

An examination of barriers to physical education for Christian and Muslim girls attending comprehensive secondary schools in the UK

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Abstract

This study examined barriers to Physical Education (PE) in a sample of Christian and Muslim schoolgirls attending UK comprehensive secondary schools. Also assessed was whether religion and school year (age) had any impact upon barrier strength and if school year $\times$ religion interactions existed. A questionnaire was developed and exploratory factor analysis was utilised to uncover barrier factors. Six factors were found; these were: 'Self-Conscious', 'Sensations', 'Embarrassment', 'Dislike/Unimportant', 'PE Uniform' and 'Religiosity'. For the total sample, the highest quotient was assigned to the 'PE Uniform' barrier factor. The remaining barrier factors received relatively low quotients. When analysed by religious persuasion, it was found that four of the barrier factors were rated significantly higher by the Muslim girls. For both Christian and Muslim samples, barrier strength tended to increase in line with school year (age). School year $\times$ religion interactions were also evident. These results provide a contemporary picture of potential barriers to PE for girls attending comprehensive secondary schools in the UK.

Keywords

Physical education, barriers, religion, school year

Introduction

In 2004, a report by The World Health Organization (Bailey et al., 2004) raised concerns about the low activity levels of girls. The report highlighted the fact that in many Western countries (e.g. USA, Canada, Spain), girls were considerably less active than boys. Similar trends have also been

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found in the UK. The most recent data indicates that only 15% of English secondary school-aged girls (11–15 years) meet the recommended physical activity guidelines (Women's Sport and Fitness Foundation, 2012a). Similar to other Western nations, gender disparities have been found, with boys being on average twice as active as comparably aged girls (Health Survey for England, 2008; Women's Sport and Fitness Foundation, 2012a). It has been predicted that the number of physically active girls could fall by another 5% by 2017 (Women's Sport and Fitness Foundation, 2012b).

School-based Physical Education (PE) is often promoted as a means of encouraging children, and in particular girls, to become physically active (Fox and Harris, 2003; Gorely et al., 2011). It is assumed that involvement in PE will provide the associated health, social, cognitive and affective benefits (Bailey et al., 2004, 2009; Fox and Harris, 2003) whilst also encouraging lifelong participation (Kirk, 2005). In 2003, the UK Government implemented the National Strategy for Physical Education, School Sport and Club Links (PESSCL). The primary aim of this strategy was to ensure that at least 85% of all school children in England received a minimum of 2 hours of high-quality PE a week; this was to be achieved through both school-based and extra-curricular activity programmes. According to official data, these targets were met, and actually surpassed in 2008 (Quick et al., 2008). Although the current UK Government, elected in 2010, discontinued the PESSCL strategy, it nevertheless stated that it intends to increase PE participatory levels even further¹ (Bardens et al., 2012).

Whilst efforts to ensure participation through school-based activity programmes are admirable, if the often-cited benefits are to ensue, then presumably pupils not only need to be fully engaged, but must also find the experience both worthwhile and enjoyable (Bailey et al., 2009; Birtwistle and Brodie, 1991). Unfortunately, it has been reported that many girls hold unfavourable views towards the subject area (Browne, 1992; Flintoff and Scraton, 2001, 2006). Researchers have identified a number of gender-specific barriers that might diminish the PE experience for secondary school girls; these include inappropriate PE uniform, a belief that PE is less important for career plans than other subjects, a dislike of the competitive elements of sport, not being good at or interested in PE, self-consciousness and embarrassment and a negative perception of physical sensations (Browne, 1992; Dwyer et al., 2006; Flintoff and Scraton, 2001; Garcia et al., 1995; Williams and Bedward, 2001). Whilst we recognise that many of the preceding examples are dated, the most recent UK survey, conducted by The Women's Fitness Foundation (2012a), indicates that many of these barriers still remain relevant. However, although the findings of The Women's Fitness Foundation (2012a) are informative, we argue that further investigation is warranted to create a more current assessment of barriers to PE for girls, especially as much of the research has been conducted outside the UK. Furthermore, the aforementioned research has tended to consider girls as a homogeneous group with little attention paid to potential moderators such as religious affiliation (e.g. Christianity and Islam) and age (i.e. school year).

Attending firstly to religion, although some studies have been conducted into the potential barriers for girls adhering to the Islamic faith, the current authors could not uncover any study that has explicitly assessed potential barriers to PE for Christian girls. Furthermore, as far as we are aware, no study to date has made direct comparisons of barriers between UK Christian and Muslim girls of secondary school age. Regarding Christianity, whilst it should be acknowledged that the tenants of Muscular Christianity were more promotive of physical activity for males (Watson et al., 2005), this seems to be less relevant in contemporary UK society. For example, Government agencies such as ContinYou (2010) and Sporting Equals (2012) make no reference to any religious-based barriers for girls adhering to 'mainstream' Christianity. A study conducted by

MacDonald and Kirk (1999) appears to concur, as it was found that Christians often believe that participation in physical activity should be encouraged, regardless of gender. However, the preceding assertions are not necessarily ubiquitous. Devout Christians and those adhering the more unorthodox denominations might experience religious-based barriers, in particular, issues surrounding modesty (ContinYou, 2010; Sporting Equals, 2012). Recognising that the study of MacDonald and Kirk (1999) is not directly applicable, given that it was conducted in Australia and focused upon student teachers attitudes to PE, the findings do nevertheless have some relevance to this investigation. It was found that some student teachers held what were considered 'traditional' views on gender and physical activity. For example, some believed that girls and young women should refrain from activities which might jeopardise feminine and Christian responsibilities. Mention was also made of how involvement in sport in general could negatively impact upon women's responsibilities as wives, although this point was not elaborated on in any detail. It is worth noting that none of those questioned by MacDonald and Kirk (1999) were aligned to what might be considered as unorthodox Christian denunciations. Some did, however, hold fundamentalist beliefs and claimed to follow a literal interpretation of the Bible, which does, for example, make reference to issues surrounding modesty (Firebible: King James Version, 2012, p.1942). Despite a lack of direct evidence regarding Christianity and female participation in physical activity in general, it does seem that for some Christian secondary school girls, barriers to PE might be impacted by their level of religiosity. However, it appears that for 'mainstream' Christians, faith should have limited influence.

Like Christianity, many believe Islam to be promotive of physical activity for all (Kahan, 2003; Walseth and Fasting, 2003). However, researchers such as De Knop et al. (1996), Williams and Bedward (2001), Kahan (2003) and Kay (2006) have suggested that religious-based issues such as mixed-sex venues, dress code, family disapproval and a belief that certain forms of physical activity can be perceived to be unreligious, might restrict sport and exercise participation for females. Such constraints have been found to be an issue in school-based activity; for example, Carroll and Hollinshead (1993) and Kay (2006) have suggested that feelings of guilt can manifest if PE uniforms do not meet the religious requirements of modesty. There have also been claims that some parents may discourage girls from taking part in some sporting activities due to the belief that it might stigmatise families and complicate the marriages of daughters (Johnson, 2000; Kay, 2006). Others still have found that changing facilities, showering and mixed-sex venues can create further barriers to participation (Dagkas and Benn, 2006; Kahan, 2003; Williams and Bedward, 2001). The Islamic concepts of 'awra' (covering nakedness), 'haya' (expressing modesty) and 'fitna' (refraining from activities that might 'tempt' men, e.g. aerobics, dance and gymnastics) likely explain why such issues exist, as Muslim females might be required to adhere to these principles when in public (Mir-Hosseini, 2007; Mir-Hosseini and Hamzic', 2010). Patriarchy, a social system in which the males have authority of women and children, might also be a potential influence (Walseth and Fasting, 2003). A number of points need to be considered before conclusions can be drawn regarding possible constraints to PE for Muslim girls of secondary school age. First, much of the available literature is dated. In recent years, UK organisations such as Muslim Women's Sport Foundation have made efforts to encourage Muslim females to embrace sport and physical activity. Second, Muslim females should not be considered to be a homogeneous group. There is diversity in the way adherents interpret its teachings (Walseth and Fasting, 2003). According to Kay (2006), many 'Westernised' Muslims adopt modernist views on issues such as clothing and mixed-sex venues. Third, many of the available studies have been conducted outside the UK (e.g. De Knop et al., 1996; Kahan, 2003; Walseth and Fasting, 2003), making it difficult to

generalise the findings to Muslim girls attending secondary school in the UK. Nevertheless, it does remain possible that many of the issues raised are relevant, as the very nature of school-based activity programmes (e.g. the potential for mixed venues and inappropriate PE uniform) might create additional barriers to participation for some Muslim girls attending UK secondary schools.

Another potential moderator of barrier strength is age. Research has shown that girls in general tend to become less physically active as they progress through secondary school (Browne, 1992; Caspersen et al., 2000; Subramanian and Silverman, 2007; Telema and Yang, 2000; van Mechelen et al., 2000). However, whilst such evidence is informative, it is by no means comprehensive. To date, there have been few attempts to ascertain whether perceived barrier strength impacts participatory rates. It seems probable that at least some barriers to PE will be influenced by age. For example, the onset and progression through sexual maturity might exacerbate issues surrounding of modesty, self-consciousness, and bodily anxieties which can also impinge upon ones feelings of being looked at or observed by the opposite sex whilst engaging in sport or when showering in public facilities. According to Mendle et al. (2007) and Davison et al. (2007), many girls do indeed become sensitive to societal responses to their biological development. Furthermore, much of the research into the age-related participatory trends of secondary school girls has paid limited attention to religious persuasion (given the sample demographics, it might be assumed that the majority of participants were Caucasian and Christian). It is conceivable that age and religion interact to intensify some barriers to PE. For example, because of the Islamic notions of 'fitna', 'awra' and 'haya', puberty progression might be particularly concerning for Muslim secondary school girls. Similarly, some barriers might be intensified as girls adhering to more orthodox forms of Christianity develop physically.

In summary, much of the research into barriers, both general and religious, to PE for secondary school girls is dated. With the introduction of the UK Equality Act in 2006, it is now unlawful to discriminate, directly or indirectly, on the grounds of religion and gender. This should ensure, in principle at least, that the concerns of girls of all religions should have been addressed within the secondary school environment. Recent data would appear to indicate that many of the issues have been resolved, as over 85% of secondary school children, in England at least, participate in a minimum of 2 hours of high-quality PE a week (Quick et al., 2008). However, one recent investigation conducted by Women's Sport and Fitness Foundation (2012a) has shown that barriers to PE still exist for secondary school girls in general. We have also argued that both religious persuasion and age might exacerbate barriers to PE, and that this might be particularly so for Muslim girls. We contend that further attention is warranted to help develop a more contemporary picture of the barriers to PE faced by secondary school girls in the UK. Therefore, the aim of this investigation is to (1) develop an instrument to measure barriers to PE, (2) examine whether barriers to PE are still evident for girls attending secondary comprehensive schools in the UK, (3) examine whether there are specific issues for girls adhering to the faiths of Christianity and Islam, (4) assess the impact of school year upon barrier strength, and (5) examine whether religion might play a role in any age-related alterations in barrier strength.

Methods

Participants

Participants were drawn from two mixed comprehensive secondary schools located in the county of Lancashire in the North of England. According to the latest census, black and minority ethnicity

(BME) accounts for approximately 10% (the majority being Asian/Asian British) of the County's population (Office of National Statistics, 2011). Access to the schools was granted by the respective head teachers, who were contacted by one of the authors. The questionnaires themselves were distributed to the participants by class teachers. Instructions were provided to the class teachers on how to administer the questionnaires. So as not to exclude any individual from the research process, an act that might be considered divisive, all the pupils in the classes involved were provided with the opportunity to take part. However, only the data from Christian and Muslim participants was actually analysed (a similar protocol was utilised in the pilot procedures). Of those who responded, 38 were unsure of their religion and 11 classified themselves as belonging to religions other than Christianity and Islam. In total, 377 girls were included in the actual investigation; 210 classified themselves as Christian, and 167 classified themselves as Muslim. Unfortunately, despite being instructed to, over 50% of the participants did not provide details of age; as such, this data cannot be provided. However, we can provide details of the age classifications in relation to the school year: 149 were in Year 7 (age approximately 11 years), 146 were in Year 9 (approximately 13 years) and 82 were in Year 11 (approximately 15 years). Ethical clearance was granted by the University of Cumbria Ethical Committee.

Questionnaire development

In phase one, a review of literature was conducted and barriers to PE were noted. This review comprised research associated with both general (Browne, 1992; Dwyer et al., 2006; Fahlman et al., 2006; Flintoff and Scraton, 2001; Garcia et al., 1995; Williams and Bedward, 2001) and religious barriers to female participation (Arar and Rigbi, 2009; Carroll and Hollinshead, 1993; De Knop et al., 1996; Johnson, 2000; Walseth and Fasting, 2003). We recognise that much of the research is dated, with the majority being conducted before the introduction of the 2006 Equality Act. Nevertheless, this fact should allow us to gauge whether such barriers remain relevant. We also acknowledge that the barrier items pertaining to religion were extracted from research based upon barriers faced by Muslim girls. Explaining this decision, there is currently a lack of research regarding possible barriers for Christians involved in PE. However, given some of the arguments regarding potential barriers for Christian girls (e.g. modesty, issues surrounding femininity) we thought it is possible that some of these might also be applicable to the Christian sample. Even if this is not the case, we will nevertheless be able to analyse the comparative impact of religious-based barriers between the samples. From the review process, an initial pool of 37 items was created (28 related to general barriers and nine related religious barriers). The items were scrutinised by a panel ($n = 3$) of experts as to their suitability. All three panel members had a minimum of 15 years' experience of teaching topics related to gender, race and religion in sport. All members of the panel had experience of teaching both qualitative and quantitative research methods at undergraduate level; this included questionnaire design. One of the panel members had published extensively in the area of gender and religion, and another was Equality and Diversity Officer for the University of Cumbria. All were Caucasian, UK Nationals. The panel agreed that the items were appropriate.

In phase two, the selected items were incorporated into an initial questionnaire draft. All questions were worded in the same direction (see Table 1) as to reduce one potential source of common method variance; that is, variance associated with the measurement scale rather than the constructs the scale actually measures (Podsakoff et al., 2003). All of the items were scored on a 5-point Likert scale (1 = Strongly disagree, 5 = Strongly agree). Questions pertaining to age,

school attended and religious orientation were also added. Also included was a question asking participants to state their level of religiousness (1 = not at all and 5 = very much so). We acknowledge that the utilisation of a single-item measure could draw criticism. However, Cotton et al. (2010) have suggested that many of the available multi-item measures of religion might be too cognitively demanding for younger populations (i.e. adolescents). The inclusion of a multi-item measure of level of religiousness would also have increased scale length, which in turn might have negatively impacted validity (Podsakoff et al., 2003) and also reduced practicality (Shukor and Jamal, 2013). According to Cotton et al. (2010), studies that have utilised single-item measures have tended to do so when level of religiousness was not a primary study aim. In the current investigation, this information could be considered secondary as it was used to provide an indication of religiousness and was not used in the main analysis (e.g. exploratory factor analysis (EFA) and multivariate analysis of variance (MANOVA)).

An initial pilot procedure was conducted using 12 female year 7 pupils at a comprehensive school in the north-west of England. Those involved were encouraged to express their opinions on issues such as the organisation of the instrument, question structure, ease of use and words or phrases difficult to read or understand. Few concerns were raised; however, it was suggested that the barriers pertaining to religion be separated from the general barriers and presented in a distinct section. When questioned on this, it was claimed that these barriers should be easily identifiable as to allow participants to make an 'informed' decision as to whether they wanted to disclose information related to religion. Questions pertaining to religion have been highlighted by Tourangeau and Yan (2007) as being sensitive and potentially intrusive. As such, this suggestion was accepted. It is worth stating that although it is often recommended that scale items measuring different constructs should be intermixed (Chang et al., 2010), Podsakoff et al. (2003) believe that this guidance is without empirical foundation.

In phase three, another pilot study was conducted. A total of 211 female pupils from two mixed-gender State Comprehensive Schools, one located in the south-east of England, the other the north-west, participated and were asked to complete the questionnaire. Both schools had a broad BME profile. EFA, a widely used data reduction technique in the social sciences (Costello and Osborne, 2005), was utilised to assess the barrier responses. According to Field (2005), the EFA method of Principle Component Analysis is a valid factor extraction method. At this stage the EFA failed to extract any meaningful factors; it is probable that multiple cross-loadings (items falling into more than one factor) accounted for this. Therefore, the descriptive data was analysed. For some of the items there was a tendency to gravitate towards the median 'neutral' value, whilst for others there was a relatively high non-response rate; this could be indicative of participants' satisficing (Krosnick, 2000) or related to clarity issues. We assumed that the response characteristics accounted for the failure of the initial factor extraction, and as such made a number of amendments to the wording of the 'problematic' items.

Exploratory factor analysis

As a data reduction method, the aim of EFA is to retain the fewest possible factors that explain the highest amount of variance (Henson and Roberts, 2006). Initial attempts to create a factor solution with all of the items proved unsuccessful, as there were again numerous cross-loadings and no obvious factor extraction. Furthermore, the total variance explained at this stage was considered unacceptable at <50% (values >60% are generally recommended). It was therefore decided to run separate EFA procedures for the general and religious-based barrier items. For the general barriers,

Table 1. Item loadings for each factor.

Scale item	Self-conscious	Sensations	Embarrassment	Dislike/unimportant	PE uniform
I don't feel comfortable taking part in PE in front of male staff	0.83				
I don't feel comfortable taking part in PE in front of male pupils	0.82				
I feel self-conscious showing my body shape during PE lessons	0.73				
I don't like showing parts of my body like my legs and arms during PE	0.72				
People staring puts me off taking part in PE	0.52				
I don't like getting breathless		0.75			
I don't like getting hot and sweaty		0.61			
I feel tired and don't feel good after PE		0.62			
I sometimes lack the energy to take part		0.58			
I don't like competing		0.55			
I feel embarrassed doing the activities in PE			0.76		
I feel embarrassed wearing my PE kit			0.69		
I worry about being teased by other pupils			0.61		
Scale item	Self-conscious	Sensations	Embarrassment	Dislike/unimportant	PE uniform
Academic subjects such as maths, science and languages are more important to me than PE				0.79	
PE isn't important as I'm not doing it as a GCSE subject				0.73	
PE is boring				0.55	
I just don't like Taking part in PE				0.52	
I'm not the 'sporty type'				0.52	
I don't like having to wear the school PE kit					0.69
I don't like having to change into my PE kit					0.69
I dislike having to carry a kit bag all day					0.55

initially, the factorability of the 28-item scale items was determined. This gave a poor factor solution, with only 53.5% variance explained. Communalities were then examined and those items possessing a value <0.4 were removed (Field, 2005). Seven items were deleted: 'I dislike playing sport outside when its wet and cold'; 'the teacher is only interested in those that are good at PE'; 'I don't like playing team sports'; 'there is a lack of choice of activities'; 'I don't like getting dirty';

Table 2. The descriptive data for each of the six factors.

Factor	No. of items	Mean (SD)	Alpha (α)
Self-conscious	5	2.50 (1.16)	0.85
Sensations	5	2.86 (1.04)	0.78
Embarrassment	3	1.99 (1.00)	0.71
Dislike/unimportant	5	2.47 (1.02)	0.79
PE uniform	3	3.03 (1.01)	0.56
Religiosity	8	1.74 (0.95)	0.86

Note: Barrier quotients (means) scored out of five (1 = lowest and 5 = highest barrier strength).

‘PE is too hard’ and ‘I feel that the teacher has low expectations of my ability’. The removal of these items produced a more acceptable solution. It is worth stating that the deleted items should not be regarded as irrelevant; rather, they were omitted because they did not fit into this particular factor solution. These items might be considered for inclusion in any future research into this area.

Analysis of the remaining items showed an R-Matrix in which none of the items possessed excessive correlations of >0.9 ; correlations of such magnitudes make it difficult to determine the unique contribution of an item to a particular factor (Field, 2005). The Kaiser-Meyer-Olkin measure of sampling adequacy was 0.89, a value that is considered as being good to great (Field, 2005), therefore suggesting that EFA was an appropriate method of analysis. Bartlett’s Test of Sphericity was highly significant ($p = 0.00$), indicating that all scale items have some level of correlation with other items, and the diagonals of the anti-image correlation were all above 0.8, thus supporting the inclusion of each item in the analytical procedure. Following the suggestions of Costello and Osborne (2005), the scree-plot point of inflection (a visual method to determine which factors should be retained) was used to ascertain the number of factors present. For the general barrier section, five factors were uncovered. The initial eigenvalues showed that the first factor accounted for 34.92% of the variance, the second 9.35%, the third 6.61%, the fourth 5.78% and the fifth 5.47%. The five-factor solution accounted for 62.1% of the total variance. It was assumed that the resulting factors would not necessarily be related, so a varimax rotation was used to discriminate between them. After rotation, the first factor accounted for 14.85% of the variance, the second 14.55%, the third 13.39%, the fourth 11.49% and the fifth 7.85%. The factors were named: (1) ‘Self-Conscious’, (2) ‘Sensations’, (3) ‘Embarrassed’ (4) ‘Dislike/Unimportant’ and (5) ‘PE Uniform’. All factors conformed to the recommendations of Costello and Osborne (2005) in that all had more than two items, possessed extracted factor loadings >0.4 (factor loadings represent the relative importance of each item to the factor and range from 0–1, with higher values representing greater importance), contained few cross-loaded items and a logical data fit. Where cross-loadings did occur, factor items were categorised by using the strongest values. Table 1 shows the final factor solution for the general barriers. Twenty-one items were included on the final scale.

The internal consistency (a measure of reliability) of each sub-scale was determined using Cronbach’s alpha. For all but the ‘PE uniform’ factor, the alphas ranged from acceptable to good (Table 2). According to De Vellis (1991), the alpha for the ‘PE uniform’ factor ($\alpha = .56$) is considered unacceptable. However, this does not mean that this factor should be omitted. Field (2005) believes that the general guidelines for factor acceptability are flawed because relatively low alpha values can be caused by having few items within a factor. The fact that the ‘PE uniform’ factor contained only three items probably accounts for the relatively low alpha value. Based on

the opinion of Field (2005) this factor was retained. Composite scores were calculated for each of the five factors (Table 2).

Religious barriers

The EFA for the religious barriers initially revealed that one item 'I have issues exposing parts of my body other than face and hands' had a low communality (< 0.4). This item was therefore removed. In this instance, given that the items all pertained to religious-based barriers, it was assumed that the items would be related. As such, the procedure was re-run with an oblique rotation (see Field, 2005). The results suggested that the remaining eight items should be considered as a single factor. Cronbach's alpha was $\alpha = 0.86$ (Table 2). The retained items were: 'I feel my family disapproves of me taking part in PE'; 'I disapprove of taking part in PE'; 'I feel that due to their religious beliefs my family does not like me to take part in PE in front of male staff'; 'Due to my religious beliefs I do not like taking part in PE in front of male staff'; 'I feel that due to their religious beliefs my family does not like me to take part in PE in front of male pupils'; 'Due to my religious beliefs I do not like taking part in PE in front of male pupils'; 'I feel that the facilities don't address my religious needs', and 'I feel that being 'sporty' may affect my chances of getting married'. This factor was termed 'religiosity'.

Correlation

To assess whether the factors should indeed be considered as independent, Tabachnick and Fidell (2006) recommend the use of bivariate correlations (Pearson's r). If strong correlations ($> r = 0.9$) are evident between any of the factors then they should be combined. The analysis revealed that none of the factors were excessively correlated, so suggesting that they are measuring independent constructs.

Questionnaire validity

The development of the questionnaire followed the procedures recommended by Silverman and Subramanian (1999) and Field (2005). The final instrument was considered to possess both content (via the initial input from a group of independent researchers) and construct related validity (via EFA and internal consistency alpha values). Without a comparative instrument, criterion validity could not be established. It is worth acknowledging that the use of EFA as a data reduction method has been criticised by some (Biddle et al., 2001; Lane et al., 2005). Nevertheless, others do support its application (e.g. Child, 2006; Costello and Osborne, 2005; Field 2005; Tabachnick and Fidell, 2006), particularly when researchers do not wish to impose preconceived structures (Child, 2006).

Results

Level of religiousness

Presented as mean values, overall, the Christian participants level of religiousness was $M = 2.07$, $SD = .75$ and the Muslim participants, $M = 2.16$, $SD = .74$. An independent t -test (a procedure that uses the t statistic to assess for differences between two means) was conducted to determine whether the samples differed in levels of religiousness. No significant differences were apparent,

Table 3. Means and standard deviations for each factor by year group.

School year	Self-conscious Mean (SD)	Sensations Mean (SD)	Embarrassment Mean (SD)	Dislike Mean (SD)	Uniform Mean (SD)	Religiosity Mean (SD)
Yr7	2.35 (1.14)	2.68 (1.03)	1.86 (0.95)	2.29 (0.96)	2.78 (1.00)	1.82 (0.98)
Yr9	2.62 (1.10)	2.99 (1.01)	2.16 (1.04)	2.69 (1.02)	3.22 (0.95)	1.69 (0.89)
Yr11	2.56 (1.25)	2.93 (1.07)	1.96 (1.06)	2.60(1.07)	3.18 (0.97)	1.65 (1.00)

Note: barrier quotients (means) scored out of five (1 = lowest and 5 = highest barrier strength).

$t(365.08) = 1.11, p = .08$. This suggests that levels of religiousness were comparable between the Christian and Muslim samples.

Multivariate analysis of variance

MANOVA (a multivariate method that uses the F statistic to assess for differences between numerous group means) was used to assess for main effects and interactions for school year, religion and school year $\times$ religion. Multivariate analysis showed that significant main effects were present (Pillai's Trace = $F(6, 322) = 134.21, p < .001$). A repeated measures ANOVA, with Bonferroni correction for multiple comparisons, revealed that most of the factor scores were significantly different to each other, $p < .001$. For main effects, only the factors of 'self-conscious' and 'dislike/unimportant' were considered to be of a statistically similar magnitude. All of the other factors were statistically different to one and other at $p = .00$. The most important findings at this stage of the analysis were that the factor with highest quotient (PE Uniform) was statistically higher than all the others. Likewise, the lowest rated factor (religiosity) was statistically lower than the rest.

Significant effects for religious persuasion (see Table 3) were found (Pillai's Trace = $F(6, 324) = 25.20, p < .001$). Pairwise comparisons, with Bonferroni correction for multiple comparisons, revealed significant differences for the factors of 'religiosity' (Christian $M = 1.28$; Muslim $M = 2.20$); ($F(1, 329) = 102.87, p < .001$), 'PE uniform' (Christian $M = 2.84$; Muslim $M = 3.33$); ($F(1, 329) = 22.71, p < .001$), 'self-conscious' (Christian $M = 2.11$; Muslim $M = 2.92$); ($F(1, 329) = 52.99, p < .001$) and 'dislike/unimportant' (Christian $M = 2.41$; Muslim $M = 2.65$); ($F(1, 329) = 4.66, p = .031$)

An effect was also found for school year (Pillai's Trace = $F(12, 650) = 2.54, p = .003$) for the factors of 'uniform' ($F(2, 329) = 10.52, p < .001$) and 'dislike/unimportant' ($F(2, 329) = 5.60, p = .004$). Pairwise comparisons, with Bonferroni correction applied, showed that for the 'PE uniform' factor, significant differences were apparent between Year 7 and Year 9, $p < .001$, and between Year 7 and Year 11, $p = .007$. For 'dislike/unimportant' differences were evident between Year 7 and Year 9, $p = .004$; differences were also approaching significance between Year 7 and Year 11, $p = .07$ (see Table 3).

Regarding the school year $\times$ religion (see Table 4), a significant interaction was present (Pillai's Trace = $F(12, 650) = 2.92, p = .01$). Independent t -tests showed that at Year 7, religious persuasion had a significant effect upon the factors of 'religiosity' ($t(108.15) = -6.93, p < .001$), 'PE uniform' ($t(130) = -2.58, p = .011$), 'self-conscious' ($t(130) = -6.88, p < .001$), 'sensations' ($t(130) = -2.21, p = .02$) and 'dislike/unimportant' ($t(130) = -3.70, p < .001$). At Year 9, there were significant differences between Muslims and Christians participants for 'religiosity'

Table 4. Means and standard deviations for each factor based upon religion and religion by year group.

Religion	Self-conscious Mean (SD)	Sensations Mean (SD)	Embarrass-ment Mean (SD)	Dislike Mean (SD)	Uniform Mean (SD)	Religiosity Mean (SD)
Christian	2.11 (1.03)	2.76 (1.06)	1.93 (0.97)	2.41 (1.03)	2.84 (0.96)	1.28 (0.61)
Muslim	2.98 (1.12)	2.98 (1.00)	2.06 (1.07)	2.65 (0.95)	3.33 (0.94)	2.21 (0.98)
Christian Yr.7	1.88 (0.91)	2.52 (1.07)	1.85 (0.99)	2.00 (0.90)	2.57 (0.99)	1.33 (0.64)
Christian Yr.9	2.39 (1.04)	3.18 (0.98)	2.21 (1.01)	2.74 (1.06)	3.17 (0.89)	1.27 (0.51)
Christian Yr.11	2.04 (1.13)	2.59 (0.99)	1.73 (0.81)	2.48 (1.02)	2.78 (0.91)	1.21 (0.70)
Muslim Yr.7	3.07 (1.07)	2.92 (0.95)	1.91 (0.99)	2.58 (0.91)	3.00 (0.92)	2.31 (0.92)
Muslim Yr.9	2.77 (1.12)	2.74 (0.97)	1.98 (1.04)	2.63 (0.94)	3.42 (0.89)	2.12 (0.99)
Muslim Yr.11	3.09 (1.17)	3.27 (0.97)	2.29 (1.22)	2.72 (1.06)	3.58 (0.93)	2.20 (1.05)

Note: Barrier quotients (means) scored out of five (1 = lowest and 5 = highest barrier strength).

($t(98.56) = -5.88, p < .001$) and 'sensations' ($t(121) = 2.39, p = .018$). At Year 11, no significant differences were present.

Discussion

This study examined barriers (general and religious) to PE in a sample of girls attending comprehensive secondary schools in the UK. The impact of religious persuasion (Christianity and Islam) and age (school year) upon barrier strength was also investigated, as were school year $\times$ religion interactions. To achieve our aims, a questionnaire was developed. EFA uncovered six factors, these being: 'self-conscious', 'embarrassment', 'dislike/unimportant', 'PE uniform', 'sensations' and 'religiosity'. The following discussion will address what the authors consider to be the most important findings.

For the total sample, the barrier factor 'PE uniform' received the highest quotient ($M = 3.03$). Issues surrounding PE uniforms have been highlighted by others; with research showing inappropriate, revealing and unfashionable PE kit to be problematic for some girls (Allender et al., 2006; Flintoff and Scraton, 2001; Gorely et al., 2011). However, it must be recognised that only one item in this factor was specifically related to the wearing of PE uniform. The other items concerned changing into, and the inconvenience of carrying PE kit. Again, such issues have been referenced before, with Bailey et al. (2004) and Gorely et al. (2011) citing dirty and unkempt facilities and being required to change in front of peers as being constraints to participation. Although the need to carry PE kit might be considered a mere hindrance, it has been reported that heavy backpacks can cause back pain in children, and in particular girls, of secondary school age (Rodriguez-Oviedo et al., 2012). As such, the importance of this concern should not be underestimated. The lowest rated factor for the overall sample was 'religiosity' ($M = 1.74$). It is likely that this is explained by the fact that the majority of the sample classified themselves as being Christian. As we have stated, there appear to be few constraints to participation emanating from 'mainstream' Christianity (ContinYou, 2010; Sporting Equals, 2012). As to the remaining barrier factors, all were below the median value, suggesting that they were of minimal consequence for most, although when the standard deviations are considered it becomes apparent that for some, issues were evident.

Religious persuasion was found to impact upon barrier strength. The most pertinent finding was that the quotients for the factors of 'PE uniform', 'self-conscious', 'dislike/unimportant' and 'religiosity', although not excessive, were nevertheless significantly higher for Muslim girls. As we have already stated, the lower quotients for the Christian girls can be explained by the fact that the sample scored low ($M = 2.07$) on the level of religiousness scale, which might suggest that most considered themselves as 'mainstream' Christians. The highest quotient for the Christian girls was ascribed to 'PE Uniform' ($M = 2.84$). With the lack of religious constraints, it is likely that issues surrounding PE uniform were related to other concerns (these are discussed in further detail throughout the Discussion section). The factor of 'religiosity' received the lowest quotient ($M = 1.28$). Although we based the 'religiosity' factor upon information gleaned from research focusing upon barriers to PE for Muslim girls, as we argued, it was conceivable that some of the issues might be relevant to those adhering to Christianity. However, we also stated that they would unlikely be a problem for 'mainstream' Christian girls of secondary school age. With this in mind, the lack of modesty requirements for 'mainstream' Christian girls of secondary school age could explain why the issues surrounding PE uniform, although rated highest, were nevertheless less problematic for this group. This in turn might explain why the barrier factors 'self-conscious' and 'embarrassed' were less of an issue. It is unclear as to why the quotient for the 'dislike/unimportant' barrier factor was lower for the Christian sample.

For the Muslim girls, although the level of religiousness ($M = 2.16$) was statistically comparable with that of their Christian peers, the quotients for four of the five barriers were significantly higher; only the barrier factor 'sensations' was statistically similar. This outcome warrants a more detailed analysis. As with the Christian girls, the Muslim girls rated the 'PE uniform' barrier factor highest ($M = 3.33$). This finding offers some support of Carroll and Hollinshead's (1993) claims that Muslim girls have an additional burden when it comes to PE uniform. The concept of 'haya' requires Muslim females to maintain modesty, decency and dignity. Consequently, PE uniforms should address these requirements (Muslim Council of Great Britain, 2007). Although the research of Carroll and Hollinshead (1993) is dated, it still appears, despite the introduction of Equality Act (2006), that PE uniforms might still not fully conform to the principles encompassed by 'haya'. As stated previously, the 'PE uniform' factor also included a statement referring to changing facilities. Carroll and Hollinshead (1993) and Dagkas and Benn (2006) have referenced the fact that Muslim girls of secondary school age can, because of the Islamic notion of 'awra' (covering nakedness), be concerned about being unclothed in front of peers. It must be stated, as far as the current authors are aware, the schools involved in this investigation do try to ensure PE uniforms cater for sensitivities surrounding modesty, etc. It is therefore possible that problems are more related to the changing facilities. Alternatively, Ameli and Merali (2006) state that some British Muslim girls are increasingly opting to wear traditional garments as an assertion of their religious beliefs. Perhaps some Muslim girls dislike wearing PE uniform because it is not in keeping with their cultural background. Of course, this is merely conjecture; future research should examine this in greater detail. The concept of 'fitna' might also have a bearing on the findings related to 'general' barriers. In accordance with 'fitna', females should refrain from movements/activities that create chaos and temptation. Ensuring that bodies are suitably covered and that physical activities are performed out of sight of the opposite sex allows this requirement to be met (Kay, 2006; Johnson, 2000; Walseth and Fasting, 2003). Together, the concepts of 'fitna', 'haya' and 'awra' might explain why the Muslim girls rated the barrier factor 'self-conscious' higher than their Christian peers. It seems reasonable to suggest that if these Islamic requirements are not met, then Muslim girls might be more sensitive to the practice of PE. As stated previously, it is interesting to note that the barrier

factor 'dislike/unimportant' was rated stronger by the Muslim sample. It is unclear as to why this would be the case. This might be an area for further research.

Although Islam is believed by many to be promotive of physical activity for females, some do consider it to be discouraging of female involvement (De Knop et al 1996; Kahan, 2003). The 'religiosity' factor addressed this. Whilst significantly higher for the Muslim girls than Christian, this barrier factor nevertheless received a relatively low quotient value ($M = 2.21$) and so suggests, that the 'religiosity' barriers were of little consequence for many. Explaining this, as we have suggested, attitudes towards PE might be moderated by the form of Islam to which one prescribes (Walseth and Fasting, 2003). The Muslim girls in this study were in general not overly religious (level of religiousness, $M = 2.16$), and so it is probable that the participants adhered to those liberal forms of the religion that support female participation (De Knop et al. 1996; Kahan, 2006; Muslim Council of Great Britain, 2007). It is therefore conceivable that many in this particular sample felt obligated to be physically active, thus reducing the impact of this factor. Furthermore, according to The Muslim Council of Great Britain (2007), the practice of PE in front of males is acceptable as long as modesty is ensured. However, accepting this does create a dilemma. The fact that most of the barriers were higher for this group does suggest that religious-based issues were evident. Concluding this section, although the values ascribed to all of the barrier factors were quite low, that most were significantly higher than those of the Christian girls implies that issues still remain for this religious group.

There is evidence to suggest that girls in general become less active as they progress through secondary school. We examined whether barrier strength increased with age and so could be considered a potential correlate. For our sample as a whole, significant differences were found between the Year 7 and Year 11 girls for the barrier factors of 'PE uniform' and 'dislike / unimportant'; these being significantly higher for the older girls. Again, with regards to 'PE uniform', Davison et al. (2007) and Women's Sport and Fitness Foundation (2012a) have stated that the physical changes associated with puberty can create barriers to physical activity. Therefore, it might be assumed that as girls mature, they would prefer uniforms that conceal alterations in body shape. In a similar vein, developmental changes might make changing into PE uniform a discomforting experience (e.g. Mendle et al., 2007); however, the relatively low quotients for the factors of 'self-conscious' and 'embarrassment' does weaken this argument. Perhaps the age-related increases in barrier strength for 'PE uniform' are attributable to clothing design. Asthana (2008) reports that many girls dislike 'uncool' PE uniforms. Whilst little is known about the fashion ideals of prepubescent girls (Pilcher, 2010) or how religious persuasion might effect this, it has been found that by early adolescence, girls in general become more fashion conscious (De Klerk and Tselepis, 2007). If this indeed is the case, secondary schools might consider allowing female pupils to have input into the design of the uniform. Explaining the age-related differences for 'dislike/unimportant', Browne (1992) and Flintoff and Scraton (2001) and have shown that as girls age there is often an attitudinal shift in the perceived importance of PE. Specifically, older girls regard PE as being less important to future career plans than the more 'academic' subjects. Perhaps more needs to be done to highlight sport-related career opportunities and the intrinsic value of the subject area (Elliott and Sander, 2011). It is worth noting that for the Christian cohort, the highest quotient values for 'PE uniform' were found in the Year 9 group, implying that for these girls it is the onset of puberty that is the issue. The changes in barrier strength for these factors might go some way in explaining the age-related decrease in secondary school girls' participatory rates. Again, we suggest that future research should consider examining these trends in greater detail.

The final part of the analysis revealed that school year $\times$ religion interactions were also present (see Table 4), the most pronounced being found in the youngest age group. At Year 7, all of the barrier factors, except 'embarrassment', received higher quotients from the Muslim girls. This is an intriguing finding, as it is likely that most girls in this group will be prepubescent. As such, it might have been assumed that issues relating to the religious requirements relating to 'haya', 'fitna' and 'awra' would be less relevant to Muslim girls of this age. It is also unclear as to why the 'sensations' factor would be significantly higher for the younger Muslim girls. Perhaps these outcomes are more indicative of the lack of barriers for the Christian girls, rather than excessively high barriers for Muslim girls. This argument is supported, to a degree, by the relatively low barrier quotients for the Christians in this year group.

In summary, according to official data (Quick et al., 2008), over 85% of secondary school children in England receive at least 2 hours of high-quality PE per week. This investigation examined whether, despite the reassuring claims, Muslim and Christian girls attending comprehensive secondary schools in the UK still experience barriers to PE. We also considered whether religion and school year impacted upon barrier strength. School year $\times$ religion interactions were also assessed. Our results show that for the sample overall, the quotients for most the barrier factors were relatively low. The 'PE uniform' factor received the highest quotient and the 'religiosity' barrier factor the lowest. When the barrier factors were analysed by religion, it was found that most of the quotients were higher for Muslim girls. Although it must be reiterated that the values were not excessively high, this finding does suggest that more needs to be done to resolve the issues surrounding PE for this religious group. Addressing these barriers might help increase the participation rates of this group (ContinYou, 2010; Muslim Council of Great Britain, 2007). Analysis by school year showed evidence of age-related increases in barrier strength; this was more evident in those prescribing to the Islamic faith. These increases in barrier strength might go some way in explaining why girls become less active as they progress through secondary education. Finally, the school year $\times$ religion interactions showed, rather unexpectedly, that many barriers were significantly stronger for the younger Muslim girls.

This study is limited in some respects. First, only two schools were utilised. Researchers wishing to develop this line of research should consider increasing the sample base. Second, this study is concerned with girls attending comprehensive secondary schools in the UK. Perhaps an examination of girls' only schools, and in the case of Muslim girls, religious schools, might provide some interesting comparisons. Furthermore, the schools in question were located in a county with a 10% BME profile. As such, generalisations should not readily be made to other areas of the UK that have different BME profiles. It is also worth noting that the census data we used, although indicating ethnic background, did not provide details on religious affiliation. Again, this also makes generalisations difficult. Third, the girls involved in this investigation were not overly religious. An examination of barriers to PE for girls with stronger religious attitudes needs to be considered. Fourth, compressing the scale items into factors might have resulted in specific concerns being overlooked. We also recognise that some of the explanations we have provided are speculative and recommend that further research is conducted to establish the veracity of our suggestions. In some respects, these results raise more questions than answers. Finally, Flintoff et al. (2008) have recommended that researchers consider an intersectional approach to the study of PE. According to proponents of intersectionality, quantitative methodologies generally fail to reflect the multi-demographic categories to which individuals might belong (Dubrow, 2008). Although we have gone further than some, studying the impact of religion and age in relation to the perceived barriers of UK secondary school girls, we do recognise that it is perhaps too

simplistic to discuss social identities in these terms. There might be many other potential moderators (e.g. level of religiosity, social economic status, disability and location) that influence an individual's perceptions of barriers to PE. We also recognise the issues surrounding the assumption of homogeneity. Using Islam as an example, Dagkas et al. (2011) caution against treating Muslims as an homogenous group, as there are many ways through which one might express their faith (Benn et al., 2011). As such, we should not expect all Muslim girls to experience the same barriers to school-based PE. Whilst some might question our approach, Spierings (2012) has claimed that quantitative designs, like that we have utilised, can make a significant contribution to research on intersectionality. Indeed, there is evidence of others adopting quantitative methods with the specific aim of examining social intersections (e.g. Covarrubias, 2011).

In conclusion, the major finding of this investigation is that issues surrounding PE uniform still appear to be problematic for both Christian and Muslim girls attending comprehensive secondary schools in the UK. Schools should therefore consider the sensitivities surrounding PE uniforms and ensure that they are, as far as is possible, appropriate for all. Changing facilities might also need to be adapted to cater for both religious and non-religious sensibilities. We do recognise that this study is limited in some respects. We recommend that further research is conducted to help develop a more comprehensive picture of the current state of girls PE in UK comprehensive secondary schools. This could take the form of a qualitative investigation, which might uncover greater detail surrounding the issues we have raised and also allow a more intersectional study of perceived barriers to PE. Researchers might also consider utilising an approach similar to that used in this study. As part of this investigation we developed an instrument to assess barriers to PE. This instrument was found to be psychometrically sound; therefore others might consider utilising it to provide direct comparisons with other areas of the UK, although we do recommend the use of confirmatory factor analysis to further validate its properties. Despite some shortcomings, this investigation adds to the extant pool of literature relating to barriers to PE for UK girls of secondary school age. The results help to provide a contemporary picture of potential barriers to PE for Christian and Muslim girls attending secondary school in the UK.

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Note

1. The current UK Government intends to meet this aim by reducing bureaucracy and top-down targets whilst also establishing Olympic-style School Games.

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