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British and Pakistani children's understanding of death: Cultural and developmental influences

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This study explored British and Pakistani 4- to 7-year-olds' (N = 188) understanding of death. The aim was to examine possible influences on the acquisition of the subcomponents of the death concept by investigating how they are understood by children of different ages and cultural and religious backgrounds. Three groups of children were compared: White British and British Muslim living in London, and Pakistani Muslim living in rural Pakistan. In line with previous research (Slaughter, 2005, *Aust. Psychol.*, 40(3), 179), irreversibility of death was one of the first subcomponents to be acquired, while causality was the last. The two groups of British children shared many similarities in their understanding of inevitability, applicability, irreversibility, and cessation. Pakistani Muslim children understood irreversibility earlier than did children in both British groups. In all three cultural groups, children's responses demonstrated very limited understanding of causality. Our findings support the view that aspects of a mature understanding of death develop between the ages of 4 and 7 years and that the process of understanding death as a biological event is, to a great extent, universal. They also suggest that aspects of children's reasoning are influenced by culturally specific experiences, particularly those arising from living in rural versus urban settings.

Death is one of many related concepts – such as the mind–body distinction (Inagaki & Hatano, 1993), illness and contagion (Kalish, 1999), inheritance (Solomon, Johnson, Zaitchik, & Carey, 1996), and the life cycle (Jaakola & Slaughter, 2002) – that constitute children's broader understanding of the biological domain. Findings from a number of studies in different countries suggest that children's understanding of death follows a broadly consistent developmental pattern (Harris & Gimenez, 2005; Slaughter, 2005).

Preschoolers do not grasp the biological basis of death and tend to believe that death is a different state of life – a state of prolonged sleep. At this age, children often say that only old and ill people die, that dead people need to eat and breathe, and that they can still see, hear, or dream (Bering & Bjorklund, 2004). Between 5 and 10 years, children come to understand the five key biological facts about death (Lazar & Torney-Purta, 1991; Poling & Evans, 2004; Slaughter & Lyons, 2003). They realize that (1) all living things must die 1 day

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(inevitability); (2) death happens to all living things (applicability or universality); (3) once people are dead, they cannot come back to life (irreversibility); (4) when death occurs, all bodily and mental processes stop (cessation); and (5) in biological terms, death is caused by the breakdown of bodily functions (causality).

These five subcomponents are not acquired at the same time (Kenyon, 2001; Slaughter, 2005; Speece & Brent, 1984). The least complex subcomponent, and the one that seems to be acquired first, is death irreversibility. Children around the age of 5 first realize that death is final. In the early school years, children grasp the ideas that death is inevitable, happens to all living things, and involves the cessation of all bodily and mental functions. Causality of death is the last subcomponent to be acquired, as it involves the understanding of complex processes that result in the breakdown of the body's functioning (Slaughter & Griffiths, 2007).

Cultural and religious influences

Research into children's biological reasoning provides evidence for cross-cultural universalities in the development of children's ideas in this domain – including those concerning death – but also for cultural influences (Inagaki & Hatano, 2002; Legare & Gelman, 2009; Ross, Medin, Coley, & Atran, 2003).

Schonfeld and Smilanski (1989) explored the impact of sociocultural influences on the conceptualization of death amongst 4- to 12-year-old Israeli and American children and found that Israeli children understood the notions of irreversibility and cessation better than their American counterparts. The unstable political situation in Israel at that time, and children's exposure to discussions about death, might have influenced their awareness of some of its subcomponents. Mahon, Goldberg, and Washington (1999) reported that Israeli 6-year-olds had an accurate notion of the cessation of death. All children in the study were exposed to conversations about death due to their fathers' involvement in military operations, which might have accelerated their understanding that death is final.

Other studies suggest that children from religious backgrounds (e.g., Muslim or Baptist) have a less scientific understanding of the irreversibility and inevitability of death than their non-religious peers, due to religious ideas about life after death that contradict biological explanations (Antony & Bhana, 1988–1989; Candy-Gibbs, Sharp, & Petrun, 1985). Florian and Kravetz (1985) reported that Jewish and Christian children living in Israel had a more scientific concept of death by the age of 10 than their Muslim and Druze counterparts, possibly due to the different religious beliefs espoused within their communities.

In a study of Spanish children, Bering, Hernandez Blasi, and Bjorklund (2005) found that 4- to 12-year-olds attending Catholic schools were more likely than those in secular schools to believe that the biological and mental functions of a dead mouse (the main character in the study's stories) continue after death. Children exposed to religious instruction about the 'afterlife' may differ in their understanding of cessation from children without religious input because the idea that some processes continue after death is supported by their educational and religious background.

Harris and Gimenez (2005) found that beliefs in the afterlife amongst Spanish children increased between the ages of 7 and 11 and that these beliefs were more likely to appear in the context of religious narratives than in the context of medical narratives. It is suggested that children growing up in cultures where both religious and biological views about death are supported often engage in a form of 'dualistic' thinking about the continuity of

mental functions after death (Harris, 2011). In this view, explanations about death that appear incompatible (e.g., biological, religious, and spiritual) coexist in children's thinking and form the basis of their understanding (Legare, Evans, Rosengren, & Harris, 2012; Rosengren, Gutierrez, & Schein, 2014).

The existing research in this area sheds light on how some culturally specific experiences (e.g., exposure to discussions, religion) may influence children's understanding of death. However, it is based largely on urban samples from Western societies, while limited evidence exists from studies in developing, rural, and traditional communities with different cultural and educational experiences that might either delay or accelerate children's conceptualizations (Coley, 2000; Inagaki & Hatano, 2006).

One such study was carried out by Astuti and Harris (2008) who explored the conceptions of death amongst Vezo people in rural Madagascar, a community with strong beliefs in the presence of dead ancestors amongst the living. Five-year to 71-year-olds were interviewed about their beliefs concerning the cessation of mental and bodily processes after death. Although 5-year-olds were unsystematic in their responses, 7-year-olds gave consistently biological explanations for the cessation of bodily and mental functions. Older children and adults believed that, although bodily processes stop after death, mental processes such as remembering and knowing continue. Young children's early grasp of the notion of cessation reflects their exposure to animal and human death that allows an early understanding of what it means to be dead (they are present when animals are slaughtered, are expected to attend funerals and wakes, and are obliged to look at their dead parents to 'register' the fact that they will never see them again). Older children's and adults' 'dual' conception of death (biological and spiritual) reflects Vezo people's exposure to the belief that the spirits of the dead are present amongst the living (Astuti, 2011).

These findings highlight the significance of cross-cultural research for our understanding of the influence of culture on children's conceptual development. As Legare and Gelman (2009) point out, it is important to explore children's biological reasoning in different cultural contexts, so that we can identify what is general in the development of their understanding and what is influenced by culturally specific or educational experiences.

The present study

The aim of this study was to explore the influence of culturally specific experiences, including religion, on children's conceptualizations of death. We compared three groups: British White children attending secular state primary schools in London, British Muslim children attending London state schools but also religious classes in their local mosques, and Pakistani Muslim children from two villages in Pakistan attending state primary schools. These groups provided us with a natural experiment for investigating some of the influences on children's developing concept of death. For example, if cultural experiences – particularly those arising from living in rural or urban settings – were a key factor in influencing children's understanding of death, then we might expect differences between rural Pakistani children and their urban British counterparts. If children's religion influenced their understanding of death, we might expect the British and Pakistani Muslims to be more similar to one another than to the White British children.

With respect to children's cultural experiences, those growing up in rural Pakistan have first-hand knowledge of life and death processes through their daily contact with animals. In these rural and often poor communities, families raise domestic animals, such

as cows, goats, or chickens, to provide meat, milk, eggs, and dung (for domestic cooking). Children are involved in raising these animals and routinely witness their slaughter for meat or for religious purposes. One significant religious celebration where this practice is observed by many Muslims is 'Eid-ul-Adha' or 'Festival of Sacrifice'. During this festival, Muslims around the world sacrifice animals and share the meat amongst family members, friends, and the poor. Although this celebration is also important for British Muslims, in Britain, the animals are taken to abattoirs, so children do not experience them being sacrificed. In this study, all Pakistani Muslim children either had a domestic animal or no longer had one because it had previously been sacrificed.

Moreover, Pakistani Muslim children – particularly those living in rural and impoverished communities – usually live with members of their extended families, and so they often have first-hand experience of seeing their grandparents and other relatives falling ill and dying. Also, especially when elderly relatives are too ill to move around, they tend to talk a great deal to the children about their life journey and pending death. These experiences are likely to provide this group of children with informal learning opportunities that can help them grasp some key facts about death earlier than their British counterparts.

Another factor that might influence children's conceptualizations of death is religion. From an early age, British Muslim children go to mosques, participate in religious activities, and are taught about the purpose of life and its relation to death. Religion also plays a big part in the lives of Pakistani Muslim children, who are taught how to read the Quran at school and have religious education as part of their curriculum. Muslims have special death prayers that they recite when a person dies, and believe that, after death, people eventually return to Allah. Children are also taught to do good deeds in order to be rewarded after death. Exposure to these religious beliefs might lead Muslim children to believe that people's mental functions such as thinking or feeling continue beyond death (Bering *et al.*, 2005) and therefore delay a biological conception of death. This delay might be more evident amongst religious Muslim children than amongst White British from secular schools, for whom religion is likely to be less influential.

We made a number of predictions about (1) the sequence of death subcomponent acquisition and (2) the differences between the three cultural groups in understanding the five death subcomponents. In line with previous research (Slaughter & Griffiths, 2007; Slaughter, Jaakkola, & Carey, 1999), our first prediction was that the three cultural groups would show a similar pattern of subcomponent acquisition. Irreversibility was expected to be understood first, as early as 4–5 years, and causality last, after the age of 6–7 years. Thus, children's understanding of neither irreversibility nor causality was expected to change between these two ages. Inevitability, cessation, and applicability were expected to appear either at the same time as, or after irreversibility, but before causality. For these three subcomponents, we expected an improvement between 4–5 and 6–7 years.

Our second prediction was that rural Pakistani Muslim children – who witness the death of animals and humans more often and openly than their British counterparts – would understand irreversibility earlier. Our third and fourth predictions were that Muslim children (British and Pakistani) would offer fewer biological explanations for applicability and cessation than White British children, owing to their greater exposure to religious beliefs about the afterlife. Beliefs such as Allah never dies, and people are rewarded or punished after death, contradict the biological fact that death applies to everyone (applicability) and that when people die, all physical and mental functions come to an end (cessation).

Finally, we expected some of these differences to be reflected not only in children's scores but also in their types of explanations. For example, we predicted that British and

Pakistani Muslim children would make more religious references when talking about applicability and cessation than White British children.

Method

Participants

Participants were 188 children: 82 4- to 5-year-olds and 106 6- to 7-year-olds. The younger group consisted of 33 White British (16 boys, 17 girls; M = 5.1 years, SD = 3.6 months), 24 British Muslim (12 boys and 12 girls; M = 5.3 years SD = 5.2 months), and 25 Pakistani Muslim (16 boys and 9 girls; M = 5.4 years, SD = 4.2 months) children. The older group consisted of 44 White British (20 boys and 24 girls; M = 7.2 years, SD = 3.9 months), 26 British Muslim (14 boys and 12 girls; M = 7.1 years, SD = 6.4 months), and 36 Pakistani Muslim (15 boys and 21 girls; M = 6.9 years, SD = 5.2 months) children.

White British children were recruited from two secular state primary schools in London. British Muslim children, who also attended London state primary schools, were recruited from three London mosques during days when they attended special religious classes. All British children came from middle and lower socio-economic backgrounds. The younger group was interviewed either at the end of Reception year or at the beginning of Year 1. Similarly, 6- to 7-year-olds were interviewed either at the end of Year 2 or at the beginning of Year 3.

Pakistani Muslim children were recruited from two state primary schools in two villages outside the town of Gadap, Karachi, and came from low socio-economic backgrounds. The younger group was attending kindergarten (reception), and the older group was in class (Year) 2 of junior school.

Measures

The death concept interview was based on previous studies (Lazar & Torney-Purta, 1991; Slaughter & Griffiths, 2007) and assessed children's understanding of five subcomponents of death. Children were asked the following questions:

1. Inevitability – Can you tell me some things that die? Do all (things mentioned) die? If people not mentioned: Do people die? If yes: Do all people die?
2. Applicability – Can you tell me a few things that never ever die?
3. Irreversibility – Could a dead person at some time become a living person?
4. Cessation – When a person is dead, do they need food? Do they need air? Do they have dreams?
5. Causality – Can you tell me something that might happen that would make someone die?

Procedure

Participants were individually interviewed in a quiet room in their school/mosque. They were told that they did not have to answer any questions they did not want to and that they could go back to their classroom at any time. Interviews lasted approximately 15–20 min. British children were interviewed in English. For the Pakistani Muslim children, interviews were conducted in Urdu and responses were translated into English. All three interviewers were British-born Urdu speakers studying at a London university.

Coding

Death knowledge

For each subcomponent, children received a score of 0, 1, or 2 (Appendix 1). An overall score, with a possible maximum of 10, was calculated for each child. A second independent judge scored one-third of the data. The resulting agreement was 98% for inevitability, 97% for applicability, 100% for irreversibility and cessation, and 94% for causality.

Responses to each question were also grouped into a small number of categories that allowed us to explore the different types of children's explanations (Table 1). For each question, there was a 'biological response' category and a small number of non-biological response categories reflecting children's alternative ideas. For example, the question 'Tell me a few things that never die' elicited four response types: (1) Only non-living things die; (2) Some living and some non-living things die; (3) God/Allah never dies; and (4) I don't know. The question 'Could a dead person at some time become a living person?' elicited three response types: (1) No; (2) Yes; and (3) Yes, qualified by a religious reference such as 'on the day of judgment'. An independent judge scored one-third of the data. Agreement was 100% on all subcomponents except for causality, for which agreement was 95%.

Table 1. Responses to the five questions by cultural group (% in parentheses)

	Cultural group		
Death subcomponent	White British (n = 77)	British Muslim (n = 50)	Pakistani Muslim (n = 61)
Inevitability (do all people die?)			
All people/animals/plants die	51 (66)	37 (74)	32 (52)
Some people/animals/plants die (not all)	25 (33)	13 (26)	25 (41)
Only animals/plants die	1 (1)	–	4 (7)
Applicability (things that never die)			
Non-living things only	46 (60)	23 (46)	30 (49)
Some living and some non-living things	20 (15)	4 (8)	9 (15)
God/Allah never dies	15 (12)	18 (36)	1 (2)
Don't know	5 (4)	5 (10)	21 (34)
Irreversibility			
No	62 (80)	37 (74)	59 (96)
Yes	6 (8)	8 (16)	1 (2)
Yes with religious references	9 (12)	5 (10)	1 (2)
Cessation (do dead people need food/air and have dreams?)			
No to 2/3 questions	57 (74)	44 (88)	52 (86)
Yes to 2/3 questions	20 (26)	6 (12)	8 (14)
Causality (something that can make one die)			
Some reference to biological causes	14 (18)	2 (4)	3 (5)
Illness (cancer, TB, heart attacks)/old age/hunger/accidents	24 (31)	16 (32)	48 (79)
Violent external events (shootings, wars, guns, knives, stabbings)	36 (47)	24 (48)	2 (3)
When God/Allah wants you to die	2 (3)	4 (8)	4 (7)

Table 2. Means and standard deviations (in parentheses) of scores for each death subcomponent by cultural and age group

	White British (n = 77)			British Muslim (n = 50)			Pakistani Muslim (n = 61)			All (N = 188)		
Subcomponent	4-5 years	6-7 years	All	4-5 years	6-7 years	All	4-5 years	6-7 years	All	4-5 years	6-7 years	All
Inevitability	1.61 (0.55)	1.68 (0.47)	1.65 (0.51)	1.58 (0.50)	1.88 (0.32)	1.74 (0.44)	1.08 (0.57)	1.72 (0.51)	1.46 (0.62)	1.44 (0.59)	1.75 (0.56)	1.61 (0.54)
Applicability	1.15 (0.93)	1.61 (0.72)	1.42 (0.85)	1.21 (0.97)	1.00 (0.98)	1.10 (0.97)	0.72 (0.93)	1.22 (0.98)	1.02 (0.99)	1.04 (0.96)	1.33 (0.91)	1.20 (0.94)
Irreversibility	1.52 (0.87)	1.68 (0.74)	1.61 (0.80)	1.42 (0.92)	1.54 (0.85)	1.48 (0.886)	1.84 (0.55)	1.94 (0.33)	1.90 (0.44)	1.59 (0.82)	1.74 (0.68)	1.67 (0.74)
Cessation	1.24 (0.96)	1.41 (0.78)	1.34 (0.87)	1.54 (0.77)	1.73 (0.60)	1.64 (0.69)	1.24 (0.87)	1.78 (0.54)	1.56 (0.74)	1.33 (0.89)	1.61 (0.68)	1.49 (0.79)
Causality	0.15 (0.36)	0.20 (0.40)	0.18 (0.39)	0 (0)	0.08 (0.27)	0.04 (0.20)	0.04 (0.20)	0.06 (0.23)	0.05 (0.22)	0.07 (0.26)	0.12 (0.33)	0.10 (0.30)
All	5.67 (1.91)	6.59 (1.32)	6.19 (1.65)	5.75 (1.65)	6.23 (1.81)	6.00 (1.74)	4.88 (1.74)	6.69 (1.47)	5.95 (1.81)	5.45 (1.81)	6.53 (1.50)	6.06 (1.72)

Results

Table 2 shows the mean scores for the five death subcomponents by cultural and age group. A mixed 3 (cultural group) × 2 (age) × 5 (death subcomponent) MANOVA with repeated measures on the death subcomponents revealed a significant main effect of subcomponent, $F(4, 179) = 171.28$, $p < .001$, partial $\eta^2 = .91$. Pairwise comparisons indicated that children's scores on irreversibility, inevitability, and cessation were higher than on applicability (ps < .001) and that their scores on all four of these subcomponents were higher than on causality (ps < .001).

There was also a main effect of age: Across the five subcomponents, older children scored higher than younger children, $F(4, 182) = 19.01$, $p < .001$, partial $\eta^2 = .10$.

The MANOVA showed an interaction between age and death subcomponent, $F(4, 179) = 3.17$, $p < .02$, partial $\eta^2 = .07$. ANOVAs indicated that 6- to 7-year-olds performed significantly better than 4- to 5-year-olds on inevitability, $F(1, 186) = 16.03$, $p < .001$, partial $\eta^2 = .07$, applicability, $F(1, 186) = 4.57$, $p = .04$, partial $\eta^2 = .02$, and cessation, $F(21, 186) = 6.12$, $p = .01$, partial $\eta^2 = .03$. There were no significant age differences in children's irreversibility and causality scores: Irreversibility scores were similarly high amongst 4- to 5- and 6- to 7-year-olds, whereas causality scores were similarly low in both age groups.

There were no significant differences between the three cultural groups in general understanding of death (i.e., across the five subcomponents), $F(2, 182) = 0.58$, $p = .56$, partial $\eta^2 < .01$, although there was a marginally significant interaction between cultural group and age, $F(2, 182) = 2.34$, $p = .09$, partial $\eta^2 = .25$: The Pakistani children's scores were (non-significantly) lower at 4–5 years and higher at 6–7 years than the other two groups' scores.

However, there was a significant interaction between cultural group and subcomponent, $F(8, 360) = 4.58$, $p < .001$, partial $\eta^2 = .09$. Post hoc Tukey HSD tests indicated that Pakistani Muslim children had the highest irreversibility scores, outperforming both White and British Muslim groups (ps < .05), and British Muslim children had higher inevitability scores than Pakistani Muslim children ($p < .05$). With respect to applicability, White British children had higher scores than Pakistani and British Muslim children, but only the difference between White British and Pakistani Muslim children reached significance. In addition, White British children had higher causality scores than both their British Muslim and Pakistani Muslim counterparts (all ps < .05).

These main effects and interactions were qualified by a 3-way interaction between age, cultural group, and subcomponent, $F(8, 360)$, $p < .05$, partial $\eta^2 = .04$. Figure 1 shows the death subcomponent means by age group for the three cultural groups. ANOVAs showed that while Pakistani Muslims' scores on inevitability, cessation (ps < .01), and applicability ($p = .05$) were higher in the 6- to 7-year-old group, a significant age difference was only revealed for applicability amongst the White British children ($p = .02$)

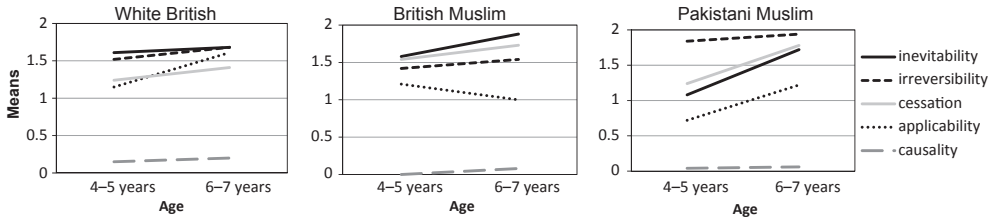

Figure 1. Death concept subcomponent mean scores by age group for the three cultural groups (maximum = 2).

and for inevitability amongst the British Muslims (p = .02). In fact, the British Muslims' applicability scores showed a non-significant *decrease* between these ages.

Influence of cultural group on children's types of responses

This analysis provided further insight into the types of explanations given by children about death. The focus was on differences between the three cultural groups, so the age groups were collapsed. A series of chi-square tests revealed significant associations between cultural group and response type for the subcomponents of irreversibility, $\chi^2(4) = 11.71$, $p = .02$; applicability, $\chi^2(6) = 43.45$, $p < .001$; and causality, $\chi^2(6) = 57.57$, $p < .001$. Table 1 shows the distribution of response types to the five death questions by cultural group.

With respect to the subcomponent of irreversibility, the majority of White British and British Muslim children knew that death is irreversible. The remainder said that dead people can come back to life. Around half of the minority of children who said that dead people can come back to life qualified their 'yes' responses with religious explanations. For example, British Muslim children said 'you can come back in life after death' and 'on the Day of Judgment', while White British children said 'you can come back to life in God's house' or 'if you are special like God'. Pakistani Muslim children's responses to the irreversibility question were very different. Only two children said that dead people can come back to life. Of these, only one gave a religious explanation ('you can come back to life if you go to Janna'). The two British groups contrasted sharply with the Pakistani Muslim group, who showed very little evidence for the influence of religion in their ideas about irreversibility.

In response to questions about applicability, around one-third of British Muslim children referred to religion (e.g., 'Allah never dies' or 'prophets and Imams never die'). Similar responses, such as 'God or Jesus never die', were given by a smaller percentage (12%) of White British children. Only one Pakistani Muslim child said that Allah never dies, while one-third could not name things that never die. Contrary to our expectations, Pakistani Muslim children's ideas about applicability showed no evidence of religious influences.

With respect to the subcomponent of causality, the majority of Pakistani Muslim children mentioned illness or old age (e.g., 'you die because of a heart attack', 'because you are old'), compared with one-third of White British and British Muslims. Amongst the Pakistani Muslims, only two children referred to violent events (e.g., 'you die because of an explosion', 'because of wars'), whereas these causes were given by nearly half of White British and British Muslim children. Finally, there were very few biological explanations, given mainly by White British children. Responses such as 'you die when the heart stops' and 'when you cannot breathe' were classified as biological because children mentioned the cessation of an organ's functioning.

Discussion

This study explored the influence of cultural experiences on the development of children's understanding of death by comparing responses to a death concept interview given by White British, British Muslim, and Pakistani Muslim 4- to 5- and 6- to 7-year-olds. Children answered questions about inevitability, applicability, irreversibility, cessation, and causality of death. Analyses focused on the sequence of death subcomponent acquisition, and on age and cultural group differences in children's understanding.

Results indicated that the sequence of subcomponent acquisition was similar for White British, British Muslim, and Pakistani Muslim children. As predicted, and consistent with previous research (Slaughter & Griffiths, 2007; Slaughter & Lyons, 2003), for children in all three groups, irreversibility was one of the first subcomponents to be grasped, whereas causality was consistently the last. This was also reflected in the finding that in all cultural groups, irreversibility scores were equally high and causality scores equally low between 4- to 5- and 6- to 7-year-olds. While most 4- to 5-year-olds grasped irreversibility, understanding of what causes death remained difficult and was not present before 8 years.

Results also suggested that, for all cultural groups, inevitability, applicability, and cessation were acquired either at the same time as or after irreversibility and consistently before causality. In addition, children's understanding of these three subcomponents improved significantly with age. This was particularly evident amongst Pakistani Muslim children, who at 6–7 years had significantly higher inevitability, applicability, and cessation scores than at 4–5 years. White British and British Muslim 6- to 7-year-olds were better than their younger counterparts at understanding applicability and inevitability, respectively. This pattern of death subcomponent acquisition generally replicates findings from research with Australian (Slaughter & Griffiths, 2007; Slaughter & Lyons, 2003), American (Lazar & Torney-Purta, 1991), and Israeli (Schonfeld & Smilanski, 1989) children and supports the view that the process of acquisition of the concept of death as a biological event is, largely, universal.

Despite the similarity in the sequence of subcomponent acquisition amongst our cultural groups, findings also support the second prediction that Pakistani Muslim children would understand irreversibility earlier than their British counterparts. It is likely that rural Pakistani Muslim children are more familiar with the life cycle of domestic animals, and the killing of these animals for domestic or religious purposes, than urban British children. Also, living in impoverished villages with poor sanitation and limited access to good health care is likely to expose Pakistani children to the fact that people die and that death is irreversible, more often than is the case with their urban British counterparts.

In contrast, there was little support for the third and fourth predictions that Muslim children (Pakistani and British) would offer fewer biological explanations for applicability and cessation than White British children due to their more systematic exposure to religious beliefs about death and the afterlife. No differences were found between cultural groups in terms of understanding of cessation, and only Pakistani Muslim children understood applicability less well than White British children.

Contrary to our final prediction, it was the two British groups, rather than the two Muslim groups, that used religious explanations for the applicability questions. While most of the Pakistani Muslim children who answered incorrectly did so because they could not name things that never die, most of the British Muslim children did so by making references to religion such as 'Allah never dies'. Responses with reference to God were also given by a small number of White British children. It appears that religion may influence the way in which some British Muslim and White British children understand the subcomponent of applicability, in that it reinforces the belief that death does not apply to all living entities. A similar picture emerged when children's explanations of irreversibility were examined: Of the 61 Pakistani Muslim children, only one said that 'you can come back to life on the day of judgment', compared with 10% of British Muslim and 12% of White British children, who referred to religion to justify their belief that death is irreversible.

There are two possible reasons why Pakistani Muslim children's responses about applicability and irreversibility did not reflect religious influences, whereas some British Muslim and White British children's responses did. Pakistani Muslim children are

religious, but most are also directly exposed to the life cycle of animals and humans. These experiences are likely to provide them with more powerful learning opportunities than religious instruction. Moreover, despite our initial assumption that religion would be more influential for Muslim children than for their White British counterparts, their responses suggest that a number of White British children also came from religious backgrounds that informed some of their explanations about death. This might also explain why, contrary to our prediction, there were no differences in the three groups' understanding of cessation.

The finding that Pakistani Muslim children's explanations of what causes death centred around illness, old age, or hunger, as opposed to shootings, wars, or explosions – the preferred explanations of British children – further supports the view that children's culturally specific experiences influence the way they reason about aspects of death. British children are likely to be influenced by exposure to media, such as books, cartoons, films, and computer games, where death is often portrayed as a result of violent events, rather than by direct exposure to ill, dying, or dead people (Mahon, 2011; Wenestram & Wass, 1987). In contrast, Pakistani Muslim children living in rural and deprived areas in Pakistan, who have limited access to Western media, are more likely to have a more realistic view that death usually results from illness or old age.

Another partial explanation for the differences between Pakistani Muslims and the two groups of British children may be that some of the death interview questions, as asked, work differently in English than in Urdu, the language in which the Pakistani children were interviewed. Despite the careful translation of the questions to and from English, it is possible that subtle differences in words between the two languages might have led to the misunderstanding or misinterpretation of some items. For example, the question 'Can you tell me a few things that never ever die?' might have confused many Pakistani children, which might explain why one-third of this group could not answer the applicability question compared with 4% of White British and 10% of British Muslim children.

Finally, no differences were found between White British and British Muslim children in their understanding of inevitability, applicability, irreversibility, and cessation. This suggests that similar schools, socio-economic status, and exposure to the same sources of information through the media may influence British children's ideas about death in similar ways. And although White British children had higher causality scores than their British Muslim counterparts, the percentages of participants in these two groups that used violent external events to explain death causality were almost identical, providing further support for the influence of the media in these children's conceptualizations of death.

The finding that British Muslim children demonstrated a very similar understanding of applicability and cessation to White British children suggests that the role of religion is not powerful enough to differentiate these two groups. Alternatively, more of the White British children might have come from religious (e.g., Christian and Jewish) backgrounds than we had expected, and therefore, differences between the two British groups in terms of exposure to religion were smaller than initially assumed. This interpretation can only be tentative, as no information about the religious background of White British children was recorded.

Although this limitation does not allow for strong claims regarding the impact of religion on different cultural groups, it provides some evidence consistent with the view that biological and religious ideas about death might coexist in children's thinking (i.e., the dead cannot come back to life unless they are special like God). Although we can only speculate, it is possible that if the interview questions in this study primed religious interpretations of death, as the work of Harris and Gimenez (2005) shows, even more responses would reflect the integration of religious views in children's biological explanations.

Another limitation of this study concerns the lack of measuring cultural practices and experiences that might explain differences between the cultural groups. We assumed that rural Pakistani children witness the slaughtering of animals and the death of relatives more openly than their urban British counterparts, due to the different cultural practices they are exposed to and environments they live in. We therefore predicted that rural Pakistani children would develop an earlier understanding of irreversibility. Nevertheless, we cannot dismiss the possibility that many British children might also experience the deaths of relatives or friends or be exposed to open conversations about death. Future research should document what children from different cultural environments hear in conversations about the life cycle and death, to help establish how specific cultural beliefs influence children's explanations (Astuti & Harris, 2008; Waxman, Medin, & Ross, 2007).

This study has provided evidence for the view that the process of understanding death as a biological event is, largely, universal as was reflected in the finding that the sequence of acquisition of irreversibility, inevitability, cessation, applicability, and causality was similar amongst our three groups of children. However, the influence of culturally specific experiences, such as living in impoverished conditions or observing animals being slaughtered, is likely to explain why rural Pakistani Muslim children grasp the idea that death is irreversible earlier than their British counterparts, why they rarely make religious references, and why their explanations of what causes death differ from those of their urban British counterparts. Similar cultural experiences, and possibly socio-economic status, education, and degree of exposure to Western media – all shared by the two groups of British children – might explain why very few differences were found between them. Finally, there was little evidence of religion making more of an impact on children's understanding of death subcomponents than culturally specific experiences, particularly those arising from living in rural versus urban settings.

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Appendix 1: Scoring criteria for responses to the death questions

Inevitability (Can you tell me some things that die? Do all . . . die?
If people not mentioned . . . Do people die? Do all people die?)
- 0 – People not mentioned as dying and when asked 'do people die?' they answer 'no'
- 1 – People not mentioned as dying but when asked 'do people die?' they answer 'yes'
- 1 – People mentioned as dying but when asked 'do all people die?' they answer 'no'
- 2 – People mentioned as dying and all people die

Applicability (Can you tell me a few things that never ever die?)
- 0 – Only living things mentioned
- 1 – Mixture of living and non-living things mentioned
- 2 – Only non-living things mentioned (God, Allah, prophets, Imams and angels were accepted only if they were additional to a list of non-living things)

Irreversibility (Could a dead person at some time become a live person?)
- 0 – Yes
- 0 – On the day of judgment/If they go to Jannah/By reciting Al Fatihah/In God's house/If you go up in heaven
- 2 – No

Cessation (When a person is dead, do they need food? Do they need air? Do they have dreams?)
- 0 – Two or three 'yes' responses
- 1 – Two 'no' responses
- 2 – Three 'No' responses

Causality (Can you tell me something that might happen that would make someone die?)
- 0 – External cause of illness without any biological explanation (e.g., cancer/guns/swords/old age/accidents/knives/hunger/fire)
- 0 – Reference to religion (e.g., if Allah wants us to die/God's will)
- 1 – Reference to body or organ but not to fully explicit biological cause (e.g., heart stops beating/if you are not able to breathe/someone cuts your throat)
- 2 – Explicit biological causal answer (knives because they cut your body and all your blood comes out so you die)