

Using Discourse Processing Methods To Study Moral Thinking

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*A 16-year-old gunslinger named "Doug," who performed nine drive-by shootings in his hometown of Omaha in 1 year, considers the films *South Central* and *Boyz'n the Hood* to be affirmations of his aspirations and lifestyle (Hull, 1993). In contrast, most viewers of these films absorbed explicit lessons about which behaviors and life choices to avoid. What are the factors that lead to these radically different understandings of the same video text? Why are the "take-home" moral lessons so distinct? Combining methods and theory from two research areas—discourse comprehension and moral judgment—a research program is summarized that examines moral thinking using methods such as narrative recall, multiple-choice moral theme extraction, thinking aloud while reading, and probing for inferences while reading on computer. These studies offer a new approach to uncovering how people process moral events in discourse such as written and visual texts, persuasive messages, and real-life events.*

KEY WORDS: moral discourse; cognitive science; text comprehension; moral development.

INTRODUCTION

A 16-year-old gunslinger named "Doug," who performed nine drive-by shootings in his hometown of Omaha in 1 year, considers the films *South Central* and *Boyz'n the Hood* to be affirmations of his aspirations and lifestyle (Hull, 1993). In contrast, most viewers of these films absorb explicit

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lessons about which behaviors and life choices to avoid. What are the factors that lead to these radically different understandings of the same video text? Why are the “take-home” moral lessons so distinct? The following research program is an attempt to address these questions. It intertwines research methods and findings from two areas which relate directly to the understanding of moral texts: discourse comprehension and moral judgment development. A research program which combines these fields offers a new approach to studying the processing of moral events in discourse, such as written and visual texts, persuasive messages, and real-life events.

When an individual is presented with a moral narrative, one may use discourse processing theory and methodology to analyze which aspects of the discourse are understood. Discourse comprehension techniques typically measure the mental representation that the discourse has evoked in the reader during and after exposure. Morality researchers can use this approach to figure out how individuals piece together their understandings of moral events using concepts such as causal relations between text events, concept activation, and theme extraction. Researchers can examine which aspects of events trigger certain understandings and analyze which individual differences (e.g., cultural background, developmental level) affect particular understandings. Knowing the sources for differential understanding will help professionals better structure moral education interventions, analyze moral wrongdoing, and find the points at which misunderstandings lead to moral conflict.

DISCOURSE PROCESSING THEORY

Elements of text and discourse theory have influenced moral judgment theory. For example, the global moral epistemologies upon which moral judgments are based (Rest *et al.*, 1999; see overview in this issue) are aptly described with the use of schemas, a type of mental structure used to organize knowledge. Although there are many constructs in discourse processing theory that may provide further insight into moral thinking, a useful set of concepts used in the studies discussed here is that of “top-down” versus “bottom-up” processing described below.

Following the description of general human processing by Bobrow and Norman (1975), Bower and Cirilo (1985) have suggested two kinds of processing that influence the comprehender’s representation of a text or discourse. Here I use a reading example. First, when a reader first begins to read, he or she employs low-level, data-driven, or “bottom-up” processing. Quickly, however, the data-driven processing activates a high-level structure or schema in the mind of the reader. For example, the processing of

the sentence, “Tristan threw his jeans into the washer,” might proceed in the following manner. First, “Tristan threw his jeans” is processed as pieces of data involving a subject, an action, and an object. Second, “in the washer” might activate a high-level “laundry schema.” After the high-level structure is activated, it, in turn, activates accompanying subschemata or conceptually driven processing. Associations of “doing the laundry” are activated and would include—in an industrialized nation, for instance—laundry detergent, washer selections, and so forth. Processing, then, continues concurrently guided by expectations (“top-down” processing). See Table I for the possible processing sequence.

The next sentence, “He sorted the rest of the items by color,” is immediately coded as fitting into the “laundry” schema because of its context. Alone, this sentence would otherwise require additional elaboration to comprehend, because “the rest of the items” could refer to candy, toys, shoes, or any number of things. As processing continues, guided by expectations, subsequent processing is an interaction between the two types of text processing—what the words of the text mean and what the reader expects.

When texts are inconsistent with the expectations or high-level knowledge structures of the reader, the reader will poorly understand (Bransford and Johnson, 1972), misrecall (Steffensen *et al.*, 1979), and even distort memory to fit with the reader’s mental schema (Reynolds *et al.*, 1981). A classic example is Bartlett’s (1932) seminal work with “The War of the Ghosts” folktale, in which subjects had an increasingly distorted recall over time of this Native American story, making it conform to familiar story schemas. Bartlett was the first in this century to provide evidence for the influence of cultural expectations, a type of conceptually driven orientation, on narrative recall. In subsequent research, Harris *et al.* (1988) found that routines from another culture were increasingly misrecalled over time by those from a different culture, indicating a conceptual influence during memory retrieval.

Differences in text comprehension as a result of conceptually driven or top-down processing have been documented in other situations as well. For example, initial perspective plays a role in what is represented and

Table I. Examples of Data-Driven and Expectation-Driven Processing

Sentence/phrase	Type of Processing
Tristan threw his jeans into the washer.	Data-driven schema activation: “DOING LAUNDRY”
He sorted the rest of the items by color.	Conceptually driven: Fit into LAUNDRY SCHEMA

later recalled due to the conceptually driven processing it elicits. Pichert and Anderson (1978) demonstrated that when readers are instructed to read a description of a home as either a potential burglar or a potential home buyer, recall is significantly influenced by the “biased” representation one has for the characteristics of the home. Recall is influenced by what is salient to the purpose of the perceiver. Anderson *et al.* (1977) postulated that a subject’s schemas provide the interpretive framework for the understanding of a discourse. They instructed subjects to read and then describe a paragraph about a person escaping a situation in which he was trapped that could be interpreted in two ways. Physical education majors interpreted the story as a wrestling match, whereas nonmajors interpreted it as a prison escape. Alexander and Judy (1987) describe research comparing good and poor readers as they studied a science lesson. Both groups of readers frequently distorted text content to conform with their preexisting knowledge, in other words, with their expectations.

In sum, two kinds of processing affect the comprehender’s understanding of discourse. Bottom-up, data-driven processing (based on what the text says) initially activates cognitive structures, which, in response, guide further processing according to the conceptual structures activated in the mind of the comprehender. Readers form a mental representation of the text using top-down processing—applying their background knowledge and bottom-up processing—constructing word and phrase units by deciphering the cues in the text. As the comprehender builds a mental representation, he or she makes inferences based on both kinds of processes (Kintsch, 1974).

STUDIES IN MORAL TEXT COMPREHENSION

Discourse processing research examines the effects of discourse on the individual both during and after reading. The reason for studying effects in both conditions is to distinguish between perceptual-encoding effects during reading and memory-retrieval effects during recall. It is important to distinguish between these two sources of concept activation (one during reading and one after reading). Concept activation during reading is a purer measure of how the brain is putting the input together with background knowledge. Concept activation after reading is more easily influenced by external factors, such as social desirability, which can modify initial interpretation. Studies measuring the effects of discourse after reading has taken place are called “off-line.” Studies conducted during discourse processing are termed “on-line.” In moral text comprehension research, it has not been conclusively determined whether moral schemas are activated under

one or both conditions. Both possibilities have been studied in normal text comprehension studies.

Off-Line Studies

My students and I have used two approaches to study differences in the understanding of moral stories after reading: recall and multiple-choice ratings and selections.

Using Recall to Study the Effects of Moral Judgment Schemas. Inspired by stories like that of “Doug,” the gang member, and other disparities in moral understanding, I undertook the study of moral text comprehension. I (Narvaez, 1998) postulated two factors in moral text comprehension, reader level of moral judgment and reading comprehension ability. I developed reading materials that included Kohlbergian moral reasoning at different stages and analyzed their content employing causal analysis of text events implemented in previous text research (e.g., Trabasso *et al.*, 1985). Causal analysis allows one to measure more exactly what and how much is remembered from a text. The researcher develops a map of how story events relate to one another, drawing links between events that are causally related (i.e., one event is “necessary in the circumstances” for the other). See Table II for an example. Events that are highly connected (having three or more causal links to other events) are better recalled and recognized, more frequently included in summaries, and more likely to be rated as important (Trabasso *et al.*, 1984; Trabasso and Sperry, 1985; van den Broek, 1990).

Previously, I (Narvaez, 1998) used groups with different levels of moral judgment development (eighth graders and college students). I asked both groups to read and recall narratives about moral situations in which the protagonist had to make a decision and considered the options. Embedded in the narratives were moral arguments at different Kohlbergian stages.

Table II. Examples of Story Events and Their Causal Links

Clause	Links
1. He sorted the rest of the items	
2. by color (he used color to sort).	
3. He loaded the rest of the dark items	Causal link to 2
4. and started the machine.	Causal link to 3

See Table III for examples of arguments and participant responses for the story called "Tom, the manager." This narrative was about a manager who hires his nephew at his sister's behest and finds the nephew to be a poor worker. In the story, he considers firing his nephew. The other stories were about different situations: (1) a poor mother receives extra money from the insurance company due to a clerical error, (2) a woman's friend wants her to join in an illegal protest against a weapons company, and (3) a young man and his friends miss out on tickets for a big game but can sneak in for free. After reading all four stories, the students were asked to recall everything about the stories. Then they took the Defining Issues Test (DIT). Recall of the stories was scored for gist recall of moral arguments and for each clause in the story. Nonmoral recall was used as a covariate representing reading comprehension skill. Construction of moral arguments not in the text was also scored. Construction (of arguments not in the text) was added to recall (of arguments mentioned in the text) to create a "reconstruction" score.

The results indicated that both groups recalled equally the lower-stage moral arguments (Stages 2, 3 and 4). However, there were significant

Table III. Examples of Story Moral Arguments and Participant Responses from "Tom"

Stage 3

On the one hand, he hated to fire his sister's child. He was afraid that such an action would strain the relationship with his sister.

Example of a Credited Response: "But he also felt that if he did so it would put a strain on the relationship with his family and sister."

Example of an Uncredited Response: "He was close to his family."

Stage 4

Part of doing his job was to fire unproductive workers. Although he was working for a big company, it still wouldn't be fair for the company to be paying Freddie for doing a poor job.

Example of a Credited Response: Tom doesn't want to fire him but it is his job to fire bad employees.

Example of an Uncredited Response: "Plus the store really needed it and he was putting his job on the line."

Stage 5

Tom realized that his position in the company and his special responsibilities were designed to create the greatest benefit for the most people, for the customers, the workers, and the investors. It was necessary part of his job to rid the company of unproductive employees. It was a policy that he fully supported.

Example of a Credited Response: "He firmly believed in the worker policy of the company and he supported this along with other workers."

Example of an Uncredited Response: "What his job meant."

differences for Stage 5 arguments. Those with higher scores in moral judgment on the DIT (indicating greater preference for Stages 5–6 thinking) were significantly more likely to reconstruct Stage 5 moral arguments during recall, including Stage 5 arguments that were not included in the original text! The results provide evidence that moral judgment development influences the processing of moral events and suggest that those with significantly different levels of moral reasoning may process moral events distinctively. For example, lower-level reasoners did not bring to mind all the issues from the story when asked to recall them. Whereas both high and low reasoners constructed reasons *not* in the text for Stages 1–4, only higher-level reasoners constructed *Stage 5 reasons* that were not in the text. Thus, moral judgment development *is* an additional factor in explaining differences in moral text comprehension beyond reading skill.

The results may help explain why Doug, the gang member, might have taken away a different message from a movie intended to put gang life in a bad light. He did not retain the arguments against his lifestyle. One could argue that his moral reasoning schemas or conceptually driven processing led him to a conclusion different from that provided by a data-based processing approach and different from the conclusions of most viewers and the filmmakers.

In order to examine whether the results of Narvaez (1998) were due to age-based developmental differences only, Narvaez (1999) used a similar design with two groups of students that varied in their adult level of moral judgment expertise. The “less-expert” group was composed of undergraduates, whereas the “more-expert” group was comprised of graduate students in political science and philosophy (this group is commonly used to represent “experts” in moral judgment research). Because there were few errors in recall, only recall was analyzed. A separate (nonmoral) story was used to measure reading comprehension. After partialling out reading comprehension, the group with more expertise was significantly more likely to recall higher stage arguments, whereas both groups recalled lower-stage arguments equally well. The results indicate that even with adults, differences in moral judgment development play a role in the comprehension of moral texts.

Although the moral narrative recall method and the DIT have been useful in studying moral thinking in adolescents and adults, they are too difficult for children. Thus, a different method was developed to study moral thinking in children.

Moral Theme Extraction in Children. Some claim that reading moral stories to children will improve their moral literacy (e.g., W. Bennett, *Book of Virtues*, 1993). However, no research has been done that examines this assumption. We performed several studies to explore whether children can

extract a moral theme from a moral story and whether there are significant developmental differences (Narvaez *et al.*, 1998a, b, 1999). After an initial study using existing texts (Narvaez *et al.* 1998a), we performed a more controlled study which I describe below (Narvaez *et al.*, 1999).

Several stories with moral lessons were written. These were not lessons about prudence or self-esteem but about getting along with others. Within each story, aspects of the components of moral behavior (Rest, 1983)—moral sensitivity, moral judgment, moral motivation, and moral character—were included. “Kim” concerns a girl whose family, while moving across the country, stops at a gas station where Kim receives too much change from the cashier. The moral messages concern honesty and self-control. “California” is a version of Hans Christian Andersen’s “The Boy and the Dike.” It is about a girl who saves the cattle of a town by holding the gate of a corral closed during a storm throughout the night. The moral messages are self-sacrifice and perseverance for others. Two stories about helping friends or family were written. “Jed” is about a boy who is tempted away from his home responsibilities. The moral messages concern doing one’s duty and being trustworthy. “Malcolm” is about a boy whose friend is an arson suspect and expects Malcolm to lie to keep the friend out of trouble but to get an innocent stranger into trouble. The moral messages are about telling the truth even about strangers, no matter what the cost.

Participants from third and fifth grades and a university were tested on whether or not they understood the gist of the stories (i.e., the moral themes). After a story example, the children read along while a tape recording of each story and follow-up questions were played. After each story, participants were asked to think about the message of the story. Then readers were asked to rate a set of vignettes (using a 5-point Likert-type scale) for how well each vignette’s theme matched the original story theme and then to select the vignette whose theme best matched the theme of the original story. Finally, using the same kind of scale, readers were asked to rate a set of one-line themes for how well they matched the theme of the original story and then to select the best (two) themes. (See Table IV for examples of the one-line theme choices for “Kim.” The correct theme items are items 5 and 7.) The theme choices were based on interviews from several pilot studies. We selected the kinds of distractors attractive to younger participants in the pilot studies.

Reading comprehension was measured with 10 true–false questions per story (comprised of inferences and facts, both true and false), using the number of correct responses as a covariate. The results showed huge developmental differences in the theme selection tasks and in theme ratings. For example, the younger children were much less likely to select the correct theme (11% of the time across stories), and they were consistently

Table IV. Message Choices and Categories from "Kim"

Item	Category
1. Good children don't embarrass their parents.	Stage 3
2. If you give up what isn't yours now, your parents will reward you later.	Stage 2
3. If you think of others first instead of your family, your family may suffer.	Ingroup
4. Monetary interchanges need to be monitored scrupulously.	Complex
5. Treat all people with honesty no matter what tempts you.	Theme
6. You might get caught if you keep money that isn't yours.	Stage 1
7. You shouldn't keep what isn't yours, even from strangers.	Theme

attracted to vignettes with the same actions (all groups were more attracted to this type of distractor, but the attraction decreased with age). In contrast to the younger children, the older children selected the theme about half the time (45%), and the adults selected the theme nearly all of the time (91%). When selections and ratings were combined into an overall "theme comprehension score" and reading comprehension was covaried out, the statistical significance was very large [$F(2,129) = 74.65, p < .0001$, effect size = 1.00³].

This study suggests that one cannot rely on readers or listeners to understand the message within a discourse as intended by the conveyer of the message, even, in this case, if the moral lesson seems obvious to an adult. Using existing or created moral stories with multiple-choice assessment of comprehension may be a profitable way to study moral thinking. It is an interesting task that can be group-administered and is easy to score. My colleagues and I are formulating other studies based on this approach to examine domain-specific ethical expertise in adults, using classic texts in the domain (e.g., for journalism and for business).

On-Line Studies

Although we know that comprehenders take different messages away from stories, we do not understand the cause. Are these individual differences due to what happens when they are *reading*?—suggesting a perceptual sensitivity factor. Or do differences take place when they are *answering* the probe questions after reading?—suggesting that they are applying their conceptual structures or schemas to interpret what they read. Two kinds of studies have examined reader differences during reading: think-aloud tasks with more and less expert groups and lexical decision tasks during reading.

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Think-Aloud Protocols by Experts and Novices. The nature of expertise within social cognitive domains has garnered less attention than other more concrete and delimited domains. Although psychologists know that groups with more experience in moral reasoning (e.g., graduate students in philosophy and political science) score higher on tests of moral judgment, what is it that moral reasoning experts do better?

Differences between experts and novices have been examined in many domains, for example, chess (Chiesi *et al.*, 1979), dinosaurs (Chi and Koeske, 1983), baseball (Spilich *et al.*, 1979), and medical diagnosis (Johnson *et al.*, 1982; Rikers *et al.*, 1997). Although it is still unclear which types of knowledge and skill advantages the expert has, some have suggested that experts are distinguished by such things as (a) the ability to perceive larger, more complex, meaningful patterns in given information (Chase and Simon, 1973; Chi *et al.*, 1988); (b) having better schema selection as well as schema availability (Spiro, 1980); (c) the ability immediately to transfer information to or activate a larger long-term memory network (Charness, 1976; Ericsson and Kintsch, 1991; Frey and Adelman, 1976); (d) the ability to derive a set of retrieval cues that facilitates the recall of meaningful information later (Chase and Ericsson, 1981); and (e) the ability to efficiently suppress inappropriate associations (Gernsbacher and Faust, 1991).

Narvaez (1999) asked a “more-expert” group (graduate students in philosophy and political science) and a “less-expert” group (undergraduates) to think aloud (saying everything that comes to mind) while reading two moral narratives with embedded (Kohlbergian) moral reasoning. Their reading aloud was recorded on audiotape and later transcribed. Similar to other studies (e.g., Trabasso and Suh, 1993; Zwaan and Brown, 1997), the protocols were analyzed for types of inferences—explanations, predictions, associations to their world knowledge or to previous information in the text, and other types of responses—lack of understanding, and evaluations of the text content or form. (See Table V for examples of the response categories.) In previous research, readers with expert background knowledge did more explaining (e.g., Chiesi *et al.*, 1979), analysis of the text (e.g., Lundeberg, 1987; Wineberg, 1991), and evaluation (Wyatt *et al.*, 1993).

As expected in this study, those with more expertise gave more explanations and total expressions, indicating a deeper understanding of and engagement with the texts. They also made more predictions and evaluations, further evidence for task engagement. In addition, they expressed more coherence breaks (e.g., disagreeing with the logic of events). In short, they performed like other skilled and expert readers (Pressley and Afflerbach, 1995). The results suggest that moral judgment may be researched like other expert domains. The author speculates that expertise in moral judgment develops like expertise in music. That is, although there is much

Table V. Examples of Think-Aloud Categories

Category	Example
Association	"You know that same argument is used against Medicaid funding for abortions."
Explanation	"With the word, 'corporal,' it is clear that it's an army captain and not a navy captain."
Prediction	"Okay, so there's going to be a dilemma about who's to go back."
Paraphrase/concurrent image	"Right now I'm thinking of <i>Crimson Tide</i> ."
Evaluation	"That's a good attitude."
Text-based coherence break	"How old is Sara, I wonder?"
Knowledge-based coherence break	"I wish I knew enough dialect. I could place it then."

that can be learned in day-to-day experience, musical expertise requires deliberative study (see Ericsson and Smith, 1991). In the same way, it appears that moral judgment develops in the lower stages from social experience, but that the higher stages (Stages 5 and 6) require purposeful study. Most forms of expertise require deliberate study. One does not become a federal law judge or an Olympic star by watching television or talking to friends. Most day-to-day interactions are not sufficient for an individual to reach a level of expertise in any field. Instead, the hour-intensive attention to skill and knowledge development is indispensable. In fact, expertise research considers domain knowledge to refer to a specific, "studied" domain (Alexander, 1992) for which full expertise may take something like 10,000 hr of study (Simon and Chase, 1972). Should moral reasoning expertise be any different? Whereas day-to-day interactions can help build moral reasoning skills, some stimulation requisite to cognitive structural development may only be available through scholarly study.

The results of the think-aloud study suggest that moral schemas affect reading "on-line." To gather corroborating evidence for this phenomenon, another study was designed using reaction time.

Testing Activated Moral Concepts with Lexical Decision Tasks. Because culture can affect the recall of culturally relevant texts (e.g., Reynolds *et al.*, 1977), a study was undertaken to examine the influence of culture on the online processing of moral texts. The cultural factor we examined was the construct individualism–collectivism. In an individualistic culture everyone is expected to look after his or herself and his/her immediate family. In contrast, in a collectivistic culture persons receive protection from a cohesive ingroup in exchange for loyalty (these definitions are from Hofstede, 1991). Triandis and his colleagues (e.g., Kim *et al.*, 1994) have studied the individualism–collectivism phenomenon and postulated that

these orientations are cultural syndromes for which evidence at the individual level is accumulating.

Previously we (Narvaez *et al.*, 1998c) tested two groups: Asians/Asian-Americans and non-Asians, expecting that the Asian group would more reliably provide us with collectivists than would other groups. Participants had native skills in English and read several stories on computer. Half were “filler” (nonmoral) stories and half were moral stories. The moral stories were about individuals who were asked for help by a relative. In half of these stories, the protagonist sacrificed his/her own goals in order to help (“help” stories); in the other half he/she did not help (“no-help” stories). While they were reading, the participants were interrupted with a “lexical decision task,” in which readers are presented with a string of letters on the computer screen and asked to decide whether or not that letter string is an English word. Some of the letter strings are not (English) words, some are words irrelevant to what they were reading, and some of the words represent inferences assumed to take place by the reader at that point. The lexical decision task has been successful in measuring the activation of particular kinds of inferences during reading. For example, van den Broek *et al.* (1994) asked readers of literary stories to respond to inference words that represented knowledge the reader would need to apply to understand the story at that point. The authors were able to select words that represented inferences from general background knowledge as well as reinstatements of earlier text information, indicating particular activations in the minds of the readers.

In this study there were two kinds of inferences tested in the moral stories: reinstatements of information from earlier in the text necessary to understand a current sentence and moral inferences—elaborations on current text action based on background knowledge. (See Table VI for an example of a story and probe words.) The moral inferences occurred after the protagonist decided to help or not help in the story. In the “help” stories, the moral inferences were represented by words like “dutiful” and “loyal.” For the “no-help” stories, the moral inferences were represented by words like “self-centered” and “shameful.” Using the nonrelevant strings of letters as a baseline, each subject served as his or her control. We expected there to be a significant response time difference between the two groups for both kinds of moral stories. However, we also expected that the Asian group would react more quickly especially to the moral probes in the “no-help” stories. We expected the violation of expectations (of the protagonist to help a relative) to create a greater reaction (immediate and negative) to the protagonist. Participants also took an inventory of their orientation to individualism or collectivism.

Scores on the collectivism scale were split into high and low groups

Table IV. Sample Story with Target Probes for Lexical Decision Study

Leroy and the Race (NO HELP)

Every morning, Leroy got up early to run before breakfast and work. He was in good shape for his age. After running, he would shower and eat breakfast and then head out for work. He was a carpenter and would drive to many places around the city. Every other Saturday he wouldn't work so he could do a 10- to 15-mile-long run. He knew how important this run was for developing good endurance, so he rarely missed it. He liked to enter races, and even though he had never won, he usually finished in the top of his age group. He worked hard to better his times. For 4 months, he trained for the local "Grandpa's" marathon race, for men 55-65. He logged nearly 60 miles a week. As he was a 57 year old in good shape, his wife and friends were certain that he could win the local title.

When the day of the race finally arrived, he got up early for breakfast, pancakes and coffee. He drank lots of orange juice and water. The event started at 8 A.M. (REINSTATEMENT PROBE: MARATHON) While he was getting dressed, the phone rang. It was Thomas, his cousin. Thomas had a family emergency; his father-in-law had had a heart attack during the night and was in the hospital. Thomas needed to drive the family to the small town hospital to see him. Thomas asked if Leroy would watch his corner grocery store for the day. The supply truck would be bringing the week's produce during the day. If no one was there to receive them, Thomas would miss getting the supplies for the week. Leroy was the only person he trusted with running the store. Leroy sympathized but told him that he had other plans. Leroy said he had a good chance at winning the race this year. He told Thomas he would call after the race. He wished him well and then hung up the phone. (MORAL INFERENCE PROBE: DISLOYAL)

After he parked his car, he jogged around to warm up and then headed for the starting line. There were so many people on the narrow street that he could hardly move. As the race got under way, Leroy found that he wasn't able to reach his normal pace until more people fell behind him. Once he hit his regular pace, he felt comfortable. Although he was exhausted at the finish, he came in with a faster time than he had ever had. But he didn't win. A 62-year-old came in first. Leroy felt good about his personal record. After some stretching, he milled around with the crowd, picked up his marathon T-shirt, and ate some bagels. That night, he went out to celebrate his accomplishment with some other racers.

using a median split. As expected, there were no significant differences in reaction time for reinstatement (nonmoral) probe words based on collectivism scores [$F(1,75) = .79, p < .37$]. But we did find significant differences in reaction time to moral probe words in the "no-help" stories based on collectivism scores [$F(1,76) = 5.43, p < .022$, effect size = .51]. Furthermore, significant differences in reaction time to moral probe words remained after holding ethnicity constant [$F(2,75) = 3.98, p < .023$, effect size = .71]. Similar results were obtained with the "help" stories. Collectivism scores, regardless of culture, were significantly related to reaction time to moral inferences but not to nonmoral inferences. Therefore, we concluded that cultural-ideological background can influence which moral inferences are made while reading. The results also suggest that judgments about moral events can be examined at the preconscious level. On-line processing of

moral events can be studied with activation measures used in discourse research. Rapid-fire, preconscious reactions to the moral or immoral actions of others may influence group and individual interaction, fuel prejudice, and contribute to disputes. Various cultural and moral schemas of interpretation may be examined with this technique and may give insight into schema activations and their effects. Studies at this level may provide more insight into the sources for moral and cultural conflict.

SUMMARY AND CONCLUSION

Several discourse processing techniques have shown their usefulness in examining moral cognition: narrative recall, multiple-choice moral theme extraction, thinking aloud while reading, and probing for inferences while reading on computer. These approaches allow a finer-grained analysis of moral thinking than the more global approaches (e.g., the DIT, Moral Judgment Interview). The parsing of discourse used by text comprehension researchers allows one to determine what *kind* of information is being processed (e.g., critical vs. noncritical) and *how much*. Those with higher levels of expertise processed more of the higher stages of moral reasoning, exhibiting more complex moral schemas and confirming Kohlberg's (1984) theory of advancing complexity in moral thinking. Like experts in other domains, they performed as if they had more and better organized knowledge (Chi and Ceci, 1987). Discourse processing techniques offer ways to measure the differences in the representations of novices and experts when processing moral discourse.

Why be concerned about individual variability in the interpretation of texts? Often, those who create texts have a message they want to convey to the audience or reader. When the theme and main points of a writer, a movie director, a journalist, or a teacher do not match the knowledge structures held by the reader, viewer, or student, the message sent will not be the message received. As is evident with the films mentioned earlier, the same text may invoke differential understanding due to the number and type of assumptions or inferences made or not made while processing (Adams and Collins, 1979). This occurs frequently with texts that are held dear. For example, a passage from a sacred text can be interpreted as offering support for a social structure or as an argument for its demise. For instance, Genesis 14:16, "To the woman he said, 'I will greatly multiply your pain in childbearing: in pain you shall bring forth children, yet your desire shall be for your husband, *and he shall rule over you,*'" has been interpreted in at least two ways. (It is ambiguous in the original Hebrew.) One interpretation has been that it is a *description* of the etiology of

male–female relations in a fallen world (Trible, 1978). The more traditional interpretation is that it is a postfall *prescription* of how male–female relations ought to be, a mandate from heaven (Aquinas, 1964). It may never be known what the writer intended. In a similar fashion, our gunslinger, “Doug,” apprehended a prescriptive message about lifestyle from the films, “*Boyz’n the Hood*” and “*South Central*,” whereas more socially distant, middle-class viewers considered the portrayal to be a graphic, dissuasive description. The director intended the latter.

Miscomprehension of moral messages should be of interest to anyone who intends to deliver a message, including character educators who seem to assume that moral texts are “self-instructing”⁴ (i.e., that children will understand the text as the author and adult user intend). But our research has shown that children do not necessarily understand “character-building” stories as designed. We don’t know whether they can understand them even when adults tell them the message directly. It may be similar to telling a typical first grader how to answer a calculus problem. The information has no edifying power because the child has not yet built the conceptual structures to assimilate it.

As we unravel further the mysteries of moral cognition, the techniques used in these studies may help us to explore new directions. However, future studies should also broach a relatively new methodology in cognitive science—connectionism—which is gaining in popularity in representing an assortment of human behaviors (e.g., Foorman, 1994). No one has really explored its usage in moral psychology. Elsewhere, the author has theorized about elements in (preconscious) moral perception (Narvaez, 1996) as a starting point for a more basic study of moral cognition. Such an exploration may be the first step in designing connectionist research in moral psychology.

REFERENCES

- Adams, M., and Collins, A. (1979). A schema-theoretic view of reading. In Freedle, R. O. (ed.), *New Directions in Discourse Processing, Vol. 2*, Ablex, Norwood, NJ.
- Alexander, P. A. (1992). Domain knowledge: Evolving themes and emerging concerns. *Educ. Psychol.* 27: 33-51.
- Alexander, P., and Judy, J. (1988). The interaction of domain specific and strategic knowledge in academic performance. *Rev. Educ. Res.* 58(4): 375-404.
- Anderson, R. C., Reynolds, R. E., Schallert, D. L., and Goetz, E. T. (1977). Frameworks for comprehending discourse. *Am. Educ. Res. J.* 14(4): 367-381.
- Aquinas, T. (1964). *Summa Theologiae*, McGraw-Hill, New York.
- Bartlett, F. C. (1932). *Remembering*, Cambridge University Press, Cambridge.
- Bobrow, D., and Norman, D. (1975). Some principles of memory schemata. In Bobrow, D.,

⁴Thanks go to Daniel Lapsley for coining this term while reading a draft of the manuscript.

- and Collins, A. (eds.), *Representation and Understanding: Studies in Cognitive Science*, Academic Press, New York, pp. 131-149.
- Bower, G., and Cirilo, R. (1985). Cognitive psychology and text processing. In *Handbook of Discourse Analysis, Vol. 1*, Academic Press, New York, pp. 71-105.
- Bransford, J. D., and Johnson, M. K. (1972). Contextual prerequisites for understanding: Some investigations of comprehension and recall. *J. Verbal Learn. Verbal Behav.* 11: 717-726.
- Charness, N. (1976). Components of skill in bridge. *Can. J. Psychol.* 33: 1-16.
- Chase, W. G., and Ericsson, K. A. (1981). Skilled memory. In Anderson, J. R. (ed.), *Cognitive Skills and Their Acquisition*, Erlbaum, Hillsdale, NJ, pp. 141-189.
- Chase, W., and Simon, H. (1973). Perception in chess. *Cognit. Psychol.* 4: 55-81.
- Chi, M., and Ceci, S. (1987). Content knowledge: Its role, representation, and restructuring in memory development. In *Advances in Child Development and Behavior, Vol. 20*, Academic Press, New York, pp. 91-142.
- Chi, M. T. H., Glaser, R., and Farr, M. J. (1988). *The Nature of Expertise*, Erlbaum, Hillsdale, NJ.
- Chiesi, H. L., Spilich, G. J., and Voss, J. F. (1979). Acquisition of domain-related information in relation to high and low domain knowledge. *J. Verbal Learn. Verbal Behav.* 18: 257-273.
- Einhorn, H. J., and Hogarth, R. M. (1986). Judging probable cause. *Psychol. Bull.* 99: 3-19.
- Ericsson, K. A., and Smith, J. (1991). *Toward a General Theory of Expertise*, Cambridge University Press, Cambridge.
- Foorman, B. R. (1994). The relevance of a connectionist model of reading for "The Great Debate." *Educ. Psychol. Rev.* 6(1): 25-47.
- Frey, P. W., and Adesman, P. (1976). Recall memory for visually presented chess positions. *Memory Cognit.* 4: 541-547.
- Gernsbacher, M. A., and Faust, M. (1991). The mechanism of suppression: A component of general comprehension skill. *J. Exp. Psychol. Learn. Memory Cognit.* 17: 245-262.
- Hofstede, G. (1991). *Cultures and Organizations: Software of the Mind*, McGraw-Hill, London.
- Hull, J. (1993). A boy and his gun. *Time* 142(5): 20-27.
- Johnson, P. E., Hassebrock, F., Duran, A. S., and Moller, J. H. (1982). Multimethod study of clinical judgment. *Organiz. Behav. Hum. Perform.* 30: 201-230.
- Kim, U., Triandis, H. C., Kagitcibasi, C., Choi, S., and Yoon, G. (1994). *Individualism and Collectivism: Theory, Method, and Applications*, Sage, Thousand Oaks, CA.
- Kintsch, W. (1988). The role of knowledge in discourse comprehension: A construction-integration model. *Psychol. Rev.* 95(2): 163-182.
- Kintsch, W. (1974). *The Representation of Meaning in Memory*, LEA, Hillsdale, NJ.
- Kintsch, W. (1979). On comprehending stories. In Just, M. A., and Carpenter, P. A. (eds.), *Cognitive Processes in Comprehension*, LEA, Hillsdale, NJ, pp. 33-62.
- Kintsch, W. (1980). Learning from text, levels of comprehension, or: Why would anyone read a story anyway. *Poetics* 9: 7-98.
- Kohlberg, L. (1984). *The Psychology of Moral Development: The Nature and Validity of Moral Stages*, Harper & Row, New York.
- Lickona, T. (1991). *Educating for Character*, Bantam, New York.
- Lundeberg, M. A. (1987). Metacognitive aspects of reading comprehension: Studying understanding in legal case analysis. *Read. Res. Q.* 22: 407-432.
- Narvaez, D. (1996). Moral perception: A new construct? Presented at the annual meeting of the American Educational Research Association, New York, Apr.
- Narvaez, D. (1998). The effects of moral schemas on the reconstruction of moral narratives in 8th grade and college students. *J. Educ. Psychol.* 90(1): 13-24.
- Narvaez, D. (1999). Expertise differences in comprehending moral narratives: Recall and thinking aloud (submitted for publication).
- Narvaez, D., Bentley, J., Gleason, T., and Samuels, J. (1998a). Moral theme comprehension in third grade, fifth grade and college students. *Read. Psychol.* 19(2): 217-241.
- Narvaez, D., Mitchell, C., and Gleason, T. (1998b). Comparing moral and non-moral story theme comprehension (in preparation).

- Narvaez, D., Mitchell, C., and Linzie, B. (1998c). Cultural influences on online text elaborations. Presented at the annual meeting of the Society for Text and Discourse, Madison, WI.
- Narvaez, D., Gleason, T., Mitchell, C., and Bentley, J. (1999). Moral theme comprehension in children. *J. Educ. Psychol.* (in press).
- Pichert, J. W., and Anderson, R. C. (1977). Taking different perspectives on a story. *J. Educ. Psychol.* 69(4): 309-315.
- Pressley, M., and Afflerbach, P. (1995). *Verbal Protocols of Reading: The Nature of Constructively Responsive Reading*, Erlbaum, Hillsdale, NJ.
- Rest, J. (1983). Morality. In Flavell, J., and Markham, E. (eds.) *Cognitive Development*, from Mussen, P. (ed.) *Manual of Child Psychology*, Vol. 3, Wiley, New York, pp. 556-629.
- Rest, J. R., Narvaez, D., Bebeau, M., and Thoma, S. J. (1999). *Postconventional Moral Thinking in Adults: A Neo-Kohlbergian Approach*, Erlbaum, Mahwah, NJ.
- Reynolds, R., Taylor, M., Steffensen, M., Shirey, L., and Anderson, R. (1982). Cultural schemata and reading comprehension. *Read. Res. Q.* 17: 353-366.
- Rikers, R. M. J. P., Boshuizen, H. P. A., and Schmidt, H. G. (1997). Nonroutine problem solving by medical experts. Presentation at the annual meeting of the American Educational Research Association.
- Simon, H., and Chase, W. G. (1973). Skill in chess. *Am. Sci.* 61: 394-403.
- Sloboda, J. (1991). Musical expertise. In Ericsson, K. A., and Smith, J. (eds.), *Toward a General Theory of Expertise*, Cambridge University Press, New York.
- Steffensen, M., Joag-Dev, C., and Anderson, R. (1979). A cross-cultural perspective on reading comprehension. *Read. Res. Q.* 15: 10-29.
- Trabasso, T., and Sperry, L. (1985). Causal relatedness and importance of story events. *J. Memory Lang.* 24: 595-611.
- Trabasso, T., and Suh, S. (1993). Understanding text: Achieving explanatory coherence through on-line inferences and mental operations in working memory. *Discourse Process.* 16: 3-34.
- Trabasso, T., and van den Broek, P. (1985). Causal thinking and the representation of causal relations in stories. *Discourse Process.* 12: 1-12.
- Trabasso, T., Secco, T., and van den Broek, P. (1984). Causal cohesion and story coherence. In Mandl, H., Stein, N., and Trabasso, T. (eds.), *Learning and Comprehension of Text*, LEA, Hillsdale, NJ.
- Trabasso, T., van den Broek, P., and Suh, S. (1989). Logical necessity and transitivity of causal relations in stories. *Discourse Process.* 12: 1-25.
- Trible, P. (1978). *God and the Rhetoric of Sexuality*, Fortress, Philadelphia.
- van den Broek, P. (1990). The causal inference maker: Towards a process model of inference generation in text comprehension. In Balota, D. A., Flores d'Arcais, G. B., and Rayner, K. (eds.), *Comprehension Processes in Reading*, Erlbaum, Hillsdale, NJ, pp. 423-445.
- van den Broek, P., Rohleder, L., and Narvaez, D. (1994). Cognitive processes in the comprehension of literary texts. In van Oostendorp, H., and Zwaan, R. (eds.), *Naturalistic Text Comprehension. Vol. LIII. Advances in Discourse Processes*, Ablex, Norwood, NJ, pp. 229-246.
- Wineberg, S. S. (1991). On the reading of historical texts: Notes on the breach between school and academy. *Am. Educ. Res. J.* 28: 495-520.
- Wyatt, D., Pressley, M., El-Dinary, P. B., Stein, S., Evans, P., and Brown, R. (1993). Comprehension strategies, worth and credibility monitoring, and evaluations: Cold and hot cognition when experts read professional articles that are important to them. *Learn. Individ. Diff.* 5(1): 49-72.
- Zwaan, R. A., and Brown, C. M. (1996). The influence of language proficiency and comprehension skill on situation-model construction. *Discourse Process.* 21: 289-328.