Travelling backwards and forwards in time: Culture and gender in the episodic specificity of past and future events

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There is considerable evidence that, when recalling past events, Westerners exhibit greater episodic specificity than East Asians and women exhibit greater episodic specificity than men. Yet it is unknown whether the same cultural and gender differences are true for future events. In the present study 209 European American and Chinese young adults were asked to recall past personal events and imagine future personal events occurring in varied time periods (i.e., 1 week, 1 year, 10–15 years). Regardless of time period, European Americans consistently produced more specific details than Chinese for future events than they did for past events, and women produced more specific details than men for both past and future events. These findings provide additional support for the constructive-episodic-simulation hypothesis, and shed new light on the influence of culture and gender on episodic thinking.

Keywords: Episodic specificity; Autobiographical memory; Mental time travel; Culture; Gender.

As human beings we are capable of mentally travelling back in time to re-experience our previous experiences and travelling forwards in time to anticipate future happenings (Tulving, 2002). Recently it has been proposed that memories of past events provide the raw materials based on which possible future events can be simulated or constructed (Suddendorf & Corballis, 1997). In supporting this constructive-episodic-simulation hypothesis, research has shown that remembering past events and imagining future events share similar cognitive processes (e.g., imagery, self-referencing, relational processing) and neural substrates (i.e., medial prefrontal, temporopolar, hippocampal-parahippocampal, and medial and lateral parietal regions) (Addis, Wong, & Schacter, 2007, 2008; Szpunar, 2010). Moreover, representations of past and future events in rich detail specific in time and place—that is, episodic specificity—vary concurrently across individuals and both decline with ageing (Addis et al., 2008; D’Argembeau & Van der Linden, 2006; Levine, Svoboda, Hay, Winocur, & Moscovitch, 2002). Against this backdrop an important empirical question arises: Will cultural and gender differences in episodic specificity during the recollection of past events apply to future events? The present study investigates the role of culture and gender in the episodic specificity of remembering past personal events and imagining future personal events.

Cross-cultural research has consistently demonstrated that Europeans and European Americans, both children and adults, often exhibit greater episodic specificity than Asians and Asian Americans in the recollection of recent and
remote autobiographical events (for a recent review, see Wang, 2009). For example, when remembering early childhood experiences (Wang, 2001, 2006) or recalling personal events across the lifespan (Wang & Conway, 2004), Euro-American adults are better able than Chinese to report specific, one-moment-in-time episodes that took place at a particular time and place in the past. And compared with their Korean and Chinese peers, Euro-American preschool and grade school children are capable of retrieving more specific memories of recent life events (Han, Leichtman, & Wang, 1998; Wang, 2004, 2008) and early childhood experiences (Peterson, Wang, & Hou, 2009), and the cultural differences appear to increase with age.

Pertaining to gender, studies have found that women exhibit greater episodic specificity than men in tasks relevant to autobiographical recollections (Herlitz & Rehnman, 2008). The gender differences in episodic memory emerge early and exist throughout the world. Research has further found that, compared with men, women show greater accessibility when recalling personal experiences from the early childhood (Davis, 1999; Mullen, 1994; Rubin, 2000), and are better able to retrieve memories of specific, one-time episodes (Pillemer, Wink, DiDonato, & Sanborn, 2003; Wang, 2001). In addition, there is evidence that women tend to report more episodic details than men when remembering significant personal experiences (Ross & Holmberg, 1990).

No study that we know of to date has examined culture and gender effects on the episodic specificity of future events. Given the recent findings that suggest an intimate relation between remembering the past and projecting oneself into the future (Addis et al., 2007, 2008; Szpunar, 2010), it is reasonable to expect that the greater episodic specificity among Westerners compared with Asians should be evident in both recalling past events and imagining future events, and women should also exhibit greater episodic specificity than men for future events than they do for past events. Such findings will provide additional empirical support for the constructive-episodic-simulation hypothesis (Addis et al., 2008; Suddendorf & Corballis, 1997). They will further shed new light on the influence of culture and gender on episodic thinking.

In the present study we investigated the role of culture and gender in the episodic specificity of past and future events. We asked Chinese and European American college students to recall past events and to imagine possible future events happening to them in three time periods that differed in distance from the present: 1 week, 1 year, and 10–15 years. We assessed episodic specificity using a standardised scoring procedure that distinguishes episodic information from non-episodic or general information in an event (Levine et al., 2002). Specifically, each generated event was segmented into distinct details that were classified as either specific if they concerned episodic information pertaining to the event (e.g., what, where, when), or general if they only concerned semantic facts or other information not specific to the event. The richer the specific details are, the greater the episodic specificity. This method of assessing episodic specificity is more fine-tuned than what has been commonly used in previous cross-cultural research, where each event is qualitatively classified as either specific if it refers to a discrete event that happened at a particular point in time, or general if it refers to an event that took place repeatedly or in an extended period of time (e.g., Han et al., 1998; Wang, 2001, 2006; Wang & Conway, 2004). We expected that regardless of time period, Euro-Americans would consistently produce more specific details than Chinese for both past and future events, and women would produce more specific details than men across both temporal directions. General details were expected to remain similar across cultures and genders.

METHOD

Participants

The participants were 209 undergraduate students, including 99 from Cornell University, USA (all European American; 58 females, 41 males) and 110 from Peking University, China (all ethnic Chinese; 61 females, 48 males; 1 did not provide gender information). At both sites, participants were recruited in various psychology and human development classes and received partial course credit for their participation. Informed consent was obtained from each participant.

Procedure

Participants met with a researcher in small groups of one to four and each received a questionnaire in their native language. A translation/back-translation
procedure was used to ensure equivalent literal and sense meanings between the English and Chinese versions of the questionnaire. The questionnaire consisted of one section on “Remembering past events” and one section on “Imagining future events”. The first page of each section contained instructions adopted from previous studies (Addis et al., 2007, 2008; D’Argembeau & Van der Linden, 2006). Participants read that they would be asked to recall (imagine) three personal events from the past (the future) that occurred (would occur) at different time points: last week, last year, last 10–15 years (next week, next year, next 10–15 years). They were instructed that each recalled (imagined) event should be of a specific one-time event that took place at a particular time and place and did not last more than a day. Specific examples were provided (e.g., visiting the Eiffel Tower on one particular day, as opposed to a 3-week trip to France; the birth of one’s future child, as opposed to one’s future child). Participants were further asked to recall (imagine) the events as if they were re-experiencing (experiencing) them, and to describe each of the events in as much detail as they could within a 3-minute time limit. For future events, participants were also told that the events must be plausible given their plans for the future, and novel, that is, not previously experienced by them. The order of the past and future sections was counterbalanced. The three time periods (week, year, 10 years) were blocked within each temporal direction (past, future) to reduce cognitive load. They were listed one on each page and their order of presentation was counterbalanced. The researcher helped to monitor the time as the participants worked on the questionnaire. On the final page participants provided demographic information. Completion of the questionnaire took approximately 30 minutes.1

Coding

The data were coded following previous studies (Addis et al., 2008; Levine et al., 2002). For each event description, the central event was first identified. In cases where more than one event was mentioned, the one that garnered the most details and occurred within a relatively brief time frame was selected as the central event. Each event description was then segmented into distinct informational details, with each detail being a unique occurrence, observation, or thought. For example, “We played games at the Science Museum last Saturday” contains three details: playing games (an event happening), Science Museum (a location), and last Saturday (a time). The details were categorised as either specific or general. Specific details were episodic information directly relevant to the central event, including happenings or the unfolding of the story, characters, place, time, perceptual experiences, emotions, and thoughts. General details were non-episodic information, including semantic details, information pertaining to other non-central events or extended events that were not specific in time and place, and repetitions. The numbers of specific and general details were tallied for each event.

An English-speaking and an English–Chinese bilingual research assistant coded the US and Chinese data, respectively. Repeated joint coding sessions were held to ensure that the same definitions were followed for the two datasets. Inter-coder reliability was assessed for 20% of the data from each group by two other independent coders. Coders were unaware of the study hypotheses. The average agreement was 97% for specific details and 91% for general details for the US data, and 93% for specific details and 97% for general details for the Chinese data. Disagreements were resolved by discussion among the coders.

RESULTS

Preliminary analyses on the length of event descriptions, measured by the total number of English words or Chinese characters used, showed that Chinese participants provided lengthier descriptions of both past (M = 87.68, SD = 24.94) and future events (M = 81.61, SD = 22.58) than did Euro-Americans (M = 79.50, SD = 15.21; M = 75.20, SD = 19.83), F(1, 204) = 7.79, p = .006, d = .39, and F(1, 194) = 4.44, p = .04, d = .30. Females provided lengthier descriptions of both past (M = 87.97, SD = 21.95) and future events (M = 83.20, SD = 22.23) than did males (M = 78.48, SD = 19.40; M = 71.95, SD = 18.64), F(1, 203) = 10.35, p = .002, d = .45, and F(1, 193) = 13.75, p = .0003, d = .53. Event length was correlated with the number of specific (rs = .44 – .57, ps < .0001) and general details

1Participants completed three additional questionnaires that address separate research questions. The data are not included here.
There was a significant culture effect, length was included in the model as a covariate.

A 2 (culture: US vs China) \( \times 2 \) (gender: male vs female) \( \times 2 \) (direction: past vs future) \( \times 3 \) (period: week vs year vs 10 years) \( \times 2 \) (detail: specific vs general) mixed model analysis using SAS PROC MIXED program (Singer, 1998) was conducted on the number of details, with culture and gender being between-participant factors, direction, period, and detail being within-participant factors, and participant being a random factor. Event length was included in the model as a covariate. There was a significant culture effect, \( F(1, 204) = 215.84, p < .0001, \Delta R^2 = .75 \), qualified by a Culture \( \times \) Detail interaction, \( F(1, 2222) = 156.66, p < .0001, \Delta R^2 = .07 \). Follow-up Tukey HSD tests \( (p < .05) \) showed that Euro-Americans produced more specific details than Chinese did, whereas the two groups produced similar numbers of general details. This pattern was consistent across both genders, both temporal directions, and the three time periods (i.e., there were no interactions involving gender, direction, or period). Figure 1 illustrates mean number of specific and general details as a function of culture, temporal direction, and time period.

A main effect of gender also emerged, \( F(1, 204) = 17.43, p < .0001, \Delta R^2 = .16 \), qualified by a Gender \( \times \) Detail, \( F(1, 2222) = 83.59, p < .0001, \Delta R^2 = .04 \), and a Gender \( \times \) Direction \( \times \) Detail interaction, \( F(1, 2222) = 4.14, p = .04, \Delta R^2 = .001 \). Follow-up Tukey HSD tests \( (p < .05) \) confirmed that females produced more specific details than males for both past and future events, although the gender difference was slightly larger for future events (LSD difference = 2.19) than for past events (LSD difference = 1.41). The number of general details did not differ between genders. Figure 2 illustrates mean number of specific and general details as a function of gender, temporal direction, and time period.

The analysis also revealed a significant direction effect, \( F(1, 2222) = 31.80, p < .0001, \Delta R^2 = .04 \), and a Direction \( \times \) Detail interaction, \( F(1, 2222) = 57.39, p < .0001, \Delta R^2 = .03 \). Tukey HSD tests \( (p < .05) \) showed that across culture and gender groups, past events \( (M = 13.56, SD = 4.04) \) contained more specific details than future events \( (M = 11.70, SD = 4.41) \), whereas general details remained similar between the two temporal directions \( (M = 1.13, SD = 0.95 \) and \( M = 1.03, SD = 0.99) \). In addition, participants provided more specific than general details for both past and future events, \( F(1, 2222) = 7650.13, p < .0001, \Delta R^2 = .77 \). Finally, a Period \( \times \) Detail, \( F(2, 2222) = 5.16, p = .006, \Delta R^2 = .005 \), and a Direction \( \times \) Period \( \times \) Detail interaction, \( F(2, 2222) = 3.24, p = .04, \Delta R^2 = .002 \), emerged. Past events from last week \( (M = 13.59, SD = 5.28) \) and last year \( (M = 14.17, SD = 5.57) \) contained more specific details than those from 10 to 15 years ago \( (M = 12.95, SD = 4.49) \), although only the difference between events from last year and last 10–15 years was significant in Tukey HSD tests \( (p < .05) \). In addition, future events from next week \( (M = 11.98, SD = 4.86) \) contained more specific details than those from next year \( (M = 11.42, SD = 4.92) \) and next 10 to 15 years \( (M = 11.39, SD = 6.12) \), although the differences were not significant in Tukey HSD tests. In general, there was a trend in which temporally recent past and future events contained more specific details than temporally distant events. No such a trend was evident for general details.

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2The patterns of findings were identical when event length was included in analysis and when it was not included.
To examine the relation between specificity of past and future events, partial correlations were calculated between past and future detail scores averaged across the three time periods, with culture and gender controlled. Participants who recalled more specific details in the past events also provided more specific details when imagining the future events \( (r = .57, p < .0001) \), and those who included more general details in the past events also included more general details in the future events \( (r = .21, p = .003) \). In addition, participants who recalled more specific details in the past events tended to include less general details in these events \( (r = -.21, p = .002) \). Specific and general detail scores of future events were uncorrelated \( (r = -.05, p = .49) \).

**DISCUSSION**

The present study provided the first empirical evidence for the consistent cultural and gender differences between recalling past personal events and imagining future personal events. As predicted, Euro-Americans produced more specific details than Chinese for both past and future events, and women produced more specific details than men for both past and future events. This was true regardless of time period in which the events took place.

The striking similarity between the episodic specificity of past and future events at the group level provides additional support for the constructive-episodic-simulation hypothesis (Addis et al., 2008; Suddendorf & Corballis, 1997). Compared with Chinese, Euro-Americans remember their autobiographical experiences in greater episodic detail and specification. They can then extract, combine, and recombine the rich sensory-perceptual-emotional details stored in their memory “database” to simulate potential future events. Consequently, Euro-Americans are able to generate more detailed future events than Chinese. Similarly, compared with men, women possess more elaborate mental representations of past events, which enable them to imagine possible future scenarios with richer episodic details.

The cultural and gender differences in episodic thinking may originate from varied narrative practices pertaining to early parent–child past talk (for reviews, see Nelson & Fivush, 2004; and Wang, 2009). Euro-American mothers often engage in high-elaborative memory conversations, where they frequently supplement rich embellished information about the past event under discussion, and provide feedback to scaffold children in the co-construction of detailed and coherent narratives of the past. In contrast, Chinese mothers tend to initiate low-elaborative memory conversations with their children, where they often ask redundant questions without providing embellished information or following up on children’s responses (e.g., “Who went to the park with us?... Who else?... And who else?”). These different maternal styles directly influence children’s abilities to recall and recount personal experiences concurrently and over the long term, such that Euro-American children as young as age 3 are able to recall more specific memory information than their Chinese peers (Han et al., 1998; Wang, 2004, 2007). In a similar vein, parent–child memory talk is gendered where girls are socialised into being more interested in the past (Fivush, 1998). Parents talk more about the past and talk in more richly detailed and elaborate ways with girls than with boys. Gender differences...
in episodic specificity in favour of women may reflect this interactive history (Davis, 1999; Herlitz & Rehnman, 2008; Mullen, 1994). Conceivably, the cultural and gender differences in parent–child past talk are translated into their future talk and further shape children’s episodic future thinking. To examine the role of culture and gender in family conversations about the future would be a fruitful future direction.

The finding that culture and gender effects on episodic specificity of memory construction are mirrored in future simulation suggests that episodic thinking represents a more fundamental style of information processing than just remembering. It is further sensitive to the social-cultural environment in which people reside and therefore exhibits group variations (Wang, 2009). For Euro-Americans, remembering detailed personal events and imagining detailed future happenings may be particularly conducive for fulfilling their culturally prioritised goals for autonomy and individuality. This may not be the case for Chinese, whose primary cultural concern is social harmony and interrelatedness and to whom generalised social knowledge may be more important in directing appropriate behaviour in interpersonal contexts. On the other hand, having elaborate personal stories seems to fit the gendered cultural expectation for women, who often share intimate details of past experiences and future dreams for social bonding. Thus, although human beings are all equipped with the capacity of episodic thinking, the prominence or actual usage of it appears to be a result of functional adaptation to specific cultures.

The present study further yielded additional interesting findings. At the individual level, people who exhibited greater episodic specificity when remembering the past also exhibited greater episodic specificity when imagining the future, in line with the constructive-episodic-simulation hypothesis (Suddendorf & Corballis, 1997). The finding is consistent with prior studies that investigate episodic specificity as a common factor in memory construction and future simulation among individuals. For example, D’Argembeau and Van der Linden (2006) found that individuals who habitually suppress their emotions exhibited lower episodic specificity in their representations of both past and future events; and individuals with more vivid visual imagery constructed both past and future events in greater visual and other sensory details. Such individual-level factors may influence how people attend to and encode information, use cues and resources in memory search, and construct events to reflect their goals and motivations, which further contribute to individual differences in mental time travel.

Also consistent with previous research (Addis et al., 2008; D’Argembeau & Van der Linden, 2006), representations of past events were associated with more specific details than representations of future events, and there was a trend that temporally close events, both in the past and future, contained more specific details than temporally distant events. General details, on the other hand, did not differ as a function of temporal direction or distance. In addition, participants from all culture and gender groups produced considerably more specific details than general details for both past and future events. It appears that individuals, at least young adults, when recalling memories of past events or constructing possible scenarios of future events, tend to include a small amount of general semantic knowledge and other non-event-specific information to supplement a contextual background for the event (Singer & Salovey, 1993; Szpunar, 2010). These general details help to ensure the coherence and comprehensibility of the generated event. The number of general details tends to increase in both past and future events as people grow older, when episodic specificity declines as a result of deficits in cognitive functioning and neural processing. Individuals consequently rely more on general information in memory recall and future event construction (Addis et al., 2008; Levine et al., 2002).

In summary, cultural and gender differences in episodic specificity evident in remembering the past extend to imagining the future. The current findings support the constructive-episodic-simulation hypothesis, and suggest that the mechanisms underlying the cultural and gender differences in the recollection of past events may also be responsible for the cultural and gender differences in the construction of future events. As the Portuguese behavioural neurologist António Damásio (1994, pp. 238–239) contends: “The plans and imaginary events constitute what I call a ‘memory of the possible future.’ It is held in dispositional representations just like any other memory.”
REFERENCES


