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The Content and Form of Reader-Generated Questions: Implications for Teaching Questioning Strategies

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Two classes in Developmental Reading were trained in question-formulation and were then required to ask any number and type of questions based on four texts. Three inter-raters coded the questions for their content and form. The results of the study showed the dominance of recognition or retrieval questions, suggesting the students' proficiency in reading for details and conversely, a deficiency in critical reading. In terms of form, although 57% of the questions were coherent and grammatical, this fact alone may not indicate a high English Language proficiency. There were also many instances of the direct copying of phrases from the original text, pointing to the students' lack of confidence or ability in summarizing and paraphrasing.

Key Words: self-questioning, types of questions, cognitive content of questions, linguistic form of questions

*My interest in the art and science of asking questions is sustained by the rich potential of questions for enhancing reading experience and performance. Questions improve reading performance because they focus the reader's attention on what is significant in a text and make for a more interactive relationship with a text, resulting in a deeper understanding and appreciation of it (Andre & Anderson, 1978-79; Davey & Mcbride, 1986a; Dreher & Gambrell, 1985 as cited in Davey & McBride, 1986b; Frase & Schwartz, 1975; King, 1991; Martin, 1982). They also have the potential of empowering the reader because they clarify personal purposes and goals in reading (Gillespie, 1990). Additionally, questions may offer "one possible way of tapping [into] some of [the reader's] cognitive processes." (Wong, 1985, p. 250). But one aspect of questioning is often overlooked: its linguistic character. Highlighting the pivotal role of language in reading, Clarke (1980, as cited in Devine, 1987) observed that "limited language proficiency … 'short circuits' the good reader's process of reading, causing him/her to revert to inferior or inappropriate reading strategies when faced with a difficult task in L2." (p. 75) More specifically, Cziko (1978, 1980), as cited by Devine (1987) compared the reading strategies of limited and advanced English language proficient French students reading in English with those of native speakers. He found that lower proficient readers use poor reading strategies such as copying or repeating the exact words of the text. Cziko concludes that linguistic proficiency is related to reading strategies: "Lower proficient readers appear to rely on bottom-up strategies for processing information in a text, whereas native and advanced proficient readers rely on both graphic and contextual cues … . "(p. 76)

Language, the key that unlocks any text, is also the key to expressing questions. In an ESL reading context such as is the case in the Philippines, a relevant issue is whether or not students/readers know how to formulate questions in English. Thus the present study attempts to address these two major aspects of reader-generated questions: the cognitive content of questions and their linguistic form. Regarding the cognitive aspect, the research tried to answer the following specific questions:

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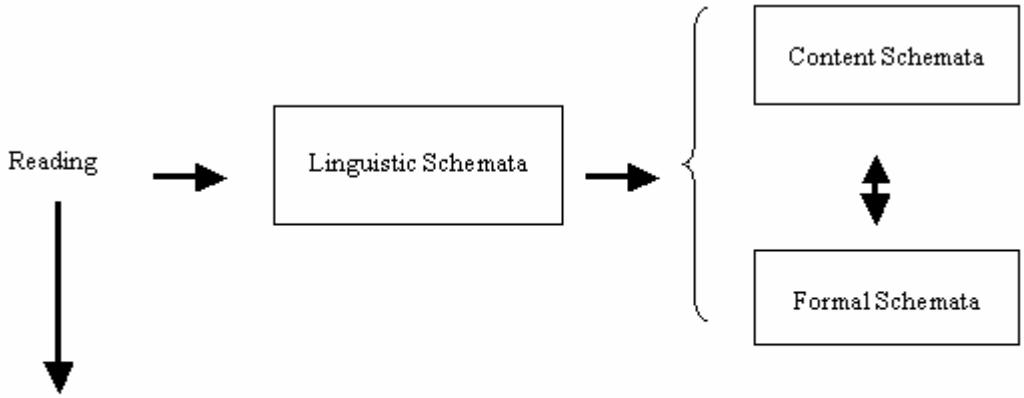

Figure 1. *The Process of Reading and Self-questioning*

1. What cognitive levels of text processing are indicated by the types of questions generated by students?
2. Are the reader-generated questions strategic questions?

As to the questions' linguistic characteristics, the study attempted to answer the following:

1. Are the reader-generated questions clear and grammatically correct?
2. In terms of form, what types of questions are asked by students?
3. Are the questions expressed in the students' own words?

The study adopted Bernhardt's (1987 as cited in Maarof, 1998, p. 22) definition of reading as "making associations through 'taking units of language and building them into a configuration'", which underscores the facilitative value of proficiency in the language of the text. As seen in Figure 1, the linguistic schema or proficiency in the (target) language unlocks the content schemata (prior knowledge of the text topic) and the formal schemata based on knowledge of text structures (Carrell, 1987 as cited in Nurss & Hough, 1992; James, 1987), after which or simultaneously, the expressive function of language facilitates the processing of the text to arrive at a "configuration." Arriving at a configuration entails the use of cognitive processes such as generalizing, deducing, inferring, analyzing, synthesizing, applying, evaluating, relating, integrating, etc., used individually or in combination. According to Bloom (1956), these operations constitute a hierarchy of cognitive skills

Methodology

Participants

Two intact classes in Developmental Reading (DEVERED) in the second term, SY 2001-02 participated in the study. The students were a mixed group of mostly freshmen and sophomores, males and females, totaling 66 students. Most of them graduated from private schools where English is not only a subject required of all students but is used as the primary medium of instruction.

Materials/Texts Read

Four texts were given to the classes. The three prose texts all had something to do with the September 11 event which at that time had just happened and was extremely topical. The researcher chose these interrelated texts for schema-building. The first text, an excerpt from a longer article entitled "Roots of Rage" that appeared in Time Magazine, tries to explain why many people hate America. The second, a news item titled US: Air Strikes Working that came out in The Philippine Daily Inquirer (PDI), reports on the bombing of Afghanistan. The third text which also appeared in PDI is an editorial entitled "Elevating Mass Media" by Isagani Cruz. It uses as a take-off point the foreign media coverage of the September 11 incident to criticize the tendency of the Philippine mass media to highlight the gory, the grotesque, and the violent episodes in life. The fourth text consisting of two graphs on fertility rates and population growth in China appeared in the January 22, 1996 issue of

Newsweek. It was chosen for two reasons: 1) relevance: the problem of the population explosion in the Philippines had often been in the news, and 2) content: the graphs are easy to understand and yet the seemingly contradictory information they present invites the exercise of critical thinking on the part of the reader.

Instruments

The scoring system for the cognitive level of the reader-generated questions, adapted from Bloom's taxonomy, included not only the range of cognitive processing from simple or literal level to the higher levels like the operation of inference, application, and evaluation but also included the categories 'Unintelligible', 'Irrelevant', and 'Schema Questions'. An unintelligible question is incomprehensible; for example: "As what Bin Laden and his supporters has done, do you think Muslim would be washed out?" However, a question that may not be incomprehensible but would be extremely difficult to interpret in the light of the text may also be classified as unintelligible. For example, all three inter-raters rated this question as unintelligible because we were not sure how it should be answered: "What idea is manifested by Ayatulla Khomeini?" The question might be lacking some details to make it clear or maybe the word 'manifested' was incorrect/inappropriate. On the other hand, an irrelevant question is tangential to the main concerns and themes of the text. For example, if the text is about the problems in using genetically modified crops, a question such as "Who is the director of the Institute of Plant Breeding?" would be classified as irrelevant. Lastly, schema questions are those that ask for the reader's background information.

A separate scoring system for the linguistic characteristics of the reader-generated questions was drawn up based on the grammatical correctness and clarity of the questions. A question is classified as 'Incoherent' if it does not make sense because of grammatical errors and/or errors in content. The category 'Sensible but Ungrammatical' refers to questions that still make sense although they are not perfectly grammatical. On the other hand, questions that make perfect sense and are grammatical are coded under the category 'Sensible and Grammatical'.

Procedure

1. During two class meetings prior to start of the study, the researcher discussed the common types of questions in terms of form and answers they require (high-level or "think-type" and low-level questions), and modeled how to get the main idea of a selection.

2. In the study proper, the reading of texts was done individually but question-generation was done by pairs, so that "the individual's construction of knowledge is facilitated through peer interaction," based on the theory of the social construction of knowledge (King, 1991, p. 315). There were times, however, when a student worked alone because he/she had no one to pair with. The partners varied as they wished. The instruction given to the partners was to ask any number and type of questions that would make for a literal, interpretative and critical/evaluative reading of the text. Because the partners worked independently of other pairs, some questions were repeated. The four texts were given at different intervals, depending on the length of time it took for the class to discuss the text after the question-generation exercise.

3. Coding. Two teachers from the Department of English and Applied Linguistics (DEAL) and the researcher separately rated all reader-generated questions. In the trial coding using a different text and trial questions, the research team refined definitions and added examples in the scoring instruments to make them clearer. In the final coding, before inter-rating the questions on each text, the team met to discuss the text's main ideas and concerns. The inter-rating was done separately and then after approximately two weeks, the results of the coding were tallied. Inter-rater reliability for the linguistic coding of questions was a high 98.6%. On the other hand, the average inter-rater reliability for the cognitive scoring of questions, for all four texts, was a high 96.38%. Where all three inter-raters disagreed completely, each one's answer to the item was discussed and then the final answer was arrived at by consensus. This procedure was followed for all four texts. However, on the originality of phrasing of questions, the researcher undertook this alone, comparing the wording of the questions with the original text.

Data Analysis

A frequency count was done to determine the levels of cognitive processing involved in reading the texts and to describe the linguistic form of the questions. All questions were counted despite the number of repetitions.

Limitations of the Study

Due to time constraints, socio-economic factors and the participants' general reading environment were not

considered. The English Language proficiency of each student was also not determined; instead, the study assumed an English Proficiency range of 'Average' to 'Very Good' for the DEVERED class based on the fact that they had passed the De La Salle University entrance examination which is in English.

Results and Discussion

The Content of Reader-Generated Questions

Table 1 shows that a total of 900 questions was generated by the participants, with "Roots of Rage" getting the most number of questions (375) and "Elevating Mass Media" getting the least (135).

The study considered the types of question asked by the students as indicative of the level of cognitive processing they did. Table 2 summarizes the types of questions for all four texts - "Roots of Rage," "Elevating Mass Media," "US: Air Strikes Working," and two graphs on fertility and population in China. On the whole, the most dominant question type was the recall type (48%), which means that the answers to these questions were explicit in the text and all the students would have done had they been required to answer them was to locate/retrieve them from the text. The preoccupation with recall questions might indicate that the participants were skilled at reading for details. A possible explanation for the students' preference for recall questions is that they are easier to form questions on. After recall questions, coming in 2nd and 3rd, but very far behind, were analysis (13.85%) and comprehension (13%) questions. Analysis questions required two or more cognitive steps in order to answer them, whereas comprehension questions needed interpretation of statements.

In general, the figures above suggest that students did little deep text processing. Although all the prose texts were on the September 11 terrorist attack, it was noticeable that there were no questions interrelating them. There were no

Table 1. *Total Questions by Text*

Text	Number of Questions
Roots of Rage	375
Elevating Mass Media	135
US: Air Strikes Working	187
Graphs on Fertility and Population	203
Total	900

Table 2. *Frequency of Questions by Type in Four Texts*

Question Type	Roots of Rage	Elevating Mass Media	US: Air Strikes Working	Fertility and Population Graphs	Total	%
Unintelligible	34	10	15	4	63	7
Irrelevant	22	8	10	4	44	5
Schema	34	3	7	8	52	5.85
Recall	190	31	93	120	434	48
Comprehension	41	24	30	24	119	13
Analysis	28	51	19	26	124	13.85
Application	0	0	0	0	0	0
Synthesis	3	0	0	0	3	.3
Creative	5	2	2	17	26	3
Evaluation	18	6	11	0	35	4
Total	375	135	187	203	900	100

Table 3. *Number of Questions not Critical to the Comprehension of the Text*

Text	Number of Questions
Roots of Rage	162
US: Air Strikes Working	47
Elevating Mass Media	28
Graphs -	123

application questions either and` only a few questions that would require students to explain their answers in ways that "are particularly diagnostic of deep comprehension" [because] they tap causal chains and networking, goal-plan-action hierarchies, and logical justifications" (Graesser & Olden, 2003, p. 357). No wonder Gonzales (2000) in his study on critical thinking in Philippine classrooms concluded that "evaluation is the least assessed thinking skill in the classroom, followed by skills to reason by induction or deduction and the ability to make comparisons" (p. 9).

The second research question, "Are the reader-generated questions strategic questions? has to do with the ability of the readers to ask questions that directly lead to the discovery of the thesis and main concerns of the text. Table 3 below summarizes the number of unnecessary or uncritical questions by text.

Almost all of the unnecessary questions were questions on details like who, what, when, such as "Who wrote the article?" "Where was it published?" (which are irrelevant to the main point of the text), "What was the fertility rate in year?" It is not that these questions do not somehow aid in comprehension but that a lot of these "isolated" questions, to use the descriptive term of Smith (1973, as cited in Gillespie, 1990), seemed to be insensitive to the thesis that the text is building up to. All these might indicate that the students were not very successful in strategically processing a text, and this is tied up with the propensity to read for details and not for main ideas. In a sense, the students saw the trees but failed to see the forest.

The Form of Reader-Generated Questions

Table 4 shows the frequency of incoherent, grammatically incorrect, and grammatically correct questions generated by the students.

As can be gleaned from the table, the majority (57.4%) of the questions generated by the students were sensible and grammatical. Although this was the case, the short, simple Wh-questions which dominated the question types might not necessarily indicate English language proficiency, precisely because they are short and simple.

The classification of questions by form is presented in Table 5. Most of the questions were of the Wh-type (92.2%), almost all of which, except for some WHY-questions, were based on one liners that give a specific information. In other words, the questions tended to be focused on details and to answer these questions, there was no need to relate one sentence/part to another, or to relate the text to other texts. To use the categories of Smith (1973, as cited in Gillespie, 1990), isolated questions (which focus on a "single location in the text") predominated over integrated questions (which require "synthesis of material from more than a single location") (p. 250).

Sunga (2004) added to the types of questions when she defined a question as [an utterance that] is "meant to elicit a response" (p. 14), making a declarative statement like, 'State the reasons why so many peoples hate Americans', a question. In this study, perhaps most of the students perceived questions as ending with a question mark, thus the infrequency of declarative questions (only three). Sunga mentions two other types of questions based on form, Or-

Table 4. *Linguistic Characteristics of Questions in Four Texts*

Linguistic Description	"Roots of Rage"	"Elevating Mass Media"	"US: Air Strikes Working"	Fertility and Population	Total	%
Incoherent	17	5	7	1	30	3.3
sensible, not grammatical	135	53	89	77	354	39.3
sensible & grammatical	223	77	91	125	516	57.4
Total	375	135	187	203	900	100

Table 5. *Forms of Questions Asked in the Four Texts*

Question Form	Roots of Rage	Elevating Mass Media	US: Air Strikes Working	Fertility & Population Graphs	Total	%
Wh-Q	349	125	161	195	830	92.2%
Yes/No Q	25	8	26	8	67	7.4%
Declarative Q	1	2	0	0	3	.4
Total	375	135	187	203	900	100%

questions and Tag questions, but no such questions were asked by the students.

Regarding the original phrasing of the questions, the idea of tabulating the number of questions that lifted words and phrases from the text came only as an afterthought when I noticed that there were a lot of questions that unnecessarily used words/phrases from the text. I thought this might be significant if we consider Cziko's (1978, 1980 as cited by Devine, 1987) observation that lower proficient readers use poor reading strategies "… such as copying or repeating the exact words of the text." Table 6 shows that 17.5% of the questions formulated by the students unnecessarily lifted phrases from the original: Although that is not very high, it is still something that is unnecessary. One possible reason why some students copy phrases is low English proficiency, as was confirmed by the formulation of questions that quoted parts from the text in haphazard manner, producing stilted, wordy, ungrammatical, and sometimes incoherent questions such as this example from "Roots of Rage": 'Why did the terrorists who killed 24 US servicemen and 2 Indians "raise the nation head high and wash away a great part of the shame has enveloped us?"' The tendency to lift from the text has also resulted in questions repeated by many pairs in exactly the same way.

Table 6. *Frequency of Questions Which Lifted Phrases from the Text*

Text	Firequency of Questions
Roots of Rage	81
Elevating Mass Media	18
US: Air Strikes Working	23
Graphs	Not Applicable

Conclusions and Pedagogical Implications

From the popularity of recall questions, it would seem that the students were very adept at reading for details but were poor in reading for the main idea or thesis of the selection, and even poorer in higher level processing like application, synthesis, and evaluation. If a student is studying for an objective test, the manner and level of text processing revealed by the reader-generated questions in this study will serve the student's purposes. However, if the target is for the student not only to understand the basic facts presented but also to fully appreciate the text (and this should be the case in tertiary education) in terms of its ramifications and style, then the present level of text processing is deficient.

Based on the dominance of grammatical but sensible questions, it would seem that the student-participants could manage to be clear and grammatical if questions were short and focused on just one isolated information at a time. On the other hand, the tendency to copy unnecessarily from the text might suggest a lack of confidence in the ability to paraphrase somebody else's ideas. This might suggest that the student's processing of the text is rudimentary.

From these conclusions, it is clear that teachers have to teach strategic questioning techniques to students. It is not enough to teach them how to ask questions but to ask significant questions, that is those that would lead to the unraveling of the main ideas and concerns of the selection. I recommend Smith's (1975, as cited in Gillespie, 1990) idea of starting training in questioning in non-print form. Non-print material may be experiential and therefore more concrete for students, or it may be less threatening for them. For example, what I did in my class was to present a puzzle: I gave a hypothetical situation where a man with baggage was found dead in the middle of a field. The class was told to ask

only Yes/No questions and that they should try to explain why/how that man died in less than five questions. Not only did my class have fun that day because the exercise was some kind of a game, but they also learned to ask critical questions because of the constraint on the number of questions that they could ask. It was also an occasion to learn about question forms because the class had to analyze if the questions asked were answerable by 'Yes' or 'No'. (My class was able to guess, on the fifth question, that the man parachuted from a plane but his parachute failed to open, that was why he died in the middle of a field.) Perhaps because the teaching strategy was non threatening, the students succeeded in asking strategic questions. But more than this, I suspect that questioning in the classroom can be promoted if there is what Graesser & Olden (2003) call "cognitive disequilibrium" that results in "sincere information-seeking." In other words, the skill of strategic questioning might be more effectively and quickly imparted if there is an actual problem or contradiction or puzzle that the students have to solve, for which they need to ask questions in order to get information that will provide the answer or explain the situation and consequently bring back cognitive equilibrium. What this implies is that students must be taught how to evaluate their own questions in terms of their "criticalness". Using a problem-solving exercise or a puzzle imparts this effectively because they would know right away that they were not asking the right questions if they failed to explain the situation or solve the problem. It would be a good idea though to drive home this point by going over the questions they have asked and analyzing which among them led very strongly to the explanation/solution and which did not and why.

Finally, when the teacher feels that the students are ready to begin posing questions using a prose text, s/he can start with Wh-questions because students are most familiar with them, however, the teacher must lead the students to scrutinize their own Wh-questions for "criticalness." Proceeding to Yes/No Questions, the teacher may stress, through examples, the fact that they may be more difficult to answer because they sometimes require careful evaluation. In all these, the teacher must underscore the necessity of paraphrasing in question-formulation. Teachers must drive home the point that failure to re-express an idea in words different from those used in the original text often represents a failure to digest the meaning of the passage. Notwithstanding these suggestions and guidelines, it is well to remember that unless the students are coached, the Wh-questions and Yes/No questions that they will ask will probably just entail locating items in the text to answer them.

To get them to ask high-order or "thinking" questions, King's (1992) suggestion to use the following question stems might prove to be a sound practice

Question Stems	*Function*
1. Explain why …	Analysis of processes and concepts
2. Explain how …	Translation into different words to clarify meaning
3. How would you use … to …?	Application of information in another context, perhaps relating prior knowledge or experience
4. What is a new example of …?	Generation of a novel example of a concept or procedure, perhaps involving relating example to prior knowledge/experience
5. What do you think would happen if … ?	Retrieval of background information and integration with reading material to make predictions
6. What is the difference between … and … ?	Analysis of two concepts through
7. How are … and … similar?	Comparison and contrast
8. What conclusions can you draw about … ?	Drawing conclusion based on the content presented
9. How does … affect … ?	Analysis of relationships among ideas in the text
10. What are the strengths and weaknesses of … ?	Analysis and integration
11. What is the best … and why ?	of concepts
12. How is … related to … that we studied earlier?	Activation of prior knowledge (schema) and integration with new information
13. What is the main idea of … ?	Identification of the central idea explicit or implicit in the text

The question stems suggested by King must be directly and explicitly taught, followed by a detailed explanation of why and how use of these question stems is superior to the ordinary Wh-question. Modeling questioning skills and techniques is highly recommended. It is not only an effective form of direct instruction but is also a form of scaffolding or teacher aid. Duffy, Roehler, & Herrman (1988) propose modeling "not only the physically observable aspects of reading but also the invisible mental processes that are at the core of reading" (p. 162). Used to explaining or dictating things, some teachers might take some time to become adept at mental modeling but with dedication and love (for their students), this will eventually happen.

Such is the art and science of asking questions.

References

Andre, M., & Anderson, T. (1978-1979). The development and evaluation of a self-questioning study technique. *Reading Research Quarterly, 14*(4), pp. 605-623.

Bloom, B. (Ed.) (1956). *Taxonomy of Educational Objectives: Handbook I. Cognitive Domain.* New York: David McKay Co.

Davey, B., & McBride, S. (1986a). Effects of question generation training on reading comprehension. *Journal of Educational Psychology, 78*(4), 256-262.

Davey, B., & McBride, S. (1986b). Generating self-questions after reading: A comprehension assist for elementary students. *Journal of Educational Research, 80*(1), 43-46.

Devine, J. (1987). General linguistic competence and adult L2 reading. In J. Devine, P. Carrell, & D. Eskey (Eds.), *Research in Reading in English as a Second Language* (pp. 75-86). Washington D.C.: TESOL.

Duffy, G., Roehler, L., & Herrmann, B.A. (1988). Modeling mental processes helps poor readers become strategic readers. In R. Allington (Ed.), *Teaching Struggling Readers* (pp. 162-167). Newark, Delaware: International Reading Asso.

Frase, L., & Schwartz, B. (1975). Effect of question production and answering on prose recall. *Journal of Educational Psychology, 72* (5), 628-635.

Gillespie, C. (1990). Questions about student-generated questions. *Journal of Reading, 34*(4), 250-257.

Gonzales, R. (2000). Types, techniques, and taxonomy of measures of thinking skills in higher education. *The URCO Digest, I,* 2 & 3, p. 9.

Graesser, A. & Olden, B. (2003). How does one know whether a person understands a device? The quality of questions a person asks when the device breaks down. *Journal of Educational Psychology, 95*(3), 524-536.

James, M. (1987). ESL reading pedagogy: Implications of schema-theoretical research. In J. Devine, P. Carrell, & D. Eskey (Eds.), *Research in Reading in English as a Second Language* (pp. 177-188). Washington D.C.: TESOL.

King, A. (1991). Effects of training in strategic questioning on children's problem-solving performance. *Journal of Educational Psychology, 83*(3), 307-317.

King, A. (1992). Comparison of self-questioning, summarizing, & notetaking-review as strategies for learning from lectures. *American Educational Research Journal, 29*(2), 303-323.

Maarof, N. (1998). *Assessing second language reading.* Selangor: Faculty of Language Studies, University of Kebangsaan Malaysia.

Martin, M. (1982). An investigation into self-questioning as a study technique for college developmental reading students. *Dissertation Abstracts International, 44,* 1401.

Nurss, J., & Hough, R. (1992). Reading and the ESL student. In S. J. Samuels & A. Farstrup (Eds.), *What research has to say about reading instruction* (2nd ed., pp. 277-313). Delaware: International Reading Association.

Sunga, N. (2004). *A teacher's package on the art of classroom questioning.* Manila: SIBS Publishing House, Inc., Nilda Sunga, and Philippine Normal University.

Wong, B. (1985). Self-questioning instructional research: A review. *Review of Educational Research, 55*(2), 227-268.

Reading Selections Used in the Study:

Beyer, Lisa. (2001, October 1). Roots of rage. *Time Magazine*, pp. 42-44.

Cruz, I. A. (2001, October 13). Elevating our mass media. *Philippine Daily Inquirer*, p. 6.

US: Air Strikes Working. (2001, October 14). *Philippine Daily Inquirer*, p. 4.

Two graphs (Fertility Rate and Population in China) (1996, January 22) *Newsweek*, p.8.

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