

Reasoning Skills: An Overview

INTRODUCTION

The problem of what Philosophy is and how it relates to the contemporary concern with thinking and reasoning is one of the first items on the agenda when introducing teachers to Philosophy for Children. Professor Cannon began offering the teachers he trains an overview of these subjects in an attempt to give them a map to some of the areas he and they were to examine during the subsequent workshop. The following is a result of our collaboration in refining this material, which we now use in our teacher training workshops. We offer it in hope that it will be of use to others.

I. FOUR DIMENSIONS OF REASONING

Reasoning may be thought of as having four dimensions: formal, informal, interpersonal, and philosophical. The order in which they are given here indicates progressively higher, broader, less mechanistic, and in some ways more sophisticated levels of thinking. The order, however, does not represent a developmental sequence of abilities or skills; nor does it represent a sequencing of curricula or class lessons. Much actual reasoning manifests some aspects of each in combination. This is as true of the thinking of children at early elementary grades as well as of adults — sometimes more so. Although the four dimensions seldom occur in isolation, we focus on each separately for reasons of clarity.

1. **Formal Reasoning** consists of following patterns of logical inference without regard to subject matter. It is concerned with obtaining definite results by applying explicit rules to clearly defined concepts and statements, as in mathematics. Practice in formal reasoning develops an awareness of the need for consistency and offers tools that reinforce the careful use of valid reasoning patterns, whatever the subject matter. Formal reasoning, when used correctly, guarantees true conclusions if we start with true premises.
2. **Informal Reasoning** includes skills of critical inquiry, problem solving, and rational evaluation in connection with concrete subject matters. It is concerned with obtaining results from inquiries that do not lend themselves to a strict application of formal logic but require reasoned interpretation, clarification, and evaluation before formal principles can be applied, if they can be applied at all. Principles of justification in informal reasoning vary depending on subject matter. Practice in it develops an awareness of the need for clarity, relevance, coherence, and truth.
3. **Interpersonal Reasoning** involves reasoning in the context of other persons and different points of view and in a manner that is responsible to them. It is con-

cerned with arriving at a position that, taking into account the various points of view involved, will in turn merit their respect, if not their agreement. Practice in interpersonal reasoning develops the attitudes of a reasonable person: the willingness to offer and respond to reasons, the impartial search for truth, a respect for one's opinions and the opinions of others, and a commitment to making common sense.

4. **Philosophical Reasoning** is a matter of thinking about thinking, of clarifying and improving the tools with which one thinks and reasons about other things. It is concerned with obtaining a more satisfying version of one's own thinking or of the thinking practiced in a given subject area: a version that is more thoughtful and sensible, more fully examined and clear, more comprehensive, more impartial, free from presumption — what some have called wisdom. It includes thoughtful exploration of the most basic ideas and principles of the various subject areas, including reasoning itself in each of its dimensions.

The development of a sense of responsibility for reasoning well in young people requires, of course, that they be able to distinguish good reasoning from poor reasoning. But it is just as important for them to be held responsible for reasoning well by others with whom they identify — namely, their peers. At the same time and partly by this means, they should be encouraged to exercise the ability they have to monitor their own thinking and inquiry. Moreover, in teaching any specific reasoning skill, it is important that the student be given the opportunity to gain a sense of how that skill may be employed in real life interactions with others. These things require that all four dimensions of reasoning be developed more or less together. In our judgment, nothing accomplishes this more effectively than open-ended, peer group discussions of ideas which the young people are interested in clarifying philosophically and where each is held responsible to the group for making good sense and reasoning well.

Taken in this global way, with priority placed on helping each student realize sovereignty over his own thinking, philosophical reasoning reveals itself to be the most appropriate foundation for the development of other reasoning skills. Philosophical issues are open ended, philosophical thinking is self-reflective, and philosophical concepts are, for the most part, distinct from those areas within the curriculum in which teachers have didactic authority. This affords the possibility of a truly democratic classroom procedure: a community of inquiry where each member and each view is present for the analysis, criticism, and synthesis of the group.

That is not to say that exercises that enhance some specific or more limited part of the total spectrum of reasoning skills ought not be assigned. It is rather to highlight the role of philosophical inquiry as the central core around which critical and evaluative thinking can best take place.

II. REPRESENTATIVE EXAMPLES OF EACH DIMENSION

Formal Reasoning

1. Relational Logic
 - a. Serial Relationships: reasoning about sequences in time or space.
 - b. Symmetric, Asymmetric, and Non-symmetric Relationships: reasoning about relationships to determine what would be true if they were reversed.
 - c. Transitive, Intransitive, and Non-transitive Relationships: reasoning to see if relationships will carry over and remain true.
2. Categorical Logic: reasoning about relationships of class inclusion, e.g., syllogisms which draw a conclusion from two premises of the form "All...are...," "Some...are...," "Some...are not...," and/or "No...are."
3. Conditional Logic: reasoning on the basis of hypothetical conditions, e.g., reasoning which draws a conclusion from two premises, one of which states a hypothetical "If...then..." conditional generalization, and the other states an "instance" to which it may or may not apply.
4. Sentential or Propositional Logic: reasoning which draws a conclusion from one or more premises which compound whole sentences together using connectives such as "and," "or," "no," "implies," etc.
5. Arithmetic: reasoning which draws conclusions concerning relationships between integers.
6. Geometry: reasoning which draws conclusions concerning relationships among spatial configurations.
7. Proof Construction: derivation of logical truths from fundamental axioms and definitions.
8. In general, any pattern of logical inference for which formally explicit rules can be devised for manipulating clearly defined concepts or statements, including combinations of the above.

Informal Reasoning

1. Applying abstract principles, including formal logic, to concrete situations and contexts.
2. Categorizing objects, relationships, events — including resolving ambiguities, vagueness, and borderline cases, and carrying out activities prerequisite to formal reasoning such as identifying sentences of the same logical type and translating them into a standard form.
3. Interpreting written and spoken language — including detecting and handling ambiguity,

vagueness, and multiple levels of meaning; identifying underlying assumptions; tracing implications; and adding missing premises.

4. Identifying and exploring different perspectives — including the detection and interpretation of motivations, personal orientation, social bias, and world view.
5. Exploring and making use of analogies, models, and metaphors.
6. Making determinations of relevance.
7. Identifying and using criteria.
8. Analyzing and evaluating arguments, including identifying conclusions and supporting reasons or premises, outlining argument structure, assessing evidence and appeals to authority, etc.
9. Constructing sound arguments.
10. Making and evaluating inductive generalizations.
11. Proposing and criticizing causal explanations.
12. Ascertaining facts of various sorts.
13. Analyzing means-end relationships.
14. Problem solving of various kinds.
15. Determining responsibility and evaluating conduct using purposes, ideals, and obligations, and weighing consequences.
16. Considering contextual factors in evaluating conduct or achievement, such as similarities and differences between situations, background information, prior knowledge, and extenuating circumstances.
17. Exploring and interpreting meaning in experience, in art, and in literature.
18. Constructing complex structures of meaning, such as stories, poems, plays, paintings, drawings, songs, etc.

Interpersonal Reasoning

1. Knowing how to and being ready to reason — i.e., respond thoughtfully to reason with reason — when circumstances call for it: offering and asking for reasons, reflecting, analyzing, criticizing, inquiring further, etc.
2. Knowing how to and being willing to engage with others in rational discussion: giving the other person the benefit of doubt, clarifying what was said, exploring the motivation and perspective of others, empathizing with other points of view, coming to an understanding of one another's position, making common sense, etc.
3. Critically reflecting on one's own opinions and reasoning in relation to others: weighing just how good an argument one happens to have, giving serious consideration to other persons' criticisms, entertaining counterarguments, considering how one may be coming across to other persons and other frames of reference, etc.

4. Sticking to one's own position in the face of challenges: demanding strong and relevant arguments before changing one's mind.
5. Knowing how to go about engaging in cooperative group inquiry: speaking clearly, listening carefully, being willing to clarify and analyze, giving and accepting constructive criticism, integrating different points of view, controlling frustration, being patient, disagreeing in productive ways, etc.

Philosophical Reasoning

1. Taking responsibility for the concepts and principles with which one thinks to insure that they make good sense, with the awareness that it is possible to think in more or less sensible, more or less thoughtful ways.
2. Pursuing understanding for its own intrinsic value, and independently of external purposes and rewards.
3. Sustaining a dialectical inquiry, that is, a pursuit of a progressively more adequate understanding of things through the critical interplay of differing perspectives and, so far as it contributes to this end, changing the terms and direction of the inquiry itself as it proceeds.
4. Identifying, exploring, and critically applying principles of sound reasoning in relation to actual instances of formal, informal, and interpersonal reasoning.
5. Critically exploring and clarifying basic concepts and their relations to one another, in general and within given subject areas, including evaluating competing analyses of given concepts.
6. Critically exploring and clarifying basic criteria for rational evaluation in any area of human judgment — such as conduct, the fine arts, and the practical arts — including evaluating competing accounts of criteria for a given kind of thing to be evaluated.
7. Identifying and critically exploring the fundamental assumptions and world view implicit in a given intellectual position or cultural expression, and assessing alternative assumptions and worldviews in relation to one another.
8. Constructing conceptual frameworks or worldviews adequate to comprehend reality and human experience as a whole or in part.
9. Recognizing, exploring, and comprehending the historical-cultural context of ideas and of philosophical reflection upon them e.g., tracing the influence of one thinker or tradition of thinking upon another and how a given thinker develops his thought in relation to others.

III. THE FOUR DIMENSIONS OF REASONING AND THE TRADITIONAL DISCIPLINE OF PHILOSOPHY

Along with concern for the basic territory that the study

of reasoning includes, beginning teachers frequently worry about the discipline of Philosophy itself. It is rare that teachers come to Philosophy for Children with more than one or two undergraduate Philosophy courses. What we offer them is an overview of the field of Philosophy. In this way the applications of reasoning skills to the problems of philosophical thought can be seen within a larger context.

Philosophical inquiry can be defined, in a broad sense, as thinking about thinking, clarifying and improving for oneself the tools with which one thinks and reasons about things. Accordingly, philosophy potentially bears upon the practice of reasoning wherever it is found, whether in specific subject disciplines or generally in human life and conversation. Philosophy arises or is found whenever people become concerned with clarifying and improving the tools with which they think and reason. This conception fits well with the recent characterization of philosophy by the American Philosophical Association in its pamphlet, "*The Field of Philosophy*," (1982):

"Philosophy pursues questions in every dimension of human life, and its techniques apply to problems in any field of study or endeavor. No brief definition expresses the richness and variety of philosophy. It may be described in many ways. It is a reasoned pursuit of fundamental truths, a quest for understanding, a study of principles of conduct. It seeks to establish standards of evidence, to provide rational methods of resolving conflicts, and to create techniques for evaluating ideas and arguments. Philosophy develops the capacity to see the world from the perspective of other individuals and other cultures; it enhances one's ability to perceive the relationships among the various fields of study; and it deepens one's sense of the meaning and varieties of human experience."

TOPICAL DIVISIONS OF PHILOSOPHY

The topics of philosophical reasoning include issues dealt with in the writings of the major historical philosophers. New topics for philosophical clarification are constantly being added to the topics philosophers discuss from virtually every subject area. The broadest subfields of philosophy are commonly taken to be:

LOGIC, which aims to provide sound methods for distinguishing good from bad reasoning;

ETHICS, which critically analyzes the meanings of our moral concepts — such as right action, obligation, and justice — and formulates principles to guide moral decisions, whether in private or public life;

METAPHYSICS, which critically analyzes the most basic concepts we have for conceiving reality, whether of specific things or of the world as a whole — including space, time, substance, and causality and competing worldviews;

EPISTEMOLOGY, which is concerned to determine the nature and scope of knowledge; and

THE HISTORY OF PHILOSOPHY, which studies both the work of major philosophers and entire periods in the

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historical development of systematic philosophical reflection.

Other branches of philosophy have grown from these traditional subfields, including Philosophy of Mind, Philosophy of Religion, Philosophy of Science, Philosophy of Mathematics, Political Philosophy, Philosophy of Art (or Aesthetics), and Philosophy of Language.

PHILOSOPHY AS AN ACADEMIC DISCIPLINE

What tends to distinguish Philosophy as an academic discipline from philosophy pursued elsewhere is the systematic clarification of concepts involving whole sectors of human experience, a professional community of scholars dedicated to that end, and a history laden with significant examples of that endeavor.

Like members of most academic communities, the professional philosopher has a characteristic style, a lexicon of technical terms and special usage, and a body of classical texts that define the issues and furnish a common basis for approaches and solutions. This often intimidates the casual reader or hearer of Philosophy, especially since professional philosophers generally write for each other, without taking into account the desirability of their work reaching wider audience.

Since Philosophy for Children wants to involve non-professionals in the philosophical dialogue, the professional attitudes often represented in philosophical journals seems to us to manifest a breakdown in interpersonal reasoning. If, as we maintain, the primary function of Philosophy is to enable the thoughtful person to clarify and improve his own thinking for himself and if, as we further maintain, the development of a community of inquiry is the best device for coming to such a clarification, then it is crucial that professional philosophers make an effort to make the issues accessible and clear to the non-professional. Indeed, Philosophy for Children, unlike other areas of professional Philosophy, has an absolute responsibility to use concepts and styles that are accessible to virtually anyone. We take as a necessary condition for philosophical inquiry the demands of interpersonal reasoning: mutual consideration, mutual clarity, mutual criticism, cooperative inquiry, and common sense.

Moral reasoning is often thought of as being separate from other sorts of reasoning. This view has been enshrined in the "fact-value" distinction, a common view that places moral thought outside of the arena of rational discussion and within the realm of subjective opinion. We believe this to be an inadequate view of moral reasoning for at least two reasons.

First, moral reasoning includes all other elements of reasoning. Reasoning about moral issues requires formal reasoning, insofar as rule-governed patterns of inference are used; informal reasoning, since application of principles to concrete instances, appeal to criteria, and the evaluation of alternatives are all at the heart of moral argument (see also examples 15 and 16 of Informal Reasoning given above); interpersonal reasoning, in as much as we develop our positions within a community and justify our positions in the light of the opinions and perspectives of others; and philosophical reasoning, since moral reasoning often includes the re-assessment of fundamental concepts and principles.

But there is an even more crucial issue. Although moral reasoning includes its own particular concern — questions of human value, considerations of the universality of claims, and the good-making characteristics of actions moral reasoning is more than just another domain of rational inquiry. Globally understood, moral reasoning permeates the entire rational enterprise. The heart of rationality is surely the appeal to the mutual recognition of independent minds. And a rational person is surely one who regards others as capable of raising considerations that deserve to be taken seriously into account and answered, considerations which otherwise might fail to be raised at all. In this respect, rationality itself requires that other persons always be treated as ends to whom one must be answerable. It follows that moral considerations, far from being tangential, are of the essence of rationality. Thus, the notion of an interpersonal dimension of reasoning as we have presented includes an essentially moral component.

To engage in rational inquiry that in principle encompasses all four dimensions (or at least the first three) is thus to assume that each individual be responsible for his own position as well as to the perspectives and criticisms of others and that, whatever position is maintained, it is maintained with personal integrity, with a sense of the urgency of the issue and with an openness to changing one's mind as good reasons for doing so come to light. For this reason, we believe that competence in interpersonal — hence moral — reasoning is at the very heart of what education in good reasoning is all about. And that is why education in good reasoning is so necessary to prepare young people for responsible citizenship in a democracy. To accomplish this end, the most effective curriculum developed thus far, in our judgment, is Philosophy for Children.

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