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A New Look at Children's Private Speech: The Effects of Age, Task Difficulty, and Parent Presence

Douglas A. Behrend, Karl Rosengren, and Marion Perlmutter

University of Michigan, U.S.A.

The present study re-evaluated several hypotheses concerning the self-regulatory nature of children's private speech. It was hypothesised that if children's private speech is self-regulatory, it should differ systematically as a function of child's age, task difficulty, and the presence of another in a task situation, and it should be positively related to task performance. Twenty-four children at each of three age levels (2, 3½, and 5 years) were videotaped while working alone and with a parent on different sets of 3 puzzles that varied in difficulty. Children's speech was recorded and coded as private or social. The proportion of total speech coded as private increased slightly with age and was curvilinearly related to puzzle difficulty, with the most private speech observed on moderately difficult puzzles. In addition, private speech was positively related to task performance, especially on medium and difficult tasks. These results are consistent with the view that private speech is self-regulatory. Parental presence had no effect on the percentage of private speech. These results suggest that parents' behaviour during joint problem-solving probably should not be taken to be strictly regulatory.

INTRODUCTION

There has been a recent resurgence of interest in children's private speech, the overt verbal behaviour that often accompanies children's ongoing activity but is directed at the children themselves rather than to a listener.

Requests for reprints should be sent to Dr. Douglas A. Behrend at the Department of Psychology, University of Michigan, 3433 Mason Hall, Ann Arbor, Michigan 48109—1027, U.S.A.

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Questions still remain about the development and possible functions of private speech. Piaget (1926) and Vygotsky (1962) disagreed about these issues, and much early research was directed at comparing the positions of these two theorists (e.g. Kohlberg, Yaeger, & Hjertholm, 1968).

Piaget suggested that private, or egocentric, speech reflected the pre-operational child's inability to distinguish self from other or to take another person's perspective. Thus, private speech was supposed to disappear when the child entered the concrete operational stage, at around seven or eight years. For Piaget, private speech serves no important function. Rather, it is an artifact of an immature stage of cognitive development.

Vygotsky, on the other hand, posited that private speech may help the child regulate ongoing cognitive activities. This type of self-regulatory speech is assumed to be an intermediate step between when the child's behaviour is regulated by an external, other source, such as a parent, and when it is regulated by internal thought. From this perspective, Vygotsky hypothesised that private speech would show a curvilinear developmental pattern, peaking in the early school years and then decreasing as regulation becomes internalised.

Due perhaps to the influence of Zivin (1979), who clarified many of the differences between these two positions, most current research in this area is being done within a Vygotskyan perspective. However, there has not been strong empirical support for Vygotsky's developmental predictions (see Anastopolous, 1985). Other than the studies of Kohlberg et al. (1968), which have been extensively criticised on both conceptual and methodological grounds (Berk & Garvin, 1984), the curvilinear pattern predicted by Vygotsky has not been regularly observed (e.g. Rubin, 1979; Berk & Garvin, 1984; Frauenglass & Diaz, 1985).

Though some of these negative results can be attributed to problems of definition and reliability, the authors of this paper believe more substantive factors can explain the obtained patterns. In particular, it is believed that task factors may play a critical role in determining the prevalence of private speech. Whereas task variables are of major importance in Vygotsky's (1962, 1978) general theory of cognitive development, they rarely have been examined systematically in studies of private speech. Indeed, as Frauenglass and Diaz (1985) pointed out, some perceptual tasks used in studies of private speech may actually inhibit the occurrence of private speech, and thus suppress any differences between age groups.

The importance of the task is more theoretically substantive than simply noting that superficial task characteristics have the potential to elicit or inhibit private speech. Rather, it is hypothesised that the *difficulty* of the task systematically affects the amount of regulatory private speech. Vygotsky (1962) himself suggested that private speech would increase with task

difficulty, because a more difficult task requires a greater amount of self-regulation. However, empirical support for this prediction has not been strong. In most studies, no overall differences in private speech have been observed with tasks differing in difficulty (e.g. Beaudichon, 1973; Deutsch & Stein, 1972). In recent research, Berk and Garvin (1984) observed more private speech when children worked on academic tasks than when they worked on non-academic tasks, and Frauenglass and Diaz (1985) found that private speech was more common during work on semantic tasks than on perceptual tasks. These results are somewhat difficult to interpret, however, because task difficulty was not explicitly measured in either study.

If one keeps in mind Vygotsky's general theory of cognitive development and the supposed self-regulating function of private speech, it should not be too surprising that the predicted effect of task difficulty has not been observed. Recall that private speech is believed to be an intermediate step in the internalisation of thought. Thus, when a task is easy for a child, the necessary regulatory capacities have been internalised already, and little private speech should be expected. As tasks become more difficult, and more appropriate for the child's ability, self-regulatory private speech should increase, but only up to a certain point. When a task is too difficult, and children do not have adequate regulatory capacities available, either their behaviour will be unregulated and unsuccessful, or some other external source of regulation will be required and private speech will decrease.

This interpretation of Vygotsky, we believe, is faithful to the spirit of his work and is a likely explanation of the failure to meet his original predictions. In fact, both Beaudichon (1973) and Yaeger (in Fuson, 1979) reported decreases in private speech on more difficult tasks for certain age groups. Thus, it may be that amount of private speech does not vary directly with child's age or task difficulty, but instead with the difficulty of a task *relative* to the abilities of a particular child or age group. Sampling multiple ages of subjects and using multiple levels of task difficulty therefore become of primary importance in studies of self-regulatory private speech.

A third factor that can potentially affect the occurrence of private speech is the presence of another individual in the problem-solving context. This factor may be especially important in light of Vygotsky's (1978) writings about, and others' current interest in, the effects of social interaction on cognitive development (e.g. Rogoff, Ellis, & Gardner, 1984; Wertsch, 1979). Vygotsky's concept of the *zone of proximal development* is particularly relevant to the issues raised in the current paper. The zone of proximal development is defined as the difference in a child's performance on a task while working alone and performance on the same task while

working with a more competent peer or adult. It is assumed that the more competent other provides the regulatory functions that the child lacks, thus enabling the child to improve performance.

If it is the case, as is often assumed, that a more competent individual in an interacting pair directly regulates the child's behaviour when the child cannot perform a task, then we would expect to observe less self-regulatory private speech in an interaction condition than when the child worked alone. Few studies have systematically tested the effects of the presence of another on children's private speech, and most of those that have do not provide conclusive results (see Fuson, 1979). Perhaps the clearest evidence comes from Berk and Garvin (1984), who found that low socio-economic status school-age children used more private speech when alone than when accompanied by a teacher (though see Goudena, 1987 for a comparison of private speech in different interactive conditions).

The tacit conception of regulation suggested here involves direct intervention in the performance of a task. It should be noted, however, that this conception is not the only possible characterisation of another's role during joint problem-solving, and, in fact, it does not do justice to Vygotsky's notions of the inter-psychological transfer of skills. Thus, another person's effect on private speech may be different than what has traditionally been hypothesised. Rather than directly regulating task completion, either by performing the task herself, physically aiding the child in carrying it out, or directing specific actions for carrying it out, an adult may provide structure for a task that will keep it within the child's zone of proximal development. Providing such facilitating structure through instruction or changes in the context has been called *scaffolding* (Rogoff & Gardner, 1984; Wood, Bruner, & Ross, 1976). More precisely, scaffolding refers to a type of regulation in which one adjusts conditions "to produce appropriate understanding of a particular problem for a learner at a particular level of ability" (Rogoff & Gardner, 1984, p. 109). Similarly to direct regulation, scaffolding would be expected to improve children's learning and performance. However, in contrast to direct regulation, scaffolding would not necessarily be expected to decrease private speech, because it allows the child to continue to be a regulator of her own behaviour. Results conforming to one of these patterns can help to define more precisely the role of another person in shared problem-solving. The present hypotheses of the effects of age, task difficulty, and parent's presence on children's private speech and task performance are summarised in Table 1.

A final issue addressed in the present study, and one that is at the crux of research on self-regulatory private speech, is whether children's private speech is truly self-regulatory. If it is, then its occurrence should be correlated with performance on the task during which it occurs. As straightforward as this hypothesis seems, it has not been confirmed with

TABLE 1
Hypothesised Effects of Age, Task Difficulty, and Parent Presence on Children's Private Speech and Performance

Variable	*Private Speech*	*Performance*
Age	On a given task, private speech will be most frequent in the age group for which the difficulty level of the task is most appropriate.	On a given task, performance will improve with age.
Task Difficulty	At a given age, little private speech will be observed on easy tasks, because necessary regulation is internalised.	At a given age, performance will be good on easy tasks, and performance will not be correlated with private speech.
	At a given age, frequent private speech will be observed on ability-appropriate tasks.	At a given age, performance will be moderately good on medium tasks, and performance will be correlated with private speech.
	At a given age, less private speech will be observed on difficult tasks, because necessary regulation is not available. Children will seek external regulation.	At a given age, performance will be poor on difficult tasks, and performance will be correlated with private speech.
Parent Presence: Direct regulation	In the presence of a parent, children's private speech will decrease, because the child is not the primary regulator of behaviour.	In the presence of a parent, children's performance will improve but not independently of parent's aid.
Scaffolding	In the presence of a parent, children's private speech will remain constant, because the child remains the primary regulator of behaviour	In the presence of a parent, children's performance will improve.

regularity (see Fuson, 1979). Recent work by Goodman (1981) and Frauenglass and Diaz (1985) has systematically investigated this issue. Goodman, in a micro-analytic study, found that the frequency of private speech was positively correlated with a measure of puzzle-solving efficiency. At a more global level, Frauenglass and Diaz (1985) divided their subjects into two groups based on the amount of private speech each child used during the task session. The "low" talkers performed significantly better than the "high" talkers on one of four tasks, and marginally better overall. Interestingly, both of these studies reported that private speech often co-occurs with *failure*, and not success, on tasks. However, it is possible that this finding was an artifact of the effects of task difficulty. That is, private

speech occurred most frequently when a child was working on tasks that were moderately difficult and thus produced frequent failures before completion. This combination of repeated failures prior to success on a task is likely to attenuate a positive correlation between amount of private speech and task performance if the unsuccessful attempts are counted against a child's performance. Such a pattern must be differentiated from the case in which a child works on a task beyond her abilities and does not achieve success.

The present study was intended to systematically test the effects of age, task difficulty, and parent presence on the occurrence of private speech in pre-school children, and to determine under what conditions private speech is related to task performance. Seventy-two children, ranging in age from 2 to 5 years, were observed in a quasi-naturalistic setting while working on puzzles of varying levels of difficulty both alone and with a parent. Based on existing research and the preceding analysis, a number of hypotheses were made. In particular, it was hypothesised that private speech would not vary consistently as a function of the subjects' age, but rather that the difficulty of the task relative to the child's age would have a strong effect on the frequency of private speech. For each age group, the most private speech was expected on moderately difficult tasks for that age. In addition, private speech was expected to be correlated with performance on that task which was of a medium level of difficulty relative to the child's age. Finally, the relationship between parent presence and child's private speech was hypothesised to reflect the role taken by the parent during the interaction. If parents directly regulate children's behaviour, private speech should decrease; but if parents scaffold the task situation, the amount of private speech should not differ from when a child works alone.

METHOD

Subjects

The subjects were 72 children and their mothers selected randomly from subject files maintained at the researcher's laboratory. There were 24 children, 12 male and 12 female, in each of three age groups. The age groups were 2-year-olds (mean age: 2 years, 1 month; range: 2.0–2.3), 3½-year-olds (mean age: 3.6; range: 3.4–3.7), and 5-year-olds (mean age: 5.0; range: 4.11–5.2).

Materials

An easy, medium, and difficult puzzle was presented to each child in each of the 2 conditions. Different puzzles were used in each condition, hence,

each child was exposed to a total of 6 puzzles. Though each child was presented with puzzles of 3 difficulty levels in each condition, there were actually 4 levels of puzzle difficulty. There were puzzles with 3 separate, non-adjoining pieces in a frame (level 1), puzzles with 3 adjoining pieces in a frame (level 2), puzzles with 9 interlocking pieces in a frame (level 3), and puzzles with 48 interlocking pieces and no frame (level 4). All of the puzzles, when completed, formed integrated scenes that were pre-tested with a sample of children to ensure equal familiarity and interest.

All subjects were exposed to the level 2 and level 3 puzzles. The 2-year-olds were also given level 1 puzzles, while the 3½- and 5-year-olds were given level 4 puzzles. This procedure was used to ensure a roughly equivalent range of *relative difficulty* of the puzzles for each age group. The level 4 puzzles were well beyond the range of the 2-year-olds and the level 1 puzzles were too simple, and thus unattractive, for the older children. The primary analyses included 3 levels of relative task difficulty: easy, medium, and difficult. Additional analyses involved comparison on the sets of puzzles (levels 2 and 3) to which all subjects were exposed. When a specific type of puzzle is being discussed, it is referred to by its level (1, 2, 3, or 4).

Procedure

The subjects were videotaped while working on puzzles during two 10-minute sessions. In one session the children worked alone and in the other session they worked with their mother. The order of the sessions was counterbalanced across subjects in each age group. During each of the two 10-minute sessions, the puzzles were placed in a randomly ordered line on a table directly in front of the child. The child or the child and mother were instructed to work on the puzzles until the experimenter returned. In the alone condition, mothers sat in an adjoining room within speaking distance of their child, and were asked not to interfere with their child's activity during that part of the session. This procedure was required to avoid upsetting the young children because of the absence of their mother. In the mother present condition, mothers were instructed to act naturally and it was emphasised that our primary interest was the child's behaviour. A video camera was placed behind a curtain in a window of the experimental room, and was as unobtrusive as possible. Few children were distracted by the camera.

Coding of Verbalisations

Each child's verbalisations were transcribed from the videotapes. A verbalisation was considered to be a separate utterance if it was separated from other speech by 3 or more seconds or if there was a shift in content,

that is, a change of topic. Each utterance was coded as being private (self-directed), social (directed towards another), or of questionable direction. The criteria used for coding speech as private were that the utterance: (1) was not part of an ongoing dialogue or a response to another's question; (2) did not contain the name (or pronoun) of a person who could be addressed; (3) was not accompanied by eye contact with another person; and (4) was not followed by the anticipation of a response from another, as indicated by eye contact, head turning towards another, or a tag question. These criteria were similar to those used by Rubin (1979), and do not take into account multifunctional speech that is both social and regulatory. Two independent coders used these criteria to code a sample of the utterances taken from 6 children in each age group. Agreement between the coders was 89%. The number of utterances and proportion of each child's speech that were coded as private or social was calculated, and these values were used in the analyses.

Coding of Performance

From the videotapes, it was also possible to assess children's performance on the puzzles. Each attempt a child made at returning a piece to the puzzle or fitting one piece with another was noted and recorded as being successful or unsuccessful. In the mother-present condition, any attempt that was made by the mother, or one in which the mother physically aided the child, was not counted as an attempt by the child.

For the purposes of the present report, the dependent measure of interest was the number of successful attempts, that is, the number of pieces returned to the puzzle by the child. This raw score was used rather than a proportional measure of successful attempts to total attempts because multiple attempts with a given piece when solving a puzzle is a worthwhile strategy, and a proportional measure would actually count these attempts against a child's performance. If a child attempted a puzzle more than once during the session, each successful return of a piece was counted towards the child's performance, providing the puzzle was completely disassembled between attempts.

RESULTS

Private Speech

The total number of utterances and the number of self-directed utterances were tallied for each child. Overall, an average of 10.8 self-directed utterances was observed in each 10-minute session. Preliminary analyses showed that the number of self-directed utterances increased with age,

TABLE 2
Percentage of Children's Speech Coded as Private

Age	Task Difficulty: Easy	Medium	Difficult	Across Task Difficulty
2				
Alone	25.4	23.0	25.3	24.6
With parent	27.8	15.5	14.7	19.3
Across condition	26.6	19.2	19.0	21.9
3½				
Alone	40.0	30.0	16.7	28.9
With parent	20.5	30.2	18.2	22.9
Across condition	30.2	30.1	17.5	25.9
5				
Alone	25.9	40.5	28.1	31.5
With parent	20.6	37.6	30.8	29.6
Across condition	23.3	39.0	29.5	30.6
Across Age				
Alone	30.4	31.3	23.4	28.4
With parent	23.0	27.8	21.0	23.9
Across condition	26.7	29.5	22.2	26.1

$F(2,66) = 5.80$, $P < 0.01$, task difficulty, $F(2,132) = 24.4$, $P < 0.001$, and mother presence, $F(1,66) = 28.1$, $P < 0.001$. A significant task × condition interaction, $F(2,132) = 9.17$, $P < 0.01$, showed that private speech was most frequent in the medium puzzle in the alone condition, but most frequent on the difficult puzzle in the mother-present condition. However, because there were large individual differences between children and age groups in the number of verbalisations produced while working on puzzles (reflecting, in part, time spent on task), the proportion of each child's speech that was coded as private was calculated and used as the dependent measure. Slightly more than 25% of all speech was coded as private. These results are summarised in Table 2.

A 3 (age) × 2 (gender) × 3 (task difficulty) × 2 (condition) repeated measures analyses of variance, in which the last two factors were within-subject factors, was used to analyse the proportional data. There was a marginally significant main effect for age, $F(2,66) = 2.89$, $P < 0.07$, that reflected an increase with age in the proportion of speech coded as private (21.9% for 2-year-olds; 25.9% for 3½-year-olds; 30.6% for 5-year-olds).

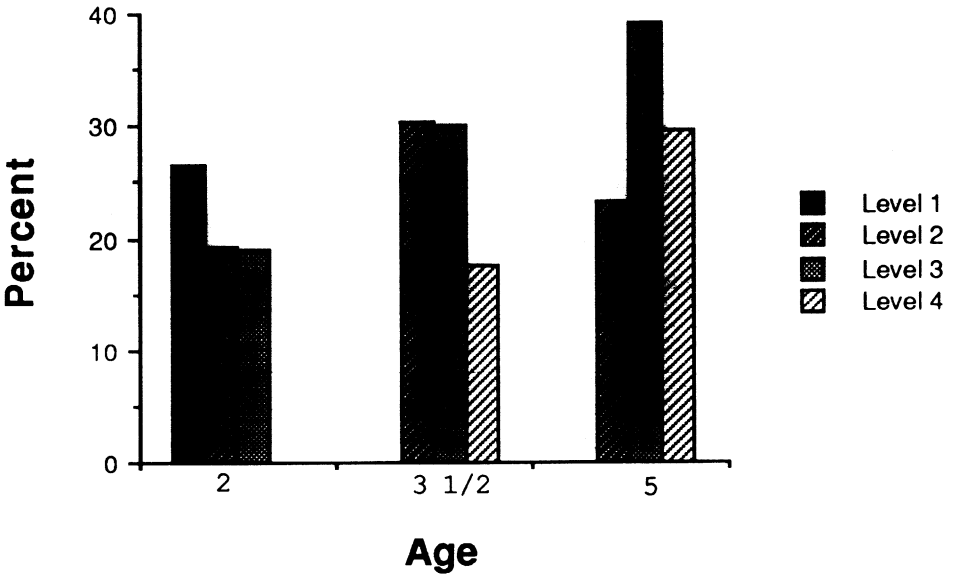

FIG. 1. Percentage of private speech for each age group on easy, medium, and difficult puzzles.

Proportion of private speech did not differ significantly between when children worked on the puzzles alone and with a parent. Moreover, the condition factor did not interact significantly with any of the other variables. Likewise, there was no main effect for gender nor were there any interactions involving that factor.

Of major interest were the significant task effect, $F(2,132) = 3.85$, $P < 0.05$, and the significant age × task interaction, $F(4,132) = 4.68$, $P < 0.01$. Follow-up tests showed that the task effect was due to the occurrence of significantly more private speech on the medium task than on the difficult task (Newman-Keuls test, $P < 0.05$).

The full nature of the task effect was clarified by the age × task interaction. As shown in Fig. 1, private speech by the 2-year-olds occurred most frequently when they worked on the easy puzzle, 3½-year-olds' private speech was most frequent when they worked on the easy and medium puzzles, and private speech by 5-year-olds was most frequent when they worked on the medium puzzle (Newman-Keuls test, all P's < 0.05). This pattern can be summarised by stating that private speech occurred most frequently when children worked on puzzles that were likely to be appropriate for, or slightly above their level of general cognitive ability.

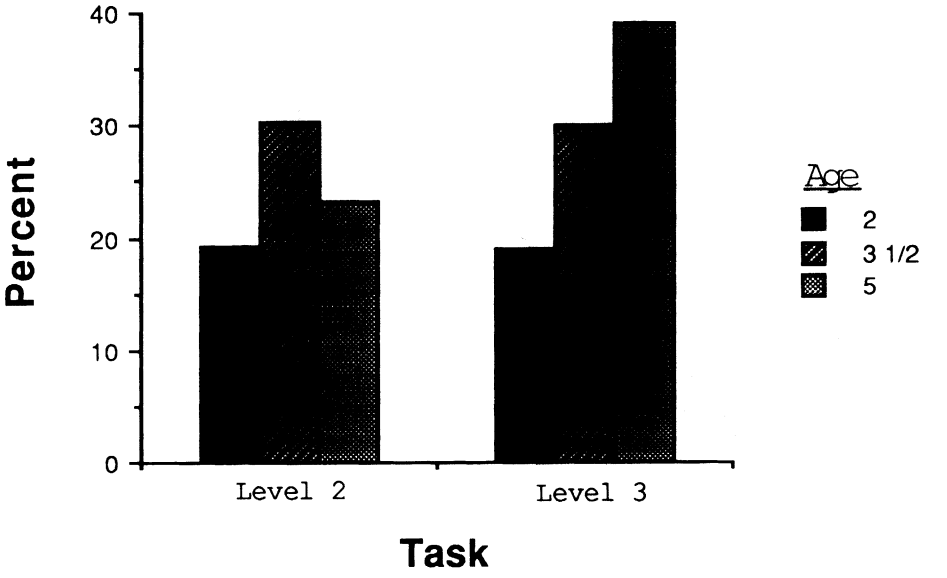

FIG. 2. Percentage of private speech for each age group on level 2 and level 3 puzzles.

Another way to view the age × task interaction is to consider identical tasks performed by all age groups. Such a comparison is presented in Fig. 2, which shows the percentage of private speech for each of the three age groups on the level 2 and level 3 puzzles. As can be seen, a curvilinear pattern was obtained for the level 2 puzzle, with most private speech being observed in the middle age group. Private speech increased linearly with age for the level 3 puzzle. It might be speculated that with the level 3 puzzle, private speech would decrease in still older age groups.

Relationship Between Private Speech and Task Performance

To determine whether the occurrence of private speech was related to performance on a task during which it occurred, correlational analyses were performed. The proportion of all children's total speech that was coded as private was correlated with the number of pieces the child successfully returned to each puzzle. Correlations were calculated for the entire group of subjects in each condition as well as for each age group separately. In general, similar patterns were obtained in all analyses; therefore, only the data for the entire sample are reported.

TABLE 3
Correlations Between Percentage of Private Speech and Number of Correctly Returned Pieces to Each Puzzle in Each Condition

	Task Difficulty		
	Easy	*Medium*	*Difficult*
Percentage of Private Speech			
Alone	0.03	0.32[a]	0.17
With parent	0.16	0.37[a]	0.43[a]

[a] $P < 0.01$.

Table 3 summarises the correlations between percentage of private speech and number of correctly returned pieces to each puzzle in each condition. As can be seen, all of the correlations were positive, and 3 of the 6 were significantly positive. The strongest correlations occurred when the child was working on the puzzles with his or her mother. It also should be noted that all of the significant correlations were found for performance on the medium and difficult puzzles. This finding corresponds well to the view that private speech is most effective when children work on puzzles that are at or slightly above their ability level. In particular, the pattern of correlations suggest that when working on medium-level tasks alone or with a parent, and when working on difficult tasks with a parent, children who use more private speech are more successful.

DISCUSSION

The present study has furthered the understanding of children's private speech because it involved the systematic manipulation of three variables that have been hypothesised to affect private speech, but which rarely have been assessed in a single study. In general, the results were consistent with the position that private speech serves an important self-regulatory function, and supported hypotheses about the effects of age and task difficulty on private speech that were forwarded in the current paper. Because the data concerning the relationship of private speech and task performance are only correlational, causation is not necessarily indicated. Conceivably, when children are engrossed in a task and making some progress, they are more apt to engage in private speech without it affecting performance. The results also bring into question the nature of the regulatory role of a parent in early shared problem-solving. If parents were directly regulating their child's activity, their presence should have resulted in a decrease in children's private speech. This pattern was not observed.

The curvilinear developmental trend in private speech predicted by Vygotsky was observed only when performance on the level 2 puzzle was compared across age groups. When different, but approximately comparably difficult tasks for different age groups were compared, the curvilinear trend was not observed. This finding was consistent with the findings obtained in several other studies (e.g. Berk & Garvin, 1984; Fuson, 1979; Rubin, 1979), and can be interpreted in a straightforward manner. The relative difficulty of the tasks balanced out the amount of private speech observed in each age group, and thus only marginal age differences were observed. The curvilinear pattern of private speech observed by Vygotsky (1962) and Kohlberg et al. (1968, Studies II and III) most likely occurred because they gave the same task to several age groups. Their task was probably most appropriate for the average age or ability group in the sample.

The importance of the effects of task difficulty on private speech seen in the present study should be emphasised. Overall, more private speech was observed when children worked on a puzzle of medium difficulty. More importantly, the puzzle on which the greatest proportion of private speech was observed was not the most difficult puzzle, as is usually predicted, but rather the puzzle that was most likely of moderate difficulty for the subject. Although there is no way to be certain that the puzzles that elicited the most private speech were "ability-appropriate", this interpretation is highly plausible. Children spent the most time on this puzzle and solved it quite successfully.

The present study also investigated the effect of parent presence on children's private speech. Although the sheer frequency of private speech increased in a parent's presence, this increase was a function of an increase in the total number of child utterances in the interactive condition. When private speech was measured as a percentage of the total number of utterances, no effect of parent's presence was observed. These findings point to important differences between frequency and percentage measures of private speech. Frequency measures are appropriate when age or condition effects (experimental or naturalistic) do not produce large differences in the amount of total speech that is elicited. When age or condition effects result in differences in amount of total speech, as in the present study, we believe that a percentage measure is appropriate.

Although proportion of private speech did not increase in the presence of a parent, this pattern does not mean that the parents in this study had no effect on their children's behaviour. Indeed, children's performance improved in the presence of a parent. This combination of a lack of change in frequency of private speech with improved performance in the presence of a parent is consistent with the results expected if the parents took a scaffolding, rather than directly regulating role. Indeed, in the same

situation, we have found that parents adjust their instruction as a function of the age of their child and the difficulty of the task (Rosengren, Behrend, & Perlmutter, 1985). This finding provides converging evidence that parents scaffold their children's activity. However, this interpretation is made with some caution. Further studies of the behaviour of a parent during joint problem-solving should clarify the relationship between interactive style, private speech, and task performance (see Goudena, 1987).

The presence of a parent also affected the pattern of correlations observed between private speech and task performance. All of the significant correlations were found when children worked on the medium and difficult puzzles, and the correlations were stronger when they worked with a parent. This pattern suggests that part of the parents' role was to make the task appropriate for their child's ability, thus increasing their child's success on the task. Nonetheless, because the correlations between private speech and task performance were somewhat irregular and of only moderate size, they should not be taken as conclusive evidence of a direct relationship between private speech and task performance. Other studies have failed to show a consistent correlation between private speech and task performance (e.g., Frauenglass & Diaz, 1985).

One possible explanation for the inconsistency of the speech–performance correlations, especially in the alone condition, is consistent with Vygotsky's theoretical position. If it is true that private speech is an intermediate step in the process of internalisation of thought, then it is likely that the tasks on which much private speech is observed have not yet been mastered by the child. As Goodman (1981) and Frauenglass and Diaz (1985) have reported, private speech often accompanies work on tasks on which the child fails. Thus, private speech may not always be related to performance on a task simultaneous to its occurrence. Instead, it may be most strongly related to performance on the task the next time the child attempts it, when the child has further internalised the necessary regulation and performs the task more efficiently, albeit with less private speech. Gaskill and Diaz (1986) recently reported encouraging significant correlations between private speech and later performance on the same tasks.

In summary, the present results fail to support entirely Vygotsky's original hypotheses, but can be interpreted as supportive of his position that private speech serves an important self-regulatory function. It was shown that some of Vygotsky's predicted results are replicable, but that when these results are isolated from the effects of other variables of potential importance, they may not provide an accurate reflection of the nature of private speech. The interrelations between age, task difficulty, and parent presence are complex, and they become even more so when the relation between private speech and task performance is considered. The present study has clarified some of these complexities. In particular, it has

shown that private speech varies systematically with age and task difficulty in a manner that confirms the self-regulatory function of private speech. Also, the results provide some suggestive evidence concerning the role of a parent in early shared problem-solving activity. Rather than directly regulating the child's behaviour, it appears that a parent may more subtly arrange the task to scaffold with the child's cognitive level, thereby improving the child's performance while still allowing the child to be the primary regulator of her own behaviour.

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