The breadth and mnemonic consequences of the youth bias

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Abstract

We have recently demonstrated the existence of the *youth bias*, referring to a tendency to favour adolescence and early adulthood over other lifetime periods when making inferences about the timing of important public events across the lifespan of a typical individual within one's culture. The youth bias integrates two discrete lines of research, that is, the literature on the privileged status of adolescence and early adulthood in human memory and cognition, and the literature on cognitive biases. Here we first examined whether the youth bias holds for specific categories of public events (i.e., deaths of public figures, United States presidential elections, and sporting events). We then investigated the possible role of the youth bias in structuring recall for public events, by probing, within subjects, for the relation between: (1) these expectations of the timing, in a typical person's life, of the most important exemplar from each public event category, and (2) the age at which the cited event occurred on a recall question asking participants to cite the most important exemplar, in their own lifetime, from each category. We found a youth bias for each category. Additionally, responses to the youth bias question were correlated with the age at which the recalled event occurred, but only where particularly salient historical events did not play a central role in driving recall (i.e., for sporting events). We conclude that the youth bias holds across different types of public events and provides a default structure for organizing recall of public events.

We have recently demonstrated that individuals demonstrate a *youth bias*, referring to a tendency to favour the period of adolescence and early adult- hood over other lifetime periods when making inferences about the timing of important public events across the lifespan of a typical individual within one's culture (Koppel & Berntsen, 2014a). The youth bias integrates two discrete lines of research. The first research tradition incorporated into the youth bias concerns work demonstrating that the period of adolescence and early adulthood (e.g., ages 11 to 30) has a privileged status in human memory and cognition. This is reflected, for instance, in the *reminiscence bump*, wherein middle-aged and older adults demonstrate preferential memory for events of this period. The bump is found in both autobiographical memory (Rubin, Wetzler, & Nebes, 1986; for a review, including a demonstration of the shifting location of the bump according to the method used to cue memories, see Koppel & Berntsen, 2015) and memory of public events (e.g., Schuman & Scott, 1989; for a review, including a delineation of excep- tions to the effect, see Koppel, 2013).

The importance of adolescence and early adult- hood is also seen in *cultural life scripts*, that is, culturally shared representations of the order and timing of major transitional autobiographical events (Berntsen & Rubin, 2004; for a review of the life script literature, see Zaragoza Scherman, 2013): events that are cited as life script events like- wise generally cluster in adolescence and early adulthood. There is considerable evidence that the reminiscence bump in autobiographical memory is, in part, a product of the dominance of adolescence and early adulthood in the life script, in that the life script structures retrieval from auto- biographical memory by providing search descriptions for events that are included within it (Berntsen & Rubin, 2004; Haque & Hasking, 2010; Rubin & Berntsen, 2003).

The second research tradition incorporated into the youth bias concerns biases in human judgement. Systematic biases are held to often arise through the improper application of heuristic principles in judgement decisions (Tversky & Kahneman, 1974; for an overview of the literature on the role of heuristics in cognitive biases, see Gilovich & Griffin, 2002). Although the use of such heuristics is often beneficial, as they simplify many judgement processes, heuristics can also produce cognitive biases. For instance, individuals often use the *availability heuristic* in assessing frequencies or probabilities. The availability heuristic refers to the tendency to make judgements according to the ease with which relevant instances or occurrences can be brought to mind. In one example of how the availability heuristic can lead to cognitive biases, Tversky and Kahneman (1973) found that when participants were asked whether there are more words that start with a given consonant, such as *r*, or have the same consonant as their third letter, most participants responded that words starting with that consonant are more numerous. They did so even when this response was incorrect, as in the case of *r*. According to Tversky and Kahneman, this is because it is easier to think of words beginning with a given consonant than words that have it as their third letter.

Similarly, in the case of the youth bias, though the precise mechanisms of the effect still need to be established, our guiding theoretical framework is that it is produced through the improper application of what we will refer to as the *youth heuristic*, that is, the principle that most important events happen in one's youth. We imagine that this principle underlies the dominance of adolescence and early adulthood in both cultural life scripts and the youth bias. However, its manifestation in the youth bias represents a more obvious and severe bias than in the case of life scripts: In contrast to autobiographical events, public events happen at all times and independently of one's own individual life course. It is clearly irrational, then, for individuals to collectively favour any period of their lifespan over another when judging the expected timing of important public events.

Although the youth bias is therefore one of several cognitive phenomena that illustrate the special importance of adolescence and early adulthood, it is critically different from these other phenomena. First, the youth bias differs from cultural life scripts in that, for one thing, it refers to expectations about

the timing of public events in particular, whereas life scripts concern autobiographical events. Moreover, the youth bias is not simply an analogue of the life script; the youth bias does not represent a formal script, in that it contains no information about the nature or content of the specific public events that are expected to occur in the lifespan of a typical individual, nor does it stipulate the order in which they are expected to take place. The youth bias merely posits that, broadly speaking, important public events are expected to occur in adolescence or early adulthood. Second, the youth bias differs from the reminiscence bump for both auto- biographical events (Rubin et al., 1986) and public events (Schuman & Scott, 1989), as it does not deal with memories, but with cultural expectations.

Extensions of the youth bias

In establishing the youth bias, we noted that it presented several questions for future research (Koppel & Berntsen, 2014a). First, to how many domains does the youth bias extend? That is, in our initial demonstration of the youth bias, we asked participants to indicate what age they expected a typical individual would most likely be at the time of the most important public event, of any kind, to occur in their lifetime. Left open, then, was the question of whether the youth bias extends to specific categories of public events as well (e.g., deaths of public figures). It is also possible that this bias is not limited to public events, but may hold for any type of event that occurs randomly across the lifespan, although addressing this issue is beyond the scope of the present article.

Second, another question left unresolved in Koppel and Berntsen (2014a) is whether the youth bias has an influence on human cognition. As we noted, one possibility along these lines is that just as the life script appears to help produce the bump in autobiographical memory by structuring retrieval of autobiographical events (e.g., Rubin & Berntsen, 2003), the youth bias may similarly produce a retrieval strategy centred on adolescence and early adulthood. If so, then the youth bias may likewise partially underlie the bump for public events.

If the youth bias does contribute towards producing the bump for public events, then it would rep- resent an alternative to the theoretical accounts which have been proposed thus far to explain the effect. The dominant account of the bump for public events holds that public events in this period receive heightened encoding due to their importance in the formation of one's generational identity (Holmes & Conway, 1999; Schuman & Scott, 1989). In another account, Janssen, Murre, and Meeter (2008) have argued that the bump for public events can be attributed to the bump period corresponding to the peak in cognitive and neuro- logical functioning over the lifespan, in that this leads to heightened encoding of all events occurring during this time, including public events. We should note, however, that a youth-bias-based account of the bump need not be mutually exclusive to these other accounts, as it is possible that multiple factors are involved in the bump.

However, the youth bias likely only plays a role in the bump for public events as attained through certain methods, and not others. For instance, the bump has primarily been tested by either asking participants to freely recall public events (Holmes & Conway, 1999; Howes & Katz, 1992), to name *x* number of public events or changes in recent history (e.g., one or two public events or changes) that they consider to be especially important or the most important of the relevant time frame (Jennings & Zhang, 2005; Koppel & Berntsen, 2014b; Schuman & Corning, 2014; Schuman & Rodgers, 2004; Schuman & Scott, 1989; Scott & Zac, 1993), or by testing their knowledge of specific public events or individuals (Janssen et al., 2008; Rubin, Rahhal, & Poon, 1998; Schuman, Belli, & Bischoping, 1997; Schuman & Corning, 2000).

The most salient difference between these methods is that freely recalling public events or citing a given number of important public events or changes, which represent different measures of open-ended recall, appear to tap into the accessibility of public events in recall. Conversely, knowledge tests appear to primarily tap into availability in recall (for discussion of the distinction between availability and accessibility, see Tulving & Pearlstone, 1966). The effect of the youth bias on recall is likely confined to, or found more strongly in, measures of accessibility rather than availability. Therefore, although the youth bias is unlikely to contribute towards the bump found in knowledge tests, if it does structure recall of public events, this would seem to hold relevance for the bump found through the first two methods.

As a final preliminary note, we should point out that there is an important methodological difference in how the bump for public events is generally measured, relative to the bump in autobiographical memory; in studies on autobiographical memory, researchers collapse across all events, within a given sample, in analysing the temporal distribution of recalled events over the lifespan. In public event studies, however, researchers have generally compared memory for specific events across cohorts, in aiming to demonstrate that individuals remember public events occurring in their adolescence or early adulthood better than do other cohorts. This has been particularly true in studies employing the open-ended recall questions described above, as opposed to knowledge tests. Furthermore, in the exceptions where researchers have collapsed across all events in analysing the results from open-ended recall for public events, evidence for the bump has been mixed (Holmes & Conway, 1999; Howes & Katz, 1992; Koppel & Berntsen, 2014b). Specifically, there has been some indication that, when treated this way, the temporal distribution of recalled events is driven more by the prominence of individual events than by age effects (Howes & Katz, 1992; Koppel & Berntsen, 2014b). This role of event importance is also seen in the more conventional studies com- paring citations of individual important public events across cohorts; here as well, in addition to cohort effects, there are often one or two events which are cited particularly frequently in the sample as a whole (Schuman & Rodgers, 2004; Schuman & Scott, 1989; Scott & Zac, 1993; and for a discussion of the role of event importance in recall for public events, see Schuman & Corning, 2012).

The current study

In the current study, we set out to address the two above-mentioned questions arising from our initial demonstration of the youth bias (Koppel & Berntsen, 2014a). First, we aimed to test whether the youth bias we had previously attained for public events overall holds for specific categories of public events. Second, we aimed to test for a possible role of the youth bias in structuring recall for public events, by probing for the relation between (1) these expectations of the timing, in a typical person's life, of the most important exemplar from several different categories of public events, and (2) the age at which the cited event occurred on a recall question asking participants to cite the most important exemplar, in their own lifetime, from the same public event categories.

We drew this comparison within subjects, and, in common with our original demonstration of the youth bias, on an online United States (US) sample. The three types of events we chose in carrying out the study were (1) deaths of public figures, (2) US presidential elections, and (3) sporting events. From a logical perspective, the occurrence of particularly important exemplars from each event category is of course randomly distributed across the lifespan of an individual. Nonetheless, following from our earlier demonstration of the youth bias on public events taken generally (Koppel & Berntsen, 2014a), we expected that, in the cultural expectations data, the youth bias would hold for each of the specific event categories we assessed here. This would confirm and extend the tendency to favour adolescence and early adulthood in estimating the expected timing of important public events.

As for the possible relation between these cultural expectations and the timing of the public event cited in the recall question, we expected that this would depend on how much room there was in each individual event category for the youth bias to influence recall. That is, given the role of event importance in recall for public events (e.g., Howes & Katz, 1992; Koppel & Berntsen, 2014b; Schuman & Corning, 2012), we expected that, in categories of public events containing one or more particularly salient historical event, such events would drive recall to a large degree. This might obscure any mnemonic effect of the youth bias in such categories. However, event importance would likely play a smaller role in categories lacking any particularly salient historical events. In these categories, therefore, we expected that the youth bias would play a role in structuring recall.

We aimed to test this prediction in our selection of event categories. We did so by including a mixture of categories in which at least one category contained a particularly notable exemplar, which would be expected to dominate recall in the sample as whole; conversely, we also included at least one category that appeared to lack any such exemplar. For instance, in the case of deaths of public figures, we expected that, given the US public's enduring interest in John F. Kennedy,— as illustrated by the estimated 40,000 books which have been written about Kennedy since his death (Abramson, 2013)—Kennedy's death would dominate recall and obviate any mnemonic influence of the youth bias. Similarly, in the case of US

presidential elections, we expected that the 2008 election between Barack Obama and John McCain would have a similar effect, given the historical significance of this election (Nagourney, 2008; Sullivan, 2007; Tesler & Sears, 2010).

In contrast, in the case of sporting events, we did not expect any single event to dominate recall. Here, therefore, we expected the youth bias to con- tribute towards structuring recall, in that we expected to find a relation between responses to the norm question and the timing of the event cited in the recall question.

METHOD

Participants and procedure

The current study was conducted through a combination of Amazon's Mechanical Turk website and the website SurveyMonkey—in the case of the latter, the website recruited participants to complete the survey. We recruited different sets of participants for each type of event. The surveys on deaths of public figures and sporting events were administered in November and December of 2012; the survey on US presidential elections was administered in November 2013. The fact that the data for each condition were collected at two separate time points should not have any bearing on our ability to compare our results across these three conditions, as the timing of the data collection would not be expected to affect either of our two central research questions—namely, whether or not we would attain a youth bias in each category, and whether or not we would find a relation in each category between the cultural expectations data and the recall data. We recruited only participants who were at least 40 years old, so that they would have ample opportunity, on the recall question, to cite events from outside the period of the lifespan covered by the youth bias.

Overall, there were 150 participants in each of the three conditions (deaths of public figures, US presidential elections, and sporting events). Table 1 provides demographic information on the sample in each condition. Of these participants, 5 in the deaths of public figures condition, 26 in the US presidential elections condition, and 24 in the sporting events condition either failed to cite an event as the most important of their lifetime, gave an overly vague response (e.g., in the sporting events condition, referring generically to "the Superbowl"), or violated the instructions by citing an event that had occurred before they were born. Therefore, the citations of most important events were, in effect, out of 145 participants in the deaths of public figures condition, 124 participants in the US presidential elections condition, and 126 participants in the sporting events condition.

Table 1. Demographic information

Deaths of public figures condition	US presidential elections condition	Sporting events condition
Age: *M* = 51.5 years (*SD* = 8.8; range = 40–76)	Age: *M* = 57.7 years (*SD* = 9.1; range = 41–82)	Age: *M* = 51.5 years (*SD* = 9.2; range = 40–77)
Gender: Male: 48.7% Female: 51.3%	Gender: Male: 45.3% Female: 54.7%	Gender: Male: 53.3% Female: 46.7%
Race/ethnicity: Caucasian: 91.2% African American: 3.4% Asian American: 1.4% Hispanic: 1.4% Native American: 2.0% Mixed/other: 0.7%	Race/ethnicity: Caucasian: 86.6% African American: 4.0% Asian American: 1.3% Hispanic: 4.7% Native American: 0.7% Mixed/other: 2.7%	Race/ethnicity: Caucasian: 93.8% African American: 0.0% Asian American: 2.1% Hispanic: 1.4% Native American: 2.1% Mixed/other: 0.7%
Education level: Less than high school: 0.0% High school: 8.0% Currently in college/some college: 30.0% Associate's degree/technical degree: 10.0% B.A./B.S. degree: 30.7% Graduate degree: 21.3%	Education level: Less than high school: 0.0% High school: 6.7% Currently in college/some college: 18.1% Associate's degree/technical degree: 10.1% B.A./B.S. degree: 26.8% Graduate degree: 38.3%	Education level: Less than high school: 0.7% High school: 8.0% Currently in college/some college: 28.7% Associate's degree/technical degree: 10.0% B.A./B.S. degree: 31.3% Graduate degree: 21.3%

Surveys

In addition to the demographic questions, the remaining questions asked of participants were analogous across all three conditions. They consisted of (1) a norm question, in which the participant was asked what age a prototypical individual of their own culture and gender would most likely be at the time of the occurrence of the most important exemplar of the relevant event category to take place in their lifetime, and (2) a recall question, in which the participant was asked to cite the most important such event of their own lifetime. The norm questions were modelled after the query we had previously used in demonstrating the youth bias (Koppel & Berntsen, 2014a). The instructions were based on the question previously used to tap cultural life norms for autobiographical events (Berntsen & Rubin, 2004), but were modified to tap the expected timing of important public events. For instance, in the deaths of public figures condition, participants were asked to imagine a typical infant of their own culture and gender, and were then instructed that

… throughout this person's life, many deaths of public figures will take place, both nationally and internationally. In some cases, these deaths of public figures will be of great importance. How old do you think this person is most likely to be at the time of the most important death of a public figure of their lifetime? If you are unsure, please give your best estimate.

The norm questions in the sporting events and US presidential elections conditions followed the same format. In all cases, response options consisted of five-year bins, starting with *0–5 years*, and continuing with *6–10 years*, *11–15 years*, etc., up to *86–90 years*.

The recall questions were modelled after the question that Schuman and colleagues (e.g., Schuman & Scott, 1989) have employed in probing open-ended recall for public events of recent history, wherein, as described in the introductory section, participants are asked to cite a given number of important public events or changes. For instance, in the deaths of public figures condition, we requested: "Please think of the deaths of public figures that have occurred over the course of your lifetime, both nationally and internationally, and name one death which Seems to you to have been especially important". As with the norm questions, the recall questions in the other conditions were similar. In each condition, the order of the norm and recall questions was counterbalanced across participants.

RESULTS

Age norm distributions

Figure 1 illustrates, separately for each condition, the age distributions of when participants stated that they believed the most important exemplar of each type of event would most likely take place.
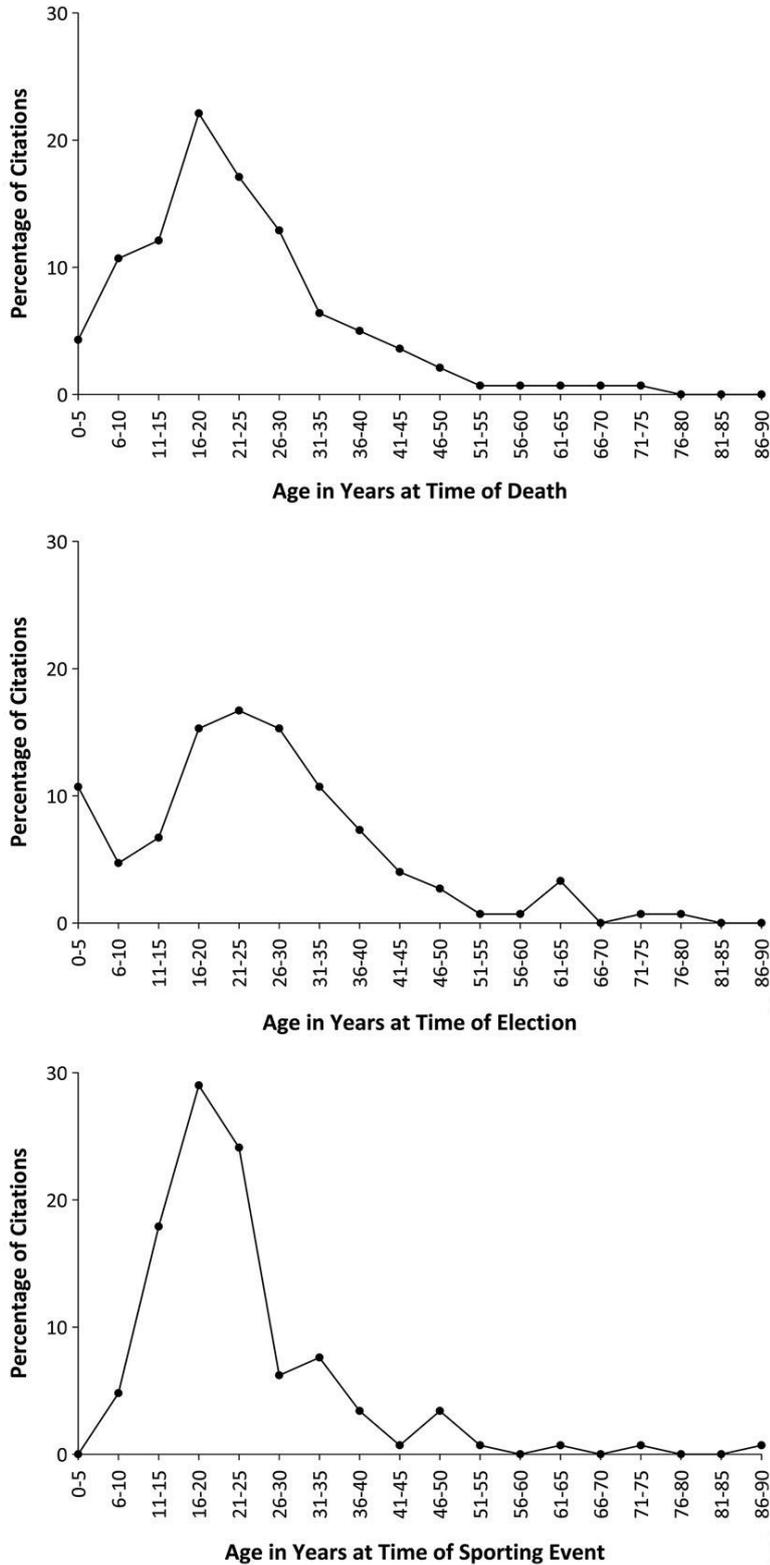

Figure 1. Cultural expectations for when the most important public events of a typical person's life are expected to take place. Data for the most important death of a public figure, US presidential election and sporting event are presented in the top, middle and bottom panels respectively.

As the figure illustrates, just as we had previously found a youth bias for important public events taken overall (Koppel & Berntsen, 2014a), we found a similar bias, in the norm data here, for each of the three specific categories of public events we probed. Though the specific curve of the distributions varied somewhat across conditions, there was, nonetheless, a broadly similar pattern in each case, with a disproportionate number of citations for the period of adolescence and early adulthood. The distribution peaked from ages 11 to 30 in the deaths of public figures condition, 16 to 30 in the US presidential elections condition, and 11 to 25 in the sporting events condition. Binomial tests confirmed the statistical significance of these increases, as, in each case, there was a significantly greater proportion of responses for the pertinent 20- or 15-year interval than for the second-most frequently cited interval of the same duration, p ⸴ .001 in each case.

Recall questions: events cited

Table 2 illustrates, for each condition, the events cited by at least 2.0% of the sample. Since each participant was asked to think of an event that had occurred in his or her lifetime, the relevant time frame varied for each participant. Therefore, some of the events listed in Table 2 were only eligible to be cited by a subset of the sample, so that the proportion of citations reported therein consequently understates the true memorability of the event. For instance, while, as the table indicates, the death of John F. Kennedy was cited by 31.7% of the overall sample, it was in fact cited by 52.2% of the sample that was alive at the time (46 out of 88 participants).

Table 2. Public events cited by at least three respondents

Deaths of public figures		US presidential elections		Sporting events	
Death	**Number of citations (%)**	**Election**	**Number of citations (%)**	**Event**	**Number of citations (%)**
John F. Kennedy (1963)	46 (31.7)	2008 election (Barack Obama vs John McCain)	40 (32.3)	1980 Winter Olympics/US hockey team's defeat of the Soviet Union	12 (9.5)
John Lennon (1980)	15 (10.3)	1980 election (Ronald Reagan vs Jimmy Carter)	23 (18.5)	2012 Summer Olympics	7 (5.6)
Martin Luther King, Jr. (1968)	14 (9.7)	2012 election (Barack Obama vs Mitt Romney)	17 (13.7)	1986 Super Bowl (Chicago Bears vs New England Patriots)	6 (4.8)
Ronald Reagan (2004)	13 (9.0)	1960 election (John F. Kennedy vs Richard Nixon)	10 (8.1)	1982 Super Bowl (San Francisco 49ers vs Cincinnati Bengals)	4 (3.2)
Princess Diana (1997)	10 (6.9)	1984 election (Ronald Reagan vs Walter Mondale)	6 (4.8)	2008 Summer Olympics	4 (3.2)
Michael Jackson (2009)	9 (6.2)	1992 election (Bill Clinton vs George H. W. Bush)	6 (4.8)	1984 Summer Olympics	3 (2.4)
Kurt Cobain (1994)	6 (4.1)	2000 election (George W. Bush vs Al Gore)	6 (4.8)	2010 Super Bowl (New Orleans Saints vs Indianapolis Colts)	3 (2.4)
Elvis Presley (1977)	3 (2.1)	1972 election (Richard Nixon vs Richard McGovern)	3 (2.4)	2012 Super Bowl (New York Giants vs New England Patriots)	3 (2.4)
Pope John Paul II (2005)	3 (2.1)				
Other	26 (17.9)	Other	13 (10.5)	Other	84 (66.7)

Note: Citations were out of 145 participants in the deaths of public figures condition, 124 participants in the US presidential elections condition, and 126 participants in the sporting events condition.

The relation between responses to the norm question and the timing of public events cited in the recall question

In assessing the role of the cultural expectations represented by the youth bias in structuring the recall of public events, we would not necessarily expect to simply find a reminiscence bump in recall for public events, roughly mirroring the distributions in the norm data. This is on account of the prominent role, as noted in the introductory section, played by event importance in recall for public events (Howes & Katz, 1992; Koppel & Berntsen, 2014b; Schuman & Corning, 2012). Therefore, rather than comparing the temporal distributions in the norm data to the temporal distributions in the recall data, our analyses on the recall distributions focus on the relation between the five-year age interval that participants assigned in their response to the norm question and the five-year age interval at which the event they cited in the recall question occurred.

As outlined in the introductory section, our theoretical framework suggests that, where recall is dominated by one or more particularly notable events, the cultural expectations represented by the youth bias may have minimal effect on recall. However, where there are no such particularly notable events, there should be more room for cultural expectations to structure recall. As Table 2 indicates, there was considerable variation, across the three conditions, in the extent to which recall was driven by individual events; the most frequently cited events in the deaths of public figures and US presidential elections conditions were cited more frequently than their counterparts in the sporting events condition. To illustrate this variation more systematically, we plotted, in Figure 2, the distribution of recalled events according to the calendar year in which each event occurred. As with the norm distributions, we plotted the recall distributions separately for each condition. We plotted these distributions back to 1960 so that the figure would reflect the death of Kennedy in the deaths of public figures condition, as that was the oldest event for which we had a large number of citations.
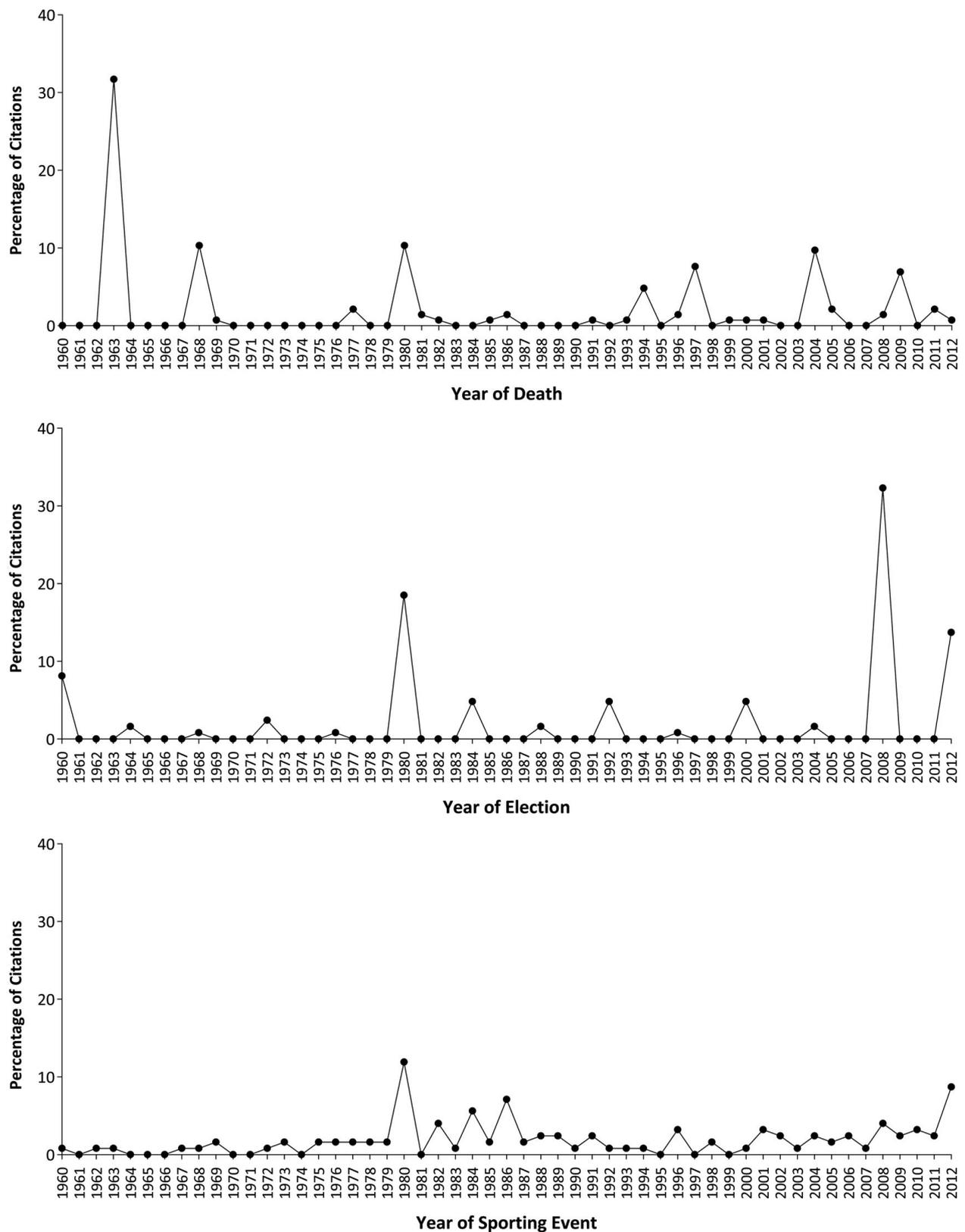
Figure 2. Citations of the most important public events of participants' lifetimes, plotted by the calendar year in which each event occurred. Data for the most important death of a public figure, US presidential election and sporting event are presented in the top, middle and bottom panels respectively.

We tested the statistical significance of this variation in the extent to which recall was driven by individual events by probing for whether there was a significant difference in the proportion of citations assigned to the most-cited event in each condition. A chi-square test confirmed that there was an overall difference across the three conditions, x^2(2, N = 395) = 23.19, $p < .001$. In particular, citations of the most frequently cited sporting event constituted a smaller proportion of overall responses than citations of either the most frequently cited death of a public figure, x^2(1, N = 271) = 19.75, $p < .001$, or US presidential election, x^2(1, N = 250) = 19.61, $p < .001$. There was, however, no significant difference across the deaths of public figures and US presidential elections conditions, x^2(1, N = 269) = 0.01, $p = .93$.

Therefore, according to our theoretical framework, we should find, in the sporting events condition, a statistically significant relation between the five-year age interval participants assigned in their response to the norm question and the five- year age interval at which their cited event in the recall question occurred. However, we would be less likely to find this relation in the deaths of public figures and US presidential elections conditions. We tested this prediction by calculating Spearman rank correlations between each set of responses. These correlations confirmed that there was a significant relation in the sporting events condition (n = 124, r = .37, $p < .001$), but not in the deaths of public figures or US presidential elections conditions (death of public figures condition: n = 135, r = .05, p = .60; US presidential elections condition: n = 124, r = −.11, p = .23).[1]

DISCUSSION

The current study extends our prior demonstration of the youth bias (Koppel & Berntsen, 2014a) in two important respects. First, we demonstrated that this bias holds not only for public events taken overall, but also for specific types of public events; for all three categories of public event (deaths of public figures, US presidential elections, and sporting events) we found that participants predominantly expected that the most important exemplar of that event, within the lifetime of a prototypical individual of their own culture and gender, would most likely take place in adolescence or early adulthood.

Second, we found that, where individual events drove recall to a relatively small degree—that is, in the sporting events condition—the five-year age interval assigned in responses to the norm question were correlated with the five-year age interval at which the event cited in the recall question occurred. One might suspect that the relation between the norm data and the recall data in the sporting events condition was due either to a carry-over effect or to participants drawing upon the timing of important sporting events from their own life in responding to the youth bias question, rather than being due to recall being driven by the youth bias. However, the fact that this relation was limited to the sporting events condition argues against either of these interpretations. Overall, then, our correlational analyses suggest that (1) where the mnemonic effect of the youth bias is not obscured by event importance as defined historically, it serves to

structure recall, and (2) the youth bias is not an experience-based effect, in that individuals do not simply draw upon the timing of important public events from their own life in responding to the youth bias question.

The relation between the cultural expectations represented by the youth bias and recall for public events suggests that the youth bias may partially underlie the reminiscence bump for public events, by structuring retrieval of public events. As we noted in the introductory section, the role of the youth bias in the bump for public events is likely confined to the bump as found through measures of open-ended recall, most notably including free- recall procedures (Holmes & Conway, 1999; Howes & Katz, 1992) and citations of a given number of important public events and changes of recent history (e.g., Schuman & Scott, 1989); that is, this effect of the youth bias probably does not extend to the bump as found in tests of knowledge of public events or individuals (e.g., Schuman et al., 1997). More research is needed to clarify this matter, though.

However, in a review of the literature, Koppel (2013) noted that there is some indication the bump is stronger when tested through open-ended recall than through knowledge tests. Relatedly, in asking participants to judge whether the second Iraq war was more like the Vietnam War or World War II, Schuman and Corning (2006) found that the Vietnam War was chosen disproportionately by those who were alive and past the age of childhood amnesia during the Vietnam War, rather than specifically by those who were in the bump period. This further suggests that the bump for public events is strongest when testing open-ended recall. The contribution of the youth bias to the bump may help explain this discrepancy in the strength of the effect across different measurement methods.

It is also worth noting that a youth-bias-based account of the bump for public events is the only theoretical account that can explain the distributions in the norm data, in that it is the only account that addresses cultural expectations of the timing of important public events in the lifespan of a hypothetical individual. This is because, as noted in the introductory section, the other accounts argue that public events occurring in the bump period receive heightened encoding, either because they play a special role in the formation of one's generational identity (Holmes & Conway, 1999; Schuman & Scott, 1989) or because cognitive and neurological functioning is at its peak in the bump period (Janssen et al., 2008). Therefore, both the existence of the youth bias itself, as well as the correlation attained in this study between the norm data and the recall data in the sporting events condition, suggest that factors other than generational identity or cognitive functioning play a role in producing the bump for public events. That said, as is likewise noted in the introductory section, the accounts of the bump are not necessarily mutually exclusive to one another. Therefore, the evidence found here in support of a youth-bias-based account does not undermine other accounts as potential explanations of the bump.

Conclusions and future directions

In sum, in the current study we have further documented the youth bias and provided answers to two questions arising from our initial demonstration of the effect (Koppel & Berntsen, 2014a). First, the youth bias does not hold only for public events taken overall, but also applies to specific categories of public events. This illustrates the robustness of the effect in that it indicates that the youth bias still holds at the more subordinate level of abstraction required in responding to the youth bias question in relation to specific event categories. Furthermore, this finding suggests that there is no competing heuristic that individuals employ, beyond the proposed youth heuristic, in responding about these specific event categories. Second, the youth bias appears to have an influence on human cognition, such as, as shown here, by structuring recall of public events, likely by producing a retrieval strategy centred on adolescence and early adulthood.

Given that the youth bias is a recently discovered effect, there remain a number of promising avenues for future research. For example, would it also be found for other specific categories of public events, such as the expected timing of scientific inventions, natural disasters, and financial crises, or for non-public events that likewise are randomly distributed across the lifespan? Additionally, though our guiding theoretical framework is that the youth bias is produced through the improper application of a youth heuristic, the specific under- lying mechanisms behind the youth bias (i.e., why people hold it) still need to be examined. Future researchers may want to investigate this issue, by, for instance, asking participants to engage in think-aloud protocols as they respond to the youth bias question.

Lastly, we do not know whether the youth bias also holds across different demographic groups or across cultures. Cross-cultural investigations of the youth bias may be particularly informative, as they may shed light on the mechanisms underlying the effect. For example, if the youth bias is indeed produced through a youth heuristic, one might expect it to be limited to or held more strongly in Western cultures than Eastern cultures, insofar as the youth bias may in that case reflect an idealization of youth and youthfulness. The Confucian values traditionally held in Eastern cultures are considered as instilling positive views about the ageing process and a level of respect and esteem for the elderly (Ng, 1998; Sung, 2001). In contrast, Western cultures are held as traditionally valuing youth and holding more negative views about ageing and the elderly (Palmore, 1975). That said, researchers have not found any consistent indication that attitudes towards ageing and age- related stereotypes vary across Eastern versus Western cultures (Boduroglu, Yoon, Luo, & Park, 2006; Löckenhoff et al., 2009; Ryan, Jin, Anas, & Luh, 2004). However, the youth bias may be one respect in which cross-cultural differ- ences on attitudes towards ageing do emerge.

Notes

[1] In this analysis, the ns in the sporting events and deaths of public figures conditions are smaller than the n of the respondents whose data contributed to the recall distributions due to missing data for the norm question.

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