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Reasoning in Language at the Elementary School Level

A reasoning, reading, and language arts program should concentrate on the sharpening of thinking skills while affording children the opportunity, through cooperative dialogical inquiry, to think philosophically about ideas that concern them. But where is one to begin? One could well begin by approximating as closely as possible the state of wonder and puzzlement that is generally characteristic of early childhood. After all, if education is to begin where the child is, rather than where the teacher is, what could be a better starting point?

When we say that children are perplexed, we commonly think of them as struggling to *explain* the world that surrounds them. But this may very well be a projection of adult puzzlement and is influenced by scientific thinking, for children not only wonder how things are caused but also wonder at the very fact that things are as they are. Thus, for example, children are puzzled by family relationships, with their intricate rules and mysterious origins. Or children will be puzzled by words, and again, it is not the origin of words that concerns them so much as the interaction of words with one another and their reference to the world. Nor are children necessarily more interested in purposes than they are in causes: the child who stares at her own face in the mirror, or who stares wonderingly at her dog's face, may not so much be trying to understand how these things were caused, or what their purpose will be, but simply what they are and that they are. Children wonder at the world. It is an awe of wonderment so profound that if it were to occur in an adult, we might call it religious.

Children wonder, and they are curious. They have an insatiable desire for reasons. When they ask questions of the form, "How can this be?" it is as if they want someone to justify the world to them. Indeed, there may be more than a slight connection between children's inability to tolerate a world that cannot be justified to them and their intense dislike of injustice.

Adults, by means of the enormously powerful scientific apparatus at their disposal, endeavor to understand the universe and, if possible, to control it. The function of intelligence in children may not be quite so

instrumental and operational in character. Children process their experience by reflecting on it. The world they marvel at may not be one they wish to capture and control so much as one whose meanings they wish to apprehend. They are trying to make sense of what puzzles them, although they would probably not be happy if the sense were to be any less delightful than the wonder. This is why they love stories so much. Stories make sense of the world, but they do so in a delightful way. The story-teller, in order to enlighten us, does not have to kill the world first and then dissect it.

So reasoning skills are correlated with meaning acquisition. The more skillfully children draw inferences, identify relationships, distinguish, connect, evaluate, define, and question, the richer the totalities of meaning that they are able to extract from their experience. In this sense, experience is like raw ore: the more powerful the refining techniques, the more effectively the pure metals are extracted from the dross. The cultivation of reasoning skills is the most promising path we can pursue if our aim is to help children find out what it is that makes their experience significant.

Reading and Writing as Reasoning

We are all familiar with the fact that virtually all children, while still very young, learn to speak the language of their parents. This is no easy matter. They must learn pronunciation, inflection, grammatical proprieties (such as the incredibly difficult use of personal pronouns), and how to converse meaningfully and intelligently with their families. Yet, for many children, to read the language they speak so readily is a formidable chore, and to write it is still more formidable. Children who love to have a story told to them over and over again may nevertheless balk at reading it for themselves, and children who read voraciously may be just the ones who freeze up when it comes to writing.

When we try to teach children to read, we tend to overlook how mechanical are our techniques, such as those that stress grammar and phonics, and how close these techniques are to what actually blocks the children from reading. Moreover, we seldom seem to be aware of the intimate relationship between reading, conversation, and writing, so that our efforts to get children to write force upon them very often a formal style quite alien to the style in which they speak. And then we wonder why they do not read and do not write.

If, instead, reading and writing are seen as natural outgrowths of conversation, and if conversation is seen to be the child's natural mode of

communication, an order of pedagogical priority very different from those that currently exist could be established, one that would be extremely valuable for the construction of an early childhood curriculum.

Ideally, what should a reading, reasoning, and language arts program do in the early grades?

First, it should establish continuity between reading and conversation on one hand and conversation and writing on the other.

Second, it should present the materials to be mastered in the form of a unified experience, on the child's own level.

Third, it should stress meaning rather than form, by giving precedence to the relationships that language has with the world rather than to grammar.

Fourth, it ought to link the child's experience with the literary experience of mankind, so that the child's wonder at everyday life is found to be akin to the marvels of folklore and fairytales.

Fifth, it should stimulate thinking.

Sixth, it should help children make better use of more familiar words, particularly some of the very simple but problematic words that are critical to our use of language—"if," "but," "and," "all," "no," and "like"—rather than introduce them to a list of new words that they will rarely encounter again.

However, we cannot assume that eight- or nine-year-old children are as ready for philosophical discussion as they will be in another year or two. But as they grow, they move toward increased collaborative competence, logical astuteness, and mastery of language and ideas.

If curiosity is the disposition that children and philosophers share, then concern with the nature of similarity and difference is their common intellectual interest. Either we compare things with one another, or we compare them with an ideal standard. The "we" here can stand indifferently for philosophers or children or, in fact, for anyone. We discover similarities and differences by making comparisons, and to make comparisons is therefore to uncover similar and different relationships. Some children are prolific when it comes to producing fanciful or even extravagant associations; others are timid or inhibited. Nevertheless, the objective for all groups must be a craftsmanlike competence in perceiving and expressing similarities and differences; those who use language with an exuberant flair for figurative expression will always feel free to go beyond such competence, whereas those who have been virtually inarticulate will find that practice in the making of comparisons suddenly opens new vistas in the description and explanation of the world around them.

Early childhood is a period in which language is being acquired at an incredibly rapid rate. We are inclined to take an indulgent view toward vocabulary expansion, even when it represents the acquisition of increasingly exotic terms by children whose proficiency in the use of such unglamorous terms as “all,” “only,” “because,” “same,” and “different” is uncertain and unsteady. This indulgence in novelty can be short-sighted and unwise: unless one has a firm command of the basic operations of a language, the addition of new terminology is more likely to aggravate the problem than to alleviate it. Yet the problem is not one that can be resolved by a brisk review of grammar, for the problems the child faces in learning to use language are substantive as well as formal, philosophical as well as syntactic, and practical as well as logical. When the child’s syntactic, semantic, and pragmatic awarenesses are keeping pace with one another, vocabulary growth will present no significant problem.

Ambiguity

Learning a new word is not more important, in and of itself, than learning that a familiar word has not just one but a variety of meanings and can have several such meanings in a given context. When children learn about language, people, and the world in general, there is a danger that they will acquire a severely over-simplified view of these matters. They may assume, for example, that people always mean what they say and that things are always what they appear to be. The naive trust of the child in a just and benevolent order must sooner or later come to grief, as the child attempts to impose a grid of orderly understanding on a world that is many leveled, turbulent in its alterations, and frequently absurd. Therefore, equipping children with an understanding of ambiguity is a valuable preparatory discipline that readies the child not only for the puns, equivocations, and double entendres of everyday discourse but also for the rich allusiveness of literature, the double binds of human relations, and the covertness of nature itself.

Moreover, although learning about ambiguity prepares children to deal with the duplicity that frequently characterizes the world around us, it also helps children discover the relationships of words with words, things with things, and words with things. As we encounter the world, terms and things are manifest and explicit, whereas relationships seem to be much more implicit and latent. We perceive the mountain and the valley, as well as the words “mountain” and “valley,” but we are slower to realize the relationship that the mountain and the valley have to one another, the

referential relationships between the terms and their objects, or the fact that the words themselves are related to one another.

Relationships

It is when we contrast and compare that we discover relationships: faster than, busier than, equal to, later than. We also discover familial connections: mother of, cousin of, grandfather of. Likewise, we find that there are important linguistic relationships: the way some verbs “take objects” and others don’t, the way nouns may be modified by adjectives and verbs by adverbs. Out of this potpourri emerges the astonishing and monumental fact of resemblance: of words with one another, of people with one another, of things and events with one another, of words with people and with things. These resemblances we express by means of literal comparisons and by figurative means as well, for example, similes, metaphors, and analogies.

In the preceding account, liberties have been taken with the order of events, for surely small children have a very lively sense of resemblances. They perceive the world physiognomically by analogy of human characteristics with non-human ones. The cup lying on its side is perceived as a “poor, tired cup,” and the numerical 10 is perceived as “daddy and mommy.” We labor heroically to convince such children that these are “category mistakes” and that things should be compared with things, numbers with numbers, and people with people. Gradually, we succeed in bringing a degree of order into their expressions by making them see that the everyday world calls for businesslike, matter-of-fact literalness, while only the world of literary expression can accommodate their physiognomic experiences and their figurative ways of expressing such experiences. The child’s imaginative response to an animate world is replaced by an armory of conventional reflex responses to a prosaic world. Children have none of the elements of deliberate artifice that are invested in adult experience. However, adults must strive for the expression of the creativity they naturally had as children.

In other words, cognitive development is, in one respect, a sorting out of contexts: we learn not to confuse the spatial and the temporal, the auditory and the visual, the physical and the personal. The very young child, having yet to learn the boundaries of these contexts, finds no difficulty in transcending them and perceives houses as having faces, furniture as cheerful or menacing, colors as happy or sad, and shapes as awkward or graceful. Three- and four-year-olds produce metaphors

at a breathtaking rate, but so many of these metaphors appear to us to be recklessly inappropriate that we take prompt steps to strengthen the child's critical abilities. As a result, the child may go to the other extreme, where contexts and orders have been clearly sorted out and random crossovers are prohibited. Therefore, the educational process must accept responsibility for the literal-mindedness of so many of the children shaped by that process.

Awareness of ambiguity, then, is the opening wedge of the struggle to establish a dynamic balance between the child's ability to function figuratively as well as literally. In a sense, simile is the inverse of ambiguity. An ambiguous word can have several distinct meanings in a particular context, whereas a simile suggests that two different things have a definite resemblance. So ambiguity sees difference in similarity, and simile sees similarity in difference.

Similes

In simile, comparison is explicit (whether one says "X is like Y," or "X is as _____ as Y"). In metaphor, however, comparison is suppressed. In metaphor, one wishes to call attention not to a resemblance between two things normally taken to be different but to the identity of those two different things. To say "George was angry" is clinical and remote, for it merely tells us that George was a member of the class of angry beings. "George's face was like a thundercloud" has more emotional effect, although it still involves us in the making of a conscious comparison. "George's face was a thundercloud" is still more dramatic because it eliminates the comparison and speaks of the two radically different things as if they were one. Writers accustomed to using figurative language find literal statements like "George was angry" pale and anemic. Writers accustomed to using literal language find metaphors to be examples of linguistic overkill. However, both forms of expression have their purposes, and it is only when used for the wrong purpose that either mode of expression may be found inappropriate.

A simile is a claim that two things normally taken to be different are in some respect similar, an analogy is a claim that two relationships are alike. Such, at least, is the minimal analogy, taking as it does the form "A is to B as C is to D." Notice that analogies, like similes, involve likeness or similarity. Just as similes become radically dramatized when the similarity claim is replaced by an identity claim and they become metaphors, so analogies can take the form "A:B :: C:D," where the relationships being

compared are ratios and the alleged comparison is in fact a statement of equivalence. But the equivalence relationship is anything but dramatic: “3:6 :: 12:24” is simply a tautology, another way of saying “ $1/2 = 1/2$.”

Not that small children—even those who are only three or four years of age—need to be counseled by us on the creation of similes and metaphors: their fertility in these matters is far greater than that of adults. What they lack, however, is the critical sense that would enable them to judge the appropriateness or the inappropriateness of the figures of speech they can so elaborately construct. The strengthening of that critical sense can in turn help them become aware of whether their own analogical reasonings are being done well or badly.

Analogies

Many thinkers have seen analogy as the mode of reasoning that is shared by creative persons in all fields. When we express ourselves with a simile, it is because we have noted a resemblance between two things that in most other respects are different. When we express ourselves by means of an analogy, it is because we have discerned a resemblance between two relationships (or between two whole systems of relationships). Whether a sense of proportion is what makes for the ability to formulate analogies or whether the ability to formulate analogies is what makes for a sense of proportion is very difficult to say: perhaps each ministers to the other. But it would certainly appear that the early strengthening of so fundamental a skill as analogical reasoning would be a sensible strategy for both cognitive and creative development.

Analogies are often much more complicated than they appear in their minimal formulations (e.g., “Cats are to kittens as dogs are to puppies”), for they may involve entire systems or constellations of relationships being compared with one another. Someone who remarks that “the rulers of present-day South Africa run their country much like the rulers of ancient Sparta ran theirs” is drawing a complex analogy between two whole systems of government. The irony in the critic’s remark that “there was considerable analogy between the way the Schubert songs were written and the way they were sung in the concert last night” is the inference that there should have been a unity between the score and the performance, not a mere similarity.

In a striking figure of speech, the physicist Murray Gell-Mann once remarked that our inquiries into nature are so successful because “nature resembles itself.” However that may be, it would appear that scientists

search for resemblances among differences and for uniformity within diversity. Whether such uniformity is genuine and substantive or simply methodological and conceptual is a matter still debated. But whenever inductive reasoning takes place, some degree of analogical reasoning is probably also involved. On another hand, the use of analogy in artistic construction is of primary importance. Perhaps the best example would be the theme and variations approach used in music, painting, architecture, and probably, to varying degrees, in every form of art. The enjoyment of the listener or beholder is often proportionate to his or her ability to educe the analogies that have been produced by varying the elements but retaining the relationships under comparison or by varying both elements and relationships while retaining barely recognizable resemblances among the different structures. Indeed, appreciation is a form of inquiry in the sense that it compels wonder and thinking, with analogical reasoning very prominent among the forms of thinking involved.

Rule and Reason

Reasons are introduced because they are what we offer when we are trying to justify what we do. Whether or not the reason offered does justify the act in question is what makes it a good or poor reason respectively. It would be well to mention here that, in teaching thinking skills, one does not necessarily begin by teaching rules, axioms, and definitions from which the remainder of the subject is to be inferred by rigorous deduction. Particularly when dealing with children, a holistic approach is more appropriate. The students must discover some generalization that will permit them to judge any particular instance of a given problem. This method is undeniably less precise and less reliable than procedure governed by rules, but it has other advantages. It is quick, and it is not mechanical. It trains judgment and facilitates comprehension.

It is more profitable in working with eight- or nine-year-old children to ask them whether a particular instance of dialogue represents good or poor reasoning than to ask them to learn and then identify the violations of logic that they find. Eventually, the children may be taught the rules that apply to such cases and whose use gives greater protection against error than the more "intuitive" holistic approach does. The holistic approach, on the other hand, permits the student to respond to minute cues or subtle nuances that would escape a mechanical application of the rules. The rules of logic screen out gross violations, but they do not exclude a vast number of linguistic inflections that would be considered improper

reasoning in an informal sense. All the more reason, then, to sensitize children first to the look and feel of illogic and to habituate them to search techniques that raise questions of appropriateness, proportion, and analogical fitness. Later they may learn more formal techniques for detecting invalid reasoning. At the same time, to make the transition to the “formal stage” more gradual, there is nothing wrong with introducing some exercises that call for the use of logical rules.