As is well known, Vygotsky (1962, 1978, 1981) argued that new achievements appear in children's mental (or cultural) development twice: first interpsychically, as part of the social interaction of the child with adults or older children, later intrapsychically, as part of the child's own internal mental operations. In this way, the child is presented with and finally internalizes cultural knowledge, and this knowledge becomes part of the child's own way of thinking. It is the hypothesis of this paper that the adult's gestures during social interactions with children are an essential part of the communication and thus of the guidance that adults provide, and that the child's gestures are a crucial source of feedback for the adult. Depending on the gestural component, completely different communicative situations can develop, success or failure can occur, and the child's willingness to learn may be strengthened or weakened. All of these processes can be observed going on during adult-child interactions. Adult's gestures embody and thus display a host of assumptions about both the social and physical world – how complexity in objects “naturally” breaks apart, what is a “natural” chunk of information (such that it is believed to be processible by the child), what an “action” is and what types there are, what counts as “attention”; and “understanding,” and what one’s approach to objects ought to be, and thus what their meaning is. Adult’s assumptions in these spheres are made manifest unwittingly in the gestures and other nonverbal behavior directed to children. The child’s gestures also are crucial because these gestures trace for the adult the process of the child’s internalization from the interpsychic to the intrapsychic and can reveal to the adult the child’s current zones of proximal development – the areas of development that are just opening up to the child and are particularly ready to show learning. Mothers act very differently when they demonstrate to their children toys the operation of which they believe are within the child’s capacity, and those that they think are beyond the child. Thus the object is presented, not just as an object,
but as an object bearing assumptions about the child, the object, its cultural meaning, the nature of information and action, and many other factors. It is fair to say that in these interactions between children and adults, mundane though they are, lie some of the earliest significant segmentations of reality.

**VYGOTSKY'S THEORY**

Three aspects of Vygotsky's theory are relevant to this chapter and will be briefly discussed in turn: (1) the steps of development appear twice, first interpsychically, next intrapsychically; (2) development is characterized by successive zones of proximal development in which guidance by adults or more skilled children is crucial; (3) pointing is a gesture that reveals mental development in microcosm.

1. **Internalization: steps appear in mental development twice.** According to Vygotsky cognition necessarily has a social foundation. The mental processes of individuals are direct reflections of the social processes in which the individual participated during earlier stages of ontogenesis (Wertsch, 1979): “The essence of this law is that in the process of development, children begin to use the same forms of behavior in relation to themselves that others initially used in relation to them” (Vygotsky, 1981, p. 157). A corollary is that new mental developments appear first in a social context: “We could formulate the general genetic law of cultural development as follows: Any function in the child’s cultural development appears twice, or on two planes. First it appears on the social plane, and then on the psychological plane. First it appears between people as an interpsychological category, and then within the child as an intrapsychological category. . . . The very mechanism underlying higher mental functions is a copy from social interaction; all higher mental functions are internalized social relationships. . . . In their own private sphere, human beings retain the functions of social interaction” (Vygotsky, 1981, pp. 163, 164). The adult’s cultural knowledge (factual and presuppositional) is brought to bear in interactions with the child, and this sets up a structure “on the social plane.” This eventually becomes, via internalization, the structure of the child’s own knowledge on the “psychological plane.” Thus the meanings of objects incorporate meanings that derive from the social interactions over these objects.

2. **Zones of proximal development.** Vygotsky wrote: “The zone of proximal development defines those functions that have not yet matured but are in the process of maturation, functions that will mature tomorrow but are currently in an embryonic state” (Vygotsky, 1978, p. 86). This concept of the zone of proximal development brings out the
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crucial part played by interpsychic representations: "It is the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (ibid.). Vygotsky's aphorism for describing mental growth was that development lags behind learning. This lag creates the zone of proximal development (Vygotsky, 1978, p. 90). A child acts differently with objects whose operation she has mastered compared to objects whose operation is far beyond her (whose zone of proximal development is yet to come), and still differently with those objects whose operation is just within reach (the zone of proximal development is now opening up). The child's own behavior with objects is a vital piece of feedback evidence that guides the adult, if the adult is ready to receive it.

3. Pointing. Vygotsky regarded the development of pointing as a microcosm of the child's entire cultural development (Vygotsky, 1981, p. 160). Specifically, he believed that all development passes through three stages, and that the successive transformations of pointing exemplify this sequence. Pointing starts out as unsuccessful grasping with movements added to indicate the desired object. Then it turns into movements indicating a desired object, aimed by the child not at the object but at an adult and to which the adult responds (Bates, 1976, p. 61). Finally the gesture is made for the child himself or herself, and an interlocutor is not necessary for it to occur. The form of the gesture thus changes during its journey inward and these changes objectively trace out the process of internalization.

In a similar way, adult gestures might trace out different packages of information at different stages of internalization as the adult responds to the child. Again, mothers may be more or less sensitive to the clues they are presented with. Bekken (1989) has documented an extremely heavy reliance on deixis in mothers' gestures to children, far higher than the same mothers' gestures to adults in the same context and with the same content of speech (talking about toys in the room). Thus gestures of mothers might also trace out the adult's estimation of the child's degree of internalization.

RECORDING AND CODING VERBAL AND NONVERBAL INTERACTIONS

To collect data on instructional interactions, we visited suburban middle-class or inner city working-class families with 2-year-old children either in their homes, at a Hyde Park (Illinois) school specializing in inner city African-American families, or at the University of
Chicago. The same families were videotaped at roughly 6-month intervals during a 2-year period. In each session a primary caretaker was present, and the procedures and instructions were the same: the caretaker was told to get the child to operate the toy, work the puzzle, or count the objects handed to her by an on-screen experimenter. The on-screen experimenter controlled the presentation of the objects but the caretaker was in charge of the child and the flow of the interaction. The on-screen experimenter would intervene if the interaction appeared to break down, and in these cases the experimenter also tended to become a participant; we have drawn examples from some of these experimenter–child interactions, below. The instructions to the caretaker rather vaguely stated that we were interested in what children “know” at different stages of their development, and asked the caretaker to induce the child to use the object; there was no suggestion that the caretaker was the primary object of our study. Most caretakers were mothers, one was a father, and two were adolescent sisters.

The interactions were transcribed and analyzed from videotape according to the coding scheme described in the appendix. Coding focused on instructional episodes of typically 2 to 5 minutes’ duration involving single objects. A new episode was recognized only when the on-screen experimenter presented a new object; any redefinition of an already present object in terms of functional task by either the caretaker or the child was considered to occur within the same episode. Coders would record the following for each interaction episode: the object, a narrative account of the interaction, the exact speech of the adult and child, the zone of proximal development (i.e., the functional task addressed by the caretaker), any change of the zone of proximal development (e.g., when the child or adult redefined the task), the focus of attention of both the child and the adult, and the dynamics of the interaction, both verbal and nonverbal, in terms of interactional features along several dimensions. In all, the coding scheme drew on 32 categories and interactional features (not all of which would be important in any given interaction). The appendix gives two illustrative transcripts utilizing the coding scheme.

THE MEANINGS OF OBJECTS INsofar AS GESTURES ARE CONCERNED

We present two contrasting examples of nonverbal communication between young children and adults during naturalistic instruction. Our purpose is to demonstrate that nonverbal signals (signals both to and from the child) can be the primary channel of interpersonal cognition. This may be especially true at the early stages. We will also use
these examples to illustrate the kinds of cultural knowledge about objects that nonverbal signals convey. Shatz (1982) found that adults simplify and set off as distinctive the gestures they address to 19- to 34-month-olds; thus they seem to make some conscious effort to adapt their gestures as a channel of communication.

1. Our first example illustrates that it is chiefly in the nonverbal actions of adults that they display assumptions about the nature of objects (how they are put together) and the nature of the child’s information-processing chunks. The example is from a videotape made at the child’s home. The child was a girl 18 months old and her mother was demonstrating a crank-operated toy (Mickey Mouse seems to be frantically eating spaghetti). The mother separates her own manipulations of the toy from manipulations that are part of her interaction with the child, and thus divides the demonstration into what she regards as “communicative” and “noncommunicative,” and what this entails. She also presents the toy in two steps, the first a static display of the toy, then a demonstration of its action. Thus she divides the demonstration into “object” and “action.” Finally, each of these divisions the mother estimates to be an appropriately sized information chunk. Thus she conveys information of a psychological sort as well, namely, what kinds and amounts of information the child’s mind can actually take in.

The mother first examines the toy in a space close to her own body. Her gaze is on the object and withdrawn from the child (object-focused, not part of any communication). Then she moves the toy into the communicative space between herself and her child and holds up the toy in a static display (thus contriving that orienting precedes action, and taking care to present a static structure before a dynamic function); this is the kind of pointing at the second stage that Vygotsky outlined, but directed to the child as interlocutor. Then the mother removes the toy from the communicative space (thus separating information-processing chunks) but immediately reintroduces to turn the crank (showing the function); this is also a kind of pointing, more like the first stage, in that action and pointing are not completely differentiated. When the mother stops cranking she moves the toy close to the child (another information-processing chunk) and for the first time actually says something: “mmm . . . like that spaGHEetti.” This locus of a verbal comment might also be significant. Saying what she did, she provided an evaluation to go with the toy and indeed the child now pretends to remove some spaghetti and eat it (moreover, the stress on “spaghetti” seems to mark the utterance as evaluative and potentially referring to the child, rather than descriptive and referring to Mickey). The mother doesn’t invite the child to work the crank at any point: apparently she thought cranking was not within a zone of proximal development (as indeed it was not, since this child never did succeed in
turning the crank on this or any other toy). Eventually the child tires of the game and turns away. Not until then does the mother remove the toy from the communicative space and put it down (thus she regarded herself as an active but secondary participant in the child’s play).

We see in this example a quite finely tuned interaction under the control of the mother but relying on feedback from the child. Nearly all of the messages are nonverbal. The one verbalization appears where an evaluative function seems useful. We also see how the mother’s beliefs about the nature of the world and the child’s information-processing capabilities are built into her nonverbal communications. For instance, the mother’s actions exhibit her beliefs that:

- Form is separable from function (she separates the display of the form of the toy from the demonstration of its function).
- Orientation should occur before demonstration.
- “Natural” chunks of information are actions such as orientation, display without movement, display with movement, evaluation, and response by addressee. These are the chunks revealed in how the mother displayed the form and demonstrated the function of the toy, and in how she invited the child to play with it. Such chunks reflect hypotheses about information-processing units; to this mother, information is classifiable according to the type of action. Different adults may divide reality along other lines, but we should expect their movements to reveal how they divide and classify chunks of information as well.

If we were to characterize the world view embodied in this interaction, it would be the view that the world is analyzable and analysis is the mode of approach to it. The mother is the side of the interaction largely responsible for the analytic onslaught on the world in this case, and the child is receiving this understanding on the social plane—in Vygotskyian terms its understanding, insofar as it understands, is interpsychic.

2. Our next example is with a second little girl (19 months) and presents a contrasting world view, which we will characterize as the attitude that objects are as they are; they come to us, have canonical uses, and should be approached over obligatory routes that admit little deviation. (This is a caricature, but we are trying to be clear.) The adult presents the object as an unanalyzable whole and insists that it be received in this light by the child. As an approach to the object, the situation is less finely tuned than the preceding example. The situation in this example may have arisen because the mother doubts that the object is within the child’s zone of proximal development, or may reflect a habitual pattern of approaching objects (future videotapes of the same mother and child will prize these interpretations apart). But this approach still provides instruction. The question is what message is being conveyed. Again,
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knowledge is interpsychic, but the message now appears to be that the object is a given; it is sacrosanct and should be approached in a foreordained way.

A second feature of this example is that there was, in the same situation at the same time, a second adult – an on-screen experimenter – who also interacted with the child and with the same object. This experimenter’s style was much closer to the style of the mother in the first example; that is, the experimenter was more analytic and expressed an approach to the object that presupposed it was something the child herself could construct. The emphasis was on building up the object rather than using it; thus the emphasis was less on following a “correct” path and more on construction. The goal of the experimenter’s interaction was to get the child to create the object, in contrast to the mother’s goal, which was to get the object to perform in a certain preestablished manner.

The object is a type of pop-up toy in which a Humpty Dumpty figure is perched on a platform. The Humpty Dumpty is made up of five separate layers. The intended use of the toy is to place Humpty Dumpty on the platform and then press a lever that causes the platform to tilt over and topple Humpty Dumpty down, who satisfyingly breaks into his five parts.

The child was relatively unresponsive to the toy. Her own acts with it were limited to knocking the Humpty Dumpty figure off with her hands. The mother’s response to this absence of enthusiasm was as we described: she herself put Humpty Dumpty back together again and then directed the child to press the button: “push the button! push the button!” The child didn’t respond, and finally the mother arranged herself behind the child, so that her arms were in the same position as the child’s arms, and then took the child’s right hand in her own right hand and mechanically pressed the child’s hand down on the lever and said “push the button again!” Here the game is: operate the object just as you are supposed to (however determined).

The experimenter’s interventions occurred when the mother was distracted from the immediate context by something else in the room. The experimenter’s goal was to get the child to put the pieces back on the platform. She first invited the child to put Humpty Dumpty together again. This overture received no reaction at all. The experimenter then picked up the pieces and offered them one at a time to the child. There was still no reaction and so the experimenter placed the bottom piece on the platform, and offered the next piece to the child and kept on offering pieces until the whole Humpty Dumpty figure was built up. In the end, the experimenter and mother had behaved in the same way, although the experimenter was less direct about it. But in the process she was
conveying, in her actions, a quite different attitude toward the object and what to do with it. For the experimenter the game is: let's see what you can do with this.

In this example, the child's nonverbal feedback is: the toy is not part of a zone of proximal development; the mother's reaction was to provide guided compliance; the experimenter's reaction was to change the task to seek a new possible zone of proximal development.

We see in this example that adult actions exhibit beliefs such as:

- Form is not separable from function (the mother treats the object as an unanalyzable form that has just one function). This attitude is the reverse of the belief shown in the first example.
- Function is specific action (the mother seizes the child's hand to make it "work" in the proper way). This also contrasts with the first example.
- Objects are constructible by oneself (the experimenter's implicit message).

**POINTING**

Vygotsky, as mentioned earlier, analyzed a series of steps in which pointing is gradually internalized as a form of representation. At first, according to Vygotsky, pointing is unsuccessful grasping, aimed at the object; then it becomes symbolic, aimed at an adult; finally it is made for the child himself. This last step marks the internalization of pointing. This series of steps is separate from and predates the release of pointing from the concrete context of speech, the famous here and now. That is, representation by internalized means would appear to be a condition to be met before the child is able to refer to objects not here and times not now. Unless a child can represent objects to herself, she cannot invent means of referring to them when they are absent. In the following set of longitudinal observations, which span one child's development from 15 to 26 months, we see a child proceeding along the full Vygotskian series of steps. Pointing initially is linked with grasping, later is incorporated into social interactions with adults, and finally is part of the child's own efforts to represent the world. This development of internalized representations, however, occurs entirely with concrete pointing gestures, locked into the child's here and now.

At 15 months, the following were typical contexts in which our subject, J, pointed/grasped at objects:

1. Reaches for toy chicks box in a pointlike movement.
2. Reaches for a new toy.
3. Points/reaches for toy being held by puppet.
4. Gazes at own hands on toy and says "doll."
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There is an almost total absence of pointing at this age other than deixis combined with reaching. The final example (4) is particularly important. The child examines her own hands and pronounces the name of an object that the hands might grasp. The connection between action and object, and the mediating role of the hands, are made visible in this example.

By 19 months, we find a different situation. J now includes the adult interlocutor in her acts of deictic indication, as in these examples:

(5) Watches adult and holds out hand, anticipating grabbing the toy; then reaches for it.
(6) Picks up puzzle piece and looks at it; looks at adult and responds to question; then points to piece and makes contact with board.

Deixis is still linked to acts of grasping, but added now is a further step: the child includes the adult in her loop. This is the interpsychic stage from which, according to Vygotsky, future developments must derive.

At 26 months, J’s pointing has taken yet another step. She now points for herself, as shown by her linking pointing, not with acts of grasping or to the adult, but to her own attempts at representation.

(7) Names animal and points to its head.
(8) Asks where to put piece, then picks a space and points to it.
(9) Picks up a piece and looks for space; says “he goes here” (gaze is the deictic action here).
(10) Points to space (no contact), then looks at Mother and asks if the space is right.

The child’s deictic indicators are organized as part of her attempts to achieve representations of where she should place the puzzle pieces. The example at (10), the one including the mother, is crucially different from the inclusion of the adult at 19 months, in (6), where the child responded to the adult’s question; at (10), the questioner is the child. At 19 months, J held out her hand in anticipation of having the object given to her by the adult. At 26 months, the child looks at her mother and points to the space in order to validate her own representation that this is the right place for the piece to go. This is representation for oneself.

Although we find Vygotsky’s account of how pointing develops applying insightfully to the three ages in J’s development, this account also implies that J’s development is not complete at 26 months. She performs overt deictic acts, not yet the invisible pointing that may be the final stage of development—only the directed gaze in the example at (9) suggests a completely internal representation.

Nonetheless, displaced verbal references appear at 26 months. The following interchange occurred at the beginning of our 26-month taping.
session; no equivalent references to events in the past appear at 15 or 19 months. J is recalling a trip to the zoo:

(11) Mother: Oh, and what did you see who had the diaper on?
(12) J: The little monkey.
(13) M: Yeah, the baby monkey had a diaper on, right . . .
(14) J: Baby monkey had a . . . [M laughs] he had a little diaper.
(15) J: He got lot toys in there.

The child displays the ability to represent past events, including a past event introduced on her own, in (15).

On the other hand, at 15 months, J displays only a partial displacement of reference. She uses her name for simulacra of herself. These are uses that dissociate her name from her actual person. However, they are still in the Now. They might be called references in the “not quite here and now.” The example starts with J looking in a mirror and then shifts to a photograph:

(16) J points to mirror and says her own name.
(17) Adult: Is that J?
(18) M: J!
(19) J closes panel on which mirror is attached, looks to M and says her own name again.
(20) M: J? Yeah! (and nods).
(21) J turns head and looks at wall and points at picture, and says her own name with rising (questioning) intonation.
(22) M confirms: looks at picture and points, and says: J’s up THERE in the pictures.

The child can use her own name to refer to images of herself. Nonetheless, at 15 months this is but partial displacement. There is no reference yet outside of the immediate physical situation. That kind of displaced reference is not evident before the 26 month example cited earlier.

Thus, at 26 months, J reveals an ability to represent the world to herself in two crucial areas, and they appear at the same stage: pointing for herself, and using language to refer to what is not here and now. Both steps imply the ability to represent the world internally, in a mental construction. Pointing, however, is still an overtly executed action, suggesting that the development of internal representation is not yet complete at this age.

**INTERACTION STYLES**

Earlier, we contrasted two styles that adults seem to adopt with children. In one, objects are sacrosanct, they are as they are given, and only one action with them is regarded as appropriate. In the
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other style, objects are tried out with a variety of actions, pragmatically seeking what might work. To examine these styles in more detail, especially to see how pervasively they appear in adult–child interactions, we selected one of the tasks, a jigsaw puzzle and board, to which all the children were exposed. We coded a variety of interactive features and compared, on these features, mothers and children from two socioeconomic groups, poor inner city families and middle-class suburban families. The following features of our interaction code can be ordered according to the degree of latitude left by the adult for the child’s own action; they are listed from least latitude to most.

• Adult does task (adult places the puzzle piece into its slot for the child).
• Adult’s hands on (the adult places her hands on the child’s hands and moves them for the child to place the puzzle piece into its slot).
• Adult’s reorientation (the adult changes the orientation of the puzzle piece in child’s hand).
• Adult removes child’s hand (the adult removes child’s hand from a puzzle piece or from the board).
• Adult blocks child’s wrong move (the adult stops the child before she places a piece into the wrong slot).
• Adult points with contact (the adult touches the puzzle piece or the slot).
• Adult points without contact (the adult points but does not contact the piece or slot).
• Adult displays for analysis (the adult holds up the piece and points at its distinctive identifying feature, such as long ears).
• Adult talks with analysis (the adult holds up or otherwise indicates the piece or slot and specifies in words the distinctive identifying feature).

We observed 10 adult–child dyads, 5 from each socioeconomic group. In most cases, the interacting adult was the child’s mother, although in two cases other family members fulfilled this role (both in inner city families). The children ranged in age from 2 to nearly 4 years of age. On several coding features, the two socioeconomic groups did not differ appreciably. On five features, however, the groups had occurrence rates that differed by at least a 2:1 ratio; these differences are large and may be significant. They point to a consistent direction of more control and less analysis in the inner city group; they also point to a pattern (though less consistent) of avoiding physical contact with the child in the middle-class group. Table 5.1 presents the average number of interactive acts per minute in which the features appeared (highlighting indicates at least a 2:1 difference).¹

Numerically, the rates per minute in Table 5.1 appear small, but if we extrapolate to the days, months, and years of a child’s development, such different rates lead to quite large cumulative differences between

1
inner city and suburban children in experiences with objects. To run through the table, we see that the inner city caretakers, more than the suburban caretakers, took control of the children’s hands and moved them for them (as illustrated earlier), removed the children’s hands from the wrong pieces, blocked the children’s wrong moves, and pointed at pieces or slots without contacting them. On the other hand, the suburban caretakers, more than inner city caretakers, pointed at pieces or slots by making physical contact with the target. The inner city caretakers thus present a consistent picture of exerting higher degrees of control over the child, tolerating less variation, and leaving less room for mistakes. At the same time, however, the inner city caretakers display more physical contact with their children. The suburban caretakers, in contrast, do fewer of all these things, including physical contact. The contrasting styles of pointing are particularly interesting. The suburban caretakers contact the object (although not quite twice as often as the inner city caretakers), and this may be to ensure that the referent of the pointing gesture is clear to the child; they then leave the action to the child. The inner city caretakers do not contact the referent in this explicit way, but rather point to its spatial locus and leave its identification to the child.

These inner city and middle-class differences, if generalizable, suggest a contrast along two dimensions of children’s early experiences. In terms of interactions with objects the middle-class caretakers, more than the inner city ones, emphasize pragmatic adaptability and flexibility. Their method would appear to encourage an outgoing curiosity that might stand the child well in later schooling. On the other hand, in

<table>
<thead>
<tr>
<th>Interaction</th>
<th>Suburban</th>
<th>Inner city</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does task</td>
<td>0.26</td>
<td>0.29</td>
</tr>
<tr>
<td>Hands on</td>
<td>0.12</td>
<td>0.57</td>
</tr>
<tr>
<td>Reorients</td>
<td>1.87</td>
<td>2.08</td>
</tr>
<tr>
<td>Removes hand</td>
<td>0.06</td>
<td>0.35</td>
</tr>
<tr>
<td>Blocks move</td>
<td>0.06</td>
<td>0.40</td>
</tr>
<tr>
<td>Points w/ contact</td>
<td>2.87</td>
<td>1.94</td>
</tr>
<tr>
<td>Points w/o contact</td>
<td>0.68</td>
<td>1.44</td>
</tr>
<tr>
<td>Displays analysis</td>
<td>1.12</td>
<td>0.44</td>
</tr>
<tr>
<td>Talks analysis</td>
<td>0.65</td>
<td>0.53</td>
</tr>
</tbody>
</table>
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terms of interactions with the child herself as a child (as opposed to an object of instruction), inner city caretakers, more than middle-class ones, favor a hands-on style that certainly looks empathic, warm, and supportive. These dimensions may be causally related. When a child is draped over her mother while working on a puzzle (as we saw only with inner city mothers), there is built into the very geometry of the situation an invitation to the caretaker to intervene and help the child. Is there a trade-off between values in the care for children – is physical aloofness the price of flexibility and curiosity? Is close, possibly stultifying control the price of physical contact? Do parents understand the price they are asked to pay?

What could explain the inner city and suburban differences shown in Table 5.1 and the possible association just suggested with interaction values? We have thought of several possible explanations, but as yet have no basis for selecting among them; any one or all of the following could create the differences in Table 5.1: (1) Although the instructions to our inner city and suburban mothers were the same, the mothers may have had different understandings of what we, the experimenters, were after. Mothers strove to meet what they took to be our expectations but differed in what they took them to be. The middle-class mothers may have thought we wanted to see what the children were going to do on their own. They were content to let the situation unfold in its own way and felt no compulsion to regulate it. The inner city mothers in contrast may have regarded us as testing their children for what they knew. Not surprisingly, they would then have tried to demonstrate their child’s capabilities. If this account is valid, neither the suburban nor inner city mothers can be said to have guessed our purposes, since we wanted to see how the caretakers attempted to teach the children and not to see what the children would do on their own. (2) The inner city and suburban mothers have different understandings of the nature of teaching itself. The suburban mothers, perhaps influenced by educational doctrines like the discovery method, may think of teaching as letting the child work at his or her own pace with just occasional interventions when failure looms. The inner city mothers, on the other hand, may understand teaching in the more active sense of getting the child to match how the mother herself is behaving or would behave in the same situation. If this explanation is valid, we should consider the costs and benefits of these contrasting educational philosophies and how they mesh with prevailing educational doctrines in schools and society in general. (3) The inner city and suburban mothers may have different teaching goals (as opposed to methods). It is said that the African-American community has a strong oral tradition for transmitting cultural knowledge. Such a tradition implies exact standards with an emphasis on
verbatim correctness. Sperry (1991) indeed found in a rural Alabama black community that children were discouraged from making up fantasy stories because adults regarded such tall tales as “lies,” distortions of reality demanding suppression. Honoring the verbatim would encourage high levels of intervention and this could extend to nonverbal performances of the kind investigated here. Factors (1), (2), and (3) help put the teaching styles of inner city mothers into interactional, pedagogical, and cultural perspective. The long-term consequences of this interventionist style, however, remain unclear.2

GIRLS AND BOYS

Our sample included five girls and five boys. A remarkable fact is that the interaction feature of Doing the Task occurred almost exclusively with the girls. This feature appeared at various points with all five of the girls, while only one of the boys had the task done for him, possibly because the caretaker in this case was his older sister. That is, caretakers treat girls – far from needing assistance – as actually being unable to perform the task. This tendency was the same in both socioeconomic groups, as the nearly identical rates of Doing the Task in Table 5.1 show. For boys, the average rate of the caretaker doing the task was .06 interactions per minute; for girls, it was 0.66 – an order of magnitude greater. (For most of the boys, the rate was 0; the sole boy for whom the caretaker did the task had a rate of 0.30, half the girl’s average.) We cannot say what part of this 10:1 difference in the treatment of girls and boys reflects “reality,” in which adults are responding to actual differences in ability, and what part is due to a social regime that assigns girls the role of being incompetent. The fact remains that boys and girls are treated very differently even at the age of two in respect to competence at putting together puzzles and presumably in other areas as well. Again, extrapolating across the years of development implies massively different experiences for the sexes on the dimension of their presumptive competence by caretakers.3

CONCLUSIONS

What do we learn from such interactions of grown-ups and children with toys? We will mention six points:

1. Even commonplace actions with objects are loaded with cultural messages and attitudes toward actions, objects, and the ways to approach them.

2. The same objects are viewed in quite different ways under different attitudes. It is not enough to specify the object, therefore, but one must also look at the manner of its presentation and, through this, at the
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attitude and the cultural message. These kinds of differences, if systematic and cumulative, can have enormous effects on children when they are multiplied over the many interactions that children have with adults over objects. The child’s eventual willingness to learn can be channeled by these kinds of experiences.

3. Vygotsky’s theory gives us a perspective for understanding the effects of adult–child interactions. The play with the object becomes part of the interpsychic representation, the opening of a path to intrapsychic knowledge. Such differences could lead to important contrasts in a child’s approach to objects in the world.

4. Vygotsky’s theory also gives us insight into the changes in children’s pointing when it makes the transition from action, to pointing for the child herself, by linking this to the growth of internalized representations. Displaced references to past events in the speech of children also do not appear until the child’s pointing has shifted to become pointing for the child herself, suggesting that internalization of representations is the underlying process for both domains.

5. Socioeconomic groups differ in how they distribute their teaching efforts. Middle-class caretakers focus on making clear the referent, and leave the action to the child (with assistance if needed). Inner city caretakers focus on the child’s action, and let the referent appear in this controlled movement. Accumulating over a child’s developmental period, these differences can lead to massively different interaction regimes for children’s instructional experiences.

6. Independently of socioeconomic group, caretakers treat boys and girls in contrasting ways in terms of being willing to take over the task and complete it for the child. This difference, summed over the development period, can also amount to massively different experiences.

In general, interactions with adults are important in children’s mental and social development. This is the case for a systematic reason. Adult interactions are important because of the facts of internalization: knowledge must be interpsychic before it can become intrapsychic. This interpsychic to intrapsychic sequence settles on caretakers an enormous importance in shaping children’s very picture of the world, their knowledge as well as their expectations of social interchange. Such is the implication of Vygotsky’s theory, and such is the conclusion pointed to by our observations of adult–child interactions.

APPENDIX: INTERACTION CODING PROTOCOL AND ILLUSTRATIVE EXAMPLES

The typical videotaping session involves a parent/caretaker, a child, and an adult researcher on camera, with an additional researcher.
taking notes on the interactions. The taping sessions are no less than an hour in length each, and are subdivided into episodes involving different toys or “stimulus objects.” The toys are introduced by the on-screen researcher to the caretaker and child, with the goal of inciting the caretaker to instruct the child as to its typical function.

After completion of the taping session, the videotape is marked with a frame-counter, which indexes the temporal location of each episode on the tape and the timing of the evolving dynamic within each episode. Each episode is then analyzed by a trained researcher into a coding scheme developed specifically for the research project. Generally speaking, episodes are coded from the point of introduction of a stimulus object to the caretaker–child duo, to the point of its removal.

The coding scheme

In this section, the coding scheme, which was inspired by the work of Barbara Rogoff (1986, 1990), is explained by describing each coded category in turn. The coding is illustrated in the appendix with examples drawn from the data base of already coded episodes.

The coding categories range from fairly objective characterizations of the participants’ activity in the interaction to evaluative features of the interaction determined to be of relevance. The following subheadings constitute those features of the coding scheme recorded in separate columns in the spreadsheet within a single data block (a “subepisode”). Each is followed by a brief description of the sort of information contained within.

Object line: In order to group the coded data into manageable units, gross subdivisions within each episode are determined by shifts in the status of the “stimulus objects” with respect to the triad of on-camera participants. Each change of state, locus, function, or possessor of the object(s) marks the initiation of a new subepisode.

Speech: Parent/Adult:
Child:

Narrative: Parent/Adult:
Child:

Within each subepisode, task-related speech is transcribed for the on-camera triad. Then, a “narrative” of the task-related activities of the on-camera participants is developed by the coder. The speech and narrative of the caretaker/parent (M) and the on-screen researcher (A) are coded within the same columns (there is considerable overlap in their interactive status vis-à-vis the child).
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ZPD (zone of proximal development): A characterization of the functional task being addressed by the caretaker is entered at the beginning of each episode, with an analysis of both the level of difficulty of the task for the child, and its degree of involvement in the task. Changes in these features are entered in the subepisode in which the change occurred.

Space main object is in (re: P/A & re: Ch): The position and any changes in the position of the main object with relation to the participants are indicated for each subepisode, if necessary.

PARENT/ADULT:
A characterization of the task-related activity of the caretaker (and the researcher, if necessary) follows for each subepisode.

Attention focus: This is tracked through the subepisodes for the caretaker (and the researcher, if necessary), with special attention to gaze, body orientation, and object manipulation.

The following six categories constitute a checklist of the caretaker’s activity during each subepisode (and the researcher’s, if necessary). Each category is further separated into both verbal and nonverbal actions.

Form: This specifies whether or not the caretaker engages in any verbal or nonverbal actions during the subepisode. Key words uttered by the caretaker are entered in the verbal column.

Initiates/responds: This specifies whether or not the caretaker tries to initiate or shift an instructional event, or responds to an attempt by the child to initiate or shift it. Attempts are further specified to indicate the new task.

Structures situation: This specifies whether the caretaker structures the situation to facilitate instruction. The method used may be further specified.

Handles hard part: This specifies whether the caretaker accomplishes a difficult part of the task or the entire task.

Transfers responsibility: This specifies whether the caretaker attempts to shift the responsibility for accomplishing a task to the child, as is often the case after the caretaker has “handled the hard part” of a task.

Bridges from familiar: This specifies whether the caretaker attempts to facilitate the child’s involvement with a toy or task by associating it to something familiar to the child.

Then, ten types of interactive features are coded:

Does task: The caretaker or researcher accomplishes the task.
Hands on: The conditions for this feature require that the child's hand(s) be on the toy when the caretaker moves the child's hand, and that the caretaker's action be directed at forcing the accomplishment of the task.

Reorientation: The caretaker or researcher shifts the toy within the child's grasp in order to "correct" its orientation without restricting the child's movements.

Removes hand: The caretaker or researcher removes the child's hand from the toy.

Blocks wrong move: The caretaker or researcher prevents an action by the child by setting up a barrier.

Points with contact: The caretaker or researcher touches a relevant part of the toy.

Points without contact: The caretaker or researcher gesturally indicates a relevant part of the toy without touching it.

Displays for analysis: The caretaker or researcher holds up the toy to the child and gesturally indicates a feature relevant to the task.

Talks with analysis: The caretaker or researcher tells the child information about the toy relevant to the task.

Gestures for analysis: The caretaker or researcher "demonstrates" or mimics an action relevant to the task without touching the toy.

Finally, a couple of catchall features are coded for:

Marking by action: This specifies other actions taken by the caretaker which are not immediately relevant to the instructional episode but which seem to be significant.

Other: This is where any other information relevant to the activities of the adults in the subepisode may be entered.

CHILD:

A characterization of the child's activity is then developed, comparable to the Parent/Adult section.

Attention focus: This is tracked with special attention to gaze, body orientation, and object manipulation, just as for the caretaker.

A checklist different from that for the caretaker follows, which describes the child's activity during each episode, again with both verbal and nonverbal actions differentiated.

Form: This specifies whether or not the child engages in any verbal or nonverbal actions during the subepisode. Key words are entered in the verbal column.
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**Initiates/responds:** This specifies whether or not the child attempts to initiate or shift to a new activity, or responds to an attempt to initiate or shift the instructional event made by the caretaker or adult.

**Places self to observe:** The child actively shifts gaze, position, or posture to observe objects in play or the task-related behavior of the adults.

**Actively directs:** The child actively determines the course of a sub-episode. This will often co-occur with cases in which the child initiates a new activity, but will also include elaborations of activities by the child.

**Feedback:** This specifies whether or not the child is providing feedback, either positive or negative, intended or not, to the caretaker. This can include demonstrations of understanding (positive), or lack of interest (negative, either intended or not).

**Other:** This is where any other information relevant to the activity of the child in the subepisode may be entered.

**Mismatches:** Finally, mismatches between various aspects of the participants' activities are noted. These could include discords within a single participants' actions (e.g., demonstrating something manually while verbally describing something else), or mismatches between the actions of different participants (see Church & Goldin-Meadow, 1986, for discussion of the issues of mismatching verbal and gestural symbols).

**Examples of coded subepisodes:**

**Example 1:** In this example the child tries to place animal figure puzzle pieces into a wooden board. The interactive style of the caretaker reflects a fairly high degree of control over the child. Notice that during the subepisode, the caretaker handles the hard part, but only after instancing the following interactive features: Hands on, Reorientation (twice), Blocks the Wrong Move, and Pointing with Contact. This episode also illustrates a type of Mismatch between caretaker and child.

**Example 2:** In this example the mother establishes a verbal Bridge from Familiar by making a ringing noise, which typically marks the initiation of a phone call. By taking up the previously introduced phone and pretending to be the caller, the mother is also Marking by Action. In the Notes section, the coder suggests a possible interpretation of the child's loss of interest in the role playing game.

<table>
<thead>
<tr>
<th>Frame #</th>
<th>Subject 1: CT, 2;3 Animal Puzzle Episode</th>
<th>Subject 2: EA, 2;0 Telephones Episode</th>
</tr>
</thead>
<tbody>
<tr>
<td>99800</td>
<td>(puzzle in C's lap)</td>
<td>5120</td>
</tr>
<tr>
<td></td>
<td>A places second phone next to first</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(first toy)</td>
<td></td>
</tr>
</tbody>
</table>
Speech: Parent/Adult: Come on put him in there . . . push on it push him in . . . no don’t take them out. Put that in . . . this way. Put him in.

Speech: Child: Nope . . . no.

Narrative: Parent/Adult: M orients piece, hands to C, reorients piece in C hand, blocks C removing piece already placed, taps space, reorients piece in C hand, presses down on C hands, presses piece into slot.

Narrative: Child: C tries to place piece, tries to remove other piece, continues attempt.

Zone of Proximal Development: (placing pieces in puzzle: difficult, interested)

Object Relative to Parent/Adult: (in C’s lap, C sitting in M’s lap)

Object Relative to Child: in lap

PARENT/ADULT: C/toy

Attention Focus: +

Form: Verbal (V): +

Form: Nonverbal (NV): +

Initiates/Responds (V): +R (no don’t take them out.)

Initiates/Responds (NV): +R (blocks move)

Structures Situation (V): +

C/toy +

+ +

+ +

+I (phone conversation)

+I (A introduces 2nd phone and M takes up phone for “phone call.”)

+ (ring ring, hello)

Child:

- phone in front of C, receiver in C hand)

- Who you talking to?

- Ring, ring, telephone.

- Hello, how you doing?

- What’s your name?

- Hm, what’s your name?

- Ball

- A places new telephone in front of C. M takes receiver 1 and points to new telephone, attempts “phone” conversation.

- C passes receiver of phone 1 to M, pulls new phone to self and holds up receiver to ear, then picks up and examines phone itself, phone slips from grasp, points toward bag asking for ball.

- imagining conversation – difficult, loses interest quickly (beside)

- in front of, then in hand

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Nonverbal factors

<table>
<thead>
<tr>
<th>Structures Situation (NV):</th>
<th>+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Handles Hard Part (V):</td>
<td>+ (presses piece into slot, etc.)</td>
</tr>
<tr>
<td>Handles Hard Part (NV):</td>
<td>+</td>
</tr>
<tr>
<td>Transfers Responsibility (V):</td>
<td>+ (hands piece to C)</td>
</tr>
<tr>
<td>Transfers Responsibility (NV):</td>
<td>+ (&quot;telephone,&quot; intonation of notification)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bridge from Familiar (V):</th>
<th>+ (ring ring)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bridge from Familiar (NV):</td>
<td>+</td>
</tr>
<tr>
<td>Does Task:</td>
<td>+</td>
</tr>
<tr>
<td>Hands on:</td>
<td>+ (presses down on C hands)</td>
</tr>
<tr>
<td>Reorientation:</td>
<td>+ (2X)</td>
</tr>
<tr>
<td>Removes Hand:</td>
<td>+</td>
</tr>
<tr>
<td>Blocks Wrong Move:</td>
<td>+ (blocks C removing piece already placed)</td>
</tr>
<tr>
<td>Points with Contact:</td>
<td>+ (taps space)</td>
</tr>
<tr>
<td>Points without Contact:</td>
<td>+ (to 2nd phone)</td>
</tr>
<tr>
<td>Displays for Analysis:</td>
<td>M takes old receiver and begins role-playing conversation.</td>
</tr>
<tr>
<td>Talks with Analysis:</td>
<td>+</td>
</tr>
<tr>
<td>Gestures for Analysis:</td>
<td>+</td>
</tr>
<tr>
<td>Marked by Action:</td>
<td>+</td>
</tr>
</tbody>
</table>

Other:

<table>
<thead>
<tr>
<th>CHILD:</th>
<th>+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attention Focus:</td>
<td>+</td>
</tr>
<tr>
<td>Form (V):</td>
<td>+</td>
</tr>
<tr>
<td>Form (NV):</td>
<td>+</td>
</tr>
<tr>
<td>Initiates/Responds (V):</td>
<td>+R (complains at M's attempts to control action)</td>
</tr>
<tr>
<td>Initiates/Responds (NV):</td>
<td>+I (attempts to terminate episode)</td>
</tr>
<tr>
<td>Places Self to Observe:</td>
<td>+R (to phone call play)</td>
</tr>
<tr>
<td>Actively Directs:</td>
<td>+</td>
</tr>
<tr>
<td>Other:</td>
<td>C's attempt to remove piece was apparently in order to try to place new piece in same slot.</td>
</tr>
<tr>
<td>Mismatches:</td>
<td>What M construes as attempts to assist C's</td>
</tr>
</tbody>
</table>

- I- (presses piece into slot, etc.)
- + (hands piece to C)
- + (presses down on C hands)
- + (blocks C removing piece already placed)
- + (taps space)
- + (to 2nd phone)
- + ("telephone," intonation of notification)
- + (ring ring)
- +R (complains at M's attempts to control action)
- +I (attempts to terminate episode)
- +R (to phone call play)
completion of task C construes as interference, or shift in task.

Notes: In order to carry on play phone conversation, C must pretend that (her) M is a different person, which may be too difficult, or just not interesting.

NOTES

An early version of this paper was presented by the first author at a conference at the University of Toronto, June 22–24, 1990. The research reported herein has been supported by a grant from the Spencer Foundation. For their help in this project, we wish to thank Kristin Avery, Desha Baker, Lori Bauer, Cynthia Butcher, Trung Dinh, and Rose Villacis.

1. In tapes shown by Colwyn Trevarthen, middle-class and working-class families in Edinburgh, Scotland, display similar interaction style differences to those we observe between inner city and suburban families in Chicago.

2. We are grateful to Sidney Hans and Rob Jagers for discussing these issues with us and for their insights into the possible factors influencing our inner city mothers. It is difficult not to regard the inner city interventionist style as frustrating children’s exploratory spirit. We saw adults actively interfere while their children fiddled in a purposeless manner with toys, as if this kind of activity should be suppressed. We can’t say, once again, exactly why this would happen, but it would seem to be a strong discouragement of exploratory activity.

3. We are planning a more extensive report of the phenomenon of sons and daughters being differentially treated by caretakers, chiefly by mothers.

REFERENCES


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