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Research Article

WHERE DID 1850 HAPPEN FIRST—IN AMERICA OR IN EUROPE?
A Cognitive Account for a Historical Bias

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Abstract—*A professor of history at The Hebrew University noted that his students were often surprised to learn that some event in America happened at about the same time as another in Europe, because the American event seemed to them to have happened more recently. We confirmed the validity of this anecdotal observation experimentally, and offer an explanation. We discuss how this bias may be an effect of judgment, rather than memory. We then show experimentally that students like those who demonstrated the bias regarded America as the New World, as opposed to Europe's Old World. Our theoretical account, based on judgment by representativeness, posits that if one category is deemed more X than another (e.g., American history is deemed more "recent" than European history), then its members will be judged more X than members of the other, ceteris paribus. Hence, an American historical event will appear more recent than a contemporaneous European event.*

Some years ago, a historian colleague[1] contacted one of us. He had noted among his (Israeli) students, he said, a tendency to place events in American history more recently in time than contemporaneous events in European history. For example, although Bismarck (1815–1898) and Lincoln (1809–1865) were contemporaries, his students often believed that Bismarck was deceased by the time Lincoln arrived on the historical stage. He could provide many such examples, he promised, but he was perplexed. Could a cognitive psychologist come up with some explanation for this puzzling bias?

A possible explanation seemed easy enough, as the associations "New World" and "Old World" quickly came to mind. What seemed harder by far, though, was to confirm our colleague's anecdotal impression. Were his examples adequately representative of a biased subjective historical timetable, or merely salient but exceptional examples of an unbiased one?

The attempt to test the empirical validity of the bias, which we call the *European-American bias* (or EAB for short), and to account for it through the New World-Old World distinction, motivated the present study.

EXPERIMENT 1: DOES THE EAB EXIST?

The opportunity to define a sample space of historic events was fortuitously provided by *The Timetables of History* (Grun, 1991). This book covers the period between 5000 B.C. and 1990 A.D. in terms of seven categories (e.g., religion, visual arts, science). The table's rows are the progressing years, and the table's columns are the seven cate-

gories. Within cells, events are listed chronologically. In the present study, we used only the first column, labeled "History and Politics."

Method

Stimuli

The study was confined to events from 1750 (when America, in the contemporary sense of the term, already had its own history) to 1961 (well before any of the participants had been born). Forty numbers between 1750 and 1961 were drawn at random, with replacement, and *The Timetables of History* was opened at the corresponding years. Half the time the first event listed for America was selected, and half the time the first event listed for Europe was selected. Events that could be considered part of both American and European history (e.g., 1776—"American Revolution: British defeated at Princeton, N.J.") or took place outside both these continents (e.g., 1941—"Rommel retreats in North Africa") were discarded. Repetitive events, individualized only by their date of occurrence (e.g., 1934— "General strike staged in France"), were rejected, as were individuals' birth or death dates.

Twenty of the events were then paired with the first event in the other continent that was listed on the following year, and 20 were paired with the first event in the other continent that was listed 10 years later. In the final questionnaire, order within pairs (i.e., which event was listed first), as well as between pairs, was randomized.

In addition, there were 20 filler pairs. These pairs consisted of events that we selected deliberately, rather than at random, with the following aims in mind: First, because most of the 40 target events were obscure and unfamiliar, we introduced some well-known events, to make the task less frustrating. Second, in order to disguise the underlying rationale of the study, none of the filler pairs consisted of an American versus a European event, and some events occurred neither in America nor in Europe. Half the filler pairs were spaced 1 year apart, and half were spaced 10 years apart. They were interspersed at random among the target pairs, subject to the constraint that no more than 5 target pairs appear consecutively. Tables 1 and 2 list some examples of the event pairs. Event descriptions are quoted verbatim from *The Timetables*.

Participants

Participants were 100 students at The Hebrew University, Jerusalem, Israel. Both men and women, mostly 20 to 25 years old, were included. They were recruited by announcements on bulletin boards around campus. They were promised that whoever answered the most questions correctly would get a prize of 300 shekels (about $100 at the time).

Task and procedure

Respondents completed the questionnaire individually, in a quiet room. They were instructed to mark which member of each of the 60

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1. This colleague was Menahem Blondheim, then of the Department of American History at The Hebrew University.

Table 1. *Examples of target event pairs*

American event		European event	
Event	Date	Event	Date
1-year difference			
Kentucky becomes a state of the U.S.	1792	Louis XVI, trying to leave France with his family, is caught in Varennes and returned to Paris	1791
N. Dakota, S. Dakota, Montana and Washington become states of the U.S.	1889	Bismarck dismissed by William II	1890
10-year difference			
Franklin Pierce inaugurated as 14th President of the U.S.	1853	William, Prince of Denmark, becomes George I, King of Greece	1863
Oregon becomes a state of the U.S.	1859	Rome proclaimed a republic under Giuseppe Mazzini	1849

event pairs occurred first. They were informed that all events occurred "between the 18th century and the present." The self-paced task took most participants about 15 to 30 min.

Results

Table 3 shows the percentage of target pairs that were answered correctly, across all participants. Overall, 58% of the responses were correct. The data were analyzed by a within-subjects analysis of variance. As the table shows, the harder event pairs (1 year apart) were ordered correctly less often than the easier pairs (10 years apart)—54% versus 62%, respectively, $F(1, 99) = 36$, $p = .0001$. More pertinent to the present purposes, the data show the EAB. When the more recent events were American, the error rate was only 36%, as opposed to 47% when the more recent events were European, $F(1, 99) = 29$, $p = .0001$. The effect size ($d = .85$) was large (Cohen, 1977). The bias was somewhat larger in the harder pairs than in the easier pairs—15% versus 7%, respectively, $F(1, 99) = 7.7$, $p = .007$.

Individually, 59% of the subjects showed the EAB, and 30% showed the converse bias. The rest were unbiased. Across respondents, the European event was selected as having happened earlier 55% of the time, $z = 2.91$, $p = .016$. The magnitude of the EAB did not depend on our respondents' knowledge of history, as indicated either by the level of high school history they completed or by their level of knowledge in the filler questions.

Having established the validity of the EAB in this experiment,[2] we now attempt to account for it. Two literatures seem, prima facie, pertinent to the uncertain dating of historical events: the literatures on memory for dates and on estimation under uncertainty. We consider them in turn.

EXPERIMENT 2: IS THE EAB A MEMORY EFFECT?

Much theoretical and experimental work has been done on dating events. Almost all of it, however, concerns memory for events that

happened during the estimator's lifetime—either autobiographical events or public events—rather than historical events that happened before the estimator's lifetime.[3]

It is debatable whether results from contemporary events are generalizable to historical events. Objectively, historical events differ from contemporary public events only in their placement in time, and what is a historical event for a young person may be a contemporary public event for an older one. But cognitively, the difference is not merely quantitative, but also qualitative—the two kinds of events reside in different memory repositories. Only for contemporary events does a connection exist between the recency of the event itself and the recency of the memory thereof (because the contemporary public events typically studied were of the sort covered by newspapers, they probably came to the respondents' attention roughly in real time). Similarly, only contemporary events can be cued by relating them to autobiographical events. Thus, memory for the date of a historical event is of necessity part of semantic memory only, whereas memory for contemporary events, if related to autobiographical events, may be part of episodic memory. In our study documenting the EAB, the dates of the events were probably not even in semantic memory, because our participants had never even heard of many of the events.

Nonetheless, two studies on memory for dates could perhaps relate to the EAB. One is by Brown, Rips, and Shevell (1985), who asked people to date contemporary public events. The events, presented and dated individually, were yoked in pairs such that events in a pair occurred in temporal proximity to each other and were similar (e.g., two assassination attempts, or two airline crashes), but one was better known than the other. Brown et al. found that the better known events tended to be dated as more recent than the lesser known events with which they were yoked. They labeled this effect the *accessibility prin-*

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2. We conducted another experiment using a different design, which called for the dating, rather than ordering, of the 80 target events of Experiment 1. This additional experiment also confirmed the EAB, but cannot be described here because of space limitations (see, however, Moshinsky & Bar-Hillel, 2000).

3. For studies involving autobiographical events, see, for example, Baddeley, Lewis, and Nimmo-Smith (1978); Linton (1975); Loftus and Marburger (1983); Rubin and Baddeley (1989); Thompson, Skowronski, and Betz (1993); and Thompson, Skowronski, and Lee (1988). For studies of public, but not historical, events, see, for example, Brown (1990); Brown, Rips, and Shevell (1985); Ferguson and Martin (1983); Friedman and Wilkins (1985); Kemp (1988); and Linton (1975). For studies of historical events, see Bratfisch, Ekman, Lundberg, and Kruger (1971) and Kemp (1987, 1988).

Table 2. *Examples of filler event pairs*

Event a		Event b	
Event	Date	Event	Date
1-year difference			
Boston Tea Party: protest against tea duty	1773	Coercive acts against Massachusetts include closing of port of Boston	1774
UN reopens Suez Canal to navigation	1957	Anglo-French ultimatum to Egypt and Israel calls for cease-fire	1956
10-year difference			
World War I: Anglo-French landings at Gallipoli	1915	Hitler reorganizes Nazi Party (27,000 members) and publishes vol. 1 of "Mein Kampf"	1925
Former Gestapo chief Adolf Eichman arrested	1960	Britain recognizes Israel	1950

ciple: "The more you know [about it], the more recent an event will seem, other things being equal" (p. 141).

Regarding contemporary events, the rationale for this principle lies in inverting a valid law of memory: Other things being equal, the vividness and detail of memories diminish over time. Hence, the amount of information recalled in a memory can be a cue to its storage age. But memories for historical events are not—cannot possibly be—the same age as the events, nor are the ages even correlated. Hence, the rationale for the accessibility principle does not hold for historical events. Furthermore, the accessibility principle applies to the retrieval of once-known dates from memory, not to the estimation of unknown dates on the basis of partial knowledge. The latter seems to have been what our participants did to order the rather obscure historical events we sampled from *The Timetables of History*. These two processes are so different that in a recent review called "Memory for the Time of Past Events," Friedman (1993) neither included studies of historical events nor listed them among excluded studies. Apparently, he simply (and correctly) regarded historical events as not even candidates for his survey. Nonetheless, whether the rationale holds or not, we wondered if perhaps Israeli students know more about American than about European history, and this makes American events seem more recent.

Because of space limitations, we do not report here the study we did to check our respondents' knowledge of American versus European historical events (a full report can be found in Moshinsky & Bar-Hillel, 2000), except to say that, if anything, the European events enjoyed a slight and insignificant advantage. Thus, the accessibility principle no more underlies the EAB empirically than it does normatively.

The second memory study that might relate to the EAB is by Huttenlocher and Hedges (1992), who presented a framework for explaining biases in dating events from uncertain memory. Their theory assumes that an inexact, but unbiased, memory for the date of an event can be modeled by a distribution of values around the true date, from which the estimator samples at random. For illustrative purposes, it is convenient to think of the distribution as roughly normal (see Fig. 1). Knowledge that the event in question belongs to some category (e.g., American history) subjects the distribution to two kinds of effects, truncation and weighting with a prototype. Truncation refers to the fact that the distribution of estimates is truncated at the category boundaries (e.g., if American history is regarded as starting in the 18th century, then values from the 17th century or earlier are no longer viable). A truncated distribution, which is no longer symmetrical around the distribution median, could bias the estimate of a date. Weighting with a prototype refers to the pull that the value of the category prototype exerts on estimates. It introduces bias insofar as the category prototype may differ from the distribution's median.

If the prototypical event in American history is more recent than the prototypical event in European history, or if the lower boundary

Table 3. *Percentage of correct answers across all participants in Experiment 1*

Question category	Percentage of correct answers	SD
European event 1 year earlier	62	17
European event 10 years earlier	66	13
American event 1 year earlier	47	16
American event 10 years earlier	59	18
European event earlier—Total	64	12
American event earlier—Total	53	14
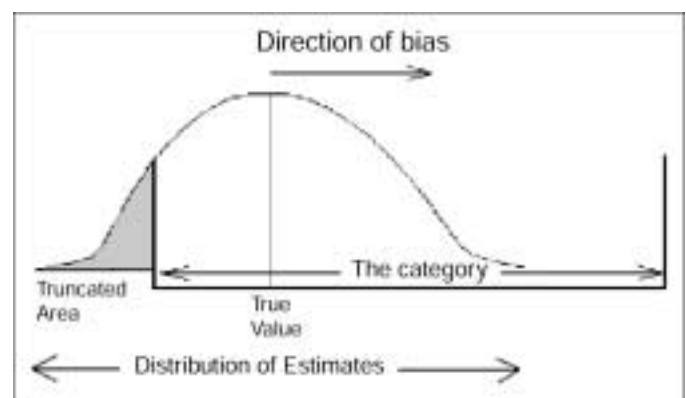
Fig. 1. Truncation of distribution around the true value as a result of a category's boundary (after Huttenlocher & Hedges, 1992).
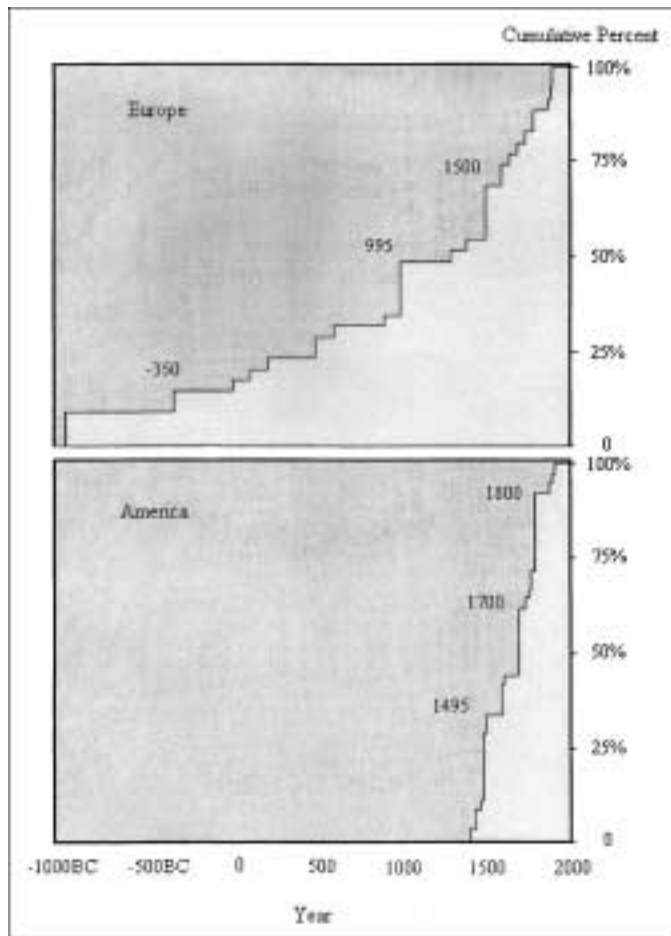
Avital Moshinsky and Maya Bar-Hillel

Fig. 2. Distribution of the low end of the range of the history of Europe (top) and America (bottom), as reported by participants in Experiment 2.

for American history is more recent than that for European history, this theory can offer a cognitive-process model for the EAB. The boundaries and prototypes of the categories of European history and American history were determined in the following experiment.

Method

The 80 students participating in this study were approached around campus and asked to volunteer. They completed the brief task in the spot where they were recruited (library, hall, etc.).

Participants were asked three questions: "What range of dates comes to your mind when you hear 'The history of America'" (or "The history of Europe," for half the participants); "What is the most notable event you can think of in American history?" (or, for half the participants, "in European history"); and "Can you date this event? If not, please guess." The first question explored the categories' boundaries, and the others the categories' prototypes.

Results

Figure 2 shows the cumulative distributions of opening dates for European and American history, in 100-year increments. Both categories are naturally bounded from above by the present time, but American

history has a far more restricted range. The median range given for European history extended about 10 centuries back from the present time, whereas the median range for American history reached only about 3 centuries into the past. Only one third of the respondents believed European history was younger than 3 centuries, whereas almost all respondents believed American history was younger than 3 centuries.

Table 4 shows the answers given to the questions regarding the "most notable" historical events associated with Europe and America. Although Europe's historical boundaries extend much further into the past than America's, and therefore European history is "older," its prototypes are not similarly "older" than American history's prototypes.

Discussion

Because few respondents thought American history had started before 1700, participants' own truncation of the possible dates of the historical American events roughly corresponded to the truncation that was imposed by telling participants explicitly that all the events they were to judge occurred in the 18th century and later. Thus, even though European events would have lost a longer tail to category truncation than American events, insofar as our instructions to participants induced a similar truncation on both types of events, the observed EAB is unlikely to have resulted from a truncation effect. Can it have resulted from a prototype effect?

In Huttenlocher and Hedges's (1992) theory, the prototype is identified with some "central value (the mean or median of observed instances)" (p. 254). This position resembles Friedman's (1993) conclusion that "when we are unsure about when some event took place, we resort to strategies, such as selecting a probable range of times . . . and guessing that it took place in the middle of the range" (p. 52). For categories such as American and European history, it is unclear what a central value might be. If it refers to the midpoint of the entire historical range, then Europe's central value is considerably earlier than America's. The respective midpoints of the maximal ranges given by our respondents were approximately 500 versus 1700, and the midpoints for the median ranges were approximately 1700 versus 1850 (see Fig. 2). Arguably, however, the central value for historical events should refer to the midpoint of the range of notable historical events only, such as those listed in Table 4. If so, the difference in pro-

Table 4. *The "most notable" historical events in Europe and in America, from Experiment 2*

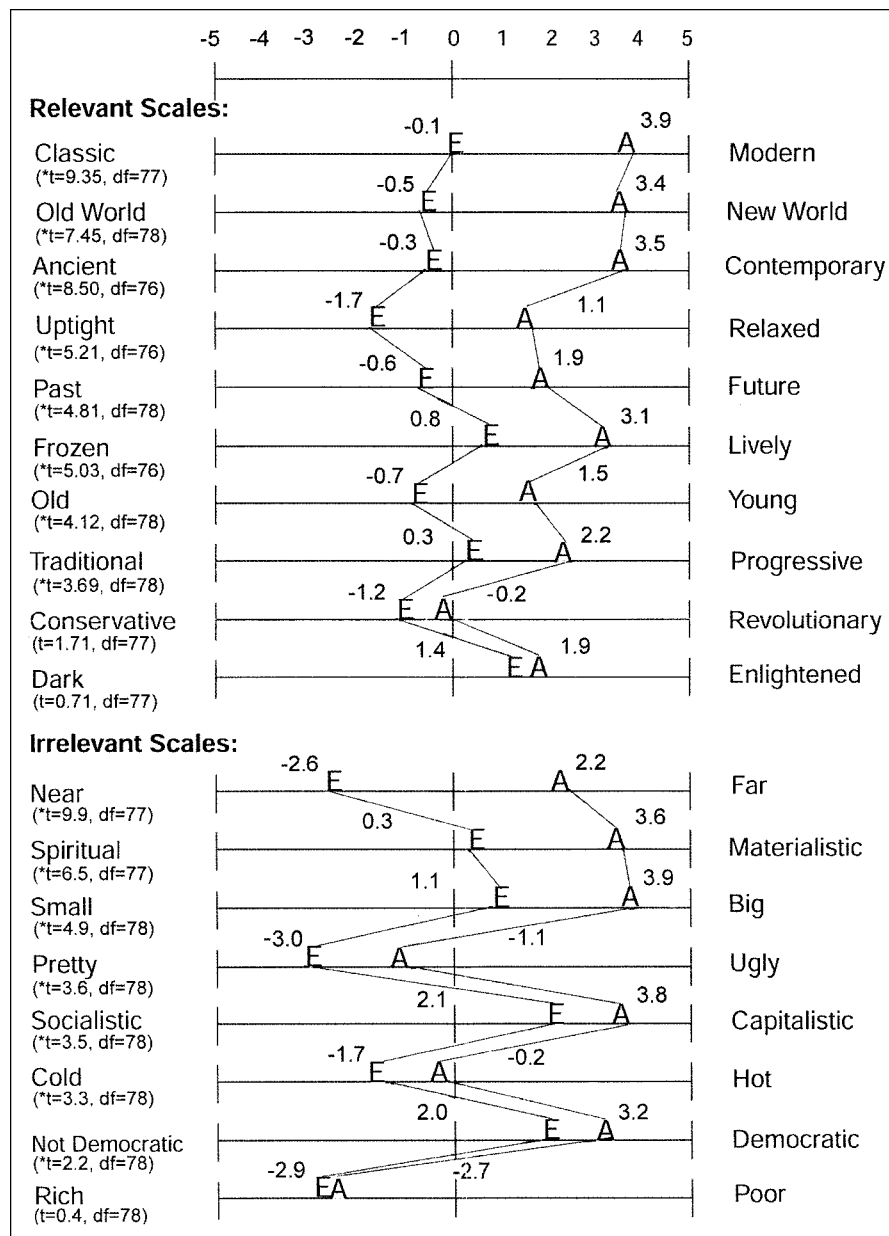| Most notable event	Frequency	Date
Europe		
Acceptance of Christianity	2	300
French Revolution	15	1789–1799
World War I	9	1914–1918
World War II	19	1939–1945
The Holocaust	4	1941–1944
America		
Declaration of Independence	5	1776
Civil War	17	1861–1865
End of slavery	2	1865
Atomic bomb is dropped	5	1945
J.F. Kennedy murder	2	1963
Vietnam War	7	1962–1973

Fig. 3. Average ratings given to America (A) and Europe (E) on the 18 bipolar scales. Significant differences are marked by an asterisk ($p < .05$).

totypes for European and American history shrinks to naught. The midpoint for Europe's "most notable" events, after removing the two outlying listings of the acceptance of Christianity, is 1867 (although with this outlier included the midpoint is 822), and the midpoint is 1874 for America.

All in all, it seems that the success of Huttenlocher and Hedges's model in explaining the EAB is arguable at best. In addition, they presented their proposal as a model of uncertain memory, and it is arguable to what extent our tasks involve memory. Although it is quite simple to adapt the model to pure estimation, we offer a far more compelling explanation of the EAB as a category effect in the next section.

EXPERIMENT 3: THE EAB AS A REPRESENTATIVENESS EFFECT

Categories' effects on cognition—on perception, memory, inference, and the like—are their ontological raison d'être, and are myriad. In this section, we postulate that the EAB is a category effect based on mere associations.

Consider two categories A and B and a feature X such that category A is more X-ish than category B. For example, let A and B be, respectively, females and males, and let X be "tenderness"; or let A and B be engineers and lawyers, respectively, and let X be "mathematically

skilled." Suppose that *a* and *b* are members of *A* and *B*, respectively, who are equally *X*-ish (e.g., a man and a woman who are equally tender, or an engineer and a lawyer who are equally skilled in mathematics). The category effect we stipulate predicts that when judging which of an unfamiliar pair (*a*, *b*) is more *X*-ish, people are biased by category membership. If *a* is in *A* and *b* is in *B*, and *X* characterizes *A* more than *B*, people will tend to guess that *a* is more *X*-ish than *b*.

This prediction resembles a well-known prediction tested by Kahneman and Tversky (1973). In a classic study, respondents were given two categories, engineers and lawyers, on the implicit assumption that the former are more mathematically skilled than the latter. Individuals were described, and the respondents were asked to guess which of the two professions each belonged to. An individual who was mathematically skilled ("Jack . . . spends most of his free time on . . . mathematical puzzles," p. 241) was judged more likely to be an engineer than a lawyer. In general, an individual whose category membership is not known, but whose attributes are, will be judged more likely to belong to a category whose characteristic attributes the individual shares (i.e., the category of which he or she is most "representative"; Kahneman & Tversky, 1972) than to a category whose characteristics the individual does not share.

Our model inverts this prediction of judgment by representativeness as follows: An individual whose category membership is known, but whose attributes are not, will be judged more likely to possess the attributes characteristic of that category than will another individual who does not belong to that category. Applied to the dating of historical events, this model makes the following prediction: If America is regarded as the New World and Europe as the Old World ("newness" being the target attribute *X*), then, ceteris paribus, American events will be judged "newer" (i.e., more recent) than European events.

The following experiment ascertained that our participants indeed regarded America as the New World and Europe as the Old World.

Method

The same 80 participants from the second experiment filled out a semantic differential (Osgood, Suci, & Tannenbaum, 1957) on a sheet of paper containing eighteen 11-point scales running between opposite adjectives. Ten of the pairs were associatively related to "new" versus "old," and 8, included to disguise the purpose of the task, were not (see Fig. 3). Forty participants rated America on these scales, and 40 rated Europe. Neither group knew about the other. The scales were ordered randomly, both within and across items.

Results

Figure 3 shows the average ratings that America and Europe received on the 18 bipolar scales. Hypothesis-relevant and hypothesis-irrelevant scales are shown separately, ordered by the magnitude of the difference between the ratings given to America and to Europe. The labels are placed so that the ratings for America are all to the right of those for Europe.

Note how the Old World adjectives line up on the left for all the relevant scales. For six of these scales, America and Europe were actually rated on opposite sides of the scale midpoint, showing that Europe is indeed perceived as the Old World, and America as the New World. In contrast, the adjectives that line up on the left in the irrelevant scales have nothing in common, and America and Europe are on opposite sides of the midpoint of these scales only once.

Discussion

The first experiment confirmed that Israeli students tend to date European historical events somewhat earlier than contemporaneous American historical events. Experiment 3 shows that these students also think of America as the New World and of Europe as the Old World. We propose that the latter fact accounts for the former, through a cognitive category effect. Insofar as the central value of European history precedes the central value of American history, the category effect we report here may reflect an extension of Huttenlocher and Hedges's (1992) model of estimation under uncertainty. More generally, it can be understood through the representativeness heuristic, according to which judgments of target cases—in this case, of the recency of historical events—are biased by associative matching to the characteristics of the categories to which the target cases belong.

Although we use the term bias, the EAB thus seen is a normatively appropriate cognitive strategy, because Europe does, indeed, have an older history than America. If all the events listed in *The Timetables of History* were put into a large book bag, and two events—one European and one American—were sampled at random, chances are that the European event would, indeed, be earlier than the American event.[4]

The category effect we posit to explain the EAB is general enough to allow predictions of similar biases in other judgment tasks—for example, geographical estimates rather than historical estimates. In fact, a geographical counterpart of the EAB has already been experimentally documented.

Stevens and Coupe (1978) found that people tend to judge Reno as lying to the east of San Diego (and Seattle as lying south of Montreal), although the opposite is true. They offered a model whereby "spatial information is stored hierarchically" (p. 422): Reno is in Nevada, San Diego is in California, and Nevada is east of California (also Seattle is in the United States, Montreal is in Canada, and Canada is north of the United States), and people infer the geographical relationship of the two cities from the geographical relationship of the two superordinate units—the states (or countries) in which these cities are located. Stevens and Coupe's model is a special case of ours. Our model is not limited to geographical location, or even to a continuous variable such as temporal location; we need no assumptions about how information is organized in memory, because our model appeals to associations even when they do not reflect objective relationships; and our model is not about achieving cognitive economy when storing encountered information (although that can follow as a side effect) but rather can also be applied to explaining inferences about novel exemplars (e.g., dating historical events one has never even heard about).

GENERAL DISCUSSION

In the words of Miller's famous presidential address (1969), this article describes a case of "giving psychology away." An informal observation by a professor of history was presented as a psychological puzzle. Experiments confirmed the validity of the observation and an intuitive cognitive explanation of it. The sequence of experiments conducted was not motivated by a theory, but rather by this observation; hence, the EAB is not a test of some theoretically based prediction, but a curious fact in search of an explanation.

A common question we encounter when presenting this work is, "But do Americans, or Europeans, also exhibit the EAB?" Interesting as

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4. This is not strictly true without some assumptions (or facts) about how the American versus European events are distributed over the time scale.

such comparisons are, our thesis is not incomplete without them. Asking whether Americans are subject to the same bias has no methodological priority over asking whether, say, the Chinese are subject to it. We make no claim and no prediction as to who should be subject to the EAB, because such a prediction follows from our model only ceteris paribus, and we cannot always assume that other things are equal. For example, Americans may know more about their own history than about Europe's, and Europeans may not think of Europe as the Old World.

Our story is self-contained: Israeli students are subject to a curious bias that no one predicted—it was just noticed. Cognitive psychology was able to illuminate it, just as our colleague hoped when he approached us. The road from theory to empirical prediction, we know, is bumpier than the road from phenomenon to theoretical explanation. This study took the road less bumpy.

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Chapter 2

THE EUROPE-AMERICA BIAS:
WHERE A HISTORICAL EVENT OCCURRED
AFFECTS WHEN PEOPLE THINK IT OCCURRED[*]

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ABSTRACT

A teacher of history noted that his students are often surprised to learn that a certain event in Europe happened at about the same time as another in America, since to them, the latter seemed to have happened more recently. In Study 1, the validity of this anecdotal observation is tested by two experiments. In the first experiment, pairs of historical events, one American and one European, were ranked by recency. In the second, American and European events were dated one by one. The results support the professor's observation. In Study 2, noting that America is known as The New World, while Europe is The Old World, we show that America is indeed regarded by our subjects as "newer" than Europe. We offer a theoretical explanation, based on judgment by representativeness, for how this perception of America and Europe could lead to this bias. Another theoretical explanation, based on Huttenlocher and Hedges' (1992) model for estimating quantitative variables under uncertainty, is also considered and tested. In Study 3, a final alternative explanation for the bias is considered, this one taken from the memory literature rather than the estimation literature: the accessibility principle (i.e., that better known events appear more recent than less well known ones). However, this principle fails to account for the bias, since the American events are found not to be better known than the European ones. The bias seems to be a judgmental bias, not a memory one.

INTRODUCTION

Some years ago, a historian colleague[1] contacted one of the present authors. He had noted among his students, he said, a tendency to place events in American history more recently in time than contemporaneous events in European history. For example, although Bismark (1815-1898) and Lincoln (1809- 1865) were contemporaries, Prof. Blondheim's students often believed that Bismark was dead by the time Lincoln arrived on the historic stage. He could provide many such examples, he promised, but he did not understand them. Could a cognitive psychologist come up with some explanation for this puzzling bias? A possible explanation seemed easy enough, as the associations "New World" and "Old World" quickly came to mind. What seemed harder by far, though, was to confirm our colleague's anecdotal impression. Were his examples adequately representative of a biased subjective historical timetable, or merely salient but exceptional examples of an unbiased one?

The attempt to test the empirical validity of the bias (which we shall call the Europe-America bias; EAB for short), and to account for it through the New World-Old World association, motivated the present study.

STUDY 1 - DOES THE EUROPE-AMERICA BIAS EXIST?

The opportunity to define a sample space of historic events was fortuitously provided by the book The Timetables of History (1991). This book covers the time between 5000BC to 1990AD in terms of seven categories (e.g., Religion, Visual Arts, Science). The table rows are the progressing years (starting round about 1915, most years require a full page or more), and table columns are the seven categories. Within cells, events are listed chronologically. Only the first column, History and Politics, was used in the present study.

Method

Stimuli

The study was confined to events from 1750 (when America, in the contemporary sense of the term, already had its own history) to 1961 (well before any of the participants had been born). Forty numbers between 1750 and 1961 were drawn at random, with replacement. The Timetables of History was opened at the years thus determined. Half the times, the first event to have happened in America was selected, and half the times it was the first event that happened in Europe. Events that could be considered as part of both American and European history (e.g., 1776 - "American Revolution: British defeated at Princeton, N.J."), or took place outside both these continents (e.g., 1941 - "Rommel retreats in North Africa") were passed by. Events of a repetitive nature, that are individualized only by their date of occurrence (e.g., 1934 - "General strike staged in France"), were skipped. So were birth or death dates of personages.

Each of the forty events sampled was then paired with another event, which occurred in the other continent. Half the times it was paired with the first event in the other continent that

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[1] Dr. Menahem Blondheim, then of the Department of American History, The Hebrew University.

was listed on the following year, and half the times it was paired with the first event in the other continent that was listed ten years later. In the questionnaire given to the students, order within pairs (e.g., which event was listed first), as well as between pairs, was randomized. Appendix 1 lists all 40 of these event pairs. Event descriptions are quoted exactly in the words of the Timetables.

In addition to the 40 target pairs, there were 20 filler pairs. These pairs consisted of events that we selected deliberately, rather than at random, with the following aims in mind: First, since most of the events sampled at random were obscure and unfamiliar, we introduced some well known events, to make the task easier and less frustrating. Second, we introduced some events that were confined neither to America nor to Europe, in order to make it less likely that any participants would discover the underlying rationale of the target pairs. Half the filler pairs were spaced one year apart and half were spaced ten years apart. They were interspersed at random among the target pairs, subject to the constraint that no more than 5 target pairs appear consecutively. They, too, are listed in Appendix 1.

Participants

Participants were 100 students at The Hebrew University. Students were recruited by announcements on bulletin boards around campus. They were promised that whomever answered the most questions correctly would get a prize of 300 NS (about $100 at official exchange rates then; considerably more in terms of impact). We did not register demographic characteristics, but can say that this was a group of male and female undergraduates, aged between 20-25.

Task and Procedure

The questionnaire, containing the 60 event pairs, was filled individually, in a quiet room. It was self-paced. Respondents were instructed to mark which member of each pair of events occurred earlier. They were informed that all events occurred "between the 18th century and the present". The task took about 15-30 minutes for most students.

Results

Table 1 shows the proportion of target pairs which were answered correctly (and their standard deviations), across all participants. Overall, 58% of the responses given were correct. Since all independent variables were varied within subjects, the data were analyzed by a within-subjects ANOVA. The table shows that the closer event pairs (one year apart) were harder to order correctly than the pairs which were further apart (ten years) -- 54% versus 62% ($F_{1,99}=36$, p = .0001), respectively. But more pertinent to present purposes, they showed the EAB bias. When the more recent events happened in America, the error rate was only 36%, as opposed to 47% when the more recent events happened in Europe ($F_{1,99}= 29$, p= .0001). According to Cohen (1977), this is a large effect size (d=.85). The bias was somewhat larger in the harder pairs (a 15% difference when the difference was one year) than in the easier pairs (a difference of just 7% when the difference was 10 years -- $F_{1,99}= 7.7$, p = .007).

Table 1. Percentage of correct answers and standard deviations in
the four categories of the questionnaire across all participants

Questions category	% of correct answers	SD
European event 1 year earlier	62	17
European event 10 years earlier	66	13
American event 1 year earlier	47	16
American event 10 years earlier	59	18
European event earlier – Total	64	12
American event earlier – Total	53	14

On the individual level, 59% of the subjects showed the EAB (i.e., they thought that the European event preceded the American event with which it was paired more often than the other way around), and 30% showed the reverse bias. The rest were unbiased either way. Averaging across respondents, the European event was selected as having happened earlier 55% of the time ($z= 2.91$, $p = .016$). The magnitude of the EAB did not depend on our respondents' knowledge of history, either as indicated by the level of high school history they took, or by the level of knowledge they exhibited in the filler questions.

This experiment verifies our colleague's impressions: There does appear to be a Europe-America bias of the kind he said he noticed. The following experiment tests for this same bias using a different design. Date estimates were collected from a fresh sample of students, in what can be regarded as a conceptual replication of the EAB.

Method

Stimuli
We used the same 80 events which were used in the previous experiment. The 40 pairs of events were reassembled into two lists of 40 unpaired events each. This was done merely in order to lighten the task placed on our respondents. In this experiment, the filler events were all either American or European events, but well known ones (including events stated by subjects in Study 2 in response to a request to list the "most notable" American or European events; the full list appears in Appendix 2). So each of the final lists included 30 European events and 30 American events. In each list, the 20 new fillers occupied the same positions among the 40 old target events as in the previous experiment.

Participants
The 60 participants were undergraduate students at The Hebrew University, who were recruited by announcements on bulletin boards around campus. They were randomly assigned in equal numbers to the two lists. We promised 300 NS to whomever dated the greatest number of events accurately.

Task and Procedure
The task was performed individually, in a quiet room, and was self-paced. The task took most participants about 15-20 minutes. They received their list of 60 events, and were asked to mark on a time scale when each had occurred. The scale ranged from 1700 AD until the present, in units of 25 years.

Results

Each respondent was given a score for each event that he or she dated. An event which was placed within the correct range of 25 years was scored as 0. Errors of dating were scored according to the number of 25-year units by which they deviated from the correct date, and the sign reflected the direction of deviation: + if the event was judged as more recent than it really was, - if it was judged to be less recent than it really was.

Since dividing the events between the two questionnaires was done merely for our subjects' convenience, and since subjects were assigned at random to the two questionnaires, our analyses can be based on a merger of the two groups. Target events, however, were separated from filler events, because the former, but not the latter, were randomly sampled. The filler events were introduced primarily to make the subjects' task less frustrating (and indeed, were dated correctly about twice as often as the target events, see Table 2, column 2). Thus, they were not controlled for factors such as familiarity, difficulty, or item dependence (e.g., one group received three events from World War I; see Appendix 2).

**Table 2. Mean scores, Percent of Correct answers and mean
absolute score in the four categories of the questionnaire**

Questions category	Mean score	% of correct answers	Mean absolute score
European target-events	-0.07	39	1.4
American target-events	0.14	31	1.6
European filler-events	-0.05	68	0.6
American filler-events	0.07	57	1.0

The leftmost column of Table 2 shows the mean score, for each type of event. These means are quite close to 0 (all four t-tests are not significant), indicating that there was no systematic bias in the dating for any event type -- at least modulo the 25-year grain. Nonetheless, European events show a negative mean and American events show a positive mean. This is just what the EAB predicts. We performed a within-subject ANOVA on the target events, comparing the difference in the mean dating of American events and European events. The EAB effect fell just short of significance ($F1,58 =3.42$, $p=.07$). No group effect was found ($F1,58$ 2.52, $p=.12$), nor an interaction between group and continent ($F1,58 =.16$, $p=.69$). The table also shows that the mean score of the European fillers is negative and of the American fillers positive, which is also in line with the EAB. However, we did not subject the fillers to a statistical significance test.

The middle column shows that the European events were dated correctly more often than the American events ($F1,58=19.43$, $P=.0001$). Furthermore, the rightmost column shows that absolute errors were larger for American target events than for European target events ($F1,58 =8.78$, $p=.0044$). The filler events show a similar tendency, though no significance test was performed on them.

Discussion

Though in this second experiment the EAB was not statistically significant, it is in the predicted direction. Most probably the lack of significance is due to the overly coarse grain of the dating scale, which hides most dating errors smaller than 25 years. Since the mean scores in Table 2 include both correct answers (which scored 0) and incorrect answers, and only the latter is subject to the EAB, the effect is diluted, making it more difficult to reach significance. In addition to hiding small errors, the coarse grain also hides small biases. Recall that in the previous experiment, an error, or bias, could be detected even if was quite small (over one year in some event pairs, over ten in others).

Having established the validity of the EAB in Study 1, in the following studies we shall attempt to account for it. A great deal of theoretical and experimental work has been done about memory for the date of events. Almost all of it, however, concerns events that happened during the estimator's lifetime. These were either autobiographical events (e.g., Baddeley, Lewis and Nimmo-Smith, 1978; Linton, 1975; Loftus and Marburger, 1983; Rubin and Baddeley, 1989; Thompson, Skowronski and Betz, 1988; Thompson, Skowronski and Lee, 1993) or, as in our study, public events (e.g., Brown, 1990; Brown, Rips and Shevell, 1985; Ferguson and Martin, 1983; Friedman and Wilkins, 1985; Kemp, 1988 ; Linton, 1975) -- but not events that happened before one's lifetime (see, however, Bratfisch, Ekman, Lundberg and Kruger, 1971; Kemp, 1987; Kemp, 1988). We shall call public events that happened in one's lifetime contemporary events, and those which happened before one's lifetime, historical events. Autobiographical events will be called just that.

It is not clear that results from the former type are generalizable to the latter, because of important differences between them. Only with regard to contemporary events does a connection exist between the recency of the event itself and the recency of the memory thereof. Since the public contemporary events typically studied were of the sort covered by newspapers, they probably came to the respondents' attention roughly in real time. Moreover, the dating of historical events cannot be assisted by relating them to autobiographical events. Thus, memory for the date of an historical event is of necessity part of semantic memory only, whereas memory for contemporary events insofar as it is related to autobiographical events, is part of episodic memory.

However, two principles found in memory for the dates of contemporary events seem generalizable to historical events. One, the so-called accessibility principle (Brown, Rips and Shevell, 1985), will be tested and discussed later in Study 3. In Study 2, the dating of historical events will be discussed in terms of category effects in estimation (Huttenlocher and Hedges, 1992).

STUDY 2 - THE NEW WORLD VERSUS THE OLD WORLD

Huttenlocher and Hedges (1992) presented a framework for explaining biases in estimated dates for events that i. does not require that there be any bias in the memory itself, and ii. may, in spite of the bias in the estimates, increase their average accuracy. In brief, the theory assumes that an inexact (but unbiased) memory for the date of an event can be modeled by a distribution of values (around the true date), from which the estimator samples at random. For illustrative purposes, it is convenient to think of the distribution as roughly

normal (see Figure 1). Knowledge that the event in question belongs to some category (e.g., American history) subjects the distribution to two kinds of effects, truncation and weighting with a prototype. Truncation refers to the fact that the distribution of estimates is truncated at the category boundaries (e.g., if American history is regarded as starting in the 18th century, then values from the 17th century or earlier are no longer viable). A truncated distribution which is no longer symmetrical around the distribution median could bias the estimate. Weighting-with-a-prototype refers to the pull which the value of the category prototype exerts on the estimates. It introduces bias insofar as the category prototype may differ from the distribution's median.
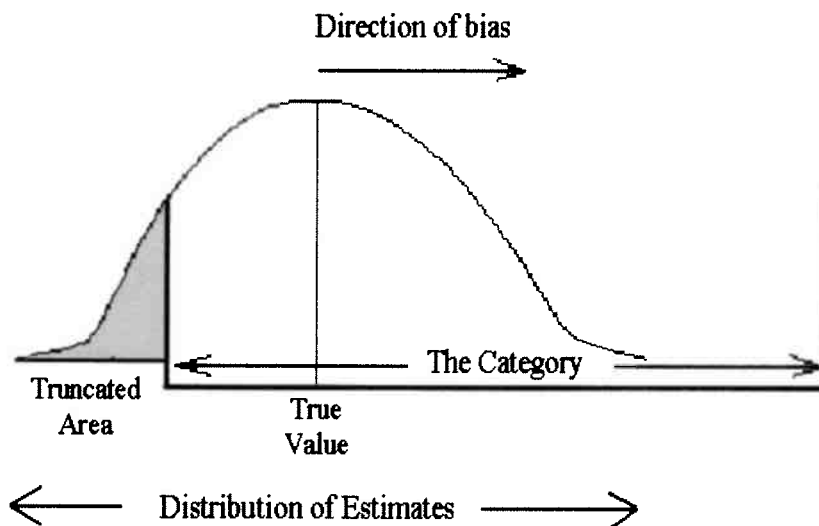
Figure 1. Truncation of distribution around the true value as a result of category's boundary (after Huttenlocher & Hedges, 1992)

The boundaries and prototypes of the categories of European history and American history were determined in the following experiment.

Method

Participants and Procedure

The 80 students participating in this study were approached in the library or while walking on campus, and asked to volunteer. They did the task in the spot where they were recruited (library, hall, etc.). The task took but minutes.

Participants were asked three questions. 1. "What range of dates comes to your mind when you hear "The history of America" (or "... of Europe", for half the participants) ". 2. "What is the most notable event you can think of in American history (or European history, for half the participants)?". 3. "Can you put a date on this event? If not, please guess." The first question explored the category boundaries, and the others -- its prototype.

Results

Figure 2 shows the cumulative distributions of opening dates for Europe and America, in 100 year increments. Both categories are naturally bounded from above by the present time, but America has a far more restricted range. The median range given for Europe extended about 10 centuries back from our own time, whereas for America it reached only about three centuries into the past. Only one third of the respondents thought European history was younger than three centuries, whereas almost all respondents thought that of American history.
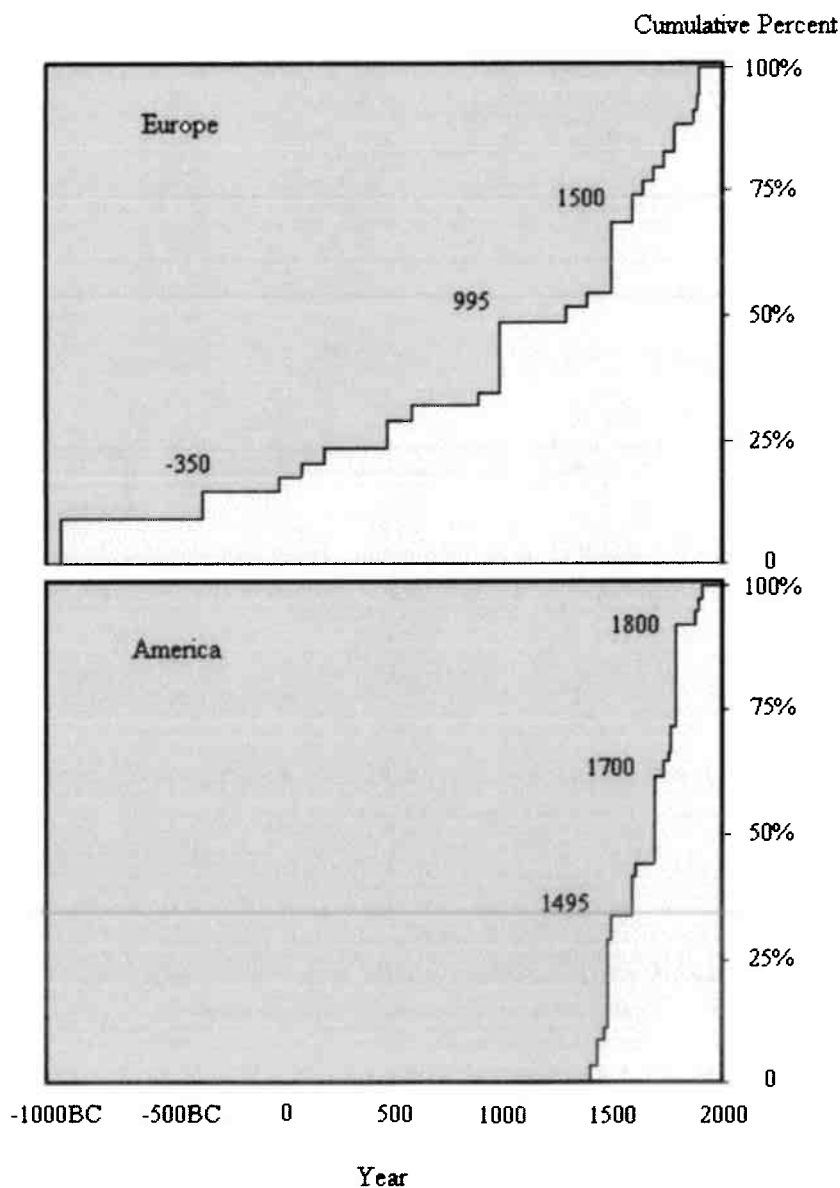
Cumulative Percent

Figure 2. Distribution of low end of the range of the history of Europe & America

Table 3 shows the answers given to the second question, regarding "the most notable historical event" associated with Europe and America. Although Europe's historical boundaries extend much further into the past than America's, and as such it is "older", its prototypes are not similarly "older" than America's.

Table 3. The "most notable" historical events in Europe and in America

Europe		
Most Notable Event	*Frequency*	*Date*
Acceptance of Christianity	2	300AD
French Revolution	15	1789-99
War World I	9	1914-18
War World II	19	1939-45
The Holocaust	4	1941-44
America		
Declaration of Independence	5	1776
Civil War	17	1861-65
End of Slavery	2	1865
Atomic Bomb	5	1945
Kennedy Murder	2	1963
Vietnam War	7	1962-73

Discussion

Since few respondents thought American history had started before 1700, the truncation of distributions of estimates for the dates of our historical American events which was achieved by the category roughly corresponded to the truncation which was achieved by having told the participants in Study 1 explicitly that all the events they were to judge -- American as well as European -- occurred in the 18th century and later. Thus, even though European events would have lost a smaller tail to category truncation than American events, our instructions to participants induced a similar truncation on both types of events. The EAB in Study 1 is thus unlikely to be the result of a truncation effect. Can it be the result of a prototype effect? In other words, is the "prototypical" European event really earlier than the "prototypical" American event?

In Huttenlocher and Hedge's theory, the prototype is identified with some "central value (the mean or median of observed instances)" (1992, p. 254). This is not unlike Friedman's (1993) conclusion that "when we are unsure about when some event took place, we resort to strategies, such as selecting a probable range of times ... and guessing that it took place in the middle of the range" (p. 52). For the categories of interest here -- American history and European history -- it is not clear what a "central value" might be. If it refers to the midpoint of the entire historical range, then clearly Europe's central value is considerably earlier than America's. The respective midpoints are approximately 500 vs. 1700, if we take the midpoint of the maximal range given by our respondents, and approximately 1700 versus 1850, if we take the midpoint of the median range (see Figure 1). However, if one were to argue that "central value" for historical events should refer to the midpoint of the range of notable

historical events only, such as those listed in Table 3, then the difference in prototypes shrinks to naught. The midpoint for Europe's "most notable" events, after removing the two outlying listings of Acceptance of Christianity, is 1867 (although with this event it is 822) versus 1874 for America.

However, a much more compelling sense of category effect may be at work in EAB, based on associations, as follows: Consider two categories A and B, and a feature X such that the category A is more X than category B. For example, let A and B be, respectively, females and males, and let X be "tenderness"; or A and B can be Engineers and Lawyers, respectively, and X can be "mathematically skilled". Now suppose that a and b are members of A and B, respectively, and are, in fact, equal on X-ness (e.g., a man and a woman who are equally tender, or an engineer and a lawyer who are equally skilled in mathematics). The category effect we stipulate predicts that judges asked to judge which of the pair (a,b) is more X would tend to bias their judgments according to the category. If (a) is thought to be in A and (b) is thought to be in B, and A is regarded more X than B, then they would tend to view a as more X than b.

This prediction is a kind of inversion of a well-known prediction tested by Kahneman and Tversky (1973). In a classical study, their respondents were given two categories, Engineers and Lawyers, on the assumption that the former is more "mathematically skilled". A person was then described, and the respondents were asked to guess which of the two professional categories he belonged to. When the individual was mathematically skilled ("Jack ... spends most of his free time on ... mathematical puzzles", Kahneman and Tversky, 1973, p. 241), he was judged more likely to be an engineer. In that study, the main point was that this judgment did not vary when the relative size of the categories in question was changed. But for present purposes, suffice it to state Kahneman and Tversky's prediction as follows: An individual whose category membership is unknown, but whose attributes are known, will be judged more likely to belong to the category that is characterized by the same attributes that characterize the individual himself -- the category of which he is more "representative" (Kahneman and Tversky, 1972). We turn this prediction around as follows: An individual whose category membership is known, but whose attributes are unknown, will be judged more likely to possess the attributes that characterize the category than an individual not belonging to this category. This, too, is judgment by representativeness.

Regarding the EAB, this prediction translates as follows: If America is regarded as the New World, and Europe as the Old World (this being X, the attribute in question), then American events will be judged "newer" (i.e., more recent), and European events "older", ceteris paribus. An existing result which lends itself to interpretation using this model is Stevens and Coupe's (1978) finding that people tend to judge Reno as lying to the east of San Diego (or: Seattle as south of Montreal), though the opposite is true. They offer a model whereby "spatial information is stored hierarchically." (p. 422). Since Reno is in Nevada, and San Diego is in California, and Nevada is east of California (or Seattle is in the US and Montreal is in Canada, and Canada is north of the US), people infer the geographical relationship of the two cities from the geographical relationship of the two superordinate units -- the states (or countries) in which these cities are located. Regarding spatial relationships between locations, our model would make the same predictions as theirs, but it is more general: it is not limited to geographical location, or even to continuous variables; it makes no assumptions about the hierarchical nature of information organization, as it appeals to associations rather than requiring an objective relationship; and it is not merely a means of

achieving cognitive economy of storage, but can also be applied to novel exemplars (such as historical events one has never heard about).

To apply the model towards an explanation of the EAB, we must ascertain that our participants indeed regard America as the New World and Europe as the Old World. Since these terms were never mentioned either to, or by, the participants, the operational sense of these terms would need to be tested indirectly. This was done in the following experiment.

Method

Design

The same 80 participants of the first experiment were given the task of filling out a semantic differential (Osgood, Suci and Tannenbaum, 1957). A sheet of paper contained 18 11-point scales running between antonymic adjectives. Ten of the pairs were associatively related to New versus Old, and eight were not (see Figure 3). (This was done partially to disguise the purpose of the semantic differential task.) Forty participants rated America on these scales, and another 40 rated Europe on them. Needless to say, the list given to the participants ordered the scales at random, both within items and across items, and neither group knew about the other.

Results and Discussion

Figure 3 shows the average rating which America and Europe received on the 18 bi-polar scales. Within each category of scales (10 hypothesis-relevant versus 8 hypothesis-irrelevant) it lists the scales in order of the magnitude of the difference between the ratings given to America and to Europe. In the figure, the scales are ordered such that America will always be to the right of Europe.

Note how the New World adjectives line up on the left for all the relevant scales. In addition, for six of them, America and Europe were rated on opposite sides of the scale midpoint. In contrast, the adjectives that lined up on the left in the irrelevant scales have nothing in common, and they place America and Europe on opposite sides of the midpoint in only one case. Only the results of the ten relevant scales are pertinent to our hypothesis. So Europe is indeed perceived as The Old World, and America as The New World.

To sum up the findings till now, we have shown that students at The Hebrew University do indeed tend to date events that happened in Europe somewhat earlier than contemporaneous events that happened in America. These students also think of America as The New World, and of Europe as The Old World. We use the latter fact to account for the former. The cognitive mechanism which mediates between the two may be understood through Huttenlocher and Hedge's model of estimation under uncertainty, insofar as the "central value" of European history precedes the "central value" of American history. It can also be understood through Kahneman and Tversky's representativeness heuristic, according to which judgments of events -- in this case, of their recency -- are biased by a matching to the categories to which they belong.

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        5   4   3   2   1   0   1   2   3   4   5
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Relevant Scales:

Left		Right
Classic (*t=9.27)	-0.1 E ... A 3.9	Modern
"Old World" (*t=7.45)	-0.5 E ... A 3.4	"New World"
Ancient (*t=8.50)	-0.3 E ... A 3.5	Contemporary
"Uptight" (*t=5.21)	-1.7 E ... A 1.1	"Relaxed"
Past (*t=4.81)	-0.6 E ... A 1.9	Future
Frozen (*t=5.03)	0.8 E ... A 3.1	Lively
Old (*t=4.12)	-0.7 E ... A 1.5	Young
Traditional (*t=3.39)	0.3 E ... A 2.2	Progressive
Conservative (t=1.71)	-1.2 E A -0.2	Revolutionary
Dark (t=0.71)	1.4 E A 1.9	Enlightened

Irrelevant Scales:

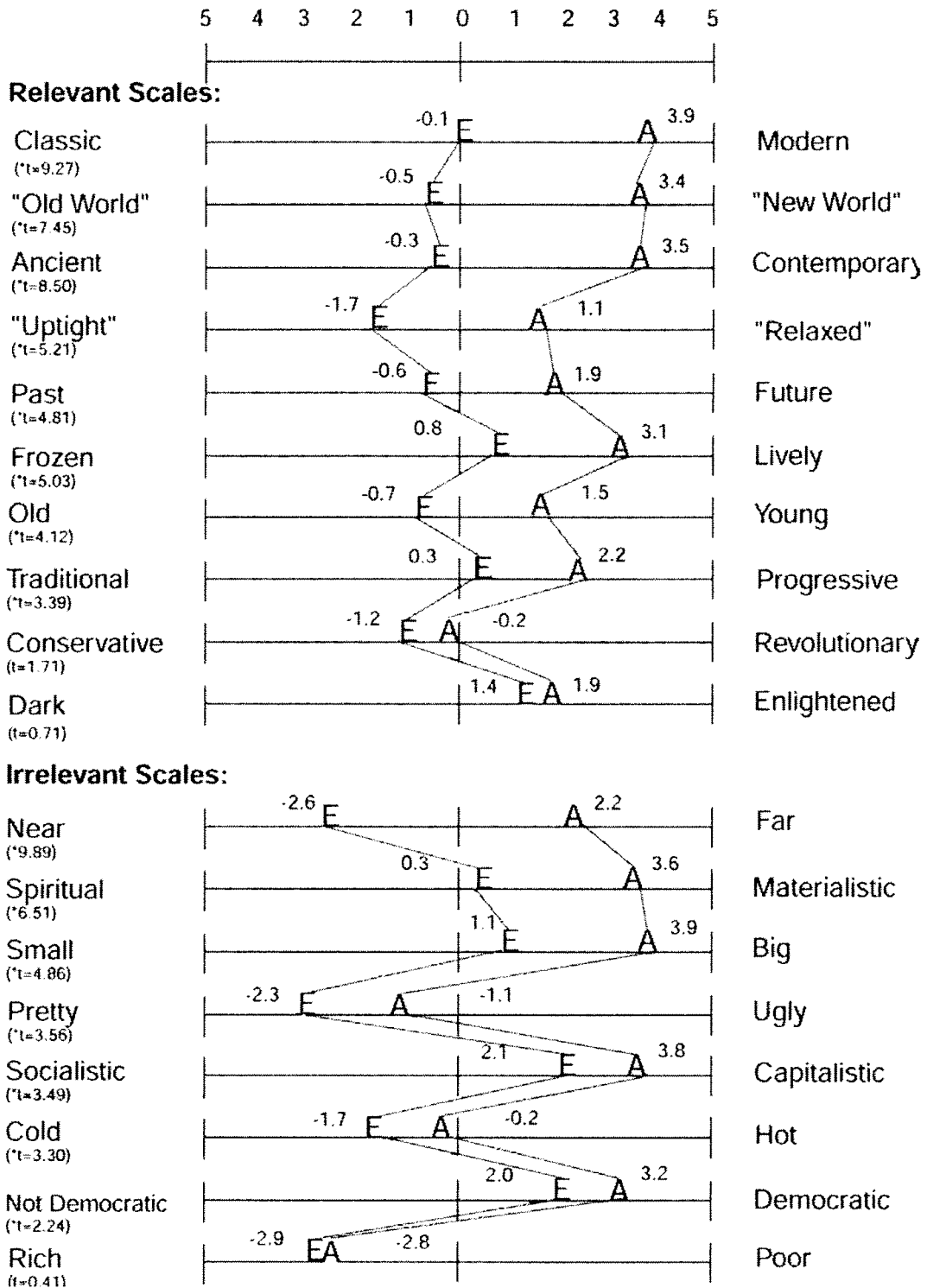| Left		Right
Near (*9.89)	-2.6 E ... A 2.2	Far
Spiritual (*6.51)	0.3 E ... A 3.6	Materialistic
Small (*t=4.86)	1.1 E ... A 3.9	Big
Pretty (*t=3.56)	-2.3 E ... A -1.1	Ugly
Socialistic (*t=3.49)	2.1 E ... A 3.8	Capitalistic
Cold (*t=3.30)	-1.7 E A -0.2	Hot
Not Democratic (*t=2.24)	2.0 E ... A 3.2	Democratic
Rich (t=0.41)	-2.9 EA -2.8	Poor

Figure 3. The average rating which America and Europe received on the 18 bi-polar scales (*p<0.05).

Both, of course, are dictated by historical fact: Europe is, indeed, historically older than America. Imagine a listing such as The Timetables of History, and imagine that all the events it lists were put into a large bookbag, and one European and one American event were sampled at random. Chances are that the European event would, indeed, be less recent than the American event. In that respect, the two cognitive mechanisms we posit are quite similar: both reflect the historical truth that Europe has an older history than America.

STUDY 3 -- IS THE EUROPE-AMERICA BIAS AN ACCESSIBILITY EFFECT?

Brown, Rips and Shevell (1985) conducted a series of experiments in which they asked people to date public events. The events, though presented and dated individually, were members of event pairs such that events in a pair occurred in proximity to each other, and were similar (e.g., two assassination attempts, or two airline crashes), but one was better known than the other. All were contemporary events. Brown et al. found that the better known events tended to be dated more recently than the less well known events. They labeled this effect the accessibility principle: "The more you know, the more recent an event will seem, other things being equal" (p. 141).

The accessibility principle provides an obvious alternative account -- though not a conflicting one -- for the EAB. In other words, perhaps our respondents know more about American than about European history, and this is what makes the American events seem more recent. The rationale for this principle regarding contemporary events lies in inverting a valid law of memory: Other things equal, the vividness and detail of memories diminish over time. Hence, the amount of information recalled in a memory can be a cue to its storage age. Of course, since memories for historical events are not -- cannot possibly be -- the same age as the events, nor are they even correlated, the rationale for the accessibility principle does not apply to historical events. Nonetheless, it might overgeneralize to such events.

One sense of "knowledge" about European versus American events resides in the accuracy with which they can be dated. Recall that Table 2 shows that our respondents actually dated European events more accurately than American events, and so in this sense they know more about the European events. Perhaps, however, in respects other than dating, they nonetheless do know more about American events -- or at least, feel they know more about them. Study 3 tests for this possibility. It checks i. whether the accessibility principle, as measured by Brown et al., can be generalized from their contemporary events to our historical events; ii. whether it can account for the EAB.

Method

We measured how much our respondents felt they knew about our events, using the same scale used by Brown, Rips and Shevell (1985), who asked their respondents "how much they knew about the events on a 0 to 9 scale" (p. 145). An informal preliminary check convinced us that for many of our events, students would be unable to give any related details. And the accessibility principle really requires no more than a subjective sense of knowing.

Participants and Procedure

The 86 students participating in this study were individually approached in the library. Those who agreed did the task on the spot. It took about 10 minutes. Subjects were told that one of them, chosen by lottery, would be paid 200 NS. Half the participants rated their knowledge of the 60 events which constitute the first 30 pairs of the questionnaire from the first experiment in Study 1 (those numbered 1-30 in Appendix 1), and half rated their knowledge about the 60 events of the other 30 pairs. Events were listed in the same order as they were there. The task instructions were as follows: "Here is list of historical events. They were taken from a history book, and described in the words of the book. Hence, the amount of detail in the descriptions was determined by the authors of that book. We shall ask you to rate how much you know about each event on a scale from 0 (nothing at all) to 9 (a lot)".

Results

Each event received a score according to the average knowledge rating it received. The average score of the European events was 2.1 (with a SD of 1.1), and for the American events it was 1.9 (SD=1). Clearly, both types of events are about equally familiar -- or should we say, equally unfamiliar -- to our respondents. The highest mean rating for any of these events was 4.9. If anything, the American events are slightly less familiar than the European events. Thus, the EAB cannot be attributed to greater familiarity with the American events. (The filler events, deliberately chosen to be more familiar, indeed received an average rating of 3.7, SD=1, and the highest mean rating for a filler event was 5.9 -- in accordance with the 71% correct answers to the filler questions in Table 1, as compared to 58% for the target pairs.)

Even though the American events as a group were not more familiar than the European ones, it could still be the case that within pairs, more familiar events tended to be ranked as more recent. So for each of the event pairs, we calculated the difference between the mean rating of the better known event and its lesser known partner. Differences were found to range between a maximum of 5 and a minimum of 0. The 60 differences were correlated with the proportion of respondents (in Study 1) who placed the better known event more recently in history. This analysis disregards the location of the events, and thus it tests the accessibility principle independently of their location. If the accessibility principle operates in our study, this correlation should be positive. In fact, the Pearson correlation was 0.21 (p=.11, NS). We also correlated the percent of respondents who thought the first event happened first, and the percent of respondents (different people, of course) who gave it a lower subjective knowledge rating. The correlation between these percentages across all 60 items was also negligible -- 0.06 (p=.65, NS).

Discussion

Two literatures seem to be pertinent to a study on the dating of historical events: that of memory for dates, and that of estimation. Reliance on the first suggests that estimating the date of the Civil War does not differ, in principle, from guessing the date of the Gulf War: Even though the first can only be, at best, part of semantic memory while the second can also be part of episodic memory, the memory principles involved are the same (e.g., using

vividness as cue). Reliance on the second suggests that guessing the date of the Civil War does not differ much from guessing the number of casualties of the Civil War – even though one is a time related variable and the other isn't, both are governed by general principles of numerical estimates.

Chronologically speaking, historical events differ from contemporary public events only in how far back in the past they are from the present. Indeed, what is an historical event for a young person may be a contemporary public event for an older one. But cognitively speaking, the difference is not merely quantitative, but qualitative, as in what memory repository these events reside. In the present study, however, the dates of the events were probably not even in semantic memory -- many of the events had never even been heard of by our participants.

The reason why the accessibility principle didn't seem to operate in our study may simply be that it is a principle that applies to the retrieval from memory of once known dates, and not to the estimation on the basis of partial knowledge of unknown dates. These two processes are so different, that Friedman (1993), in a recent review called "Memory for the time of past events" neither included historical events nor did he explicitly exclude them in his list of excluded studies. Apparently, they were simply (and correctly) regarded as not even candidates for his survey. In other words, the EAB is an estimation-based bias, not a memory-based one.

GENERAL DISCUSSION

In a famous Presidential address, George Miller (1969) spoke about "giving psychology away". The present paper is a case of giving psychology away. A curious observation by a professor of history was presented as a psychological puzzle. An experiment confirmed the validity of the casual observation, and other experiments confirmed the validity of an intuitive cognitive explanation, ruling out others.

It is important to realize that the sequence of experiments we conducted and described was not motivated by a theory, but rather by an observation. The EAB is not a test of some theoretically based prediction, it is a curious fact in search of an explanation. We stress this because of a common question we have encountered when presenting this work: "But do Americans, or Europeans, also exhibit the EAB?".

Our study was done in Israel, and involved Israeli students. According to the university's student admissions statistics, about 30% of them have European origins, about 6% of them have North American origins, and the rest are mostly of Mid Eastern or North African origins, including third generation or deeper Israeli born. We did not ask our participants to indicate their origins, because we did not attribute the bias to their origins. For the same reason, we see no need to find out whether the EAB exists in other populations. We do not deny that such extensions would be interesting -- on the contrary, we would be happy to see them done. We only deny that our thesis is incomplete without them. Asking whether Americans are subject to the same bias has no more bearing on our thesis, methodologically speaking, than asking whether the Chinese are subject to it.

In particular, we wish to clarify that we are making no claim and no prediction as to who should be subject to the EAB. In fact, we are not even making the conditional prediction that if someone believes that America is The New World and Europe is The Old World, then they should be subject to the EAB -- for the simple reason that such a prediction requires the

addendum: other things equal. Quite possibly, when people judge events from their own history (say, Americans judging American events) things are not "equal" to judging events from others' (e.g., European) history. Quite possibly, Americans know more about their own history, and their judgments will be subject to the accessibility principle, even if the Israeli students' weren't. Quite possibly, Europeans students don't even think of their continent as "The Old World".

Our story is a self contained one: Israeli students are subject to a bias which no one predicted -- it was just noticed. Gratifyingly, cognitive psychology can shed light on it, just as Prof. Blondheim hoped when he approached us. The road from theory to empirical prediction, we all know, is bumpier than the road from phenomenon to theoretical explanation. With all due modesty, we took the road less bumpy.

ACKNOWLEDGEMENTS

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APPENDIX 1 - ALL EVENT PAIRS

No.	loc	The American Event	The European Event	Date	Date
		1 year difference			
1	56	Six leading Quakers resign from Pennsylvania Assembly	J. F. Damiens attempts to assassinate Louis XV	1756	1757
2	37	Indian massacres at Wyoming, Pa., and Cherry Valley, N.Y.	Peace of Teschen ends War of Bavarian Succession	1778	1779
3	23	Kentucky becomes a state of the U.S.	Louis XVI trying to leave France with his family, is caught in Varennes and returned to Paris	1792	1791
4	32	Tennessee becomes a state of the U.S.	Napoleon defeats Austrians at Rivoli	1796	1797
5	16	Thomas Jefferson inaugurated President of the U.S. at Washington	Napoleon becomes president of Italian Republic	1801	1802
6	42	James Madison becomes 4th President of the U.S.	The year of Napoleon's zenith: he marries archduchess Marie Louise of Austria; annexes Holland, Hanover, Bremen, Hamburg, Lauenburg and Lubeck	1809	1810
7	46	Michigan becomes a state of the U.S.	The people's Charter initiates the first national working-class movement in Great Britain	1837	1836
8	26	U.S. General Amnesty Act pardons most ex-Confederates	Thiers falls and MacMahon is elected Fr. President	1872	1873
9	35	James A. Garfield inaugurated as 20th president of the U.S.; He is shot and killed in Sept.; Succeeded by Vice President Chester Arthur	Lord Beaconsfield (Disraeli) resigns as Brit. Prime Minister; Succeeded by W. E. Gladstone.	1881	1880
10	27	Pedro II abdicates; Brazil proclaimed a republic[1]	Ger. Emperor William I dies (Mar.); succeeded by his son William III, The "Kaiser"	1889	1888

[1] This is one of four "American" events which occurred in South America. In the present paper, "America" is taken to mean "The United States of America". In accordance, these events should not have been included, however removing them makes no difference at all to the reported results.

APPENDIX 1 - CONTINUED

11	51	N. Dakota, S. Dakota, Montana and Washington become states of the U.S.	Bismarck dismissed by William II	1889	1890
12	53	Grover Cleveland elected U.S. President	Independent Labor Party formed at conference in Bradford, England, under Keir Hardie	1892	1893
13	59	William Howard Taft elected U.S. President	Turkey and Serbia recognize Aust. Annexation of Bosnia and Herzegovina	1908	1909
14	21	Mrs. Nellie Taylor Ross of Wyoming becomes the first woman governor in America	Fascist youth organizations "Ballilla" in Italy and "Hitlerjugend" in Germany founded	1925	1926
15	50	Socialist Party nominates Norman Thomas for U.S. presidency	Trotsky expelled from the U.S.S.R.	1928	1929
16	58	First U.S. aircraft carrier, Ranger is launched	In U.S.S.R. the second Five-Year plan begins	1933	1932
17	48	Franklin D. Roosevelt died and is succeeded as President of the U.S. by Vice-President Harry S. Truman	World War II: Russians capture 100,000 Germans at Minsk	1945	1944
18	31	22nd Amendment to the U.S. constitution passed by Congress: provides for maximum of two terms (eight years) service as president and one term for vice presidents succeeding to the presidency who have already served more than two years	Klaus Fuchs found guilty of betraying Brit. Atomic secrets to U.S.S.R. and imprisoned	1951	1950
19	54	Peron reelected President of Argentina [1]	West Germany joins Council of Europe	1951	1950
20	28	U.S. protests against Cuban expropriations	De Gaulle proclaimed President of the fifth Republic in France	1960	1959

APPENDIX 1 - CONTINUED

		10 years difference			
21	39	James Monroe inaugurated as fifth President of the U.S.	Russia, France and Britain urge Turkey to end war with Greece; their note is rejected by the sultan	1817	1827
22	2	U.S. House of Representatives elects John Quincy Adams as president when none of the four candidates wins a majority in the national election	Murat deserts Napoleon and joins Allies	1824	1814
23	3	Uruguay (which was part of Brazil for a few years) becomes independent republic following treaty of Rio de Janeiro [1]	Bavarian constitution proclaimed; followed by constitution in Baden	1828	1818
24	14	Franklin Pierce inaugurated as 14th president of the U.S.	William, Prince of Denmark, becomes George I, King of Greece	1853	1863
25	47	Oregon becomes a state of the U.S.	Rome proclaimed a republic under Giuseppe Mazzini	1859	1849
26	33	Union Forces capture Fort Henry, Roanoke Island, Fort Donelson, Jacksonville and New Orleans	Civil war in Spain - Carlists are defeated and Don Carlos escapes to France	1862	1872
27	60	Arizona and Idaho organized as U.S. territories	Republic proclaimed in Spain	1863	1873
28	38	Benjamin Harrison elected as President of the U.S.	Major Esterhazy acquitted in Dreyfus forgery trial	1888	1898
29	17	Oklahoma is opened to non-Indian settlement	Fr. Prince of Imperial, son of Napoleon III, killed in action	1889	1879
30	44	Utah becomes a state of the U.S.	Armand Fallieres elected President of France	1896	1906
31	29	Literacy requirements for U.S. citizenship passed over Wilson's veto	"Black Friday" in Germany - the economic system collapses	1917	1927

APPENDIX 1 - CONTINUED

32	20	Socialist party nominates Norman Thomas for U.S. presidency	War World I: Russ. Constituent assembly in Petrograd dissolved by Bolshevics	1928	1918
33	6	Franklin D. Roosevelt wins U.S. presidential election in Democratic landslide; 472 electoral votes over Herbert Hoover's 59	Raymond Poincare' succeeds Aristide Briand as Prime Minister of France	1932	1922
34	13	20th Amendment to U.S. constitution	World War II: Germany withdraws from the Caucasus	1933	1943
35	41	F.D. Roosevelt reelected President of the U.S. by landslide	Churchill gives his "Iron Curtain" speech	1936	1946
36	9	World War II: Congress passes Selective Service Act to mobilize U.S. military	Name of Constantinople changed to Istanbul	1940	1930
37	24	President Roosevelt appoints Wiley B. Ruteledge to the supreme court	New constitution proclaimed in Yugoslavia; Marshal Tito elected president	1943	1953
38	11	Juan Peron elected president of Argentina [1]	King George V of England dies; succeeded by his son Edward VIII	1946	1936
39	18	Over President's Truman's veto, U.S. Congress passes Taft-Hartly Act restricting rights of labor unions	Poland refuses to sign agreement to return Danzig to Germany	1947	1937
40	7	U.S. breaks of diplomatic relations with Cuba	Czechoslovak Communist Party purged	1961	1951

APPENDIX 1 - CONTINUED

FILLERS					
1 year difference					
41	8	China invades Tibet	Great Britain adopts Gregorian calendar	1751	1752
42	22	Boston Tea Party: protest against tea duty	Coercive acts against Massachusetts include closing of Port of Boston	1773	1774
43	40	American Revolution: Thomas Grenville sent from London to Paris to open peace talks with Benjamin Franklin	American Revolution: Great Britain recognizes independence of the U.S.	1782	1783
44	1	The first guillotine in Paris	Queen Marie Antoinette executed	1792	1793
45	15	World War I: Archduke Francis Ferdinand, heir to the Austrian throne and his wife assassinated in Sarajevo June 28	War World I: Ger. Airship bombs E. Anglian ports	1914	1915
46	43	War World II: Germany invades Poland and annexes Danzig Sept. 1	War World II: the London "Blitz" (all night raids)begins; U.S. destroyers sold to Britain	1939	1940
47	4	D-Day Russians capture 100,000 Germans at Minsk	U.S. drops atomic bombs on Hiroshima Aug. 6 Nagasaki Aug. 9	1944	1945
48	49	World War II: U.S. and U.S.S.R. troops meet at Torgau	De-Gaulle resigns Presidency and is succeeded by Bidault	1945	1946
49	19	Senator Joseph McCarthy advises President Truman that State Department is riddled with Communists and Communist sympathizers	Julius and Ethel Rosenberg are sentenced to death for espionage against the U.S.	1950	1951
50	52	Anglo-Fr. Ultimatum to Egypt and Israel calls for cease-fire	UN reopens Suez Canal to navigations	1956	1957

APPENDIX 1 - CONTINUED

10 years difference					
51	55	Horatio Nelson destroys Fr. Fleet in Abukir Bay	FR. Army occupies Rome, invades Spain, and takes Barcelona and Madrid. Joseph Bonaparte becomes King of Spain	1798	1808
52	25	Coronation durbar for Edward VI, King-Emperor, at Delhi	Mahatma Gandhi, leader of Indian Passive Resistance Movement, arrested	1903	1913
53	10	Lenin leaves Russia and founds the newspaper "The Proletarian"	World War I: Balfour Declaration on Palestine	1907	1917
54	45	Lenin establishes connection with Stalin and takes over editorship of "Pravda"	Soviet states form U.S.S.R.	1912	1922
55	57	War World I: Anglo-Fr. Landings at Gallipoli	Hitler reorganizes Nazi Party (27,000 members) and publishes vol. 1 of "Mein Kampf"	1915	1925
56	30	War World I: Italy declares war on Germany	Hirohito succeeds his father Yoshihito as Emperor of Japan	1916	1926
57	34	Passfield White Paper on Palestine suggests that Jewish immigration to be halted	World War II: Chamberlain resigns and Churchill becomes Brit. Prime Minister	1930	1940
58	12	The Jewish state comes into existence, Weizmann president, Ben-Gurion Premier	Egypt and Syria join to form the United Arab Republic with Nasser as president	1948	1958
59	5	Britain recognizes Israel	Former Gestapo chief Adolf Eichman arrested	1950	1960
60	36	Assassination attempt against Truman made by two Puerto Rican nationalists; one is killed, the other sentenced to death, later commuted to life imprisonment	John F. Kennedy elected President of the U.S.	1950	1960

APPENDIX 2 – FILLER EVENTS

List	No.	loc.	American fillers	Date
1	1	22	Boston Tea Party: protest against tea duty	1773
1	2	55	American Revolution: George Washington made commander-in-chief of Amer. Forces	1775
1	3	25	Amer. Congress resolves suppression of authority of Brit. Crown	1776
1	4	5	Abraham Lincoln assassinated Apr. 14; succeeded as president by Andrew Johnson	1865
1	5	8	U.S. Civil War ends May 26 (surrender of last Confederate army)	1865
1	6	4	U.S. drops atomic bombs on Hiroshima Aug. 6 Nagasaki Aug. 9	1945
1	7	36	John F. Kennedy elected President of the U.S.	1960
1	8	34	50,000 persons demonstrate against Vietnam war at Washington, D.C.	1967
1	9	52	Rev. Martin Luther King Jr., leader of Negro civil rights movement and winner of 1964 Nobel Peace Prize, is assassinated in Memphis motel	1968
1	10	40	Panamian General Noriega surrenders to U.S. troops and arrested on drug-trafficking charges	1990
2	1	25	First U.S. Congress meets in New York	1789
2	2	22	U.S. federal offices are moved from Philadelphia to Washington D.C., the new capital city: free inhabitants 2,464, slaves 623	1800
2	3	19	"Emancipation Proclamation" – effective Jan. 1, 1863, all slaves held in rebelling territory declared free	1862
2	4	40	Confederate States of America formally surrender at Appomattox Apr. 9	1865
2	5	52	World War I: fuel and food controls in U.S.	1917
2	6	30	Senator Joseph McCarthy advises President Truman that State Department is riddled with Communists and Communist sympathizers	1950
2	7	1	President John F. Kennedy assassinated by Lee Harvey Oswald in Dallas, Tex., Nov. 22	1963
2	8	5	U.S. strength in Vietnam is reduced to below 400, 000 men	1970
2	9	55	Argentina puts on trial former military leaders for crimes against human rights	1985
2	10	8	Vice President George Bush announces his candidacy for the presidency	1987

APPENDIX 2 – CONTINUED

List	No.	loc.	European fillers	Date
1	1	1	Queen Marie Antoinette executed	1793
1	2	19	Battle of Austerlitz: Napoleon's victory over Austro-Russ. Forces	1805
1	3	10	Lenin leaves Russia and founds the newspaper "The Proletarian"	1907
1	4	15	World War I: Archduke Francis Ferdinand, heir to the Austrian throne and his wife assassinated in Sarajevo June 28	1914
1	5	30	War World I: Italy declares war on Germany	1916
1	6	45	Soviet states form U.S.S.R.	1922
1	7	57	Hitler reorganizes Nazi Party (27,000 members) and publishes vol. 1 of "Mein Kampf"	1925
1	8	43	War World II: the London "Blitz" (all night raids) begins	1940
1	9	12	Allied Control Commission divides Germany into four	1945
1	10	49	Free travel to the west is sanctioned and the Berlin Wall is demolished	1989
2	1	36	The French Revolution: National Assembly decides on nationalization of church property	1789
2	2	45	Lenin establishes connection with Stalin and takes over editorship of "Pravda"	1912
2	3	15	World War I: Ger. Airship bombs E. anglian ports	1915
2	4	57	War World I: Anglo-Fr. Landings at Gallipoli	1915
2	5	10	World War I: Balfour Declaration on Palestine	1917
2	6	43	War World II: Germany invades Poland and annexes Danzig Sept. 1	1939
2	7	34	World War II: Chamberlain resigns and Churchill becomes Brit. Prime Minister	1940
2	8	12	World War II: the murder of millions of Jews in the Nazi gas chambers begins	1942
2	9	4	D-Day Russians capture 100,000 Germans at Minsk	1944
2	10	46	De-Gaulle resigns Presidency and is succeeded by Bidault	1946