

## **Questions and Question Asking in Verbal Discourse: A Cross-Disciplinary Review**

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*Received September 8, 1975*

*The linguistic, psychological, and social aspects of questions and question asking in verbal discourse are discussed. Classification taxonomies for question forms and functions are outlined. Research on the processes of question formation, question selection, and question asking is reviewed. Descriptive data for the occurrence of question types in verbal discourse are presented. Suggestions are made concerning further descriptive and experimental approaches to the study of questions.*

### **INTRODUCTION**

Question asking is one of those mundane and everyday activities which we spend considerable time engaged in yet have a very rudimentary technical understanding of. Ask people you know to tell you why they ask the questions they do. A shrug. Or why they ask questions at all. They will probably respond (if they don't think the question too absurd) by telling you that they ask questions to find out something they don't know. But ask them how, out of all the possible things they don't know when they ask a question, do they choose to ask a particular question, in a particular way. Wouldn't

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another question have been as good? Ask them if they think questions also convey information as well as request it—as in the following<sup>3</sup>:

*You did what?* (1)

*So that's your little game, is it?* (2)

*Are you sure you can do that?* (3)

These questions all express the attitude held by the question asker, namely, surprise or disbelief, sarcasm, and doubt, respectively. You might ask your friend how to distinguish questions from nonquestions—by characteristic intonation pattern, by syntactic structure, by semantic appropriateness, by nonverbal gestures, or perhaps by all of these. All of these aspects of questions and question asking are open to empirical investigation.

However, a prerequisite for empirical study is an adequate theoretical framework which suggests the most fruitful avenues of exploration. At present, there is no such theoretical framework for question asking. In this article, I shall attempt to draw together research from linguistics, sociolinguistics, cognitive psychology, and developmental psychology to make a more comprehensive and systematic statement about question asking. This represents only a first (perhaps feeble) step toward an integrated conceptualization of question asking. Moreover, my focus will be exclusively on the use of questions in conversational discourse. Thus I will omit mention of research on question asking in problem-solving situations (e.g., Kearsley, 1975a; Kochen and Badre, 1974; Rimoldi, 1971) and also a considerable amount of work done in analytical philosophy (for reviews, see Hamblin, 1967; Kearsley, 1975b). There are, as well, studies of question asking as it pertains to educational applications (e.g., Chaudhari, 1974; Frase, 1968; Hunkins, 1972), which, while being of practical importance, are not germane to the theoretical purposes of this article.

The plan of exposition is as follows. The first section reviews our linguistic knowledge regarding the forms of questions and leads up to a taxonomy of question forms. The next section discusses different functional perspectives on question asking. This is summarized by a taxonomy of question purposes. The third section considers the question processes of formation, selection, and asking. In the fourth section, descriptive data on question asking in verbal discourse by children and adults are presented. The concluding section suggests directions for future research and theory and attempts to locate the study of question asking in the mainstreams of research in cognitive psychology, psycholinguistics, and artificial intelligence.

<sup>3</sup>Underlined words indicate stressed intonation.

### QUESTION FORMS

In this section, we are concerned with distinguishing the different types of questions on the basis of structural characteristics or form. The functional distinctions made in the next section allow finer discriminations to be made within and between the structural categories. Although question form is based mostly on syntactic criteria and question function on semantic characteristics, it is not possible to draw an exact correspondence between question form and syntax and question function and semantics. This is partly because some aspects of form classification are semantic and some aspects of functional classification are based on syntactic considerations, and partly because it is often difficult to distinguish the syntactic from semantic features of questions.<sup>4</sup>

The taxonomic scheme indicated in Fig. 1 is intended to be a fairly comprehensive classification of question forms (but not definitive). An initial distinction is made between verbal and nonverbal questions. Nonverbal questions can be overt or covert: overt nonverbal questions are gestures which serve to elicit a verbal response such as questioning glances, raised eyebrows, shoulder or hand shrugs, and puzzled facial expressions; covert nonverbal questions are internally directed questions we ask and answer ourselves.

<sup>4</sup>Hudson (1975) has looked at the syntax-semantics issue in detail with respect to yes/no questions (which he calls polar questions).

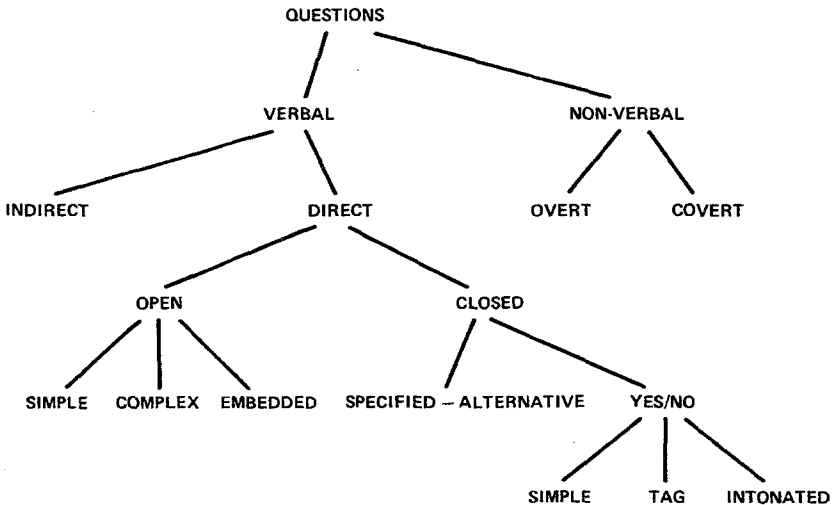


Fig. 1. A taxonomy of question forms.

Verbal questions subdivide into direct and indirect questions. Indirect questions (Baker, 1968) are declaratives which contain an embedded partial interrogative phrase, e.g.,

*I wonder where the house is.* (4)

*It isn't obvious what you mean.* (5)

Although these are not "true" questions in the syntactic sense (since they lack question marks), they still serve the essential purpose of a question, which is to elicit a verbal response from the addressee. Direct questions are indicated in written discourse by the question mark and in verbal discourse by certain intonation patterns. They can be subdivided into two major groups: open (fill-in-the-blank or lexical gap) questions and closed (disjunctive or whether) questions. The answer to an open question belongs to an essentially infinite set of possibilities not specified in the question; the answer to a closed question is from a fixed alternative either explicitly or implicitly contained in the question. Open questions are always formed by the use of wh-constructions and hence are also called wh-questions. Wh-questions typically have a falling intonation pattern with stress on the wh-word (however, there are variations; see Watanabe, 1973, and footnote 7). It is possible to distinguish simple wh-questions with a single wh-word [usually in the initial position, but not always, e.g., question (1)] from complex wh-questions (Kuno and Robinson, 1972) such as

*Who said what to whom?* (6)

and from embedded wh-questions such as

*Why did you do that?* (7)

which contain an embedded closed-form question.

Closed-form questions are usually indicated by their rising intonation pattern.<sup>5</sup> Two major subtypes can be identified: specified alternative and yes/no forms. Specified alternative questions provide the alternatives which are acceptable as an answer, e.g.,

*Do you want coffee, tea, or hot chocolate?* (8)

Yes/no questions require confirmation or denial of the assertion of the question. They may be answered by modal quantifiers such as "sometimes," "never," "maybe," and "possibly." Three subforms of yes/no questions can be

<sup>5</sup>Langacker (1970) has argued that if we view yes/no questions as abbreviated disjunctive questions, then the usual rising intonation of yes/no forms is simply the nonfalling intonation of the first clause of a disjunctive question.

distinguished. Simple yes/no questions are those formed by an initial auxiliary verb, e.g.,

*Is that dog dead?* (9)

Tag-type yes/no questions (Arbini, 1969; Kohler, 1973) involve inverted auxiliaries at the end of the question, e.g.,

*That dog is dead, isn't it?* (10)

The third type of yes/no questions, intonated declaratives, are indicated by the raised intonation, e.g.,

*That dog is dead?* (11)

It is always possible to consider yes/no questions as abbreviated forms of specified alternative questions.

*Is that dog dead (or not)?* (12)

is the expanded form of (9). However, yes/no questions as they actually occur omit the full disjunctive except for particular expressive cases (discussed in the next section).

This taxonomy of question forms may be useful for descriptive analysis. It poses the interesting question of how these different forms are generated and what different cognitive purposes they serve. However, a purely structural analysis neglects important functional differences between question types. Thus a taxonomy of question forms must be supplemented by one for question functions.

## QUESTION FUNCTIONS

From the preceding discussion, it can be seen that there is no single structural form or set of characteristics which describes all types of questions. However, all questions share a common functional intent: to elicit a verbal response from the addressee (Chafe, 1972). This functional definition excludes rhetorical questions (to which no answer is expected or required) such as

*Who cares?* (13)

*You know?*<sup>6</sup> (14)

<sup>6</sup>The commonest rhetorical form is a tag question, e.g., *Nobody likes to work anymore, you know?* Question (14) as it stands is not necessarily a rhetorical question.

and includes indirect questions such as (4) and (5). It is possible to think of questions as imperatives which demand linguistic responses rather than overt action or behavior, as Katz and Postal (1964) have suggested. Also, Aqvist (1965) has constructed a formal system for interrogatives in which questions are considered epistemic imperatives: requests to remove ignorance.

While the functional definition above describes the necessary purpose of a question, it is not sufficient. Questions serve various functions over and above the elicitation of verbal responses. A possible classification for these purposes is outlined in Fig. 2. This scheme is much more speculative than the one presented for question forms. It is also important to realize that while the categories of the structural hierarchy shown in Fig. 1 are exclusive of each other, the categories in Fig. 2 are not. This means that a particular question may have two or all of these purposes simultaneously. I have suggested four different functional types of questions: echoic, epistemic, expressive, and social control.

Echoic questions are those which ask for the repetition of an utterance or confirmation that an utterance has been interpreted as intended. Questions such as "Pardon?" or "What?" or "Huh?" demand the literal repetition of an utterance. However, in the following exchange

Q: *What was the best year for selling yo yos?* (15)

R: *When were yo yos big sellers?* (16)

question (16) is asked to confirm that the interpretation of the original question (15) is correct. As illustrated in this example, echoic questions of this type are often paraphrases of the original question rather than literal repetitions.

Epistemic questions serve the purpose of acquiring information. They have been subdivided into referential and evaluative types. Referential ques-

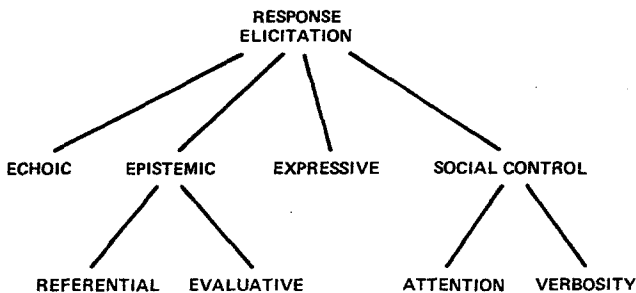


Fig. 2. A taxonomy of question functions.

Table I. Modes of Wh-Questions<sup>a</sup>

Wh-question	Mode	Example
Who (whom)	1. Unique person specification 2. Role specification	Who is that? John Smith. The mailman.
Where	1. Geographical/common knowledge 2. Relative location 3. Shared private knowledge	Where does he live? In Canada. Two miles south. Near your parents.
When	1. Objective date 2. Relative time 3. Personal age 4. Shared private knowledge	When were you there? In 1975. Last year. When I was 20. Before we met.
How	1. Evaluative (ascriptive) 2. Evaluative (nonascriptive) 3. Explanation of procedure 4. Justification (same as why-mode 1)	How are you? How many are there? How do you play this? How come I always lose?
Why	1. Justification of reasons 2. Puzzlement 3. Information 4. Explanation	Why did you do that? Why doesn't this work now? Why do you ask? Why did that happen?
What	1. Specification of objects, activity, definition	What kind is that? What do you mean? What is he doing?
Which	1. Specification of objects, attributes	Which book do you want?
Whose	1. Specification of ownership	Whose car is that?

<sup>a</sup>Adapted from Robinson and Rackstraw (1972).

tions are intended to provide contextual information about situations, events, actions, purposes, relationships, or properties. The various modes of wh-questions illustrate the major types of contextual features which can be filled in by referential questions. Table I lists the modes for each kind of wh-word compiled from the analysis of Robinson and Rackstraw (1972) as well as Isaacs (1930) for why questions. Evaluative questions are asked not for the informational content of the answer but rather to establish the addressee's knowledge of the answer. Evaluative questions are asked in various types of test situations (examinations), interviews, discussions, etc. Small children also use this mode extensively as a means of demonstrating their knowledge to others.

When questions are used for an expressive purpose, they convey attitudinal information to the addressee. The expressive content of the question is independent of its information content. Particular syntactic patterns (and their corresponding intonation patterns) convey different expressive information. Thus the question

*Are you coming or aren't you?* (17)

which is the full disjunctive form of a yes/no question usually expresses impatience, whereas

*Aren't you coming?* (18)

which uses the negative form of the auxiliary verb typically indicates either surprise or disbelief, and

*You are coming, aren't you?* (19)

with the tag form of the auxiliary expresses a state of doubt. It should also be pointed out that yes/no questions can be worded so as to express either a neutral, negative, or positive expectation (Quirk *et al.*, 1972). The question

*Are you coming?* (20)

indicates a neutral expectation, while (18) indicates a negative expectancy and (19) without the stress on "are" conveys a positive expectancy.<sup>7</sup> Wh-questions can also be used for expressive purposes, e.g.,

*What do you think of that?* (21)

conveys confidence, (13) expresses apathy, and (7) may indicate surprise if the "why" is stressed.

The social control purposes of questions are also independent of the information content. Questions are used for social control when they are used to exert authority by maintaining control of the discourse. Attentional questions (the "Hey, know what?" questions of children, for example) allow the questioner to take over the direction of the discourse. Their metamessage is "listen to me" or "think about this." Questions asked for the purpose of verbosity are asked only for the sake of politeness or to sustain conversation.

<sup>7</sup>I assume it is obvious that the location of the stressed word in the question results in different expressive meanings. Consider:

*Why did you do that?*  
*Why did you do that?*  
*Why did you do that?*  
*Why did you do that?*  
*Why did you do that?*



They serve to avoid embarrassing silences in conversations and maintain interaction between speakers. The question asker may not really be interested in the answer and in fact may not even pay attention. Most cocktail party questions are probably of this flavor.

I have already mentioned that these functional categories are not exclusive of each other. Thus while some questions are intended to serve only one purpose, many have multiple intents. For example, questions (15) and (18) serve "pure" referential functions while (21) has both referential and expressive purposes; (11) may be both expressive and echoic and (7) both referential and social control. The use of the different purposes likely depends on various situational variables (e.g., number of people involved in the discourse, degree of intimacy between questioner and question answerer, peer pressures) and individual variables (e.g., age, education, sex). For example, Bernstein's (1962) "restricted" and "elaborated" codes may reflect class-specific preferences for the use of the social control and expressive function of questions rather than the epistemic function. There is a definite need here for systematic observation on how these individual and situational variables influence the use of questions.

We have now considered two taxonomic schemes which classify questions on the basis of either form or function. Although I will not take the space to elaborate, there are simple and complex relationships between form and functional categories. For example, most referential questions have open forms (wh-questions) while most expressive uses probably involve closed forms. Moreover, it seems likely that open forms are used for epistemic purposes when we have little knowledge of the subject but closed forms are used when it is familiar (this is similar to a suggestion of Cygan, 1967, regarding the function of wh-words). These suggestions are, however, guesses and require empirical confirmation. The taxonomies can be useful for organizing and suggesting empirical studies about questions and may be helpful for discussing question processes. This is a topic to which we now turn our attention.

## QUESTION PROCESSES

This section discusses three levels of question processes: question selection, question formation, and question asking. The first is concerned with the essentially cognitive problem of how a particular question arises; the second with the generative rules by which a question, once decided upon, is formulated linguistically; and the third with how questioning is part of and

maintains conversation and discourse. Although I will discuss each of these as separate processes, it is a mistake to think of them as in any way independent—they all occur together and concurrently.

The process of question selection involves how the present situation or cognitive context determines exactly what is to be asked about and what expressive mode (if any) is to be used. It also involves the basic choice between asking an open- or closed-form question. This aspect of question process falls within the domains of cognitive psychology (including attitude research) and psycholinguistics. Berlyne (1960, 1965) is one of the few psychologists who has worked extensively in this area. He postulates an epistemic drive which causes the organism to be curious, engage in exploration, and ask questions. In particular, questions arise due to conceptual conflict, i.e., when there exists conflict between incompatible symbolic response patterns in the form of doubt, perplexity, incongruity, contradictions, confusion, or irrelevance. Questions serve the purpose of reducing subjective uncertainty and conceptual conflict and, ultimately, the epistemic drive. Closely related to this position are various theories of attitude formation and change in social psychology. Common to cognitive consistency theories (see Abelson *et al.*, 1968) is the idea that the individual attempts to maintain a system of consistent beliefs and to avoid “imbalances” or reduce dissonance. From this perspective, questions may be asked to either weaken the degree of belief or plausibility of a dissonant attitude or strengthen that of a favorable one. Some mechanism of this sort is necessary to account for the expressive functions that questions can serve.

Neither the ideas of Berlyne nor those of the cognitive consistency theorists tell us anything about how a particular question comes to be selected in relation to the specific context of occurrence. They suggest how questions *in general* arise. In order to explain the generation of a particular question, we need a theory which relates the context to the conceptual structure of the individual. Elsewhere, I have attempted such a theoretical formulation limited to referential questions (Kearsley, 1973c). The essential notion is that question asking involves filling in the “gaps” in a cognitive model, where a cognitive model is defined as that subportion of an individual’s entire conceptual structure which currently conveys the meaning of events or objects in the immediate environment. Filling in the “gaps” involves specifying the concepts and relations in six basic reference frames: space, time, properties, causes, procedures, and roles. I suggest that *wh*-questions attempt to select subsets of relations for a reference frame relevant to the current context while disjunctive and *yes/no* questions (closed forms) are intended to specify particular concepts within a selected reference frame. The theory is intended

to predict the content and form of questions to be asked, given the details of a specific context and the conceptual structure of a particular individual. However, the actual syntax of question formation is beyond the scope of the theory. For this we must look to research in linguistics and psycholinguistics proper.

The most thorough consideration of the transformational rules for question formation has been the work of Katz and Postal (1964). Briefly, their view is that questions are derived from an underlying phrase structure by the application of transformation rules of deletion and transformation. They suggest two semantic markers: a *Q* morpheme which indicates that the phrase is a question (indicates the condition: "I request that you answer...") and a *wh* morpheme which specifies the element that is "questioned." The *wh* morpheme is considered to operate as a scope marker for the *Q* morpheme. Disjunctive questions are also considered to be *wh*-questions with a particular *wh* + either/or adverbial and an additional deletion transformation which removes the *wh*- construction. Figures 3a and 3b show the phrase structure

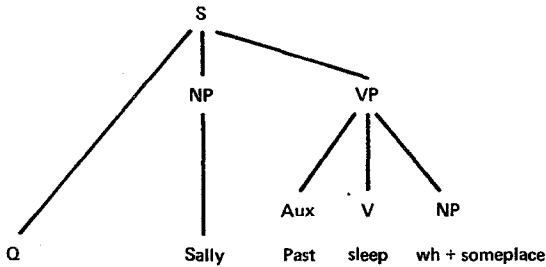


Fig. 3a. Phrase structure of *Where did Sally sleep?*

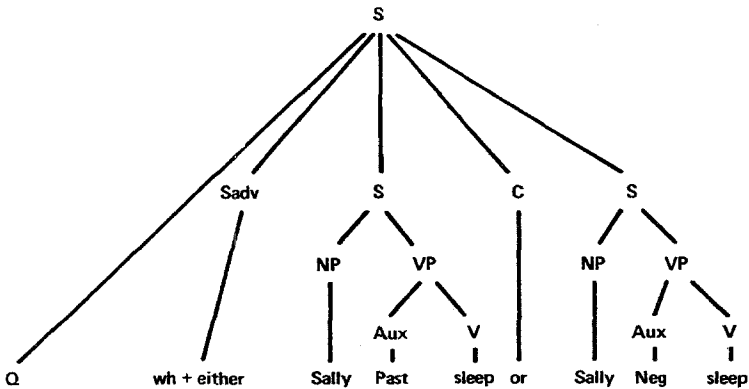


Fig. 3b. Phrase structure of *Did Sally sleep (or not)?*

diagrams for a wh-questions and a yes/no question. The five transformation rules they propose for question formation do cover echoic questions, but they are inadequate with respect to tag form questions or expressive function.

Others (Baker, 1970; Koutsoudas, 1968; Malone, 1967) have suggested modifications or extensions to these question transformation rules, and Baker (1970) has proposed a universal rule of question word movement (see also Frantz, 1973, for a criticism of this rule). Chafe (1972) has provided a generative semantics account of question formation.

There seems to have been relatively little empirical work concerned with the processes of question formation. Brown (1968), studying the wh-questions asked by children, suggested the idea of a two-stage transformation from a normal form (*What will John read?*) to an intermediate form (*What John will read?*) then to an occasional form (*John will read what?*) in which the "what" is to be replaced by the appropriate lexical unit. He provided evidence for the use of intermediate and occasional forms in children's question asking. Wright (1972) showed that fewer errors were made in answering questions about a sentence when both the sentence and the question were in the same voice (active/passive). She suggests that we may simply choose the transformation which minimizes or optimizes the information or memory reorganization. Fillenbaum (1968, 1972) has investigated the constraints that the question imposes upon the expected answer. He demonstrated differences in processing times between compatible and incompatible answers as well as differences in recall for expected and unexpected answers to yes/no questions.

Up to this point, we have discussed only the question processes inherent in the generation of a single question. However, questions are asked as part of an interactive and social discourse. Thus question asking must be viewed as a social activity as well as a cognitive one and approached from a sociolinguistic perspective. There have been a few investigators who have studied question asking in this framework. Mishler (1975) considers question asking as a mode of exerting authority or control over others and has provided empirical support from studying children's discourse in elementary school. He suggests that the actual interrogative unit is not question and answer but question (Q), response (R), and confirmation (C). He identifies three modes by which such interrogative units form connections in conversations: chaining, in which the conversation is extended through successive questions by the initial questioner; arching, in which it is continued by the respondent's question response; and embedding, in which there are two responses to a question. It is suggested that these different patterns reflect role relationships between speakers. Chaining is used by the questioner to maintain control of the discourse; arching is used to regain control when asked a question; and embedding

reflects a more equal power structure. Mishler's evidence indicates that teachers use chaining and arching to maintain control over their pupils and also that children use these patterns to exert authority over each other. Mishler also discovered the interesting result that the probability of successive questions follows a simple exponential curve and is independent of the temporal location of the utterance in the conversation. It will be interesting to see if this quantitative finding holds up in other types of discourse.

Robinson and Rackstraw (1972) have completed an extensive analysis of the question-answering behavior of middle-class and working-class children, in order to test Bernstein's notions of class differences in language. They found evidence to support the ideas of "restricted" and "elaborated" codes previously mentioned. There are other sparse references in the literature to qualitative and quantitative differences in question asking/answering patterns between different social classes (e.g., lower-class children asking fewer questions in general) as well as cross-cultural differences. The comprehensive study of Moravcsik (1971) on yes/no questions forms in 85 different languages and the study of Terry (1970) on French interrogative forms have provided some interesting evidence pertinent to the relativistic and universal aspects of questions.

To summarize this section, we have only sketchy and partial knowledge about the three levels of question processes that have been considered above. There has been little empirical work done to test the existing ideas about question formation and selection, and there is a relative paucity of theoretical developments to encourage such efforts. Even less understood is how these different levels interact and occur together in interactive discourse. In fact, we still lack even basic descriptive data about question asking in naturally occurring verbal discourse. The next section reviews some of the data available from developmental studies and presents some data from adult discourse.

## **DESCRIPTIVE ANALYSES OF QUESTION TYPES**

There seems to have been little descriptive analysis of questions as they occur in actual verbal discourse. The data available come from developmental studies of language. Piaget (1928) suggested that question-asking behavior reflects the stage of cognitive development reached by the child, and hence changes in the content of questions over age should reflect cognitive growth. An early study by Davis (1932) and a more recent one by Meyer and Shane (1973) classified children's questions (in a school situation) using the content categories suggested by Piaget: causality, reality, human actions and inten-

Table II. Percentage of Question Types by Age Groups

Question type	School grade			
	1-3	4-6	7-9	10-12
How	20.7	32.0	20.2	12.8
Why	25.2	21.0	30.1	32.3
When	2.6	2.7	1.2	2.9
Who	2.9	3.4	2.3	1.3
What	11.3	15.8	14.8	14.9
Where	2.5	0.8	0.7	1.2
Auxiliaries	14.6	24.4	30.5	34.5

tions, classification, and calculations. Both studies confirm that the number of questions about physical causality decline with age and questions about human actions and intentions increase with age. Questions about reality comprise the greatest proportion of older children's questions. Davis included a comparison sample of adult questions and found that over half of these were about actions and intentions. As well as analyzing content, Meyer and Shane analyzed questions by type across four age groups. Their data are given in Table II. The percentage of "why" questions increases and the percentage of "how" questions decreases across the four age groups sampled. In addition, the proportion of auxiliary-type questions increases relative to wh-questions. They note that the more "sophisticated" children use the auxiliary (closed-form) type question more frequently. This developmental pattern corresponds to the observations of Yamamoto (1963) using an "Ask and Guess" game.

With respect to language acquisition, the earliest question forms of the child rely on intonation and context for their meaning such as "Daddy?" for "Where is Daddy?" The wh-questions appear next, with "where," "who," and "what" learned first, followed by "when," "why," and "how" (see Weeks, 1974). Questions using auxiliary forms are infrequent in early childhood, with wh- and intonated questions being most common. They also appear to be qualitative changes in question types in the age span of 7-9 years when children acquire the idea of class concepts and equivalence relations (Mosher and Hornsby, 1966).

In order to obtain comparable data for question types in adult conversation, two sources of conversation were analyzed: the transcripts of five successive group psychotherapy sessions<sup>8</sup> and the conversational portions

<sup>8</sup>I would like to thank Dr. J. McLeish, Department of Educational Psychology, University of Alberta, for making the transcripts of the psychotherapy sessions available to me for the descriptive analyses.

Table III. Percentage of Question Types in Group Psychotherapy Sessions (All Participants)

Question type	Session					
	1	2	3	4	5	6
Wh-questions						
How	17.8	13.4	9.7	14.2	28.7	15.8
Why	8.9	8.6	7.5	9.7	2.1	7.9
What	34.6	20.7	33.8	13.4	12.8	24.1
Where	0.5	0.8	3.1	1.4	—	0.9
When	—	0.8	2.3	—	—	0.6
Who	0.5	1.2	—	3.7	—	1.4
Total wh-questions	64.0	46.1	55.6	43.4	43.6	51.4
Yes/no questions <sup>a</sup>						
Have/has	2.0	—	—	1.4	3.1	1.1
Are/is	5.2	6.4	12.8	10.4	16.0	9.0
Do	4.7	14.4	11.3	16.4	13.8	11.7
Obligatories <sup>b</sup>	1.5	1.7	2.2	6.7	6.3	3.2
Total yes/no questions	13.6	22.4	26.3	35.1	39.4	25.1
Rhetorical questions	16.6	21.1	24.1	10.4	11.7	17.6
Intonated questions	5.0	10.3	1.5	11.2	5.3	7.1
Questions/all utterances	22.7	27.9	22.2	16.5	12.6	20.5

<sup>a</sup>Includes negative forms.

<sup>b</sup>Could, should, would, can, may, etc.

of selected fiction stories. I doubt that either of these sources is very representative of "normal" conversations (e.g., telephone or casual conversations at meals, parties, meetings).<sup>9</sup> On the other hand, I do not think they will be grossly misleading. In any case, these data should be viewed cautiously since I do not know how reliable (in terms of intersubjective agreement) the categorization procedure is.

The percentage of question types (of all questions) for each of the five psychotherapy sessions across all participants (including the leader) is shown in Table III. Any verbal response was considered an utterance. Echoic questions were not recorded. Total wh-questions account for a greater percentage of all questions asked than yes/no questions in all sessions,

<sup>9</sup>Unfortunately, corpora of such "normal" conversations do not seem to be available. There is definitely a need for a standard and easily obtainable corpus for spoken discourse in everyday situations.

Table IV. Number and Percentage of All Utterances Which Are Questions for Each Participant in the Group Psychotherapy Sessions<sup>a</sup>

Participant	Session				
	1	2	3	4	5
Leader	140 (34)	125 (48)	73 (31)	58 (23)	44 (23)
A	5 (9)	27 (17)	23 (26)	30 (18)	22 (10)
B	11 (20)	26 (18)	9 (21)	13 (31)	11 (11)
C	10 (8)	22 (17)	7 (8)	18 (16)	3 (3)
D	14 (9)	15 (13)	9 (16)	6 (15)	7 (7)
E	6 (8)	11 (12)	9 (0)	6 (10)	4 (4)
F	3 (2)	4 (3)	6 (4)	2 (8)	2 (22)
G	2 (50)	2 (10)	6 (8)	1 (6)	1 (5)

<sup>a</sup>Percentages are indicated in parentheses.

although the difference decreases as the sessions progress. This may reflect a change in the social atmosphere or may be simply artifactual. The number and percentage of questions asked by all participants in each session are given in Table IV. Ranking by either number or percentage of questions asked, individuals tend to stay in about the same position across the five sessions. This may reflect a characteristic tendency to ask questions or not ask questions (questioning style?), or perhaps the individual's tendency to exert control over the other members via question asking.<sup>10</sup> About half of all questions asked in a session are asked by the leader, possibly indicating a very manipulative type of therapy (on the role of questions in psychiatry, see Lowental, 1972).

Data for conversations in selected fiction stories are given in Table V. (The choice of material was governed by what was close at hand.) Even though I did not expect these data to resemble those of the real discourse in the psychotherapy session because of their artificiality, they are quite similar. The percentage of question types is also fairly consistent across the different types of fiction. Whether this reflects that the frequencies of occurrence of the different question types are relatively constant across the different types of conversations or whether this indicates that both sources of discourse are similarly artificial is a point that will require more descriptive studies of different types of discourse to resolve.

Looking at the data from both sources, wh-questions and yes/no

<sup>10</sup>The tendency to ask questions is also likely to be affected by the questioning behavior of others. Rosenthal *et al.* (1970) have demonstrated this with children.



Table V. Percentage of Question Types in Selected Fiction

Question type	<i>Walden Two</i> <sup>a</sup>	Science fiction short stories <sup>b</sup>	Mystery short stories <sup>c</sup>
Wh-questions			
How	8.3	9.8	5.5
Why	8.0	7.9	3.7
What	22.1	18.7	24.7
Where	1.4	3.6	1.8
When	4.5	0.6	1.4
Who	1.1	2.0	5.5
Total wh-questions	42.0	42.8	42.8
Yes/no questions			
Have/has	4.4	2.6	2.2
Are/is	14.1	12.1	7.0
Did/do	10.9	11.5	11.1
Obligatories	3.6	5.5	6.3
Total yes/no questions	38.0	29.3	29.9
Rhetorical questions	11.1	7.0	6.3
Intonated questions	9.0	21.0	24.7
Questions/all utterances	14.6	23.2	19.7

<sup>a</sup>B. F. Skinner.

<sup>b</sup>J. Christopher, "Socrates"; R. A. Heinlein, "And He Built a Crooked House"; R. Sheckley, "Love, Inc."; R. Phillips, "The Yellow Pill"; B. Stickgold, "Susie's Reality." In Katz *et al.* (1974).

<sup>c</sup>All of the stories in the March 1974 issue of *Ellery Queen's Mystery Magazine*.

questions together account for about 70-80% of all questions asked, with wh-questions constituting the largest percentage. Some informal analyses of two-person dialogues suggest that the percentage of yes/no questions may exceed that of wh-questions in this type of conversation. Thus the proportion of wh-questions to yes/no questions may vary with the degree of the formality of the discourse or the degree of intimacy between the speakers or the number of individuals. As a percentage of all utterances, questions account for 10-30% of the discourse sampled here, with an average of about 20%. The range and mean agree with a number of other estimates given in Davis (1932).

To conclude this section, let me make a few qualitative remarks. In transcripts of actual verbal discourse, questions are usually embedded in or appended to larger declarative constructions. Thus it is not a simple matter to recognize exactly what constitutes the question. Also, yes/no questions are in fact seldom answered by "yes" or "no" responses, e.g.,

Q: *Do you think it will rain tonight?* (22)

A: *It always rains around here.* (23)

In general, answers to questions are not usually "straightforward" in the sense that they directly answer the question [as (23) above] and usually the question asker must infer the answer indirectly from the response. The fact that questions do not look like questions, that yes/no questions are not answered by "yes" or "no," and that answers do not seem to be direct answers to the questions that elicited them suggest to me that our current theoretical ideas about questions and question asking do not correspond very well with questions as they are used in everyday discourse. What is called for, in my opinion, is a more adequate descriptive analysis of question asking in different situations. Of course, descriptive data themselves have no explanatory power, but they do prevent us from getting lost in a jungle of *unnecessary* theoretical constructs.

## CONCLUSIONS

In this article, the present knowledge about question structure, question processes, and question occurrence in verbal discourse has been reviewed. Taxonomies for question forms and question functions have been proposed which, it is to be hoped, will be useful in organizing empirical data on question asking. In discussing the question processes of selection, formation, and asking, the lacunae in our understanding of what questions do and how they work have been pointed out. The various theoretical orientations toward questions have been outlined. Question processes are behavior of sufficient complexity to necessitate analysis from these different perspectives. However, if we are to understand the details of question processes, a conceptual framework is needed which spans the various disciplines involved—a view which cuts across linguistics, psychology, and sociology. Perhaps the present effort will encourage such a framework.

The study of questions and question asking has not yet begun in earnest. However, insofar as question asking is one of the major modes by which knowledge is acquired by humans, it should be of vital interest to those who are concerned with the representation and reorganization of knowledge. This latter topic is currently in focus in the closely related fields of cognitive psychology, psycholinguistics, and artificial intelligence (e.g., see Gregg, 1974; Schank and Colby, 1973). With respect to cognitive psychology, questions provide an indication of how an individual's knowledge (or belief) system is

organized and how it is reorganized as new knowledge is acquired. Thus questions are a behavioral reflection of change in conceptual structure. Moreover, question asking is of broad theoretical interest because it transcends the traditional paradigmatic tasks—it plays an important role in problem solving, concept formation, verbal learning, etc. In the realm of psycholinguistics, question asking provides a convenient medium in which to relate syntax and semantics. In the previous section, a theoretical conceptualization was mentioned which seeks to explain how the psychological context specifies both the content and the form of a question—this must occur concurrently with the generation of the specific linguistic expression of the question (correct word order, tense, etc.). Furthermore, an understanding of question asking is necessary if computer programs for natural language understanding are to be extended from isolated sentences to connected discourse and conversation. The interest in the representation of knowledge is currently of interest to the entire spectrum of workers in artificial intelligence rather than just those involved in natural language understanding programs (Michie, 1976). As more work is done with large knowledge-based programs, it will be highly desirable to allow the program to modify and build its knowledge via self-directed question asking.

The prospects of findings and theories about question asking in each of these different areas spilling over into the others are most exciting. Such interdisciplinary exchanges tend to weave a stronger fabric of explanation. However, these prospects lie in the future—for the moment, we should establish satisfactorily what kinds of questions exist, what purposes they serve, and under what conditions they occur.

## ACKNOWLEDGMENTS

I would like to thank W. J. Baker and L. P. Mos for their critical reading of an earlier draft of this article.

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