# The Wonderlic Personnel Test and elementary cognitive tasks as predictors of religious sectarianism, scriptural acceptance and religious questioning ☆

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## ARTICLE INFO

## ABSTRACT

Lynn, Harvey and Nyborg [Lynn, R., Harvey, J., & Nyborg, H. (in press). Average intelligence predicts atheism rates across 137 nations. *Doi:10.1016/j.intell.2008.03.004.*] discovered that average intelligence (IQ) co-varies with national atheism rates. Extending this work, we investigated relationships among individual IQ scores, elementary cognitive task (ECT) performance, and three types of religious beliefs. Sectarianism (believing one's religion is the only path to God) correlated negatively with IQ and ECT. Considerable mean differences also existed on this factor between the highest and lowest IQ ($d = .69$) and ECT ($d = .73$) quartiles. Scriptural acceptance (believing one's scripture is literally true), however, correlated only nominally with IQ and ECT. Religious questioning (one's willingness to question religious convictions) correlated positively with ECT, and consistent differences existed on this factor between the highest and lowest scoring IQ ($d = .38$) and ECT ($d = .55$) quartiles. Only ECT explained unique variance in religious beliefs, as controlling for it attenuated the effects of IQ. Possible theoretical explanations for these effects are discussed.

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## 1. Introduction

In 1928, Howells and Sinclair independently published findings showing a negative relationship between measures of religiosity and intelligence (IQ) test scores. Since then, others have replicated these results with a variety of measures (see Francis, 1998; Lynn, Harvey, & Nyborg, in press, for reviews). As markers of religiosity, researchers have used (among other things): preference for conservative Christian beliefs (Symington, 1935), attitudes toward organized religion (Young, Dustin, & Holtzman, 1966), church attendance (Bender, 1968), and national atheism rates (Lynn et al., in press). Measures of intellectual ability have included: the Primary Mental Abilities test (Turner, 1980),

grade point average (Young et al., 1966), membership in Mensa (Southern & Plant, 1968), the Peabody Picture Vocabulary Test (Kanazawa, in press, as cited in Lynn et al., in press), and the Armed Services Vocational Aptitude Battery (Lynn et al., in press).

Despite differences in measures used, research in this area generally paints a consistent picture. On average, people who rate themselves as "not religious at all" have higher IQs than those who hold stronger religious beliefs (Kanazawa, in press). Those with more traditional religious beliefs score lower on IQ tests than do those with less strict beliefs (Franzblau, 1934; Verhage, 1964). Similarly, positive attitudes toward organized religion have been associated with lower grade point averages (Young et al., 1966), while those who disbelieve in a God tend to have higher IQs (Lynn et al., in press).

Explanations for why IQ scores predict religious belief often focus on the perceived incompatibility of the unquestioning acceptance of divine influence central to most religions, and the desire for naturalistic explanations which epitomize scientific and skeptical thinking (see, e.g., Dawkins,

2006). Further, the ability to think skeptically and critically presumably overlaps with whatever IQ tests measure (Lynn et al., in press). Several studies find that fewer members of scientific societies believe in the existence of a God compared with the general population. Larsen and Witham (1998), for example, report that belief in a God is vastly under-represented among members of the American National Academy of Science (only 7% report theistic beliefs). Similarly, developmental studies show a decrease in religious commitment as children mature and their abstract reasoning skills improve (see, e.g., Turner, 1980). This decrease is seen particularly during adolescence, as students are exposed to more intensive, science-based curricula.

The size of the relationship between IQ scores and religious beliefs is relatively small (correlations range in the mid .20s to mid .30s, depending on the measures used), and the direction of causality is unknown. Possibly, increased exposure to skeptical thinking and the method of scientific discovery reduces the strength with which irreconcilable religious beliefs can be maintained, resulting in somewhat better performance on IQ tests. Alternatively, people who are less able to acquire the capacity for critical thought may rely more heavily on comfortable belief systems that provide uncontested (and uncontestable) answers.

We posit here that differences in intelligence should co-vary with the degree of fundamentalism people express about their religious beliefs. Specifically, we suspect that people with more dogmatic, literal beliefs about the truth of their religion will average lower IQ scores than those with more open and non-literal beliefs. We do not expect large differences, but finding that IQ explains some of the variance in how literally people view their religion would be notable, and consistent with recent research in this area (e.g., Lynn et al., in press). Moreover, we do not expect the relationship to be linear across the range of IQ. Although clearer differences should exist between those in the lowest and highest scoring IQ groups, the link between religious beliefs and intelligence is likely not strong enough to be additive across all ranges of IQ. This hypothesis was tested by grouping students into quartiles based on their level of general mental ability. We predicted reliable differences in religious beliefs at the lower and higher ends of general mental ability, with weak to no differences in between.

A second goal of our study was to explore whether measures of basic information processing ability (e.g., reaction time) co-vary with religious beliefs. Information processing ability may be key to the development of other forms of intelligence, like crystallized knowledge, or the capacity for abstract reasoning and critical thinking (see Jensen, 2006, p. 176). For example, Kranzler and Jensen (1989; see also Vernon, 1989) reported significant correlations between information processing ability and scores on the Raven's Progressive Matrices. Verguts, De Boeck, and Maris (2000) later replicated this result, and showed that faster participants were able to generate and test more solution rules on a problem by problem basis, which then led to higher overall matrices scores. Similarly, Arend et al. (2002) found that measures of information processing ability accurately predicted subject performance on a deductive reasoning task. Hence, we were interested in whether information processing ability—in addition to global IQ scores—would predict aspects of religious belief like fundamentalism.

We measured information processing ability via subject performance on Elementary Cognitive Tasks (ECTs). ECTs represent a range of tasks where subjects perform trivially easy cognitive acts (like judging line lengths, or selecting letters). In general, ECTs require people to evaluate and react to simple visual stimuli, but presumably they index the speed and efficiency with which the nervous system processes information (Jensen, 1998, 2006). A large literature shows that ECT performance correlates about .50 with scores on standardized IQ tests (see Jensen, 1998; 2006; Sheppard & Vernon, 2008, for reviews).

We used three ECTs in the present study: inspection time (IT), reaction time (RT) and over-claiming (OC). In the IT task, participants see two rapidly-presented (vertical) lines presented on a computer screen. One line, selected randomly, appears longer than the other. The task is simply to pick the longer line on every trial. Responses are not timed; instead, accuracy is tracked as a function of the display duration for the lines. Lower IT scores indicate better performance (i.e., the person still maintains high levels of accuracy, even when the two lines appear very briefly). Nonetheless, scores on the IT task correlate around .50 with standardized IQ tests, once corrected for attenuation (for meta-analytic reviews, see Grudnik & Kranzler, 2001; Kranzler & Jensen, 1989).

RT-based elementary cognitive tasks come in many varieties (see, e.g., Jensen, 2006; Sheppard & Vernon, 2008). Here, we used a choice-RT task where on every trial subjects rapidly selected the position of a target letter (i.e., the letter "A") in a display containing both the target and distractor letters (i.e., the letter "S"). This RT task contributes two measures to analysis: the average (median) time it takes the participant to respond over all trials, and the average variability (standard deviation) in response speed across trials. As with IT, scores on RT tasks correlate moderately well with IQ (Jensen, 2006). Reaction time, however, is a complex construct, and different measures of RT correlate more or less with intelligence (see Sheppard & Vernon, 2008, for a review).

The third ECT employed here is the over-claiming task (Paulhus & Harms, 2004). This task measures corrected familiarity with general world knowledge items. Participants see the name of a famous person, scientific term, or other concept, and then merely rate how familiar they are with the concept using a Likert scale. On some trials, the presented concept is fictitious. Signal detection analysis is then used to separate the person's true familiarity from his/her tendency to over-claim (i.e., to claim familiarity with concepts that do not exist). Corrected familiarity in the over-claiming task also correlates moderately well with scores on standardized IQ tests (Paulhus & Harms, 2004; see Williams, Paulhus, & Nathanson, 2002, for evidence that familiarity in the over-claiming task is an automatic process).

In sum, we had college students complete the Wonderlic Personnel Test (WPT), and three elementary cognitive tasks. Participants then responded to various surveys — pre-existing in the literature—measuring several aspects of religious belief. Specifically, we measured the degree to which people (1) believe their particular religion is the one favored by God (sectarianism), (2) accept their religion's