The religiousness-IQ nexus is not a Jensen effect: Evidence from the NLSY79

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A recent study by Dutton et al. (2019) found that the religiousness-IQ nexus is not on g when comparing different groups, with various levels of religiosity, and the non-religious. Rather than attributing the frequent finding of a small negative relationship between IQ and religiosity to ‘general’ intelligence, it was instead suggested that the relationship should be attributed to specialised analytic abilities measured by the IQ test, with the latter indicating an autism-related cognitive profile and predicting atheism. Here we test, at the individual level, whether the religiousness-IQ nexus is on g, using the ASVAB (Armed Services Vocational Aptitude Battery) in the NLSY79 as well as the MIDUS I. We find that, on the NLSY, the relationship with religion is unrelated to the tests’ g-loadings.

Keywords: autism spectrum disorder; intelligence; Jensen effect; religion
Many studies have found a weak negative relationship between religiousness and IQ or between religious participation and IQ. The first studies reporting this finding were published in the 1920s (e.g., Gilkey, 1924; Howells, 1928), and it has been replicated ever since. Meta-analyses have shown that this relationship is in the region of $-0.2$, in the general population, when using ‘religious belief’ as a measure, and $-0.1$ when employing ‘religious attendance’ (e.g., Zuckerman et al., 2013). A recent meta-analysis has, once more, found that the relationship between religious belief and IQ is approximately $-0.2$ (Zuckerman et al., 2020). Similar weak negative correlations are also found between many measures of religiousness and assorted proxies for IQ, such as education level and salary (Meisenberg et al., 2012). Religious groups that are more fundamentalist tend to have lower average IQ than do groups that are more religiously liberal (Nybørg, 2009).

A variety of theories have been developed to explain this consistent relationship such as: (1) Everybody needs the certainty of a consistent worldview and if people are insufficiently intelligent to follow a purely scientific one then they will retreat into religion (Nybørg, 2009). (2) The arguments for God’s existence are illogical, meaning that intelligent people would be better able to see through them (Dutton, 2014). (3) We are adapted to the Savannah, which is ‘evolutionarily familiar’, where we solved problems using instinct and developed religious belief or, at least, belief in a spiritual universe. Moving off the Savannah, we could no longer solve problems using instinct, so had to use intelligence. Thus, intelligent people are attracted to other ‘evolutionarily novel’ ways of thinking, such as atheism (Kanazawa, 2012) (4). A component of problem-solving, and thus intelligence, involves the ability to rise above our instincts, no matter which ecology they have derived from, and test out non-instinctive, superficially odd possibilities in pursuit of solving a problem. Intelligent people will, therefore, be attracted to multiple unusual ways of thinking, including atheism (Dutton & van der Linden, 2017). Proponents of these models reject the idea that secular ideologies are more logical than belief in God. They argue that both involve non-empirical dogmas and an implicit belief in fate, and some also by cautiously defending versions of William James’ ‘pragmatic argument’ for believing in God (Dutton & van der Linden, 2017). But the problem with each of these explanations is that they assume that the nexus really does relate to intelligence; that it is on the highly heritable and core intelligence ability known as $g$ (general intelligence) (Jensen, 1998). They assume that it is not caused by group differences in specialised skills, which weakly correlate with $g$ and which are assessed by tests in the IQ battery, manifesting as intergroup differences in IQ. However, a recent study has provided compelling evidence that the nexus is not on $g$. The relationship is not a so-called Jensen effect.

Dutton et al. (2019) have analysed two large data sets from the Netherlands, allowing them to compare the IQs of groups with different levels of religiousness, including those who were atheists and agnostics. They found that the religiousness-IQ nexus was not on $g$, meaning that it related to specialised abilities rather than to general intelligence, the latter being what we usually mean when we refer to ‘intelligence’. This study can be argued to have provided compelling evidence that the relationship is not on $g$, at least when comparing religious and non-religious samples from the same ethnic group within a particular country. Evidently, the study’s critical limitation is its use of group level data rather than individual data. If Dutton et al.’s findings could be replicated using individual data, then this could be said to more conclusively prove that the negative religiousness-IQ nexus is not on $g$. Accordingly, in this study, we set out to replicate the findings of Dutton et al. using individual level data.

METHOD

National Longitudinal Study of Youth – 1979

We employed data from the National Longitudinal Study of Youth (NLSY) of 1979 (National Longitudinal Surveys, 2019). The NLSY79 Cohort is a longitudinal project that tracks the lives of a sample of Americans born between 1957 and 1964. The cohort originally included 12,686 people aged between 14 and 22 when they were first interviewed in 1979. Between 1979 and 1982 they were annually interviewed about church (or other place of worship) attendance. They were not interviewed about extent of religious belief. However, we drew upon the church attendance results, which we averaged across the three years because, as discussed, church attendance is negatively associated with IQ in meta-analyses at least based on US data. The cohort was administered cognitive tests in 1980, specifically the 10 subtests of the ASVAB: (1) science; (2) arithmetic; (3) word knowledge; (4) paragraph comprehension; (5) numerical operations; (6) coding; (7) auto and shop knowledge (meaning a workshop and tools); (8) mathematics knowledge; (9) mechanical comprehension; and (10) electronics info. Scores were residualised for age and standardized. The g factor was calculated from a principal components analysis of all 10 tests.
RESULTS

The correlations of the 10 subtests with the g factor and with sex differences on the test are summarised in Table 1. We see that the strongly male-biased tests 7, 9, and 10 all have negative relationships with religious attendance. The female-biased tests 3, 4, 5, and 6 all have positive relationships with religious attendance.

Table 1
Subtest Correlations with Religious Attendance (‘Religion’) and with the g Factor (‘g-loading’).

<table>
<thead>
<tr>
<th>Subtest</th>
<th>r with religion</th>
<th>g-loading</th>
<th>Sex difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Science</td>
<td>-.010</td>
<td>.887</td>
<td>-.265</td>
</tr>
<tr>
<td>Arithmetic</td>
<td>.018</td>
<td>.873</td>
<td>-.204</td>
</tr>
<tr>
<td>Word knowledge</td>
<td>.008</td>
<td>.890</td>
<td>.032</td>
</tr>
<tr>
<td>Paragraph comprehension</td>
<td>.036</td>
<td>.838</td>
<td>.190</td>
</tr>
<tr>
<td>Numerical operations</td>
<td>.059</td>
<td>.735</td>
<td>.224</td>
</tr>
<tr>
<td>Coding</td>
<td>.063</td>
<td>.672</td>
<td>.417</td>
</tr>
<tr>
<td>Auto and shop knowledge</td>
<td>-.120</td>
<td>.731</td>
<td>-.893</td>
</tr>
<tr>
<td>Mathematics knowledge</td>
<td>.074</td>
<td>.833</td>
<td>-.049</td>
</tr>
<tr>
<td>Mechanical comprehension</td>
<td>-.050</td>
<td>.804</td>
<td>-.628</td>
</tr>
<tr>
<td>Electronics info</td>
<td>-.068</td>
<td>.830</td>
<td>-.602</td>
</tr>
</tbody>
</table>

Table 2 compares the subtest correlations with religious attendance with the subtests’ g-loadings and sex differences. There is no relationship at all between the extent to which subtests correlate with religious attendance and the subtests’ g-loadings. We can also see that there is virtually no relationship between a test’s g-loading and its sex difference, meaning that sex differences are not a Jensen effect and the sex differences cannot be conceptualised as a difference in g.

Table 2
Correlations of the ‘Religious Loadings’ (r with Religious Attendance) of ASVAB Subtests (N = 10) with their g-loadings and Sex Differences (Positive Favouring Females), Mixed Male and Female Sample.

<table>
<thead>
<tr>
<th></th>
<th>r with rel. Attendance</th>
<th>g-loading</th>
<th>Sex difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>r with rel. attendance</td>
<td>1</td>
<td>-.023</td>
<td>.923**</td>
</tr>
<tr>
<td>r with g</td>
<td>-.023</td>
<td>1</td>
<td>-.142</td>
</tr>
<tr>
<td>sex difference</td>
<td>.923**</td>
<td>-.142</td>
<td>1</td>
</tr>
</tbody>
</table>

The correlations of sex differences could result from females being more religious than males, as many studies have found (see Dutton, 2014, Ch. 11), and also by their scoring higher or lower on the tests. Therefore, separate analyses were performed for males and females to see whether the observed relationships are valid also within each sex. Results for males only and females only are shown in Table 3.
Table 3
Correlations of the ‘Religious Loadings’ of ASVAB Subtests (N=10) with their g-loadings and Sex Differences (Positive Favouring Females), Males Above the Diagonal, Females Below. * p < .05; ** p < .01.

<table>
<thead>
<tr>
<th></th>
<th>rw. rel. Attendance</th>
<th>g-loading</th>
<th>Sex difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>r with rel. Attendance</td>
<td>1</td>
<td>-.126</td>
<td>.836*</td>
</tr>
<tr>
<td>g-loading</td>
<td>.247</td>
<td>1</td>
<td>-.282</td>
</tr>
<tr>
<td>sex difference</td>
<td>.753</td>
<td>.101</td>
<td>1</td>
</tr>
</tbody>
</table>

There is no substantial correlation between the subtests’ g-loadings and religious loadings in either sex. However, sex differences favouring females still predict a positive relationship with religious attendance in both males and females. This effect appears to be somewhat attenuated compared to the mixed-sex sample. It should be noted that the relative religious loadings of the subtests are very similar in males and females, but the correlations are generally more positive in males. The correlation of the g factor with religious attendance is +.053 in males and −.025 in females. In other words, higher cognitive test scores tend to raise the religious attendance of males but tend to reduce it in females. Interpretation of this observation is difficult in the absence of measures for religious faith.

There is no relationship between ASVAB subtest g-loadings and the extent to which the subtests have positive or negative relationships with religious attendance. Good performance on those tests on which females usually do better than males are associated with higher church attendance. High marks on those on which men do better than women are associated with lower church attendance. We are dealing here with a rather general masculinity-femininity dimension, such that individuals who are more masculine in their cognitive ability profile are less likely to go to church, and those with a more feminine cognitive ability profile are more likely to go to church. This relationship is observed both among males and females. This finding has been explored in more depth in Dutton and Meisenberg (2021).

DISCUSSION

The NLSY79 has the advantage of having cognitive tests with large sex differences. Our analysis of the NLSY79 further supports the findings of Dutton and his colleagues and, in addition, extends these findings into the realm of individual, rather than group, differences. The method that we have employed to reach this conclusion—the Method of Correlated Vectors (MCV)—has been critiqued by some researchers such as Wicherts (2018), who claims that it can yield ‘nonsensical results’. However, te Nijenhuis et al. (2019) have refuted criticisms of the hypothesis in considerable depth, demonstrating that it does not lead to the anomalies that Wicherts claims it does. Thus, as far as we can see, there is no reason to be sceptical of the MCV. Accordingly, we have indeed demonstrated that at the individual level, on a large and representative sample, the negative religiousness-IQ nexus (in this instance with regard to service attendance) is not a Jensen effect. It is not on g.

However, a key point of interest is a masculinity-femininity relationship, which has already been explored in Dutton and Meisenberg (2021). Religiousness predicts scoring better on the subtests that females score better on; and lack of religiousness predicts scoring better on the subtests that males score better on, even in the male-only and female-only subsamples. In other words, the typical IQ profile of females—whether among males or females—is associated with religious belief and religious attendance while the IQ profile of males—whether in males or females—is associated with atheism and not attending religious services. This finding adds credence to the veracity of the hypothesis cautiously advanced by Dutton and colleagues (Dutton et al., 2019) that the negative religious-IQ nexus is explicable in terms of the association between atheism and Autism Spectrum Disorder (ASD) traits, these being high among males and also predicting atheism.
CONCLUSION

In terms of future research, it would of course be useful to attempt to replicate our finding – that religiousness-IQ nexus is not on g – on as many data sets as possible. It would also be useful to discover if any aspect of religiousness is negatively associated with g by exploring as many measures as possible. From an evolutionary perspective, there is evidence that Europeans were under intense selection for g (Dutton & Woodley of Menie, 2018) and also for religiousness (Blume, 2009) until the Industrial Revolution took hold around 1800 and child mortality dramatically decreased and reliable contraception came to be used widely, among other relevant changes. In most developed countries, g is negatively associated with fertility (Dutton & Woodley of Menie, 2018) but religiousness is positively associated with fertility (Blume, 2009). Only the Scandinavian countries seem to have a small positive correlation between IQ and fertility, at least in males (Kolk & Barclay, 2019).

While the heritability of intelligence is usually estimated as .5 to .8 and religiousness is roughly .4 heritable, being ‘born again’ – undergoing a dramatic conversion experience and often focusing your entire life around religious fundamentalism – is approximately .6 heritable (Bradshaw & Ellison, 2008). However, genetic selection is unlikely to play a role in the statistical association between religiousness and intelligence, as long as genetic variants affecting religiousness assort independently from those affecting intelligence. This association more likely is mediated through cognitive styles or educational experiences.

Being part of a born-again, and thus fundamentalist, church is associated with particularly low IQ (Nyborg, 2009); a particularly strong desire for a large family (among ‘fundamentalists’ more broadly) (Hayford & Morgan, 2008); particularly high fertility beyond the general religiousness-fertility correlation (Kaufmann, 2011); and atrophy of the hippocampus, which is itself associated with hyper-religiosity (Owen et al., 2011) and reduced intelligence (Reuben et al., 2011). Religiousness in general, however, is not associated with atrophy of the hippocampus (Owen et al., 2011). Future studies should, therefore, investigate whether there is a Jensen effect when specifically comparing the IQs of born-again fundamentalists to those of controls.

One unexpected incidental observation is that in the NLSY overall, higher cognitive test scores have slightly positive associations with religious attendance in males (+.045, p = .001 with g), but these associations are more negative in females (r = -.017). One possible explanation is that this is related to the lower average religiosity of males. If religiosity is the main motivation for churchgoing in females but social convention is more important for males, and conformity to social convention is favoured by higher IQ while religiosity is favoured by lower IQ, this is exactly the result we would expect.

Acknowledgement

Tables 1 to 3 and components of some of the sections herein were originally published in Personality and Individual Difference by Dutton & Meisenberg (2021) as part of a different analysis of the same data set.

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