**ADMINISTERING FAITH: DOES THE RELIGIOUS INSTITUTION ADMINISTERING A SCHOOL INFLUENCE EDUCATIONAL ACHIEVEMENT?**

**ABSTRACT**

Australia’s education landscape is rather unique among developed nations having a high proportion of students taught at non-government schools by a diverse range of religious providers, which receive relatively high levels of government funding. It therefore offers the ideal setting for a study on the outcomes achieved by students at schools administered by the major faith providers relative to their peers in government institutions. We take advantage of a six-year panel of nationwide academic test data, along with a comprehensive suite of control variables, to test whether there are differences in average school performance. We *find strong evidence to suggest that significant differences in achievement exist between various faith-based providers that cannot be explained solely with reference to educational advantage and prior performance.*

**Keywords**: education; educational achievement; religion; schools.

**INTRODUCTION**

There is surprisingly little extant research on the effect of school choice on primary school education achievement. What we do have are a number of studies in the context of America, augmented by a few from the United Kingdom and Australia, which have compared outcomes between government, Catholic and private schools (for a review of these studies see Ngheim et al., 2015). Generally, the finding has been that *prima facie* differences in performance disappear when controls are put in place for educational advantage (the occupation and education of parents in particular) and prior achievement. However, all of the existing studies have considered non-Catholic faith providers as a single category (‘private schools’) which fails to capture the diversity of religious institutions (which include Islamic, Jewish and other Christian providers).

Australia’s education landscape is unique among developed nations in terms of the diversity of providers, the proportion of students enrolled with non-government providers (19.3% of the nation’s primary school students are educated in Catholic institutions and 11.8% in other faith-based institutions), and the extensive government financial support for faith-based institutions (the Federal government provides 63% of the revenue for Catholic schools and 38.4% of the revenue for other non-government schools) (ACARA), 2017; Caldwell, 2010). Moreover in Australia long panels of national examination data for year 3 and 5 (in the domains of spelling, reading, writing, grammar, and numeracy) along with data on various aspects of educational advantage (i.e., student background) and school resourcing are available to scholars who sign a deed of licence with Australian, Curriculum, Assessment and Reporting Authority (ACARA). Australia thus presents the ideal context for a more nuanced study of the association between faith-based institutions (which disaggregates non-Catholic schools into major religious groupings) and educational achievement.

Differences in performance between faith-based institutions are generally ascribed to screening effects – the most notable is the levying of often substantial fees – which result in concentrations of educational advantage (Teese, 2005). This explanation has been used to explain differences in achievement between government, Catholic and ‘private’ institutions (e.g., Marks, 2015) and we note that appropriate controls exist in the Australian dataset to account for this explanation in a more disaggregated study of faith-based institutions. Another explanation for differences in performance looks to resourcing levels both in terms of funding, and teacher and non-teacher staffing (e.g., Davies and Davies, 2013) and once again controls are available to account for this effect. In addition, past performance of students has also been cited as a major determinant of non-government school outcomes – and this explanation can be controlled for (Marks, 2014). If differences persist despite controlling for educational advantage, resourcing differences, and prior academic performance then explanations based on religion become important.

There is a large literature that examines the association between religion and educational attainment (i.e., the number of years of formal study) that has thus far been neglected in the academic achievement literature, but seems to have strong potential to explain observed differences (Lehrer, 2006; Erickson and Phillips, 2012). These explanations have particular salience for institutions where students must be affiliated with the religion of the administering authority (e.g., orthodox Jewish schools) or where, despite open enrolment practices, all students are affiliates as in the case of Islamic schools (Evans and Gaze, 2010).

However, even in faith-based institutions noted for having heterogeneous student populations such as Catholic schools, there is a distinct concentration of affiliates that is large enough to affect average achievement (indeed 69% of students at Catholic schools are affiliates; National Catholic Education Commission, 2014). There is strong evidence to suggest that indirect effects (which include the quantity-quality, diaspora and immigration hypotheses) and direct effects (the value of introspection, transference of rote learning skills, intergenerational mentoring, and engagement with philosophically sophisticated material) of religion can affect educational attainment. Thus, we need to carefully consider the applicability of these ideas for explaining differences between faith-based education achievement that persist despite controls for education advantage and resourcing.

Our study is particularly timely given the current debate regarding the level of federal funding provided to faith-based schools in Australia. For instance, a number of Islamic schools – including Malek Fahd, Australia’s largest Islamic school, the Islamic School of Canberra, and the Islamic College of South Australia – have had Federal government funding discontinued as a result of failure to ‘operate on a not-for-profit basis, and to dedicate all funding received to the benefit, welfare and educational advancement of students’ (Birmingham, 2016).

Moreover, in May 2017 the Federal government announced significant changes to its schools funding model (see, Drew and Fahey, 2018). These changes are set to hit Catholic schools particularly hard, thus prompting the National Catholic Education Commission to warn of school closures and decry that the Federal government was ‘undermining our ability to provide an equitable education for families’ (Cronin cited in Bye and McDougall, 2017).

This paper tests whether there are differences in educational achievement between government schools, various religious authority schools and other independent schools over a six-year panel of data (2010 to 2015) and analyses it in terms of both existing explanations *and* theories from the religion and education literature. The balance of this journal article is organised as follows. First, we employ the Theory of Religious-Secular Competition to explain the choices confronting individual families regarding their children’s education, which might be expected to give rise to significant aggregate effects. Next, we outline our empirical strategy, which extends the literature by significantly increasing the level of disaggregation used to examine associations between various faith-based institutions and performance on national examinations. Thereafter, we discuss the results of our empirical analysis with respect to explanations based on education advantage, school resourcing and religion. The article concludes with an enumeration of the public policy lessons, which arise from our work.

**THEORETICAL AND EMPIRICAL CONTEXT**

A useful way of examining individual’s choices regarding where they might educate their children is with reference to the Theory of Religious-Secular Competition developed by Stoltz and colleagues (Stoltz et al., 2016). The theory suggests that when individuals can choose between secular and religious providers of a good (in our case education) then this can set up the conditions for competition. The Religious-Secular Competition theory draws attention to how innovation (changes to the game), regulation (how the game is played) and resources (economic, cultural and social) affect both religious and secular suppliers and the consumers of the good on offer (Stoltz and Tanner, 2017). Moreover, it notes the salience of family preferences and beliefs to the choice of individuals whose affects we can observe in the aggregate (Stoltz and Tanner, 2017).

In Australia, many parents are able to choose between various secular and religious providers of education – depending on their beliefs, preferences, and resources. Competition has been heightened since the innovation of MySchool in 2010 (a website administered by ACARA which reports average results of national examinations, an index of community socio-educational advantage, various statistics on the composition of the school, and details of resourcing).

Regulation is generally considered to allow faith-based institutions to discriminate in employment and enrolment practices if the intent is to ‘avoid injury to the religious susceptibilities’ of the members of the religion for which the school was established to propagate (Seemann, 2018: 237). This allows faith-based providers to create a community that is composed of students and employees that hold a specific set of values. Faith-based schools also draw on economic (substantial government funding and private tuition fees), social (for example, alumni), and cultural (for instance, public image) resources. Supply side responses to innovations, regulation and resourcing result in faith-based schools ‘screening’ student populations (for example, offering scholarships to high performing students or refusing enrolment to non-affiliates) to establish concentrations of socio-educational advantage and values (Teese, 2000; Caldwell, 2010; Nghiem et al., 2015; Marks, 2015).

Screening affects are also exerted from the demand side of the competitive market. The most obvious screening occurs when parent’s factor in the resources required for membership in various educational communities (how much they will have to pay, how willing they are to participate in school community life, and how willing they are to support the values that certain faith-based institutions will promote) (Cardak and Vecci, 2013). In addition, beliefs of families clearly play a part in the decision making process (people subscribing to a certain faith would be more likely to seek a place at institutions consistent with that faith, and shun faith-based institutions that they consider inconsistent with beliefs particularly if the faith in question had distinctive dress or behaviours). Moreover, individual preferences combine with perceptions regarding resourcing, quality of teaching, peer groups and discipline to guide choice making (Caldwell, 2010; Contreras et al, 2010).

As a result of both supply and demand side screening a ‘disproportional number of students from the most disadvantaged backgrounds attend government schools’, ‘a more even spread of socioeconomic backgrounds [occur] among students attending Catholic schools’ and ‘almost half of all [non-Catholic] independent students fall into the top quarter of socio-educational advantage’ (Gonski et al. 2011: 10-11). Moreover, as we have noted some faith-based schools insist that their communities subscribe to given religious values, while even the most liberal faith-based institutions (Anglican) require staff and students to adhere to a set of ‘core’ values (Evans and Gaze, 2010).

As we have noted, data is available to control for explanations relating to concentration of socio-educational advantage and differences in resourcing for the various faith-based institutions. This allows us to examine whether there might be education outcomes that are not explained by concentration in socio-educational advantage or resourcing arising from the religious-secular competition. Values are more difficult to control for and are likely to be associated closely with the faith of the institution given that the school communities invariably concentrate affiliates, and persons who are not opposed to the values taught by faith-based schools whose mission is to propagate the faith (Seemann, 2018). Concentration of religious affiliates and persons willing to observe religious inspired values suggest that theories from the large religion education attainment literature might be profitably used to explain associations that persist even after controlling for factors associated with common explanations for differences in education achievement in government and non-government schools.

There are three hypotheses that are routinely used to explain differences in educational outcomes contingent upon religion. The first is the diaspora hypothesis, which contends that religions associated with persecution and exile are more likely to invest in mobile human capital (Lehrer, 1999). The second is the immigration hypothesis, which argues that skilled migration policies in some countries result in a selection bias, which is also incidentally related to religious affiliation (Beyer, 2005; Cobb-Clark and Trong-Ha, 2012). Finally, the quantity-quality hypothesis asserts that certain religions are associated with large or small family size, strong or weak patriarchal tendencies, and definite views on divorce that are likely to effect the resources available for education (Norton and Tomal, 2009; Keysa and Kosmin, 1995). These hypotheses are considered to explain the indirect effects of religion on education, and it is the quantity-quality hypothesis that has strong empirical support and is widely accepted amongst scholars (hence our further explication below).

This quantity-quality hypothesis asserts that there is a close association between religion and family characteristics which are salient to education, such as attitudes to divorce (and hence divorce rates), the size of families, attitudes to female participation in the labour market, and attitudes to gender equality in education. Specifically, it is claimed that Jews tend to have smaller families, relative to other religions (particularly Catholics and Muslims, which tend to have larger families) and that some religions (particularly Islam) are highly patriarchal and thus affect the ability of mothers to participate in market based work and pursue educational opportunities (Keysa and Kosmin, 1995; Read, 2004). In addition, it is contended that if more resources (time and money) can be invested into individual children – due to smaller numbers of siblings and the presence of both parents – then better academic performance might be expected *ceteris paribus*. Table 1 includes data relevant to the quantity-quality fertility model by religious affiliation. This hypothesis is most relevant to the homogenous student populations such as those who attend Jewish and Islamic schools. In more heterogeneous schools (like Anglican schools), the trend evident in the wider population may not manifest quite so strongly. It is important to note that this hypothesis relates specifically to the quantity-quality attributes of religious affiliates and differs somewhat to the non-religion education literature, which focuses on the association between achievement and socio-education advantage.

[Please insert Table 1 here]

There are also a number of more direct effects of religious practice, which may well have a bearing on the distribution of average school performance with respect to the religion of the administering authority. For instance, the need to commit to memory long and complex texts (and recite same, often in a different language, by rote) – such as occurs in Islam, Judaism and Catholicism for example – may develop skills which are readily transferable to academic endeavours like learning to spell (e.g., Moore, 2012). In a similar vein, religions that emphasise the study and engagement with philosophically sophisticated materials are likely to promote reading comprehension and persuasive writing skills. Self-discipline, introspection, and obedience to authority are also salient skills developed in many religious environments (Sander, 1992).

Moreover, intergenerational mentoring facilitated by the regular gathering of adherents has been argued to have a positive effect on attainment (Erickson and Phillips, 2012). This is also applicable in many Catholic and Anglican school communities (despite the fact that the latter are religiously heterogeneous) where churches often exist on or adjacent to school grounds and the religious community is active in pastoral care. Much has also been made of fundamentalist Christian refusal to engage with science and humanism – although this is likely to be most relevant in high school and university levels of education. In a similar vein, religious attitudes to alcohol, illicit drug use, and sexual promiscuity have also been advanced to explain higher levels of educational attainment; however, these factors are relevant for only for secondary and tertiary education (Erickson and Phillips, 2012). These direct effects of religious practice are clearly pertinent in relatively homogeneous school populations like those we might expect to find in Jewish and Islamic schools.

However, it may also be the case that many of the direct effects might be transmitted to more religiously heterogeneous student populations (such as those that occur in Anglican schools) through pastoral care, the attitudes and beliefs of religious adherent teaching staff (who may be motivated by religion to put in efforts beyond what might be expected of occupation alone) and compulsory religious education programmes (although it might be noted from the literature abroad that assessing teacher quality is an imprecise science at best) (see, Davies and Davies, 2014; Rothstein, 2010). If this is the case, then it may be that some of the more fruitful practices could be incorporated into the pedagogy and curriculum of public schools to improve educational achievement.

We now describe our empirical approach to identify whether there is an association between the administering faith of institutions and the average education achievement of students, after controlling for explanatory factors identified in previous education achievement literature.

**DATA AND EMPIRICAL STRATEGY**

This study extends the scholarly literature by being the first empirical work to disaggregate education providers beyond the public-Catholic-private trichotomy. We employ the census dataset obtained from ACARA under licence to test whether there is an association between average scores in the national assessment program for year 3 and 5 students, and the faith-base of schools. It is appropriate to use school level data given that our research question examines the association between educational achievement and the religion of the administering authority; not the student gain in achievement attributable to the religious authority, which is a much narrower and more nuanced question. Moreover, it should also be noted that ACARA does not allow researchers to have access to both student level data and school level data under the deed of licence, due to a possible risk to anonymity of student data.

The National Assessment Program for Literacy and Numeracy (NAPLAN) is an ‘annual national assessment for all students in Years 3, 5, 7, and 9 in all Government and non-Government schools across Australia’ (Miller and Voon, 2012: 152). The NAPLAN tests, which have been administered since 2008 (Marks, 2014), cover the following domains: (i) grammar, (ii) reading, (iii) spelling, (iv) writing, and (v) numeracy. The tests have been designed to be grade-based (as opposed to age-based), with national test participation rates at 95% or more for Years 3 and 5 (Miller and Voon, 2014: 152). NAPLAN test scores range from 0 to 1,000 and were designed to permit the comparison of academic achievement from different schools and across time (Nghiem et al., 2015). The data is pre-sorted by the ACARA according to ‘Government’, ‘Catholic’ and ‘Independent’ identifiers and all previous studies have employed this categorisation without qualification. However, lumping all non-public schools together as either Catholic or non-Catholic may not be the most reasonable foundation for analysing performance, particularly where the religion of the school is of interest. There are likely to be substantial differences in the student populations and pedagogical approaches of say Jewish and Islamic schools on the one hand, and more secular (relatively high-fee) Anglican schools. To correct for this crude categorisation, we augmented the ACARA data set, with details of the specific faith administering the school and constructed an eight-part categorisation scheme.

The categorisation augmented existing ACARA data to also identify: Anglican, Council of Churches Christian, non-Council of Churches Christian, Islamic, Jewish, and other independent schools. Anglican schools were included as a separated category in view of the fact that they are the largest non-government provider next to Catholic. We then sorted the remaining denominational Christian schools according to membership in the Australian Council of Churches (CoC) (for the purposes of ensuring sufficient category size and keeping the number of categories manageable). The Australian CoC is a volunteer peak body that requires members to subscribe to core Christian beliefs – churches who are not members are so because of incompatible beliefs or parochialism. The two non-Christian categories are Islamic schools (which are particularly topical in the funding debate in Australia) and Jewish schools (which have been written about extensively in the American literature). Other-independent schools were comprised mainly of grammar schools. The categorisation necessarily retains some heterogeneity (as do all categorisation systems) but we note that it is a six-fold improvement with respect to the ‘independent’ identifier used in existing work.

In order to identify residual differences in education achievement that are not closely related to concentrations of socio-educational advantage our regression models included a number of control variables. The principal control for socio-economic advantage is the Index of Community Socio-Educational Advantage (ICSEA) developed by ACARA, which combines school enrolment and census data on parent’s occupation, parent’s school and post-school education attainment, and school remoteness index. In addition to ICSEA, we also control for concentrations of advantage by including variables for proportion of students identifying as Aboriginal or Torres Strait Islander, and students from a non-English speaking background. To control for resourcing differences we included a variable for gross income per student, and variables for student-teacher and student-support staff ratios.

As a robustness check we also re-estimated the Year 5 regressions (for each domain), controlling for the relevant Year 3 scores (that is, the Year 3 score for the same domain from two years prior). This effectively controls for academic potential of the student population if we accept the assumption that the cohort of students in a given school in Year 5 are, for the most part, the same group of children who sat the Year 3 exams at the school two years earlier. This is a reasonable assumption given that ‘only about 5% of students change school’ (Ngheim et al., 2015: 58).

In sum, the various control variables address most of the explanations around concentration of socio-educational advantage, but do not address religious values and religious screening effects (hence, the importance of hypotheses regarding religion and education discussed earlier).

Separate regression analyses for Year 3 and Year 5 were used to examine the association between the religious authority of the school and the academic achievement for each domain using the following model:

Y = α + β1R + β**2**X + ε (1)

In Equation (1), Y is the NAPLAN test score for each domain (i.e., grammar, reading, spelling, writing, and numeracy), R is the religious authority of the school (i.e., Government, Catholic, Anglican, Islam, Jewish, Council of Churches, non-Council of Churches, and Other Independent), X is a vector of control variables (i.e., school location, index of community socio-educational advantage, the proportion of Indigenous enrolments, the amount of recurrent income received by a school from all sources per student, the proportion of indigenous and non-English speaking students, student-teacher ratio, student-support staff ratio, proportion of female students, and examination participation rate), and ε is an independently identically distributed error term. All results are estimated using ordinary least squares (OLS) regression model, which is consistent with previous studies (e.g., Miller and Voon, 2014; Nghiem et al., 2015). Since we observe the same schools over several waves, our standard errors are clustered at the school-level to account for within-school serial correlation. The definitions, means, and standard deviations for the control variables used in the empirical analysis are reported in Appendix A.

**DISCUSSION OF RESULTS**

Figures 1 and 2 provide an overview of NAPLAN achievement by administering faith between 2010 and 2015. The graphs suggest that for the five categories of tests administered to Year 3 students, Government (public) schools have underperformed non-government schools in all instances, except for the case of the 2014 mean reading result (Islamic schools had the lowest mean score for this year). By way of contrast, the mean NAPLAN result for Jewish schools was consistently above peers for most years and for most subjects (with the exception of spelling) followed by the Anglican schools. In all cases, the Catholic schools, which dominate the provision of non-Government schooling in Australia by volume, have outperformed Government schools but in most cases underperformed with respect to their non-Government peers (with the exception of Islamic schools in some years, especially in reading). The mean NAPLAN performances of the other categories of schools are relatively closely clustered between the outliers already detailed. A similar story emerges with the mean NAPLAN scores for Year 5, although there is reason to believe that the relative performance (with respect to peers) of Islamic schools has dropped somewhat, particularly in the domains of reading, and, to a lesser extent, numeracy.

[Please insert Figures 1 and 2 here]

However, figures of this type, while providing a quick overview of the mean performance of different categories of schools, cannot give us a complete understanding of the association between the faith-based schools and the distribution of educational achievement, *ceteris paribus* (i.e., holding all other factors constant). The Theory of Religious-Secular Competition draws our attention to how regulation and resourcing, in particular, can result in screening effects from both the supply and demand side (Stoltz et al., 2016). Moreover, a key assumption of the theory is that ‘many reactions…can better be seen in the aggregate than in the individual, since individuals are often influenced by a variety of idiosyncratic causes’ (Stoltz and Tanner, 2017: 312). Regression analysis is therefore an ideal technique because it reports on the aggregate mean (or typical) response of NAPLAN scores to the various categories of institutional faith, after controlling for important screening effects – in particular, the socio-educational advantage (ICSEA) and various measures of resourcing. Thus, our regressions yield typical responses at the ‘meso-level of … [religious] group competition’ consistent with theory (Stoltz and Tanner, 2017: 302). Moreover, it is important to emphasise that we are working here with an entire census of data (all schools in the nation), and that therefore sample size considerations are not relevant. However, it is the case that some categories have relatively small numbers of schools associated with them and this is reflected in relatively lower frequency of statistically significant coefficients and relatively higher standard errors. This mainly becomes problematic when the size of the standard error is such that it might cast doubt on the sign (positive or negative) of the coefficient.

[Please insert Tables 2 and 3 here]

Table 3 reports the results for each faith and the important screening and resourcing variables. Notably ICSEA is a statistically significant determinant of average NAPLAN results for each domain and year level, which is in line with theoretical expectations. Moreover, the mean response to ICSEA is relatively strong, especially when one considers the degree of variation between the various categories of schools (Table 2). ICSEA is a consequence of both supply and demand side competition – for the former we have things like scholarships based on merit, for the latter we have capacity to pay tuition fees (which is likely to concentrate students from parents in high skilled occupations). Similarly, the economic resources (total income per student) available to different categories of schools reflect both supply (government support for faith-based schools) and demand (parent payment of tuition fees) effects. There is a statistically significant but relatively weak association for reading and numeracy NAPLAN scores in response to student income that seems to be somewhat at odds with government policy and commonly held perceptions about the association between funding and performance. In most cases, even a doubling of existing funding (i.e., an extra $10,000 per student) would only result in improvements to the mean reading and numeracy scores of just a few points. Student-teacher ratios were also statistically significant but represent a relatively weak response and the sign of the coefficient here suggests that we may be picking up the effects of scale (which allows for more specialist teachers, greater peer support and the like) rather than resourcing *per se*.

However, the key variables of interest regarding the effect of administering faith on educational achievement relate to the categories of non-government education institutions. Even after controlling for screening effects, statistically significant and relatively strong differences in performance on standardised exams persist. Indeed, the results in Table 3 suggest that the performance of Catholic schools is somewhat below that of government institutions, that Anglican schools continue to perform relatively well as do non-CoC schools, that Islamic schools outperform peers quite strongly and that other independent schools perform relatively poorly, when we hold all other factors constant. Moreover, the performance of Jewish schools while positive in most instances is not nearly as impressive as the raw data might suggest (lack of statistical significance is likely an artefact of the small cohort size). This all goes to suggest that the explanations commonly found in the literature regarding differences in performance between government, Catholic and non-government schools may not be adequate to explain completely the results arising from our more nuanced study of the association between faith-based institutions and educational outcomes. In addition, it also underlines the importance of disaggregating the non-Catholic private school cohort which otherwise would have represented a conflation of very disparate outcomes. It is possible that there are some lingering screening effects (for instance, screening effects arising from perceptions of the quality of faith-based schools) that we have not been able to completely control for owing to data limitations. However, it is also more than likely that the large body of work on the association between religion and educational attainment also has some relevance to educational achievement.

In terms of the indirect hypotheses from the religion attainment literature, the quantity-quality model is the most likely candidate to explain much of the statistically significant results, and seems especially relevant to Islamic, non-CoC, and Catholic schools. These types of schools have high levels of religious adherents, and all three religions have been associated with large family size, which suggests the relevance of the hypothesis (Keysa and Kosmin, 1995). However, the education achievement response for the Catholic faith-based institutions relative to non-CoC and Islamic schools are entirely at odds with one another. One way of explaining these disparate mean responses with reference to the quantity-quality argument might lie with the distinctly low workforce participation rates associated with Muslim and non-CoC mothers which might allow these groups to invest more social resources into education, both at schools and at home (Read, 2004; Vance, 1999).

It is also possible that the immigration hypothesis is relevant to the outcomes achieved by Islamic schools, in particular, in view of the fact that most growth in the religion is driven by immigration (ABS, 2017). However, given the absence of data for this variable we can only speculate regarding the explanatory power of this hypothesis at present. The diaspora hypothesis has been strongly associated with performance by Jews in the literature from America, but finds no support in our results, although we do reiterate that the relatively small number of Jewish schools may largely be responsible for lack of statistical significance. The relatively high performance at Anglican schools is more difficult to explain with reference to the indirect religion hypotheses given the likelihood of religiously heterogeneous student populations.

The extant religion and education literature also draws attention to the direct effects of religion on attainment and it appears that there may be some cause to think it applicable for explaining education performance also. The very strong results for spelling at Islamic schools appears to provide good support for the argument that exposure to rote learning practice may have positive implications for some domains of education performance (Moore, 2012). It is also noteworthy that positive coefficients occur for all faith-based schools in the domain of writing. This may point to a potential link between exposure to philosophically sophisticated material and introspection on the one hand, and the ability to write persuasively on the other although further evidence would be required to advance this tentative observation.

Some of the literature has stressed the importance of prior achievement as a determinant of educational outcomes (e.g., Marks, 2015). We therefore ran a separate set of regressions for Year 5 NAPLAN results in which we controlled for performance in Year 3 exams by way of a robustness check for our results. Table 4 reports the results of these regressions. In general, the coefficients for the various faith-based associations have attenuated somewhat, although some are no longer statistically significant. These results confirm that associations between faith and education outcomes are robust and therefore warrant further scholarly investigations.

[Please insert Table 4 here]

**CONCLUSION**

This paper set out to add to the nascent empirical literature on primary school educational outcomes by testing whether there were statistically significant differences between the performance of various faith-based institutions. By augmenting the ACARA database with details of the faith administering non-Catholic private schools, we were able to achieve a six-fold increase in the degree of disaggregation relative to extant work. The results of our regressions demonstrate the importance of our approach to disaggregation, given that these statistically significant and disparate associations had previously been conflated under a single category.

Our results are consistent with some of the previous theoretical and empirical literature, which point to the importance of screening effects associated with regulation and resourcing. There were relatively strong and statistically significant associations with the index of socio-educational advantage, as might be expected, for all categories of non-public schools consistent with both demand and supply side outcomes from competition between religious and secular institutions. However, statistically significant associations with resourcing were relatively weak and only applied to two domains – reading and numeracy – somewhat against expectations.

The most important finding of our empirical work, however, was the persistence of differences in performance even after we controlled for an extensive array of socio-educational advantage, resourcing, and demographic factors. This suggests that some of the theories and work found in the religion and education attainment literature may well be applicable to education performance. Indeed, while religion is clearly not the only driver of differences in performance it is noted that the size of the coefficients were often substantial, including in schools where all students are known to be affiliates. Our results may come as a surprise to many in the scholarly and practitioner fields, which emphasises the importance of addressing this large gap in the literature.

However, while these findings break new ground there is still much work to be done before scholars can fully appreciate the association between the faith-base of institutions and performance in standardised examinations. Data on the religiosity of students and their parents, along with details of the proportion of time typically spent in school on religious instruction would better clarify how much of the observed effect can be ascribed to screening and how much to religious practice. In similar vein, comparative studies of the religiosity, attitudes and commitment of teaching staff at religious schools would clarify how much, if any, of the difference in performance is related to the quality of instruction and pastoral care (although studies from abroad cast doubt on teacher quality explanations) (Davies and Davies, 2014; Rothstein, 2010). Qualitative work based on interviews would also allow scholars to better appreciate how values and beliefs affect demand-side religious-secular competition. This is clearly required before definitive conclusions about the association between the faith-base of schools and achievement can be made.

One of the major limitations of this study – and indeed most studies – is lack of suitable data. For instance, while the index of community socio-educational advantage allowed us to control for many of the variables noted in the literature it would have been much more helpful to have disaggregated data on parental income and education so that we could more precisely identify determinants. If additional and consistent data sources could be found and combined with ACARA data, without breeching the strict terms of the deed of licence, then some of these limitations could be mitigated. Another limitation is the amount of heterogeneity that still exists within our categories, notwithstanding the fact that our approach was a six-fold improvement on previous work. It might be that there are differences in approaches taken by different dioceses or various denominations (Orthodox versus Reform Judaism for instance) and future work might profitably introduce additional categories to improve heterogeneity (although this may well come at the expense of the efficiency of the regression model).

It must be born in mind that regression analysis aims to identify mean, or typical, responses. This is consistent with the meso-level aggregate approach underlying the religious-secular competition theory that eschews idiosyncratic responses of individuals and, in this case, individual schools. However, when formulating public policy it may be important to also look at specific cases in more detail (matching like for like schools and augmenting empirical analyses with qualitative approaches), rather than just the typical case.

Indeed, our study might have weighty implications for the ‘education funding wars’ currently being fought according to faith-based lines in Australia (Drew and Fahey, 2017). For instance, a case could be made against the (past) generous government funding for Catholic schools and the recent commitment by the Federal government to keep special arrangements for Catholic schools in place for a further twelve months as they transition to putatively more equitable arrangements (SBS, 2017). Otherwise stated, the taxpayer *prima facie* may not be getting the biggest ‘bang-for-their-buck’ with respect to NAPLAN outcomes for this cohort although we note that a contrary argument is sometimes raised that poorly performing units should receive extra funding. This contention may be tested in the future via a natural experiment when funding levels for Catholic schools are reduced as part of Gonski 2.0. Moreover, if further evidence is forthcoming that supports the quantity-quality hypothesis then this might suggest a need for additional early education or after school care funding for large families (especially where the mother is a workforce participant) and perhaps a funding model which takes into account the family dynamics of students.

In conclusion, our study demonstrates that the academic community and public policymakers have much to learn from this hitherto largely neglected field of inquiry and we thus commend this work to our peers.

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**Table 1: Quantity–Quality Fertility Data**

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| --- | --- | --- | --- | --- | --- | --- |
| Religious affiliation | Divorce rate | No children | Proportion of one-child families | Proportion of two-child families | Proportion of three-child families | Proportion of families with more than four children |
| No religion | 6.0% | 29.6% | 13.0% | 29.5% | 16.3% | 11.7% |
| Jews | 7.2% | 21.5% | 13.0% | 38.5% | 18.4% | 8.6% |
| Catholics | 6.7% | 21.4% | 11.6% | 29.9% | 18.9% | 18.2% |
| Anglican | 6.5% | 15.6% | 11.7% | 36.2% | 21.4% | 15.2% |
| Council of Churches | 6.7% | 14.0% | 12.5% | 34.1% | 23.8% | 15.6% |
| Non-Council of Churches | 6.4% | 20.2% | 9.7% | 28.0% | 22.7% | 19.2% |
| Muslims | 3.4% | 22.3% | 18.5% | 27.4% | 12.8% | 19.0% |

Source: HILDA Survey.

**Table 2: Resourcing by School Type**

|  |  |  |  |
| --- | --- | --- | --- |
| **School Type** | **Number of Schools** | **Mean ICSEA** | **Mean Income per Student** |
| Government | 26,403 | 989.3 | 12,358 |
| Catholic | 7,687 | 1,044.9 | 11,773 |
| Anglican | 846 | 1,117.4 | 19,935 |
| Islamic | 193 | 1,012.6 | 12,364 |
| Jewish | 85 | 1,141.9 | 18,642 |
| CoC | 727 | 1,084.0 | 16,048 |
| Non-CoC | 1,811 | 1,050.5 | 14,738 |
| Other Independent | 637 | 1,095.5 | 18,155 |

**Table 3: OLS regression estimates of the association between the school’s religious authority and academic achievement**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variable** | **Grammar** | **Reading** | **Spelling** | **Writing** | **Numeracy** |
| **Panel A: Year 3** |  |  |  |  |  |  |  |  |  |  |
| ***Religion*** | **β** | **SE** | **β** | **SE** | **β** | **SE** | **β** | **SE** | **β** | **SE** |
| Catholic | -3.583\*\* | 0.614 | -2.435\*\* | 0.490 | -2.081\*\* | 0.522 | 2.424\*\* | 0.531 | -7.034\*\* | 0.495 |
| Anglican | 3.966\* | 1.613 | 4.851\*\* | 1.344 | 3.992\*\* | 1.354 | 6.858\*\* | 1.292 | 1.562 | 1.347 |
| Islam | 10.784\* | 4.697 | 3.186 | 3.515 | 20.269\*\* | 3.430 | 15.907\*\* | 3.240 | 3.764 | 4.107 |
| Jewish | 6.037 | 6.179 | 0.078 | 5.287 | -1.579 | 3.565 | 2.787 | 5.058 | 3.982 | 4.839 |
| Council of Churches  | 2.351 | 1.811 | 0.637 | 1.536 | 1.894 | 1.422 | 3.829\* | 1.557 | -1.492 | 1.469 |
| Non-Council of Churches | 4.043\* | 1.343 | 4.434\*\* | 1.122 | 6.028\*\* | 1.196 | 1.796 | 1.144 | 2.982\*\* | 1.074 |
| Other Independent | -4.098 | 3.034 | 2.639 | 2.583 | -8.475\*\* | 2.814 | -8.099\*\* | 2.556 | 0.209 | 2.253 |
|  |  |  |  |  |  |  |  |  |  |  |
| Socioeconomic status | 0.398\*\* | 0.004 | 0.384\*\* | 0.003 | 0.292\*\* | 0.003 | 0.264\*\* | 0.004 | 0.317\*\* | 0.003 |
| Student/teacher ratio | 0.543\*\* | 0.140 | 0.428\*\* | 0.112 | 0.599\*\* | 0.123 | 0.574\*\* | 0.141 | 0.472\*\* | 0.110 |
| Total income/10000 | 1.714 | 1.076 | 2.957\*\* | 0.863 | -0.284 | 0.917 | -1.969\* | 0.986 | 4.997\*\* | 0.896 |
|  |  |  |  |  |  |  |  |  |  |  |
| Additional controls | **YES** |  | **YES** |  | **YES** |  | **YES** |  | **YES** |  |
| Constant | -11.93 | 6.496 | 9.95 | 5.622 | 74.88\*\* | 5.112 | 106.38\*\* | 5.306 | 64.98\*\* | 4.911 |
| R2 | 0.639 |  | 0.685 |  | 0.631 |  | 0.631 |  | 0.622 |  |
| **Panel B: Year 5** |  |  |  |  |  |  |  |  |  |  |
| ***Religion*** |  |  |  |  |  |  |  |  |  |  |
| Catholic | -2.819\*\* | 0.536 | -2.065\*\* | 0.433 | -1.027\* | 0.451 | 3.721\*\* | 0.489 | -7.217\*\* | 0.488 |
| Anglican | 4.171\*\* | 1.372 | 4.471\*\* | 1.211 | 4.346\*\* | 1.122 | 7.861\*\* | 1.244 | 3.201\* | 1.278 |
| Islam | 10.765\*\* | 3.802 | -4.790\* | 2.440 | 17.123\*\* | 2.631 | 10.190\*\* | 2.879 | -2.002 | 3.501 |
| Jewish | 5.148 | 5.577 | -4.054 | 4.081 | 1.417 | 2.995 | 4.029 | 4.723 | -0.497 | 5.621 |
| Council of Churches | 2.337 | 1.415 | 0.911 | 1.279 | 2.007 | 1.134 | 4.241\*\* | 1.274 | -0.849 | 1.298 |
| Non-Council of Churches | 5.543\*\* | 1.193 | 3.175\*\* | 0.975 | 4.928\*\* | 0.972 | 2.334\* | 1.077 | 2.047 | 1.056 |
| Other Independent | 3.156 | 2.163 | 8.159\*\* | 1.784 | -3.504 | 2.029 | -6.621\*\* | 2.305 | -1.433 | 2.064 |
|  |  |  |  |  |  |  |  |  |  |  |
| Socio-educational advantage (ICSEA) | 0.363\*\* | 0.004 | 0.347\*\* | 0.003 | 0.254\*\* | 0.003 | 0.270\*\* | 0.003 | 0.313\*\* | 0.003 |
| Student/teacher ratio | 0.627\*\* | 0.126 | 0.438\*\* | 0.097 | 0.528\*\* | 0.107 | 0.506\*\* | 0.116 | 0.520\*\* | 0.105 |
| Total income/10000 | 1.568 | 0.865 | 3.135\*\* | 0.735 | -0.864 | 0.836 | -0.386 | 0.929 | 4.494\*\* | 0.865 |
|  |  |  |  |  |  |  |  |  |  |  |
| Additional controls | **YES** |  | **YES** |  | **YES** |  | **YES** |  | **YES** |  |
| Constant | 99.93\*\* | 6.294 | 122.98\*\* | 5.117 | 199.59\*\* | 4.587 | 153.27\*\* | 5.382 | 156.10\*\* | 4.715 |
| R2 | 0.674 |  | 0.703 |  | 0.643 |  | 0.670 |  | 0.655 |  |

\*\* *p* < 0.01, \* *p* < 0.05.

**Table 4: OLS regression estimates of the association between the school’s religious authority and academic achievement (controlling for school gain)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variable** | **Grammar** | **Reading** | **Spelling** | **Writing** | **Numeracy** |
| **Year 5** |  |  |  |  |  |  |  |  |  |  |
| ***Religion*** | **β** | **SE** | **β** | **SE** | **β** | **SE** | **β** | **SE** | **β** | **SE** |
| Catholic | -4.313\*\* | 0.536 | -2.996\*\* | 0.445 | -2.321\*\* | 0.485 | 2.273\*\* | 0.507 | -7.864\*\* | 0.483 |
| Anglican | 1.600 | 1.358 | 1.857 | 1.187 | 2.621\* | 1.170 | 5.130\*\* | 1.190 | 0.259 | 1.233 |
| Islam | 6.881 | 4.269 | -3.869 | 2.824 | 16.614\*\* | 2.859 | 10.536\*\* | 3.054 | -0.875 | 3.586 |
| Jewish | 6.131 | 5.165 | -3.241 | 3.958 | -1.510 | 2.604 | 3.403 | 4.249 | 3.474 | 4.856 |
| Council of Churches | 0.733 | 1.473 | -0.887 | 1.234 | 1.222 | 1.194 | 3.069\* | 1.290 | -2.356 | 1.304 |
| Non-Council of Churches | 2.753\* | 1.208 | 1.270 | 0.987 | 4.511\*\* | 1.057 | 0.814 | 1.069 | 0.916 | 1.022 |
| Other Independent | -1.738 | 2.354 | 3.323 | 1.823 | -6.011\* | 2.348 | -7.777\*\* | 2.397 | -3.540 | 2.043 |
|  |  |  |  |  |  |  |  |  |  |  |
| Socio-educational advantage (ICSEA) | 0.384\*\* | 0.004 | 0.368\*\* | 0.003 | 0.278\*\* | 0.003 | 0.272\*\* | 0.003 | 0.325\*\* | 0.003 |
| Student/teacher ratio | 0.776\*\* | 0.128 | 0.592\*\* | 0.106 | 0.661\*\* | 0.112 | 0.739\*\* | 0.128 | 0.619\*\* | 0.113 |
| Total income/10000 | 2.421\* | 1.055 | 4.644\*\* | 0.876 | 0.217 | 0.901 | -0.043 | 1.051 | 5.691\*\* | 0.909 |
|  |  |  |  |  |  |  |  |  |  |  |
| ***School gain*** | 0.327\*\* | 0.008 | 0.317\*\* | 0.008 | 0.333\*\* | 0.009 | 0.439\*\* | 0.007 | 0.394\*\* | 0.009 |
|  |  |  |  |  |  |  |  |  |  |  |
| Additional controls | **YES** |  | **YES** |  | **YES** |  | **YES** |  | **YES** |  |
| Constant | 48.659\*\* | 6.120 | 75.586 | 6.077 | 145.99\*\* | 5.171 | 118.82\*\* | 5.674 | 105.10\*\* | 4.925 |
| Observations | 23,686 |  | 23,682 |  | 24,023 |  | 23,997 |  | 23,999 |  |
| R2 | 0.746 |  | 0.770 |  | 0.694 |  | 0.751 |  | 0.743 |  |

\*\* *p* < 0.01, \* *p* < 0.05.

**Appendix A: Definition and summary statistics of explanatory variables**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variable** | **Definition** | **Mean/%** | **SD** | **Mean/%** | **SD** |
| ***Religion*** |  | **Year 3** | **Year 5** |
| Government (ref.) | Government | 68.8 |  | 68.4 |  |
| Catholic | Catholic | 20.0 |  | 20.3 |  |
| Anglican | Anglican | 2.2 |  | 2.2 |  |
| Islam | Islam | 0.5 |  | 0.5 |  |
| Jewish | Jewish | 0.2 |  | 0.2 |  |
| Council of Churches | Assyrian, Coptic Orthodox, Greek Orthodox, Lutheran or Uniting Church | 1.9 |  | 1.9 |  |
| Non-Council of Churches | Brethren, Baptist, Adventist, Presbyterian, Christadelphian | 4.7 |  | 4.8 |  |
| Other independent | Other independent | 1.7 |  | 1.7 |  |
| ***State*** |  |  |  |  |  |
| NSW (ref.) | New South Wales | 32.1 |  | 32.0 |  |
| ACT | Australian Capital Territory | 1.4 |  | 1.4 |  |
| VIC | Victoria | 24.3 |  | 24.3 |  |
| QLD | Queensland  | 17.7 |  | 17.8 |  |
| SA | South Australia | 8.4 |  | 8.3 |  |
| WA | Western Australia | 11.6 |  | 11.6 |  |
| TAS | Tasmania | 3.0 |  | 2.9 |  |
| NT | Northern Territory | 1.6 |  | 1.6 |  |
|  |  |  |  |  |  |
| ***ICSEA*** | Socio-educational advantage | 1010.2 | 95.4 | 1010.6 | 95.5 |
|  |  |  |  |  |  |
| ***Indigenous*** |  |  |  |  |  |
| Low | No recorded enrolments | 9.2 |  | 9.1 |  |
| Medium (ref.) | 1-50 recorded enrolments | 74.8 |  | 74.7 |  |
| High  | 51-100 recorded enrolments | 2.6 |  | 2.6 |  |
| Missing | Missing | 13.5 |  | 13.6 |  |
| ***School type*** |  |  |  |  |  |
| Combined (ref.) | Primary and high school | 16.4 |  | 16.9 |  |
| Primary | Primary school | 83.5 |  | 82.9 |  |

**Appendix A: Definition and summary statistics of explanatory variables (cont.)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variable** | **Definition** | **Mean** | **(SD)** | **Mean** | **(SD)** |
| ***Year*** |  | **Year 3** | **Year 5** |
| 2010 (ref.) | 2010 | 16.4 |  | 16.7 |  |
| 2011 | 2011 | 16.7 |  | 16.8 |  |
| 2012 | 2012 | 16.6 |  | 16.4 |  |
| 2013 | 2013 | 16.8 |  | 16.8 |  |
| 2014 | 2014 | 16.7 |  | 16.6 |  |
| 2015 | 2015 | 16.8 |  | 16.7 |  |
|  |  |  |  |  |  |
| Student/teacher ratio | Full time equivalent school enrolments/Full time equivalent teaching staff | 15.5 | 3.2 | 15.5 | 3.2 |
| Student/non-teacher ratio | Full time equivalent school enrolments/Full time equivalent non-teaching staff | 53.9 | 34.6 | 53.9 | 34.8 |
| Proportion of girls | Proportion of girls enrolments per school (1= only female, 0= only male) | 48.9 |  | 48.8 |  |
|  |  |  |  |  |  |
| ***NESB*** |  |  |  |  |  |
| Low | No recorded enrolments | 1.7 |  | 1.6 |  |
| Medium (ref.) | 1-50 recorded enrolments | 73.9 |  | 74.0 |  |
| High | 51-100 recorded enrolments | 12.1 |  | 12.0 |  |
| Missing | Missing | 12.3 |  | 12.4 |  |
|  |  |  |  |  |  |
| Participation rate | Percentage of students who participated | 95.4 |  | 95.9 |  |
| Exempt percentage | Percentage of exempt students | 1.47 |  | 1.37 |  |
| Total income | The amount of recurrent income received by a school from the Australian Government and state and territory governments, plus gross income from fees, charges, parent contributions and other private sources, calculated per student/10000 | $12,665 | $4,495 | $12721 | $4,726 |

Note: Results were very similar across all domains.

**Figure 1: Year 3 mean NAPLAN test scores by domain and the religious authority of the school, 2010-2015**







**Figure 1: Year 3 mean NAPLAN test scores by domain and the religious authority of the school, 2010-2015 (cont.)**





**Figure 2: Year 5 mean NAPLAN test scores by domain and the religious authority of the school, 2010-2015**







**Figure 2: Year 5 mean NAPLAN test scores by domain and the religious authority of the school, 2010-2015 (cont.)**





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