interdisciplinary differences that Gibson and Light found. An analysis of the

average SAT scores (converted into IQ by Education Testing Services) achieved by undergraduates in different majors in the United States attests to clear interdisciplinary differences: physics majors, 133; mathematics majors, 130; physical sciences majors, 125; humanities and arts majors, 120; social science majors, 115 (Educational Testing Services 2012).[1] There are considerable variations within the disciplines. For example, the average philosophy major has an IQ of 129, while the average history major has an IQ of 119, yet both are humanities students.

Harmon (1961) researched the school records of all 8,930 students who were awarded Ph.D.s in the United States in 1958. She ended up with a usable sample of 6,259 subjects, 80 percent of the Ph.D. graduates of 1958 who were U.S. citizens. Using their various school IQ tests, she standardized the tests according to the Army General Classification Test, which was still in use at the time. That test, which was not precisely comparable to an IQ test, had a mean score of 100 and a standard deviation of 20. Harmon found that the average Ph.D. student scored 130.8, which Eysenck (1979: 96) claims is an IQ of "about 125" (in fact, 123). Math Ph.D. students scored 138 (IQ: 128), physics Ph.D. students scored 140 (IQ: 130), and social science Ph.D. students scored 132 (IQ: 124); the mean score was reduced by the scores of education Ph.D. students, who scored only 123 (IQ: 117). We can see that these are approximately comparable to the IQ scores of Gibson and Light's (1967) Cambridge University sample, and the significant difference between social science and physics and math is replicated. However, the small differences are noteworthy. Gibson and Light's social science category was composed of geography, economics, and politics, while Harmon conflated all social sciences; this might partly explain the different scores. Not only did Gibson and Light use an elite academic sample, which replicates Harmon's interdisciplinary differences based on a large sample, but also their categories allow us to be more specific.[2]

However, drawing on Gibson and Light's data presents a number of problems. First, it involves using a U.K. sample to assess academics in the United States. This can be justified by noting that the average intelligence in the two countries is approximately the same and the essential differences are replicated by a large U.S. sample of Ph.D. graduates (Harmon 1961) and a large U.S. sample of undergraduates (Educational Testing Services 2012).

Second, using Gibson and Light's data raises the issue of differing academic systems, especially in comparing the United Kingdom and the United States, the latter having a broader academia, including more community colleges and more religiously affiliated colleges that are teaching-only colleges (Pepovic and Green 2012). We address this issue by comparing the Cambridge University sample to

[1] No *N* was provided.

[2] Both economics and geography are far more social science oriented in the United Kingdom, including more history and sociology, respectively, than is the case in the United States.

Ecklund and Scheitle's (2007) sample of academics at elite U.S. universities, on the assumption that Cambridge University would be comparable to these institutions (Simonton 2002). Moreover, we might legitimately expect the IQ differences between academic subjects to be the about the same when we compare scholars at elite and nonelite universities, and the comparable differences found by Harmon (1961) imply this.

Third, it might be suggested that the U.K. and U.S. academic systems have different relationships with religiosity, the nations are differentially religious, and this might affect the differential religiosity of academics. For example, the three oldest universities in England (Oxford, Cambridge, and Durham) maintain connections with the Church of England. Students live in colleges with chaplains who lead prayers at regular and often compulsory formal meals, and the church plays a part in graduation ceremonies. By contrast, elite universities in the United States, such as Harvard College, are much more clearly secular. This being the case, it might be that the academic elite in the United Kingdom are being exposed to religiosity while the academic elite in the United States are being exposed to secularism (or, at least, not being overtly exposed to religion), in both cases at impressionable ages.

It is possible that for religious reasons, religious people are less likely to go to elite universities in the United States and therefore are less likely to pursue Ph.D.s and less likely to become elite academics. However, we are unaware of research that would confirm or disprove this. Even if highly religious individuals in the United States are avoiding elite universities that they might be intelligent enough to attend, this would have no bearing on interdisciplinary differences in religiosity because, as we will see, a religious personality profile in itself does not predict being either a scientist or a social scientist. In addition, it is extremely unclear how this point might affect the validity of comparing data from the United Kingdom with data from the United States. It could be relevant only if the U.K. elite academic system, as described above, interfered with differences in IQ between social scientists and physical scientists in a way that the U.S. system did not. It might be argued that the U.K. system could do this by repelling social scientists (who, as we will see, are more likely to begin their academic careers as atheists) from Cambridge University. However, this seems extremely unlikely, given the prestige of the university, and is highly speculative; one might just as easily suggest that Harvard repels natural scientists, who tend to be more religious as undergraduates. In addition, elite scientists in the United Kingdom, such as members of the Royal Society, are far more atheistic than are their peers in the United States. Larsen and Witham (1998: 313) report that 7 percent of members of the U.S. National Academy of Scientists believe in God; by contrast, only 3.3 percent of members of the Royal Society believe in God. Also, research into religious dynamics at Oxford (Dutton 2008) and at universities in the United States (e.g.,

Hammond and Hunter 1984; Magolda and Ebben 2006) indicate that in both countries, there is a strong student evangelical movement on campus and that the justification for this, from a Christian perspective, is to assist Christians in a highly secular environment that challenges their faith. In addition, at prestigious universities in both the United States and in the United Kingdom, in contrast to less prestigious institutions or Bible colleges, evangelicals tend to be more fundamentalist when they leave than when they arrive, seemingly as a reaction to an environment that challenges their faith (Dutton 2008). This implies that with regard to the effect on religiosity, Oxford and higher-level U.S. universities are structurally similar and that elite U.K. universities are religious only in a very superficial sense. Therefore the university variable does not affect anything relevant in the direction that would be predicted. Moreover, as we have seen, differences in IQ between undergraduates in social sciences and those in physical sciences are parallel in the United Kingdom and the United States.

Fourth, there is evidence that since the 1950s, Western countries have been becoming increasingly cognitively stratified (Herrnstein and Murray 1994). In this view, greater meritocracy has meant that intelligence is now less equally distributed across social classes. Therefore, we might expect the average IQ of an academic to have increased. But concomitantly, access to higher education has expanded substantially over this period, which may have counteracted the effect of stratification (Richards 2007). Indeed, even in 1990, Herrnstein and Murray (1994) estimated that a Ph.D. holder was likely to have an IQ of at least 120.

Fifth, it is possible that the IQ differences between natural scientists and social scientists have changed since 1967. The social sciences expanded in the United States and Western Europe in the 1960s and 1970s (Commission on the Social Sciences 2004), and the expansion occurred disproportionately in comparison to the natural sciences. However, the main expansion—a tripling of social science degrees in Europe and the United States—occurred between 1960 and 1970 (Backhouse and Fontaine 2010; National Center for Education Statistics 2013), so even if the average IQ of social scientists changed during this period, it may only partially have affected the data that Gibson and Light (1967) gathered in June 1965. If such changes in average IQ took place, a relative increase in the numbers of social scientists between 1967 and 1970 might imply a slight overall change in the average IQ of social science scholars.

Recent data on student IQ do not indicate that the social sciences have, since 1967, attracted students who are proportionately more intelligent in comparison to students in the natural sciences than they were in 1967. Mascie-Taylor, McLarnon, and Lanigan (1983), drawing on a sample of 141 Cambridge University undergraduates, found that the most important predictor of IQ was subject studied. Science students scored the highest, while humanities students (including some in the social sciences) scored the lowest. Mixed subjects, such as economics, were in

the middle. Mascie-Taylor, McLarnon, and Lanigan do not provide the average results by subject, but their research does, broadly speaking, replicate Gibson and Light's findings. Mascie-Taylor, McLarnon, and Lanigan also note that Heim (1968) found the same interdisciplinary IQ differences when testing a sample of 946 U.K. undergraduates and postgraduates.

Gibson and Light (1967) put the difference in IQ between the average Cambridge social scientist and the average Cambridge mathematician at about half a standard deviation, while Harmon found a fractionally lower difference between the average physicist and the average social scientist. The difference between U.S. math and social science students in 2012 was around 1 standard deviation (Educational Testing Services 2012). The difference between the samples may be explained partly by the relative expansion of the social sciences.

Sixth, it may be that social science faculties have failed to expand in proportion to the growth in students, with the effect that the relative IQ of social science academics is boosted in relation to the relative IQ of academics in the natural sciences. However, we can find no evidence to support this proposition. Indeed, at Birmingham University in the United Kingdom, for example, the Economics Department expanded in the 1970s, "reflecting a much wider expansion of social science education. In 1962/63 there had been only 7 academic staff, which expanded to 22.5 by 1970/71, the number remaining around 20 till the early 1990s" (Birmingham Business School, Department of Economics 2013) when, presumably, it expanded further because higher education began to expand anew in the West around this time (Bathmaker 2003; Gumport et al. 1997).

Seventh, the datasets are presented in such a way that like is not always being precisely compared with like. Ecklund and Scheitle (2007) categorize sociology, economics, political science, and psychology as social sciences, whereas Gibson and Light's (1967) data for social science are taken from the fields of economics, political science, and geography. In addition, although Rothman, Lichter, and Nevitte (2005) do include economics and political science, they do not include geography. Finally, Gibson and Light's sample is all male, whereas Ecklund and Scheitle's sample is 73 percent male. However, Gibson and Light's main differences are also found in the study by Harmon (1961), which is gender-mixed. This being the case, it cannot be argued that religious differences between social sciences and physical sciences are due to there being a higher percentage of women in the social sciences.[3] Gibson and Light's research finds that the interdisciplinary differences in intelligence exist even in an all-male sample. This sample, it might be added, was also entirely made up of U.K. natives. That it might not control for background is not relevant, because twin studies have demonstrated that shared environment plays no role in adult intelligence (Bouchard and McGue 2003).

[3] Lynn and Irwin (2004) found that on average, women have slightly lower intelligence than men do.

Eighth, it might be argued that methods of intelligence testing have changed substantially between the 1960s and the current day. However, this is simply untrue. For example, the WAIS has not changed substantially since 1955. Raven's Progressive Matrices was originally developed in 1936.

This research indicates that there are robust interdisciplinary differences in IQ, individuals in the physical sciences (and mathematics) having higher IQs than those in the social sciences among undergraduates, Ph.D. holders, and elite academics. Physical scientists (though not biologists) are seemingly more intelligent than are social scientists of comparable academic rank.[4]

Interdisciplinary Academic Differences in Personality Profile

Because all academics have relatively high IQs (Herrnstein and Murray 1994), it has been argued that a certain personality profile predicts the highest academic success, intelligence predicting postgraduate success only at a correlation of 0.4 (Eysenck 1994; Jensen 1979). In personality research, the Five Factor Model posits that there are five different personality traits, often referred to as the Big 5 (see Nettle 2007). Each trait is conceived of as a spectrum, named after the high extreme of the spectrum. The Big 5 are as follows:

1. Conscientiousness: impulse control
2. Extraversion: feeling positive feelings strongly
3. Neuroticism: feeling negative feelings strongly
4. Agreeableness: altruism
5. Openness-Intellect: a trait characterized by creativity, intellectual curiosity, hypnotizability, and unusual psychological experiences, such as visions

Each of these traits is around 0.5 heritable (see Nettle 2007). Most of the Big 5 do not correlate with intelligence or only very weakly correlate with it: Openness-Intellect has a correlation with intelligence of 0.3. Differences in their strengths are associated with specific genes (though debate remains with regard to Openness-Intellect), and differences in the traits have significant effects on life history, high Neuroticism being a strong predictor of depression and low Conscientiousness being a strong predictor of addiction, for instance (see Nettle 2007).

Individuals who intend to pursue postgraduate study have relatively higher Conscientiousness ratings than do those who do not (Benovenli et al. 2011). According to the most recent meta-analysis, Conscientiousness predicts years of

[4] It might be argued that we are assuming that all individuals want to be physicists but, if they aren't intelligent enough, filter down to less intelligent fields. However, we have made clear that personality factors also influence choice of subject. All that we are asserting is the empirical fact that, on average, individuals who study physics have higher intelligence than do those who study social sciences.

education at a correlation of around 0.55 (Almlund et al. 2011). Academic attainment in adulthood is positively correlated with childhood Agreeableness, at least until the completion of school (Shiner 2006). Agreeableness predicts university academic performance at a correlation of 0.17 (Conard 2006), and DeYoung (2013) has found a positive correlation of about 0.15 between Agreeableness and intelligence. The correlation is stronger, around 0.3, between intelligence and correlates of Agreeableness, such as empathy (DeYoung 2013).

Research with U.K. students found that those with above-average levels of Neuroticism were more likely to complete a university education than were those who were low in Neuroticism (Kelvin, Lucas, and Ojha 1965). McKenzie, Taghavi-Khonsary, and Tindell (2000) discovered that successful university performance was predicted by an optimum level of relatively high Neuroticism combined with high ego strength (impulse control, found in a certain degree of Conscientiousness). This seems to indicate that individuals who are high in Neuroticism and in Conscientiousness are more likely to excel at a university. Finally, level of Openness-Intellect positively predicts the number of years spent in education (Bozionelos 2004; Goldberg et al. 1998), a recent analysis having found that it predicted this with a correlation of 0.31 (Almlund et al. 2011). Conversely, there is a negative relationship between psychopathy (low Agreeableness, low Conscientiousness, and low Neuroticism) and educational attainment, psychopaths being the most likely to drop out at every educational level (Lynn 2011). So it would appear that all academics are likely to be relatively high in Neuroticism, Conscientiousness, Agreeableness, and Openness-Intellect.

Unfortunately, the research on interdisciplinary differences in personality profile is confined to undergraduates and limited in extent. However, it is useful to draw on the research on undergraduate interdisciplinary personality differences because, although postgraduate and academic interdisciplinary differences in personality might not be as pronounced as undergraduate ones, they are likely to differ in the same direction, just as the interdisciplinary IQ differences between undergraduates and academics appear to differ in the same direction. This supposition is further evidenced by Feist's (1998) meta-analytic finding (twenty-six studies) that academics who are scientists are higher in Conscientiousness and lower in the Openness aspect of Openness-Intellect than are nonscientists, just as is the case, as we will see, with the undergraduate samples. Lievens and colleagues (2002) examined personality differences among 785 undergraduate students at the University of Ghent in Belgium. They found significant differences between students in different faculties but also significant crossover. De Fruyt and Mervielde (1996) conducted a similar analysis of 934 students at the same university. Table 2 lists, for each personality trait, the subjects that were statistically significantly different in rank order from high to low. In compiling this listing, we

have drawn on the findings of De Fruyt and Mervielde (1996); their results were substantially replicated by Lievens and colleagues (2002).

Table 2: Academic Discipline and Modal Personality

Neuroticism	Extraversion	Openness-Intellect	Agreeableness	Conscientiousness
1. Philosophy, languages and history, psychology and education	1. Economics, psychology and education, science, engineering, law, economics, social science	1. Philosophy, languages and history, psychology and education, social science	1. Science	1. Economics, engineering, science, law
2. Law, science, engineering, economics, bioengineering, social science	2. Philosophy, languages and history, bioengineering	2. Science, economics, law, engineering, bioengineering	2. Philosophy, languages and history, psychology and education, social science, economics, engineering, bioengineering, law	2. Social science 3. Philosophy, languages and history, psychology and education, bioengineering

Source: De Fruyt and Mervielde (1996).

Baron-Cohen and colleagues (1998) found that autism occurs more frequently in the families of physicists, engineers, and mathematicians than in the families of other types of scientist or other researchers. In addition, undergraduate natural scientists score higher, on average, on autism measures than do other undergraduates (Feist 2006). However, Agreeableness and theory of mind (empathy) correlate at only around 0.4 (Nettle 2007). So it seems that natural scientists are high in Agreeableness but relatively low in empathy. By contrast, social scientists may be low in Agreeableness but high in empathy.

Both De Fruyt and Mervielde (1996) and Lievens and colleagues (2002) found a distinction within Openness-Intellect that can be broken down along faculty lines. Students in science and engineering are significantly higher in an investigative nature (in effect, Intellect) than are all other students. By contrast, students in philosophy, languages, and history are significantly more artistic (the other aspect of Openness-Intellect) than are social scientists, who are in turn significantly more artistic than are natural scientists (for a detailed discussion of this personality trait, see DeYoung 2013).

According to a meta-analysis by Saroglou (2002), religiosity is not predicted by Openness-Intellect overall. This trait predicts liberal religiosity (0.22) but negatively predicts fundamentalism (−0.14). Religiosity is not predicted by Neuroticism overall, but Neuroticism predicts extrinsic religiosity (0.11) while negatively predicting intrinsic religiosity (−0.1). Neuroticism negatively predicts fundamentalism (−0.12). Agreeableness (0.2), and Conscientiousness (0.17) do predict religiousness. None of the values quoted are significantly different from each other based on the samples. Also, Neuroticism is positively associated (0.26) with religious quest orientation (Hills et al. 2004). Studies have shown that individuals who undergo a conversion experience tend to be high in Neuroticism (Argyle and Beit-Hallahmi 1975). Some studies have found that involvement in unusual religiousness (such as New Religious Movements) is predicted by high Neuroticism. For example, Buxtant and Saroglou (2008) have found that former members of New Religious Movements are relatively high in Neuroticism compared to the general population, with 25% of the sample being, as Buxtant and Saroglou term them, "depressive" types. Neuroticism correlates with depression at 0.85 (Nettle 2007). Almost all former members of New Religious Movements in their sample were drawn into the movement they joined during an episode of mental instability and left the movement on recovering. Thalbourne (2009) found that depressive symptoms (predicted by Neuroticism) were associated with individuals reporting paranormal experiences. Therefore there appears to be a case for arguing that high Neuroticism will predict transient acceptance of unusual or extreme religious perspectives. As such, the personality profile that predicts academic success has points of commonality with that which predicts religiousness.

In addition, research indicates important differences between the personality of the average academic and the personality of academics who are regarded as geniuses (highly original thinkers) and who reach the top of their field. Simonton (1988) observes that academic geniuses tend to be highly creative (abnormally high in the Openness aspect of Openness-Intellect). Accounts by eminent researchers of the process of reaching a scientific discovery sound similar to accounts of religious experiences (Rambo 1993). Simonton (1988: 26) has reported that many eminent mathematical scientists, including Einstein, have recalled "the prominence of visual images and sometimes kinesthetic feelings during the early phases of discovery and invention." However, genius academics are also abnormally low in Agreeableness and high in Neuroticism. It seems that their Conscientiousness is actually slightly lower than that of their colleagues, permitting a more spontaneous way of working. Feist (1998) conducted a meta-analysis of eighty-three studies over fifty years of the creative scientist and the creative artist and their modal personalities. He interpreted each study in terms of the Big 5. He compared scientists with nonscientists, creative scientists with less creative scientists, and artists with nonartists. He found that "[i]n general, creative people are

more open to new experiences, less conventional and less conscientious, more self-confident, self-accepting, driven, ambitious, dominant, hostile, and impulsive. Out of these, the largest effect sizes were on openness, conscientiousness, self-acceptance, hostility, and impulsivity" (Feist 1998: 290). Thus Feist confirms Simonton's (1988) conclusions that high Openness-Intellect, high Neuroticism, low Agreeableness (i.e., being confident and hostile), and relatively low Conscientiousness (when combined with very high Intellect) are associated with academic originality.

This being so, we might expect interdisciplinary personality differences to lessen as we move up the academic hierarchy and therefore to be not as clear among elite academics as they are among De Fruyt and Mervielde's (1996) students.

Interdisciplinary Academic Differences in Religiosity

A number of studies have looked into academic differences in religiosity, but none have tested for intelligence. Leuba (1916) conducted a survey of U.S. scholars at eminent institutions. He found that 39 percent of them believed in God. By comparison, a Gallup poll taken approximately 30 years later found that around 95 percent of the U.S. population believed in God (Gallup 1948). Leuba also found some departmental variation, with 48 percent of historians believing in God in comparison to 24 percent of psychologists.

Ladd, Lipset, and Trow (1978) surveyed 60,000 U.S. professors and found that 42 percent of life scientists, 32 percent of political scientists, 38 percent of sociologists, and 20 percent of psychologists regularly attended church, in comparison to 75 percent of Americans at the time. Two other studies also found that social scientists are less religiously involved than are natural scientists (E. C. Lehman and Shriver 1968; Thalheimer 1973). More recently, Gross and Simmons (2009) conducted a survey of faculty religiosity in 2006. They drew on 1,471 responses not only from elite, Ph.D.-granting institutions (the top 50 ranked U.S. universities) but also from B.A.-granting institutions and community colleges. Gross and Simmons found that 23.4 percent of professors were either atheist (10 percent) or agnostic, in comparison to 5.9 percent of Americans in general and 11.1 percent of college graduates. Elite universities were the most atheistic, with 36.6 percent atheist or agnostic in comparison to 22.7 percent at B.A.-granting institutions and 15.2 percent at community colleges. Gross and Simmons found clear differences between departments. In their results, 61 percent of biologists and psychologists were atheists or agnostics, as were 50 percent of mechanical engineers and 40 percent of economists and political scientists. By contrast, 56.8 percent of education professors and 46 percent of humanities professors had "no doubt God exists," in contrast to 35.7 percent of the broader sample. Gross and

Simmons's sample was very broad, and they concede that differential distribution of subjects over institutions of different standards may have significantly influenced their results.

Ecklund and Scheitle's (2007) Religion Among Academic Scientists (RAAS) Survey found rather different results. They surveyed 1,646 natural and social scientists at twenty-one elite U.S. universities between 2005 and 2006. Of these, 275 subjects were interviewed in-depth. Ecklund and Scheitle found that 34 percent of scientists classed themselves as atheists, claiming that they "do not believe in God." A further 30 percent would be classed as agnostics, having stated that they were not sure whether God existed. So 64 percent of scientists at the most elite U.S. universities were not believers. Accordingly, they were much more atheistic than were the elite U.S. academics in the broader survey conducted by Gross and Simmons (2009). However, it could be argued that Ecklund and Scheitle's (2007) elite were more elitist. Gross and Simmons's sample were merely from the top fifty ranked colleges in the United States, while Ecklund and Scheitle's sample were from twenty-one elite colleges that were selected according to how often they appeared in the top twenty-five universities for nine indicators, including research funding, endowment assets, faculty awards, and doctorates granted. Ecklund and Scheitle concluded that either there are no interdisciplinary differences in religiosity or they exist only in one comparison. The only statistically significant difference on all measures of religiosity was found to be that between physicists and political scientists. About 33 percent of physics professors answered, "There is very little truth in any religion," compared to 15 percent of political scientists who gave this answer. Their other measure of religiosity was belief in God.

We can see from Table 3 that the general direction is for social scientists to be more religious than natural scientists are. However, Ecklund and Scheitle (2007) emphasize that only the difference between physicists and political scientists is statistically significant.[5]

[5] In this regard, it might be pointed out that both chemists and sociologists were significantly less likely than physicists to say that "there is no truth in religion," according to Ecklund and Scheitle's (2007) research. Therefore one might ask whether the argument is that chemists are less intelligent than physicists. The answer is no. The difference between physicists and chemists on this question was not statistically significant. These data show a statistically significant difference between a natural science and a social science. This may imply, given a larger sample, that there might be such differences between natural and social science per se, but it does not imply such differences between physicist and chemist senior academics. As was noted above, the IQ differences between chemists and physicists at Cambridge were not statistically significant.

Table 3: Belief in God Among Elite University Scientists in the United States

	Physics	Chemistry	Biology	Nat. Sci. Average	Sociology	Economics	Pol. Sci.	Psychology	Soc. Sci. Average
I do not believe in God	40.8	26.6	41	37.6	34	31.7	27	33	31.2
I do not know if there is a God and there is no way to find out	29.4	28.6	29.9	29.4	30.7	33.3	32.5	27.8	31
I believe in a higher power but it is not God	8.1	9.4	7.7	8.2	11.8	4.9	5.5	7.7	7.2
I believe in God sometimes	2.8	6.3	4.1	4.2	2.8	4.9	5	7.7	5.4
I have some doubts but I believe in God	12.8	18.2	10	12.9	11.8	14.8	21.5	12.9	15.5
I have no doubts about God's existence	6.2	10.9	7.4	7.8	9	10.4	8.5	10.8	9.7

Source: Ecklund and Scheitle (2007).

Interdisciplinary Academic Differences in Political Persuasion

A number of studies have examined interdisciplinary differences in political viewpoint among U.S. academics. Studies based on Carnegie Commission data found that U.S. academics were more liberal than the U.S. population and that humanities scholars were more liberal than those in the natural sciences, engineering, or business studies (e.g., Ladd and Lipset 1975; Lipset and Dobson 1972). More recent research has replicated these findings (e.g., Hamilton and Hargen 1993). In

addition, it has been found that academics at more prestigious universities tend to be more liberal than those at less prestigious ones and, also, more likely to vote Democrat rather than Republican (e.g., Klein and Western 2005). Most recently. DeYoung (2013) has observed that there are problems inherent in making a dualistic division between "liberal" and "conservative." The current consensus in psychology is that two broad dimensions are necessary to describe socio-political attitudes. One of these is resistance to change or traditionalism and the other is antiegalitarianism or justification of inequality. Collapsing the two, therefore, may

Table 4: Politics in U.S. Academia

Field of Study	Liberal (%)	Moderate (%)	Conservative (%)	Democrat (%)	Independent (%)	Republican (%)	*N*
All faculty	72	13	15	50	39	11	1,643
Social science	75	16	9	55	38	7	289
Humanities	81	10	9	62	32	6	449
Other	67	13	20	43	42	15	905
English literature	88	9	3	69	29	2	87
Performing art	84	0	16	63	35	2	31
Psychology	84	8	8	63	30	7	68
Fine art	83	9	8	55	41	4	36
Theology	83	8	5	49	35	16	26
Political science	81	17	2	58	34	8	67
Philosophy	80	15	5	62	27	11	26
History	77	13	10	70	26	4	62
Sociology	77	14	9	59	41	0	61
Biology	75	8	17	56	31	13	59
Communications	75	11	14	47	42	11	66
Music	74	18	8	56	38	6	63
Computer science	74	0	26	43	36	21	44
Mathematics	69	14	17	43	42	15	49
Physics	66	23	11	48	47	5	37
Linguistics	65	24	11	64	34	2	53
Chemistry	64	7	29	41	34	25	52
Education	61	10	29	55	38	7	88
Economics	55	6	39	36	47	17	44
Nursing	53	0	47	32	42	26	32
Engineering	51	30	19	34	53	13	90
Business	49	12	39	26	48	26	101

Source: Rothman, Lichter, and Nevitte (2005).

lead to problems. For example, DeYoung (2013) points out that the people who are high in Compassion (a dimension of Agreeableness) will tend to be egalitarian, but this does not predict traditionalism, which is associated with politeness (another dimension of Agreeableness) and orderliness (Conscientiousness). This implies that some people will be traditionalist yet egalitarian and vice versa on the basis of their personality mix, which seems to imply that the single factor "conservative" ignores too much nuance. Nevertheless, the published research has tended to use this division.

Most recently, Rothman, Lichter, and Nevitte (2005) surveyed 1,643 faculty members at 183 four-year colleges and universities in the United States. Their results are shown in Table 4.

DISCUSSION

If our theory is correct, we would expect physical scientists to be less religious than social scientists and less politically extreme than social scientists, as this would be predicted by their higher intelligence. We would expect to find this, in particular, when personality factors are controlled for.

We will discuss, first, the research on religion. According to Ecklund and Scheitle (2007), the largest single predictor of whether an academic would believe in God was religious background. Scientists who rated religion as "very important" in their childhood homes and whose background was Protestant had a 14 percent probability of classing themselves as atheist. This is compared to a 54 percent probability that scientists who were raised in homes with no religion and in which religion was "not at all important" would class themselves as being atheists.

Ecklund and Scheitle (2007) seem to downplay the significance of the difference between physicists and political scientists with regard to religiosity. Their findings imply that among elite scientists, there are insufficient religious differences to make a binary division between social science and natural science. But there are sufficient differences to see a clear difference between what might reasonably be seen as the most scientific subject of those assessed (physics) and, according to Mascie-Taylor, McLarnon, and Lanigan's (1983) division, one of the least scientific (political science). This might imply a weak relationship between academic discipline and religiosity if Ecklund and Scheitle had used a larger and more representative sample.

Ecklund and Scheitle's (2007) results conflict with those of other studies that have found that, in general, natural scientists are more religious than are social scientists at specific state universities (Thalheimer 1973). A number of scholars have looked at why natural scientists are more religious than social scientists are. Argyle and Beit-Hallahmi (1975) put the greater religiosity of natural scientists

down to scholarly distance; that is, they suggested that social scientists are more likely to come across religion in their research and therefore think about it. However, this appears unlikely because the existence of God is a fundamental philosophical question (Hick 1990) that all intelligent people think about, and it is an abstract question. Intelligence especially strongly predicts abstract reasoning ability to a greater extent than social reasoning ability (Kaufman et al. 2011).

Wuthnow (1985) regards the difference as reflecting a boundary-posturing mechanism whereby social science scholars wish to create a sense of otherness and use nonreligiousness as a means of creating distance between themselves and the public. Natural scientists have already achieved this sense of otherness with codified language. But it can be countered that social science is notorious for using academic jargon that is incomprehensible to ordinary people (Andreski 1974), so social scientists have no greater motive than natural ones for rejecting religion.

A further possibility is that social scientists study human cultures, may adopt relativistic accounts, and are therefore more likely to see everything in these terms, including religion, as most religions make claims about truth. The problem with this argument is that natural scientists are trained to test truth claims rigorously and so would be just as likely to be critical of religion as would social scientists.

A more likely explanation is that social scientists, at least at the student level, are lower in Conscientiousness and Agreeableness (De Fruyt and Mervielde 1996), traits that positively predict religiosity. This being so, we would expect social scientists, to a greater extent than natural scientists, already to be irreligious when they begin their courses. Argyle and Beit-Hallahmi (1975) demonstrated that this is so; 20 percent of 429 U.S. social scientists (in contrast to 1.9 percent of Americans) surveyed in 1967 reported "no religious preference" even in adolescence, implying that they were already atheists when they elected to study social science. In some cases, atheism among social scientists may be part of an ideology (such as Marxism) and may be believed fervently, rather like a religion. Indeed, many scholars hold the view that political ideologies can be understood as replacement religions (Boyer 2001; Scruton 2000). It may be that significant numbers of atheists choose to study subjects that reflect their ideology, while Christians, for example, avoid subjects of this kind precisely because they are seen to reflect an atheistic ideology (Rothman, Lichter, and Nevitte 2005), a point that has been found in field work with evangelical students (Dutton 2008).

A further explanation is that E. C. Lehman and Shriver (1968), Thalheimer (1973), and Gross and Simmons (2009) do not concentrate on the most elite universities. It is possible that Ecklund and Scheitle's (2007) anomalous results can be explained by the intelligence and personality profiles of the academics in their sample. As we have seen, the personality profile that predicts educational success is very similar to the profile that predicts religiosity. However, there is a distinct

personality profile associated with highly creative academics. This includes high Neuroticism, high Openness, very high Intellect, relatively low Conscientiousness, and relatively low Agreeableness in comparison to less creative academics. A possible explanation for the way in which natural scientists (and, implicitly, physical scientists) may be less atheist than social scientists overall but with a reversal of this pattern at highly elite universities is that those particular universities might be more likely, in selecting the academically most able physicists, to select those who are extremely high in intelligence (negatively predicting religiosity) but also extremely high in Openness-Intellect and, relative to less prestigious universities, lower in personality factors that predict religiosity (Agreeableness and Conscientiousness). In doing so, they would select a more irreligious personality trait profile relative to lower-level academia. In selecting political scientists, universities would be doing the same, but we know that even among elite academics, such as those at Cambridge University, social scientists (including political scientists) are less intelligent than are physical scientists. Therefore in that universities would have been substantially selecting for personality, the lower intelligence of elite social scientists would be reflected in higher religiosity.

Social scientists remain, even if only marginally, higher in Openness (though not Intellect), lower in Conscientiousness, and lower in Agreeableness than physical scientists and one may speculate that this contributes to their possible higher religiosity. However, lower Conscientiousness and lower Agreeableness would negatively predict religiosity, and high Openness (though not high Intellect) would, in itself, merely predict a proneness to spiritual experiences (Lewis et al. 2012), which 22 percent of self-described atheists and 27 percent of self-described agnostics among the RAAS sample implied that they had undergone (Ecklund and Park 2009). Moreover, the difference in having religious experiences between natural and social scientists in the RAAS sample was not significant; 69 percent of social scientists and 66 percent of natural scientists described themselves as "spiritual," a term that was defined in terms of an awareness of something outside oneself.

One could speculate that the personality profile of elite scientists does not include many creative scientists, so the personality differences between natural and social sciences would be the same as those noted by De Fruyt and Mervielde (1996). However, this would predict that natural scientists would be more religious than social scientists, further implying that the difference between elite academics and less elite academics is explicable in terms of intelligence. Finally, there is a possibility, as Rothman, Lichter, and Nevitte (2005) argue, that social science has been, to a greater extent than natural science, which has a clearer quantitative base, taken over by left-wing ideology (for discussion, see Charlton 2009). In this view, being highly creative, in that it might persuade one to critique such an ideology, would make it less likely that one would be appointed to an

elite social science post. However, elite social scientists would need to be more original in their thinking in comparison to less elite scientists, even if certain areas were taboo (for discussion of these areas, see Chagnon 2013). It might also be argued that there are taboos in natural science that might be problematic for highly creative scientists (for discussion, see Segerstråle 2000). Furthermore, other research has found that there is no discrimination against conservatives in the social sciences (Prentice 2012).

RESULTS

Ecklund and Scheitle's (2007) sample of natural scientists are slightly more likely to have been raised in a nonaffiliated home (16.8 percent) than social scientists (12.4 percent). However, Ecklund and Scheitle find that the correlation between an elite scientist being an atheist and that scientist having a religiously nonaffiliated childhood is 0.54, a moderate positive correlation. Twin studies have found that childhood environment predicts adult religiosity at a correlation of about 0.12 (Bouchard 1998). However, if we compare Ecklund and Scheitle's results on theistic belief in 2007 with the average IQs of social scientists and physicists at Cambridge University in 1967 (Gibson and Light 1967), we can see that there is 0.94 positive correlation between atheism and the average IQ of a scientist in a given subject at Cambridge University. This result is achieved by comparing the IQs of physicists and social scientists (economists, political scientists, and geographers) with the rates of atheism for physicists, political scientists, and economists. We have avoided comparing differences in the rates of atheism that were found to be nonstatistically significant by Ecklund and Scheitle, but we included economics because it was part of the Cambridge University sample. The strength of this correlation means that even accounting for problems with the comparison, the difference is very likely to be meaningful. This finding would add credence to the hypothesis that at a very high academic level, personality profile is already heavily selected for, so intelligence becomes the main predictor of atheism, although childhood irreligiousness may be a factor as well. But the likely intelligence of an elite scientist is a much better predictor of the person's adult atheism than is his or her childhood lack of religiosity.

The results in regard to politics among academics (Rothman, Lichter, and Nevitte 2005) add further credence to our case. However, the predictive value of intelligence would be lower because Rothman, Lichter, and Nevitte's sample was not selected for personality and intelligence in the way that Ecklund and Scheitle's (2007) sample was. We can see that academics in the disciplines that have higher average IQs tend to be more moderate, in general, in their degree of liberalism, something that was predicted by Meisenberg and Williams (2008), who found a −0.78 correlation at a country level between extremism (defined as

opting for the extreme options in surveys that provide choices ranging from strong agreement to strong disagreement, for example) and intelligence.

It is very difficult to explain the differences between natural and social sciences using personality alone. Natural scientists are likely to be lower in the Openness aspect of Openness-Intellect and higher in Intellect (De Fruyt and Mervielde 1996). But both of these dimensions would predict nonconformity (DeYoung 2013). Natural scientists are higher in Agreeableness and Conscientiousness than are social scientists, as we have discussed. This being so, on the basis of personality alone, we would expect natural scientists to be as extreme as social scientists if political extremism is assumed to be similar to religiosity. Also, because natural scientists are higher in Agreeableness, we would expect them to be more liberal (at least in terms of egalitarianism); but because they are higher in Conscientiousness, we would expect them to be more traditionalist (DeYoung 2013). Social scientists are more Neurotic than natural scientists, but Neuroticism negatively predicts fundamentalism. Therefore if extremism is assumed to be similar to fundamentalism, high Neuroticism would predict moderate political views. In that Neuroticism predicts religious quest orientation, it would likewise predict being highly questioning and thus moderate. As we have seen, it might be argued that Neuroticism predicts temporary religious fervor in the wake of paranormal or religious experiences. It may, therefore, be that this trait also predicts political extremism. This characteristic will have been an element in the samples examined by Saroglou (2002), but it was clearly outweighed by other aspects of Neuroticism, as this trait had no influence on religiousness. Therefore intelligence would seem to be a significant factor that is likely to explain political differences between the two kinds of scientists. If it were not, we would have to assume that intelligence differences and political differences between the disciplines were simply coincidental.

Explaining the differences in terms of intelligence is also congruous with research that has found that low intelligence predicts political extremism (e.g., Deary, Batty, and Gales 2008; Kemmelmeier 2008; Rindermann, Flores-Mendoza, and Woodley 2012). The apparent higher intelligence of natural scientists would make them more able to be empathetic by comprehending social situation variables (Kaufman et al. 2011) but also more inclined to question popular perspectives (Deary, Batty, and Gales 2008), better able to see through fallacious arguments, and more centrist in their views (Meisenberg and Williams 2008). This is as we would predict because individuals at the extremes tend to have more implicitly religious dimensions. Scholars of religion generally concur that it is these extremes of left and right that have the most in common with religion (Eliade 1957; Saliba 2003; Scruton 2000). A movement in religious studies (Bailey 1997; Boyer 2001) argues that political parties are effectively replacement religions if we follow an operational definition of religion.

Overall, we would expect to find that the most intelligent scholars were moderately liberal and highly independent while the least intelligent scholars would be either extremely high in liberalism or extremely high in conservatism. This is indeed what we find. If we compare Rothman, Lichter, and Nevitte's (2005) results to IQs for Cambridge University scholars, we find that there is a weak positive correlation of 0.25 between the percentage of academics in each subject area for which we have both IQ and political data who are moderate (neither liberal nor conservative) and intelligence. This is achieved by comparing political science and economics (for social science) and biology, physics, chemistry and mathematics (for natural science). However, making the same comparison using the intelligence results from Harmon's (1961) study provides a much stronger correlation. If we compare IQ scores in education, math, physics, chemistry, biology, engineering, social science, and arts and humanities with the degree of political moderateness in the results of Rothman, Lichter, and Nevitte (2005), we find a correlation of 0.59. This difference may reflect the way in which Harmon's sample includes a broader array of social sciences and includes humanities, in which scholars tend to have lower intelligence and to be more politically extreme.

CONCLUSION

There is sound evidence of a negative correlation between intelligence and religiosity and between intelligence and political extremism. This makes it unlikely that these results are a statistical fluke. Therefore the most probable reason behind elite social scientists being more religious than are elite physical scientists is that social scientists are less intelligent. Intelligence is also a factor in interdisciplinary differences in political extremism, physicists, who have high IQs, being among the least extreme and lower-IQ scholars being among the most extreme. Future research using larger academic samples would be extremely useful in exploring these areas in greater depth.

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