

What young children think you see when their eyes are closed*

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Abstract

The common assumption that young children egocentrically believe you cannot see them when their own eyes are closed was investigated in two studies. It was found that 2.5–4-year-olds, but not 5-year-olds and adults, would indeed often give a negative reply to the experimenter's question "Do I see you?" when their eyes were closed and covered with their hands. However, they would also correctly reply that the experimenter did see their arm and an object placed in front of them and did not see their eyes and back, indicating that they were making veridical, nonegocentric inferences about the experimenter's visual experience. In addition, their eyes being visible to the experimenter did not prove to be either a necessary or a sufficient condition for their judgment that the experimenter could see "them" ("you"). It was concluded that, in this context, adults take "you" to mean their whole body while young children take it to mean primarily their face region. Speculations were made as to how young children could have acquired this meaning, and about possible similarities and differences between the self conceptions of young children and adults.

Knowledge concerning visual perception constitutes one form of social or psychological cognition (Shantz, 1975). Flavell and his co-workers have hypothesized that there are at least two developmental levels of such knowledge (Flavell, 1974, 1978; Lempers, Flavell, and Flavell, 1977; Masangkay,

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McCluskey, McIntyre, Sims-Knight, Vaughn and Flavell, 1974). At earlier-developing Level 1, the child can nonegocentrically infer what objects another person does and does not see, given adequate cues. At later-developing Level 2, the child further knows that an object simultaneously visible to both the self and the other person may nonetheless elicit different visual impressions or experiences in the two if their viewing circumstances differ (cf., Hughes, 1975).

A recent study by Flavell, Shipstead, and Croft (1978) illustrates how surprisingly nonegocentric and skillful Level 1 children can be at inferring whether an object is or is not visible to another person under various perceptual conditions (see also Hughes, 1975). Children of ages 2.5, 3, and 3.5 years were tested for their understanding of object hiding. Even the youngest subjects nonegocentrically hid an object from another person's sight by placing it on the opposite side of a screen from that person, even though placing it there necessarily left it unconcealed from themselves. Most of them also correctly recognized that the other person could see the object when the screen was interposed between them and the object (thereby blocking their own view of it), but that the other person could not see it when the screen was interposed between that person and the object. In sum, they did not seem to mistake what they themselves did and did not see for what the other person did and did not see.

Thus, previous research would lead us to expect that children of this age would also do well on the following unusual type of Level 1 task: (a) the child and another person face one another, (b) the child's eyes are closed and/or covered, (c) the child is told that the other person's eyes are open and directed at the child's face, (d) the other person then says, "Do I see you?" The child's total lack of visual input or experience in this situation should provide an unusually powerful temptation to respond egocentrically. Consistent with this, there seems to be a popular assumption that young children do often egocentrically assume that others cannot see them when their own eyes are closed. For instance, they are sometimes observed to merely close or cover their eyes rather than conceal their whole body when playing hide-and-seek. On the other hand, if it should turn out that young children respond nonegocentrically rather than egocentrically in this putatively egocentrism-tempting situation, it would suggest that their Level 1 knowledge is very solid indeed. It would also lead us to question what appears to be a folk belief about what young children think you see when their eyes are closed. The major purpose of Study 1 was therefore to test the solidity of 2- and 3-year-olds' Level 1 knowledge.

Study 1

Method

Subjects

The subjects were 64 children from middle-class nursery schools and kindergartens, plus nine Stanford University students and staff. The age groups were categorized as 2.5 years (mean age 32.9 months, range 30–35 months), 3 years (mean age 39.4 months, range 36–41 months), 3.5 years (mean age 44.7 months, range 42–47 months), 5 years (mean age 63.3 months, range 60–67 months), and adult (mean age 23.0 years, range 21.2–26.0 years). There were eight girls and eight boys in each child group, four women and five men in the adult group.

Procedure

The experimenter and subject sat facing each other across a low table with a Snoopy dog toy on it. The adult subjects were told that the tasks were designed for young children and were therefore very simple. The adults were also told to answer each question quickly, giving their first, “gut-level” reaction; they were not to think before answering—just answer. The tasks described below were presented in random order, with the exception that the task *Two Eyes Closed or Covered*,¹ administered twice, was always the first (A) and the last (B) task given.

1. Two Eyes Closed or Covered A

After the child closed or covered both eyes, the experimenter said, “Now your eyes are closed, and my eyes are open.” Then she asked, “Do I see Snoopy?”, and then, “Do I see you?”. If the child indicated that the experimenter did not see him, the experimenter proceeded to ask, “Do I see your head?”, and then again, “Do I see you?”. (A number of children had difficulty keeping their eyes closed and so were asked to cover them with their hands instead. Regrettably, we did not record which or how many children covered rather than closed their eyes.)

2. One Eye Covered

The same procedure (minus the initial statement and the Snoopy question) was repeated while the child covered one eye with his hand.

¹To aid discrimination, Study 1 task names will be italicized and Study 2 ones will not.

3. *Mouth Covered*

The child was asked to cover his mouth with a hand. The experimenter asked, "Do I see your mouth?", and then, "Do I see you?".

4. *Two Eyes Exposed*

The child stepped away from the table and stood behind a long piece of material and looked at the experimenter through a small rectangular slot. The experimenter could thus see only the child's eyes and the bridge of his nose. The experimenter asked, "Do I see your eyes?", and then, "Do I see you?".

5. *Turn 180°*

The child sat facing away from the experimenter with both eyes open. The experimenter said, "Your eyes are open, and I'm going to keep my eyes open too." She then asked, "Do I see you?". If the child responded in the negative, the experimenter followed with, "Do I see your head?", and "Do I see you?".

6. *Experimenter Eyes Covered*

A second experimenter faced the child, closed both eyes, and covered them with her hands. The first experimenter then asked the child, "Do you see — (name of second experimenter)?".

7. *Reflective Glasses*

The child and experimenter took turns putting on the "special" glasses (silvered ski sunglasses) to show that the wearer of the glasses could see the other but the other could not see the wearer's eyes. The experimenter verified the child's understanding of these features of the glasses before posing the questions. The child put on the reflective glasses and was then asked, "Do I see your eyes?", and "Do I see you?".

8. *Two Eyes Closed or Covered B*

Same as 1.

Rationale

A curious and wholly unanticipated pattern of responding was observed during the pilot testing for this study. With only their eyes closed or covered, some young children would say that the experimenter did not see “them” (“you”), just as the popular assumption would predict. However, they would also correctly reply that she *did* see their head, arm, or other objects in her field of vision. The *Both Eyes Closed or Covered* task was included to find out how frequently this pattern would be observed in children of different ages. More generally, the set of seven tasks was designed to identify the visual conditions of observed and observer which influence young children’s judgments about what the observer sees.

One possibility is that young children egocentrically assume the other person cannot see anything at all when they themselves cannot. As suggested above, recognizing that others can see when the experience of not seeing anything is filling one’s own field of awareness may require more Level 1 ability to decenter from one’s own perspective than young children possess. Negative answers to all *Two Eyes Closed or Covered* questions would support this possibility; negative answers to the “you” questions only (the response pattern seen in pilot testing) would clearly rule it out. A second easily tested possibility is that they believe the other cannot see “them” unless *both* their eyes are open (*One Eye Covered*). A third is that she cannot see “them” if *any* important part of the face is concealed from her view, or if they engage in any sort of self-hiding gesture (*Mouth Covered*). The other tasks, together with *Two Eyes Closed or Covered*, could provide at least tentative evidence for other possibilities that will be considered below.

Results and discussion

Table 1 shows the percentages of correct answers to each task question in each of the five age groups. Recall that the questions which are most indented in Table 1 were asked only of subjects who had given an incorrect (negative) answer to the “you” question immediately preceding them. We shall first describe and discuss the adult response pattern, then the developmental trends leading to it, and finally the nature and possible meaning of immature patterns.

Adult pattern

The adults answered all object and body part questions correctly. They also seemed to construe “you” and “———” (experimenter’s name) as referring

Table 1. *Percentage of correct answers to each question in each age group (correct answers given in parentheses)*

Tasks and Questions	Age ^a				
	2.5	3	3.5	5	Adults
1. <i>Two Eyes Closed or Covered A</i>					
Snoopy? (yes)	100	100	100	100	100
You? (yes)	37	37	50	87	100
Your head? (yes) ^b	80	90	75	100	–
You? (yes)	10	30	12	0	–
2. <i>One Eye Covered</i>					
You? (yes)	87	100	94	100	100
3. <i>Mouth Covered</i>					
Your mouth? (no)	100	94	100	100	100
You? (yes)	81	94	100	100	100
4. <i>Two Eyes Exposed</i>					
Your eyes? (yes)	100	100	100	100	100
You? (yes) ^c	81	75	81	31	33
5. <i>Turn 180°</i>					
You? (yes)	50	31	50	69	100
Your head? (yes)	88	91	100	100	–
You? (yes)	25	18	12	20	–
6. <i>Experimenter Eyes Covered</i>					
Do you see (experimenter)? (yes)	44	50	56	87	100
7. <i>Reflective Glasses</i>					
Your eyes? (no)	94	100	100	100	100
You? (yes)	44	31	62	63	100
8. <i>Two Eyes Closed or Covered B</i>					
Snoopy? (yes)	100	100	100	100	100
You? (yes)	31	44	50	87	100
Your head? (yes)	91	89	100	100	–
You? (yes)	9	11	12	0	–

^a*N* = 16 for each child group and 9 for the adult group.

^bIndented questions were only asked of subjects who had responded incorrectly (i.e., negatively) to the preceding “you” question. The percentages in these rows are thus based on *N*s of less than 16 in all cases. For example, 6 of the 16 2.5-year-olds answered the initial “you” question of Task 1 correctly (37%). Of the remaining 10, 8 (80%) correctly answered the subsequent “head” question and 1 (10%) correctly answered the subsequent “you” question.

^cThe “correct” answer to this question is somewhat arbitrarily set as yes here.

to each individual’s physical body taken more or less as a whole. Like body parts and external objects, “you” the body-as-a-whole was apparently experi-

enced as “seen” to the extent that it was unconcealed and visible to the observer: definitely and unambiguously seen when most of it was visible; not seen or less certainly seen when only the eyes (or, for all one knows, any small portion of the body) were exposed to view, as in *Two Eyes Exposed*.

Developmental trends

The data in Table 1 suggest that there is considerable development towards the adult pattern between three and five years of age. Significant or near-significant decreases across this age range obtained for task 1, $\chi^2(3) = 10.79$, $p < 0.05$, task 6, $\chi^2(3) = 7.51$, $p < 0.10$, and task 8, $\chi^2(3) = 11.29$, $p < 0.05$; the apparent decrease for task 5 is not significant. The age *increase* in negative answers to the “you” question of the *Two Eyes Exposed* task was also significant, $\chi^2(3) = 12.69$, $p < 0.01$. While not all 5-year-olds responded like the adults, a good many did: eight responded affirmatively to each of the five “you” questions on tasks 1, 5, 6, 7, and 8 and five more responded affirmatively to four of the five; the corresponding figures for the three younger groups were, from youngest to oldest, 3 and 1, 2 and 0, and 6 and 0.

Immature patterns

There is no suggestion whatever in the data that even the youngest subjects egocentrically assumed that the experimenter could not see anything when they themselves could not see anything. As Table 1 indicates, all subjects said the experimenter saw the Snoopy doll on both administrations of *Two Eyes Closed or Covered*. In addition, of those children who were asked the “head” question on Tasks 1, 5, and 8 (by virtue of having just said no to the “you” question), the percentages responding correctly were 83%, 94%, and 93% respectively. These affirmative answers are significantly more numerous than would be expected by chance (all are $p < 0.001$ by Sign Test) and therefore, of course, also far more numerous than would be predicted by any total-inability-to-decenter hypothesis.

The data in Table 1 also indicate that almost all the children believed the other could see “them” when only one rather than both of their eyes was covered (*One Eye Covered*). The possibility that they would say no to the “you” question no matter what facial part was covered was also ruled out by the finding that most of the children also said yes to the “you” question when their mouth was concealed (*Mouth Covered*).

Only 10 subjects consistently gave incorrect answers to the five “you” questions of tasks 1, 5, 6, 7, and 8. We analyzed children’s patterns of yes and no answers to these “you” questions plus the “you” question of *Two*

Eyes Exposed (task 4) to see if these patterns might at least provide clues about underlying beliefs in this area. We first excluded from these pattern analyses the 18 children who gave correct answers to the task 1, 5, 6, 7, and 8 “you” questions, plus two others who responded incorrectly to several “head” questions and may therefore have had unusual attention or comprehension problems. This left a sample of 44 subjects. One imaginable childish belief is that you “see me” *if and only if I see*, i.e., am sighted. A child who believed this should say no to at least one of the two “you” questions where he is unsighted (tasks 1 and 8), but should say yes to all the “you” questions where he is sighted (tasks 4, 5, and 7). A second possible belief is that you “see me” *if and only if I see you*. A child who believed that should also respond as above, except to say no rather than yes on the task where he is sighted but cannot see the experimenter (task 5). A third possible belief is that you “see me” *if and only if you see my eye(s)*. The response pattern consistent with this belief is a yes on the task where his eyes are visible to the experimenter (task 4) and no on those where they are not (tasks 1 or 8, 5, and 7).

Of the 44 subjects considered, one showed the first pattern, eight the second and 14 the third. Moreover, 11 of the latter 14 also said they could not see the experimenter in *Experimenter Eyes Covered* (task 6), a pattern consistent with the more general belief that anyone can be seen by an observer if and only if the observer can see the person’s eyes. The third belief differs from the first two in that it takes as the relevant consideration what the observer sees rather than what the observed person sees. The young subjects in this study obviously took what the observer sees as the relevant consideration when answering “head” and “Snoopy” questions. It is therefore reasonable to suppose that the same was also true when they answered the “you” questions.

The overall pattern of results in Study 1 led us to the following conclusions and speculations. Consistent with their performance on other Level 1 tasks, 3-year-olds are quite capable of accurately and nonegocentrically inferring what physical objects the other does and does not see, even in the extreme condition when they themselves do not see anything. This suggests that their Level 1 knowledge is very robust and well consolidated, and thereby answers the question that originally motivated this study.

If this is true, however, it implies that their negative answers to “you” questions were not usually caused by incorrect inferences concerning what or how much of their physical bodies were actually visible to the other. We are thus left with an intriguing puzzle that had not been anticipated when we undertook this study. The most likely alternative cause of these answers seemed to be that “you” or “see you” means something different to young

children than it does to adults; the fact that some children deny that they can see the experimenter when her eyes are closed (*Experimenter Eyes Closed*) clearly suggests that semantic rather than perceptual considerations must be important here. It looks as if the rumored tendency of young children to think that others do not see them when they avert or cover their eyes does have a factual basis, although its meaning appears to be very different from what most of us would have suspected. Perhaps young children really do believe you “see them” in some special, nonadult meaning of these terms if and only if you see at least one of their eyes (see the above pattern analysis). And if so, could it conceivably be because they (a) take “you” to refer to their inner-psychological rather than outer-physical self in these task settings, and (b) believe that their inner-psychological self is somehow visible to others through their eyes? A search through thesauruses revealed that many writers from Cicero on have spoken metaphorically of the eyes as “the windows of the soul” or the equivalent. Implausible as it may appear, perhaps young children entertain some literal version of this idea, especially when eyeball to eyeball with large, seemingly all-knowing and all-seeing grownups. Study 2 was undertaken to obtain more and better evidence relevant to these possibilities than Study 1 afforded, as well as to see if the basic Study 1 results could be replicated.

Study 2

Method

Subjects

The subjects were 6 boys and 16 girls from middle-class nursery schools (mean age 46.6 months, range 39–52 months).

Procedure

The tasks described below were presented to the children in random order, with the exception that the Cognitive Self Interview was always administered last. Their rationales will become apparent in the Results and Discussion section.

1. Two Eyes Covered

The child and experimenter sat facing one another. The child closed his eyes and covered them with his hands. After making sure he could not see any-

thing, the experimenter said: "My eyes are open and I'm looking. Do I see _____ right now?". This question was asked five times in succession, with the blank filled by "you", "you, _____" (child's first name), "your eyes", "your back" (a nonvisible body part), and "your arm" (a visible body part). These five questions were asked in a random order that was variable across subjects, with the constraint that the two "you" questions were always separated by at least one other question. This same questioning procedure was used in the next four tasks as well, except that the visible body part queried was not always the child's arm.

2. Card

The experimenter held a 5 × 8 inch white card perpendicularly about 20 cm in front of the child's face, such that neither could see the other's face. The visible body part was "your foot" in this task.

3. Turn 135°

A second experimenter sat 135° to the subject's right rear, holding a puppet. The child continued to look at it over his shoulder while being questioned, turning his upper torso a greater or lesser amount in order to do so. The visible body part was "your arm." "Your back" continued to be used as the supposedly nonvisible body part, although at least a portion of the child's back was in fact usually visible to the first experimenter while the child looked at the puppet.

4. One Eye Exposed

The child stood behind a long piece of material with one eye pressed against a hole about the same size and shape as his eye. The questioning procedure was identical to that used in task 1, except of course that "your eye" was substituted for "your eyes".

5. Reflective Glasses and Mirror

The properties of the silvered reflective glasses were demonstrated to the child much as in Study 1. The child then put the glasses on and the experimenter knelt behind him, holding a 33.5 × 23 cm mirror in front of them. The child could thus see in the mirror both his own face and that of the

experimenter looking at him, but of course could not see his own eyes. Unlike in the *Reflective Glasses* task of Study 1, however, the child also “saw” that the experimenter could not see his eyes either. The visible body part queried was “the top of your head” and a sixth question followed the usual five, namely “Do you see yourself?”.

6. *Where Experimenter Looks*

The experimenter faced about 180° away from the child and said: “My eyes are open and I’m looking right here (pointing to an object across the room). Do I see you right now?”. The statement and question were then repeated with the experimenter pointing successively at (but not naming) the child’s shin, stomach, eyes, chin, and finally shin again. The order of eyes, stomach, and chin was randomized, however, thus making the order of the entire set of subtasks as follows: Away—Shin—(Chin, Eyes, Stomach)—Shin.

7. *Experimenter and Doll Eyes Closed*

The experimenter said “Now ——’s eyes are closed. Do you see —— right now?”. The child’s visual targets were, in random order, the second experimenter who had just closed her eyes and a small doll whose eyes automatically closed when it was placed in a horizontal position.

8. *Cognitive Self Interview*

The interview dealt with the meaning, location, and potential visibility of the “cognitive self”, in that order. Using the abovementioned doll, the experimenter first explained that dolls are like people in some ways, namely, both have legs, arms, heads, etc. (pointing to corresponding body parts on the doll and on the child and experimenters). The experimenter then asked how dolls are different from people, and whether dolls know their names and think about things, as the child and other people do. The inflection of the questions and the nature of accompanying remarks suggested that people are in fact different from dolls in just these ways. The location questions then were: “Where is the part of you that knows your name and thinks about things? Where do you do your thinking and knowing?”. Every effort was made to get the child to listen very attentively to these questions and comprehend them as best she could. If the child did not indicate a location in response to these questions the experimenter gestured randomly and imprecisely towards

different areas of the child's body, asking "is it here, here, here... where?" The visibility questions came next: "If I look here (points), at (in) your —, do I see the part of you that knows things and thinks?" Four body parts were named and inquired about in random order: stomach, foot, nose (but with the experimenter actually staring at the child's eyes), and eyes. Ad lib follow up questions about the location and visibility of the cognitive self were also asked in many cases, depending upon the child's previous responses and responsivity to the standard questions.

Rationale

The subjects used in Study 2 were selected with the hope that they would still be young enough to give some immature responses to key "you" questions but also old enough to comprehend the ideas and questions presented in the Cognitive Self Interview. The questioning procedure of tasks 1–5 in this study was intended to be a methodological improvement over that used in Study 1.

As for specific tasks, Two Eyes Covered provides a replication of Study 1's *Two Eyes Closed or Covered*, but with all subjects hiding their eyes in the same fashion. The Card task presents a condition in which the child can "see" that his face is not visible to the experimenter. If the visibility of his eyes to the observer is critical for the young child, this task should elicit a great many negative answers to its "you" questions.

In Turn 135°, most of the front of the child's body and a bit of the side of his face remains visible to the experimenter; as in Turn 180°, however, the child cannot see the experimenter. Moreover, in contrast to tasks like Two Eyes Covered, *Two Eyes Closed or Covered*, *Two Eyes Exposed*, *One Eye Exposed*, *Card*, and perhaps even Turn 180°, the child's turning to look at the puppet in Turn 135° does not closely resemble any hiding-of-self action one could imagine young children of any culture performing in everyday life, e.g., in hiding games with parents. If young children also say that the experimenter does not see "them" in this task, therefore, it probably means they are not merely assimilating all our task conditions to culturally-acquired, stereotyped hiding games.

One Eye Exposed provides a more stringent test than *Two Eyes Exposed* of the hypothesis that, for young children, eye visibility is a sufficient condition for a judgment that they are seen. Similarly, Reflective Glasses and Mirror should be a better test than *Reflective Glasses* of the possibility that eye visibility is a necessary condition. Once the reflective glasses were put on them, a number of the younger children in Study 1 seemed to have trouble maintaining their just-established recognition that others cannot see the

wearer's eyes through the glasses. For such children, then, the "you" question came immediately after a hard won and perhaps merely token negative answer to the "eyes" question; this could have led to a similarly shallow negative answer to the "you" question. In contrast, the children in Study 2 had no difficulty in believing that the experimenter did not see their eyes. The reason is that they could not perceive their own eyes and could also "see" that the experimenter could not perceive them either.

The subtasks of Where Experimenter Looks might answer several questions. Would young children adopt the adult, whole-body-as-visual-target interpretation of "see you" in a situation designed to highlight it? The Away-Shin sequence should highlight it, since the experimenter first looks away from the child, then turns to look at a part of his body. When the experimenter does look at the child, will the child tend to say the experimenter sees him only when the experimenter looks at his eyes? Or might the tendency to reply affirmatively instead increase more or less continuously as the experimenter's gaze approaches the eyes, for example from Shin to Stomach to Chin to Eyes? Will there be less tendency to say yes to the second Shin question than to the first one, since the immediate context is now being looked in the eye rather than not being looked at at all? Finally, as in Turn 135°, negative answers to, for example, Shin cannot be easily dismissed as generalizations from previous experience with hiding games.

The Experimenter and Doll Eyes Closed subtasks follow up the Study 1 *Experimenter Eyes Covered* task. The child sees no hands-over-eyes actions that could be assimilated to gamelike hiding rituals in the former, however. The Doll subtask was included simply to find out whether any tendency to say that one cannot "see" other people when their eyes are closed applies only to real people.

The principal motivation for appending the Cognitive Self Interview was to provide evidence for or against the windows-of-the-soul speculations advanced at the conclusion of Study 1. If the child localizes at least the cognitive part of the inner, psychological self ("soul") in the head and also harbors this "windows" intuition, she ought to say the experimenter can see that part when he looks into her eyes. If this intuition depends upon actual eye contact as against the experimenter's verbal and gestural specification of what he is looking at, the response to Nose and Eyes should be the same; if not, the two responses should differ. Finally, we were simply interested in finding an effective, methodologically adequate method for assessing whether and where young children locate at least one, fairly clearly specifiable part of the psychological self, namely, the thinking and knowing part. A search of the literature suggests that no such method has yet been devised (cf., Horowitz, 1935).

Results and Discussion

Table 2 shows the percentage of subjects giving correct answers to body part and "you" questions. As in Study 1, the children did well on the body part questions. The one apparent exception (task 3, nonvisible part) is readily explained: as indicated earlier, part of the child's back *was* in fact usually visible to the experimenter when the child turned to look at the puppet. Of the 14 other body part questions in tasks 1–5, the mean number correctly answered was 12.91. The sturdiness of 3-year-olds' Level 1 percept inference skills in the face of probable temptations to egocentrism is again demonstrated.

The Two Eyes Covered "you" questions seem to have elicited roughly the same proportion of no answers in this study as the *Two Eyes Closed or Covered* "you" questions did for the Study 1 group most similar in age to the present sample, namely, the Study 1 3.5-year-olds. The somewhat similar Card task "you" questions also elicited substantial percentages of negative answers. The curious tendency for this sort of task situation to elicit "you don't see me" judgments in many young children thus appears to be quite

Table 2. Percentages of subjects giving correct answers to each question

Tasks	Types of Questions					
	Body Part Questions			"You" Questions		
	Eye(s)	Visible	Nonvisible	"You"	"You, —"	Both
1. Two Eyes Covered	100	86	100	54	45	36
2. Card	91	82	100	23	36	23
3. Turn 135°	86	86	23	64	64	46
4. One Eye Exposed ^a	100	100	100	41	59	32
5. Reflective Glasses and Mirror	100	82	77	86	82	77
6. Where Experimenter Looks						
a. Away	—	—	—	100	—	—
b. Shin	—	—	—	45	—	—
c. Stomach	—	—	—	73	—	—
d. Chin	—	—	—	86	—	—
e. Eyes	—	—	—	86	—	—
f. Shin	—	—	—	50	—	—
7. Experimenter and Doll Eyes Closed						
a. Experimenter	—	—	—	77	—	—
b. Doll	—	—	—	100	—	—

^aAs in Study 1's *Two Eyes Exposed* task, the "correct" answer to "you" questions is arbitrarily set as yes here.

robust. There were nine no answers (41%) to whichever “you” question was asked first in Turn 135°, compared to 50% for Turn 180° in Study 1. More than is true for Turn 180°, negative answers to Turn 135° “you” questions cannot easily be explained as simple generalizations from self-hiding actions or games learned at home.

The data from One Eye Exposed suggests that eye visibility is not in fact a *sufficient* condition for judged “you” visibility for at least a number of 3.5-year-olds. Although all the subjects said their eye was visible, 32% said no to both “you” questions and 68% said no to at least one. Notice that these results could hardly reflect a belief that the experimenter had to see *both* of their eyes in order to see “them.” That belief would generate negative answers to the Study 1 *One Eye Covered* “you” question, and such answers were very rare (Table 1).

The data from Reflective Glasses and Mirror very strongly indicate that eye visibility is not usually a *necessary* condition either. Although all subjects said their eyes were not visible in this task, 77% said yes to both “you” questions and 91% said yes to at least one (all subjects also said that they could see themselves). These percentages of yes answers are similar to those for Where Experimenter Looks: Eyes, where the experimenter actually looks at the child’s completely visible eyes. Finally, a child who consistently believed eye visibility to be both a sufficient and a necessary condition for “you” visibility should give two yes answers in One Eye Exposed and two no answers in Reflective Glasses and Mirror. Not one child showed this response pattern, however. It is of course possible that eye visibility might be a sufficient and/or necessary condition for judged “you” visibility in children younger than 3.5 years, although we frankly doubt it.

It is apparent from the Where Experimenter Looks data that the Away-Shin sequence did not seem to lead most of the 3.5-year-olds to adopt the adult, whole-body-as-physical-target interpretation of “see you”, as we thought it might: only 45% gave a yes response to the “you” question when the experimenter looked at their shins after having just looked away from them (first Shin question), with a similar (50%) rather than a significantly lower number giving the same response to the second Shin question. It is also clear from the Where Experimenter Looks data that yes answers were not given solely when the experimenter looked at the children’s eyes: they were as common or nearly so when their chins and stomachs were the visual targets. These, together with the yes answers to the Shin questions, constitute further evidence against the eye-visibility-as-necessary-condition hypothesis. The frequent no answers to the Shin questions, like those in Turn 135°, once again seem to argue against the supposition that children were merely assimilating our tasks to familiar hiding games. Finally, five of the 22 subjects

(23%) said they did not see the second experimenter when her eyes were closed (task 7a), but none said this when the doll's eyes were closed (task 7b).

Fourteen of the subjects met the following criteria in their responses to the Cognitive Self Interview. First, they unequivocally localized the "part of you that knows your name and thinks about things" in one specific place. Second, they did not do or say anything in addition that was inconsistent with that unique localization, such as later indicating that the experimenter could see that part of them at a location other than the one initially specified. Of these 14 subjects, 10 localized it in the head, three in the mouth, and one in the shoulders. Among the other eight subjects, there were three mentions of stomach, one each of face, foot, hand, and knee, and one failure to specify any location. Significantly, no subject in either group mentioned or pointed to her eyes as a location. Our general impression was that the 14 who met these criteria understood our questions quite well and that most of the remaining eight probably did not. The two subgroups did not differ consistently in their performance on other tasks.

Of the 14 who met these criteria, one said that the experimenter saw the part in question only when he indicated he was looking into the child's eyes, one only when he indicated that he was looking at the child's nose (but, according to procedure, was actually looking at her eyes), three answered affirmatively to both questions, and the remaining nine answered negatively to both questions. However, an examination of the interview protocols of even the five subjects who responded affirmatively here revealed no evidence whatever that they entertained any "windows-of-the-soul" conception of their eyes. The subsequent interchange with one went like this:

"Can I see you thinking? No. Even if I look in your eyes, do I see you thinking? No. Why not? Cause I don't have any big holes. You mean there would have to be a hole there for me to see you thinking?" The child nods.

Two others also subsequently denied that the experimenter could see them thinking ("Cause the skin's over it", said one), while the remaining two localized the thinking part in the mouth and shoulders, respectively. From the children's responses to standard and follow-up questions, the modal intuition seemed roughly to be that thinking and knowing go on inside the head and are therefore not visible to others; in particular, others cannot see these activities or the part of the self that does them by looking into one's eyes. Although the main purpose of the Cognitive Self Interview was to settle the visibility-of-the-inner-you question, it also appears to be a more promising method for learning about very young children's concept of the self than previous ones of its kind (Horowitz, 1935).

How, then, to explain the results of the two studies? It is possible that the young child's tendency to say yes in response to a given task's "you" question partly depends upon what he thinks the observer sees in that task condition. What he may think the observer sees is characterized below in the form of an ordered series of categories. The Study 2 tasks that seem to belong in each category are also given, together with justifications where needed:

1. *None of body*—Where Experimenter Looks: Away.
2. *None of face but some of body*—Where Experimenter Looks: Shin, and Card. In pilot work with the Card Task, we found that a number of children did not think the experimenter saw their arm when he held the card between their faces. Many did think he could see their foot, however, and that was consequently selected as the visible body part. This explains the present classification of this task under "some of body."
3. *None of face but most of body*—Where Experimenter Looks: Stomach.
4. *Some of face*—Two Eyes Covered, Turn 135°, and One Eye Exposed. In Two Eyes Covered, the child's hands covered most of the rest of her face as well as her eyes.
5. *Most of face*—Reflective Glasses and Mirror.
6. *All of face*—Where Experimenter Looks: Eyes and Where Experimenter Looks: Chin.

Let us make the post hoc hypothesis that the child's inclination to say yes to "you" questions increases as task conditions progress from category 1 to category 6. We can then compare the rank order of the 10 tasks based on their category membership with the rank order of these same tasks based upon children's percentages of yes answers, as shown in Table 2 (where a task had two "you" questions, the average of the two percentages was used for the rank-ordering). The rank-order correlation between the two sets of ranks is 0.92, suggesting that the "dimensions" underlying this ordered categorization may in fact have affected the children's judgments in the hypothesized way. These and other findings in the two studies suggest the following speculations about the nature and development of the young child's reactions to our "Do I see you?" questions.

When adults (and children) refer to the child, to themselves, or to other people present by the appropriate personal pronoun, they are apt to look at or otherwise direct attention to the face of the person referred to. "Look at me" is usually correctly understood by the child listener to mean "Look at my face." "I want to tell you something" is normally accompanied by looking at the child's face, a co-occurrence he can readily observe. Moreover, should he fail to turn his face to meet the adult's gaze under these circumstances for any reason (inattention, apprehension, etc.), the adult may effectively get each pronoun associated with its appropriate face by saying

something like “Look at me when I talk to you”, perhaps manually turning the child’s face towards her for good measure. When adults refer to “your arm”, “your leg”, etc., while speaking to the young child, the child usually sees them look at those parts of his body. On the other hand, when they refer to “you” while speaking to the child, he usually sees them look at his face.

Such experiences might lead a child to think that the “you” that is sometimes visible to another and sometimes not (thus, precisely the “you” that our tasks must make salient) is roughly coextensive with his face. It might thus seem sensible to the child, although not to an adult, to say that he does not “see” another person whose hands cover her eyes and most of her face (*Experimenter Eyes Covered* task in Study 1). This “You, your face”, like the adult’s “You, your body”, is a wholly external, physical affair; like the adult, the child has learned that only external, physical entities normally vary in visibility from one observer circumstance to another. The Cognitive Self Interview data suggest that many young children may also have inklings of another “you”—one that knows and thinks. Interestingly, this “you” is situated quite close to the other one. However, it is wholly internal rather than external, and has no ocular windows through which it can be seen (although it might be conceived as material by some young children, and hence visible if one could only see inside somehow).

Part of self concept development may therefore take the following form, at least in the subculture from which our subjects were drawn: Both adults and young children (*circa* 3–4 years of age) have intuitions about at least one kind of inner, psychological self, a cognitive one, and they both probably localize it in the same place: the head. Both have also developed intuitions about at least one kind of outer, physical self, the self that is visible to others, but they probably localize it in different places: the entire body surface, in the case of the adults; largely the facial surface, in the case of the children. By age 5 or so, these differences in the conceived extension of this kind of physical self have largely disappeared.

References

- Flavell, J. H. (1974) The development of inferences about others. In T. Mischel (Ed.), *Understanding other persons*. Oxford, England, Blackwell, Basil & Mott.
- Flavell, J. H. (1978) The development of knowledge about visual perception. *Nebraska Symposium on Motivation*, 25, 43–76.
- Flavell, J. H., Shipstead, S. G., and Croft, K. (1978) Young children’s knowledge about visual perception: Hiding objects from others. *Child Devel.*, 49, 1208–1211.
- Horowitz, E. L. (1935) Spatial localization of the self. *J. Soc. Psychol.*, 6, 379–387.

- Hughes, M. (1975) *Egocentrism in preschool children*. Unpublished doctoral dissertation, University of Edinburgh.
- Lempers, J. D., Flavell, E. R., and Flavell, J. H. (1977) The development in very young children of tacit knowledge concerning visual perception. *Genet. Psychol. Mono.*, 95, 3–53.
- Masangkay, Z. S., McCluskey, K. A., McIntyre, C. W., Sims-Knight, J., Vaughn, B. E., and Flavell, J. H. (1974) The early development of inferences about the visual percepts of others. *Child Devel.*, 45, 357–366.
- Shantz, C. V. (1975) The development of social cognition. In E. M. Hetherington (Ed.), *Review of child development research* (Vol. 5). Chicago, University of Chicago Press.

Résumé

L'idée, largement répandue, que les jeunes enfants croient égocentriquement qu'on ne peut les voir lorsque leurs yeux sont fermés a donné lieu à deux études. Les sujets de 2.5 à 4 ans répondent souvent négativement à la question de l'expérimentateur "Est-ce que je te vois?" quand leurs yeux sont fermés et couverts par leurs mains. Ni les sujets de 5 ans ni les adultes ne donnent cette réponse. Cependant, les jeunes sujets répondent correctement que l'expérimentateur peut voir leur main et un objet placé devant eux alors, et ne peut voir ni leur yeux ni leur dos indiquant ainsi qu'ils peuvent faire des inférences vraies et non égocentriques sur les possibilités visuelles de l'expérimentateur. En outre, le fait que leurs yeux soient visibles par l'expérimentateur n'est ni une condition nécessaire ni une condition suffisante pour justifier leur position que l'expérimentateur peut les voir "toi". On conclut donc que les adultes considèrent "toi" comme représentant leur corps entier alors que les jeunes enfants considèrent qu'il représente la région de leur visage. On s'interroge pour savoir comment les jeunes enfants ont acquis cette idée et sur les points de différences et de ressemblances entre les conceptions du moi chez les jeunes enfants et les adultes.