

**Religiosity and mental wellbeing among members of majority and minority religions: findings from
Understanding Society, The UK Household Longitudinal Study**

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It is unclear if links between religiosity and mental health are found in contexts outside the US or are causal. We examined differences in mental wellbeing and associations between mental wellbeing and religiosity among the religiously unaffiliated, white and non-white Christians, Muslims of Pakistani, Bangladeshi and other ethnicities, and other minority ethnoreligious groups. We used four waves of Understanding Society, a UK longitudinal household panel (2009–2013, N=50922). We adjusted for potential confounders (including socioeconomic factors and personality) and for household fixed effects to account for household level unobserved confounding factors. Compared with those with no religious affiliation, Pakistani and Bangladeshi Muslims and members of other minority religions had worse wellbeing (as measured by Shortened Warwick-Edinburgh Mental Wellbeing Scale (SWEMWBS) and General Health Questionnaire (GHQ)). Higher subjective importance of religion was associated with lower wellbeing according to GHQ; associations were not found with SWEMWBS. More frequent religious service attendance was associated with higher wellbeing; effect sizes were larger for those with religious affiliations. These associations were only partially attenuated by adjustment for potential confounding factors including household fixed effects. Religious service attendance and/or its secular alternatives may have a role in improving population-wide mental wellbeing.

Key words: Religiosity; religious affiliation; mental health; mental wellbeing.

Abbreviations: Shortened Warwick-Edinburgh Mental Wellbeing Scale (SWEMWBS), General Health Questionnaire (GHQ).

Introduction

Mental health and wellbeing are important to individuals, families, and society. Mental ill health is a leading contributor to the global burden of disease(1) which motivates a need to better understand its modifiable determinants. There is increasing awareness that mental health and wellbeing are multidimensional constructs; positive mental wellbeing may be a different construct to mental ill health.(2) Across the non-disordered population, higher positive mental wellbeing appears to have protective effects on other important outcomes such as physical health,(3) and socioeconomic outcomes such as productivity.(4) It is therefore important to identify the modifiable determinants of both mental ill health and positive mental wellbeing.

A growing body of literature—largely conducted in the US(5, 6) and mostly cross-sectional(7, 8)—has suggested that greater religiosity (particularly religious service attendance) is associated with reduced mental ill health risk and greater subjective wellbeing. Religious attendance may benefit these outcomes through a myriad of mechanisms, including reducing loneliness, increasing social support, and fostering engagement with other community services.(7, 9, 10) Conversely, there could be adverse effects, such as through feelings of guilt associated with some religious beliefs, or ostracization from other secular societal activities. Interpretation of the existing literature is however currently hampered by difficulty in generalizability—any effect of religiosity on wellbeing outcomes is likely to differ by societal context and religious denomination. Indeed, Christian faith is a prominent part of public and political life in the US;(11) more research is therefore needed elsewhere, including analysis of other religious groups.(5) Since associations between religiosity and outcomes may be due to confounding and/or reverse causality,(12, 13) research using alternative empirical strategies is also required.

We extend the existing literature by examining associations between multiple religiosity measures and wellbeing outcomes in the UK—a more secular country compared with the US.(11) We used a large nationally representative household panel with information on religious affiliation, attendance, and the perceived importance of religion. Its ethnically diverse sample contains considerable heterogeneity in these religiosity measures. We hypothesized that greater religious service attendance would benefit wellbeing across Christian and Muslim groups and members of other minority religions,(14) yet average wellbeing would be

lower among Muslims and members of other minority religions, due to their increased exposure to discrimination,(15, 16) socioeconomic disadvantage,(17) and higher levels of acculturation stress.(17, 18) Finally, we used the household nature of the study to examine within-household differences in religiosity and wellbeing outcomes to account for unobserved confounding at the household level.(19) We hypothesized that effects of religious service attendance would be partly but not fully explained by such household-level confounders such as family socioeconomic status and shared cultural determinants of wellbeing.

Methods

Data

Data from Understanding Society: The UK Household Longitudinal Study were used.(20) This is a nationally representative household panel study started in 2009 with over 70,000 individuals in 30,000 households which included 4,000 households from an Ethnic Minority Boost sample.(21) 16+ original sample members are attempted to be interviewed yearly. Individuals who are co-resident with these households are also interviewed. Wellbeing and other sensitive variables are measured via self-completion questionnaires to reduce social desirability bias. Further details and sampling methodology can be found elsewhere.(21) All participants consent for use of their anonymised survey information, and data was accessed through the UK Data Service (<https://www.ukdataservice.ac.uk/>).

The analytic sample includes 16+ year old respondents who took part in Wave 1 (2009/2011) and Wave 4 (2012-2014) and have responded to questions on religiosity or wellbeing. We also use data collected in Wave 3 (2011-2013) on personality traits and the number of close friends. The final sample was composed of around 50,000 individuals. We use the outcome variables in Wave 2 (2010-12) for robustness checks.

Religion and wellbeing measures

Participants were asked whether they belong to any religion and if so, which one. As norms and experiences of individuals from different ethnic groups within the same religion differ—as may be the long-term consequences (e.g., subsequent socioeconomic outcomes)(22, 23)—we categorised individuals into

ethnoreligious groups rather than just religious affiliation groups. To avoid including ethnoreligious groups with very small sample sizes we identified groups which were substantively meaningful and had sufficiently large sample sizes.(24) For example, 95% and 93% of Pakistani and Bangladeshi respondents, respectively, were Muslim and 64% of Muslims were Pakistani or Bangladeshi. Thus, we distinguished 1) Pakistani and Bangladeshi Muslims and 2) Muslims of other ethnicity. Using this principle across all affiliation and ethnicities resulted in five ethnoreligious groups: nonreligious, white Christian, non-white Christian, Pakistani/Bangladeshi Muslim, other Muslim, and any other group (Sikh, Jewish, Buddhist, Hindu etc). We additionally examined specifications whereby religion and ethnicity were treated as separate variables.

Religious attendance was measured by asking *'How often, if at all, do you attend religious services or meetings?' with responses of 'weekly' 'monthly' 'yearly' 'never or practically never', or 'only at weddings, funerals etc.'* The importance of religion was captured by asking *'how much of a difference would you say religious beliefs make to your life?'* with responses of *'a great', 'some', 'a little', or 'no' difference*. Dummy variables were created for service attendance and religious importance categories.

Wellbeing was measured using the Shortened Warwick-Edinburgh Mental Wellbeing Scale (SWEMWBS)(25, 26) and the General Health Questionnaire (GHQ).(27, 28) SWEMWBS captures positive mental wellbeing in a unidimensional construct with seven questions on participants' feeling and thoughts in the past 2 weeks such as "I've been feeling optimistic about the future" and "I've been feeling close to other people", with responses on a Likert scale ranging from "none of the time" to "all the time" (scores range from 7-35, higher scores indicate better wellbeing). The GHQ is an affective or experienced measure of wellbeing/mental health capturing anxiety, stress and depressive symptoms. It includes 12 questions which ask how a person felt recently on a four-point Likert scale—items capture information on concentration problems, sleep concerns, and difficulty in decision making (scores range from 0-36, we reverse coded the scale so higher scores indicate better mental health).

Potential confounders

The following were considered as potential confounders: age, gender (male/female; there was no evidence for religiosity \times gender interaction), country of birth (England, Scotland, Wales, Northern Ireland, non-UK), marital status, region (12 category Nuts-1), education (degree, other degree, A-levels, GCSE, other qualification, no qualification), employment status (employed, unemployed, retired, student, at home, long-term sick, other), natural logarithm of net personal income and of the number of close friends + 1, self-rated general health, whether the respondent was ever diagnosed with clinical depression, interaction frequency with neighbors, personality (Big5). All confounders were measured in Wave 1 except close friends and personality which were measured in Wave 3.

Analytical Strategy

Associations between religiosity (Wave 1) and wellbeing outcomes at Wave 4 were examined using linear regressions (results were similar when using the available outcome at Wave 2—GHQ only). Since some potential confounders (e.g., income, self-rated health) may operate as mediators, sequential adjustments were made to aid interpretation. Models were first fitted only with the three religion variables, then adjusted for 1) potential confounders (age, sex, country of birth); 2) additionally adjusted for outcome measured in Wave 1 and clinical depression; and 3) additionally adjusted for potential factors which may either confound or mediate the observed associations (self-rated health, marital status, income, region, personality, education, friends, employment status, and communication with neighbors). Models were fitted using Full Information Maximum Likelihood estimation (FIML) to reduce the impact of missing data on power and potential bias. Because we addressed panel attrition also with FIML, we applied cross-sectional survey weights in Wave 1 and adjusted the standard errors per complex sampling (strata and psu).

We then used multi-level models to control for household fixed effects;(19) these models account for unobserved household-level confounders, such as socioeconomic or cultural factors (formula and illustrative syntax shown in Web Appendix 1; *xtreg* in Stata). Such models estimate the differences in wellbeing outcomes of more religious persons in each household compared with household average, utilising within-household differences in exposure (42% and 46% of the variation in religious attendance and importance,

respectively are within households—when these variables are treated as continuous). Cluster-robust standard errors and Wave-1 cross-sectional household-level survey were used in these models. Since households are generally of the same ethnoreligious affiliation, household fixed effects analyses were not used when examining ethnoreligious affiliation (e.g., amongst 2208 households with at least one Muslim member, only 117 (5%) had a member of another religion). 13,805 single-member households were excluded from the fixed effects analyses as they have no within household variation in exposure and outcome.

Additional and sensitivity analyses

To examine whether wellbeing outcomes were comparable, we checked for measurement invariance across religious affiliation groups and identified potentially problematic items. Main analyses were then repeated removing these items. We repeated the main analyses using self-reported life satisfaction (ranging from 0-7) as a cognitive outcome measure. We repeated analyses with treating religious affiliation (nonreligious, Christian, Muslim, any other) and ethnicity (12 categories) as separate variables instead of combining them into ethnoreligious groups. To examine whether mean differences in outcomes by religiosity was due to differences in the lower or upper tails of the wellbeing distributions, we fitted quantile regression models. To address potential co-linearity between ethnoreligious affiliation, attendance, and importance, we added them separately in the models. Finally, we performed a multilevel analysis with random (instead of fixed) intercepts for households.

Results

Among around 50,000 Wave 1 respondents, 25,114 participants had complete data for religious affiliation, importance of religion, service attendance, and mental health/wellbeing outcomes in Wave 4, and 50,922 participants have non-missing data for either SWEMWBS and GHQ, or at least for one of the exposure variables and hence included in the FIML estimation. See Table 1 for sample sizes for each variable. GHQ and SWEMWBS scores were strongly correlated (.65 in Wave 4, .61 in Wave 1). As anticipated, Christians or Muslims reported higher religious importance and attendance than non-religious participants (Figure 1). Muslims were more likely than Christians to report religion as being important and to regularly attend religious services (Figure 1). The R-squared values for our models were (for religiosity variables, minimal

controls, baseline mental health, and all covariates, respectively): 1.15%, 2.14%, 28.09%, and 35.04% for SWEMWBS, and 0.60%, 2.30%, 23.69%, and 30.18% for GHQ.

Religious affiliation and mental health/wellbeing outcomes

Muslims had worse wellbeing which was largely accounted for by the likely colinear variable ethnicity (Web). Compared with those with no religious affiliation, Pakistani and Bangladeshi Muslims had worse wellbeing outcomes according to both SWEMWBS and GHQ, and members of other minority groups had worse wellbeing according to GHQ (Figure 2 and 3). These associations were partly attenuated after adjustment for potential confounders, yet associations with Pakistani and Bangladeshi Muslims remained. Christians (White and other) had higher SWEMWBS (GHQ) scores than those without affiliations, these differences attenuated to null after adjustment for potential confounders (particularly age; Figure 2 and 3).

Importance of religion and mental health/wellbeing outcomes

Higher reported importance of religion was associated with higher SWEMWBS yet lower GHQ scores (Figure 2 and 3). The association with SWEMWBS attenuated to null once a minimal set of confounders were accounted for; when household fixed effects were accounted for, the association switched sign, but 95% confidence intervals included the null (Figure 4). The association with GHQ—worse mental health—remained even after controlling for all potential confounders and mediators (Figure 3) and household fixed effects (Figure 4).

Religious service attendance and mental health/wellbeing outcomes

Attendance was favourably associated with both mental wellbeing outcomes (Figure 2 and 3). For example, those who attend services weekly had 0.81 (95% CI: 0.53, 1.09) points higher SWEMWBS scores and 1.44 (95% CI: 1.08, 1.79) points higher GHQ scores than those who never attend religious services (Figure 2 and 3). These changes correspond to about 18% and 26% of the standard deviations in SWEMWBS and GHQ scores, respectively (Table 1). These differences were still found, albeit partly attenuated, after adjustment for potential confounders and mediators (Figure 2 and 3) and household fixed effects (Figure 4). While those who attended weekly had highest wellbeing, the difference between monthly and yearly attendance was small.

We found suggestive evidence that the associations of religiosity with outcomes were more positive for those with religious affiliations (Figure 5); however, confidence intervals in each group overlapped (P affiliation \times attendance = 0.702 for SWEMWBS and 0.801 for GHQ), P (affiliation \times importance = 0.020 for SWEMWBS and 0.094 for GHQ). There was no evidence for interaction when restricted to those with religious affiliations (P (affiliation \times attendance = 0.499 for SWEMWBS and 0.873 for GHQ), P (affiliation \times importance = 0.168 for SWEMWBS and 0.941 for GHQ)).

Additional and sensitivity analyses

Findings were similar when 1) excluding items which lowered psychometric invariance of SWEMWBS and GHQ (Web Appendix 2); 2) using life satisfaction (Web Figure 2); 4) entering the three religious variables separately (Web Figure 3); and 3) using random household effects (Web Figure 4). Average differences reported above (Figures 2, 3, 4) were driven particularly by differences at the most negative parts of the mental health/wellbeing distribution (Web Figure 5).

Discussion

Main findings

Using nationally representative household data from the UK, we found that Muslims had lower average mental wellbeing scores than Christians or those with no religious affiliation. Higher religious service attendance was associated with higher mental wellbeing. This association was found across two outcomes and was stronger for those with religious affiliations. These findings were robust to adjustment for multiple confounders and after accounting for unobserved household-level confounders. In contrast, the subjective importance of religion was not associated with higher mental wellbeing—those who reported greater importance of religion on life in fact reported more mental health symptoms.

Comparisons with previous evidence and explanation of findings

Our findings are consistent with previous evidence—largely conducted in the US on samples of Christians—suggesting beneficial effects of religious attendance.(5-8) Findings are also consistent with the only

randomized controlled trial to which we are aware, suggesting causal effects of religiosity.(29) However, given the specific intervention (evangelical Christian) and target population (low-income Filipino households), generalizing from this ethically contentious trial is challenging. Findings are also consistent with a natural experimental study suggesting that greater involvement in a religious activity (Ramadan fasting) increases wellbeing amongst Muslims.(14)

We observed notable differences in wellbeing outcomes according to ethnoreligious group, which reflects the effects of both religious affiliation and ethnicity. Recent research has shown that globally Christians appear to be happier than those without religious affiliations and Muslims.(30, 31) In our analyses, however, there was no evidence after accounting for a minimal set of confounders (notably age) that Christians had higher wellbeing than those without affiliation. Association between religious affiliation and wellbeing may therefore be context dependent. In contrast, there was consistent evidence—before and after adjustment for confounders—that the Pakistani/Bangladeshi Muslims had worse wellbeing than those without affiliation. The negative associations between belonging to a minority ethnoreligious group and wellbeing may reflect harassment and discrimination,(15, 32) socioeconomic disadvantage,(17) and higher levels of acculturation stress.(17, 18) Larger samples with variation across religious affiliation, ethnicity, and socioeconomic disadvantage are likely required to attempt to separate out effects due to religious affiliation and ethnicity. Religious service attendance, however, was positively associated with wellbeing among members of minority religions. This suggest that, consistent with past research, service attendance may buffer the negative consequences of belonging to a minority religion.(33)

By using longitudinal data and accounting for household fixed effects to account for unobserved household level confounders, our results are consistent with there being a positive causal effect of religious service attendance as opposed to subjective religious beliefs on mental wellbeing.(9) The effect of service attendance may operate via multiple mechanisms, which may differ depending on the religion and societal context. These mechanisms include direct and indirect impacts of social networks such as social support, reducing loneliness, and fostering engagement with other community services.(9)

We found that reported importance of religion had no or potentially negative associations with wellbeing. This finding may reflect acculturation, guilt associated with some religious beliefs, and/or unobserved factors which select into both worse wellbeing and greater perceived importance of religion.

Despite our use of longitudinal data, accounting for multiple potential confounders and household fixed effects, our findings may still reflect non-causal relationships. First, findings may reflect reverse causality—mental ill health may impede attendance in religious activities. While we used longitudinal data, adjusted for baseline mental ill health/wellbeing scores, there may be remaining residual impacts of preceding mental health on the religious attendance. Reverse causality may also impact on analysis within households (fixed effect analysis), yet this method is likely to better account for household-level invariant confounding factors such as family socioeconomic status. Ultimately, given the practical and ethical barriers to using randomized trials in this topic—and difficulties in generalization from trials—future progress in this topic will likely be guided by findings from observational studies.(34)

Strengths and limitations

Our study was limited by a relatively short follow-up period (about 3 years). Thus, longer follow-up is required given concerns over reverse causality. It is possible however that causal beneficial effects of religious attendance in the UK are in fact short term, and thus weak or non-existent when using longer periods of follow-up. Nevertheless, evidence in the US suggests that associations are indeed observed across longer time periods.(35) The outcome variables in wave-4 were missing for about half of the wave-1 sample. This was addressed with FIML which produces unbiased estimates if missingness depends on observed data only (i.e. missing at random—MAR) and under multivariate normality.(36) Since we controlled several key variables in the analysis, violations of MAR should arguably be minor. Moreover, results with listwise deletion were similar to FIML estimates.

Strengths of the study include the large sample from a variable population, enabling examination of Muslims—a previously understudied group in studies of religion and wellbeing. Indeed, religion is noted stratifier of health inequality according to World Health Organization guidance.(37) However, there is

substantial within-group heterogeneity in each religion regarding religious belief and practice which we were unable to investigate. While we used a large nationally representative study with considerable religious heterogeneity, we were underpowered to investigate wellbeing outcomes in smaller religious groups. This warrants investigation with more granular data on religious affiliation.

While residual confounding cannot be ruled out, our analyses contained substantial data on potential confounders unavailable in much prior research; further, we utilised household fixed effects analyses. We also considered several outcomes and found similar findings across them. Unlike existing studies which focus on mean differences only, we also used quantile regression and found that mean differences were driven by those with poorer mental health.

Potential implications

If associations between religious service attendance and outcomes are causal, our findings may have implications for strategies to improve population-wide mental health. Given the increasing levels of mental ill health observed in the population(38) and the decline in religious attendance observed in the West,(11) one naive suggestion would be that religious service attendance should be increased across the entire population. However, we would caution against such suggestions, since alignment is clearly required between individuals' faith and the religious services available. Further, there may be other deleterious consequences of such attendance which we do not observe.(13, 39) Indeed, we found that associations between religious service attendance and positive wellbeing outcomes were most evident amongst those with religious affiliations—although we were unlikely powered to detect differences between each sub group. Instead, we argue for a need for secular alternatives to religious services which can replicate and/or improve upon its potential benefits, regardless of religious faith. Many predominant religious institutions have benefited from centuries of publicly subsidized development, resulting in established physical and social capital. Secular alternatives are arguably in their infancy—such as alternatives to religious service attendance (eg, the Sunday Assembly, established 2013), and organisations which seek (from a secular perspective) to improve society and aid individuals (eg, Humanists UK, American Humanist Association). Other civic organisations without such explicit goals may confer similar benefits to religious institutions. Indeed, one potential explanation of the

worsening of mental health outcomes in recent decades(38) is the increasing individualization nature of society, characterized by declines in communal activities such as religious service attendance.(40)

Amongst those with religious faith, our findings may suggest that facilitating religious service attendance may be one means by which the negative consequences of belonging to a minority religion could be averted. Such considerations may particularly benefit already vulnerable groups—for example, a recent report implied that in the UK while most masjids and mosques have facilities for women, they are typically limited in smaller masjids and in some ethnic minority groups.(41)

Conclusions

Associations between religious service attendance and mental wellbeing were found in the UK and present for both majority (Christians) and minority religions. Our longitudinal and household fixed effects analyses support the notion that such associations may be causal. In contrast, we found a strong negative association between belonging to a minority ethnoreligious group and mental wellbeing. Religious service attendance and/or its secular alternatives may have a role in improving population-wide mental wellbeing.

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Table 1. Descriptive statistics of the study sample—Understanding Society, The UK Household Longitudinal Study Waves 1 (2009/2011) and 4 (2012-2014).^a

| Characteristic | Non-religious | | Christian | | Muslim | | Other | | <i>P</i> -value ^b |
|----------------------------------|---------------|------|-------------|------|-------------|------|-------------|------|------------------------------|
| | No | % | Mean (SD) | % | Mean (SD) | % | Mean (SD) | % | |
| Religious affiliation | 47659 | 43.6 | | 43.4 | | 7.9 | | 5.1 | |
| Age | 47659 | | 42.1 (16.8) | | 52.1 (18.3) | | 35.6 (13.9) | | 42.5 (16.6) |
| Sex – female | 47658 | 51.2 | | 61.5 | | 52.3 | | 54.1 | <0.001 |
| Birth country non-UK | 47651 | 8.8 | | 15.1 | | 69.3 | | 60.1 | <0.001 |
| Race white British | 47635 | 88.5 | | 81.2 | | 5.0 | | 22.6 | <0.001 |
| Self-rated health - fair or poor | 47610 | 20.3 | | 23.5 | | 21.3 | | 22.3 | <0.001 |
| Income (logged) | 44311 | | 6.8 (1.1) | | 6.8 (1.0) | | 6.6 (1.1) | | 6.7 (1.1) |
| Education - degree or higher) | 47639 | 21.1 | | 20.3 | | 23.6 | | 35.4 | <0.001 |
| Partnership status – married | 47642 | 42.2 | | 56.0 | | 61.5 | | 61.1 | <0.001 |
| Neuroticism score | 27183 | | 3.6 (1.5) | | 3.5 (1.5) | | 3.6 (1.3) | | 3.5 (1.4) |
| Number of close friends | 30306 | | 5.0 (4.8) | | 5.4 (5.9) | | 4.0 (4.9) | | 4.8 (5.9) |
| Wellbeing: GHQ in Wave 1 | 39665 | | 24.9 (5.3) | | 25.0 (5.2) | | 24.9 (5.9) | | 24.9 (5.7) |
| Wellbeing: GHQ in Wave 4 | 25236 | | 24.9 (5.6) | | 25.1 (5.4) | | 24.1 (6.2) | | 24.8 (5.7) |
| Wellbeing: WEMWEBS in Wave 1 | 38361 | | 24.9 (4.5) | | 25.5 (4.5) | | 24.6 (5.3) | | 25.5 (4.6) |
| Wellbeing: WEMWEBS in Wave 4 | 25336 | | 24.4 (4.5) | | 25.0 (4.4) | | 23.5 (5.1) | | 24.7 (4.8) |

^acategorical variables shown in binary form to aid presentation (all categories used in regression analyses)

^b*P*-values calculated using ANOVA (for continuous variables) or chi-squared tests (for categorical variables).

Figure legends

Figure 1. Distributions of A) perceived importance of religion and B) religious service attendance, by religious affiliation (Understanding Society Wave 1 (2009/2011)). Note: proportions shown on Y-axes.

Figure 2. Associations between religiosity measures and Shortened Warwick-Edinburgh Mental Wellbeing Scale (SWEMWBS); A) exposure: religious affiliation (reference category is nonreligious); B) exposure: importance of religion (reference category is none); C) exposure: religious attendance (reference category is never); Note: Model 1: only adjusted for religion variables, Model 2: additionally adjusted for age, sex, country of birth, Model 3: additionally adjusted for outcome and clinical depression in baseline (wave 1), additionally adjusted for all other covariates; reference categories: nonreligious for religious affiliation, no for importance, never for attendance; religiosity measured in Wave 1 (2009/2011) and outcomes in Wave 4 (2012-2014); Full Information Maximum Likelihood Estimation (FIML) was used to account for missing exposure and confounder data; higher SWEMWBS scores equate to more favourable wellbeing; CI = Confidence Interval; N = 50922 (72 observations from the original sample of 50994 were dropped due to the sampling design as six strata contained no population members).

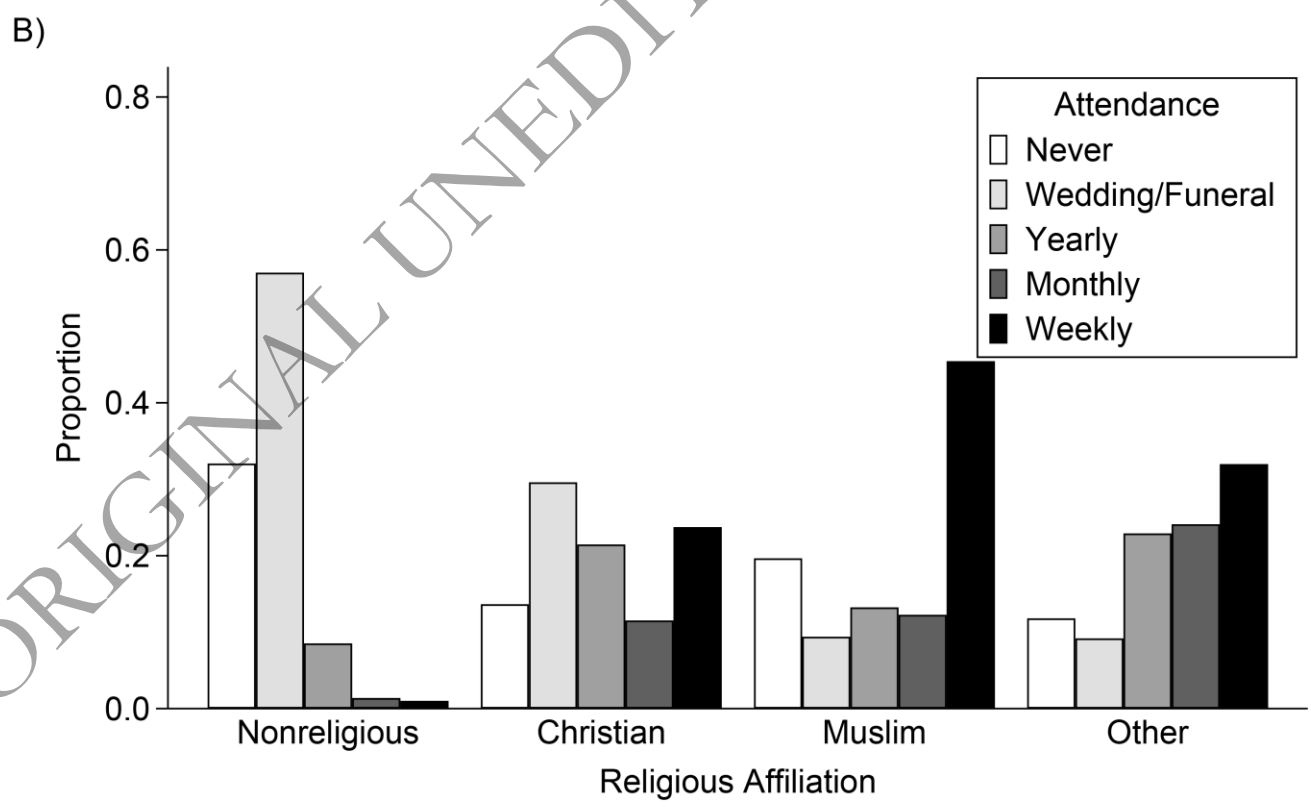
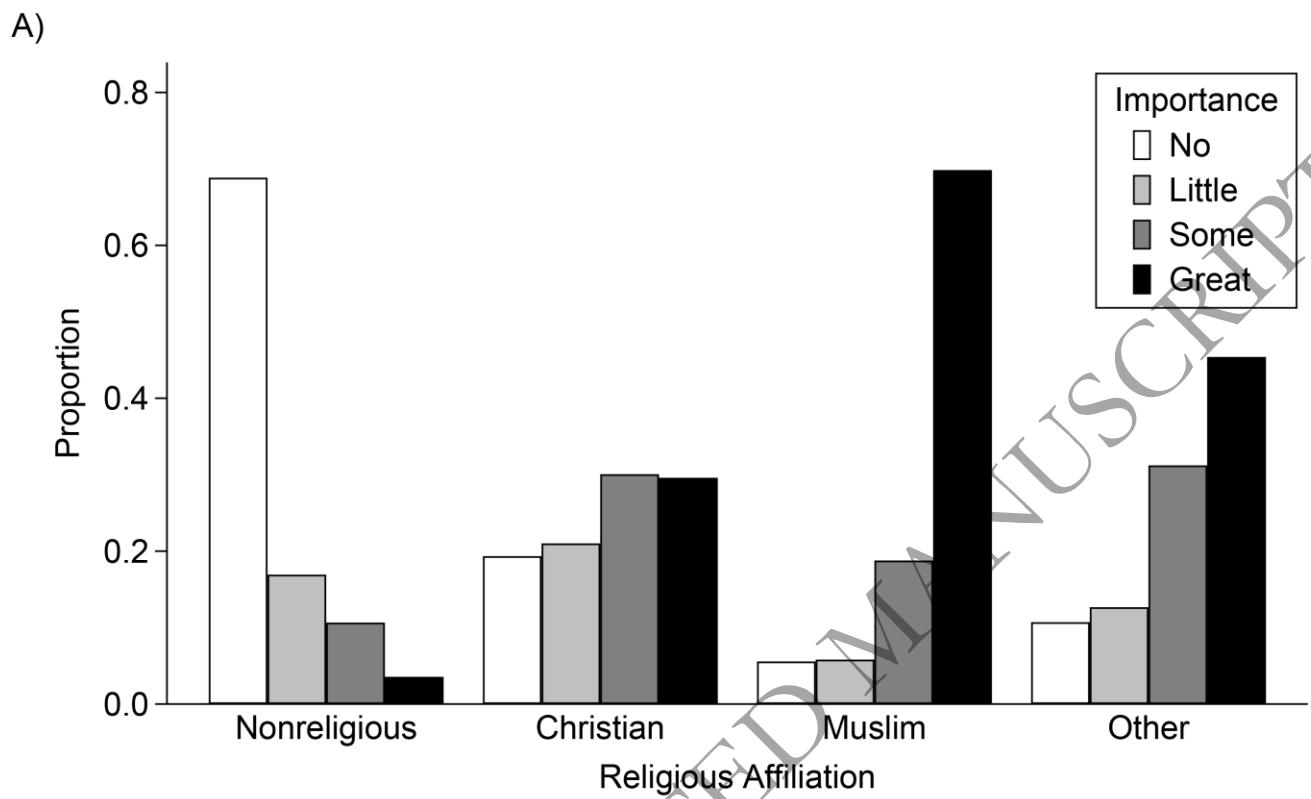
Figure 3. Associations between religiosity measures and General Health Questionnaire (GHQ); A) exposure: religious affiliation (reference category is nonreligious); B) exposure: importance of religion (reference category is none); C) exposure: religious attendance (reference category is never); Note: Model 1: only adjusted for religion variables, Model 2: additionally adjusted for age, sex, country of birth, Model 3: additionally adjusted for outcome and clinical depression in baseline (wave 1), additionally adjusted for all other covariates; reference categories: nonreligious for religious affiliation, no for importance, never for attendance; religiosity measured in Wave 1 (2009/2011) and outcomes in Wave 4 (2012-2014); Full Information Maximum Likelihood Estimation (FIML) was used to account for missing exposure and confounder data; higher GHQ (reverse coded) scores equate to more favourable wellbeing; CI = Confidence Interval; N = 50922 (72 observations from the original sample of 50994 were dropped as the sampling design as six strata contained no population members).

Figure 4. Associations between religiosity measures and mental wellbeing outcomes health outcomes: A) Shortened Warwick-Edinburgh Mental Wellbeing (SWEMWBS); B) General Health Questionnaire (GHQ)

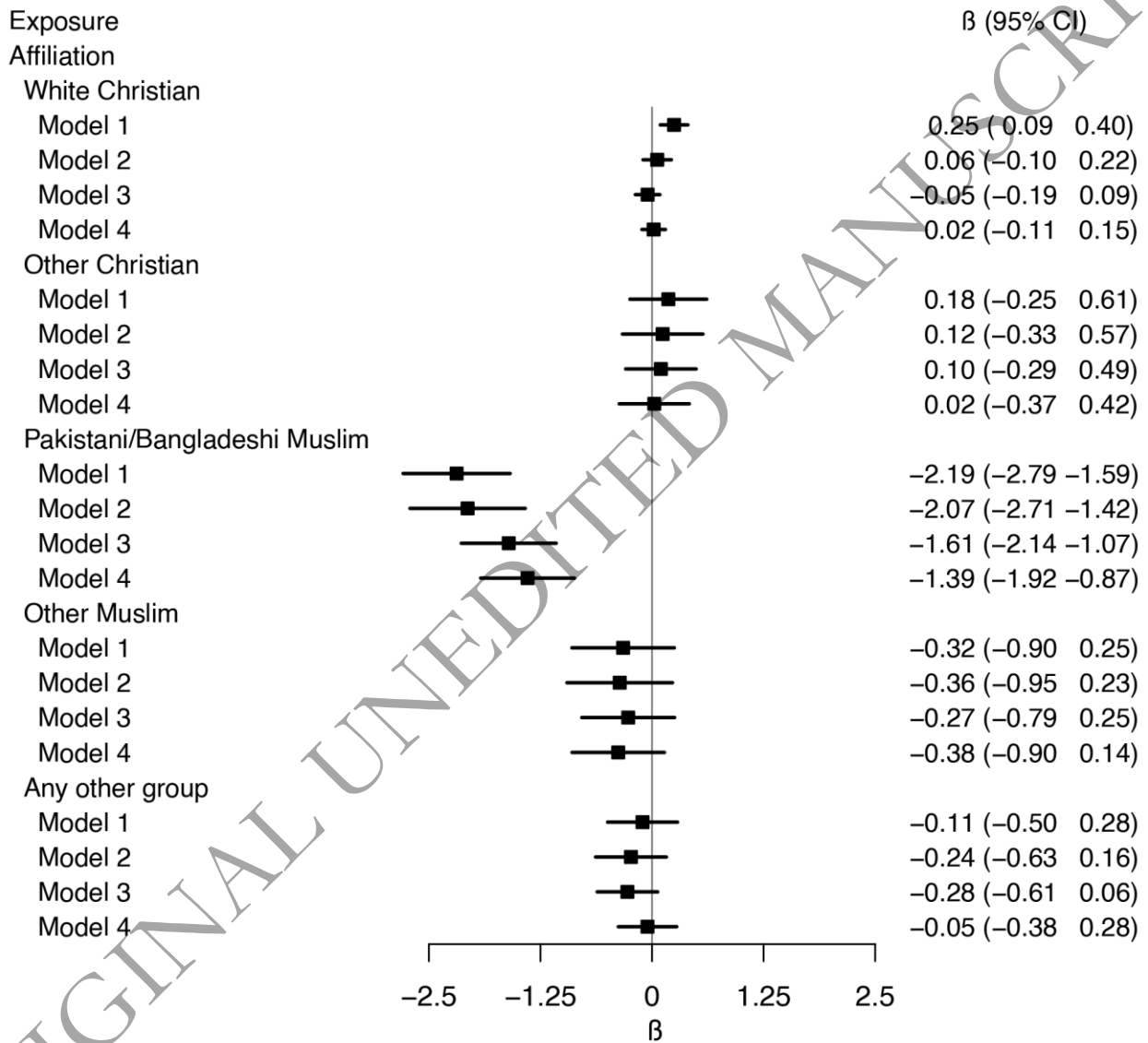
score, accounting for household fixed effects. Note: Model 1: only adjusted for religion variables, Model 2: additionally adjusted for age, sex, country of birth, Model 3: additionally adjusted for outcome and clinical depression in baseline (wave 1), additionally adjusted for all other covariates; reference categories: nonreligious for religious affiliation, none for importance, never for attendance; religiosity measured in Wave 1 (2009/2011) and outcomes in Wave 4 (2012-2014); higher SWEMWBS and GHQ (reverse coded) scores equate to more favourable wellbeing; Data Source: Understanding Society; CI = Confidence Interval; N = 18641 for WEMWEBS, 18589 for GHQ.

Figure 5. Associations between importance of religion and religious attendance and mental wellbeing outcomes for A) nonreligious, B) Christian, C) Muslim, and D) member of other minority religions, adjusted for sex, age, country of birth. Note: Religiosity measured in Wave 1 (2009/2011) and outcomes in Wave 4 (2012-2014); higher SWEMWBS and GHQ (reverse coded) scores equate to more favourable wellbeing; reference categories: nonreligious for religious affiliation, none for importance, never for attendance; estimated with FIML; Data Source: Understanding Society; N = 20502 for Nonreligious, 20565 for Christian, 3742 for Muslim, and 2438 for Other.

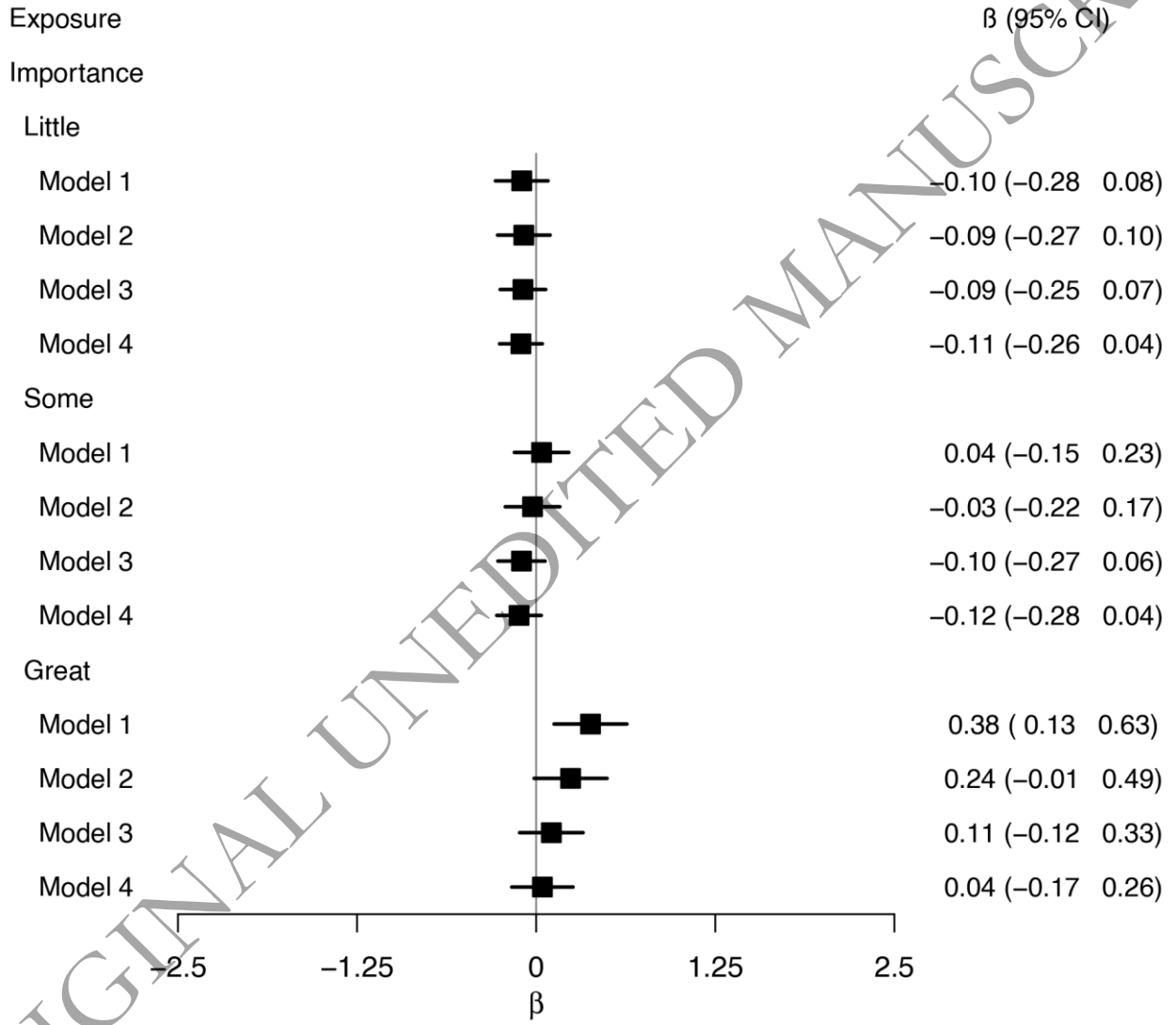
ORIGINAL UNEDITED MANUSCRIPT



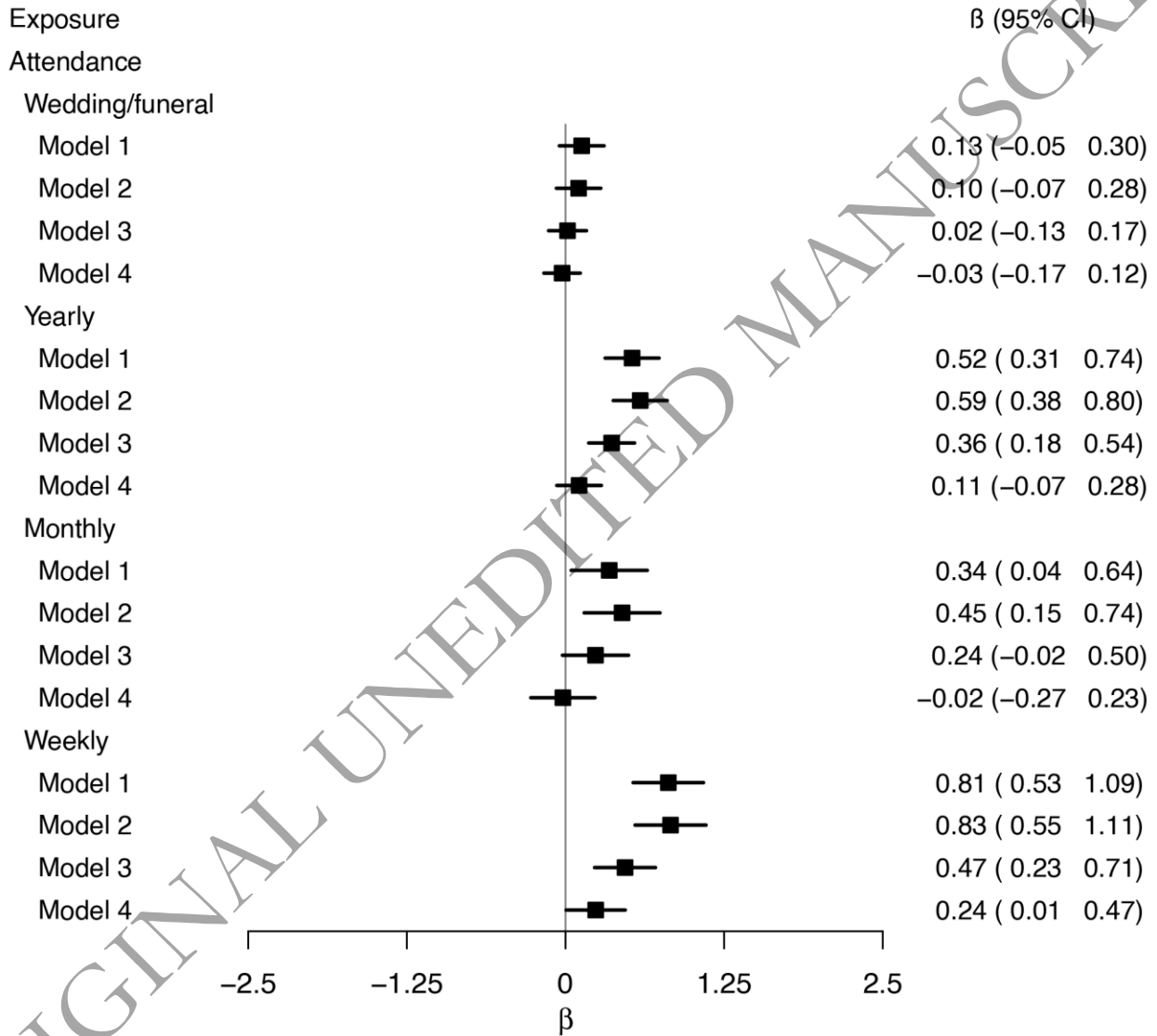
A)



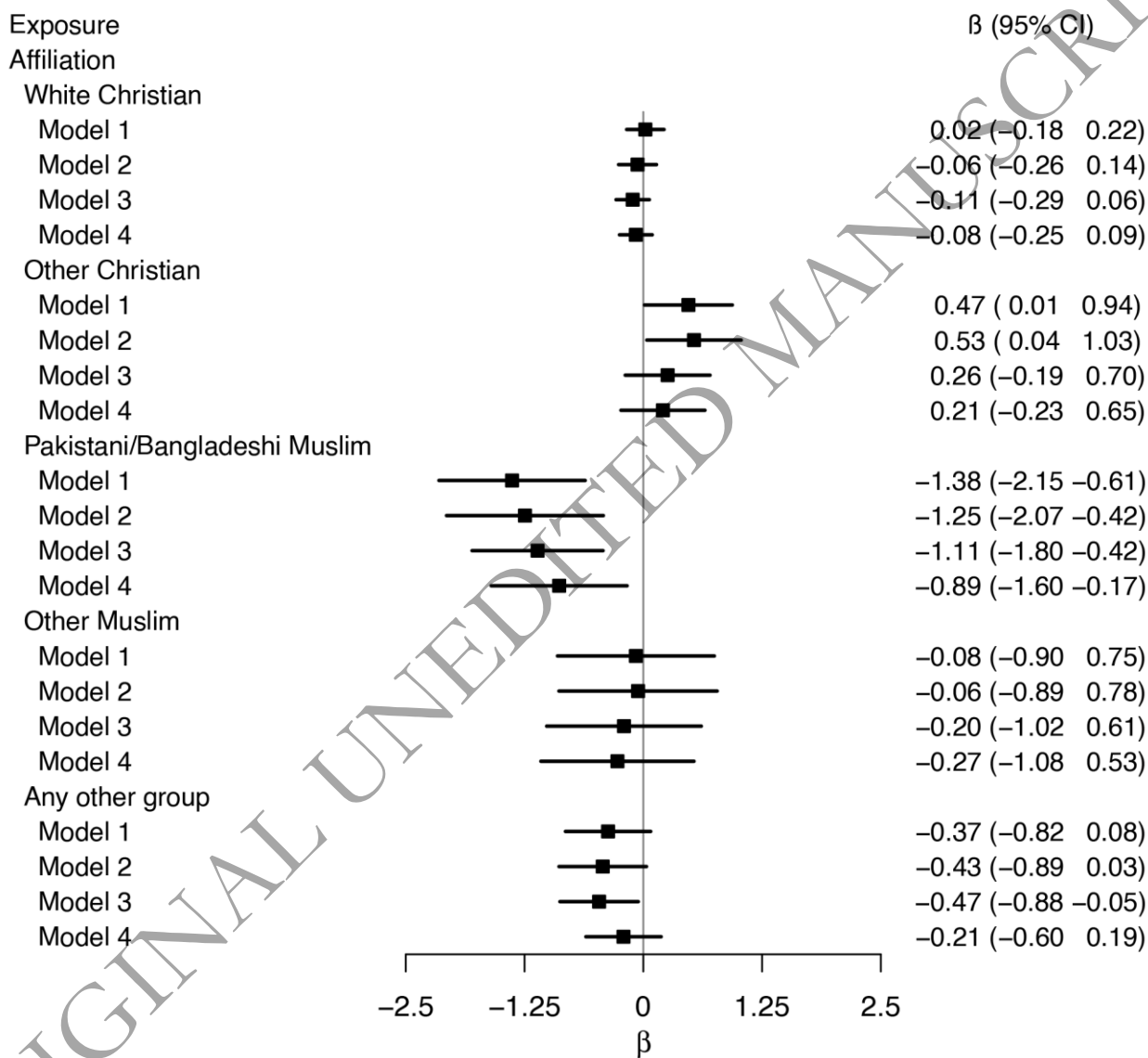
B)



C)



A)



B)

Exposure

Importance

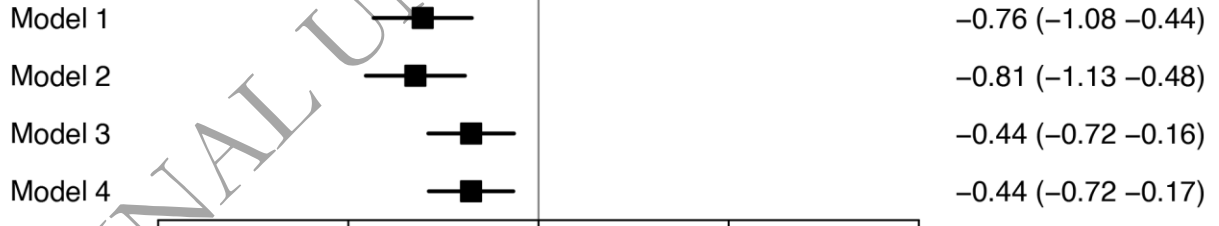
Little



Some



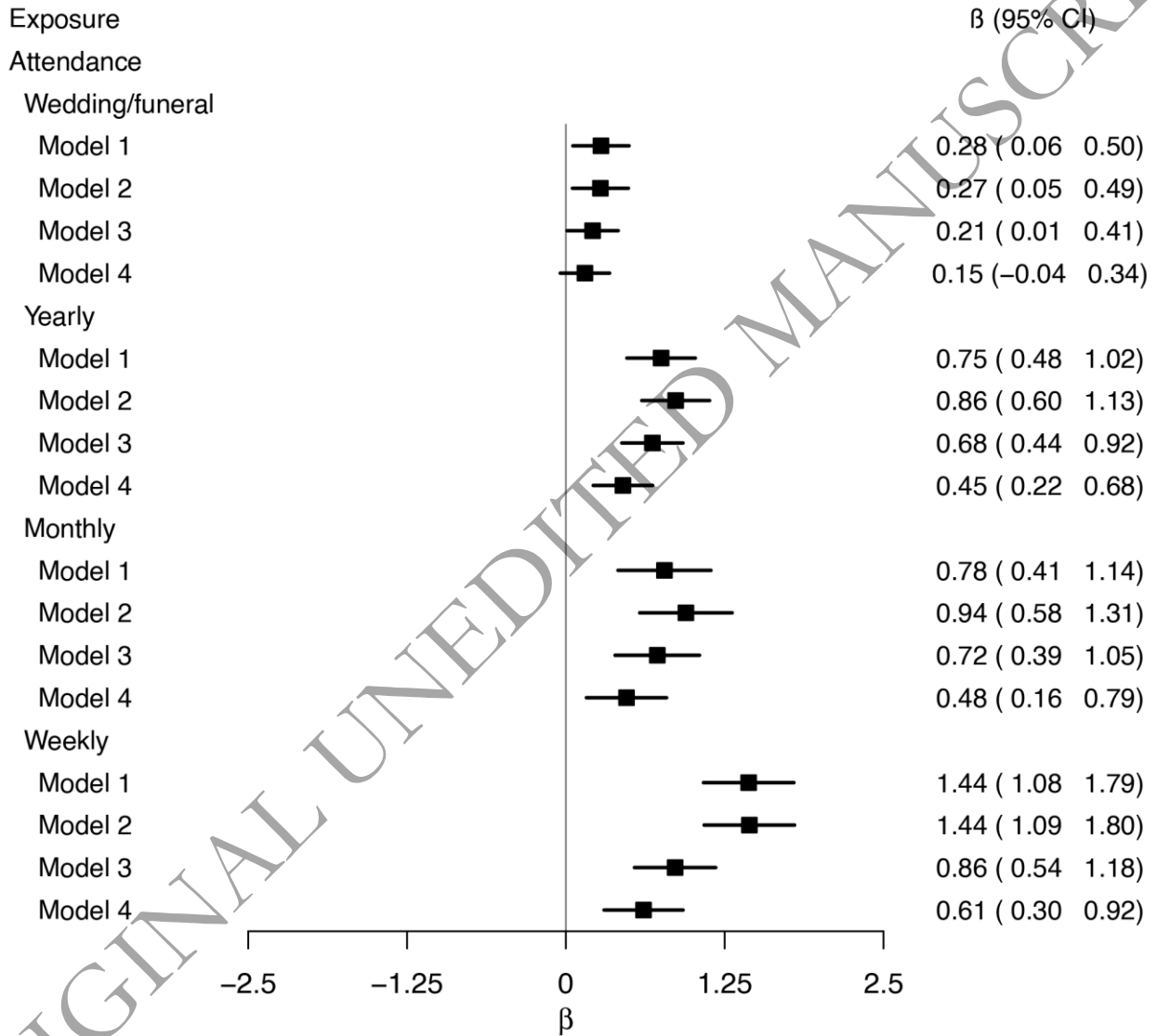
Great



-2.5 -1.25 0 1.25 2.5
 β

ORIGINAL UNEDITED MANUSCRIPT

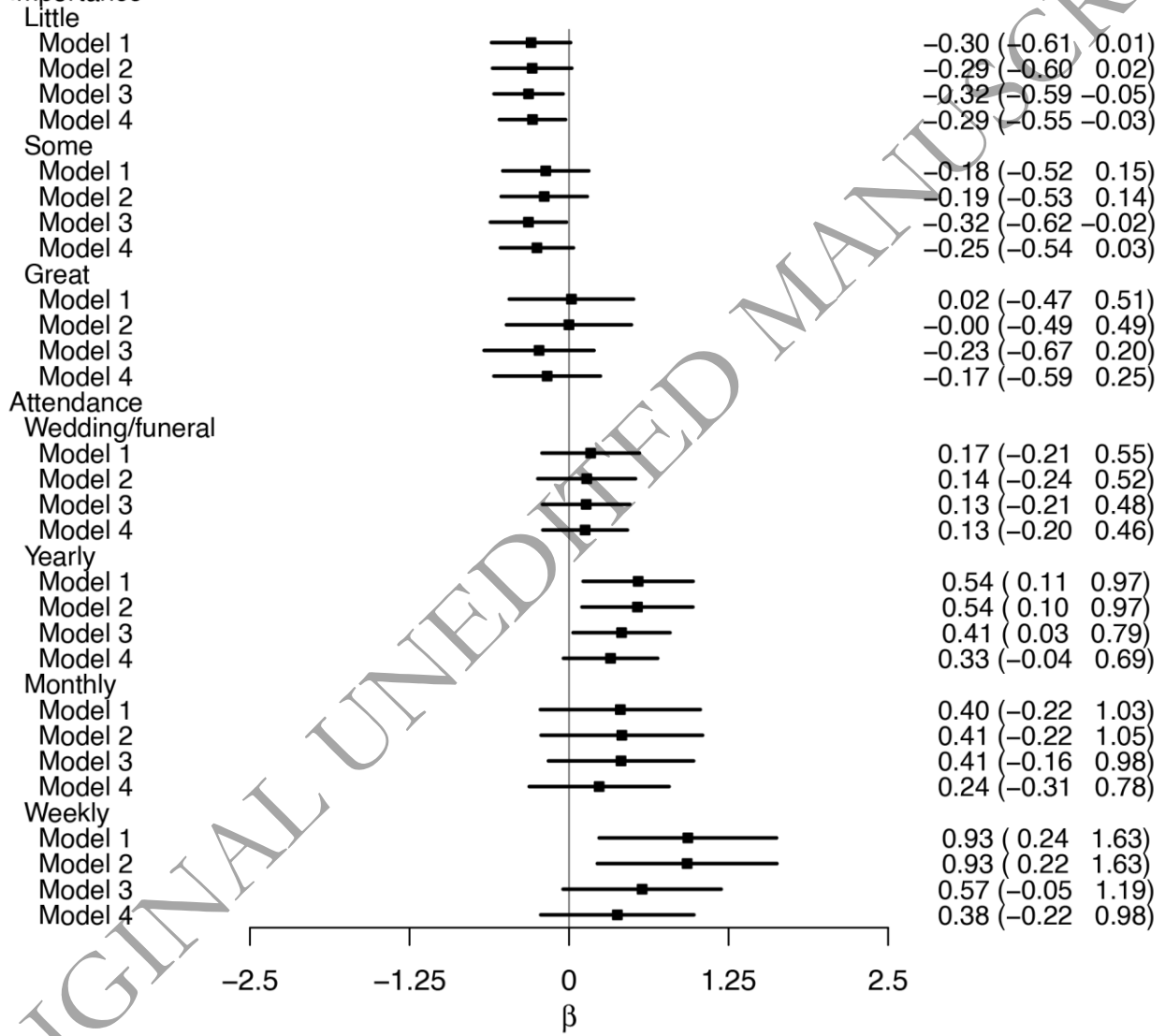
C)



A)

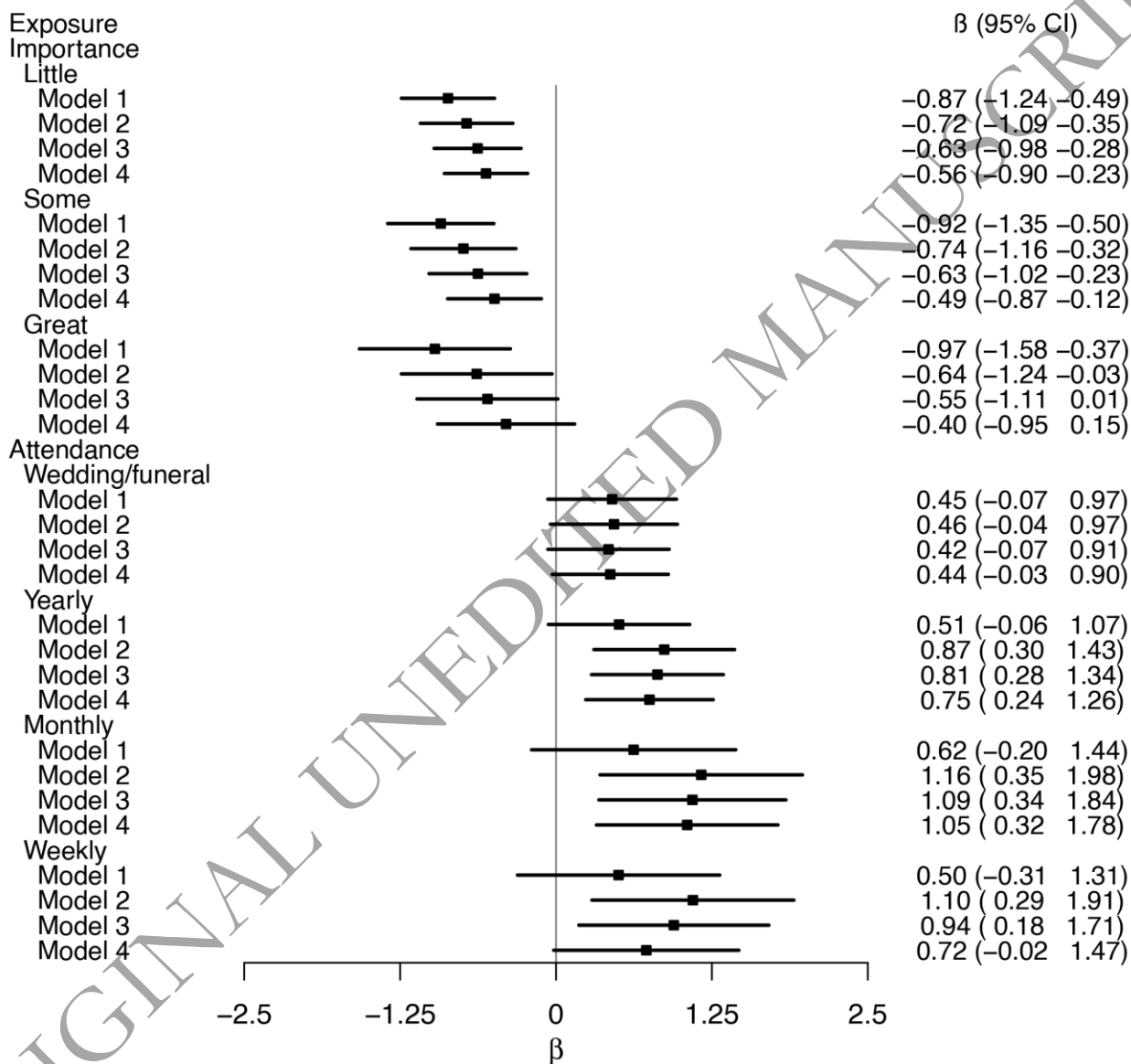
Exposure
Importance

β (95% CI)

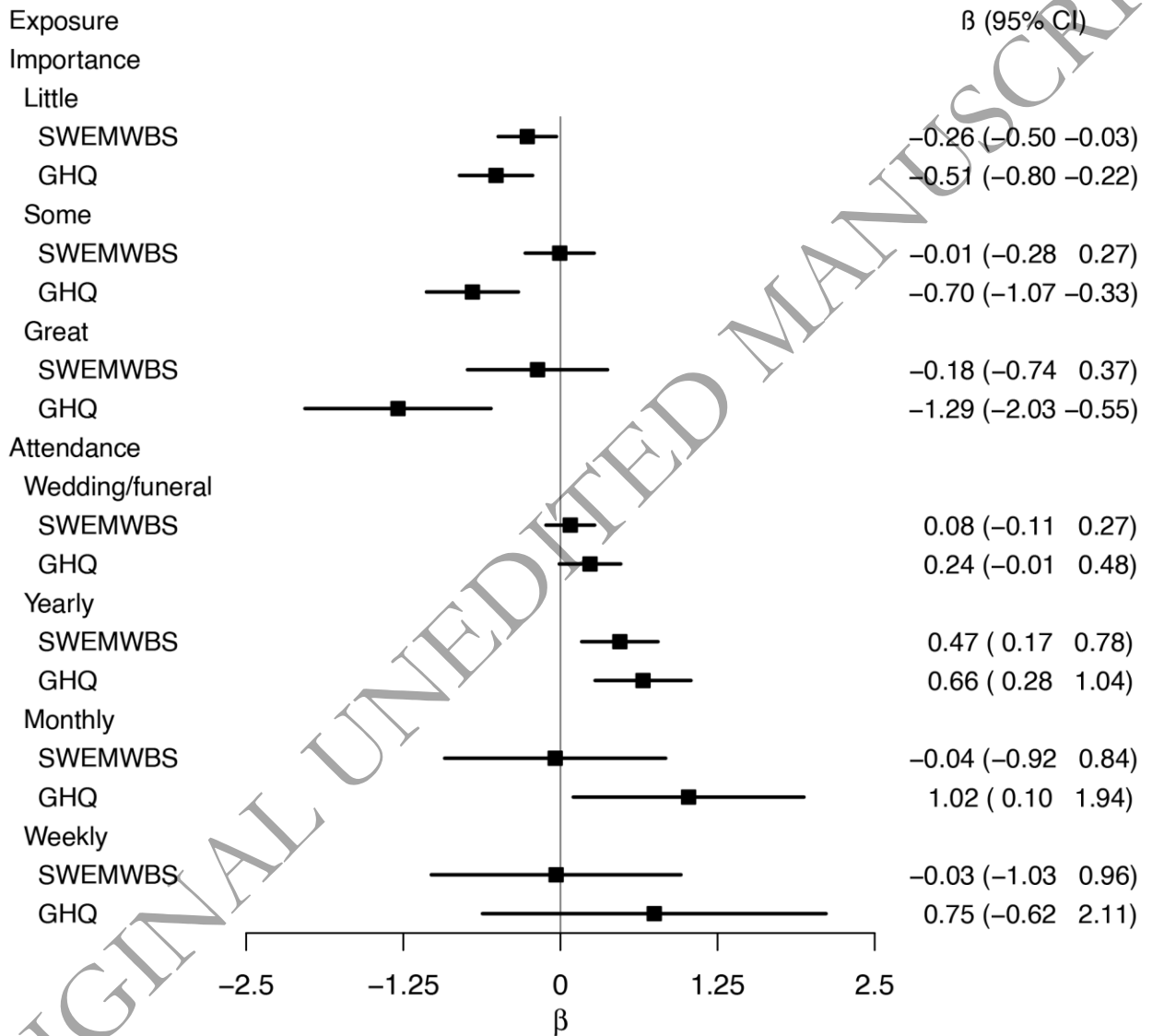


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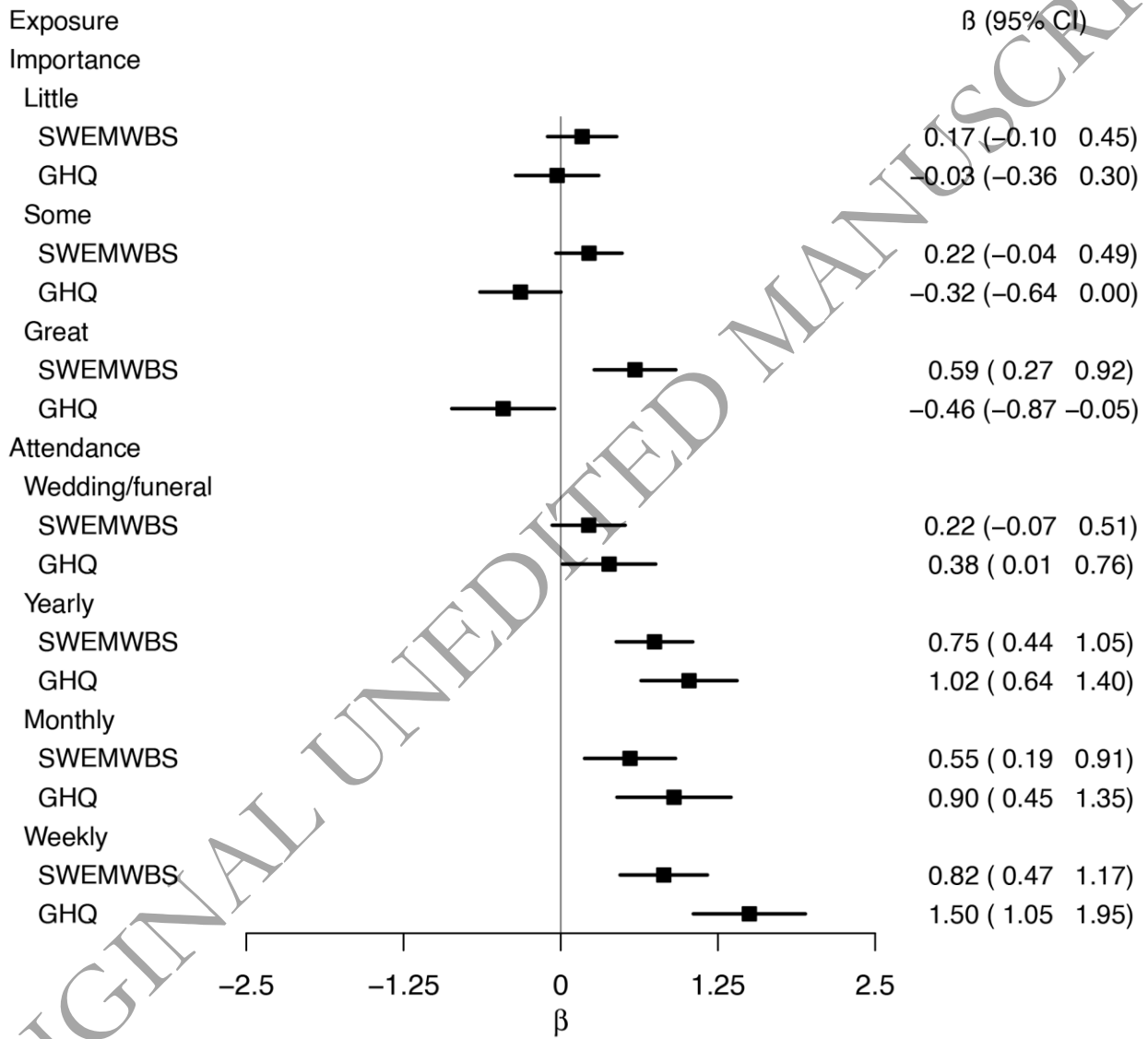
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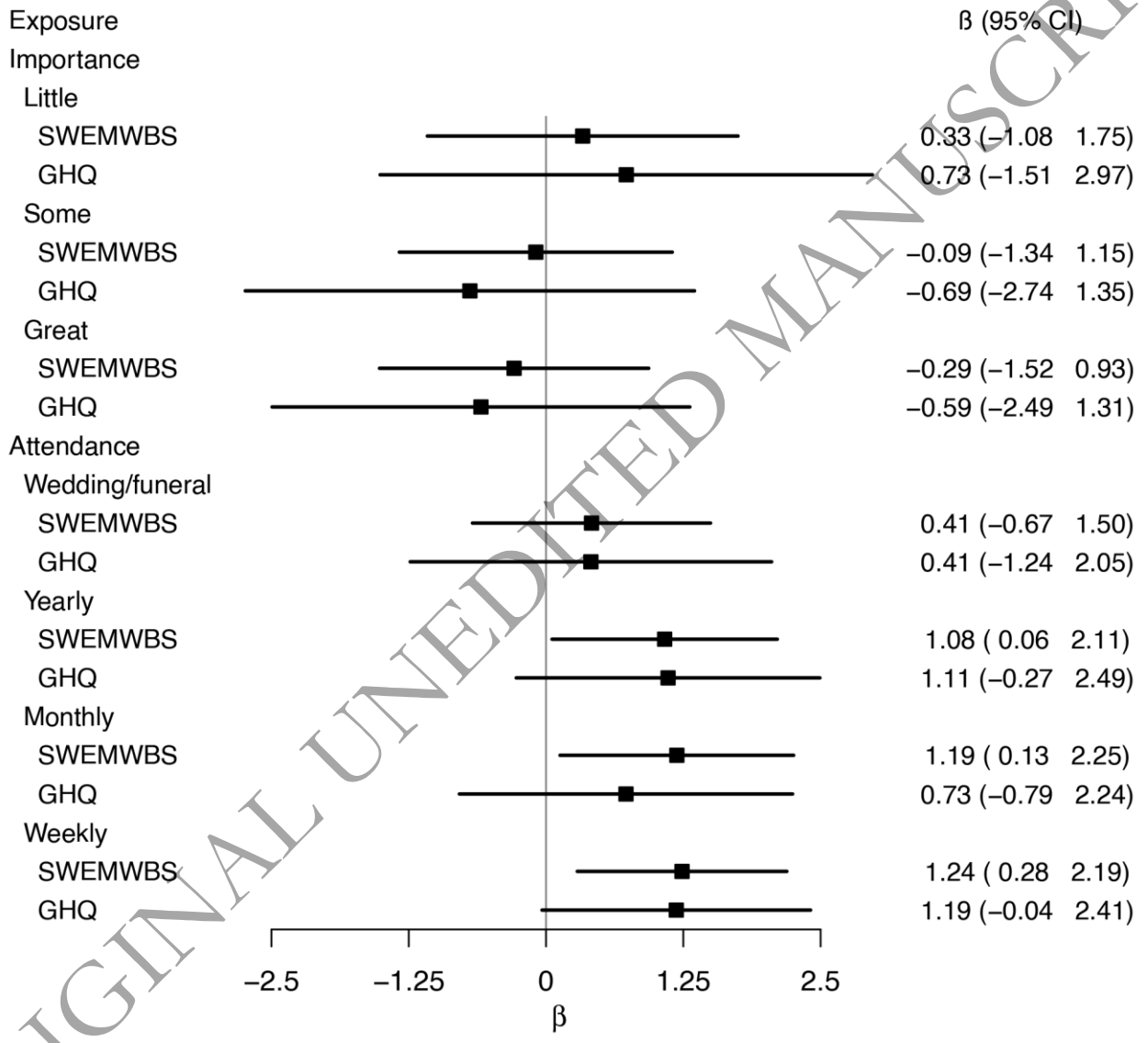
A)



B)



C)



D)

