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Was White right? Biblical interpretation, theological stance and environmental attitudes among a sample of UK churchgoers

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Author note

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**Abstract**

Lynn White's controversial hypothesis, that Judaeo-Christian belief led to attitudes towards the environment that have spawned an ecological crisis, has received much attention from sociologists of religion, notably in the United States. Surveys of the general population show negative correlations between biblical literalism and environmentalism, but these seem to be due to the particular nature of religion and politics in the USA. This study uses more nuanced measures of biblical interpretation and theological stance to examine the issue among a sample of 537 committed churchgoers from a range of mainly conservative Protestant denominations in the United Kingdom. Literal interpretation of Genesis was directly negatively correlated with concern for the environment, after allowing for indirect effects through dominion and stewardship theologies. The effect of symbolic interpretation was mediated by sacramental understanding of creation and stewardship. Stewardship was a key belief that mediated the effects of symbolic interpretation and theological stance on concern for the environment. Biblical interpretation, dominion and sacramentalism were uncorrelated with willingness to sacrifice to protect the environment, but stewardship was indirectly positively correlated through its effect on environmental concern.

Keywords: dominion; environmental concern; literalism; sacramentalism; stewardship; symbolism; willingness to sacrifice

1. **Introduction**

Most studies on the relationship of religion to environmentalism will engage at some point with Lynn White's seminal lecture *The historical roots of our ecologic crisis*, published in the journal Science in 1967 (White, 1967). White pointed out that modern science and technology owed their roots to developments in medieval Europe, and that it was the world view and assumptions of Western Christianity that shaped human relationships with the environment in modernity. In particular he argued that it was Christianity's rejection of animism and anthropocentricism that gave rise to a Western technology that was bent on mastering nature. This was coupled with a science that arose from natural theology and therefore framed human activity as 'thinking God's thoughts after him'. The combination has given human beings powers which are out of control and ecologically disastrous. White was specific about the guilt of Christianity in this process, which he claimed stems from a fundamental assumption that 'nature has no reason for existence save to serve man.' (p. 1207). The biblical basis for this is mentioned only briefly in the article, but his link with the creation narrative in Genesis has become a focal and controversial aspect of his argument that the biblical injunction to rule the earth and have dominion over living things is ultimately responsible for contemporary beliefs and attitudes that harm the environment.

White's article caught a tide of rising concern for the environment in the latter half of the twentieth century, and has shaped the way that many writers view Christianity and ecology. The two main types of response might be broadly classified as theological and social scientific.

* 1. *Theological responses to White*

The ideas associated with dominion are that the earth was created by God primarily as a place for humans, that humans have a divine mandate to use the resources of earth for their benefit, and that human beings are distinct from, and superior to, all other creatures. Such ideas have provoked strong counter-reactions among Christian theologians since the 1960s. These range from denying White's premise that the Judaeo-Christian tradition does not care about the environment, to accepting this premise but trying to rediscover new theologies for contemporary Christianity (Bouma-Prediger, 1995; Joranson & Butigan, 1984; Kinsley, 1995; Northcott, 2011; Reuther, 2000). Many writers who accept that mastery of creation is indeed evident in Scripture would nonetheless argue that it was not necessarily understood as exploitative dominion in early Christian tradition. Richard Bauckham (2002) points out that the essence of dominion in the early Christian tradition was the anthropocentric idea that the world was created specifically for human use, while Peter Harrison (2006) shows how even in the seventeenth century the aim of controlling nature was to try and restore it to its pre-Fall perfection.

The prevailing theological response to notions of dominion is what John Haught (1993) has termed the 'sacramental approach', whereby creation is seen not simply as a theatre for human divine interaction, but as the 'primary symbolic disclosure of God.' Haught stresses that this is not a single theological notion, but one that summarises elements of 'creation-centred' spirituality espoused by writers such as Thomas Berry (1988) and Matthew Fox (1983, 1990). A sacramental view of creation lies behind the rapidly expanding discourses in creation-centred spirituality, ecotheology, 'deep ecology' and eco-feminism. It understands God as not just revealed through nature, but also (in various ways) present in nature, giving it an essential goodness and placing human beings on an equal footing with the natural world.

The notion of stewardship, often seen as a counter to dominion, is used by many Christians as a way of explaining how humans should understand their purpose and place in creation (Berry, 2006). Bauckham (2002) argues that it is often thought to be strongly rooted in Christian tradition, but in reality it arose in the early modern era, at a time when humans were gaining more control over nature. This control was understood as carrying ethical responsibilities that were related to the inherent value of creation. Human interaction with other creatures and the earth's resources must involve respect for justice, an idea that is reflected today in the World Council of Churches under the programme unit 'Justice, diakonia and responsibility for creation' (WCC, 2013). Stewardship implies that humans are accountable to God for what they do to God's creation, and that the relationship with creation is one of care or guardianship. Stewardship is not without its critics, and it has been seen as also promoting desacralisation of nature by envisaging God as an 'absentee landlord' (Fox, 1983, 1990), or the natural world as something at the bottom of a master-servant-goods hierarchy (Palmer, 1992). For many people the role of steward is still linked with notions of human superiority to other creatures, and therefore seen by some as another form of dominion.

Theological beliefs about creation are likely to shape attitudes towards the environment, and theologians who write on the subject tend to do so for precisely this reason. Changing theological stance is seen as a crucial step in motivating Christians to recognise the danger of ecological catastrophe and thereby be willing to do something about it. So far-reaching has been the influence of White's critique, and so powerful the attempts to counter it, that dominion and mastery are rarely considered as acceptable or credible stances toward the natural world among theologians today. Whether this is so among Christians more generally has been a preoccupation of social scientists for the last four decades.

* 1. *Social-scientific responses to White*

White's hypothesis triggered a spate of activity among social scientists, who began looking for connections between religious belief and attitudes towards the environment. The intervening decades have seen a plethora of studies that have reported sometimes apparently contradictory findings (for a review of some of these studies, see Hitzhusen, 2007). Some early reports from the United States showed that religious affiliation or biblical literalism were negatively correlated with environmentalism (Eckberg & Blocker, 1989; Hand & Liere, 1984), but more recent analyses have tended to find either no relationship or a positive relationship (Boyd, 1999; Eckberg & Blocker, 1996; Hayes & Marangudakis, 2001a; Kanagy & Nelsen, 1995; Kanagy & Willits, 1993; Wolkomir, Futreal, Woodrum & Hoban, 1997a; Woodrum & Hoban, 1994; Woodrum & Wolkomir, 1997).

Differences between studies may partly be due to the range of measures used in assessing either environmental attitudes or religiosity. Attitudes toward the environment have been assessed by instruments such as the New Environmental Paradigm scale (Dunlap & Vanliere, 1978), the New Ecological Paradigm Scale (Dunlap, Van Liere, Mertig & Jones, 2000), and the Thompson and Barton (1994) scales of ecocentrism (valuing nature for its own sake) and anthropocentrism (valuing nature because it benefits humans). The difficulty in defining what constitutes a 'pro-environment' attitude has meant that opinion polls often use proxy measures such as the level of concern for a particular issue or how willing people are to make sacrifices to improve the environment (Dunlap, 1991; Dunlap, Gallup & Gallup, 1993; Sherkat & Ellison, 2007). The disconnect between attitudes and behaviours is well known among social psychologists (Ajzen, 2005), and these measures of environmentalism are not always correlated with what people actually do in terms activism or pro-environmental behaviours (Kollmuss & Agyeman, 2002). This is evident in some studies of the effects of religion on environmentalism. For example, Schultz, Zelezny and Dalrymple (2000) sampled 2160 students from North and South America using the New Environmental Paradigm scales and the measure of biblical literalism often used in the General Social Survey (ARDA, 2013). Biblical literalism was associated lower concern for the environment, but there was no relationship with self-reported pro-environmental behaviour.

The variety of measures of environmentalism is matched by a variety of measures of religiosity. National and trans-national social surveys tend to use religious affiliation or religious salience (Eckberg & Blocker, 1996; Hagevi, 2008; Hayes & Marangudakis, 2001b; Javor, 2012; Kvaløy, Finseraas & Listhaug, 2012; Schultz et al., 2000). Comparing environmental attitudes between religious and non-religious participants is not necessarily a good test of White's hypothesis. For example, in the United States denominational affiliation is associated with socio-economic and political factors, and several studies have concluded that the link between conservative Protestantism and right-wing politics may largely explain the relationship of religion and environmental attitudes (Guth, Green, Kellstedt & Smidt, 1995; Shaiko, 1987; Woodrum & Wolkomir, 1997).

Some researchers have tested the White hypothesis more directly by using surveys that include items related to bible belief, dominion and/or stewardship, and environmentalism. Boyd (1999) used the1993 General Social Survey data (a frequently used dataset by researchers on this topic because it included sections on religion and environmentalism) to examine the correlation of several religious variables with environmental attitudes and behaviours. Biblical literalism was negatively correlated with willingness to spend more on environmental protection, but this relationship disappeared after controlling for socio-political factors. Wolkomir et al. (1997b), in a national study of 1228 adults in the USA, found that biblical literalism was correlated positively with views of dominion, negatively with environmental concern, and negatively (but weakly) with pro-environmental behaviour. However, multiple regression indicated that the effects of literalism were explained entirely by its relation with dominion, which was the key predictor of low concern for the environment and consequently infrequent pro-environmental behaviours. Sherkat and Ellison (2007) examined a sample of 908 adults from the 1993 General Social Survey using structural equation modelling to explore the ways in which religious effects on environmentalism may be shaped by belief about stewardship or political conservatism. They found that biblical inerrancy was associated with political conservatism, which reduced concern for the environment. However, it was also associated with a stronger sense of stewardship, which promoted concern, so the net effect was no direct or total effect of inerrancy on concern. These studies suggest that any effects of biblical interpretation on environmentalism may be mediated by theological beliefs about creation.

Empirical work in this field to date suggests that examination of the relationship of biblical interpretation to environmentalism needs careful attention both to the kinds of measures used, and to their relationship with one another. Large scale national surveys use general measures of biblical belief (usually on literalism or inerrancy) which may be rather rudimentary indicators of how the Genesis accounts are interpreted. Theological measures tend to be based on post-hoc use of items available in general surveys, which are open to different interpretations (compare , for example the use of the 1993 GSS by Eckberg and Blocker (1996) with use of the same data by Sherkat & Ellison (2007)). The widely reported influence of political affiliation on both religion and environmentalism may be a particular issue in the United States, and this may be less important in other societies. There have been a few surveys of religion and environmentalism in the United Kingdom, but the different religious and political culture suggests the links between religion and environmentalism may not match those reported in the United States. Hayes and Marangudakis (2001a) used a sample of 1065 adults from the 1993 British Social Attitudes survey data to examine attitudes towards nature in relation to religious affiliation. The scale of 'dominion' did not specifically ask about human dominance or exploitation, but it did contain an item about animals having the same moral rights as humans. The results suggested that, if anything, religious people had lower dominion scores than atheists, and that among Christians it was Catholics, rather than Protestants, who held stronger dominion beliefs. The difference between the religious and non-religious was explained by differences in scientific knowledge between the two groups.

This brief overview of the response to White's idea suggests several factors that might guide current research in this area: first, the need for more studies outside the United States, where the parallel politicisation of religion and environmentalism is less prevalent; second, the need to develop notions of biblical literalism that are more directly relevant to theological ideas about creation; and third, the need to develop more sophisticated operationalisations of the theological constructs of dominion, stewardship and sacramentalism that may mediate between biblical interpretation and environmentalism. Another issue is the legitimacy of using Bible questions in populations that are largely biblically illiterate. If biblical interpretation does shape environmentalism, either directly or indirectly, it is likely to do so only among those who are familiar with the Bible and for whom it has some sort of authority. In Europe this is no longer the population at large. This study therefore examines a sample of committed churchgoers in the United Kingdom, using measures of the interpretation of the Genesis creation story that are based on Hunt's Literal, Anti-literal, Mythological (LAM) scales (Hunt, 1972), alongside empirical operationalisations of the theological constructs of dominion, stewardship and sacramentalism. The aim was to test the idea that, among committed Christians, biblical interpretation of Genesis influences theological beliefs about the environment, and that these in turn influence environmental concern and/or willingness to make personal sacrifices for the good of the environment.

* 1. *Interpreting Genesis literally and symbolically*

Richard Hunt (1972) developed his LAM scales as a way of differentiating between religious belief that was based on a literal understanding of the Christian orthodoxy, rejection of that belief altogether ('anti-literal' belief), and belief based on a mythological understanding of orthodoxy that interpreted the tenants of faith symbolically. Hunt's scales have been adapted by a few researchers who have applied them to interpreting the Bible (Loman & Francis, 2006; Poythress, 1975; van der Lans, 1990). Recently, the typology has been used to develop scales that assess preferences of literal, rejecting (= anti-literal) and symbolic (= mythological) interpretations of Genesis (Village, 2014). Literal and symbolic interpretations were, as expected, the most preferred methods of interpretation among committed churchgoers. Although preference scores for the two scales were inversely correlated, some participants scored high on both scales, suggesting the two modes of interpretation are not necessarily mutually exclusive.

* 1. *Conceptualising the relationships of interpretation, theology and environmentalism*

The three stances outlined earlier (dominion, sacamentalism and stewardship) may be the underlying theological beliefs that directly shape concern for the environment. Dominion is expected to be associated with literal rather than symbolic interpretation of Genesis, and to lead to reduced concern and low willingness to sacrifice. Sacramentalism is expected to be associated with symbolic rather than literal interpretation of Genesis, and to lead to increased concern and greater willingness to sacrifice. Stewardship may lie somewhere between these two, and there reasons for thinking that it may be a product of the other theological stances, rather than something that is directly related to the Genesis text (Palmer, 1992). Stewardship does have some aspects that may derive directly from a literal interpretation of Genesis (such as the idea of Adam as the one put in the garden to 'till it and keep it', Gen. 2:15, New Revised Standard Version), and some of these are have been linked to notions of dominion. On the other hand, stewardship is theology that has arisen in response to concerns about an over-dominant and unethical attitude towards the environment, so it might also be associated with sacramentalism.

 Environmentalism is a broad construct that consists of different aspects such as concern for the environment, willingness to make sacrifices to improve the environment, and taking active steps to promote the well-being of the environment. People who have pro-environment attitudes may not have the capability or opportunity to be environmental activists, so assessing attitudes may be a more sensitive way of assessing environmentalism. Willingness to sacrifice is often linked to concern for the environment, and it seems reasonable to assume that former is driven by the latter, such that concern may be a mediator between theological beliefs and willingness to sacrifice.

Based on the above, the links between biblical interpretation, theological stance and environmentalism can be expressed as in Figure 1. Dominion is predicted to be the most likely theological position to be driven directly by a literal reading of Genesis: the White hypothesis is predicated on this and some studies have demonstrated this possible link. Sacramental understandings of creation are less likely to be derived directly from Genesis, but symbolic readings may allow the accounts to say something about the deeper relationship of God and humans to the natural world. Sacramental ideas of the environment seem to be partly derived from a rejection of dominion, and they may therefore arise among those who have a low attachment to such ideas. The two main theological stances toward the environment of dominion and sacramentalism influence notions of stewardship, which in turn increases concern and/or willingness to sacrifice.

[Figure 1 about here]

 This way of conceptualising the issue raises two broad questions that are addressed in this study:

1. Is there any relationship between literal or symbolic interpretation of Genesis and attitudes towards environment?

2. If so, do preferences for biblical interpretation influence attitudes towards environment directly or indirectly through theological beliefs about the relationships of God, humans and creation?

These broad questions result in a several specific hypotheses derived from the model:

1. Dominion is positively correlated with literalism and negatively with symbolism, but the reverse is true for sacramentalism. Stewardship has no direct relationship with either mode of interpretation.
2. Belief in stewardship mediates the effects of dominion and sacramentalism on concern.
3. Concern mediates the effects of theological stance on willingness to make sacrifices for the environment.
4. Method
	1. *Sample*

In 2009, churches in England were recruited to take part in a survey related to beliefs about creationism and the environment using a network sampling technique. Initial requests were made to all Anglican churches in the York diocese and all Methodist churches in the York and Hull Methodist District. In addition, churches linked to a number of Pentecostal and Free Evangelical networks were approached and asked to take part. This was not a random sample of Christian affiliates, but a convenience sample of committed churchgoers from mainly conservative Protestant denominations

There were two versions of the questionnaires, which were distributed at random among the participating churches. Only one version contained questions related to the environment or interpretation of Genesis, and 537 were sufficiently fully completed to be included in this analysis. Of the 537 respondents in this sample, 52% were women and 48% were men; 36% were aged under 50, 47% were aged between 50 and 69, and 17% were aged 70 or older; 93% attended church at least once a week, 67% read the Bible daily, and 90% prayed daily. Participants were asked for their current church denomination and the main responses were Independent Evangelical (23%), Baptist (21%), Anglican (18%), Methodist (10%), and Pentecostal (15%), with others from various Protestant denominations. For the purposes of this study, affiliation was divided into ‘Anglican-Methodist’ (AM, which included a few from United Reformed churches) and ‘Evangelical / Pentecostal’ (EP, which were mainly individuals from churches in the Fellowship of Independent Evangelical Churches, Baptists, and churches affiliated to the Assemblies of God or Elim).

* 1. *Instruments*
		1. *Interpretation of Genesis.* The two six-item Likert scales used to assess preference for literal and symbolic interpretation of the Genesis creation accounts have been described elsewhere (Village, 2014), and are shown in Table 1. Neither scale contained items related to human relationships with the created order. Both scales had a high internal consistency reliability in this sample (Cronbach's alpha: literal = .95; symbolic = .85).

[Table 1 about here]

2.2.2 *Concern for the environment.* Scales measuring levels of concern for the environment have been widely used in social surveys such as the General Social Survey in the United States or the British Social Attitudes survey. A common way to assess concern is to list issues that are relevant to the context in which they are used and ask individuals to express concern on Likert-type response scales (Fransson & Gärling, 1999; Hand & Liere, 1984; Taylor, 2012; Woodrum & Wolkomir, 1997). This method was adopted in the present study, and the six items in this scale (Table 2a) were introduced with the question 'How concerned are you about the following environmental issues?' The five-item response scale ranged from 'totally unconcerned' (= 1) to 'very concerned' (=5) and there was a high internal reliability (alpha = .85).

2.2.3 *Willingness to sacrifice for the environment.* The contingent valuation method (Mitchell & Carson, 1989) has been used for many years to assess the value or importance that members of the public attach to cultural services. Social surveys will often use respondents' willingness to make personal sacrifices for a common good as a measure of the contingent value they give to something. In environmental surveys, this has been expressed as a willingness to see more money spent by government on environmental protection or a willingness to pay more tax to protect the environment (Boyd, 1999; Kanagy & Nelsen, 1995; Sherkat & Ellison, 2007; Taylor, 2012). The six items in the scale used in this study (Table 2b) were derived from other surveys used in the United Kingdom and elsewhere, updated to include an item on wind farms as this was a strongly contested political issue at the time. The items were introduced by the question 'If it helped to protect the environment, how willing would you be to…? ' The five-item response scale ranged from 'totally unwilling' (= 1) to 'very willing' (=5) and there was a high internal reliability (alpha = .83).

2.2.4 *Dominion.* Although the notion on dominion, or 'mastery over nature' has been widely used in empirical studies or religion and the environment, (e. g. Hand & Liere, 1984; Hayes & Marangudakis, 2001a) its operationalisation has varied, and has often lacked face validity. The six items in the dominion scale drew on some items used elsewhere, but also used new items designed to assess more specifically attitudes toward the dominance of human beings and their relationship to other creatures (Table 3a). They were coded such that a high score indicated the superiority of humans over other living things and the right of humans to rule, dominate or exploit the earth. The item on the exploitation of resources was endorsed by 29% of the sample and had a rather low correlation with the other items in the scale. It was retained because of its face validity with the notion of dominion using creation for human benefit. The scale had a moderate internal consistency reliability of .73 as measured by Cronbach's alpha (Cronbach, 1951).

2.2.5 *Sacramentalism.* These items were created to reflect Haught's (1996) definition of a sacramental approach to the environment, which stresses sacral quality of creation as a primary source of divine revelation. The six items in this scale refer to the presence of God in creation, the revelation of God through creation, and the intimate connection of humans to other living things (Table 3b). One item referring to the right of every living thing to exist was the reserved-coded version of an item used in the dominion scale: its inclusion improved reliability and made no significant difference to any of the results. Cronbach's alpha was adequate at .65.

2.2.6 *Stewardship.* Like the notion of dominion, stewardship has been operationalised in some studies of religion and the environment (e. g. Eckberg & Blocker, 1996; Sherkat & Ellison, 2007), but not always in ways that capture different aspects of this belief. The six-item scale used in the present study employed some items from previous studies and some newly created items that reflected the role of humans as those who look after the earth and have charge of it (Table 3c). The item related to respect for God's creation was intended to capture the notion God as the 'owner' and has been used elsewhere as a measure of stewardship (Sherkat & Ellison, 2007). The item on the earth supplying human needs, although also linked to dominion, was retained in the stewardship scale because it linked to notions that humans, as stewards, are the main focus and beneficiaries of creation. The scale had an alpha reliability score of .64, which is close to the .65 generally considered adequate for analytical purposes (Kline, 2000).

* 1. *Analysis*

Analysis was in three stages. First, bivariate correlations were calculated for all variables to examine the total effects of biblical interpretation and theological stance on concern for the environment and willingness to sacrifice to preserve it. Second, path analysis using Amos 20.0 (Arbuckle, 2011) examined direct and indirect effects of interpretation and theological stance on concern and willingness to sacrifice. The full model was based on the *a priori* conceptualisation in Figure 1 and included all direct effects of biblical interpretation and theological stance on environmental variables. Finally, a path model was specified by removing non-significant direct effects and the model fit to the data was tested using a range of indices (Byrne, 2010).

1. **Results**

Levels of concern for the environment were fairly high in this sample, with 72%, on average, expressing some concern for the six areas mentioned in the scale (Table 2a). Concern was highest for pollution (85%) and loss of habitats (86%), and lowest for global warming, where only 57% of the sample expressed concern. Willingness to sacrifice was slightly less often endorsed, with 61%, on average, expressing willingness in relation to matters such as paying more for fuel, travelling less or having a wind farm built nearby. Willingness to pay more tax, at 49%, was the least supported idea, but was still considerably higher than among a national sample taken around the same time, where only 22% were willing to pay more tax to protect the environment (Taylor, 2012).

[Table 2 about here]

Most items in the dominion scale were frequently endorsed: 85% agreed that God wants humans to have dominion over other creatures, 81% agreed that humans are the most important species on earth, and 71% disagreed with the idea that earth was not created to be ruled by human beings (Table 3a). Far fewer (29%) agreed that humans should exploit the earth's resources, and dominion seemed to be mainly about the superior status of humans in the divine economy.

Sacramental notions of creation were also well supported (Table 3b), which is perhaps surprising in a sample of mainly conservative Evangelicals and Pentecostals. Nearly all agreed that nature reveals God's generosity, and 72% that God is revealed as much in creation as in the Bible. The presence of God in creation was agreed by 84%, though slightly fewer (68%) agreed that all of creation is sacred.

Stewardship was also strongly supported, mainly in terms of respecting the God's creation, or humans being either guardians of nature, created to look after the earth, or in charge of the earth, which were all endorsed by over 80% of respondents (Table 3c). There was less support (60%) for the idea that the earth was created to supply human needs, so stewardship was not necessarily seen as primarily about human benefit.

[Table 3 about here]

Overall, scores were slightly above the mid-scale score (18) for all three theological scales, highest for stewardship and lowest for dominion (Table 4). Average dominion scores for Anglicans and Methodists in this sample were significantly lower than for those from other churches, suggesting that expanding the survey to include a wider range of churches may indicate less support for dominion than indicated here. Nonetheless, the generally high levels of support suggest that among many ordinary churchgoers the idea of human superiority over other creatures is widely believed. Among Anglicans and Methodists, sacramental attitudes toward creation seemed to be more prevalent than those of dominion, but dominion and sacramentalism scored the same among Evangelicals and Pentecostals. Concern, but not willingness to support, was higher for Anglicans and Methodists than for others.

[Table 4 about here]

* 1. *Bivariate correlations*

The strong negative correlation of literal and symbolic interpretation (Table 5) has been reported elsewhere (Village, 2014) and indicates that, as expected, literal and symbolic interpretation are generally (but not entirely) opposite ways of understanding the Genesis accounts. Literal interpretation was negatively correlated with the environmental variables and positively correlated with the dominion scale, which would seem to confirm the White hypothesis. It was not related to sacramental scores but was positively correlated with stewardship. The results for symbolic interpretation were largely predictable from its strong negative with literal interpretation: it was positively correlated with both environmental variables, negatively with dominion and stewardship, and positively with a sacramental view of creation. The relationships among the theological variables were not quite in line with initial expectations because both sacramental and dominion views of creation were positively correlated with stewardship. Concern for the environment was positively correlated with sacramental belief, negatively with dominion, and uncorrelated with stewardship. Willingness to sacrifice was strongly correlated with concern, but only weakly correlated, if at all, with the theological variables.

[Table 5 about here]

* 1. *Path analysis*

Interpretation of Genesis had significant overall effects on concern for the environment, with symbolic interpretation promoting concern and literal interpretation reducing it (Table 6). For literal interpretation this was a direct effect, but for symbolic interpretation this was mostly indirect. Dominion had a strong negative direct effect on concern, and a weak positive indirect effect. Sacramental stance to the environment was positively related to concern, but only indirectly. Effects of interpretation scores on willingness to sacrifice for the environment were weak or non-existent and, of the three theological stances, only stewardship had any overall effect: a positive effect that was indirectly mediated through concern. Dominion had no overall effect on sacrifice, but there was a weak but statistically significant negative indirect effect which was mediated through its negative correlation with concern. The lack of an overall effect was partly because high dominion scores were also correlated with high stewardship scores, and the latter tended to increase rather than decrease concern.

[Table 6 about here]

The final path model (Figure 2) was a reasonably good fit to the data (χ2 = 16.02, *df* = 8, *p* = .04; Adjusted Goodness of Fit Index = .97; Root Mean Square Error of Approximation = .04, 90% CL = .01 - .07, PCLOSE = .60). The effects of interpretation on theological stance were not entirely symmetrical: although dominion was positively correlated with literalism and negatively with symbolism, both modes of interpretation seemed to promote sacramental attitudes to creation, while only literalism (weakly) promoted stewardship. Combining direct and indirect effects, the standardised total effect of literal interpretation on stewardship was .40 (*p* < .01) while the comparable effect of symbolic interpretation was .08 (*p* < .05).

[Figure 2 about here]

1. **Discussion**

This study set out to explore two main questions that stem from the White hypothesis. The first was about the relationship between literal or symbolic interpretation of Genesis and attitudes towards environment. Previous studies have tended to be from the United States, and have mostly used single-item scales to assess general attitudes to the Bible, such as the 'literalism' question in the General Social Survey (ARDA, 2013). This tends to classify people as either literalists or not literalists, and there is little attention given to the importance of symbolic interpretation. This study used two scales specifically related to literal or symbolic interpretation of Genesis. The results showed that concern for the environment and willingness to sacrifice to protect it were negatively correlated with literalism and a positively correlated with symbolism. These results are in line with studies in the United States that have shown negative bivariate correlations between biblical literalism and a range of attitudes associated with environmentalism (Boyd, 1999; Greeley, 1993; Schultz et al., 2000; Wolkomir et al., 1997b; Woodrum & Hoban, 1994; Woodrum & Wolkomir, 1997). Most of these studies have concluded that it is not literalism *per se* that reduces environmentalism and that the relationship arises because literalism is also associated other factors that more directly affect environmental attitudes.

This raises the second main question addressed by this study: do preferences for biblical interpretation influence attitudes towards environment directly or indirectly through theological beliefs about the relationship of God, humans and creation? The two main sorts of factors that have explained the associations between biblical interpretation and environmentalism in the United States are socio-political factors and wider theological and religious beliefs. In the United Kingdom party political affiliation is not closely related to religiosity (McAndrew, 2010) and there unlikely to be political reasons why biblical interpretation would be linked to environmental attitudes. In the United States, theological beliefs about dominion and stewardship have been shown to mediate the effects of literalism or inerrancy (Sherkat & Ellison, 2007; Wolkomir et al., 1997b). In this study theological stances of dominion, stewardship and sacramentalism mediated at least some of the effects of biblical interpretation. Symbolic interpretation had only indirect effects on environmentalism, mediated through promoting sacramental creation theology and inhibiting dominion theology. Literalism had similar (but opposite) indirect effects, but also retained some small but statistically significant direct negative effect on concern for the environment. Given that the literalism scale was specifically related to interpretation of the Genesis creation accounts, the findings suggest that this way of interpreting these passages might indeed reduce the concern for the environment. However, this did not result in any reduced willingness to sacrifice to protect the environment, and in this sense the White hypothesis did not seem to hold in this particular sample.

Having answered the two main questions, the analysis also examined three specific hypotheses that tested the conceptual model linking interpretation, theology and environmentalism:

*Dominion is positively correlated with literalism and negatively with symbolism, but the reverse is true for sacramentalism. Stewardship has no direct relationship with either mode of interpretation.* This was supported for symbolic interpretation, which had the expected relationships with dominion (negative), sacramentalism (positive) and stewardship (no correlation). Literalism, as predicted, was positively correlated with dominion, but also positively correlated with sacamentalism and with stewardship. Literalists may see in the Genesis accounts the sort of intimate interaction of God and creation that is a common thread in sacramental approaches to the environment. Sacramental theologians might argue that this precisely the sort relationship that was present all along, but may have been forgotten by later Christian traditions. Matthew Fox's book title *Original Blessing* (Fox, 1983) succinctly points to his contention that Augustinian notions of the corruption of nature by the Fall do not do justice to the power of Genesis 1:31 'And God saw everything that he had made, and indeed it was very good' (New Revised Standard Version). The idea that literalism is simply a label that implies dominion theology needs refining and nuancing, at least for the churchgoers in this sample.

*Belief in stewardship mediates the effects of dominion and sacramentalism on concern.* This seemed to be true for sacramentalism, but dominion had both direct and indirect effects on stewardship. Although the relationship of stewardship theology to Genesis is problematic, this kind of attitude to creation seems crucial to mediating general theological positions about the status of humans in the created order to concern for the environment and hence willingness to sacrifice to protect it.

*Concern mediates the effects of theological stance on willingness to make sacrifices for the environment.*  This was shown to be so, with sacrifice being directly correlated only with concern. This highlights that the measures used to assess environmentalism in relation to religion may influence the outcome. It could be argued that it is only individual pro-environmental activity that is a true test of White's hypothesis, but this would be to ignore the important aspect of changed mind-sets and the way that changes in willingness to sacrifice can lead to large-scale political initiatives that achieve more than individual actions. Concern seems to be driven by two opposite tendencies: reduction in concern linked with literalism and dominion, and increased concern linked with stewardship. Reduced concern may arise because God in the Genesis accounts is portrayed as being in control of creation (especially in the priestly account in chapter 1), so strong views about divine sovereignty may see any apparent ecological 'crisis' as nonetheless falling within God's purposes for the human race. If human dominion of nature is by divine fiat, then there is less reason to fear any effects of human interaction with nature. This tendency is countered by belief that humans have a key role of caring for creation of God's behalf. In this study stewardship was crucial in promoting concern and hence willingness to sacrifice.

* 1. *The relationship of the theological stances to creation*

These results refer to a sample of committed churchgoers from mainly Evangelical and Pentecostal traditions. As such, the levels of support for dominion are probably higher than for most churchgoers in the United Kingdom, but nonetheless indicate that this is a commonly-held stance. The higher level of support for sacramental creation theology among the more liberal Anglican and Methodist churches was not surprising, but even among the more conservative churches there was willingness to accept the presence of God in creation. Statements such as 'God is present in all creation' might seem to hint at a panentheism that is at odds with orthodox and Reformed notions of the fall of creation, but over 80% of those sampled agreed with this statement. Where there was contrast in the two stances it seemed be about relation of humans to other creatures, with sacramental views seeing more equality and connection, and dominion positing more distance and superiority.

White's hypothesis was that the attitude of dominion made it easier for Western cultures to see the environment as something distinct from humans, and therefore more likely to be over-exploited. This, as Bauckham (2002) and others have pointed out, is not necessarily so, and what is claimed for at a historical-cultural level may also operate at an contemporary-individual level. In this sample both dominion and sacramental stances predicted stronger stewardship attitudes, but perhaps for different reasons. Dominion stresses human privilege, which may be seen as carrying the responsibility for care of creation. Sacramentalism stresses the unity of creation and the divine presence within it, which gives a different reason for the requirement for humans to respect and care for creation. So although dominion and sacramentalism are in some ways opposite stances to nature, they both can promote stewardship, and the empirical evidence of this study seems to support this.

1. **Conclusion**

In some ways the social-science attempts to 'test' the White hypothesis have been misconstrued from the start because his idea was that it was broad historical trends in culture that led to the sort of zeitgeist that could foster the industrial revolution and the ecological damage that resulted from it. Among population at large it seems likely that views on the environment will be driven by the wider political and social context rather than by specific religious beliefs. Meaningful religious effects, especially those related to the Bible, are more likely to emerge among those who are familiar with the text and for whom it holds unique authority. This study of committed Christians has moved the field forward by looking at the question in a culture where religion and politics are less closely related, and by using more relevant and nuanced scales relating to biblical interpretation and theological stance to creation. Although cross sectional analyses can never prove cause and effect, a model in which interpretative choices influence theological stances, which in turn influence concern for the environment, but not willingness to sacrifice to protect it, seems to fit the data reasonably well. Stewardship emerges as a key notion that is derivative of both dominion and sacramental views and which helps to counter the lack of concern induced by literal interpretation of Genesis or dominion theology.

Table 1: Details of the biblical interpretation scales

|  |  |  |  |
| --- | --- | --- | --- |
| a) **Literal** α = .95 | Percentage response to items |  |  |
|  | Disagree | Not certain | Agree | CIT | FL |
| The Genesis account shows exactly how the world came to be | 20 | 12 | 69 | .88 | .92 |
| Genesis tells us exactly how humans were created | 19 | 11 | 70 | .87 | .91 |
| I interpret the biblical account of creation literally | 29 | 13 | 59 | .81 | .87 |
| The whole human race is descended from Adam and Eve | 13 | 13 | 75 | .85 | .90 |
| Human sinfulness exits because of Adam and Eve’s disobedience | 12 | 9 | 80 | .80 | .86 |
| Adam and Eve did not exist as historical people\* | 75 | 16 | 8 | .83 | .89 |
|  |  |  |  |  |  |
| b) **Symbolic** α = .85 | Percentage response to items |  |  |
|  | Disagree | Not certain | Agree | CIT | FL |
| The Genesis account contains truths expressed in fictional stories | 62 | 14 | 25 | .65 | .79 |
| Genesis uses symbolic language to say why humans were created | 48 | 14 | 37 | .76 | .87 |
| Genesis uses analogies to teach us about God and human nature | 36 | 14 | 50 | .74 | .85 |
| I interpret the biblical account of creation symbolically | 57 | 13 | 30 | .73 | .85 |
| Eating the forbidden fruit is a metaphor of human disobedience | 35 | 11 | 54 | .65 | .76 |
| Adam and Eve stand for the human race | 15 | 13 | 71 | .22 | .30 |

Note. Categories at either end of each response have been combined, *n* = 537. α = Cronbach's alpha; CIT = Corrected item-total scale correlation; FL = factor loadings from a principal components extraction.

Table 2: Details of the environmental scales

|  |  |  |  |
| --- | --- | --- | --- |
| 1. **Concern** α = .85
 | Percentage response to items |  |  |
|  | Unconcerned | Neither | Concerned | CIT | FL |
| Global warming | 23 | 20 | 57 | .63 | .73 |
| Over population | 18 | 18 | 65 | .59 | .70 |
| Industrial pollution | 7 | 8 | 85 | .72 | .82 |
| Intensification of farming | 14 | 23 | 63 | .61 | .74 |
| Extinction of species | 9 | 16 | 76 | .67 | .80 |
| Loss of natural habitats | 5 | 9 | 86 | .68 | .81 |
|  |  |  |  |  |  |
| 1. **Willingness to sacrifice** α = .83
 | Percentage response to items |  |  |
|  | Unwilling | Neither | Willing | CIT | FL |
| Pay much higher taxes | 23 | 28 | 49 | .64 | .79 |
| Pay more for food or fuel | 17 | 22 | 61 | .68 | .81 |
| Accept cuts in your standard of living | 11 | 24 | 65 | .71 | .83 |
| Reduce the amount you travel | 15 | 23 | 62 | .59 | .73 |
| Have a wind farm built near to where you live | 18 | 15 | 67 | .47 | .61 |
| Support restrictions on economic development | 13 | 27 | 60 | .56 | .68 |

Note. For explanations, see Table 1.

Table 3: Details of the theological stance toward creation scales

|  |  |  |  |
| --- | --- | --- | --- |
| 1. **Dominion** α = .71
 | Percentage response to items |  |  |
|  | Disagree | Not certain | Agree | CIT | FL |
| The earth was not created to be ruled by human beings\* | 71 | 12 | 17 | .48 | .68 |
| Animals should have the same moral rights as humans\* | 75 | 13 | 12 | .58 | .78 |
| God wants humans to have dominion over other creatures | 7 | 9 | 85 | .55 | .73 |
| Human beings are the most important species on earth | 10 | 9 | 81 | .55 | .76 |
| We should exploit the earth’s resources for our benefit | 56 | 15 | 29 | .16 | .33 |
| Every living thing has an equal right to exist\* | 34 | 19 | 47 | .42 | .67 |
|  |  |  |  |  |  |
| 1. **Sacramental** α = .65
 | Percentage response to items |  |  |
|  | Disagree | Not certain | Agree | CIT | FL |
| God is revealed in Creation as much as in the Bible | 18 | 10 | 72 | .41 | .70 |
| Humans are deeply connected to all living things | 15 | 21 | 64 | .33 | .54 |
| All of Creation is sacred | 16 | 16 | 68 | .52 | .74 |
| God is present in all Creation | 9 | 8 | 84 | .40 | .68 |
| Nature reveals God’s goodness and generosity | 1 | 3 | 97 | .24 | .41 |
| Every living thing has an equal right to exist | 34 | 19 | 47 | .38 | .60 |
|  |  |  |  |  |  |
| 1. **Stewardship** α = .64
 | Percentage response to items |  |  |
|  | Disagree | Not certain | Agree | CIT | FL |
| Humans should respect nature because it was created by God | 2 | 2 | 96 | .43 | .65 |
| Humans were created to look after the earth | 7 | 4 | 88 | .49 | .73 |
| Humans are not the guardians of nature\* | 83 | 8 | 9 | .29 | .60 |
| God has put human beings in charge of the earth | 8 | 9 | 83 | .54 | .78 |
| The earth was created by God to supply human needs | 25 | 15 | 60 | .34 | .50 |
| Preserving Creation is one the most important human duties | 13 | 12 | 75 | .22 | .36 |

Note. \* These items were reverse coded to create the scale. For other explanations, see Table 1.

Table 4: Mean (*SD*)scores of variables for main church-tradition groups

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | All |  | AM | EP |  | *t* |
|  | *N =* | 537 |  | 163 | 374 |  |  |
| Biblical interpretation | Literal | 23.9 (6.6) |  | 18.7 (6.7) | 26.1 (5.2) |  | 7.4\*\*\* |
| Symbolic | 17.1 (6.3) |  | 21.3 (5.0) | 15.3 (5.9) |  | 6.1\*\*\* |
| Theological stance | Dominion | 21.6 (4.4) |  | 19.1 (4.2) | 22.6 (4.1) |  | 3.5\*\*\* |
| Sacramental | 23.2 (3.9) |  | 24.3 (3.0) | 22.7 (4.1) |  | 1.6\*\*\* |
| Stewardship | 24.6 (3.5) |  | 23.9 (3.4) | 24.9 (3.4) |  | 1.0\*\* |
| Environmentalism | Concern | 22.6 (4.4) |  | 24.3 (3.8) | 21.9 (4.4) |  | 2.5\*\*\* |
| Sacrifice | 21.0 (4.2) |  | 21.5 (3.9) | 20.8 (4.4) |  | 0.8 |

Note. AM = Anglican and Methodist churches; EP = Evangelical and Pentecostal churches. *t* = Student's *t* for difference in means between church traditions with 535 *df. . \*\* p* < .01*; \*\*\* p* < .001*.*

Table 5: Correlation matrix

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Sacrifice | Concern | Stewardship | Sacramental | Dominion | Symbolic |
| Literal | -.16\*\*\* | -.26\*\*\* | .34\*\*\* | -.06 | .46\*\*\* | -.72\*\*\* |
| Symbolic | .16\*\*\* | .28\*\*\* | -.17\*\*\* | .29\*\*\* | -.48\*\*\* |  |
| Dominion | -.07 | -.36\*\*\* | .37\*\*\* | -.45\*\*\* |  |  |
| Sacramental | .09\* | .24\*\*\* | .24\*\*\* |  |  |  |
| Stewardship | .09\* | .06 |  |  |  |  |
| Concern | .41\*\*\* |  |  |  |  |  |

Note. \* *p* < .05; \*\*\* *p* < .001.

Table 6: Direct and indirect effects of interpretation and theological stance on environmental variables

|  |  |  |  |
| --- | --- | --- | --- |
|  | Concern for the environment |  | Willingness to sacrifice to protect the environment |
|  | Total |  | Direct |  | Indirect |  | Total |  | Direct |  | Indirect |
|  | *B* | β |  | *B* | β |  | *B* | β |  | *B* | β |  | *B* | β |  | *B* | β |
| Concern |  |  |  |  |  |  |  |  |  | 0.402\*\* | .418\*\* |  | 0.402\*\* | .418\*\* |  |  |  |
| Literal | -0.096\*\* | -.143\*\* |  | -0.105\* | -.157\* |  | 0.009 | .014 |  | -0.064 | -.099 |  | -0.062 | -.097 |  | -0.002 | -.002 |
| Symbolic | 0.116\* | .166\* |  | 0.023 | .033 |  | 0.093\*\* | .133\*\* |  | 0.056 | .083 |  | 0.029 | .043 |  | 0.027 | .040 |
| Dominion | -0.283\*\* | -.286\*\* |  | -0.357\*\* | -.360\*\* |  | 0.074\* | .075\* |  | 0.023 | .024 |  | 0.134 | .141 |  | -0.111\* | -.116\* |
| Sacramental | 0.132\* | .116\* |  | -0.002 | -.002 |  | 0.134\*\* | .118\*\* |  | 0.102 | .092 |  | 0.025 | .023 |  | 0.077\* | .070 |
| Stewardship | 0.317\*\* | .248\*\* |  | 0.317\*\* | .248\*\* |  |  |  |  | 0.183\* | .148\* |  | 0.055 | .045 |  | 0.127\*\* | .104\*\* |

Note. B = unstandardised coefficient; β = standardised coefficient; \* *p* < .05; \*\* *p* < .01; \*\*\* *p* < .001.

Figure 1: Conceptualisation of the relationships of interpretation, theological stance and environmentalism

Interpretation

Dominion

Sacramental

Stewardship

Environmentalism

**+**

-

-

**+**

-

**+**

Literal

Symbolic

Figure 2: Path diagram with standardised regression coefficients.

Literal

Dominion

Sacramental

Stewardship

Concern

Sacrifice

.23\*\*\*

-.46\* \* \*

.52\* \* \*

-.37\* \* \*

.25\* \* \*

.47\* \* \*

.42\* \* \*

.13\* \*

-.18\*\* \*

.41\* \* \*

Symbolic

-.32\*\*\*

.36 \* \* \*

-.72\*\*\*

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