

## CHAPTER 33

# Expertise in History

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### Overviews of Expertise and of History

#### *Expertise*

Expertise, studied in a variety of domains, has referred to highly skilled performance in an activity such as violin playing or playing chess. Expertise has referred also to a person's knowledge and/or ability to perform representational tasks of a particular domain. The term also may be based on a reputation established by publications and/or lectures, or on a "certification" such as a PhD. In the present context, an expert in history is assumed to have a general and a specialized knowledge of history as well as facility in the skills of historical research and writing.

Although the study of expertise began in the late nineteenth century, the primary impetus occurred in the late twentieth century with the work on chess by de Groot (1965) and Chase and Simon (1973a, 1973b). This research, comparing expert, middle-range, and novice performance, demonstrated the importance of recognizing functionally related "chunks" of chess pieces.

Similarly, physics experts were superior to novices in their conceptual understanding of physics problems, which in turn led to their better problem solving (Chi, Feltovich, & Glaser, 1981; Larkin, McDermott, Simon, & Simon, 1980).

The nature of expertise in any domain involves an interaction of a person's knowledge (both domain-specific and general) and skills, and the characteristics of the domain that constrain performance. Some domains, because of their conceptual evolution, permit the use of mathematics, formal logic, or well-controlled experimentation. Such domains are generally termed "well structured," frequently dealing with problems having a single answer, readily identifiable constraints, and agreed-upon solutions. Other domains such as history and political science have conceptual structures that allow relatively little opportunity to use mathematics, formal logic, or controlled experimentation. Instead, reasoning and problem solving usually are verbal (not mathematical), with evidence for a solution presented as an argument, usually developed in relation to particular facts and

interpretations. Such problems are termed “illstructured,” having more than one possible answer, requiring identification of constraints, and having no agreed-upon solution.

With respect to the study of expertise in history, although centuries ago historians as a group were concerned about the quality and accuracy of their writings, the study of expertise in history as well as the social sciences emerged in the 1980s, the seminal papers being Voss, Greene, Post, and Penner (1983) in political science and Wineburg (1991) in history. Two suggestions are made regarding why and when these works emerged. One is that the study of expertise began in domains having well-structured problems, probably because such problems are relatively tractable and in many cases computer simulations of performance could be obtained. Political science and history, however, generally are concerned with ill-structured problems that have a large amount of potentially related information, and different experts may approach the same issue differently, depending on the expert's theoretical background, related knowledge, and other factors. Such solutions are usually verbal arguments, which typically do not have right or wrong answers, but the answers may vary in relative acceptability. Furthermore, evaluation may occur by examining the acceptability of the information provided *per se*, the extent to which the solution information supports the solution, and the quality of a counterargument or alternative solution that may be offered. The evaluator may be influenced also by the evaluator's own beliefs, theoretical orientation, or other factors. Thus, because of the nature of the domain, there is relatively little opportunity to profit from the benefits of quantitative analysis, which leads to relatively less certainty in subject-matter knowledge and more heterogeneity in constraint usage.

### **History**

As expected, a number of definitions of history have been advanced. Stearns (1998) regards history as “change over time” (p. 281),

adding that such study has two components, continuity and causation, that is, the historian documents change and works to determine its causes.

Leinhardt, Stainton, and Virji (1994) developed a definition obtained from interviews with seven professional historians and two history teachers. The composite definition that Leinhardt et al. derived is “History is a process of constructing, reconstructing, and interpreting past events, ideas, and institutions from surviving or inferential evidence to understand and make meaningful who and what we are today. The process involves dialogues with alternative voices from the past itself, with recorders of the past, and with present interpreters. The process also involves constructing coherent, powerful narratives that describe and interpret the events, as well as skillful quantitative and qualitative information from a theoretical perspective” (p. 88). The above definitions emphasize change, reconstruction, and the importance of historiography, that is, the processes whereby the historian obtains and uses information.

The beginning of the study of history is usually marked by the writings of Herodotus (484–425 BC), which contain an account of the Persian-Greek Wars and related matters (Herodotus, 1987). Although his writings include some Homer-like mythological and religious components, Herodotus primarily wrote to provide a record for future readers. Thucydides (460–400 BC), also explicitly writing for the future, provided an account (1954) of the Peloponnesian War that matched Athens and Sparta. The war began in 431 BC, ending in 404 BC with the defeat of Athens. Thucydides focused on the military and political aspects of the war, considering social, cultural, and economic aspects when relevant. Moreover, by including speeches of leaders he provided examples of political rhetoric, with Pericles' funeral oration probably the most notable.

In a broader sense, a major contribution of these writers was to make history secular, that is, to consider human activity as causing events rather than seeing the forces of religion and myth as causes. In addition, the

authors used a criterion of evidence for the historical accounts, namely, eyewitness testimony, including obtaining corroboration across witnesses.

From the time of Herodotus to the present, the field of history expanded substantially, and during this time, history frequently has been interpreted to support a particular ideological viewpoint. As examples, during the Middle Ages history was used by the Church to determine "God's Plan," during the Enlightenment it was used as a demonstration of progress, and during the nineteenth century as a means to support broad socio-cultural ideas of civilization's progress (Lemon, 2003).

Two historical developments of the twentieth century are noted. The field of social history developed, addressing more egalitarian topics related to the lives of everyday people. Second, the Covering Law, stated by Hempel (1942), constituted an attempt to subsume history under the theoretical framework of positivism, the atheoretical view of science emphasizing experimentation and the operation of laws. Under the Covering Law, history was regarded as event contingencies mediated by lawful relations, that is, event A was followed by event B because of a law operating to produce the relation.

The Covering Model raised a number of questions. Dray (1957), for example, argued that since each historical set of events is unique, there would need to be many laws of history. Moreover, historians generally have not found such laws, nor actually do they seek them (Mink, 1987). In addition, there is the importance of contextualization, that is, events occur in a context and the so-called meaning or importance of that event is often a function of that context. This would suggest a need for a law for each occurrence of A that is in a different context.

Finally, comparing the Herodotus period to the present, the study of history has not changed substantially, especially if compared, unfairly, to the technological changes in scientific investigation. Specifically, over time more and better sources have become available, but the basic means and

procedures have changed relatively little. As an example, in the Sixteenth century some historians were concerned about their methods and developed rules of writing historical accounts. These included avoidance of one's own or another person's religious, social, or patriotic biases, being detached when writing about recent events, writing in an appropriate manner and not for entertainment, and being sure to "stick to facts rather than inventing them" (Lemon, 2003, p. 119).

To this point we have provided some background in the fields of expertise and of history, and we turn now to the historian. The goal of the historian generally is to study a particular topic and provide a coherent, interpretive, and persuasive account stating a position that usually but not necessarily is a narrative. The contents of the narrative are usually concerned with the changes that took place in the topic being studied and what produced them. In the next section we delineate two inter-related tasks of the historian, obtaining information and writing a narrative.

### **Expertise in History: The Historian's Tasks**

In this section we are inserting the first of ten Characteristics of History Experts (CHEs). Each CHE is a summary statement of the findings of expert or expert-related research in history or, in a few cases, a related discipline.

#### ***Obtaining Information***

The historian may use many resources, including biographies, autobiographies, journals, other library sources, museum archives, letters, paintings, objects, birth and death records, and photographs, examining them for their reliability, validity, authenticity, and usefulness.

#### **CHE 1**

Historians evaluate sources emphasizing original and authentic information, using

criteria different than novices. Historians also tend to have less intra-group variability in source evaluation than novices.

Wineburg (1991) had eight high school students and eight professional historians evaluate eleven sources pertaining to the Battle of Lexington. Eight written sources came from diaries (2), an autobiography, a deposition, a newspaper report, and a letter of protest, each written close to the time of the battle. The other two written excerpts were from a historical novel and a high school textbook, respectively, each written in the 1960s. The other three sources were paintings done, respectively, in 1775, 1859, and 1886.

"Think-aloud" protocols were obtained as well as rankings of each written document for its "trustworthiness as a source for understanding what happened on Lexington Green" (p. 75). The paintings were rated for "what most accurately depicts what happened on Lexington Green" (p. 75).

For the eight written documents, historians provided substantial within-group agreement, novices having less. There was poor agreement between the two groups, with experts, for example, rating one of the diaries as most trustworthy of the written sources and novices rating the textbook and novel excerpts as most trustworthy, which historians rated quite low. Rating the paintings for their description, analysis, relevance, and qualification, experts provided more information. History graduate students also were shown to evaluate information usefulness in a different way than psychology graduate students, with history students also demonstrating a more historian-like way of expressing and supporting their respective positions (Rouet, Favart, Britt, & Perfetti, 1997).

#### CHE 2

Experts use at least three heuristics in their analysis of sources, corroboration, sourcing, and contextualization (Wineburg, 1991).

Corroboration is the "act of comparing documents with one another," sourcing is the "act of looking first to the source of the document before reading the body of the text,"

and contextualization is the "act of situating a document in a concrete temporal and spatial context" (p. 77). Using both quantitative and qualitative indices, experts used the heuristics more frequently and more appropriately than novices. Wineburg speculated about a possible fourth heuristic, identifying absent evidence, which was also a more frequent strategy among experts. As Wineburg notes, the prior knowledge of the historian, both in general and in reference to specific expertise, is an important factor in the effective use of such heuristics.

The use of heuristics by historians raises a more general issue. Such heuristics, used as early as the Greek writings, provide the historian with a means of systematizing their inquiry, helping to constrain and interpret the material. In other words, the historian is improving the structure of an ill-structured task. These and findings reported later in this chapter support a conclusion of Ericsson and Lehmann (1996) that across a wide range of domains, one of the characteristics of expertise is the ability to adapt and use constraints.

#### CHE 3

When analyzing sources, historians develop mental representations of the events and activities discussed in the text (situation models) and also generate subtext.

Following cognitive text processing theory (e.g., Kintsch, 1988), Wineburg (1994), via the use of "think-aloud" protocols, studied how eight historians processed the written sources on the Battle of Lexington described above. Theoretically, each historian was presumed to have three mental representations derived from the text, namely, the text contents *per se*, the event, and the subtext. The text representation is of the contents of the text *per se*. The event model is the representation of the event as conceived by the historian, and the subtext, an elaboration of the situation model, is constructed by the reader, using whatever seems reasonable about the time and place of the text events, the intention of the author, the intended audience, and other factors. To construct the event representation

the reader uses the preceding text contents as well as prior knowledge. Using knowledge and inferences based upon the event model, the reader may construct a subtext, possibly dealing with inferences about the author's goals and/or intentions, the motivations of the characters being discussed, or perhaps hidden assumptions about the actions. Historians' event and especially the subtext representations may vary depending on the background knowledge of the historian. As an example, one historian, in analyzing the diary of a British officer who wrote a description of what happened at the Lexington battle, indicated that given what the British army did immediately after the battle, the diary writer did not have time to write the diary until the next day, and he wrote the diary because he thought he may be questioned by his superior about his actions. Thus, he wrote the diary to show his actions in a favorable light. Subtext development has the difficulty of varying in the extent to which different historians would be in agreement.

#### CHE 4

Historians show expert-expert differences in performance based on differences in areas of specialization, but they show similarities in the use of domain-related skills.

Both Wineburg (1998) and Leinhardt and Young (1996) examined expert-expert differences. Wineburg presented two history experts with seven documents concerning statements by or about Abraham Lincoln and his attitudes concerning race. One expert's specialization was the Civil War and Abraham Lincoln, whereas the other expert's field was American History, the latter thus having substantial knowledge of the Civil War but not that of the first expert. Leinhardt and Young (1996) also provided historians with documents close to or in the particular historian's field of specialization.

Both studies demonstrated that experts specializing on the particular issue in question produced more extensive and detailed analysis of the documents. In addition, in the Wineburg (1998) study, the non-specializing

expert, through the application of general skills of the historian, was able to perform high-quality analyses but not at the specialized expert's level. Also, although both historians spoke of contextual aspects of the respective documents, such analysis was greater for the specializing expert. Furthermore, this result showed a greater development of subtext by the specialist, that is, this historian used his or her knowledge and beliefs to consider matters such as the intention of the text writer and for whom the text was intended. Finally, theoretically, Leinhardt and Young postulated that two schemas operate when historians read documents, an "identify" and an "interpret" schema, which in turn are related to procedures of analysis.

We want to mention in passing that an aspect of the historian's task that is virtually never studied in history or any other subject-matter domain is the ability of the expert to be adroit in selecting and defining the issue to be studied. Problem finding is the critical first step in problem solving (cf. Getzels, 1979), and expert historians must have skill at posing interesting yet researchable questions.

#### *Narrative Construction and Analysis*

Much has been written about the narrative, by historians, philosophers of history, literary critics, and psychologists. We next focus on the historical narrative and its purpose and use.

#### CHE 5

Historians have the goal of constructing narratives, based on evidence, that provide a reasonable account of particular historical events and actions. As such, narratives are rhetorical constructions aimed at building a case for a particular position in a manner persuasive to readers.

In his *Rhetoric*, Aristotle discussed arguments involving probability or plausibility rather than certainty. He described two types of argument structures employed for this purpose, the enthymeme, that is, a claim and a supporting reason, and the

paradigma or narrative (Aristotle, 1954; McGuire, 1990). In the narrative, the claim of the argument is the interpretation or conclusion of the author and the narrative is the supporting evidence. Within the narrative there may of course be other arguments, including extensive development of causal arguments. Moreover, the narrative may be written for a specific audience or a more general audience, as described by Perelman and Olbrechts-Tyteca (1969). Similarly, the historian may develop an argument in expository or categorical form. The use of these two types of argument within a discipline is current in other fields, such as Schum's (1993) distinction of temporal and relational arguments in jury decision making.

One of the issues raised by critics of the historical narrative is the relation of the historical narrative and the fictional narrative. One view is that the former is written to provide an accurate account based on the available evidence, whereas the latter is not based on evidence or seeking truth, except in the most abstract sense (cf. Mink, 1987). Although this comparison appears to be reasonable, historical narratives require further examination.

A historical narrative typically consists of organizing and interpreting actions and events and their consequences. But in doing so, to what extent does the historian "fill in the dots?" Hayden White (1987) has argued that a critical factor in historical narrative is "emplotment," that is, the events of the narrative take on meaning according to the development of the narrative's plot. Chronology is not enough, and the historian provides coherence and thematic content by generating the plot. To White the plot "endows them (real events) with illusory coherence" (White, 1987, p. xi), or similarly, he states "Reality wears the mask of meaning" (White, 1987, p. 21).

Mink (1987) argued that the narrative serves as a "cognitive instrument," and that it provides the historian with a valuable tool providing opportunity for interpretation. Mink also noted that the aggregation of historical information could occur via incorporation of narratives with one another,

but that this seldom happens. Instead, Mink maintains that historic information increases via new discoveries and interpretations.

#### CHE 6

Narrative quality is related to five components: coherence, chronology, completeness, contextualization, and causation. Although not studied extensively, evidence suggests that narratives deficient in one or more of these characteristics may produce lower trustworthiness, the amount depending on the characteristics and the narrative contents.

What constitutes a "good" narrative has been studied empirically by Leinhardt, Stainton, Virji, and Odoroff (1994). The above five characteristics were those stated by seven professional historians when asked to indicate the qualities needed for a narrative to be "good."

Coherence, regarded as the most important characteristic, refers to the narrative's organization and focus on a central theme. Chronology refers to the reasonable and accurate discussion of the sequencing of events in time. Completeness, or exhaustivity, refers to the use of all available evidence that supports or opposes the expressed ideas and arguments. In practice this criterion is quite demanding because a writer must make judgments regarding what to include and what to omit. Contextualization refers to placing the narrative subject matter into a broader perspective, for example, writing about the causes of the 1991 Gulf War by framing it in the context of the interest of the United States to preserve its Middle East hegemony. Causation is demonstrating convincingly that events or actions produced particular consequences, thus providing coherence to the narrative as a whole and providing linkages of events and actions.

The importance of some characteristics of narrative quality was studied by Voss, Wiley, and Sandak (1999). Set in a legal context, fictional narratives were presented to college students, each narrative containing a murder. The texts included a baseline narrative, a narrative in which coherence and chronology

together were degraded, and one in which causation was degraded by using fewer irrelevant (not pertaining to the murder) causal connectives than the baseline text. However, for all types of text the information pertaining to the respective murder was held constant. Participants were asked to regard each text as the summary of a prosecuting attorney and to rate (on a numerical scale) whether the defendant was guilty and also to rate the texts for cohesiveness and for quality.

The important result is that each of the degraded texts (coherence and chronology, and causality) produced not only lower ratings of text coherence and quality than the baseline text, but also yielded lower guilty ratings, that is, the poorer narratives were rated as having less convincing content, even though the murder-related contents were equivalent.

#### CHE 7

Historical narratives, although chronological, do not consist of linear chains; they typically have both narrative and expository components.

Voss, Carretero, Kennet, and Silfies (1994) asked two political science Soviet Union experts and 32 novices to write an essay on the collapse of the Soviet Union. The non-expert narratives, except those in which information was minimal, all contained narrative and expository components. This observation holds for most narratives in that there is a chronological flow that is marked by occasional sections, expository in nature, that provide rationales, explanations, elaborations, or speculations about some aspect of the narrative. Another finding is that there was a substantial difference in the approach of the two experts, with one describing the collapse in narrative form, providing a chronological account of the collapse interspersed with interpretive comments, the other expert producing an expository account listing and developing reasons for the collapse.

A related study on expository text was conducted by Schooler, Kennet, Wiley, and

Voss (1996) in which an expert and novices read two newspaper editorials, making comments as they read. Novices included political science or psychology graduate students. The expert, a political scientist, in reading the first few sentences, categorized the (anonymous) author of one editorial as a neo-realist, indicating problems he felt with that position. Although the graduate students of each discipline provided about the same number of evaluative comments, the political science graduate students supported their own positions more than the psychology graduate students, whereas the latter provided more comments about possible bias. Furthermore, only the political science graduate students used counterfactual reasoning. These findings support discipline-related expertise development at the graduate level.

#### CHE 8

Alternative narratives about a particular topic may be constructed for a variety of reasons, including differences in interpretation, information, and political-cultural factors.

We think of taking a course in school called "U.S. History." By the title it appears that the course contents constitute "The" history, the only history of the United States. But there are or could be multiple histories about virtually any topic addressed in the course. Why are there alternative histories? It is because each person writing a history bases it on his or her own particular perspective, which may include the person's knowledge, experience, beliefs, information available, theoretical orientation, and the time and place in which the individual lives.

#### CHE 8A

Alternative narratives may be written because of differential source use and interpretation.

One of the more interesting studies (Cronon, 1992) regarding alternative narratives involves a comparison of two books, each pertaining to the years of the Dust Bowl on the American Western Plains. Using much of the same information, one author

wrote an upbeat book concerning its long-term effects while the other author wrote of it as a major disaster. Cronon notes that the matter does not simply concern the difference in conclusion, but that the stories told are also different, an issue leading Cronon into discussion of the historian and the constraints involved.

## CHE 8B

Historians may produce alternative narratives because of differences in the time at which they write. Such differences may be due to the number and accuracy of sources as well as the cultural milieu of the time.

There are many examples of earlier and subsequent revisionist writings. In this regard, Lowenthal (2000) commented, "We are bound to see the Second World War differently in 1985 than in 1950 not merely because masses of new evidence have come to light but because the years have unfolded further consequences – the Cold War, the United Nations, the revival of the Japanese and German economies" (p. 78).

Historical events may be interpreted in terms of present conditions, but when this is done to an extreme, thereby apparently distorting events of the past, it is termed presentism. On the other hand, Levine (1989) pointed out that French historian Marc Bloch stated that "Misunderstanding of the present is the inevitable consequence of ignorance of the past, . . . But a man may wear himself out just as fruitlessly seeking to understand the past, if he is totally ignorant of the present" (pp. 671–672).

## CHE 8C

Alternative narratives are found in countries in which the government and the citizens are not in agreement regarding historical-political-social thinking.

Alternative historical narratives also may coexist because of political-cultural factors. Wertsch and Rozin (1998), studying in the former Soviet Union, and Tulviste and Wertsch (1994), studying in Estonia, distinguished between an "official" history, a government-promoted history based on its

ideology, and an "unofficial" history, held by a number of the citizens, who nevertheless are quite knowledgeable about the "official" history. Moreover, an "official" history was organized and coherent, whereas an "unofficial" history was more piecemeal but in conflict with the "official" history. Wertsch and Rozin (1998) suggest three reasons for states to have an "official" history: to develop an instrument that shows the vision of the state, to foster community identity, and to produce loyalty to the state.

A related case is change in "official" histories when one set of government rulers replaces another. Ever since at least ancient Egypt it has been relatively common for new regime members to destroy statues, change names, burn records and pictures, and even kill family members of the old regime. Even today, in Russia, compared to the Soviet days, history books are being rewritten, there are few pictures and posters of Stalin and Lenin, and Leningrad is once more St. Petersburg.

Conflict between two "official" histories was shown in a study by Carretero, Jacott, and Lopez-Manjon (2002). Comparing history textbooks in Spain and Mexico, the Spanish text spoke of Columbus's discovery of America, whereas the Mexican text spoke of two cultures colliding. Similarly, whereas the Spanish text regarded Columbus as a leader and hero who endured hardship, the Mexican text hardly mentioned Columbus, emphasizing explorers as a group, and indicating that Columbus thought he was in Asia and at one time was put in chains.

## CHE 8D

Alternative narratives are produced in classrooms by differences in students' cultural backgrounds.

Epstein (1998) reported that in a U.S. History class having a slightly greater number of white than Afro-American students, the teacher included more information about the role of Afro-Americans and women than typical U. S. History classes. Whereas students generally agreed that the teacher had done this, questionnaire and interview

data indicated that Afro-Americans thought it was not enough, holding that the teacher should be Afro-American. The Americans identified as most important by Afro-American students were Martin Luther King, Malcolm X, and Harriet Tubman, whereas white students named George Washington, John F. Kennedy, and Martin Luther King Jr. Afro-Americans also rated the most important theme in U. S. History as Afro-American equality (66%) and nation building (13%), as opposed to nation building (56%) and equality (22%) for white students. Finally, the most important source for learning history was the family for Afro-American students; for white students it was the textbook, followed by the teacher. These findings are of course related to the “official” and “unofficial” history issue.

In another example of cultural differences, Barton (2001) found that whereas American students had a linear view of history, focusing on the expansion and growth of the United States, students of Northern Ireland considered history in terms of the changes over the centuries of the peoples that inhabited Northern Ireland, a view of history as a change of context or scene rather than linear development.

In this section we discussed the work of obtaining information and writing narratives. In the performance of such tasks, historians engage in a variety of mental activities, and we turn now to two such inter-related processing skills, reasoning and problem solving.

### *Reasoning and Problem Solving*

By reasoning we mean the performance of an inferential process by which a person uses his or her knowledge to infer other information related to the initial knowledge (Voss, Wiley, & Carretero, 1995). The correctness or acceptability of the inference largely rests upon the proposition or information that justifies and connects the old and new information (Toulmin, 1958). As such, an inference can be an argument, A inferring C, justified by the statement B, connecting A and C. Furthermore, in history, as well as

most other disciplines, such inferences usually have plausibility or probability, but not certainty. Finally, these processes typically take place in the context of a goal, and reaching that goal may involve a number of such inferences, as well as assumptions and knowledge usage.

By problem solving, we mean addressing a domain-related question or problem and developing a solution or answer to it. As previously mentioned, the overall structure of a problem solution is an argument. Specifically, the problem statement constitutes a premise, the solution is viewed as the conclusion, and the steps to go from the initial statement to the goal or conclusion completes the argument. The solution process, by showing the movement from the initial state to the conclusion, serves to justify the conclusion. The form of the solution process in history or political science may be a narrative, an expository text, or a series of steps that would likely be in agreement with some model of problem solving. Evaluation of the solution, as stated, takes place by examining the quality of the evidence, the extent to which the evidence supports the solution, and the examination of opposing solutions.

### CHE 9

Because of the conceptual nature of domains such as history, evidence or justification for a claim or conclusion usually is verbal. Moreover, such justification makes use of “weak” methods of reasoning and problem solving such as analogy, decomposition, and hypothesis or scenario generation and testing (thought experiments), as opposed to “stronger” solution methods such as mathematical proof and inference from well-controlled scientific experiments.

“Weak” methods (Newell, 1980), such as those mentioned above, typically do not lead to specific conclusions, as opposed to “strong” methods such as mathematics or logic that provide certainty. “Weak” methods also tend not to be taught in the classroom but are acquired as language structures from an early age. These methods are called “weak” because they do not lead to

specific solutions, whereas “strong” methods do. Furthermore, as related to previous discussion, “strong methods” are generally used in relation to well-structured problems and “weak methods” in relation to ill-structured ones. It is not correct, however, to simply say that history is ill structured and physics is well structured. Tweney (1991), for example, in his study of Michael Faraday’s discovery of electromagnetism, showed that Faraday’s solution process was that of solving an ill-structured problem. So likewise may some history problems have known quantitative solutions, that is, they may be well structured. But in general, problems and issues of history are ill structured, and reasoning and problem solving take place by more informal means (Voss & Post, 1988).

The solving of ill-structured problems in political science has been studied by Voss et al. (1983). Using experts and novices with respect to knowledge of the Soviet Union, each person was asked to assume he or she was Head of the Ministry of Agriculture of the Soviet Union and, given the poor crop productivity, to say what he or she would do to improve it. (The research was conducted while the Soviet Union was in existence.) Individuals’ “think-aloud” answers were tape-recorded, with expert protocols often being pages in length. In such an ill-structured problem the problem statement does not include a statement of the constraints of the problem.

The solving process of experts typically occurred in two phases, one of problem representation, which essentially is an analysis delineating the causes of the problem. The second, the solution phase, expresses how the problem should be solved and the justification of the solution. The problem representation may be developed in different ways. One expert began by describing the history of the problem, including a comparison showing that England developed a middle class, whereas Russia did not. He also discussed previous attempts at a solution in the Soviet Union and from this analysis generated the representation that the basic cause of poor crop productivity was a lack of modernization. This type of relatively

overarching representation is not uncommon for experts, as opposed to novices who tend to list specific problems. Other experts may not develop a problem history but may emphasize particular aspects of the problem such as political-economic factors. An important aspect of the representation process of experts is that in developing the representation they articulate some of the constraints that exist in relation to the particular problem, and it is not uncommon to attack one or more of the particular constraints in order to solve the problem.

Following representation development, a solution typically is stated. The expert who developed the representation of poor modernization went on to state that the solution was modernization, subsequently stating some of the ways to do this as well as some of the existing constraints. He stated that one would need to go to Gosplan (the Soviet economic planning agency) and argue to increase Soviet funds for agriculture, perhaps taking such funds from the military budget, a questionable possibility. He also suggested that since each family had a private plot, and since productivity on the private plots was greater than on the state farms, the private plots should be increased in size, and people should be allowed to sell the products at market. But this, he pointed out, was against government policy. This is an example of posting a constraint that negates one aspect of a solution. This expert mentioned other aspects of modernization, such as a better transportation system (because some grain rotted in silos) and the development of plastics (because a large amount of grain degenerated in wet paper bags). He also advocated putting people who knew about agriculture in charge of agricultural stations designed to help the farmers, rather than party members who knew little about agriculture. So, this expert provided a solution that involved different facets of modernization, although all of the possibilities could not be implemented.

The above example of an expert solution illustrates the following: first, the expert used a variety of weak methods including analogy, hypothesis generation and testing,

and decomposition. Second, the expert attempted to improve on the solution process by using a strategy called "constraint satisfaction." The strategy adds power to the solving process by delineating the constraints that are particularly important to satisfy to obtain an acceptable solution.

A historical example that shows the importance of constraints in decision and problem-solving processes involves two examples of the United States going to war. When the Japanese bombed Pearl Harbor on December 7, 1941, President Roosevelt had virtually no choice in his decision to request war be declared on Japan. His actions were quite constrained. Indeed, probably any president or politician would have done the same thing. However, President George W. Bush's decision to invade Iraq was a choice made under much less constraint, that is, there were alternative actions possible and many people would likely agree that not all presidents or politicians would have made his decision, even if he himself perhaps felt constrained.

#### CHE 10

Causal reasoning in history faces at least two issues: the general absence of control groups and the presence of temporally antecedent events. Attempts to deal with these matters include, respectively, counterfactual reasoning and the categorization of prior events.

In good scientific experimentation, the results frequently provide reliable and verifiable evidence for the hypothesis under study, although such investigation does not produce certainty. Taking the experimental versus control design as the fundamental form of experimentation, history generally, as life, has no control groups; historical events happen once and control conditions do not exist (although simulations may be made). This lack of control and the fact that history is cumulative, that is, past events and actions are influencing today's events and actions, constitute two difficulties for causal analysis in history.

Counterfactual reasoning allows the historian to invent a hypothetical control con-

dition, that is, "If X did not happen, would Y have happened?" when X and Y did happen. The quality of a counterfactual argument depends on the same three factors as other arguments, namely, the acceptability of the evidence, the extent to which the evidence is judged to support the claim, and the consideration of opposing evidence. However, people may differ in their evaluations, especially in relation to their own beliefs and knowledge. Tetlock and Belkin (1996), discussing the difficulties with such evaluation, suggest that successful evaluation of counterfactuals is tenuous. Tetlock (1999) presented 52 Soviet Union experts with seven counterfactuals involving hypothetical Soviet events. He presented the entire counterfactual, the If-Then statement, or only the antecedent If part of the statement. He also obtained measures of the political positions of the participants on a liberal-conservative scale. Ideological belief was related to agreement or disagreement with the If-Then statements, but not to the If only antecedents. Subsequently, participants were told that new evidence found in the Kremlin made it more likely that one of the counterfactuals is more likely to have been true. Individuals with positions not in agreement with that counterfactual asserted a much more critical analysis, using three means to attack the new information, namely, challenging the authenticity of the documents, challenging the representativeness of the documents, and questioning the competence and motives of the unknown investigator who found the new information. These results are thus in agreement with other findings demonstrating belief bias. Tetlock (1999) found a similar effect when experts were asked to predict events, that is, when shown to be wrong, experts felt high confidence in their prediction and defended themselves by use of similar bias procedures. Tetlock further pointed out that the results suggest that one reason why it is so difficult to learn from history is that there is the tendency to defend one's own position even when confronted by information that brings that position into question, rather than examining one's position for alternatives.

The above findings are not meant to suggest that the use of counterfactuals is always open to substantial bias. Breslauer (1996), for example, effectively argues that debates focused on counterfactuals have occurred when there is a quite substantial body of data available concerning the issue in question, when the issue suggests a discontinuity that is difficult to explain, and when there is political partisanship. For example, the collapse of the Soviet Union would likely be an interesting issue to deal with counterfactually since theoretically it was unexpected and the large amount of historical data on pre-Soviet days would suggest the possible operation of a number of important factors.

Pursuing the matter of learning from history, two political scientists (Holsti & Rosenau, 1977) collected data from over 2,000 individuals who worked in ten different occupations. The study, addressing lessons learned from the Vietnam War, had participants answer items pertaining to support of or opposition to the war at the beginning and the end, the individual's political belief system, and reasons for the outcome of the war. A relationship was found between a person's belief system and the particular reasons for the war's outcome, with hawkish people holding such reasons as not enough force was used early and that Vietnam was helped from Russia and China, and with dovish people indicating that the spirit of the North Vietnamese was underestimated and the United States had unrealistic goals. Occupation also was related to belief system and outcome selection. These results also indicate the operation of belief in learning from history.

The second difficulty of causal thinking is exemplified by a quotation found in various places of history literature, namely, "If Cleopatra's nose would have been one-half inch longer, the history of Western Civilization would have been changed." The difficulty is that for any event, there are typically many preceding related events, thus raising the question of whether one, a number, or all of the preceding events should be considered as a cause (causes). Further, distant

events are typically not considered as casual antecedents by lay people, as the causal importance of preceding events has been found to be inversely related to their distance from the event (Voss et al. 1994). Some writers (Mackie, 1965; Ringer, 1989) have delineated two classes of preceding events, namely, enabling conditions and causes. The former are antecedent conditions enabling events to occur. They are neither necessary nor sufficient to produce that event but may look necessary a posteriori. Ringer (1989) used the analogy of a driver hitting a sheet of ice and sliding into a ditch. The fact that the person made the trip and took the particular road and that the car is being driven at the appropriate speed are enabling conditions, with the ice being the cause of the car sliding. Within this general view, historical flow appears to happen such that at any point in time a set of conditions exists and some action is taken or occurs, as in a natural disaster, and conditions change. Or a government official takes an action that not only may but quite likely will lead to consequences that were not intended or anticipated. The historian attempts to make sense out of this chaos.

### Concluding Comments

In this section we examine expertise research in history and, in so doing, relate it to expertise research in other subject-matter domains. Before summarizing what factors are important to expertise in history, we first ask whether there likely are any representative tasks in history that enable the investigator to do some type of measurement of such expertise. Not considering factual historical knowledge as a legitimate indicator, one is left with using tasks such as providing a substantial amount of information and asking that a historical account or analysis be written concerning a particular aspect of the information or perhaps some specific aspect of the information. Scoring would then be in terms of the use of skills of the historian as described above. Or, a number of historical accounts or analyses of the same topic could

be provided, asking which account is best (or poorest) and why. Such tasks may be of some value at the undergraduate or graduate levels, but they probably would not be diagnostic for experts because skill performance likely would be quite high. However, as reported above, differences among experts could be found depending on subject-matter knowledge.

Similarly, especially in political interviews, historians are sometimes asked to predict what is likely to happen in a given situation in view of their knowledge of the past. Although some present situations may seem to be similar to particular past situations, these analogous occurrences are as weak as other analogies. That is, situations may seem similar at one level, but the similarity breaks down at some point. Indeed, situations in history usually have large differences. Occasionally in the literature you read "The past is unpredictable" or words to that effect, and when past events are not predictable given knowledge and perspective of the preceding actions and events, predictions of what is going to happen in the future is even more problematic. Indeed, it is more accurate to say that historians are more interested in providing an understanding or even explanation of the past than in trying to predict it.

Turning now to the major factors of historian expertise, the first factor of the expert historian that is noted is the person's subject-matter knowledge, especially that in his or her field of specialization, and to a lesser extent in related subject-matter. However, despite the demonstrated importance of subject-matter knowledge across virtually all domains, our understanding of the development of such knowledge is inadequate, in history as well as other domains. Longitudinal studies of knowledge development are especially needed, although there quite likely are many routes to expertise in a given domain and it may not be possible to identify necessary and/or sufficient conditions to become an expert. Moreover, although experts in a given subject-matter domain no doubt spend much time in study, the question is what are they learning and

how are they organizing their knowledge rather than how much time is spent *per se*. The data we have in history suggest that particular characteristics of expertise begin to emerge in graduate school, such as defense of one's position, use of counterfactuals, and the development of techniques of historical analysis. Finally, with respect to history knowledge, we know of no studies that compare the knowledge of the historian to that of the non-professionally trained "history buff." Such a comparison may provide a better understanding of the nature of the historian's expertise.

A second knowledge-related factor is that the historian acquires a number of research skills. In addition to being excellent and prolific readers, historians also have research skills that focus on how to seek and find sources and extract the most authentic and high-quality information from them. However, the research conducted to the present on how historians engage sources is but scratching the surface. There is much more to learn about source seeking and evaluation and especially subtext generation. How does subtext generation facilitate historical understanding and how consistent is subtext generation from one historian to another? Similarly, how narratives are constructed is another issue requiring more study.

Up to this point we have discussed how historians and experts in other subject-matter domains have a high level of domain-specific knowledge and skill. Initially, it seems that the skills, methods, and procedures differ considerably across domains, and expertise is likely relatively domain-specific. What we argue, however, is that across domains there are similarities in the highest level of problem-solving and reasoning processes. What is consistent across domains is the existence of some problem or issue, and the person working in the domain has the goal of solving that problem. Furthermore, whatever the domain, the person needs to provide a solution that includes evidence providing support for that solution; in other words, he or she must present a convincing argument. This general argumentative structure is what is in common. What

differs among domains are the standards for what constitutes an acceptable solution and the related matter of what in that particular domain constitutes appropriate evidence and justification, that is, the content of the inquiry and the nature and extent of proof that is appropriate for that content. In physics the solution may be justified by demonstration of the appropriate steps to a solution. In this domain, this evidence for solution is in a sense the proof. In history the same goal exists. The goal of the historian is to convince an audience that a narrative or perhaps an essay is highly acceptable, and this is done by providing a solution or answering a question with contents that provide evidence, which is done by verbal argument. Most often there is not a deductive argument or mathematical equation but a position that is being advanced and defended. As previously stated, a narrative often serves as the support and justification for the particular position. Thus, in history, the solution is not usually correct or incorrect but acceptable at some level. However, the similarity in goal structure and argument structure at a high level occurs across subject-matter domains with the lower-level specification of the specific domain goals, the solution, and the evidence or justification of the solution being essentially domain specific.

A final case is our own field, psychology. The subject matter of this domain is a combination of both informal and formal elements. We post constraints to make our problems more tractable. We search for regularities or laws. But ultimately, we are trying to explain human behavior, and that behavior is necessarily probabilistic. So, in essence, our field may be much closer to history than we might think initially. We may gather evidence, but the crux of our argument is the interpretation of data, and we build a narrative around the data. We test and operationalize them via experiments. As a result, one expert may say that experimental evidence supports a conclusion, whereas another may say that the study does not adequately test the hypothesis or lacks a control condition.

This divergence in expert opinion occurs because the domain of psychology is one in which answers cannot be demonstrated formally. For all the expertise research that has been conducted, little attention has been directed to our own field. Expertise in psychology requires skill in both the collection of empirical evidence and in appropriate informal reasoning about that evidence. As such, psychology would seem to be an excellent candidate for future investigation of expertise in academic domains.

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