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SOCIO-COGNITIVE DEVELOPMENT AND ARGUMENTATIVE WRITING: ISSUES AND IMPLICATIONS FROM ONE RESEARCH PROJECT

In earlier issues, the *Journal of Basic Writing* has carried an exchange about adult socio-cognitive development and college students' writing. To date, this colloquy has included Myra Kogen's "The Conventions of Expository Writing," my (Hays) reply to that article, and Joseph and Nancy Martinez's response to both papers. Whether or not such dialogue changes any minds, it forces us to question, clarify, and sometimes modify our assumptions about issues crucial to the study and teaching of composition. It is in this spirit that I want again to discuss intellectual development and writing.

In her article, Kogen questioned descriptions of college freshmen as cognitively immature and suggested that such students' problems

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with writing might be explained by their lack of familiarity with academic conventions, implying that they needed simply to learn about the nature of academic writing in order to perform satisfactorily on it. In response, I contended that some student-writing problems result from more than just lack of familiarity with the academic discourse community. Using excerpts of student writing gathered from a research study, I pointed to certain audience postures that were correlated significantly with levels of socio-cognitive development as assessed by a Perry Scheme rubric. The Perry Scheme (see Appendix A of this essay) describes an adult socio-cognitive sequence that traces the development of epistemic reasoning, or the ways in which thinkers make meaning out of their worlds (Perry; see Kitchener for a general discussion of epistemic cognition). In their article, Martinez and Martinez supported Kogen's position, asserting flawed premises and methodology in my research and that of other writing researchers studying socio-cognitive development.

In what follows, I want to look at developmental issues in writing by focusing on the research alluded to in my earlier piece, a study involving argumentative writing, audience adaptation, and socio-cognitive structures as assessed by the Perry Scheme. I will use this project to illustrate more general points about developmental research on writing.

The Writers and Writing

The study, begun in 1983, involved 136 students from the senior class at a Colorado Springs high school and from undergraduate classes at the University of Colorado at Colorado Springs. College-entrance requirements ensured that all students met minimum criteria of academic competence, and we excluded any for whom English was a second language. Because ours is a commuter campus with many nontraditional students, writers' ages ranged from 16 to 55. My colleague Kathleen Brandt and I utilized a computerized random-selection program to choose a representative sample of students from three grade levels (high school senior, college freshman/sophomore and junior/senior) and three academic areas (the liberal arts, business, and engineering/computer sciences).

All students wrote two essays about the tough drunk-driving laws that the Colorado Legislature was, at that time, debating. Writers were asked to present and support their own positions on these laws, which were summarized on an assignment sheet. We used an argumentative task because argumentation is both intellec-

tually taxing and a common form of college writing. The first topic asked students to write for the newsletter of a "friendly" audience, one that on the whole would probably agree with them. On the topic sheet, we suggested twelve or so readerships—for example, Mothers against Drunk Driving in support of the legislation, the Colorado Springs Bar and Tavern Owners Association in opposition to it. The second essay, written two to seven days after the first, used the same topic except that writers were to address "hostile" readers, those who would probably disagree with them. We wanted to see if students would write differently about the same topic for different readerships and what such differences might be. We knew about the limitations of impromptu writing as an accurate indicator of writing ability. However, we needed to ensure that all writers performed under similar conditions, and constraints governing socio-cognitive assessment meant that we had to gather data within a short time period (see Moore 3).

We placed no time limit on the writing although most students spent about three hours on it; a few finished earlier, and a few wrote for four or five hours. High school students wrote at their school, university students on campus on two consecutive Saturdays. With the study, we hoped to explore questions about audience adaptation, flexibility of thinking, dialectical engagement with readers, and the relationships of these variables to argumentative writing performance and socio-cognitive development. The nature of our sample enabled us to study the impact of various factors, both individual and social-contextual, on impromptu writing performance: education, age, academic interests, gender socialization, and socio-cognitive development.

Evaluations

Each paper was rated blind by the two researchers and a graduate student, all of whom trained together to read to a common norm. We used a criterion-referenced instrument that assigned ratings in four areas: quantity and quality of ideas, organization and focus, clarity and effectiveness for readers, and correctness and felicity of syntax and usage. We assumed that students would probably not use sophisticated strategies for influencing readers and so defined "effectiveness" quite minimally. Readers' scores for each paper were summed. Statistical tests showed acceptable levels of rater consistency.

We chose a systematic random sub-sample of papers from 52 students for closer analysis (a total of 104 papers) and sent copies to the Syracuse Rating Group in New York, a team of developmental

psychologists trained and experienced in evaluating socio-cognitive performance using a Perry Scheme rubric. Thus it should be clear that I did not, as the Martinezes assert (81), myself assign Perry Scheme ratings to the essays. It should also become clear that the papers I cited in my response to Kogen exemplified trends found in the larger sample.

A Perry Scheme assessment looks for evidence of subjects' epistemic reasoning, or the ways in which they construct meaning out of the materials of their world. To provide adequate data for assessment, a production—essay or interview—must be on a topic that elicits epistemic reasoning and be long and complex enough to contain a sufficient number of socio-cognitive “cues,” or indicators. According to Zachary, coordinator of the Syracuse Rating Group, in the Colorado study even subjects who performed at lower levels of the Perry Scheme produced more than sufficient data rich in cues. A particular level of epistemic reasoning can exist in both fluent and nonfluent writers. We found writers who were assessed as “dualistic” (position two in the Perry Scheme, the lowest performance level in our study) who were anything but remedial-level. We also found some assessed as moving into relativism (position four) whose writing was flawed with incoherence. In fact, the incoherence, which we writing assessors had penalized, probably indicated that these students were in transition to more complex styles of reasoning and thus had difficulty integrating all their ideas about the topic—a finding important for writing teachers to note lest we penalize writers for conceptual growth.

In making Perry Scheme assessment, the Syracuse Rating Group draws upon cues (about 40 for each Perry Scheme position) dealing with overall protocol style, with ways of knowing, ways of acting (including reasoning style and conceptualization of the self), and ways of perceiving and relating to the environment, including the social environment of peers, authorities, and the general society and culture (see Appendix B of this essay for examples of Syracuse rated papers). To pinpoint transitions between levels, evaluators assign each essay a three-digit rating: a 2-2-3 rating would indicate a paper primarily at position two of the Perry Scheme but showing some characteristics of position three thought. Scores on the Syracuse ratings in this study ranged from 2-2-2 to 7-7-7, with the majority of essays falling in the 3-3-3 to 3-4-4 range—early multiplistic to late multiplistic. In Hays, Brandt, and Chantry, we have discussed the Syracuse Rating Group's methods at greater length, and I refer interested readers to that source (for a more general discussion of Perry Scheme-evaluation methodology, readers should consult Moore; and Mentowski, Moeser, and Strait).

Brandt and I conducted lengthy and detailed textual analyses of various aspects of the writing: audience adaptation, discourse structure, argumentative structure, depth and elaboration of development, syntax and diction, and rhetorical strategies. We used textual coding schemes for each area, some of our own devising and some derived from other researchers, applying them, one at a time, to the 104 papers. Because of the project's complexity, to date we have studied only the audience-adaptation results in depth.

We developed the audience instrument partly from prior research (for example, Berkenkotter) and partly from what appeared in the texts themselves. The audience coding rubric included five broad categories, and each in turn contained three to ten different codings, or "moves," indicating writers' adaptations to their readers. The categories ranged from very simple indications of audience awareness, such as actually naming the readers, to more complex ones: strategies to appeal to the audience and responses to readers' inferred points of view (see Appendix C of this essay). One researcher coded all 104 papers, marking each indication of audience activity. We tested the coder's consistency by training two other experienced readers in the scheme and asking them to apply it to 75 examples that the initial researcher had also coded; inter-rater agreement was high among all three raters.

The researchers tabulated the coding results and converted them into audience moves per T-unit. A research assistant entered these numbers in an SPSS data file. Thus each student's computer record listed that writer's demographic data, Perry Scheme performance evaluation (from the Syracuse raters), holistic paper ratings, and audience activity scores on each paper. There were 48 kinds of audience moves a writer could make, and frequencies ranged from a low of no moves to a high of 6.00 per T-unit. At this point, we enlisted Kathryn Chantry, a statistician trained in research psychology, to design and perform the study's statistical analyses. These included examinations of relationships between the writing group's demographic characteristics, Perry Scheme ratings, holistic paper scores, and audience adaptations. The statistician summed individual audience moves into categories (for example, Strategy, Response, Context) in order to decrease the number of individual variables in the regression equations.

We used a social-survey approach to statistical analysis in order to identify significant patterns in the cohort studied. A statistical relationship establishes the likelihood that in a sample population, one phenomenon is related to another or others on the basis of something besides chance. Statistical procedures correct for the effects of individual variations on overall patterns and for overlaps

between variables. For example, in our study, age and grade were correlated: as age increased, so did grade level ($p < .02$). In equations studying the relationship of both to a third variable—Perry Scheme, for example—the statistical procedure itself discounted commonalities between age and grade, leaving the “variation,” or change, in Perry Scheme score that could be predicted by grade only or by age only. Other statistics (beta weights) explored the proportions in which demographic factors contributed to the prediction for Perry Scheme score: only grade level was statistically significant in predicting the group’s variation in Perry Scheme score, and it accounted for only a portion of that score.

Statisticians usually do not consider findings “significant” unless they are apt to occur by chance less than five times out of a hundred. This figure is a convention based on the assumption that if an outcome happens 95 times out of 100, it is not a chance event. However, depending on the nature of the study, many statisticians prefer lower levels of probability. In the University of Colorado study, many findings had a probability level of .0001, meaning that the odds were less than one in 10,000 that these results occurred by chance. Estimates about chance or nonchance are grounded in assumptions about probability. Insurance actuarial tables apply such premises when they assume, for example, that a 25-year-old American female with no complicating medical history is likely to live for about 57 more years. Not all 25-year-old females will, in fact, live to the age of 82, but in the general population enough will so that it pays the life insurance company to “bet” on these odds and issue policies at lower premium rates to 25-year-old females than to 50-year-old ones. Survey statistics rest upon rigorous assumptions about the representative nature of the sample studied. Thus results obtained with a correctly chosen sample of students at one university will accurately reflect what would occur with that entire university’s student population but not necessarily with students at another institution in another part of the country. If, however, similar results occur in different settings, we are fairly safe in generalizing to the national population.

Statistically significant results do not prove causation. A significant correlation in a regression analysis (one type of statistical study) establishes only that a factor studied occurs in a linear relationship to others also under examination—that within a population, as one factor increases or decreases, so does another (as years of smoking increase, so does the incidence of lung cancer), or else that as one increases, the other decreases (as income increases,

convictions for violent crime decrease)—and that this relationship does not occur by chance but is predictable.

Our profession is currently the site of a lively debate about the nature of proof in composition research, with many members questioning statistical methodology. Certainly quantifiable data are only one ground for justification of findings, not the only one. However, those who appear to advocate abandoning all statistical methods do not, it seems to me, take into sufficient account the sophistication and subtlety of statistical analysis that recent computer technologies have made possible. Nor do objections to statistical studies seem adequately to differentiate between experimental and survey statistics. The former assume a control of variables difficult to achieve with human subjects; the latter identify significant trends within populations and study interactions among variables being examined (for an extended discussion of survey research, see Anderson).

In regression analysis, if at least 30 subjects are studied in the same or a similar context, we can tell if their behavior is statistically significant. Of course, all research methods have strengths and weaknesses. We learn a great deal from observing individuals that we could not from examining aggregate data. However, without statistical analysis we are on shaky ground when we make assumptions about universality. Some nonstatistical research involves so few subjects that its results may be idiosyncratic rather than indicative of more general patterns. For example, Peter Smagorinsky has observed that generalizing from the Graves and Calkins research with New Hampshire children's writing is questionable because of the small number of children studied and because the researchers are affecting outcomes in ways they have not acknowledged.

Similarly, when Kogen asserts that she observes improvement in students' writing performance after she teaches certain academic writing conventions, I don't doubt that she is accurately describing changes in her students' writing; I am sure she is a fine teacher who gets results. However, I have questions about what causes the change: How long does it take—a week? A month? A year? How many students has Kogen observed? How old are they? What methods does she use? Is the change global or selective? Do other teachers get the same results with different students but using the same methods? Unless Kogen tells students about an academic convention during one class and sees immediate change—say, on the next paper—it is possible that what she observes is attributable to socio-cognitive shifts facilitated by the activities she engages students in. Of course, any one of a dozen other factors could also

cause the improvement. But without more rigorous methods than a teachers' sense of what happens in a classroom, we cannot know what is implicated in change.

While the accumulation of many case studies with similar patterns suggests that the observed behavior characterizes many writers, without statistical analysis it is difficult to know what the patterns mean, which of them are significant predictors of writing performance and which are incidental to it. For instance, in the Colorado study, we discovered that a great many subjects engaged in "Context" activity. That is, they established a frame of reference for their readers by explaining the issue or problem, the proposed laws, and so on. The frequency of such activity was higher than that of some other audience adaptations. Yet statistical analysis showed that Context had no predictive value for overall paper scores. Without statistical analysis, we might conclude that establishing context had considerable impact on students' argumentative writing when in fact it had far less than some activity that occurred with less frequency. Statistical studies are, of course, only as good as the assumptions and interpretations of researchers making them. My point is not that all writing studies should be statistical but that in the profession we should utilize a variety of methods and use one to check another.

Because of the nature of survey statistics, overall results are not affected, as the Martinezes suggest they might have been in the Colorado study (80-1), by some students having problems with writing tasks. That is, a few such responses would not significantly influence the pattern evident in the overall population; such concerns would, of course, be important in the case of individual students being tested for evaluation or placement. If large numbers of students had such difficulties, this fact would show up in the statistics, and for research purposes such information would be useful. For example, dualists in our study interpreted the paper topic differently than did early multiplists, and they, in turn, understood it differently than did late multiplists. That is, dualists read the assignment as asking them to give their own opinions on the topic. Multiplists interpreted the topic as primarily a problem-solving exercise, and dealt with it by offering practical ways that readers could help to solve the drunk-driving problem. Some late multiplists and all relativists saw the assignment as asking that the merits of the case for or against the proposed laws be argued. This pattern gives us useful information about systematic differences in the ways that students at varying socio-cognitive levels process information. The Martinezes also suggest that "channel inefficiency" in writing might have caused students to perform poorly on

the Perry Scheme assessments. Such assumptions confound writing-evaluation with Perry Scheme-assessment criteria, which are quite different. Except in subjects above the "flip" (position five, that point at which students shift from multiplistic to relativistic structures), Perry Scheme researchers have not found differences between assessments derived from oral and written productions (Zachary). In our study, only two students scored above the flip.

Results

In the Colorado study, audience activity predicted strongly for overall writing performance with both friendly and hostile readers. On the nonwriting factors explored, level of Perry Scheme-performance predicted most significantly both for overall writing performance and for certain kinds of audience adaptation. Yet if familiarity with academic-discourse conventions alone explained academic-writing performance, and if such writing performance had no connection to socio-cognitive development, then we should have found a strong predictive relationship between educational level and writing performance, and a weak or nonexistent one between Perry Scheme level and writing performance. If indeed, as the Martinezes argue (80), the Perry Scheme itself only reflects socialization into a particular kind of college environment, then in our analysis the statistical procedures would have discounted the impact of Perry Scheme ratings in predicting writing performance, and instead have established educational level as the significant variable in the writing studies.

Initially, we omitted the Perry Scheme measure from equations examining the impact of nonwriting factors (age, gender, and so on) on writing. Of the demographics studied, grade level was the only statistically significant predictor of overall writing performance. Thus had we not later added Perry Scheme rating to the equation, we could have concluded that educational level was *the* contributing factor to writing performance. However, when we included Perry Scheme performance in the equations, the contribution of grade level dropped below the level of significance, and the Perry Scheme measure was the only nonwriting variable predicting for writing performance.

These findings suggest that whatever is assessed by a Perry Scheme measure involves socio-cognitive factors in addition to those accounted for by educational level. In our study the impact of these factors on writing performance was enough greater than that of grade level so that in the presence of the Perry Scheme measure, educational level ceased to contribute significantly to writing

performance. More generally other (nonwriting) studies with the Perry Scheme show that educational level does indeed influence the development of epistemic reasoning, more so than chronological age (see, for example, Benack and Basseches, Kitchener and King). Such findings certainly accord with the "socialization into the academic environment" thesis—but only up to a point, for a considerable proportion of what the Perry Scheme assesses is not accounted for by age and grade level alone. In other words, the Perry Scheme measures "something" in student performance related to more than just the combination of age and grade level. I would surmise that this "something" captures the socio-cognitive structures the Perry Scheme describes.

I am not arguing that the Perry Scheme reflects universal socio-cognitive development. Rather, it demonstrates that a particular context—the American college or university—requires students to make sense out of multiple and often conflicting views about reality. In coming to terms with these varying perspectives, students construct new and more complex socio-cognitive structures. These structures in turn influence ways in which students respond to the college environment, and so on. That is, socio-cognitive structures interact with experience and environment but are not synonymous with them. It is also, of course, possible that such processes can take place prior to college although in the United States, at least, such does not often appear to happen. To date, nationwide Perry Scheme data from both traditional and nontraditional students show that most freshmen enter college in transition between Perry positions two and three "while juniors and seniors are primarily in transition between positions three and four and in stable position four" (Moore, 2). However, a study in Germany showed that recent high school graduates there performed at socio-cognitive levels typical of college seniors in this country (Kitchener and King, 17).

The rate at which learners construct these structures varies, but the sequence in which they do so apparently does not. These structures have little to do with intelligence, for very bright students can be dualists. What appears to be "invariant" is that dualism will give way to multiplicity, multiplicity to relativism, and so on. This sequence has important implications for teaching: if we know that multiplicity follows dualism, we will not assign dualistic students relativistic tasks, a practice that would require them to respond two or three positions beyond where they presently are. Studies suggest that they will neither understand the assignments nor respond to them relativistically but will, instead, approach them dualistically (for example, see Stern). On the other hand, students can be stimulated by assignments designed to challenge them with tasks

just one position above their current level of socio-cognitive performance “plus-one staging”) provided they also receive support appropriate to their current socio-cognitive level. Earlier, I noted that dualists in our study interpreted the assignment as asking them simply to state their opinions about the drunk-driving issue. For the most part they did not support these opinions with argument or evidence although some dualistic writers included graphic examples of friends or family members injured by drunk drivers. One could, of course, argue that these students simply did not as yet know about college-level conventions requiring evidence and argument. However, since a third of these dualistic performers were in college, and since a quarter of them were sophomores, not freshmen, it seems equally likely that they did not apply academic conventions to their writing because they had not as yet constructed the cognitive structures to integrate and support the conventions. Such an interpretation does not negate the importance of either individual cognitive processes or social context. It suggests that both are involved in the way that people make meaning and that the process is more complex than either model alone suggests.

In our study a fourth of the high school students and a third of the college freshmen/sophomores were early multiplists, and they did recognize that they needed to support their positions. But instead of dealing with arguments that an adversarial reader might make against their points, they detoured into discussions of ingenious but not always realistic proposals that, they suggested, would solve the drunk driving problem and so not cause the tougher laws adversely to affect their hostile readers; this pattern was also typical of many late multiplists. Only those in transition to the upper levels of Perry Scheme performance fully engaged their hostile readers’ probable objections to the law and argued them, conceding that the laws would bring problems to these readers but suggesting beneficial trade-offs, such as improved public relations for the beverage industry or avoidance of still more regulation of the alcohol business. All students had the same essay prompt, and the marked differences by Perry Scheme level in their responses to that prompt suggest the need for assignments specifically designed for level of socio-cognitive performance.

If teachers know that multiplicity follows dualism and know what characterizes both kinds of performance, they can, for example, construct assignments for dualistic students to stimulate multiplistic functioning in a few key areas while retaining some of the support that dualists need—for example, lots of well-defined structure (see Knefelkamp and Slepitz). This approach is similar to Vygotskian “scaffolding” (Applebee and Langer) but includes

verified information about the order in which epistemic reasoning develops and the characteristics of each of its levels. To illustrate, our results suggest that dualistic students could be helped towards multiplicity with assignments asking them to give detailed reasons for their own viewpoints together with illustrative examples, without, initially, considering opposing views. Engaging them in exercises to explore aspects of some specific problem might also help them look at issues from several angles while still staying close to the concrete particulars of the problem itself. Early multiplistic students could be helped by assignments asking them not only to generate solutions to problems but to explore in detail the likely effects of these ideas and deal with the possible negative consequences of some solutions, an activity that few students in our study engaged in. Instead, numbers of multiplists proposed, for example, that bar owners install breath-a-lyzers so that customers could test their levels of intoxication. Writers inevitably followed this proposal with assurances that if bar owners did so, tougher drunk-driving laws would not be needed. Yet none of the early multiplistic performers addressed the question of how bar owners could guarantee that their patrons would use such devices, what their legal responsibilities might be for patrons who exceeded safe blood-alcohol levels, nor the fact that a great deal of drinking that results in drunk driving does not, in fact, take place in bars. Some of these points did occur to late multiplistic performers.

We also found that although Perry Scheme performance was the strongest predictor of overall writing quality, on papers directed to friendly readers, educational level predicted strongly for audience Strategy activity—tactics that recognized readers' attributes or mounted strategies to align them with the writer's point of view. In one such move (S [Strategy] 1 in Appendix C of this essay), writers characterized or "defined" their readers to those readers: "You alcohol counselors struggle daily with this problem [recidivism in problem drinkers]"; "Members of the Colorado Highway Patrol know what it's like to arrest drunk drivers and then watch them get off with a slap on the wrist." In another important Strategy activity (S 7 in Appendix C), writers established a common bond with their friendly readers: "We all care about the welfare of our children," or, "As church members, we want to help those in need."

Yet Strategy moves directed to hostile readers were significantly predicted by Perry Scheme performance and less so or not at all by grade level. Such Strategy activity included writers not only establishing commonality between themselves and their hostile readers (perhaps the fact that both were concerned citizens or parents) but also praising their hostile readers ("The Colorado

Beverage Association is a responsible group that cares about the state's economic and social welfare"; S 6 in Appendix C). Even more, Perry Scheme predicted for Response, a dialectical measure in which writers inferred readers' positions and their reasons for them, and then in some way responded. A typical Response sequence would read: "You might feel that the laws will hurt business [Response 1, stating reader's position] because customers will be hesitant to patronize taverns [Response 2, reason for reader's position]. However, the law doesn't propose to restrict the consumption or sale of alcoholic beverages" [Response 3, response to reader's position]. Such sequences were especially important on the hostile-audience papers, for they required writers reasonably to engage viewpoints different from their own. This kind of dialectical thinking is probably at the heart of argumentative writing. Most writers in our study did not, however, use a full Response sequence, often omitting the statement (implicit or explicit) of reasons for readers' views. Many writers simply articulated readers' positions and then responded to them, often in overfacile ways suggesting that they did not fully understand why their audience might question their points. This truncated pattern implies that many students, even those rated as relativistic, were not yet performing at fully dialectical levels, and, in fact, Benack and Basseches have established that full dialectical functioning does not emerge before the upper levels of Perry Scheme functioning.

However, of the audience variables examined, Response predicted most strongly for overall writing performance on the hostile-audience papers, and statistically it was significantly related to Perry Scheme level and not at all to grade. Again, if exposure to college requirements for argumentative thinking and writing alone explained writers' performances on such tasks, then the dialectical activity in our study should have been strongly predicted by grade level and not at all by Perry Scheme rating. Nor can we assume that some subjects had already been socialized into this facet of the academic writing environment in high school. The strong linear relationship was between Response moves and level of Perry Scheme performance. Frequency counts showed that on the friendly-audience paper, late multiplists engaged in over twice as much Response as early ones, nearly three times as much as dualists. On the hostile-audience paper, late multiplists made around twice as many Response moves as early ones, nearly four times as many as dualists. Yet in our study, at least, only one high school student (out of 15) was a late multiplist. It seems clear that in the school our high school subjects attended (one of the "best" in Colorado Springs), socialization into the academic discourse environment did not account for certain kinds of cognitive functioning.

However, academic socialization prior to college may well explain other strands of writing behavior. The linear relationship between friendly-audience Strategy and grade level suggests that all students in the study had achieved a sufficient level of socio-cognitive development to relate to readers like themselves and that, given that level, more years in school may simply have offered students more general information with which to approach readers. Yet although writers' Strategy activity with friendly readers was not related to Perry Scheme performance, that with hostile readers was. This finding suggests something like cognitive egocentricity reflected in papers assessed at the lower and even middle positions of the Perry Scheme: effective conceptualization (probably through identification) of readers sharing writers' views but not of those opposing them. Papers in the upper levels of Perry Scheme performance did show more evidence of accurate and empathetic images of hostile readers. Grade in school did not predict for audience Strategy moves requiring writers to conceptualize hostile readers. That is, the papers of early multiplicitic college seniors showed less evidence of such imaging than those of late multiplicitic sophomores.

Our findings suggested that both socialization into the academic discourse community and socio-cognitive functioning were important contributors to argumentative writing for two kinds of audiences, with Perry Scheme performance being a stronger factor than school socialization. In the Colorado study, the sample was large enough and the subject mix varied enough as to grade level, age, major, and gender that we could discount factors such as particular class or instructor effects. Our results also showed that while overall level in school had a significant relationship to certain aspects of writing performance, area of academic major did not—a discouraging finding for proponents of a liberal-arts education but one that will not go away just because we do not like it. Yet here again, these results question notions about socialization into academic paradigms as exclusively accounting for writing performance. If the latter were so, then as a group the engineers in our study should have performed differently than the business or liberal-arts students. They did not, even though their curriculum and writing conventions are quite different from those in other colleges; on more discourse-specific writing tasks, I would expect results to differ.

In choosing subjects, we were careful to select a representative random sample of our own population, and rigorous statistical tests show that we succeeded. We cannot be sure, of course, that our students are like those in other universities in other parts of the country. We have no reason to believe that they differ drastically from students at comparable four-year colleges, but until our results are duplicated

with other high school and college subjects, readers should exercise caution in generalizing to the nationwide high school and college population. Our results do, however, accurately reflect how the entire population sampled in our study would perform on the argumentative task we assigned in the context in which it was assigned; the population so sampled totaled around 5500 students. The Colorado study also does not explore what differences instructional intervention might make in subjects' writing and socio-cognitive performances. We hope to address this question in future research.

By now enough research in enough different settings has examined audience adaptation and socio-cognitive development to suggest that some connections found in our study reflect more general patterns (see Crowhurst and Piché; Kroll; Piché and Roen; Rubin and Piché; Rubin and Rafoth; Rubin, Piché, Michlin, and Johnson; Shapiro). These studies have demonstrated statistically significant relationships between socio-cognitive abilities, assessed with a variety of measures, and several aspects of writing performance. Some of this research examines children's writing, and so one can, of course, dismiss it by claiming that socio-cognitive development is relevant for children's writing but not for adults'. This would be a curious conclusion considering what we know about the importance of developmental structures for other aspects of adult performance. Such studies do not rule out contributions to writing performance made by context, culture, academic socialization, socio-economic status, and so on. What they do suggest is that socio-cognitive structures cannot be ignored as contributors to students' writing performance. Because one thing appears true, not everything else is false. Before writing theorists and teachers dismiss intellectual development's relevance for college composition, they need to study socio-cognitive research fairly and ponder its implications for the college composing process.

Appendix A

Descriptive Summary of Positions Two through Five in the Perry Scheme

Stage Two, Multiplicity Prelegitimate

In this position, individuals perceive alternative points of view. However, legitimate multiplicity is often rejected in favor of discrete units of knowledge. Authorities are the source of knowledge, but because individuals perceive alternative points of view, they are

forced to separate authorities into Good Authority, which is truthful, and Bad Authority, which may be ignorant, wrong, or misinformed. The individual is a passive knower who knows reality through Authority. Peers, like Authority, are bifurcated into those who support the reality of Good Authority and those who are bad, ignorant, or wrong. In reasoning about reality, the individual is forced to confront the diversity perceived. Position two subjects will rely on simple, often nonrational, solutions to the contradictions of reality in an attempt to maintain the Good.

Stage Three, Multiplicity Subordinate

In position three, individuals acknowledge the existence of different views and, further, acknowledge that the differences are legitimate. However, they perceive the legitimacy of diversity as temporary and hold out for the possibility of discovering the absolute nature of knowledge through Good Authority's hard work. As emulators of particular authorities, individuals view their own hard work as essential in knowing. Learners have become active. As active learners of the *quantity* of knowledge, they will embrace certain authorities for their personal characteristics—i.e., friendliness, clarity of thought, wisdom, good looks, dress, etc. Peers' views are recognized, but have little impact on knowing since learners view them from a reasoning stance incapable of distinguishing between bias and inference. As a result, experiences of diversity are expressed or reported as lists of unconnected events or opinions without logic or modifiers.

Stage Four, Multiplicity Legitimate

Position four individuals recognize that in many areas they will never achieve certainty, but fail to generalize this insight to an integrative theory or view of knowledge. The realization that they may never banish uncertainty can on the one hand result in a cynicism towards authority—a sense of being let down, or failed, in their search for the truth. On the other hand, it can lead to a deeper embracing of authorities, particularly those who recognize the individual's particular genius. In either case, it is the individual who will generate his or her truth. For one, it is a lonely oppositional process; for the other, it is a partnership with an idolized authority. Peers are important to position four individuals. They are respected because they, too, have been left to generate their own truth. For this reason, one belief is as good as another. Individuals are able to see that evidence leads to hypothesis and conjecture rather than to absolute answers. But they are unable to endorse a conclusion unless it coincides with their own

view. The truth which they establish for themselves becomes the absolute through which all judgments are made. The individual has created his or her own absolute world.

Stage Five, Relativism

With position five, a qualitative change has occurred in the individual's view of the structure of knowledge. It is as if the long personal history of accumulated *quantities* of data, experiences, and the like has resulted in a *qualitative* shift in the perception of reality. For the first time, the individual sees that the "big picture" depends upon understanding the frame of reference from which it is developed. Authorities are seen as experts who interpret reality and who have preferences and biases. For these reasons, it is possible for the individual to evaluate authorities qualitatively, distinguishing between authorities who have carefully weighed the evidence at hand and thus arrived at a considered judgment or point of view and those who have failed to approach with logic and passion the search for knowledge. Since all knowledge is viewed as relative, the self emerges as a consciously active partner along with experts in the process of exploring reality. In the educational context, the self emerges as the agent of its own learning. Because knowledge is viewed through the experiences of the self and because the individual understands the importance of exploring the context of experience, the individual realizes the legitimacy of others' considered judgments and thus may attempt to view knowledge and understand problems through the experience and perspective of others. This empathic ability brings about a recognition of the social/communal nature of knowledge. To this active, self-generated role in knowing, the individual brings a reasoning style characterized by logical inquiry and use of evidence to support his or her point of view. Unlike the position four learner, the individual in five can distinguish subtle differences in the evidence. Right/wrong, either/or thinking is no longer sufficient to the task of knowing.

—Based upon descriptions of stage positions in B. Hannum et al.

Appendix B

Examples of Syracuse Rating Group Assessments of Student Papers for Perry Scheme Position

The following excerpts illustrate how one cluster of rating cues, "ways of knowing," was applied to papers in the present study. A

position two, “multiplicity prelegitimate” (dualism), performance suggests that “Knowledge [Truth] is knowable . . . , concrete, finite, absolute, factual, complete,” shows “no tolerance for gray areas,” and perceives knowledge as dualistic while rejecting multiplicity as “the wrong way.” Experience is dichotomized into good/bad, right/wrong, we/they, and so on. The Syracuse raters noted that dualistic essays in the Colorado study “spoke to one factor of the [drunk-driving] problem and/or proposed a single-factor solution The knowledge [utilized] was usually based on complete, concrete, global examples,” and “dogmatic and absolute statements were common.” The position two essay excerpted below was assigned a Perry Scheme rating of 2-2-3 (only one paper in the study was rated 2-2-2). Cited writers support the proposed laws and direct their essays to members of the beverage industry.

Two. First of all, innocent lives are sacrificed because of this incessant indulgence [drunk driving]. There is no excuse for getting drunk and then driving at any time. Second of all, it is hard for companies to keep selling alcohol if most of their customers are getting killed on the highways by carelessness. This carelessness must somehow be curbed. Labels on the bottle won't help because people ignore them anyway. A simple slap on the wrist won't help because like masochists they will only be back for more. The best way to curb this carelessness is through education and through tough enforcement [17-year-old high school senior].

This excerpt reflects absolutist assumptions: statements such as, “People ignore [labels] anyway,” and, “Like masochists, they will be back for more [punishment],” surely are not true of all people all of the time. Yet the phrasing here allows no exceptions. The assertion that companies can't sell alcohol “if most of their customers are getting killed on the highway by carelessness” appears to wrench reason in order to dismiss a perceived diversity: that although excessive drinking can result in drunk driving, members of the beverage industry have the right to sell alcohol. The writer resolves this diversity by implying that most customers kill themselves on the highways anyway—so, presumably, bar and tavern owners have nothing to lose from the stiffer laws. The excerpt shows the writer's awareness of multiplicity (some people advocate labels on bottles, some would say there are already laws against drunk driving) but dismisses these factors (people ignore labels, the laws amount to a “slap on the wrist,” the “best” way to deal with drunk drivers is through “tough” enforcement and education). No details define or support these contentions, nor does

the writer explain how "education" and "tough enforcement" will solve the problem. Such lack of justification suggests a view of knowledge-truth-reality as concrete and complete, and hence needing only to be stated. Also note the good/bad, we/they approach: drunk drivers are "incessant indulgers," are "careless," have "no excuse." Yet the quality of the writing is not remedial, and indeed suggests a good vocabulary and grasp of syntax.

With reference to ways of knowing, a position three ("multiplicity subordinate") performance suggests that although "total truth (definite answers) is not known YET," this uncertainty is temporary. Position three essays imply that "perfection is possible" in the future. "Alternative points of view are acknowledged," and "differences are intriguing [and] interesting." Knowledge [truth, reality] has "multiple components or factors," with concomitant assumptions that "the more multiple components, the better . . . [that] knowledge is quantifiable," and that "*what* is more important than *why*." Position three essays use detailed, descriptive examples and list alternate viewpoints—often matter-of-factly and without genuine evaluation or integration:

Three. [The excerpt follows two sections, one on drunk driving statistics, the other asserting that bars and hosts should be responsible "to see that no one is injured or killed by our friends and customers."] Tougher drunk driving laws will keep first-time offenders from overindulging in the future. If they do overindulge, they will be more likely to bring someone to get them home safely. This would help the alcoholic industry by having more customers at local bars. The friend responsible would more than likely have a drink or two himself. . . . If everyone brought a friend to supervise his actions at the pub and escort the drunk home, the streets would be safer for all of us and them. The industry would prosper from more customers [29-year-old college senior].

The excerpt reflects a "multiple components" approach to the issue: it lists information about drunk driving, raises the issue of responsibility, and, like many position three papers, takes a "we can solve this problem" approach, in this case suggesting that patrons' friends who are designated drivers for the evening will add to bar business by having a few drinks themselves [!]. In general, such papers imply that perfection is, indeed, possible—drunk driving can be stopped, and the alcohol business will not be affected.

Position three essays give lots of facts. Usually these are not explored in depth, but the diversity of information and views

suggests a position three “more is better” emphasis upon quantity of knowledge. This laundry-list approach differs from the single-component emphases of most position two papers. Position three texts take a less pejorative tone towards the audience’s business interests than do position two essays, some of which mention these interests but seem not to credit them with legitimacy. Position three papers genuinely acknowledge alternative points of view as represented by the adversarial readers’ concerns although they rely upon overly facile “solutions” to mitigate the seriousness of these concerns.

Position four, “multiplicity legitimate,” is the quintessential “everyone is entitled to his or her own opinion” position. Where a position three performance acknowledges alternative points of view, position four accepts multiplicity as “legitimate in areas where the truth is not yet known,” in fact affirming and embracing it. Other position four ways of knowing cues include “opinions are equal when the facts are not known,” and “knowledge is ideas in process.” A position four performance engages in some qualitative reasoning—“‘better’ is perceived in some areas”—and recognizes the reasons why something is so as being more important than the fact that it is so. Also, in a position four performance, “truth is becoming personal”—is “my truth.”

Four. I realize that you are not responsible for the behavior of other people. You do, however, produce a food that affects people’s behavior. Consequently, you are indirectly responsible for their behavior.

No law should or could deprive you from the right to operate on a market at which there is a demand for alcoholic beverages. You could, however, through commercials, advertisements, and the labels on your bottles, point out to people the possible consequences of alcohol consumption. In this way you could create an awareness among alcohol consumers of the effects of alcohol and still sell your product. Laws against the total consumption of alcohol would not be the answer to the problem, nor would the absence of any law. . . . We need laws to punish those who acted irresponsibly and deprived others, the victims, from good health or their life. Tougher laws constitute one aspect to prevent people from driving while under the influence of alcohol. Public awareness constitutes another aspect and might keep people from driving while drunk. Your assistance would be highly appreciated by your customers who are against drunk driving and the American people as a whole [20-year-old college sophomore].

Many position four papers reveal the “personalizing” of knowledge: “I realize,” “I feel,” “I’m sure,” “I propose,” introduce the writer into the dialogue in ways not evident earlier; a position four performance “owns” its point of view. The cited excerpt also illustrates writers’ concerns with “why” rather than “what,” explaining why alcohol producers’ warnings could alter drinkers’ behavior and yet not interfere with liquor sales. Other Position four papers explain why the proposed law is necessary or unnecessary, why its provisions will or won’t work, and so on.

Rather than the quantity of ideas that position three papers list, position four essays focus upon fewer ideas but argue causally for them. Yet despite this narrower lens, position four performances see more facets of opposing points of view than do position three essays: the essay excerpted above recognizes that bar and tavern owners and liquor producers are not just concerned with “business” but also worry about public relations and maintaining a broad base of public support. The writer is aware of the producers’ legal right to sell alcohol and the public demand for these products.

Yet such papers still imply that alternative perspectives are straw men to be handily toppled by the writer’s asserted solution for the reader’s likely problems with the new laws. By contrast, the few position five essays in this study make no such claims, recognizing that the laws will hurt the beverage business but nevertheless contending that they are the lesser of probable evils: some reduction in profits versus likely governmental regulation or other legal consequences if the drunk driving situation continues unchecked. Such papers appear genuinely to ponder alternatives and, as a result, to recognize that ideas are contingent and contextual.

—Based upon B. Hannum et al.

Appendix C

Audience Coding Rubric: Definitions and Examples

Positive Moves

N Naming; recognizes that an audience exists by direct and indirect reference.

N 1 Direct reference “you”: speaks or writes directly to the audience.

- “You would not want the drunk driver in your bar.”

- N 2 Indirect reference “They, their”: usually appears when writer is generalizing about audience in protocol although may appear in text.
- “They won’t go along with this.”
- N 3 Names audience: appears in text and protocol when writer names the group to whom the paper is written.—MADD, Bar and Tavern Owner Association, etc.
- S *Strategy; implements a strategy or tactic for reader.*
- S 1 Appeals to self-interest vis-à-vis laws: how laws will help reader; how reader might benefit financially, socially; how business will benefit, reputation improve.
- “These laws will make your job easier.”
 - “You will not have to put up with drunks in your bar.”
 - “Drunk drivers are not good for your business.”
- S 2 States readers’ responsibility, obligation; what readers ought to do. Key words: “ought,” “should,” “your duty,” “your responsibility.”
- “Bar and tavern owners ought to be sensitive to these problems.”
 - “You should be a responsible citizen.”
- S 3 States readers’ circumstances, beliefs, experiences, characteristics: their state of being. Key phrases: “you have seen . . . ,” “you might think . . . ,” “you put your family first . . . ,” “you are”
- “As bartenders, you see drunks all the time . . .”
 - “You come in contact with this”
 - “Parents care about the well-being of their children”
- S 4 Direct emotional appeal
- “What if you lost a child, spouse, or friend because of drunk driving?”
 - “This tragic incident may occur to your child.”
 - “You might be affected personally.”
- S 5 Tells readers they have choices.
- “You have a choice”
 - “These issues present us with choices”
- S 6 Praises, supports, shows appreciation, flatters: calls readers “responsible people,”
- “[Yours is] a prominent association”
 - “We as upright citizens”
- S 7 Use of shared features, aligns with audience: “we.”
- “Just recently in *our* city”
 - “We all want a better place to live”

- S 8 Asks reader to take some kind of *action* or to support laws or to take action to solve the problem.
- “I urge you to support these laws”
 - “You can ask your customers to drink less”
 - “You can write your congressman”
- C Context: establishes context and gives background information for the reader.
- C 1 Simply states own position but not as a summarizing statement or not repeating an earlier statement. This is the initial statement of the position: limited to first part of paper.
- “I’m here to argue against the proposed changes in these laws.”
 - “The state should pass and enforce tougher drunk driving laws.”
- C 2 Introduces self, establishes a persona.
- “I’m speaking to you as a concerned citizen.”
 - “I know how law enforcement officers feel because my father was a policeman.”
- C 3 Gives reasons for own position (not general reasons; some variety of “I” statement).
- “I feel very strongly about drunk driving because my best friend was killed by a drunk driver.”
 - “One of my best friends was permanently disabled in an accident involving a drunk driver.”
- C 4 States issue or problem: what it is, why it’s a problem; comes in the opening section only.
- “The number of accidents caused by drunk drivers has risen sharply.”
 - “The provisions of the present law are not enforced. Drunk drivers are let off with a slap on the wrist.”
- C 5 Gives specific information or clearly explains the proposed laws (does not give an opinion but clarifies what the terms of the laws are).
- “Under the proposed law, anyone found guilty of drunk driving must enroll in an alcohol education program.”
 - “One such bill provides for a mandatory twenty-four hour jail sentence, license suspension for thirty days, and a stiff fine.”
- R Response; responds, accommodates to reader’s concerns, values, beliefs.
- R 1 Articulates readers’ possible worries or fears or possible objections—that laws might affect business or financial position, that reader might see laws as extreme or unfair.

- “Bar owners may feel that the laws will hurt business.”
- “You will probably believe that these laws are too costly.”
- R 2 Gives reasons for these fears, worries, etc.: often signalled by “because” clause.
 - “Some [tavern owners] fear these laws *because* they are afraid they will hurt business.”
 - “Many [drivers] object to the new laws *because* they are afraid they will be caught driving drunk.”
- R 3 Answers objections, fears; rebuttal. Explains why the reader need not be concerned.
 - “The laws won’t keep anyone from drinking but only from driving drunk.”

Negative Moves

I Inappropriate or Negative Appeals

- I 1 Negative or pejorative references to readers. The writer blames the readers or attempts to make them feel guilty; negative representations of readers.
 - “You [bartenders] don’t care what happens to people: you just want to make money.”
 - “Maybe you just don’t care about how you drive”
- I 2 Inappropriate argument for audience. The argument is ineffective with the specified audience.
 - “Alcohol is a depressant. It does not give *you* your judgment.” [to Council of Churches]
 - “Those laws are a step in the same direction parents have tried to go all along where raising their kids is concerned.” [to Bar and Tavern Owners Association]
 - “Drinking is popular among teenagers.” [to Playboy Club]
- I 3 Private or code references.
- I 4 Vague pronouns.
- I 5 All purpose words.

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