7 TOWARD A SOCIOCOGNITIVE

MODEL OF LITERACY

CONSTRUCTING MENTAL MODELS

IN A PHILOSOPHICAL

CONVERSATION

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A writer writes. A reader reads. The effort to understand these apparently simple acts and the relationship between them has motivated numerous research agenda in recent years. Reading research, writing research, composition studies, rhetorical theory, anthropology, critical theory, sociolinguistics, cognitive science, literary studies — each of these terms invokes an affiliation, a national conference, and a set of epistemic beliefs that have all been pressed into the service of explaining these peculiarly human acts.

Against this backdrop, the goal of synthesizing a sociocognitive model of literacy has received increasing attention (Langer, "Musings . . ."). If achieved, such a model would allow researchers to consider human acts such as reading and writing along two dimensions that have often been seen at odds: the axis of individual cognition and the axis of social inter-action. Although such a goal is clearly beyond the scope of any individual study, the results presented here move in that direction. In particular, they suggest that experts at advanced philosophical argument use acts of reading and writing to construct and act upon *socially configured mental models*. The presence of such mental models, I will argue, indicates that a purely conversational model of literacy may be missing the point of why individuals propose and maintain written interaction in the first place.

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Design: Reading and Writing about Philosophy

The study reported here examined the practices of four individuals asked to read and write about the ethical issue of paternalism. Two were disciplinary insiders: professional philosophers familiar with ethical philosophy, both men. Expert 1 had recently completed his Ph.D. and had accepted a position at a prestigious university. Expert 2 was still working on his degree. Two were disciplinary outsiders: second-semester freshmen at a private university who had not yet taken an introductory freshman philosophy course, both women. Novice 1 was an engineering student who had received an A in her humanities course the previous semester. Novice 2 was a design student who had received a B in her writing course the previous semester.[1]

All four participants were asked to complete the same reading/writing task: they were asked to read eight articles on the ethical issue of paternalism and to write an original essay defining paternalistic interference and describing the conditions, if any, under which it could be justified. They were told that the intended readers were to be "well-educated people who may at some time in their lives have to deal with the issue of paternalism." The philosophers were solicited through contacts with the philosophic community and worked on the project as consultants. The freshmen were solicited through advertising on campus and completed the work as regular student employment.

Paternalistic interference is an issue for ethical philosophers because it appears to violate widespread assumptions about individual rights and yet occasionally to be justified. John Stuart Mill claimed that the individual had exclusive rights to make decisions regarding his or her own welfare. This "harm principle" has become the starting point for many ethicists' discussions on the nature of rights. Paternalism is a problem in these discussions because it involves the interference by one person in the affairs of another for his or her own good; it thus appears to violate the harm principle. Nevertheless few would argue that it cannot be justified in some cases: parents' paternalism toward children; teachers' paternalism toward students; government paternalism toward the mentally incompetent. In an effort to define the boundaries between justified and unjustified action, ethical philosophers have offered conflicting definitions of paternalistic interference and conflicting specifications of the conditions under which it can be justified.

The two expert philosophers described here were both familiar with Mill's harm principle and with the general discussion of individual rights. Neither, however, was familiar with the issue of paternalism or the particular literature they were given at the start of the project. The two novice freshmen were unfamiliar with the technical issues of ethics, but both

readily recognized that they had been subject to the paternalism of parents and school.

All participants worked on the task at their own rate for between 30 and 60 hours spread over 10 to 15 weeks during the spring of 1985. Data were collected during this time in three ways: First, participants were asked to verbalize their thoughts into a tape recorder whenever they worked on the project, producing "think-aloud" protocols (Newell and Simon; Ericsson and Simon). Second, participants were asked to keep all of the writing they produced. And third, participants were interviewed between working sessions concerning what they had accomplished and what they were hoping to accomplish on the task. The resulting transcripts and texts amounted to over 750,000 words.

Framework for Analysis:
A Hybrid Model of Literacy

The departure point for the data analysis was a hybrid sociocognitive model of literacy combining aspects of Scribner and Cole's model of literacy practice and Heritage's model of conversational turn-taking. These two models take complementary sociocognitive perspectives on human action. By combining them, we achieve a hybrid model of some theoretical power.

Along the cognitive axis of the hybrid model, we locate the cognitive components suggested by Scribner and Cole's model of literacy practice. Scribner and Cole proposed this model to account for their observations of the Vai, a West African tribe with literacy in three different scripts. Their research indicated that individuals literate in each of these scripts showed different patterns of cognition. The model they put forward emphasized the effects of social context on the three cognitive components examined in this study: activities, knowledge representations, and goals.[2]

While the first and last of these cognitive components are familiar to researchers on reading and writing, the middle component of knowledge representation merits some introduction. Researchers in cognitive science now generally believe that knowledge representations in the form of mental models play a central role in defining expertise (Glaser; Johnson-Laird). A mental model is an abstraction from everyday, often spatial or visual, perception that allows people to think about a situation without the clutter of unnecessary details or the cumbersome (and sometimes impossible) requirement of actually manipulating physical objects. An example of a mental model that nearly everyone uses are the "mental maps" with which we plan shopping trips and give visitors directions.

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Researchers investigating particular domains of expertise have found that individuals who are good at something — baseball (Chiesi, Spilich, and Voss), radiology (Lesgold), chess (Chase and Simon), social science (Voss, Greene, Post, and Penner), physics (Larkin), geometry (Anderson, Greeno, Kline, and Neves) — make use of mental models that are even more abstracted from everyday experience than mental maps. Where most of us would see blurs and blobs in an X-ray, for example, a student of radiology sees isolated organs, muscles, and bones; a skilled radiologist sees even more abstract "systems."

As of yet, we have little understanding of the special mental models that may be used by those expert at advanced literacy practices in academic fields such as philosophy. Some suggestive remarks have been made, however, by researchers centered at the Ontario Institute for Studies in Education (OISE). In a much-cited article on the relationship between speech and writing, Olson has claimed that literacy depends on decontextualized features of language. In speaking, he argues, we attend to the intentions of the speaker, to what is meant; in writing, on the other hand, our attention must shift to the meaning of the language itself, to what is actually said. In a similar vein, Bereiter and Scardamalia have argued that learning to write means learning to move away from dependence on conversational input from an interlocutor. Although these claims have implications for the kinds of knowledge representations that experts in fields such as philosophy might be expected to construct, these implications have not yet been investigated.

Along the second, social axis of literacy, the hybrid model locates the turn-taking sequence described by conversation analyst John Heritage (*Garfinkel and Ethnomethodology*). According to Heritage, conversational participants build, maintain, and shift contexts through the mechanism of three-turn sequences. In the first turn, a speaker proposes a given context by using the first part of an adjacency pair such as a greeting, question, or invitation. In the next turn, a second speaker responds with one of the following: the preferred response (an acknowledgement, acceptance, or answer); a dispreferred response plus some account for it ("Oh, that would be nice, but I've already made plans"); a completely unexpected response (staring the first speaker in the eye and not returning the greeting). Finally, in an optional third turn, the first speaker can repair any contextual misunderstandings indicated by the second speaker's response.

Applied to the uses of reading and writing in philosophy, this conversational sequence suggests a mechanism by which social context can be created and sustained through written language. A written text can be seen

as one philosopher's proposal. The writing of a new text can be seen as the other philosopher's response. Through a series of such written interactions, the context of a philosophical conversation can be built, maintained, or shifted. Applied in this way, Heritage's conversational model refines the many suggestions that have been made concerning the conversational nature of literacy (Bartholomae; Bazerman, "A Relationship between Reading and Writing"; Bizzell; Bruffee; Latour and Woolgar; McCloskey).

The analysis in this study used the hybrid model of literacy in a two-stage procedure. At the first level, the text, protocol, and interview data were analyzed to provide information concerning the three cognitive components suggested by Scribner and Cole. Here my questions concerned the way the *readers*, reading texts that represent previous conversational turns, became *writers*, taking a turn of their own. What activities did they engage in? What knowledge representations did they construct and manipulate? What goals did they have?

At the second level of analysis, the descriptive data were examined for evidence of the ways in which the individuals made use of their reflexive awareness of the social dimension. If we assume that written interactions can be appropriately described as conversational, we can then ask how the philosophers' cognitions exhibited characteristics that are peculiarly conversational. The undeveloped state of sociocognitive theory prevents us from being definitive about what would constitute an answer to this question; nevertheless, the implications seem to be at variance with the OISE position. As we have already noted, Olson seems to argue that advanced literacy involves *moving away* from conversation. The sociocognitive model we have constructed following Heritage leads us to expect some movement *toward* it. Untangling these expectations was one of the major goals for this second level of analysis.

The design of this study as a comparison of expert and novice cognitions plays a crucial role in working toward answers to questions at both levels of analysis. Using the hybrid model, we can view expert/novice studies as comparisons of organizations along the cognitive axis at what we assume are qualitatively different places along the social axes. That is, we assume the experts are effective participants in the conversation of the disciplines of philosophy whereas the novices are not. We can use the data from novices, then, to highlight the significant cognitive characteristics that accompany effective conversational participation. In this way, the novice practices serve a heuristic function in helping us to pick out significant features of expert practice.[3]

First-Level Results: Descriptions of Literacy Practice

ACTIVITIES

We begin our description of the cognitive literacy practices of the four participants with an examination of their activity structures. To determine how the participants sequenced their activities, I coded the think-aloud protocols using a set of categories developed inductively from the data. These five-categories — reading, reflecting, organizing, drafting, and revising — were defined as particular constellations of (a) the materials consulted, (b) the materials produced, and (c) the sequencing principle guiding attention. Specific definitions are given in figure 7.1.

	Materials Consulted	Materials Produced	Sequencing Principle
READING	articles	notes	order of words in articles
REFLECTING	articles notes	notes	on-the-fly
ORGANIZING	notes	linear order of topics	on-the-fly
DRAFTING	notes articles outline	continuous draft intended for product	outline
REVISING	draft	annotations to draft	order of words in draft

Figure 7.1. Definitions of categories used to segment the activities of each participant

Once the protocols were coded, I examined the way participants distributed these activities over 100 percent of their working time. The results of this analysis indicate that all four participants used the same activity structure to complete the task. All began by reading, followed with a period of reflecting, moved to organizing, and then finally to drafting interspersed with revising. The only major departure from this sequence occurred with Novice 1 who divided her working time into two halves, the first concerned with the definition of paternalism and the second with its justification. Within each half, however, the sequencing from reading to drafting/revising occurred, albeit in a more abbreviated form the second time round.[4]

KNOWLEDGE REPRESENTATIONS

The knowledge representations used by the participants were examined using a construct developed from the interview data, the construct of authorship. Like many professionals, we began this study with the assumption that authorship was an important attribute of the texts on paternalism. We had even taken care to choose articles by authors who cross-referenced each other. The interview data caused us to reexamine this assumption. In particular, the two novices did not talk about the articles as having authors. In fact, one of them regularly referred to the collection of articles as "the book" and, on occasion, described herself as checking what "the book said" about an issue. On the other hand, the experts both regularly spoke in terms of the authors they were reading.

To analyze participants' use of the construct of authorship, I examined the protocol data for the presence of *author mentions*, which were defined to include:

- names of specific authors (e.g., "Childress")
- nominals standing for an aggregate of authors (e.g., "these guys");
- nominals standing for roles of authors (e.g., "a moral philosopher");
- pronouns standing in for any of the above ("she"; "they").

The results of this examination showed that the novices attended to authorship an average of 3.5 times in each 1000 words of think-aloud protocol. The experts, on the other hand, attended to authorship at least twice as often in the case of Expert 1 and almost four times as often in the case of Expert 2.
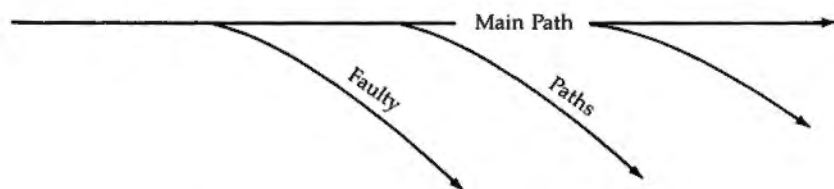
FINAL TEXTS

To examine what participants saw as the desired goal of their task, I analyzed the final texts they produced using a modified version of Langer's system for the analysis of structure (*Children Reading and Writing*; see Appendix). The product of this analysis is a complex tree diagram in which each T-unit of a text forms a node that can either be subordinated or coordinated to other nodes in the tree.[5] In addition to this structural analysis, a cross-check was made of the texts for the presence of author mentions.

On a global level, several generalizations can be made concerning the differences between the expert and novice texts. To begin with, experts' texts are longer (1280, 1680, 2930, and 6010 words[6]). In addition, they show an advantage in both the number of T-units (70, 93, 121, and 271) and the average length of the T-units (18, 18, 24, and 22 words/T-unit).

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Finally, they show greater subordination (11, 11, 19, and 16 levels) and contain a greater number of author mentions (0, 12, 44, and 74 author mentions).

A review of the individual texts makes clear the source of these global differences. The expert texts follow a similar pattern. Major sections present the terms of definition and justification given by the task. Subordinate to them, secondary units present cases of paternalism and approaches to these cases. Further, in both expert texts, author mentions are almost exclusively associated with the secondary units presenting approaches. That is, both experts used authorship attribution to define what we call an "approach" which, in turn, is the major structure of their final texts.
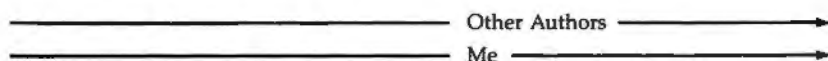
In addition, the experts organized their presentation of approaches similarly. Each began with an approach he considered faulty. Then, through a critique, he eliminated that approach. The order in which the approaches were characterized and eliminated was determined by how faulty the approach was. Very wrong approaches were dealt with early; more complex and harder to refute approaches were dealt with later. Then, after all the elimination was done, the resulting approach, the main path taken by the expert himself, was left as the only remaining alternative. This organization can be visualized in terms of a set of faulty and main paths through an issue as shown in diagram A of figure 7.2.[7]

Main Path

Faulty Paths

A. Faulty Path/Main Path Organization Used by the Experts

Main Path

B. Single Path Organization Used by Novice 1

Other Authors

Me

C. Side-by-Side Organizations Used by Novice 2

Fig. 7.2. Organizing structures in participant's texts

Toward a Sociocognitive Model of Literacy

Units 5 through 8 of Expert 2's text can serve as an example of this faulty path/main path organization. Unit 5, dealing with the approach taken by Dworkin, is a typical faulty path, containing both a characterization of Dworkin's approach (52–53) and a critique that eliminates that approach (54–60):

> (52) The prominence of such examples as these in the discussion of the moral status of paternalism suggests to Dworkin (source one above) the following "rough" definition of paternalism (pg. 7):
>> (53) D1: "Paternalism is the interference with a person's liberty of action justified by reasons referring exclusively to the welfare, good, happiness, needs, interests, or values of the person being coerced."
>
> (54) The definition D1 is faulty in several respects, and is not made any better by Dworkin's admission that it is "rough". (55) First, as it stands, if the definition is right, there can be no unjustified (i.e. wrong) paternalistic action for D1 says paternalism is justified. (56) Doubtless this is part of the "roughness". (57) Perhaps what Dworkin intends is something more like the following:
>> (58) D1: "Paternalism is interference with a person's liberty of action of such a sort that if justified at all it is justified exclusively by its positive bearing on the welfare, good, happiness, needs, interests or values of the person's being coerced."
>
> (59) But this will still not work, as can be seen from Example 3 above. (60) In the case of the drug laws, potential buyers who can't buy because the product is not on the market are not coerced at all though they are the ones whose benefit is intended.

The units following this one deal similarly with the approaches taken by Buchannon and Carter, by Gert and Culver, and by Childress. The ordering is keyed to how faulty Expert 2 considered the approach. With Dworkin, whom he dealt with first, the approach is highly flawed and the critique is intended to be devastating. With Childress, whose approach he dealt with last, the approach is plausible and his critique is more pro forma:

> (94) I will have more to say of this shortly. (95) For now it is enough to point out that plausible definitions satisfying this requirement are in the field. Here, for instance, is Childress' definition (pg. 17, source 3):
>> (97) D5: "Paternalism is nonacquiescence in a person's wishes, choices and actions for that person's own benefit."
>
> (98) The definition is not without flaw ([99] surely he means "or"

and not "and", [100] and "nonacquiescence" is even fuzzier than "paternalism") (101) but it illustrates the point.

Although the novices used similar terms of definition and justification to structure the major units of their texts, their secondary units point to significant differences. In her secondary units, Novice 1 used a typological organization. In the first major section she enumerated the factors important to defining paternalism (7 units); in the second, she enumerated the conditions for justification (7 units). Although her protocols suggest she was aware of disagreements between authors, her final text neither includes specific authors' names nor indicates any difference in approach among them. Thus, in contrast to the faulty path/main path structure used by the experts, her text seems to represent the issue of paternalism as a single main path with everybody on it (see diagram B in figure 7.2).

Novice 2 organized the secondary units of her text with greater awareness of disagreements. Unlike Novice 1, she had an abiding and continuing personal disagreement with all of the authors she read. From her protocols and interviews, we know that she had seen her own family disregard her grandfather's wishes not to be placed on a respirator and she was convinced that this had been wrong. Thus, based on a family experience, she was fundamentally opposed to paternalistic interference. In her text, she was careful to state her position by giving her own definition of paternalism and her own approach to justification.

What is interesting to note, however, is that her claims stand in ambiguous relationships to the claims of the authors she is opposing. She does not, for example, make clear how her own definition of paternalism relates to other definitions she reviews earlier. Is it in agreement? Is it in disagreement? Is it a qualified agreement? She is not clear.

Further, even when she is more careful to specify that her claim about justification is in disagreement, she still fails to articulate the grounds for her differences. Instead, she simply characterizes the opinion of others and then gives her own as a contrast:

> (68) If we accept the following descriptions of Rosemary Carter, Bill is considered incompetent. (69) There is a group of people who we as a society label as being incompetent, therefore justifying paternalistic acts toward them. (70) These people are described and labelled as the following: those who are unable to understand or practice satisfactorily the basic requirements of survival, and so whose lives would be at worst in constant peril, and at best grossly unhappy, if not for the intervention of others. (71) Those suffering from mental retardation, below a certain level,

and those suffering from certain kinds of insanity are included in this class.

(72) Rosemary Carter's description of competence as a means for justification also speaks for both James Childress and Gerald Dworkin, with the following exceptions: . . .

(77) Altogether, these people tend to describe the same conditions for justification, but in a different manner with different examples. (78) While these conditions for justification are accepted by some of today's society, I feel that paternalism can be justified under only one condition, that of prior consent. (79) The conditions of mental retardation, and insanity do not give justification for paternalistic actions. (80) These persons should have the right to incorporate their views and feelings into medical decisions. (81) After all these people do have the ability to communicate to certain extents. (82) Why should the views of these people be carelessly disposed of.

Structurally, what is lacking here is the critique used so extensively by both experts. Instead of an argument structure that eliminates other authors' approaches on the way to validating her own, Novice 2 simply presents the two approaches side by side, and distinguishes between them on the basis, not of truth, but of authorship: Here is what others believe: here is what I believe (figure 7.2, diagram C).

SUMMARY

Before proceeding to the results of the second-level analysis, we can summarize the first-level descriptions as follows:

1. The literacy practices of the two experts in this study appear to be aimed at producing positions on the issue of paternalism by characterizing and critiquing approaches taken by other authors. To achieve this goal, both experts read, reflected on what they read, organized their thoughts, and wrote and revised a draft. Throughout their working time, they attended to the authorship of claims and, in their final texts, they used authorship as the defining attribute of the approaches they characterized and critiqued.

2. Like the experts, the two novices in this study appeared to use literacy practices to create positions on the issue of paternalism. To do so, they read the articles, reflected on what they had read, organized their thoughts, and wrote and revised a draft.

3. Unlike the experts, however, the novices did not seem to represent

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their knowledge as a series of approaches distinguished by authorship. What they did instead, however, varied.

4. Novice 1 developed a knowledge representation consisting of positions on each of a number of subissues. We know from the protocols that the majority of her reflecting time was spent identifying these subissues and figuring out her position on them. Her final text presents these positions, but it does not explicitly identify them as her own. Nor does it distinguish her positions from positions taken by other authors. Consonant with her goal, she did not attend to the authorship of claims with anywhere near the frequency of either of the experts.

5. Perhaps driven by her personal experience, Novice 2, on the other hand, developed a knowledge representation in which authorship played some role. Her final text carefully distinguishes between her own position and the position taken by the authors she disagreed with. This structure remains different from that employed by the experts, however, because it does not indicate the relationship between the position she takes and the position she's opposing. Indeed, during most of her reflecting time, Novice 2 tried to construct her own position with little attention given to the positions of the authors she had read. Thus, despite the presence of some author mentions in her final text, she did not attend to authorship in her working time at any greater rate than did Novice 1.

Second-Level Results: Socially Configured Mental Models

Turning to the second-level analysis, we can now ask how the expert cognitions described above were shaped by their participation in a philosophical conversation. Although the descriptive data of this study cannot support a definitive answer to this important question, they do suggest a possible hypothesis for future research. Specifically, I will argue that the expert cognitions seemed to involve the construction and manipulation of socially configured mental models — knowledge representations shaped by attributes of the social axis, but which depart in systematic ways from standard conversation.[8]

To begin the case for socially configured mental models, we return to evidence from the knowledge representation data. There we found that, indeed, experts' practices were configured by at least one attribute of the social axis: the authorship of claims. Further, insofar as attention to authorship indicates an awareness of other interlocutors, these practices appear to be somewhat conversational. Here we have evidence, then, that advanced literary practices in philosophy *are* configured by social context, just as the model of written conversation would suggest.

Toward a Sociocognitive Model of Literacy

Other evidence warns us, however, against assuming these practices are isomorphic with those of standard conversation. The first evidence comes from the data on activity structure. As shown in figure 7.3, the participants in this study structured their activities in four-part sequences of reading, reflecting, organizing, and drafting/revising. Standard conversation, by contrast, is structured as two-part interchanges with an optional third turn for repairs. Assuming that reading is the equivalent of the first speaker's conversational turn and drafting/revising is the equivalent of the second speaker's response, we see that these participants' literacy practices involved two activities that are not found in standard conversation: reflecting and organizing. Their literacy practices, then, appear to have opened up a reflective space for cognition that simply would be unavailable to oral interlocutors.

	Conversational Practice	Literacy Practice
Turn 1:	Proposes context	Writes
Turn 2:	Responds	Reads Reflects Organizes Drafts/Revises
Turn 3:	Repairs misunderstandings	

Figure 7.3. Comparison of the activity structures of conversational practice and literacy practice

The kind of mental work that the experts may have been accomplishing in this additional reflective space is further suggested by the final texts they produced. In several respects, these texts reflect mental models of written interaction that are not isomorphic with those of standard conversation. To begin with, they are made up of "approaches" that are only indirectly related to other authors' actual claims. For example, Expert 1 did not assume a one-to-one isomorphism between the set of claims made by Dworkin and the approaches he discussed in his own argument. Instead, once he had characterized and dismissed the definition Dworkin actually gave, he went on to consider what Dworkin might have meant:

> Perhaps what Dworkin intends is something more like the following: . . . (59) But this will still not work. . . .

If Expert 1's goal were simply to respond to previous interlocutors, then discussing what Dworkin might have said makes little sense. But if his

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intention were to construct a mental model made up of a wide range of approaches, then this abstraction is a sensible inventional strategy.

The abstract nature of the experts' mental models is also suggested by the way they organized their texts. As noted earlier, both experts arranged their discussions of approaches in descending order of faultiness: more faulty approaches were discussed first; less faulty approaches discussed later. This written practice differs from standard conversation in two ways. First, conversational interlocutors rarely take on the burden of creating a spontaneous single response to multiple previous speakers' first turns. Instead, they respond to claims locally as they arise, one at a time. Second, on those few occasions when they do address multiple prior claims, the linear ordering is ad hoc – indeed, if meaningful, we assume that it arises from cognitions outside of the current conversation ("I see you've been giving this some thought"). Thus, the experts' mental models appear to be consolidated and linearized in ways that are unpredicted and almost inconceivable accomplishments within the constraints of standard face-to-face interaction.

The final evidence concerning the abstract nature of the experts' mental models concerns the conventions by which they treat previous authors. Basically, the authors in these written interactions were treated differently than interlocutors in standard conversations: personal attributes and social affiliations are off-limits; actual intentions are irrelevant.[9] For example, Expert 1 did not argue against Dworkin's approach on the grounds that he was a "Reaganite conservative" – even though his protocol shows that he thought so. Nor did Expert 2, when attributing an approach to Buchannon and Carter, consider whether these two authors liked each other or, indeed, whether they had ever met. These personal considerations, important in everyday conversation, were inappropriate according to the conventions of written interaction these experts followed.

Furthermore, authors' rights to the third-turn repairs, so common in standard conversation, were restricted in these written interactions. As mentioned earlier, Heritage suggests that third-turn repairs are always an option for first-turn speakers who feel they have been misinterpreted. Thus, in oral conversations, we routinely expect to be able to say, "No, that is not what I meant to say. What I really meant was . . ." Authors, however, are not routinely extended this right. Thus, for example, Dworkin could not reply to Expert 1's critique by saying that he didn't *really* mean what he wrote. Miswritings, unlike misspeakings, are not good grounds for repairing intersubjective knowledge. Of course, authors have many other ways they can repudiate misinterpretations of their work or repudiate previous positions, but, as Olson points out, these rely on conventions for what words mean rather than on independent evidence of what the author actually intended. In fact, these conventions of interpretation

are so widely available that third-turn repairs may be made by someone other than the original author — a freedom less often assumed by third parties in oral interactions.

Taken together, this evidence suggests that our philosophers were creating special mental models that, like those used in so many other domains, departed in characteristic ways from everyday practice — in this case, the practice of standard conversation. Although they were configured by some of the attributes of everyday conversation and might even be taken as identical by those less than expert, the mental models of advanced literacy in philosophy appear to be different. By expanding their activity structure, abstracting approaches, consolidating and linearizing their responses, and accepting restrictions on their right of repair, the philosophers in these literacy interactions were able to produce knowledge beyond that which is ordinarily possible in everyday conversation.

Concluding Remarks:
Toward a Sociocognitive Model

Thus far, I have argued that the expertise of advanced literacy practices exhibited by the philosophers studied here can best be characterized as the construction and manipulation of special socially configured mental models. In closing, I would now like to consider some of the implications this claim has for a sociocognitive model of literacy.

According to the hybrid model with which this study began, social and cognitive practices are arrayed along two intersecting dimensions of human action. As it now stands, this two-dimensional model cannot account for mental representations that depart from standard conversational practice: The individual cognitions suggested by Scribner and Cole were assumed to be directly embedded in the social practices of everyday conversation outlined by Heritage. To accommodate the existence of abstract mental constructs, we must amend this model in at least one of two ways.

First, we might say that advanced literacy practices are embedded in *different* social contexts than those of standard conversation. That is, we might assume that those who make use of advanced reading and writing propose and maintain specialized contexts for their interpretation. Learning to read and write, then, would mean learning to function in these specialized contexts, learning the rules of new discourse communities such as the community of philosophers.

Some precedents already exist for arguing that departures from standard conversation define specialized contexts. In schools, for example, teachers ask questions for which they already have the answers; thus they

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reserve for themselves the unusual right to bring a turn-taking sequence to a close or extend it until the correct answer is reached (Mehan). In news interviews and interrogations, questioners systematically withhold acknowledgements of the truth or newsworthiness of respondents' answers; they thus simultaneously maintain the required institutional indifference and acknowledge the role of the overhearing audience (Heritage, "Analyzing News Interviews"). Whenever such unusual practices are invoked, according to Heritage (*Garfinkel and Ethnomethodology*), participants know they are operating in specialized contexts.

The trouble with amending our model to allow for alternative social contexts is that the novices in this study showed less, not more, evidence of being in everyday conversation. If learning to read and write in philosophy required moving toward more specialized contexts, then we would expect novices to show greater, not fewer, signs of conversational practice. In this study, however, we saw evidence of the reverse: it was the novices, not the experts, who were operating in a world without interlocutors.

A second way of amending the hybrid model of literacy is suggested by my use of the concept of "mental models." Mental models in all domains characteristically exhibit a specific duality of reference: they *both* move away from everyday practice and remain rooted there. In radiology, for example, mental models of the body both surpass what we can do with ordinary understanding and have implications for everyday treatment. In effect, they create a new plane of understanding by projecting and abstracting from everyday entities while, at the same time, remaining connected to those entities. Indeed, it is this ability to go beyond mundane reasoning while speaking to it which justifies the social expense of developing expertise.

In professions like philosophy, we see a similar duality: written interactions are both rooted in the everyday practices of conversation and go beyond them. In this study, for example, both philosophers felt impelled to discuss their ideas with colleagues as well as work on them in the privacy of their office. Like most academics and researchers, they accompany their writing with conversation — in the hallways, on the phone, and at conferences. Mental models like those described above may be the mechanism by which they are able to overlay abstract cognitions on everyday conversational practices.

We can amend our hybrid model, then, by projecting outward from the social and cognitive axes to hypothesize a new kind of practice that both extends and refers back to standard conversational practices. The suggestion is that by opening up the activity structure of oral conversation, literacy in philosophy provides experts with the reflective space necessary to construct socially configured mental models. These mental

models create, in effect, a new plane of intersubjective knowledge, a third dimension of culturally shared abstractions. Such a three-dimensional model of literacy would help us explain not only how ways of thinking inconceivable in oral conversation are interwoven with and supported by distinctive social practices, but also why — throughout history — people have considered reading and writing to be their link with a more timeless wisdom of the ages.

APPENDIX: ANALYSIS OF STRUCTURE

The analysis of text structure was carried out in four phases. In the first phase, texts were divided into T-units.

In the second phase, this list of T-units was divided into rhetorical units linked by: (a) explicit connecting phrases such as conjunctions, comparatives, demonstratives, enumeratives, and various linking phrases; (b) anaphoric links or any transition from the indefinite to the definite article; (c) intended parallel structures; (d) some connecting punctuation; and (e) narrative schemata.

In the third phase, the structure of each rhetorical unit was diagrammed as a series of subordinations and coordinations in which each T-unit was attached to one of the rightmost nodes of the developing tree. T-units were coordinated if they served the same function, were in some standard relationship to one another, concerned the same superordinate T-unit, or elaborated upon a multi-T-unit entity rather than a single T-unit. They were subordinated if one was an elaboration of the other.

In the fourth phase, rhetorical units were joined together into an integrated tree.

NOTES

1. Gender and expertise were inextricably mixed in these case studies. Both experts were men; both novices were women. Although we will focus on expertise rather than gender in our interpretations, it is important to realize that academic expertise may be more comfortable to men than to women. Belenky, Clinchy, Goldberger, and Tarule, for instance, have suggested that women may prefer a style of "connected knowing" that prizes identification rather than the distance of "separate knowing" commonly prized in philosophical argument.

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2. The fourth component, technology, actually combines cognitive and social concerns and was not included in the initial hybrid model.

3. The status of the novice data, considered independently of the experts, is beyond the scope of this article. See, however, North for one treatment.

4. A comparison of the percentage of working time given by the participants to each of the five activities indicates the following: All four participants gave the greatest percentage of their time to reading (37% average) through the articles on paternalism. All gave the smallest percentage of time to organizing topics into a linear structure (5% average). The participants varied in the percentage of time given to revising and reflecting. Novice 2 and Expert 1 revised extensively; Novice 1 and Expert 2 revised for proportionately less time. Novice 1, Novice 2, and Expert 1 spent about the same percentage of time reflecting; Expert 2 spent proportionately more time.

Interesting differences between the experts and novices occurred with respect to drafting. Even though all participants spent about the same percentage of their time in reading and organizing, both philosophers took a smaller percentage of their time to draft (29% and 32% for the novices vs. 17% and 13% for the experts). Since both experts completed the task in less time than both novices, the difference in the actual time spent drafting was even greater. The experts also delayed drafting longer than the novices. The two novices began drafting about 35% of the way through their work. The two experts, by contrast, began drafting at 61% and 76% of the way through their work.

5. Reliability checks on sample texts revealed 100% agreement among six raters (who apply a coding scheme to data) on T-unit segmentation, 89% agreement between two raters on the location of a T-unit attachment, and 87% agreement between two raters on the type of attachment.

6. Statistics are ordered: Novice 1, Novice 2, Expert 1, Expert 2.

7. An example of what is involved in teaching students to construct the faulty path/main path organization is found in Kaufer, Geisler, and Neuwirth.

8. The argument made here extends an observation by Bazerman ("Physicists Reading Physics") on the existence of special-purpose reading schemata among professional physicists.

9. The difference between authors and everyday people has also been commented on by Foucault (121–22).

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