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ABSTRACT

A study was conducted to investigate developmental aspects of the logical organization of reasons among 30 boys and girls from each of the first, sixth, and tenth grades. Participants were administered the Responsibility Story Test, a measure consisting of stories portraying moral dilemmas and corresponding semistructured interview schedules. Interview questions requested justification for subjects judgments of what story protagonists should and must do. Subjects' responses were classified as instrumental or normative. Additionally, subjects' elaboration of their basic premise by offering subsidiary information was assessed, complexity of arguments was rated, and the number of simple clauses in each response was calculated. Results indicated that tenth graders gave more arguments and were more likely to include explicit reference to contrasting or alternative arguments than were sixth and first graders. Tenth graders also qualified their inference rules by explicitly stating more contextual constraints on the application of the rules. Sixth graders produced longer reasons than did first graders. Elaboration among sixth graders was similar to that of tenth graders in amount and kind, but, while sixth graders gave more complex reasons than did first graders, their reasons were not as complicated as those of tenth graders. First graders gave essentially single-premise reasons. They were able to use both instrumental and normative logical schemata, but they included virtually no complex argumentation or elaboration of premise. (RH)

A Developmental Study of Giving Reasons

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A developmental study of giving reasons

Problem. The purpose of this study was to investigate developmental aspects of the logical organization of reasons. Giving reasons in justification and explanation of actions is a central human activity. Further, psychological research in topics such as moral reasoning and social cognition often use reasons given in interviews to infer underlying concepts and their development. However, not much is known about reasons as such, i.e., how the concepts are organized to form logical, adequate, and convincing arguments. Other forms of discourse, notably narratives, have been actively studied and seem to develop with age. The present study was conducted to determine whether and how the act of giving a reason develops. A model of the process of giving reasons is shown in Figure 1.

Subjects. Ninety children participated in the study, thirty from each of the first, sixth, and tenth grades. They were evenly divided between boys and girls and came from middle to upper middle class backgrounds.

Procedure. All children were interviewed individually at school by adults on several occasions, and each child had sessions with both male and female interviewers.

The basic instrument used in the interview was the Responsibility Story Test, which consists of a set of stories portraying moral

dilemmas and corresponding semi-structured interview schedules. The format was basically a series of questions requesting justifications for the children's judgments of what the protagonists should and must do. From transcriptions of the clinical interviews, three reasons were selected for each subject: the answer to a 'why should ...?' question, the reply to a 'why must ...?' question, and the longest reason (by word count). (see Tables 1 & 2)

The basic logic of their reasons was classified as instrumental (a goal oriented logic which focus on the consequence of the action as a premise in a practical syllogism leading to the moral judgment as a conclusion) or normative (schemata in which inference rules were aplied to actions, characterizations, or interpretations of the situation.) (using connectives described in Table 3) Elaboration of the basic premise by subsidiary information included temporal and conditional antecedents, causes, and statements of clarification. Such elaborations were essentially subarguments for the basic premise of the practical syllogism. In addition, complex arguments were constructed by combining basic premises (and their subarguments); this was accomplished by conjunction, disjunction, opposition, and qualification of independent premises. Finally, the number of simple clauses (an index of productivity) was calculated.

All coding was performed blindly by coders who had established reliabilities of .85 or better (category agreement) on each variable. Data were analyzed primarily by a Grade(3) x Sex(2) ANOVA design.

Results. Results are summarized in Tables 4, 5, & 6.

The main findings were that first graders gave essentially single premise reasons. They were able to use both instrumental and normative logical schemata, but they included virtually no elaboration of the premise or complex argumentation.

Sixth graders produced longer reasons than the first graders. While the logic of their reasons varied significantly across dilemmas, there were no grade differences observed in inference rules (instrumental or normative). Elaboration was similar to that of tenth graders in amount and kind, but while the sixth graders did give more complex reasons than first graders, they were not as complicated as those of tenth graders, in the sense of using multiple independent premises.

Tenth graders were distinct from sixth graders in the complexity of argument construction, while being similar in other respects. Specifically, they gave more arguments and were more likely to include explicit reference to contrasting or alternative arguments. They also qualified their inference rules by explicitly stating more contextual constraints on the application of the rules.

Conclusions. The results suggest that first graders responded to the moral why-questions as essentially requests for a single premise argument.

Both the older groups widened the scope of their answers to include subarguments to buttress the main premise. This entailed spelling out some of the steps in the chain of reasoning which led them (and could or should lead the interviewer) to that premise.

It was primarily the tenth graders who recognized that in the context of a dialogue about a moral dilemma, a why-question about a judgment is a request for explicit consideration of the contradiction of moral principles. Tenth graders not only chose and justified one horn of the dilemma, but they also tried to rebut the alternative.

In short, it seems the ability to give reasons is age-related. From the perspective of the requirements of giving reasons in a dialogue about a moral dilemma, the development has two related aspects. The older children were more able to communicate the thinking processes which led to their argument, and the adolescents were most attentive to the problem of resolving the contradiction, the basic task in responding to a moral dilemma.

Figure 1

A Model of Reason-giving

Steps in the process	Examples of questions
Comprehension and memory of the story-dilemma	What does this story mean?
↓	
Judgment	A should do X (& not Y).
↓	
Moral why-question	Why should A do X (& not Y)?
↓	
Sociolinguistic analysis	Should I answer?
↓	
Argument type	What kind of practical syllogism should I give?
↓	
Explication	How explicitly should I express the syllogism?
↓	
Elaboration	What should I add to bolster the premises?
↓	
Complex argument construction	Should I give more than one reason?
↓	
Give reason	

Table 1

Types of arguments

Type/subtype	Definition/example
Consequences	Asserts goals or future consequences of actions.
Good	Good consequences from protagonist's perspective.
Bad	Bad consequences from protagonist's perspective. Because the workers will all lose their jobs.
Situational	Asserts present or past states of affairs relevant to moral norms.
Interpretation	Gives relevant features of the situation or categorizes actions. Because there is a law against it. Because not going would be like breaking his promise.
Characterization	Gives social or psychological characterization of persons. Because he likes his friend. Because he is a city official.
Action	Gives a concrete action with moral implications. Because he promised. Because he invited him to the party first.

Table 2

Argument Schemata

Consequences (Instrumental)	
Positive consequences of the presupposition (PCP)	A wants Z If A does X, then Z A should do X.
Negative consequences of the contrary (NCC)	Not both X and Y A does not want Z If A does Y, then Z A should do X.
Situation (Normative)	
Action	A did Y A should do X.
Characterization	A is P A should do X.
Interpretation	X is P A should do X.

Note: A ranges over actors.

X and Y range over actions.

Z ranges over states of affairs.

P ranges over predicates.

Table 3

Connective Coding Categories

Category	Examples
Andthen	Because his parents will come home and be angry.
To	Because her friend will do things to help her in the future.
Because	Because Tom owes him a favor because Fred helped him out in the past.
Ifthen	Because if he won't get caugnt, he doesn't have to obey the law.
But	Because he's his friend, but Harry did ask him first.
IE	Because he'll be punished. He might not be able to watch tv for a whole week.
And	Because he's not a good friend and it's the law.
Or	Because he has to obey the law or obey his conscience, so I think he should be true to himself.

Table 4

Summary of Global Differences between First and Sixth and Tenth Graders

Level/step	Output measures	Direction	p
Global			
Fluency	Mean propositions	1<6,10	.01, (.01[a])
Connectives	Because	1<6,10	.01
	But	1<10	.05[b]
	IE	1<6,10	.01. (01)[a]
Embeddedness	Left branching	1<6,10	.01, (.01)[a]
	Right branching	1<6,10	.01
	Recursive nesting	1<6,10	.01

Note: In those cases in which the first graders differed from both the sixth10 and tenth graders, only one level of significance is given if both levels were the same.

[a] Grade x sex interaction.

[b] Between first and tenth grades only.

Table 5

Summary of Process Differences between First and Sixth and Tenth Graders

Level/step	Output measures	Direction	p
Process			
Sociolinguistic	Preschematic	1>6,10	.01
	Null reason	1>6,10	.05
	Concrete judgment	1>6,10	.01
Argument Type	Total Arguments	1<6,10	.01,(.01)[a]
	Action	1<6	.03[b]
Explication	NE Explicit Ifthen	1>6	-, (.01)[a]
	NE Explicit Andso	1<6,10	.01/.05
	E Explicit Andso	1<10	.01[c]
Elaboration	Total elaboration	1<6,10	.001
	IE	1<6,10	.01
	Andthen	1>10	.01[c],(.01)[a]
	Ifthen	1<6,10	.10
	Because	1<6,10	-, (.01)[a]
Argument construction	Total construction	1<10	.01[c]
	Simple	1>10	.01[c]
	And	1<6,10	.05
	But	1<6,10	.01
	Or	1<10	.025[c]
	Because/Ifthen	1<6,10	.01
	2nd degree	1<6,10	.05/.01
	3rd degree	1<10	.025[c]
	But/Because	1<6,10	.05/.01

Note: In those cases in which the first graders differed from both the sixth10 and tenth graders, only one level of significance is given if both levels were the same.

[a] Grade x Sex interaction.

[b] Between first and sixth grades only.

[c] Between first and tenth grades only.

Table 6

Summary of Differences Between Sixth10 and Tenth Graders

Level/step	Output measure	Direction	p
Global			
Fluency	Mean Propositions	(6<10)	- , (.05)[a]
Connectives			-
Embeddedness	Recursive nesting	6<10	.05
	Left branching	(6<10)	- , (.05)[a]
Analysis of request			
Sociolinguistic			-
Argument type	Total arguments	6<10	.05
	Consequences		-
	Bad consequences	6>10	.08
	Good consequences	6<10	.08
Explication	E Explicit Andso	6<10	.05
	NE Explicit Ifthen	6>10	- , (.01)[a]
Elaboration	Andthen	6>10	.05
Argument	Total construction	6<10	.01
construction	Simple	6>10	.01
	But	6<10	.025
	Or	6<10	.025
	Because/Ifthen 3rd degree	6<10	.025
	But/Because	6<10	.10

[a] Grade x Sex interaction.