



DATA NOTE

REVISED Parental spiritual and religious beliefs and behaviour data collected from the Avon Longitudinal Study of Parents and Children, 2020 [version 3; peer review: 3 approved]

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Abstract

There are few studies that chart the ways in which the religious beliefs and practices of parents and their offspring vary over time. Even fewer can relate this to aspects of their physical and mental health or distinguish the different facets of the environment that may have influenced the development or loss of religious/spiritual belief and behaviours over time. This paper describes the recent data collection in the Avon Longitudinal Study of Parents and Children (ALSPAC) on the beliefs and behaviours of the study parents some 27-28 years after the first measures were collected. Questions that were previously administered to the mother and her partner on religion, spirituality, behaviours, and beliefs (RSBB) were repeated for the fourth time, together with enhanced data on RSBB. The new data are described and compared with previous responses. The most notable difference between the 9 year and the 2020 sweep was the increase of professed non-believers in both the mothers (17.5% vs 29.8%) and partners (31.9% vs. 45.3%).

As expected, on each occasion study partners were less likely to acknowledge RSBB compared to the study mothers. In the latest sweep, respondents were less likely to be unsure if they believed and more likely to not believe. Responses to "Do you believe in God or a divine power?" in mothers ranged from 49.9% stating 'yes' antenatally to 43.5% doing so in 2020; 14.9% vs 29.8% for 'no' and 35.2% to 26.6% for 'not sure'. For partners, the corresponding figures are: 'yes' 37.0% vs. 30.0%; 'no' 28.6% vs. 45.3% and 'not sure' 34.5% vs. 24.6%. We plan to undertake detailed analyses of the antecedents and consequences of RBSS. All data are available for use by interested researchers.

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Any reports and responses or comments on the article can be found at the end of the article.

Keywords

Religious belief, spirituality, religiosity, behaviour, ALSPAC, parent, sex differences, trends with age.



This article is included in the [Avon Longitudinal Study of Parents and Children \(ALSPAC\)](#) gateway.

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REVISED Amendments from Version 2

At the request of reviewers, we have omitted the right-hand column of [Table 6](#) containing the p values and deleted any p values in the text. The following has been added to the Limitations section of Discussion.

We acknowledge that the religious/spiritual belief and behaviour measures chosen for the study are not those that are approved by all. We asked advice of a number of experts in the field, but not all responded. The data such that it is described here so that any researchers who would like to use them will see what is available and how to access it.

Any further responses from the reviewers can be found at the end of the article

Introduction

There is increasing evidence that Western populations are becoming increasingly secular with each new generation (e.g., [Chaves, 2017](#); [Iles-Caven et al., 2019](#); [Office of National Statistics, 2012](#); [The Pew Forum on Religion and Public Life, 2017](#)). For example, the British Social Attitudes Survey ([Curtice et al., 2019](#)) has demonstrated a dramatic decline, between 1983 and 2018, in those with no religion (31% to 52%, respectively); identification with a Christian denomination (66% vs. 38%) and a steady increase in non-Christian beliefs (2% vs. 9%). Those who identified as being very or extremely religious remained similar (6% vs. 7%) but those stating they were extremely, or very non-religious increased from 14% in 1983 to 33% in 2018. Those who professed they had never believed in God rose from 13% to 26%. Among the younger generations particularly, there was an increased tolerance towards different religious or belief systems, including non-belief. At every age, more women than men were affiliated with a religion, believed in God, and attended religious services. These findings echo those found in the Avon Longitudinal Study of Parents and Children (ALSPAC) over time ([Iles-Caven et al., 2019](#)).

Evidence, mainly from cross-sectional studies, has shown associations between religious/spiritual belief and positive health outcomes. These are described in brief elsewhere ([Iles-Caven et al., 2019](#)). Nevertheless, definitive proof of causal consequences of belief is lacking. Any study designed to identify whether some aspect of religious/spiritual beliefs or behaviours (RSBB) affects physical or mental health must analyse data longitudinally (i.e., by identifying beliefs first and determining their relationships with subsequent aspects of health). In addition, it is also important to have information collected longitudinally on factors that may be confounders, moderators, or mediators. To this end, the Avon Longitudinal Study of Parents and Children (ALSPAC) received funding to enhance the data resource on the topic of RSBB in 2020, which will be analysed along with extensive additional data on potential mediators, moderators, confounders, and physical and mental health outcomes to be collected over the next two years.

This paper describes the RSBB data collected in 2020 from the parents enrolled ALSPAC. These questions were designed to enable linkage to other longitudinal data from the cohort on the environment, traumatic incidents, physical and mental health, and genetic background. It can be used for research into various

aspects of the antecedents and consequences of RSBB, and changes over time. A separate paper will describe the RSBB data collected on the 28–29-year-old offspring in 2020.

Previous data on RSBB collected prenatally and on two subsequent occasions (at 5 and 9 years post-delivery) are described in detail elsewhere ([Iles-Caven et al., 2019](#)). The data showed strong sex differences regarding RSBB (e.g., 49.9% of women vs. 37% of men stated that they believed in God/a divine power; 28.6% of men vs 14.9% of women declared they were non-believers). Among the 6256 women and 2355 men who responded at all three time points, a slight increase over time in the proportion stating that they were non-believers and a small reduction in professed belief were apparent.

Materials and methods**Participants**

The ALSPAC survey was specifically designed to determine ways in which the individual's genotype combines with environmental pressures to influence health and development [[Golding et al., 2001](#)]. The study is geographically based in the south-west of England, centred around the city of Bristol and its surrounding rural and semi-urban areas, with a population of about 1 million. To capture as much valid information as possible, unbiased by knowledge of details of the characteristics of the baby, the study was designed to start as early in pregnancy as possible. All women resident in the area at the time they were pregnant were eligible, provided that their expected date of delivery lay between 1st April 1991 and 31st December 1992. In total, 14,541 pregnant mothers, resident in the area, were recruited into the ALSPAC study. From these pregnancies, there were a total of 14,676 fetuses and 14,062 live births. Of the children, 13,988 were still alive at 1 year of age. Mothers were considered enrolled if they had returned at least one questionnaire or attended a "Children in Focus" clinic by 19th July 1999. At the age of 7 years, the study team reached out to eligible mothers who had not been included in the study previously and thus recruited additional families to boost the number of participants. As such, from the age of 7 the total sample number is 15,454 live births, resulting in 15,589 fetuses, of which 14,901 were alive at 1 year of age ([Boyd et al., 2013](#); [Fraser et al., 2013](#)).

Following advice from the [ALSPAC Ethics and Law Committee](#), partners were recruited into the study *only* if the mothers wished them to be included. Questionnaires were sent to the mother who then passed the questionnaire on to the partner with a separate pre-paid return envelope. This method meant that ALSPAC were unable to follow up or communicate directly with the partners ([Birmingham, 2018](#); [Fraser et al., 2013](#)). Therefore, the numbers of partners' questionnaires returned were less than those received from the mothers. Around 75% of partners participated in the study. Partners were subsequently enrolled in their own right in 2010 (n=3000).

A detailed data dictionary on the [study web pages](#), and a detailed proposal form for access to specified data are available.

Data have been collected from pregnancy onwards using a variety of methods: (a) self-completion questionnaires; (b) assays of biological samples; (c) hands-on examination of the subjects; (d) linkage to educational and health data on the individuals; (e) linkage of addresses to measures of geographic exposures; (f) information on schools attended with details of behaviour of the child and his/her parents completed by teachers and head teachers.

Since the offspring were aged 22 years, data have been collected and managed using REDCap electronic data capture tools hosted at the University of Bristol (Harris *et al.*, 2009). REDCap (Research Electronic Data Capture) is a secure, web-based software platform designed to support data capture for research studies.

Previous data collection on religious/spiritual beliefs and behaviour (RSBB)

The population of Avon comprises a predominantly protestant Christian population, with a lower rate of non-Christian religions (ALSPAC: 3.5% mothers; 3.5% partners) than the general UK population (6.2%). Whilst population-level religious affiliation data for England or Avon in 1991 are not available, we can illustrate the similarities between ALSPAC, the city of Bristol and England and Wales ten years later, when the national Census collected data on religion for the first time. Partners, along with the general Bristol population, were more likely to state they had no religion compared with the rest of the country (Table 1).

The initial religious behaviour and belief questions used by ALSPAC were asked at three time points (antenatally, and at 5 and 9 years later) were identical and are described elsewhere (Iles-Caven *et al.*, 2019). In brief, the items covered the following aspects of belief: (a) the participants' fundamental beliefs: 'Do you believe in God or some divine power?' which had three possible responses: 'yes; not sure; no'; (b) whether they felt that they had received or asked for assistance from such a power; (c) the type of religion the parent reported, almost all were Christians of various denominations – they were also asked how long they had had that particular faith; (d) the frequency with which they attended religious services; and (e) whether they had received help and/or support from members of their own and/or other religions. When the child

was 9 years old, an additional question was asked of parents concerning whether they prayed 'even when not in trouble'.

Table 2 illustrates the social demographic distributions antenatally and at the 2020 sweep for each parent (age of the parents at birth, highest education level, social class (based on occupation), housing, employment, composition of the household, and ethnicity). The ages of the parents at enrolment in pregnancy ranged from 14 to 47 years, median 28, for mothers, and from 15 to 70, median 30 for partners. The respondents to the 2020 questionnaires were proportionately older (mothers aged 43 to 76; partners aged 44 to 99), better educated, more likely to have lived with their partner during pregnancy and less likely to have non-White ethnic backgrounds (this was especially true of the partners).

Enhanced data collection on RSBB

The religion questions used at the three earlier time points were repeated in the 2020 sweep (see Table 3, questions C1-C6, C9, C10), and enhanced with additional questions (Table 3: C7, C8, C11-C24, highlighted in bold) to capture details of extrinsic/intrinsic behaviour, and interests in religious worship using the written word and/or radio, television or other electronic media. Most of these new questions comprised elements from well-validated, standardised scales recommended by an international workshop of RSBB/Health experts in August 2019 (see Acknowledgements) and are described below. In the 2020 sweep, both the parents and their offspring received identical RSBB questions.

The new measures

The Duke University Religion Scale (DUREL) (Koenig *et al.*, 1997), a five-item measure of religious involvement was developed for use in large cross-sectional or longitudinal studies. It assesses organisational and non-organisational religious activity and intrinsic religiosity. The scale has high test-retest reliability (intra-class correlation = 0.91), high internal consistency (Cronbach's alpha's = 0.78-0.91); and high convergent validity with other religiosity measures (r 's = 0.71-0.86). The DUREL has been used extensively (Koenig *et al.*, 2011). The five questions that comprised this scale were split up in the questionnaire (see Table 3, questions C9, C11, C14-C16). As can be seen from Table 4, women were more likely than their partners to attend organised religious worship and to practice

Table 1. Comparison of the stated religious affiliation from the national census 2001 (the first year the national census collected this data), with ALSPAC data collected at the 9-year sweep (2000/2001).

| Belief | ALSPAC Mothers 2000/2001 | ALSPAC Partners 2000/2001 | Bristol 2001 Census Men & Women | England & Wales 2001 Census Men & Women |
|-------------------|--------------------------|---------------------------|---------------------------------|---|
| None | 15.8% | 25.2% | 27.0% | 16.0% |
| Christian | 80.7% | 71.3% | 68.5% | 77.8% |
| All non-Christian | 3.5% | 3.5% | 4.5% | 6.2% |

Table 2. Proportion (n) of enrolled parents who completed the religion questions in a) pregnancy (1991–2) and in b) 2020 by selected sociodemographic factors.

| | Mothers in Pregnancy | Mothers 2020 | Partners in Pregnancy | Partners 2020 |
|---|----------------------|--------------|-----------------------|---------------|
| <i>Age of parents at the birth</i> | | | | |
| <25 | 21.2% (2599) | 12.6% (571) | 21.3% (2042) | 15.5% (364) |
| 25–34 | 68.5% (8384) | 74.2% (3359) | 68.4% (6553) | 58.4% (1371) |
| 35+ | 10.3% (1260) | 12.4% (595) | 10.3% (988) | 26.1% (614) |
| <i>Highest parental education level*</i> | | | | |
| Low (<O level) | 28.5% (3304) | 16.4% (714) | 26.9% (2436) | 11.1% (219) |
| Medium (O level) | 35.2% (4089) | 34.2% (1505) | 34.9% (3154) | 20.5% (406) |
| High (>O level) | 36.3% (4219) | 49.4% (2174) | 38.2% (3450) | 68.4% (1353) |
| <i>Partner lived with mother during pregnancy</i> | | | | |
| Yes | 91.7% (11109) | 96.4% (4180) | 95.2% (9018) | 98.1% (2014) |
| No | 8.3% (1003) | 3.6% (154) | 4.8% (456) | 1.9% (39) |
| <i>Sex of child</i> | | | | |
| Boy | 51.5% (6323) | 47.3% (2262) | 51.5% (4949) | 46.7% (1022) |
| Girl | 48.5% (5950) | 51.8% (2518) | 48.5% (4670) | 53.3% (1176) |
| <i>Ethnic background</i> | | | | |
| White | 97.6% (11288) | 98.0% (4291) | 97.2% (9367) | 98.3% (2019) |
| Other than White | 2.4% (273) | 2.0% (89) | 2.8% (268) | 1.7% (35) |

*Public exams, usually in 5–10 subjects, are normally undertaken at the end of Year 11 (age 16, although they can be taken at any age). Formerly called 'O' (Ordinary) Levels the current equivalent are GCSEs.

Table 3. Questions (numbered as in the questionnaire) asked of the mother and partners 27+ years post-delivery (2020) with their variable names (mothers have suffix _M, partners _P and corresponding variable numbers (e.g., Y3000_M) and number of valid responses. Questions not previously asked of the cohort are in bold.

| Questions 2020 | Variable | Mothers valid responses (Total 4663) | Partners valid responses (Total 2181) |
|---|----------|--------------------------------------|---------------------------------------|
| C1. Do you believe in God or in some divine power? Yes/Not sure/No | Y3000 | 4627 | 2157 |
| C2. Do you feel that God (or some divine power) has helped you at any time? Yes/Not sure/No | Y3010 | 4616 | 2144 |
| C3. Would you appeal to God for help if you were in trouble? Yes/Not sure/No | Y3020 | 4611 | 2147 |
| C4. Do you 'pray' even if not in trouble? Yes/No | Y3030 | 4585 | 2143 |

| Questions 2020 | Variable | Mothers valid responses (Total 4663) | Partners valid responses (Total 2181) |
|---|----------|--------------------------------------|---------------------------------------|
| <i>C5. What sort of religious faith would you say you had? (tick only one)</i> None; Church of England; Roman Catholic; Jehovah's Witness; Christian Science; Mormon; Other Christian (please describe); Jewish; Buddhist; Sikh; Hindu; Muslim; Rastafarian; Other (please describe) | Y3040 | 4578 | 2125 |
| <i>C6. How long have you had this particular faith?</i> All my life/More than 5 years/3-5 years/ 1-2 years/ Less than a year | Y3050 | 4548 | 2107 |
| C7. Were you brought up in this faith? Yes/No/If no, please describe what faith if any | Y3060 | 4487 | 2094 |
| <i>C8. Did you bring your child(ren) up in your current faith/belief (including none)?</i> Yes this faith/No. If no, what faith did you bring your children up in, if any? | Y3070 | 4536 | 2111 |
| <i>C9. How often do you go to a place of worship or other religious meetings?</i> Yes, at least once a week/Yes, at least once/month/Yes, at least once/year/Not at all | Y3080 | 4579 | 2139 |
| <i>C10. Do you obtain help and support:</i> | | | |
| <i>-From leaders of your religious group?</i> Yes/No | Y3090 | 4556 | 2132 |
| <i>-From other members of your religious group? Yes/No</i> | Y3091 | 4507 | 2106 |
| <i>-From leaders of other religious groups (please describe)?</i> Yes/No | Y3092 | 4294 | 2019 |
| <i>-From members of other religious groups (please describe)?</i> Yes/No | Y3093 | 4247 | 1238 |
| C11. How often do you spend time in private religious activities, such as prayer, meditation, or holy scripture study? More than once/day/Daily/2+times/week/Once/week/ Few times/month/Rarely or never | Y3100 | 4553 | 2110 |
| C12. How often do you listen to/watch religious programming on the radio/television/social media? Daily/Several times/week/Several times/month/Occasionally/ Never/Please describe | Y3110 | 4587 | 2144 |
| C13. How often do you read religious related texts or publications (e.g. the Bible, the Koran, prayer book, Watchtower, The War Cry, The Friend, Spirituality & Health, Catholic Digest) Daily/Several times/week/Several times/month/Occasionally/ Never/Please describe | Y3120 | 4586 | 2147 |
| C14. In my life, I experience the Presence of the Divine (e.g. God) Definitely true of me/Tends to be true of me/Unsure/ Tends not to be true of me/Definitely not true of me/ Not applicable | Y3130 | 4551 | 2137 |
| C15. My religious beliefs are what really lie behind my whole approach to life Definitely true of me/Tends to be true of me/Unsure/ Tends not to be true of me/Definitely not true of me/ Not applicable | Y3140 | 4544 | 2135 |
| C16. I try hard to carry my religion over into all other dealings in life. Definitely true of me/Tends to be true of me/Unsure/ Tends not to be true of me/Definitely not true of me/ Not applicable | Y3150 | 4530 | 2131 |

| Questions 2020 | Variable | Mothers valid responses (Total 4663) | Partners valid responses (Total 2181) |
|---|----------|--------------------------------------|---------------------------------------|
| C17. I attend a place of worship mainly because it helps me make friends: Strongly agree/Mildly agree/Not sure/Mildly disagree/Strongly disagree/Not applicable | Y3160 | 4536 | 2131 |
| C18. I pray mainly to gain relief and protection. Strongly agree/Mildly agree/Not sure/Mildly disagree/Strongly disagree/Not applicable | Y3170 | 4521 | 2130 |
| C19. Did you ever have a religious or spiritual experience that changed your life? Yes/No, If yes, age/please describe | Y3180 | 4558 | 2140 |
| C20. Have you ever had a significant gain in your faith? Yes/No, If yes, age/please describe | Y3190 | 4525 | 2129 |
| C21. Have you ever had a significant loss of faith? Yes/No, If yes, age/please describe | Y3200 | 4532 | 2132 |
| C22. To what extent do you consider yourself a religious person? Very/Moderately/Slightly/Not at all | Y3210 | 4569 | 2144 |
| C23. To what extent do you consider yourself a spiritual person? Very/Moderately/Slightly/Not at all | Y3220 | 4569 | 2138 |
| C24. How important to you is religion or spirituality? Highly/Moderately/Slightly/Not important at all | Y3230 | 4570 | 2146 |

Table 4. Duke University Religion Scale (DUREL) derived variables.

| | | Mothers | Partners |
|---|--|--------------|--------------|
| | Organised religion activity score | | |
| 1 | Not at all | 2359 (49.8%) | 1254 (58.0%) |
| 2 | Occasionally | 1388 (29.3%) | 494 (22.9%) |
| 3 | At least 1/yr | 359 (7.6%) | 162 (7.5%) |
| 4 | At least 1/mth | 205 (4.3%) | 83 (3.8%) |
| 5 | 1+/week | 423 (8.9%) | 168 (7.8%) |
| | Private religious activity score | | |
| 1 | Rarely | 3535 (75.1%) | 1768 (83.0%) |
| 2 | Few/month | 287 (6.1%) | 84 (3.9%) |
| 3 | 1/wk | 129 (2.7%) | 38 (1.8%) |
| 4 | 2+/wk | 270 (5.7%) | 80 (3.8%) |
| 5 | Daily | 354 (7.5%) | 100 (4.7%) |
| 6 | >1/day | 130 (2.8%) | 60 (2.8%) |
| | Intrinsic score | 4664 (N) | 2143 (N) |
| | Mean | 6.44 | 5.52 |
| | SD | 4.04 | 3.74 |
| | Range | 3–15 | 3–15 |
| | DUREL Total Index | 4576 (N) | 2090 (N) |
| | Mean | 10.15 | 8.89 |
| | SD | 6.11 | 5.72 |
| | Range | 5–26 | 5–26 |

SD = standard deviation.

private worship (e.g., prayer). Questions C9 and C11 measure organisational activity; and questions C14-C16 measure intrinsic religious motivation when combined, and again the women scored higher (means 6.44 vs. 5.52).

Specific questions to elicit extrinsic and intrinsic religious motivation were included for the first time. Extrinsic individuals are more likely to exploit religion, e.g., to provide security and solace, for social reasons, status, and self-justification. Whereas intrinsic individuals aim to live their life according to the tenets of that religion and exhibit behaviours consistent with those tenets. Of the original Allport & Ross scale (1967), 14 questions had been selected and revised by Gorsuch & McPherson (1989) so that the questions could be answered by non-believers. Each question has a five-point scale ranging from ‘strongly agree’ to ‘strongly disagree’, with an additional ‘not applicable’ option. We used two of the extrinsically weighted items (see Table 3, questions C17 and C18).

Three questions (see Table 3, questions C19-C23) are from the Fetzer Brief Multi-Dimensional Measure of Religiosity/Spirituality for use in health research (BMMRS) (Fetzer Institute, 2003). The questions were chosen to enquire about religious/spiritual history: whether an individual has had a religious/spiritual experience that changed their life or experienced a significant gain or loss of faith and if so when. Note that the study team added a request for a free text description of the experience/gain/loss in faith after discussion with the workshop attendees. This request was worded in such a way that it was seen as optional by the respondents.

At the suggestion of Connie Svob (personal communication) question C24, “How important to you is religion or spirituality?” was included. This question has been shown to be highly predictive in a transgenerational longitudinal study of depressed and nondepressed probands and their offspring followed over 30 years (Anderson et al., 2021; Weissman et al., 2016). Future comparison with the ALSPAC data was thought to be of great value.

Questions C7 and C8 were devised by the study team and asked whether the participants were brought up in a particular faith and whether they had brought their own child(ren) up in a particular faith.

Questions C12 and C13 were devised by Golding & Iles-Caven for this sweep to elicit contemporary forms of private belief/worship such as radio, TV programmes and social media, and the reading of religious texts and periodicals.

In each of the questionnaires administered at the four time points (pregnancy; +5years; +9 years, and in 2020) the question (C6) concerning the duration of their current faith was included. In pregnancy, the majority responded: ‘all my life’ and fewer than 5% responded <5 years. These responses were consistent over time and enable the study to identify a large proportion of the population for whom there are consistent responses throughout the time span (see below and Table 8a, Table 8b for examples). We believe that using this data to extrapolate backwards for this large group of the population is valid, especially when supported by earlier data. We can identify a large sub-group for whom data on RSBB will be able to be extrapolated throughout the life-course (Table 5).

Table 6 shows the mothers’ and partners’ response rates to each question in the 2020 sweep. There were many differences evident between the sexes: women were more likely than men to believe in a divinity, participate in private and public worship, and to lead their lives according to their religious principles.

Table 7a and Table 7b show the total numbers of each parent who answered the RSBB questions at any of the four time points of data collection, and Table 8a and Table 8b show only those parents who completed the questions at every sweep. Modern statistical techniques will allow imputation increasing statistical power for those for whom we have incomplete data.

In the 20 years since the questions were previously asked at 9 years on belief in God/a divine power, whether God/a divine power had helped them or if they would appeal for help from such powers, mothers seem to have become more certain of their beliefs, with the largest reduction in the ‘not sure’ categories. Very few stated they had only followed their current faith for less than five years (3% at 9y and 1.7% at 2020), but 16.2% (at 9y) vs 23.3% had followed their faith for more than 5 years (but not all their life) (Table 7a). Similar results were shown for their partners (Table 7b).

The most notable difference between the 9 year and the 2020 sweep was the increase of professed non-believers in both the mothers (17.5% vs 29.8%) (Table 7a) and partners (31.9% vs. 45.3%) (Table 7b).

For those mothers who responded to the same questions at all four time points, a dramatic increase in those professing non-belief can be noted (from 6.6% antenatally to 19.6% in

Table 5. Depiction of data collected on RSBB at various stages (years from birth of the index offspring) for mothers and their partners, where + indicates actual data collection, and E denotes extrapolation backwards.

| Time | PP | P | 0-1 | 2-3 | 4-5 | 6-7 | 8-9 | 10-11 | 12-13 | 14-15 | 16-17 | 18-19 | 20-21 | 22-23 | 24-26 | 27-28 |
|------|----|---|-----|-----|-----|-----|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| RSBB | E | + | E | E | + | E | + | E | E | E | E | E | E | E | E | ++ |

RSBB = religion, spirituality, behaviours, and beliefs, PP = pre-pregnancy; P = during pregnancy; ++ = RSBB data collected in 2020

Table 6. Parental responses to each question in 2020 (p values compare the responses between mother and partner).

| Question | Mothers No. (%) | Partners No. (%) |
|---|--------------------|---------------------|
| <i>Do you believe in God or some divine power?</i> | | |
| Yes | 2082 (43.5) | 654 (30.0) |
| Not sure | 1429 (29.9) | 538 (24.7) |
| No | 1270 (26.6) | 986 (45.3) |
| <i>Do you believe that God/divine power has helped you at any time?</i> | | |
| Yes | 1651 (34.6) | 509 (23.5) |
| Not sure | 1222 (25.6) | 424 (19.6) |
| No | 1897 (39.8) | 1233 (56.9) |
| <i>Would you appeal to God for help if you were in trouble?</i> | | |
| Yes | 2319 (48.7) | 670 (30.9) |
| Not sure | 937 (19.7) | 410 (18.9) |
| No | 1510 (31.7) | 1089 (50.2) |
| <i>Do you 'pray' even if not in trouble?</i> | | |
| Yes | 1602 (33.8) | 448 (20.7) |
| Not sure | 328 (6.9) | 129 (6.0) |
| No | 2809 (59.3) | 1588 (73.3) |
| <i>Did you bring your child(ren) up in your current faith/belief (including none)? If no, what faith did you bring your children up in, if any?</i> | | |
| Yes, this faith | 3177 (67.6) | 1335 (62.7) |
| No | 1524 (32.4) | 794 (37.3) |
| <i>How long have you had this particular faith?</i> | | |
| Whole life | 3467 (74.8) | 1434 (67.8) |
| >5 years | 1091 (23.5) | 649 (30.7) |
| 3–5 years | 46 (1.0) | 23 (1.1) |
| <3 years | 34 (0.7) | 10 (0.5) |
| <i>Do you go to a place of worship?</i> | | |
| At least once a week | 423 (8.9) | 168 (7.8) |
| At least once a month | 205 (4.3) | 83 (3.8) |
| At least once a year | 359 (7.6) | 162 (7.5) |
| Occasionally | 1388 (29.3) | 494 (22.9) |
| Never | 2359 (49.8) | 1254 (58.0) |
| Do you obtain help and support: | | |
| <i>From leaders of your religious group?</i> | | |
| Yes | 431 (9.2) | 180 (8.4) |
| No | 3161 (67.1) | 1303 (60.5) |
| Not applicable* | 1117 (23.7) | 671 (31.2) |

| Question | Mothers No. (%) | Partners No. (%) |
|---|--------------------|---------------------|
| <i>From members of your religious group?</i> | | |
| Yes | 536 (11.5) | 203 (9.5) |
| No | 3012 (64.7) | 1254 (58.9) |
| Not applicable* | 1110 (23.8) | 671 (31.5) |
| <i>From leaders of other religious group?</i> | | |
| Yes | 68 (1.5) | 31 (1.5) |
| No | 4373 (98.5) | 2009 (98.5) |
| <i>From members of other religious groups?</i> | | |
| Yes | 110 (2.5) | 46 (2.3) |
| No | 4283 (97.5) | 1972 (97.7) |
| <i>Type of religious belief</i> | | |
| Stated "none" | 1285 (27.2) | 864 (40.2) |
| Church of England | 2313 (48.9) | 889 (41.4) |
| Roman Catholic | 361 (7.6) | 137 (6.4) |
| Jehovah's Witness | 20 (0.4) | 8 (0.4) |
| Methodist | 182 (3.8) | 57 (2.7) |
| Baptist/Evangelical | 171 (3.6) | 56 (2.6) |
| Other Christian (please describe)* | 126 (2.7) | 52 (2.4) |
| Judaism, Sikh, Hinduism, Muslim | 27 (0.5) | 14 (0.7) |
| Buddhist | 34 (0.7) | 17 (0.8) |
| Other non-Christian | 213 (4.5) | 53 (2.5) |
| <i>How often do you spend time in private religious activities, such as prayer, meditation, or holy scripture study?</i> | | |
| More than once/day | 130 (2.8) | 60 (2.8) |
| Daily | 354 (7.5) | 100 (4.7) |
| 2+ times/week | 270 (5.7) | 80 (3.8) |
| Once/week | 129 (2.7) | 38 (1.8) |
| Few times/month | 287 (6.1) | 84 (3.9) |
| Rarely or never | 3535 (75.1) | 1768 (83.0) |
| <i>How often do you listen to/watch religious programming on the radio/television/social media?</i> | | |
| Daily | 41 (0.9) | 19 (0.9) |
| Several times/week | 91 (1.9) | 33 (1.5) |
| Several times/month | 129 (2.7) | 47 (2.2) |
| Occasionally | 1421 (30.0) | 556 (25.7) |
| Never | 3059 (64.5) | 1511 (69.8) |
| <i>How often do you read religious related texts or publications (e.g. the Bible, the Koran, prayer book, Watchtower, The War Cry, The Friend, Spirituality & Health, Catholic Digest)</i> | | |
| Daily | 214 (4.5) | 78 (3.6) |
| Several times/week | 123 (2.6) | 47 (2.2) |

| Question | Mothers No. (%) | Partners No. (%) |
|---|--------------------|---------------------|
| Several times/month | 106 (2.2) | 49 (2.3) |
| Occasionally | 641 (13.5) | 256 (11.8) |
| Never | 3656 (77.1) | 1739 (80.2) |
| <i>In my life, I experience the Presence of the Divine (e.g. God)</i> | | |
| Definitely, true of me | 503 (10.7) | 161 (7.5) |
| Tends to be true of me | 507 (10.8) | 156 (7.2) |
| Unsure | 793 (16.9) | 264 (12.2) |
| Tends not to be true of me | 411 (8.7) | 166 (7.7) |
| Definitely, not true of me | 1345 (28.6) | 819 (37.9) |
| Not applicable* | 1146 (24.4) | 593 (27.5) |
| <i>My religious beliefs are what really lie behind my whole approach to life</i> | | |
| Definitely true of me | 461 (9.8) | 157 (7.3) |
| Tends to be true of me | 723 (15.4) | 257 (11.9) |
| Unsure | 520 (11.1) | 150 (7.0) |
| Tends not to be true of me | 491 (10.5) | 195 (9.0) |
| Definitely not true of me | 1256 (26.7) | 693 (32.1) |
| Not applicable* | 1247 (26.5) | 704 (32.7) |
| <i>I try hard to carry my religion over into all other dealings in life.</i> | | |
| Definitely true of me | 411 (8.8) | 152 (7.1) |
| Tends to be true of me | 667 (14.2) | 213 (9.9) |
| Unsure | 500 (10.7) | 156 (7.2) |
| Tends not to be true of me | 454 (9.7) | 168 (7.8) |
| Definitely not true of me | 1296 (27.7) | 702 (32.6) |
| Not applicable* | 1356 (28.9) | 762 (35.4) |
| <i>I attend a place of worship mainly because it helps me make friends:</i> | | |
| Strongly agree | 87 (1.9) | 18 (0.8) |
| Mildly agree | 352 (7.5) | 127 (5.9) |
| Not sure | 155 (3.3) | 80 (3.7) |
| Mildly disagree | 309 (6.6) | 123 (5.7) |
| Strongly disagree | 939 (20.0) | 406 (18.9) |
| Not applicable* | 2847 (60.7) | 1399 (65.0) |
| <i>I pray mainly to gain relief and protection.</i> | | |
| Strongly agree | 212 (4.5) | 39 (1.8) |
| Mildly agree | 748 (16.0) | 178 (8.3) |
| Not sure | 388 (8.3) | 123 (5.7) |
| Mildly disagree | 351 (7.5) | 146 (6.8) |
| Strongly disagree | 740 (15.8) | 369 (17.1) |
| Not applicable* | 2235 (47.8) | 1297 (60.3) |

| Question | Mothers No. (%) | Partners No. (%) |
|---|--------------------|---------------------|
| <i>Did you ever have a religious or spiritual experience that changed your life?</i> | | |
| Yes | 542 (11.5) | 196 (9.1) |
| No | 4171 (88.5) | 1966 (90.9) |
| <i>Have you ever had a significant gain in your faith?</i> | | |
| Yes | 481 (10.3) | 184 (8.6) |
| No | 4199 (89.7) | 1967 (91.4) |
| <i>Have you ever had a significant loss of faith?</i> | | |
| Yes | 660 (14.1) | 290 (13.5) |
| No | 4024 (85.9) | 1864 (86.5) |
| <i>To what extent do you consider yourself a religious person?</i> | | |
| Very | 113 (2.4) | 46 (2.1) |
| Moderately | 653 (13.8) | 255 (11.8) |
| Slightly | 1549 (32.8) | 512 (23.6) |
| Not at all | 2408 (51.0) | 1352 (62.4) |
| <i>To what extent do you consider yourself a spiritual person?</i> | | |
| Very | 368 (7.8) | 99 (4.6) |
| Moderately | 937 (19.8) | 347 (16.1) |
| Slightly | 1400 (29.6) | 439 (20.3) |
| Not at all | 2019 (42.7) | 1275 (59.0) |
| <i>How important to you is religion or spirituality?</i> | | |
| Highly important | 662 (14.0) | 222 (10.2) |
| Moderately important | 793 (16.8) | 284 (13.1) |
| Slightly important | 1417 (30.0) | 476 (22.0) |
| Not important at all | 1853 (39.2) | 1186 (54.7) |

*P values are calculated excluding the 'not applicable' responses.

Table 7a. Mother's beliefs/religion and support at each time point, where data for the questions are available.

| Question | Antenatal | 5 years | 9 years | 2020 |
|---|--------------|--------------|--------------|--------------|
| | N | N | N | N |
| <i>Do you believe in God or some divine power?</i> | | | | |
| Yes | 6160 (49.9%) | 4141 (46.5%) | 3776 (48.2%) | 2016 (43.6%) |
| Not sure | 4353 (35.2%) | 3018 (33.9%) | 2682 (34.3%) | 1231 (26.6%) |
| No | 1838 (14.9%) | 1745 (19.6%) | 1369 (17.5%) | 1380 (29.8%) |
| <i>Do you believe that God/divine power has helped you at any time?</i> | | | | |
| Yes | 4181 (33.9%) | 2672 (30.1%) | 2566 (32.9%) | 1598 (34.6%) |

| Question | Antenatal | 5 years | 9 years | 2020 |
|---|--------------|--------------|--------------|--------------|
| | N | N | N | N |
| Not sure | 4672 (37.9%) | 3047 (34.3%) | 2774 (35.6%) | 1184 (25.6%) |
| No | 3477 (28.2%) | 3152 (35.5%) | 2454 (31.5%) | 1834 (39.7%) |
| <i>Would you appeal to God for help if you were in trouble?</i> | | | | |
| Yes | 5738 (46.6%) | 4070 (45.9%) | 3578 (45.8%) | 2241 (48.6%) |
| Not sure | 3861 (31.3%) | 2653 (29.9%) | 2288 (29.3%) | 903 (19.6%) |
| No | 2722 (22.1%) | 2146 (24.2%) | 1943 (24.9%) | 1467 (31.8%) |
| <i>Mother prays even if not in trouble</i> | | | | |
| Yes | - | - | 3012 (39.2%) | 1552 (33.8%) |
| No | - | - | 4677 (60.8%) | 2715 (59.2%) |
| Not sure* | | | - | 318 (6.9%) |
| <i>Mother brought up child in this faith including none</i> | | | | |
| Yes | - | - | 5167 (72.0%) | 3074 (67.6%) |
| No | - | - | 2010 (28.0%) | 1474 (32.4%) |
| <i>Length of time mother has followed her current religion</i> | | | | |
| Whole life | 8905 (81.8%) | 6610 (83.6%) | 5667 (80.8%) | 3365 (75.0%) |
| >5 years | 1472 (13.5%) | 1018 (12.9%) | 1135 (16.2%) | 1047 (23.3%) |
| 3-5 years | 290 (2.7%) | 147 (1.9%) | 119 (1.7%) | 43 (1.0%) |
| <2 years | 215 (2.0%) | 127 (1.7%) | 90 (1.3%) | 32 (0.7%) |
| <i>Frequency mother attends a place of worship</i> | | | | |
| At least once a week | 885 (7.3%) | 886 (10.3%) | 927 (12.0%) | 405 (8.8%) |
| At least once a month | 836 (6.9%) | 849 (9.8%) | 723 (9.4%) | 200 (4.4%) |
| At least once a year | 3520 (29.2%) | 2287 (26.5%) | 2276 (26.4%) | 1697 (37.1%) |
| Never | 6824 (56.6%) | 4602 (53.4%) | 3838 (49.7%) | 2277 (49.7%) |
| <i>Has the mother received help from:</i> | | | | |
| <i>Leaders in her religious group</i> | | | | |
| Yes | 897 (7.7%) | 645 (7.6%) | 738 (10.0%) | 413 (9.1%) |
| No | 10735(92.3%) | 7789(92.4%) | 6620 (90.0%) | 4143 (90.9%) |
| <i>Members of her religious group</i> | | | | |
| Yes | 1087(9.4%) | 856 (10.2%) | 921 (12.6%) | 513 (11.4%) |
| No | 10465(90.6%) | 7499 (89.8%) | 6384 (87.4%) | 3994 (88.6%) |
| <i>Members of other religious groups</i> | | | | |
| Yes | 233(2.1%) | 144 (1.8%) | 186 (2.6%) | 107 (2.5%) |
| No | 11059(97.9%) | 7911 (98.2%) | 6862 (97.4%) | 4140 (97.5%) |
| <i>Type of religious belief</i> | | | | |
| Stated "none" | 1979 (16.3%) | 1408 (16.2%) | 1276 (16.7%) | 1235 (27.0%) |

| Question | Antenatal | 5 years | 9 years | 2020 |
|--|--------------|--------------|--------------|--------------|
| | N | N | N | N |
| Church of England | 7767 (63.9%) | 5528 (63.6%) | 4602 (60.4%) | 2238 (48.9%) |
| Roman Catholic | 971 (8.0%) | 669 (7.7%) | 582 (7.6%) | 350 (7.6%) |
| Other Christian (please describe) ** | 956 (7.9%) | 786 (9.0%) | 895 (11.7%) | 486 (10.6%) |
| Other non-Christian (please describe)*** | 474 (3.9%) | 300 (3.5%) | 268 (3.5%) | 269 (5.9%) |

*Not sure option added to 2020 sweep only

**Other Christian comprises: Christian Science, Mormon, Baptists, Evangelical, Methodists, Orthodox, Jehovah's Witness etc.

***Other non-Christian comprises: Buddhism, Judaism, Sikhism, Hinduism, Muslim, Rastafarian, Spiritualism, New Age etc.

Table 7b. Partner's beliefs/religion and support at each time point, where data for the questions are available.

| Question | Antenatal | 5 years | 9 years | 2020 |
|---|--------------|--------------|--------------|--------------|
| <i>Do you believe in God or some divine power?</i> | | | | |
| Yes | 3621 (37.0%) | 1505 (33.6%) | 1275 (35.3%) | 648 (30.0%) |
| Not sure | 3376 (34.5%) | 1573 (35.1%) | 1183 (32.8%) | 531 (24.6%) |
| No | 2801 (28.6%) | 1406 (31.4%) | 1149 (31.9%) | 978 (45.3%) |
| <i>Do you believe that God/divine power has helped you at any time?</i> | | | | |
| Yes | 2472 (25.3%) | 1031 (23.0%) | 876 (24.3%) | 501 (23.4%) |
| Not sure | 3158 (32.3%) | 1430 (32.0%) | 1117 (31.0%) | 419 (19.5%) |
| No | 4144 (42.4%) | 2013 (45.0%) | 1606 (44.6%) | 1224 (57.1%) |
| <i>Would you appeal to God for help if you were in trouble?</i> | | | | |
| Yes | 3536 (36.2%) | 1586 (35.5%) | 1248 (34.9%) | 660 (30.7%) |
| Not sure | 6288 (27.5%) | 1319 (29.5%) | 1014 (28.3%) | 407 (19.0%) |
| No | 3548 (36.3%) | 1566 (35.0%) | 1319 (36.8%) | 1080 (50.3%) |
| <i>Father prays even if not in trouble</i> | | | | |
| Yes | - | - | 902 (25.4%) | 440 (20.5%) |
| No | - | - | 2650 (74.6%) | 1575 (73.5%) |
| Not sure* | - | - | - | 128 (6.0%) |
| <i>Father brought up child in this faith including none</i> | | | | |
| Yes | - | - | 2012 (60.7%) | 1321 (62.7%) |
| No | - | - | 1301 (39.3%) | 786 (37.3%) |
| <i>Length of time father has followed his current religion</i> | | | | |
| Whole life | 6671 (79.0%) | 3052 (78.3%) | 2449 (76.2%) | 1418 (67.7%) |
| >5 years | 1409 (16.7%) | 744 (19.1%) | 678 (21.1%) | 643 (30.7%) |
| 3-5 years | 180 (2.1%) | 48 (1.2%) | 54 (1.7%) | 23 (1.1%) |

| Question | Antenatal | 5 years | 9 years | 2020 |
|--|--------------|--------------|--------------|--------------|
| ≤2 years | 183 (2.2%) | 52 (1.3%) | 35 (1.1%) | 10 (0.5%) |
| <i>Frequency father attends a place of worship</i> | | | | |
| At least once a week | 588 (6.1%) | 358 (8.2%) | 322 (9.0%) | 166 (7.8%) |
| At least once a month | 415 (4.3%) | 282 (6.5%) | 240 (6.7%) | 81 (3.8%) |
| At least once a year | 2515 (26.2%) | 987 (22.7%) | 952 (26.7%) | 650 (30.4%) |
| Never | 6077 (63.3%) | 2712 (62.5%) | 2049 (57.5%) | 1242 (59.1%) |
| Father receives help from: | | | | |
| <i>Leaders in his religious group</i> | | | | |
| Yes | 559 (6.0%) | 301 (7.1%) | 287 (8.2%) | 178 (8.3%) |
| No | 8717 (94.0%) | 3947 (92.9%) | 3198 (91.8%) | 1954 (91.7%) |
| <i>Members of his religious group</i> | | | | |
| Yes | 642 (7.0%) | 335 (7.9%) | 327 (9.4%) | 200 (9.5%) |
| No | 8544 (93.0%) | 3894 (92.1%) | 3146 (90.6%) | 1906 (90.5%) |
| <i>Members of other religious groups</i> | | | | |
| Yes | 144 (1.6%) | 65 (1.6%) | 55 (1.6%) | 43 (2.2%) |
| No | 8944 (98.4%) | 4093 (98.4%) | 3356 (98.4%) | 1954 (97.8%) |
| <i>Type of religious belief</i> | | | | |
| Stated "none" | 2633 (27.3%) | 1118 (25.6%) | 921 (26.3%) | 859 (40.4%) |
| Church of England | 5237 (54.3%) | 2453 (56.2%) | 1847 (52.8%) | 876 (41.2%) |
| Roman Catholic | 699 (7.3%) | 314 (7.2%) | 274 (7.8%) | 135 (6.4%) |
| Other Christian (please describe)** | 633 (6.6%) | 347 (8.0%) | 344 (9.8%) | 52 (2.4%) |
| Other Non-Christian*** | 437 (4.5%) | 132 (3.0%) | 110 (3.1%) | 53 (2.5%) |

*Not sure option added to 2020 sweep only

**Other Christian comprises: Christian Science, Mormon, Baptists, Evangelical, Methodists, Orthodox, Jehovah's Witness etc.

***Other non-Christian comprises: Buddhism, Judaism, Sikhism, Hinduism, Muslim, Rastafarian, Spiritualism, New Age etc.

2020). However, at 5 and 9 years the corresponding figures were similar at 10.0% and 9.8% respectively. There was a steady decrease in the numbers of mothers stating that they would appeal for help when in trouble (Table 8a).

For those mothers answering the type of religious beliefs they had had at each time point, those stating 'none' were fairly consistent at the first three points (range 25.6% to 27.3%) and then rose to 40.4% in 2020. A corresponding decrease was especially notable in those who stated they belonged to the Church of England (54.3% antenatally to 41.2% in 2020) (Table 8a).

Strengths and limitations of the data

The strengths of these data include the large sample size, with almost 7000 participants having data available from the

2020 sweep. The participants are broadly representative of the general population in the area, at the time of recruitment, in terms of sex, ethnicity, and socio-economic status (Fraser *et al.*, 2013). The extensive data on mediators, moderators, confounders, and physical and mental health outcomes to be collected over the next two years will facilitate huge amounts of research.

A key limitation of the data is the lack of ethnic diversity. At the time of enrolment, the county of Avon was mainly Caucasian, therefore there were too few Black, Asian and Minority Ethnic (BAME) participants (<6% in total) to allow for detailed analysis by ethnic background. A further limitation is that, as with all longitudinal studies there is increasing attrition over time. For these study parents, the loss is due mainly to mortality, change of address, as well as of reluctance to stay involved

Table 8a. Mother's beliefs/religion and support at each time point, where data for the questions are available for mothers who completed all questions at all time points (N = 2042).

| Question | Antenatal | 5 years | 9 years | 2020 |
|---|-------------|-------------|-------------|-------------|
| <i>Do you believe in God or some divine power?</i> | | | | |
| Yes | 1251(61.3%) | 1144(56.0%) | 1129(55.3%) | 979(47.9%) |
| Not sure | 657(32.2%) | 695(34.0%) | 712(34.9%) | 663(32.5%) |
| No | 134(6.6%) | 203(10.0%) | 201(9.8%) | 400(19.6%) |
| <i>Do you believe that God/divine power has helped you at any time?</i> | | | | |
| Yes | 798(39.1%) | 690(33.8%) | 721(35.3%) | 756(37.0%) |
| Not sure | 851(41.7%) | 797(39.0%) | 798(39.1%) | 574(28.1%) |
| No | 393(19.2%) | 555(27.2%) | 523(25.6%) | 712(34.9%) |
| <i>Would you appeal to God for help if you were in trouble?</i> | | | | |
| Yes | 1168(57.2%) | 1112(54.5%) | 1108(54.3%) | 1082(53.0%) |
| Not sure | 612(30.0%) | 602(29.5%) | 591(28.9%) | 429(21.0%) |
| No | 262(12.8%) | 328(16.1%) | 343(16.8%) | 531(26.0%) |
| <i>Mother prays even if not in trouble</i> | | | | |
| Yes | - | - | 917(44.9%) | 722(35.4%) |
| No | - | - | 1125(55.1%) | 1161(56.9%) |
| Not sure* | | | - | 159(7.8%) |
| <i>Mother brought up child in this faith including none</i> | | | | |
| Yes | - | - | 1578(77.3%) | 1457(71.4%) |
| No | - | - | 464(22.7%) | 585(28.6%) |
| <i>Length of time mother has followed her current religion</i> | | | | |
| Whole life | 1666(81.6%) | 1703(83.4%) | 1692(82.9%) | 1569(76.8%) |
| >5 years | 316(15.5%) | 281(13.8%) | 299(14.6%) | 436(21.4%) |
| 3-5 years | 35(1.7%) | 39(1.9%) | 31(1.5%) | 24(1.2%) |
| ≤2 years | 25(1.2%) | 19(0.9%) | 20(1.0%) | 13(0.6%) |
| <i>Frequency mother attends a place of worship</i> | | | | |
| At least once a week | 187(9.2%) | 251(12.3%) | 273(13.4%) | 173(8.5%) |
| At least once a month | 193(9.5%) | 268(13.1%) | 217(10.6%) | 93(4.6%) |
| At least once a year | 798(39.1%) | 717(35.1%) | 774(37.9%) | 181(8.9%) |
| Occasionally* | - | - | - | 680(33.3%) |
| Never | 864(42.3%) | 806(39.5%) | 778(38.1%) | 915(44.8%) |
| Has the mother received help from: | | | | |
| <i>Leaders in her religious group</i> | | | | |
| Yes | 187(9.2%) | 177(8.7%) | 220(10.8%) | 175(8.6%) |
| No | 1855(90.8%) | 1865(91.3%) | 1822(89.2%) | 1867(91.4%) |

| Question | Antenatal | 5 years | 9 years | 2020 |
|--|-------------|-------------|-------------|-------------|
| <i>Members of her religious group</i> | | | | |
| Yes | 235(11.5%) | 236(11.6%) | 257(12.6%) | 219(10.7%) |
| No | 1807(88.5%) | 1806(88.4%) | 1785(87.4%) | 1823(89.3%) |
| <i>Members of other religious groups</i> | | | | |
| Yes | 40(2.0%) | 42(2.1%) | 54(2.6%) | 42(2.1%) |
| No | 2002(98.0%) | 2000(97.9%) | 1988(97.4%) | 2000(97.9%) |
| <i>Type of religious belief</i> | | | | |
| Stated "none" | 136(6.7%) | 145(7.1%) | 155(7.6%) | 404(19.8%) |
| Church of England/ Anglican | 1476(72.3%) | 1455(71.3%) | 1403(68.7%) | 1170(57.3%) |
| Roman Catholic | 185 (9.1%) | 179(8.8%) | 177(8.7%) | 162(7.9%) |
| Other Christian (please describe)** | 189 (9.3%) | 229(11.2%) | 260(12.7%) | 211(10.3%) |
| Other (please describe)*** | 56 (2.7%) | 34(1.7%) | 47(2.3%) | 95(4.7%) |

*'Not sure' and 'Occasionally' options added to 2020 sweep only

**'Other Christian' comprises: Christian Science, Mormon, Baptists, Evangelical, Methodists, Orthodox, Jehovah's Witness etc.

***'Other' comprises: Buddhism, Judaism, Sikhism, Hinduism, Muslim, Rastafarian, Spiritualism, New Age etc.

Table 8b. Father's beliefs/religion and support at each time point, where data for the questions are available for all partners who completed all questions at all time points (N=718).

| Question | Antenatal | 5 years | 9 years | 2020 |
|---|------------|------------|------------|------------|
| <i>Do you believe in God or some divine power?</i> | | | | |
| Yes | 349(48.6%) | 320(44.6%) | 328(45.7%) | 266(37.0%) |
| Not sure | 245(34.1%) | 263(36.6%) | 243(33.8%) | 193(26.9%) |
| No | 124(17.3%) | 135(18.8%) | 147(20.5%) | 259(36.1%) |
| <i>Do you believe that God/divine power has helped you at any time?</i> | | | | |
| Yes | 229(31.9%) | 224(31.2%) | 220(30.6%) | 198(27.6%) |
| Not sure | 254(35.4%) | 237(33.0%) | 252(35.1%) | 161(22.4%) |
| No | 235(32.7%) | 257(35.8%) | 246(34.3%) | 359(50.0%) |
| <i>Would you appeal to God for help if you were in trouble?</i> | | | | |
| Yes | 357(49.7%) | 343(47.8%) | 313(43.6%) | 266(37.0%) |
| Not sure | 175(24.4%) | 193(26.9%) | 208(29.0%) | 150(20.9%) |
| No | 186(25.9%) | 182(25.3%) | 197(27.4%) | 302(42.1%) |
| <i>Father prays even if not in trouble</i> | | | | |
| Yes | - | - | 238(33.1%) | 179(24.9%) |
| No | - | - | 480(66.9%) | 490(68.2%) |
| Not sure* | - | - | - | 49(6.8%) |

| Question | Antenatal | 5 years | 9 years | 2020 |
|--|------------|------------|------------|------------|
| <i>Father bringing up child in this faith</i> | | | | |
| Yes | - | - | 493(68.7%) | 488(68.0%) |
| No | - | - | 225(31.3%) | 230(32.0%) |
| <i>Length of time father has followed his current religion</i> | | | | |
| Whole life | 528(73.5%) | 537(74.8%) | 540(75.2%) | 490(68.2%) |
| >5 years | 168(23.4%) | 172(24.0%) | 156(21.7%) | 220(30.6%) |
| 3–5 years | 12(1.7%) | 5(0.7%) | 15(2.1%) | 7(1.0%) |
| ≤2 | 10(1.4%) | 4(0.6%) | 7(1.0%) | 1(0.1%) |
| <i>Frequency father attends a place of worship</i> | | | | |
| At least once a week | 78(10.9%) | 90(12.5%) | 103(14.3%) | 66(9.2%) |
| At least once a month | 54(7.5%) | 83(11.6%) | 69(9.6%) | 34(4.7%) |
| At least once a year | 269(37.5%) | 212(29.5%) | 236(32.9%) | 58(8.1%) |
| Occasionally* | - | - | - | 167(23.3%) |
| Never | 317(44.2%) | 333(46.4%) | 310(43.2%) | 393(54.7%) |
| Father receives help from: | | | | |
| <i>Leaders in his religious group</i> | | | | |
| Yes | 71(9.9%) | 73(10.2%) | 82(11.4%) | 69(9.6%) |
| No | 647(90.1%) | 645(89.8%) | 636(88.6%) | 649(90.4%) |
| <i>Members of his religious group</i> | | | | |
| Yes | 90(12.5%) | 82(11.4%) | 98(13.6%) | 81(11.3%) |
| No | 628(87.5%) | 636(88.6%) | 620(86.4%) | 637(88.7%) |
| <i>Members of other religious groups</i> | | | | |
| Yes | 21(2.9%) | 19(2.6%) | 11(1.5%) | 12(1.7%) |
| No | 697(97.1%) | 699(97.4%) | 707(98.5%) | 706(98.3%) |
| <i>Type of religious belief</i> | | | | |
| Stated "none" | 117(16.3%) | 114(15.9%) | 120(16.7%) | 222(30.9%) |
| Church of England | 423(58.9%) | 434(60.4%) | 420(58.5%) | 355(49.4%) |
| Roman Catholic | 64(8.9%) | 64(8.9%) | 66(9.2%) | 55(7.7%) |
| Other Christian (please describe)** | 75(10.4%) | 90(12.5%) | 84(11.7%) | 60(8.4%) |
| Other (please describe)*** | 39(5.4%) | 16(2.2%) | 28(3.9%) | 26(3.6%) |

*'Not sure' and 'Occasionally' options added to 2020 sweep only

**'Other Christian' comprises: Christian Science, Mormon, Baptists, Evangelical, Methodists, Orthodox, Jehovah's Witness etc.

***'Other' comprises: Buddhism, Judaism, Sikhism, Hinduism, Muslim, Rastafarian, Spiritualism, New Age etc.

in the study. [Morgan and colleagues \(2022\)](#) have shown that the parents with religious beliefs and/or behaviours are also more likely to continue to be retained in the study over time. They have indicated methods of counteracting the problems that this and other biases in response causes to the imputation of missing data in this study.

We acknowledge that the religious/spiritual belief and behaviour measures chosen for the study are not those that are approved by all. We asked advice of a number of experts in the field, but not all responded. The data such that it is are described here so that any researchers who would like to use them will see what is available and how to access it.

Ethical approval and consent

Prior to commencement of the study, approval was sought from the ALSPAC Ethics and Law Committee and the Local Research Ethics Committees (Birmingham, 2018). Informed consent for the use of data collected via questionnaires and clinics was obtained from participants following the recommendations of the ALSPAC Ethics and Law Committee at the time. Questionnaires were completed in the participants own home and return of the questionnaires was taken as continued consent for their data to be included in the study. Full details of the approvals obtained are available from the study (<http://www.bristol.ac.uk/alspac/researchers/research-ethics/>). Study members have the right to withdraw their consent for elements of the study or from the study entirely at any time.

Data availability

ALSPAC data access is through a system of managed open access. The steps below highlight how to apply for access to the data included in this paper and all other ALSPAC data. Note that Table 3 in this paper gives the variable numbers for the religion data.

1. Please read the [ALSPAC access policy](#) which describes the process of accessing the data and biological samples in detail, and outlines the costs associated with doing so.
2. You may also find it useful to browse our fully [searchable research proposals database](#), which lists all research projects that have been approved since April 2011.

3. Please [submit your research proposal](#) for consideration by the ALSPAC Executive Committee using the online process. You will receive a response within 10 working days to advise you whether your proposal has been approved.

If you have any questions about accessing data, please email: alspac-data@bristol.ac.uk (data) or bbl-info@bristol.ac.uk (samples).

The [ALSPAC data management plan](#) describes in detail the policy regarding data sharing, which is through a system of managed open access.

Acknowledgements

We are extremely grateful to all the families who took part in this study, the midwives for their help in recruiting them, and the whole ALSPAC team, which includes interviewers, computer and laboratory technicians, clerical workers, research scientists, volunteers, managers, receptionists, and nurses.

In addition, we would like to thank those who attended the Religion and Health Workshop at the University of Bristol in 2019 and/or contributed to ongoing discussions on questionnaire content: Professor Alan Emond (Bristol); Professor Peter C. Hill (Biola); Dr Carol Joinson (Bristol); Dr. Jonathan Jong (Coventry); Professor Michael King (UCL); Professor Ursula King (Bristol); Professor Harold G Koenig (Duke); Professor Deborah Lycett (Coventry); Professor Stephen Nowicki (Emory); Dr. Crystal Park (Connecticut); Professor Connie Svob (Columbia).

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Open Peer Review

Current Peer Review Status:   

Version 3

Reviewer Report 07 December 2022

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Kendal Boyd 

Department of Psychology, Loma Linda University, Loma Linda, CA, USA

The Tables 8a and 8b are sufficient evidence for me to approve this data note.

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Psychology of religion; psychometrics

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Reviewer Report 02 December 2022

<https://doi.org/10.21956/wellcomeopenres.20662.r53509>

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Ralph L. Piedmont 

Center for Professional Studies, Timonium, MD, USA

I think things are very much improved, but did find two small issues. The first, is that the description to Table 6 still includes reference to p-values, which are no longer in that table. So the description needs to be adjusted. Second, in referring to information in table 8a, the authors note that there was a "dramatic" increase. This term needs to be deleted. Going from a 6% level to a 19% level is only that: a 13% increase. Without the use of any effect size index, it is not know the size of this change. So, delete "dramatic." The other descriptions of percentage changes in the data are all accurate and well-done, not using any descriptors of magnitude change. Other than

this, I believe my major concerns have been addressed.

Competing Interests: No competing interests were disclosed.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Version 2

Reviewer Report 08 September 2022

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Ralph L. Piedmont 

Center for Professional Studies, Timonium, MD, USA

I am disappointed by the authors' response to my review. The authors responded to my initial comments saying that this paper was just a descriptive study and not a research report. Yet, they are conducting statistical analyses of the data to show that there are significant changes in response patterns over time.

My problem with the statistics is that all the p-levels are very low, namely because the sample sizes are very large. Just giving p-values may lead readers to assume that the observed effects were very strong, when, in fact, they are small to moderate. I noted in my initial comments that when providing statistical results one needs to provide all relevant data for that analysis. In this report, only p-levels are given. The authors should provide the statistical analysis they used (from their comments it seems they used a chi square test), associated degrees of freedom, the obtained value and its associated p-level. In this manner, readers have sufficient information to accurately interpret the findings.

The paper analyzes and presents data from established studies with the intent of deriving inferences from that data. The authors fail to provide readers with appropriate cautions, not only about the data analyses but the scales as well. There are problems with these measures, but they must let the reader know of these limitations. Good form and appropriate application of professional standards is essential for any good paper. To justify this by referring to this paper as "descriptive" is unacceptable.

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: I have been involved in this field for over 25 years; I have served as the founding editor of the APA journal, Psychology of Religion and Spirituality, editor of Research in

the Social Scientific Study of Religion. I have published numerous articles on this topic, with special emphasis on measurement/scale development, clinical predictiveness of R/S constructs, and cross-cultural research.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Author Response 22 Nov 2022

Yasmin Iles-Caven, University of Bristol, Bristol, UK

We are sorry you were disappointed with our response. We hope the below will clarify our meanings.

We probably did not describe clearly the nature of a Data Note as described by the Wellcome Open Research journal itself: "Data Notes are brief descriptions of scientific datasets that promote the potential reuse of research data and include details of why and how the data were created; they do not include any analyses or conclusions." They go on to point out the likely benefits of publishing Data Notes as sharing research datasets in a discoverable, useable and reproducible way, and fostering new collaborations across disciplines.

In retrospect, given this we are convinced that we should not have carried out any analyses or used P values at all. We have therefore removed them from Table 6, and from the text. Furthermore, in answer to the criticism concerning the questions used, we have added to the 'Limitations' section in the Discussion the sentence: 'We acknowledge that the RSBB measures chosen for the study are not those that are approved by all. We asked advice of a number of experts in the field, but not all responded. The data such that it is are described here so that any researchers who would like to use them will see what is available and how to access it.'

Competing Interests: None

Reviewer Report 02 September 2022

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Kendal Boyd

Department of Psychology, Loma Linda University, Loma Linda, CA, USA

The authors have addressed some of the concerns over their interpretation of these data,

however, they still have not addressed the issue of socioeconomic bias in those who continue to remain in the study. There is some evidence that socioeconomic status is inversely related to religiosity, at least in the United States (Scheiman, 2010), but also globally (Rachmatullah, Ha, & Park, 2019).

Although this is countered by their reference that suggests that the study's religious respondents were more likely to continue in the study, it still should be noted that the findings of decreased religiosity over time could, in part, be due to the remaining sample's increased socioeconomic status.

The bias for the dataset over time to be of a higher socioeconomic status seems to be an important consideration for anyone using it for subsequent analyses, in particular when making interpretations about the religious trends of the population in England.

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Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Psychology of religion; psychometrics

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Author Response 22 Nov 2022

Yasmin Iles-Caven, University of Bristol, Bristol, UK

We agree that there are various ways in which to interpret the trends in prevalence. In order to address the possibility that the changes maybe due to social or other biases in the attrition rate we presented the data for the adults who had answered all four questionnaires in Tables 8a and 8b. They show a drop in prevalence of religiosity even within the same individuals.

This, we feel is one relatively simple way of answering the question as to the likelihood of bias from differential follow-up in comparing results from one data sweep to the next.

Competing Interests: None

Reviewer Report 01 September 2022

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Ellen Idler

Department of Sociology and the Rollins School of Public Health, Emory University, Atlanta, GA, USA

The framing of the front end of the paper is improved, my biggest concern. I approve.

Competing Interests: No competing interests were disclosed.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Version 1

Reviewer Report 17 August 2022

<https://doi.org/10.21956/wellcomeopenres.18785.r51348>

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Kendal Boyd 

Department of Psychology, Loma Linda University, Loma Linda, CA, USA

The study describes the decline in the religiosity of parents and partners in the Bristol, England, area over time, and the longitudinal correlates of this, which will be a helpful empirical contribution.

One methodological issue is that, due to attrition, the sample became older and more educated over time in that the younger and less-educated respondents were more likely to drop out of the study. This is a systematic bias and doesn't appear to be random.

A related issue is the replacement of missing data with imputation; however, the study does not specify how this will be accomplished.

It will be important for the imputation procedure to take into account the non-random pattern of missing data, and for this to be described in detail so it could be replicated by other researchers.

Further, the limitations of the scientific generalization of the findings will need to be made clear.

Also, as the authors note, the religious traditions represented are primarily Christian, and again caution will have to be taken in generalizing these results to non-Christian religions.

Is the rationale for creating the dataset(s) clearly described?

Yes

Are the protocols appropriate and is the work technically sound?

Yes

Are sufficient details of methods and materials provided to allow replication by others?

Partly

Are the datasets clearly presented in a useable and accessible format?

Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Psychology of religion; psychometrics

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Author Response 23 Aug 2022

Yasmin Iles-Caven, University of Bristol, Bristol, UK

We thank the reviewer for their helpful comments.

re Attrition: We have added two sentences to the Strengths & Limitations section (as reviewer 1 had also highlighted attrition). I am repeating our answer to Rev 1: Attrition is of major concern in ALSPAC and known to be non-random and likely to result in selection bias (see e.g. Taylor et al 2018; Cornish et al 2021). It has been higher in those mothers from lower socioeconomic backgrounds, with complications in the index pregnancy and those with a lack of social support. More recent data collection shows a positive bias in participation towards older mothers, those with co-habiting partners in pregnancy, educated to degree level, higher socioeconomic status (Fraser et al., 2013) and more likely to attend a place of worship at least monthly (Morgan et al., 2022). The latter paper, in particular, discusses the ways in which these biases may be addressed in future analyses.

Cornish RP, Macleod J, Boyd A, Tilling K. Factors associated with participation over time in the Avon Longitudinal Study of Parents and Children: a study using linked education and primary care data. *International journal of epidemiology*. 2021 Feb;50(1):293-302.

Morgan J, Halstead I, Northstone K, Major-Smith D. Religious/spiritual beliefs and

behaviours and study participation in a prospective cohort study (ALSPAC) in Southwest England. Wellcome Open Research 2022; 7:186.

Taylor AE, Jones HJ, Sallis H, Euesden J, Stergiakouli E, Davies NM, Zammit S, Lawlor DA, Munafò MR, Davey Smith G, Tilling K. Exploring the association of genetic factors with participation in the Avon Longitudinal Study of Parents and Children. *International journal of epidemiology*. 2018 Aug 1;47(4):1207-16.

A related issue is the replacement of missing data with imputation; however, the study does not specify how this will be accomplished. A related paper [Morgan et al., 2022] has discussed this in regard to the RSBB data in ALSPAC as follows: “Religious attendance appears to be ‘missing not at random’ (MNAR, i.e., continued participation may depend on religious attendance). As such, when using religious attendance as an exposure or outcome, there is a risk of potential selection bias. Additional sensitivity analyses—such as not at random multiple imputation (Lee et al., 2021; Tompsett et al., 2018), simulations (Millard et al., 2021) or Bayesian approaches to model selection (Du et al., 2022)—may be required to explore the extent of selection bias and whether this may impact the subsequent conclusions drawn (Griffith et al., 2020; Smith, 2020). Additionally, other aspects of RSBB—belief in God/a divine power and religious affiliation—were frequently associated with continued participation in unadjusted analyses, but these associations were often attenuated to null after adjusting for potential confounders. This suggests that these RSBB factors may be ‘missing at random’ (MAR, i.e., adjusting for confounders included here, religious belief and affiliation are not associated with selection). These RSBB factors may not therefore be MNAR, and so are at less risk of causing selection bias; however, to avoid these RSBB variables resulting in selection bias, these demographic and socioeconomic confounders would also need to be controlled for in subsequent analyses. Although some studies have suggested that association with participation would have to be fairly severe for the subsequent bias to cause concern (Cornish et al., 2021; Pizzi et al., 2011), this needs to be explored on a case-by-case basis. It is hoped that highlighting the potential for selection bias in ALSPAC’s RSBB data will inform future users of the resource.”

We have therefore added a couple of sentences to this effect in our revised version of the Data Note (to the end of Strengths and Difficulties). Morgan et al., 2022 reference has been added to the reference list.

Competing Interests: None

Reviewer Report 16 August 2022

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Ralph L. Piedmont 

Center for Professional Studies, Timonium, MD, USA

The purpose of this report was to provide additional assessments on a longitudinal sample regarding issues of religious involvement, spirituality, faith development, and family factors that influence religious/spiritual development in children. This paper provides a fourth evaluation of this sample. Data were collected that examined religious involvements of parents, their partners, on their children. Longitudinal data sets like this one are important for charting generational changes in key variables. While there is value here, with the potential for more to come, there are some issues that need to be addressed.

1. The authors tend to make some very strong statements about the value of longitudinal designs over cross-sectional ones. For example, the authors noted, "Any study designed to identify whether some aspect of religious/spiritual beliefs or behaviours (RSBB) affects physical or mental health must analyse data longitudinally." This is false. Longitudinal designs have no advantage over cross-sectional ones in terms of evaluation causality. This paper (Piedmont, Fox, and Toscano 2020)¹ is an example of a cross-sectional study, using SEM analyses to identify the causal precedence of spiritual variables on mental health functioning. While not a longitudinal study, it nonetheless is able to evaluate the relative merits of different causal models. Only a research design can examine causality, whether one is conducting a cross-sectional or longitudinal study. Without an experimental manipulation and random assignment of subjects, any study becomes correlational in nature. Such sweeping statements need to be avoided. This longitudinal study has nothing to contribute to the examination of any causal effects, it is merely descriptive in nature. I am referencing some papers that do examine causal issues using cross-sectional data.
2. I am completely underwhelmed by the selection of measures employed in this study. Many of the study's own measures are simply single item scales that require only a "yes/no" response. Such items are quite useless because they contain so much error. It is unclear what a "yes" or "no" answer really means because no normative data is given. If someone says that they are spiritual, how spiritual are they? Do we just lump all the "yes" responders together in a single group? Not very informative. Further, without controlling for potential mediators, in this case factors like economic status, ethnicity, and related constructs, it is not clear what is uniquely important about responses to these items. It was noted that gender was a factor influencing responses, but no effort was made at explaining why this is. No effort was made to determine what influence gender had on score changes over time. This would be important to know. What else is going on in the lives of these people that may be influencing their responses. England has been going through lots of economic and political upheaval over the course of this study (e.g., Brexit, the new "leveling up" policies, etc.), all of which may impact these scores. Some control for potential mediators and moderators of responses needs to be given, especially when only single items are used. More on this below.
3. The other scales used in this study are also quite problematic. The DUREL scale is widely used in medical research, but because all the items are positively phrased, the scale is contaminated by acquiescence bias. One reason why this scale correlates well with other religious/spiritual (R/S) scales is because many of those are similarly biased (like those on the BMMRS scale). This issue needs to be acknowledged as a relevant limitation to the

study. The other scale used, the Fetzer BMMRS is noted by the authors as being, "from the well-validated Fetzer Brief Multi-Dimensional Measure of Religiosity/Spirituality." I am not aware that the BMMRS is well-validated. The measure is NOT a scale in any sense of the term. It is merely a collection of approximately 32 items taken across 12 different constructs. There is no scalar information about this instrument and is best considered an epidemiological screener. Without any normative information about responses to these items, it is difficult to interpret their meaning. However, this is a fixable issue whereas the manual to this instrument does give mean level data for each item. This information can be used as a comparison to the current data. Finally, it is not clear to my why such out of date scales are used, like the Intrinsic-Extrinsic Religiosity Scale? This is a very old scale with problems to it. There are so many newer, and better scale available that can be more useful, like the Assessment of Spirituality and Religious Sentiments (ASPIRES) scale or the Numinous Motivation inventory (see www.centerforprofessionalstudies.com for information about both). One the one hand, continuity is important in a longitudinal study, but it would be helpful if some better instruments are also included.

4. The data are just descriptive in nature, and clearly show a decrease in R/S salience for the sample over time. Why this is, is not discussed or examined. Similar data trends have been found by other organizations, like the Pew Foundation in the US which has documented the rise of the non-affiliated. It would be helpful conceptually for readers if connections with these other studies are made. Where data analyses are conducted no real statistical information is given. First, providing p-values as way of demonstrating effect is problematic; p-values are NOT measures of effect size and should never be used as a means of presenting results. I would like to know, what exact statistical tests were conducted in comparing mothers and their partners and what the observed values for those tests were. In this manner, readers can get a better sense of the magnitude of effects being presented. Given the very large sample sizes noted here, it is completely expected that any statistical test will generate a very small p-value. Even small effects can generate small p-values. As we know, when a two-tailed test is used, as sample size increases the probability of rejecting the null moves to 1.0. The authors also need to comment on the actual effect sizes noted in their analyses. How much of a change is really going on here? I would suggest that the authors drop the p-values and give appropriate effect size estimates.
5. I think the data here have great potential. I am looking forward to seeing more results from this data set. I hope that the authors will consider providing longitudinal analyses that will examine the causal precedence of the relevant variables in the study. This can be done nicely either with a cross-lagged panel design or using structural equation modeling. Hopefully, appropriate mediational analyses will be conducted.

References

1. Piedmont R, Fox J, Toscano M: Spiritual Crisis as a Unique Causal Predictor of Emotional and Characterological Impairment in Atheists and Agnostics: Numinous Motivations as Universal Psychological Qualities. *Religions*. 2020; **11** (11). [Publisher Full Text](#)

Is the rationale for creating the dataset(s) clearly described?

Yes

Are the protocols appropriate and is the work technically sound?

Partly

Are sufficient details of methods and materials provided to allow replication by others?

Yes

Are the datasets clearly presented in a useable and accessible format?

Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: I have been involved in this field for over 25 years; I have served as the founding editor of the APA journal, Psychology of Religion and Spirituality, editor of Research in the Social Scientific Study of Religion. I have published numerous articles on this topic, with special emphasis on measurement/scale development, clinical predictiveness of R/S constructs, and cross-cultural research.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Author Response 23 Aug 2022

Yasmin Iles-Caven, University of Bristol, Bristol, UK

We thank you for your helpful and insightful comments on this paper.

Your point 1. Firstly, this is purely a descriptive paper (data note) of the data available on RSBB collected in 2020 and the ability to link this to a rich phenotypic dataset collected over a 30-year period including RSBB data collected antenatally and at 5 and 9 years post-partum. It is not a research article.

We apologise for our sweeping statement concerning longitudinal studies. We agree cross-sectional studies have their value, but in order to examine trajectories of poor mental and/or physical health and whether RSBB has any influence or causality on the (non-) development of disease, longitudinal studies are required (e.g. non-genetic inheritance via grandmaternal smoking in pregnancy and RSBB in granddaughters (Golding et al., 2022); or RSBB influences on the initiation or giving up of habits such as alcohol, smoking and drug use as well as aspects of diet, such factors may be on the causal pathway between RSBB and aspects of mental or physical health. Such features are most easily interpreted when it is clear as to the sequence of exposures, mediators and outcomes.

Golding J, Gregory S, Northstone K, Pembrey M, Ellis G, Watkins S, Iles-Caven Y, Suderman M. Possible transgenerational associations between grandparents' childhood exposures and religious belief in their granddaughters: a longitudinal cohort study. Wellcome Open Research. 2022 Aug 12;7(213):213.

Selection of measures. The RSBB data collected within ALSPAC questionnaires only

comprises one section among many others including socioeconomic status, health, measures of anxiety and depression, personality, social interactions, locus of control, and traumatic experiences. We are therefore not limited in our exploration of RSBB in itself.

To repeat, this is a description of RSBB data collected in this wave. Data Notes, as defined by Wellcome Open Research do not involve detailed analyses. They are meant to describe the relevant data available and the ways in which the interested researcher may access it.

Your point 2. We have omitted the phrase ‘well-validated’ from the paper. We are sorry you have been less than enthusiastic about some of the measures used. We relied on recommendations from experts in the field. This paper merely describes what is available to the interested researcher.

Your point 3 Statistical analyses. We have compared proportions using chi-squared, and quoted the corresponding P value. We do not claim that this is equivalent to an effect size. Rather it is there as an indicator of a difference that may not be explained by chance. The data provided in the tables is such that the interested researcher can calculate unadjusted effect sizes if required. Again, we reiterate this is purely a descriptive paper. ALSPAC welcomes collaboration (see data availability section).

Your point 4. There are a number of researchers working with these data, but more are always welcomed. Because of the broad wealth of data collected by ALSPAC, there are a large number of questions that we hope that interested researchers may address.

Competing Interests: None

Reviewer Report 25 March 2022

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Ellen Idler

Department of Sociology and the Rollins School of Public Health, Emory University, Atlanta, GA, USA

This manuscript presents descriptive data from a 2020 (4th wave) follow-up of a long-running cohort study of parents and children born to them in Bristol, England in the early 1990s. The children are now in their late 20s. The focus of the data presented is on a large number of measures of religiousness and spirituality, some of which (but not all) had been asked in previous waves. The major take-away is the decline in religious and spiritual beliefs and behaviours reported by the participants during the period of the study. The manuscript is well-written and clear for the most part.

1. Table 1 usefully compares the 2000-2001 stated religious affiliation of sample mothers and partners with both the local Bristol population and the population of England/Wales at the time. The text notes that the study sample was more likely to state that they had no religion than the national census but at the same time they were considerably more likely to state that they were Christian than the surrounding local area census shows. Given the attrition from the sample (see #2), it would be important to continue benchmarking the results against whatever local data are available.
2. The sample is dramatically reduced in size by the 2020 follow-up. This is acknowledged briefly in the limitations section of the discussion, but I would say that it is a much more serious issue. I do not see sample sizes for the 2nd and 3rd waves of data collection, but with the Ns that are given for T1 and T4, it appears that only 37% of the mothers (4525/12,243) and 24.5% (2349/9583) of the partners who began the study in 1991/92 provided data in 2020. Table 2 usefully tells us that a considerable amount of selection has occurred such that 2020 sample mothers were older, better educated, more likely to have been living with their partner, and more likely the mothers of girls compared with those who attrited from the study. This is really a huge amount of loss, and it calls for some procedures, perhaps Heckman correction models or other ways of attending to the ways in which the sample is different from the population from which it came. Without this, and a much more major acknowledgement of the magnitude of the attrition, the implications of the language in the text and abstract, of a change over time in RSBB is quite misleading.
3. Another area of concern is the meaning of these measures of religious belief and practice in the context of an extremely secular environment. What does it mean to say that one has brought up one's child in one's current faith (2/3 of parents say they have done this) when half or more than half "never" go to a place of worship and consider themselves "not at all religious" and fewer than half say they believe in God or some divine power? I could go on with more examples of the seeming contradictions here. Some qualitative interviews might help uncover the meaning of these responses.

Is the rationale for creating the dataset(s) clearly described?

Yes

Are the protocols appropriate and is the work technically sound?

Partly

Are sufficient details of methods and materials provided to allow replication by others?

Yes

Are the datasets clearly presented in a useable and accessible format?

Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: My areas of research include social factors in health, aging and perceptions of health, religion as a social determinant of health. I am a sociologist with training in epidemiology.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Author Response 23 Aug 2022

Yasmin Iles-Caven, University of Bristol, Bristol, UK

The authors thank the reviewer for their helpful and insightful comments, which we endeavour to address:

1. Thank you for this suggestion, we aim to add census data when available to our blog: <https://ahrp.blogs.bristol.ac.uk/>

2. Attrition

Attrition is of major concern in ALSPAC and known to be non-random and likely to result in selection bias (see e.g. Taylor et al., 2018; Cornish et al., 2021). It has been higher in those mothers from lower socioeconomic backgrounds, with complications in the index pregnancy and those with a lack of social support. More recent data collection shows a positive bias in participation towards older mothers, those with co-habiting partners in pregnancy, educated to degree level, higher socioeconomic status (Fraser et al., 2013) and more likely to attend a place of worship at least monthly (Morgan et al., 2022). The latter paper, in particular, discusses the ways in which these biases may be addressed in future analyses.

Cornish RP, Macleod J, Boyd A, Tilling K. Factors associated with participation over time in the Avon Longitudinal Study of Parents and Children: a study using linked education and primary care data. *International journal of epidemiology*. 2021 Feb;50(1):293-302.

Morgan J, Halstead I, Northstone K, Major-Smith D. Religious/spiritual beliefs and behaviours and study participation in a prospective cohort study (ALSPAC) in Southwest England. *Wellcome Open Research* 2022; 7:186.

Taylor AE, Jones HJ, Sallis H, Euesden J, Stergiakouli E, Davies NM, Zammit S, Lawlor DA, Munafò MR, Davey Smith G, Tilling K. Exploring the association of genetic factors with participation in the Avon Longitudinal Study of Parents and Children. *International journal of epidemiology*. 2018 Aug 1;47(4):1207-16.

3. Meaning of measures

Format of all questions have been through extensive ethical and participant vetting in order to be inclusive. To this end (see Table 3), the actual question asked (C8). Did you bring your (child)ren up in your current faith/belief (**including none**)? Yes, this faith/No. If no, what faith did you bring your children up in, **if any** (describe)? This refers back to question C5. What sort of religious faith would you say you had? Options included 'None'. Therefore those responding 'yes' to C8 include the 'nones'. Text responses have yet to be coded which may elucidate further.

Competing Interests: None