

Possible Origin of Speech in Selective Orienting

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Pointing and speaking enrich the infant's repertoire of communicative action. However, pointing emerges as a component of action-for-self: selective orienting to salient (usually, moving or changing) things. Pointing with vocalization, followed by pointing with naming, indexes the child's shifting focus of attention. Evidence that they emerge for the purpose of intentional communication is lacking.

Contemporary investigations of language development center on the social aspects of young children's speech. The attempt to chart the development of communicative competence has renewed interest in the one-word speech stage and in the communicative value of the gestures that precede single words. The theoretical framework for this work derives from the distinction between the propositional and the illocutionary force of utterances in speech act theory (Austin, 1963; Searle, 1969). Whereas the proposition is the conceptual content of the utterance, the illocutionary force (performative) conveys the speaker's communicative intent (e.g., to transmit information, to request an action). For example, the illocutionary force of "Eat the apple, John" is a command. The proposition ("John eat apple") is in this case conveyed through an imperative rather than, for instance, a question.

Investigators agree that performatives have a preverbal antecedent in the form of the infant's gestures, notably in pointing and reaching (Bates, 1976; Bruner, 1975a, 1975b; Clark & Clark, 1977; Dore, 1973). A corollary of this view is that words (conceptual content) map on the same performative structures that can be discerned in preverbal infants and appear in the form of social or communicative speech. However, whereas Bruner assumed that performatives originate in social procedures shared by the infant and caretaker,

Bates argued that pointing and reaching initially lack communicative intent. There is also some divergence as to when language assumes a cognitive as well as a social function. Whereas Bates, Bretherton, Shore, and McNew (1983) indicated that spoken words also subserve private cognition in the shape of early solitary naming, Bruner (1966) believed that language does not have a role in cognitive functions until about age 5.

There are two contrasting traditions regarding the developmental relation between the social and cognitive functions of language. Vygotsky (1962) believed that social language differentiates into communicative speech and into egocentric speech (speech that gradually becomes internalized thought) at about age three. In contrast, Piaget (1963a) proposed that children move from egocentric to socialized speech. The position of Bates and her associates bridges the classic Vygotsky tradition (exemplified by Bruner and most investigators of early language) and that of Piaget.

The social aspects of early speech have mostly been studied separately from the origins of its conceptual content. Piaget's view that overt action is fundamental to the evolution of language as a symbolic system and that the child's first words are tied to action has been generally accepted. In contrast, we argue that the referential function of early verbal naming develops from selective orienting—turning, looking, and pointing—and that vocal naming itself may emerge as a component of selective orienting action in the form of egocentric speech and not as communicative speech.

Because it is not feasible to question infants about whether they intended their utterance to communicate, we have to resort to observational criteria: Is the infant behaving in a manner that suggests an attempt to communicate? Specifically, does the infant name mostly (if not exclusively) in social situations, look at the companion, and pause for a response or appropriate action? The same criteria apply to the gestures that precede naming. These are conservative criteria liable to Type II error; adults sometimes speak with communicative intent without meeting these criteria. However, somewhat older children do exhibit these signs of communicative intent, leaving the onus of demonstrating communicative intent in younger ones who do not on those who claim it. The weight of such evidence can then be evaluated relative to evidence that children's early words serve another purpose.

We begin by discussing the development of performative structures, with emphasis on whether or not they emerge in behavior with communicative intent.

Emergence of Pointing

Infants typically first point sometime between 8 and 14 months (Bates, 1976; Leopold, 1939-1949; Werner & Kaplan, 1963). Murphy (1978) found that four of eight 9-month-old infants pointed at least once to pictures in a book and six of eight pointed at 15 months. Leung and Rheingold (1981) reported that only one of eight infants pointed at 10½ months when regarding distant visual stimuli such as a chime mobile and a large colorful clock with moving hands. Nine of 16 infants pointed at 12 months, and all eight 16-month-old infants pointed. Once pointing appears, it is used both for near and distant objects (Bates, 1976).

Pointing and Attention

Pointing is credited with special importance in communicative interactions because it is capable of being used to call another person's attention to an object or event. Werner and Kaplan (1963) believed that pointing develops from shared contemplation of objects and from turning to look at objects in an inter-

personal context. Bruner (1975a, 1975b) and investigators such as Leung and Rheingold (1981) and Murphy (1978) adhered to the view that infants point for the purpose of communicating with a social partner. Bates (1976), however, argued that (a) pointing emerges from the orienting response (OR) and thus is essentially an attentional behavior, and (b) pointing initially appears as pointing-for-self and only subsequently is used for social exchange. We consider her ideas in order, beginning with the relation between pointing and the OR.

The OR is attending behavior that can be elicited by novelty, perceptual change, and variation in the rate of change. It has a general component (alerting with arrest of ongoing activity) and a selective component (receptor repositioning) that optimizes perception of the attended cue (Sokolov, 1963). *General orienting behavior occurs after onset of appropriate stimulation even in neonates* (Pratt, 1964) and during sustained attention in the second month (White, 1971). However, the selective component of the OR—turning of head and gaze—is also found in neonates in response to appropriate stimulation (Muir & Field, 1979). A fixed posture, staring, and abrupt arrest of movement are noted at approximately 4 or 5 months of age in response to novelty or change (Kagan, Kearsley, & Zelazo, 1978). When in the second half of the first year, the infant can turn the head freely to the object of attention, the infant often looks surprised during sustained attention. The mouth and eyes open simultaneously and the forehead muscles contract (Peiper, 1963).

Although the outstretched arm gesture that the infant uses to point to distant objects may have developed from reaching, index finger extension does not seem to develop from grasping (Bates, 1976; Hannon & Fogel, 1981; Werner & Kaplan, 1963). However, reaching may itself emerge as part of the selective component of the OR. Infants ranging in age from 2 to 2½ months may not only adjust their activity level when fixating an object, but may reach toward it without obvious intent to grasp—the infant's fisted hand would even preclude this (White, 1971). The report that infants younger than 6 months, but not those aged 6 to 12 months,

reach toward the source of sound in total darkness (Bower, 1974) is consonant with an orientational interpretation of early reaching, as is the report that congenitally blind infants orient toward the source of sound and even reach out at about 16 weeks, but not at 24 weeks (Fraiberg, Siegel, & Gibson, 1966). If reaching for an invisible object is at first a component of orienting to the source of sound, babies would reach in the direction they orient even without recognizing there is an object out there.

Bates (1976) videotaped the emergence of pointing in a 9-month-old child within the context of (general and selective) orienting response to a novel stimulus. Although the coincidence between the first appearance of pointing and evidence of orienting response does not establish that pointing emerged from the OR, Leung and Rheingold (1981) reported an association between pointing and visual attention in infants aged 9 to 17 months. They found that stimuli that attracted more attention as judged by duration of visual regard were also accorded more points than those that received less attention. One object attracted so much visual attention and pointing that it had to be left out when the investigators tried to differentiate between spontaneous pointing and pointing in response to the mother's gesture. On the basis of longitudinal study of pointing in four infants, Masur (1983) also concluded that early pointing has a self-directing attentional function. These findings supplement anecdotal evidence of a relation between early pointing and attention (Greenfield & Smith, 1976; Leopold, 1939-1949).

Whereas evidence of a relation between pointing and attention may not seem surprising, the related view that it has no communicative intent initially is more controversial. We now consider evidence for Bates's claim and some counterclaims.

Development of Social Pointing

Bates (1976) reported that pointing in two infants first occurred independently of established social behaviors such as cooing, smiling at, and regarding a companion. It was an object-directed behavior that occurred when the infants attended to novelty or inspected small pictures in books. Pointing began to

merge with social actions (namely, looking at a person) at about 12 months. Bates noted that early reaching also seemed to be an object-directed behavior.

Bates verified her initial claim by a longitudinal study of 13 American and 12 Italian infants (Bates, Benigni, Bretherton, Camaioni, and Volterra, 1977). Pointing-for-self when inspecting pictures in books or when attending to distant objects continued even after communicative pointing was established (Volterra, Bates, Benigni, Bretherton, & Camaioni, 1979). Sugarman-Bell (1978) independently found that person-directed (communicative) and object-directed behaviors were initially discrete in 7 infants. Integrated person-object behavior patterns increased in frequency toward 13 months of age, thus corresponding to the age range delineated by Bates and her associates. Sugarman-Bell also described a pattern whereby infants at first treat the adult's hand as an instrument. That is, they do not make social contact with the adult, but instead may push the adult's hand toward an object out of the child's reach.

Bates (1976; Bates, Benigni, Bretherton, Camaioni, & Volterra, 1979) reported that intentional use of pointing and reaching in communicative sequences coincides with the beginning of nonsocial tool use in object-to-object means-end sequences. She suggested that both depend on the same basic cognitive capacities, but that social pointing (and reaching) require an additional capacity for communication.

Murphy (1978) criticized Bates's criteria for social pointing (and reaching), namely, concurrent visual regard. She found that even 2-year-olds may not regard the parent when pointing to pictures in a book. Leung and Rheingold (1981) argued that infants are so certain of the parent's response that they do not need to look at the parent when pointing. However, Lempers, Flavell, and Flavell (1977) noted that although ten of twelve 1-year-old children pointed to objects, they seemed to point and look at the object without paying attention to an adult. In contrast, 50% of the 18-month-old subjects alternated between looking at an adult and looking where they pointed. This behavior became the norm for children ranging in age from 27 to 37 months. Thus, infants did not regard an adult when

pointing in situations in which toddlers did. It seems implausible to suppose that infants begin to look at an adult when pointing because they have become less certain of the parent's response at that time than when they first began to point.

In contrast, Masur (1983) found that a mean of 29% of 4 infants' first recorded instances of pointing included visual gaze at the mother, provided that the gesture was itself directed at the mother (e.g., when the mother held up an object that elicited pointing). Dual-directional signaling (looking at an adult while pointing at an object in a disparate visual field) appeared between 13 to 15 months. Like Bates (1976), Masur suggested that it involves a sensorimotor form of the cognitive ability to consider two things concurrently (e.g., a means and a goal).

To summarize, although all instances of pointing are often interpreted as occurring for a social partner, the infant's manifest behavior before approximately 12 to 13 months hardly ever substantiates the inference that the gesture is intended to communicate. Not even once social pointing has been documented in a child can all subsequent instances of pointing be taken a priori as meant to communicate. If an adult were to point to the lines of print when reading in the presence of a companion, the gesture would not be understood as a communicative signal simply because of the pointing gesture. Using the same principle, infants may point as a concomitant of their attention to an object or an event and not because they want another person to look where they point. On the basis of the available evidence, we conclude that most early pointing is noncommunicative. Whether noncommunicative pointing differentiates into social pointing and into pointing for self (private attending) or whether they have separate roots cannot be ascertained on the basis of currently available evidence.

Early Word Usage

Indexes Versus Symbols

According to Bates (1976), the communicative use of words originates in preverbal social pointing (proto-declaratives) and social reaching (proto-imperatives). She proposed that in the case of proto-declaratives objects

are means to the goal of interacting with an adult. For example, the preverbal infant might point to an object to get the parent's attention. An older infant presumably would point and name for the same purpose. In contrast, for proto-imperatives, an object is the goal, and the adult a means or instrument. For instance, the younger infant when reaching may regard the adult as a signal for assistance. In addition, an older infant may name the object. We find Bates' views persuasive but point out that infants' first words might be uttered without either purpose in mind. Naming might at first be selective orienting (a component of noncommunicative pointing) and only subsequently merge with the infant's existing communicative behaviors, such as social pointing.

In what follows, early manifestations of naming will be regarded as indexes rather than as true symbols (Peirce, 1932). The word in this sense stands for its referent in the way that the ringing of a telephone or the noise of an automobile motor stands for the objects they signify. Naming in infants typically occurs only in the presence of the word's referent (or in the presence of a stimulus that is associated with it). However, words are not usually regarded as true symbols unless the child has previously used words for absent referents (or manifested other behaviors that are taken as evidence that the child can represent an absent referent). However, naming what is in front of the child does not require re-representation (recall memory), but simply recognition of the object, and such recognition clearly implies that the child has stored information about previous encounters with that object (or with one that resembles it). Also, if the infant names on sight of the object alone, then the infant's representation obviously includes certain perceptual characteristics. The words could be acquired as associates to perceptual representations and elicited when the object attracts the child's attention (elicits an orienting response). To develop this argument, we now consider the circumstances in which names develop and first appear in speech.

Properties of Early Nominals

By about 12 or 13 months, infants have usually begun to utter sounds that seem to

function as names (Bates, 1976; Greenfield & Smith, 1976; Volterra et al., 1979). By about 15 months, the child is likely to have said 10 different words (Nelson, 1973). Nominals in early production vocabulary are almost always words for dynamic objects or items the child can use (mostly food and food related, e.g., cup, milk, cookie). So-called dynamic words are names for people and animals and for inanimate things that can produce sound or move (e.g., clock, ball, car, truck). Conversely, early-spoken words rarely include names for common items that are stationary (e.g., table, chair, tree; Benedict, 1979; Gruendel, 1977; Leopold, 1939-1949; Nelson, 1973; Volterra et al., 1979). When vocabulary increases to 50 words, names for static objects continue to be infrequent.

Why is there this early propensity to name dynamic and interactive things? Nelson (1974) hypothesized that early concepts are based on actions that people and animals perform independently (e.g., running, barking) or on function (the uses of objects). Nelson's view was that children more usually associate names with perceptual representations that she supposed children subsequently acquire for their functional concepts rather than with the functional concept itself (Nelson, Rescorla, Gruendel, & Benedict, 1978). Thus, Nelson tried to reconcile Piaget's emphasis on early action concepts (a kind of memory for actions) with evidence that early-word usage generalizes across perceptual attributes, not functional properties (Anglin, 1977; Bowerman, 1978a, 1978b; Clark, 1973; Rescorla, 1980).

The manual naming schemas that Bates et al. (1983) described in 30 children studied from 13 to 20 months are consistent with Nelson's claims about early functional meaning. An example is a child who notes an empty cup on the floor picks it up, brings it to the mouth, and then tosses it away. Bates et al. suggested the action is a way of recognizing the object. They reported that children who had a word for a concept never used manual naming for the same concept. However, although manual naming inevitably must give way to vocal naming, Bates et al. did not find that individual children followed a manual → vocal naming progression for individual concepts. Consequently, their findings

do not demonstrate that vocal naming of an object follows prior functional knowledge of it.

Volterra et al. (1979) argued that Nelson does not mean that functional knowledge underlies early concept formation, but that action and function determine which things are more likely to be selected as worthy of concept formation. Thus, things that undergo or cause interesting changes of state as well as things the child can manipulate would be conceptualized earlier than static things because they attract the child's attention. If this is so, then Nelson actually relates concept formation to the OR (because the OR is the behavioral correlate of attention to external stimuli).

Manipulation may participate in early concept formation by directing the infant's visual attention to salient structural characteristics. It may also add information, so that some early concepts might include both perceptual and functional information (Ruff, 1982b). In addition, manipulation reveals an object across different perspectives and therefore can make it more recognizable later. However, viewing a moving object from a distance also serves this purpose (Ruff, 1982a). Thus, children could have representations even for objects they have never manipulated and so be able to recognize these objects on sight.

Whatever the substrate for early concepts may be, there is another reason why names for dynamic things predominate among early words. Unless the child has heard a word, the child cannot utter it, except perhaps by chance. Word learning itself is influenced by a referent's salience for the child.

Attention and Early Word Learning

A parent who observes an infant turning and intently watching something typically turns and looks there too (Collis & Schaeffer, 1975). By the time the infant is 9 months old, the mother may also name the object at which she supposes the infant is looking (Leung & Rheingold, 1981; Masur, 1982; Murphy, 1978). The association between naming by the parent and the infant's attending behavior peaks at about 14 months (Masur, 1982) when most infants are able to point to where they attend, but it occurs even

earlier. So, in some ways, infants control the range of objects that the caretaker names for them. By virtue of their attentional response toward certain things, they prompt parents to label these objects.

Conversely, the parent may direct the child's attention and then label the item (Murphy, 1978; Murphy & Messer, 1977). However, at least until the end of the first year, the mother more usually follows the child's line of regard than the reverse (Collis & Schaeffer, 1975). This suggests that naming what has attracted the child's spontaneous attention is taken to be more useful than naming what the mother wants the child to look at.

Names for active objects may predominate among early words because movement and sound are attention catching. These properties can trigger orienting response even in the neonate (Brazelton, Scholl, & Robey, 1966; Haith, 1966; Muir & Field, 1979; Tronick & Clanton, 1971; Volkman & Dobson, 1976). Children may learn words for dogs, cars, and clocks at a young age simply because their dynamic properties can capture the child's attention. Once the child has turned (and pointed) toward the source of stimulation, the parent may seize the opportunity to label the attended item. Parents' naming practices may also explain why nominals exceed verbs in early vocabulary.

Children presumably learn the names for functionally significant objects such as cookie and milk in the same way that they learn names for dynamic objects, namely because parents label things when the child is attending to the item. For example, parents name when the infant reaches for an item (e.g., "Billy wants a cookie?"; Huttenlocher, 1974). They also label when the child holds out a toy to show to the parent (Messer, 1978). Even so, mothers of infants aged 9 to 18 months label objects more often when the infant is pointing than when the infant is reaching toward an item or holding it out. Also, across ages 9 to 18 months, the number of different words in the child's lexicon is positively correlated with the degree to which the mother names when the infant points (Masur, 1982). Because pointing is an attentional response, Masur's report is consistent with the contention that dynamic (i.e., atten-

tion-catching) objects are particularly likely to be labeled by the parent and thereby likely to appear in the early vocabulary. Incidentally, some words for objects seem to include the context in which the object was viewed and only gradually dissociate from this context (Bates et al., 1983). Perhaps these words were not acquired through parental labeling of the object to which the infant pointed (in effect, the child may not know the word's specific referent).

Early Words and Action

Piaget thought naming is at first part of complex schemas of action (mainly, the child's own). De Laguna (1927) also claimed that the child does not clearly distinguish early object names from acts connected with the objects. Bloch (1921) believed that early names designate not only the referent, but all action related to it. Although these early conclusions were based on anecdotal evidence only, Rodgon, Jankowski, and Alenskas (1977) reported, on the basis of controlled observation of three children, that about two thirds of their intelligible single-word speech occurred during action. About one third to one half accompanied physical interaction with an object. The investigators concluded that their data "confirm the notion that language arises in conjunction with overt action" (p. 42), but what kind of action?

Rodgon et al.'s (1977) criteria for physical interaction were not restricted to manipulation. They included holding, touching, and looking. Apparently, the presence of an object when the child vocalized was considered sufficient for physical interaction because utterances in which the child's hand was not even on the object at the time are included in this category. Also, one child was already 16 months old and two were 22 months old when the observation sessions began. All three children were beginning to produce phrases during the final sessions. Thus, the observations do not relate to the emergence of single words, but to the later stage of one-word speech when children do not simply name, but, according to Greenfield and Smith (1976), also talk about objects in terms of semantic roles such as object of action and agent of action. Thus, Rodgon et al.'s work

does not demonstrate that language originates in manipulatory action.

Functional knowledge could be included in the child's knowledge of certain objects without being the vehicle for referential speech. Indeed, Bowerman (1978b) specifically noted that 2 children produced their first object words (ball, bottle, dog) not when they or others were using the objects, but when the children saw the objects at some distance. Bretherton et al. (1981) found that vocal naming is unusual during object manipulation either at 13 or 20 months in the 25 infants they studied longitudinally. Greenfield and Smith (1976) reported that their two subjects usually named when the referent was not in their possession at the time.

In older infants, object manipulation can actually decrease naming. Nelson and Bonvillian (1973) reported negative correlation between frequency of object manipulation and object naming in children who were 16 and 17 months when the study began. Also, the children named those objects that they handled in a fashion appropriate to their use less frequently than those that they handled nonspecifically.

One reason why investigators think early words relate to action on objects is because infants produce consistent vocalizations during such action (e.g., *bam* while knocking down or messing up arrangements of toys, *br-r-r* while pushing or pulling vehicles. Bretherton et al. (1981) termed these vocalizations *sound effects*. Although sound effects appear at about 9 months and are more frequent at 13 than at 20 months, Bretherton et al. reported that an equal number of children produced them at 13 and 20 months. Sound effects also accompanied the manual naming schemas described earlier.

Because sound effects usually precede naming, students of language acquisition who regard them as words will conclude that speech emerges from action. However, sound effects are typically part of the child's action. They have no referential value with respect to the object that is being handled or even with respect to the action (Bates, 1976; Greenfield & Smith, 1976). As described in the next section, vocal naming is more usually a concomitant of pointing.

Naming and Pointing

Greenfield and Smith (1976) reported that the first instances of naming in two infants coincided with turning of head and gaze toward the referent. At approximately 13 months, naming also began to accompany pointing. Because Greenfield and Smith observed a constant relation between pointing and naming when object names were developing, they suggested that "the gesture is a fundamental aspect of semantic structure . . . and not just an incidental characteristic of early speech" (p. 7). Although Greenfield and Smith assumed that the words were intended to indicate something to a social partner, we use the term *indicative naming* simply as a descriptive label.

Leopold (1939-1949), observing his daughter, also noted an association between naming and pointing. He suggested that the words were a "method of linguistic pointing" (p. 159). Masur (1982) reported that four infants produced significantly more object-labeling words between 9 and 18 months when they pointed than when they either reached for objects or held them out. Other categories of utterances are more evenly distributed across gestural types—pointing, extending objects, open-handed reaching (Masur, 1983). By 16 months, children may name with a variety of concomitant gestures (Bloom, 1973), but even at 24 months children usually still point when they name a referent, if their intention is referential (Murphy, 1978).

Although Piaget (1963b) claimed that the first words express requests, "language proper" (Greenfield & Smith, 1976) more usually first appears in the form of indicative naming (Bates, 1976; Greenfield & Smith, 1976; Leopold, 1939-1949; Volterra et al., 1979; Werner & Kaplan, 1963). Piaget's claim is based on one child's use of *nana*, the origin of which he ascribed to the child's word for grandfather. However, the word was simply an all-purpose volitional term without referential value (a sound-effect that occurred with reaching). Greenfield and Smith pointed out that Piaget's instances of early words (e.g., *bow wow*) refute his claim.

Greenfield (1982; Greenfield & Smith, 1976; Greenfield & Zukow, 1978) noted that

her two subjects typically named when the referent was a novel element in the current situation, or when it changed the stimulus situation in some way, as by its unexpected appearance or disappearance. Naming coincided more with the orienting of attention than with what might sustain attention after the novelty has been perceived. Spontaneous naming did not occur after the child was accustomed to the presence of an object, even if the child was still watching it (Greenfield, 1982). This could be one reason why infants who understand a word for an object may not include it among their first spoken words. Bloom (1973) used as an example a child who behaved as though the names for an overhead bird mobile and a record player were understood, but did not name them when beginning to say words 5 months later. By then, the child presumably was accustomed to their presence in the room. This may also be another reason why words for dynamic items predominate in early production vocabulary. Because their movement and sound can change the stimulus situation, dynamic items may be better able to elicit naming than are static objects (assuming that the child has a word for a static entity). However, why should there be this relation between naming and novelty and between naming and pointing?

Is Early Naming Selective Orienting?

Novelty not only attracts the infant's attention but also presents a new state of affairs to be processed. If the new percept is recognized (categorized in terms of what is known), and if the child has a word for that percept, the word seems to be uttered as overt recognition. By this we do not mean that the infant consciously uses the name to classify or categorize the object, but that the word is elicited when the representation corresponding to the current percept is accessed or activated. Vygotsky (1978) called it *verbalized perception*. However, at some point in development naming comes to be used to classify (Bates et al., 1983). The naming routines whereby older infants successively label objects in their surroundings (Dore, 1978) may be such instances.

The view that early naming is verbalized perception is consistent with the view that it is a component of selective orienting. Even when the stimulus consists only of sound, perception/recognition in infants seems to include looking and pointing in the direction of the stimulus. Thus, naming may accompany pointing simply because perception/recognition occurs while the infant's attention is focused on the stimulus configuration. It may be virtually impossible for infants to inhibit pointing when they process an external stimulus, and thereby, to name without pointing (unless, for example, they hold another object at that moment). However, it is also possible that vocal naming is itself primed by pointing in some as yet undetermined manner (Greenfield, 1982).

That naming involves perception/recognition of what is named may seem obvious. However, our argument is that naming initially might be no more than that, and because it is overt instead of covert it is credited with communicative intent even when there is none. The communicative role of language has been so greatly emphasized that investigators have not even considered the possibility that vocal naming might emerge as private naming without any communicative intent. Yet, as described in the next sections, infants' speech is not always meant to communicate, either before or after social pointing has appeared.

Nonsocial and Social Speech

Early Noncommunicative Speech

Early pointing is often accompanied by certain consistent vocalizations. According to Greenfield and Smith (1976), these vocalizations are the immediate precursors of indicative naming and thereby of "language proper." Sometimes these utterances are simply aspirations of breath (Bates, 1976; Sully, 1903). More usually, they are sounds such as *də* (Leopold, 1939-1949) *da* (Dore, Franklin, Miller, & Ramer, 1976) and *ada* (Greenfield & Smith, 1976), which sound like childish imitations of deictic words such as *that*, *there*, and *this*. Sometimes the vocalizations that accompany early pointing sound like real words. For example, Leopold's daughter

began to say *pretty* (and also *də*) at 10 months, apparently as a concomitant of her interest in objects to which she pointed. De Laguna (1927) described a coincidence between pointing and uttering *ti-ti* at 8 months, initially to a clock, but subsequently to anything to which the child turned and pointed. Infants also vocalize when reaching, but these sounds are often of the form *ma-ma*, *na-na*, and *m-m-m*.

If pointing (and reaching) mostly occur without communicative intent until about 12 months, then most vocalizations that accompany these gestures before that age cannot be accorded communicative purposes. Nor are the sounds that occur with action on object (e.g., *bam*) used to communicate (Bates et al., 1983). Yet this cannot be because infants lack the nonverbal prerequisites to communicate. Bruner (1975b) has described the infant's ability to follow the caretaker's line of regard as early as 4 months (although the reverse is more usual even at 52 weeks; Collis & Schaeffer, 1975). Bruner suggested that such joint action, which may culminate in vocalization by the child, serves the purpose of communicating with respect to the object of regard (the shared topic). But is that why the child does it? The child's vocalization could simply be a preprogrammed concomitant of the child's response to novelty, which has communicative value for the parent, but is not uttered with this intent by the infant.

Leung and Rheingold (1981) found that 87% of pointing gestures in infants ranging from 9 to 17 months were accompanied by vocalization. The authors inferred that the vocalizations (and gestures) were always evidence of the intent to communicate. However, the infants looked at their mothers while pointing only 38% of the time. The majority of their vocalizations could have been vocal components of attending, particularly in the younger infants. The fact that the parents looked where the child pointed or verbally acknowledged an average of 88% of the child's points is not evidence that the gestures and accompanying vocalizations were intended to have this effect.

Harding and Golinkoff (1979) studied the contingencies of intentional vocalizations. They demonstrated that infants younger than about 9 months of age vocalize without ex-

hibiting evidence of intent to communicate, whereas after 11 months most of their vocalizations were accompanied by evidence of such intent. However, even the younger infants showed that they were capable of communicative intent at other times when not vocalizing.

The argument that has been applied to early pointing also holds for vocalization, namely that we need additional corroborating evidence to accept that it is intended to communicate. Investigators may be reading communicative intent into children's behavior because parents turn the behavior into social exchange (perhaps more often in the observation session than when their responses are not being studied). Even after social pointing has appeared, not all instances of naming are intended to have this effect.

Social and Nonsocial Naming

Bates et al. (1983) reported that their young subjects used vocal naming not only in a communicative framework, but also to label things to themselves (solitary naming). They suggested that whereas solitary naming serves the private function of categorizing reality, social naming serves the social function of communication and shared reference. Dore (1978) also noted that most investigators of early speech have found that children sometimes regard an object and label it, without apparent intention to communicate anything to another person (no eye contact, no pause for response, and so on). One child often engaged in prolonged naming routines, successively labeling items; about 75% of the child's utterances over a 3-month period were noncommunicative. Greenfield (1982) described an episode in which words were spoken without apparent communicative intent at an age as late as 18 months. When the child's father entered the room, the child pointed and said *daddy* four times while walking toward him. Because the child did not solicit interaction when he reached his father, Greenfield concluded that he simply named the changed element in his surroundings.

Volterra et al. (1979) found that social naming between ages 9 to 13 months occurred in the context of communicative gestures,

mostly social pointing. Although noncommunicative pointing was not related to communicative gestures, it related to language measures such as the number of different words used by the child. Thus, their data imply a relation between noncommunicative pointing and spoken words when object names are developing. However, their data do not show whether solitary naming precedes social naming or follows it, because (a) the circumstances in which the children first began to name were often described as "unclear," and (b) it is not always clear which words named objects (or actions) and which were simply sound effects. Evidence of individual differences in the degree to which infants name-for-self (Nelson, 1981) does not resolve this issue either, although, as Nelson noted, the individual differences suggest that the social and cognitive uses of language are to some degree independent systems for the language-learning child.

Bates et al. (1983) concluded that manual naming (object-specific action) is not used to communicate, either at 13 or at 20 months, because the children performed these actions without involving a social partner in any manner. It follows that any sound effects that coincided with the action were not meant to communicate. But if manual naming is a recognition action that does not develop out of the capacity for communication, then the same could well apply to solitary naming. If so, then perhaps vocal naming, but not manual naming, becomes used in the service of communication because parents respond to vocal naming as if it had communicative value. This suggestion is in accord with evidence that 13-month-old deaf children will use manual naming in requests and as labels addressed to others (Bellugi & Klima, 1979; Hoffmeister, 1978).

Of course, infants use speech in social contexts before naming emerges. For example, some early sound effects are uttered during social interactions, for instance, *hi* and *bye-bye* when waving (Greenfield & Smith, 1976). When give-and-take routines develop at around 12 months, children may accompany the action by utterances such as *da* and *ta* (Bates, 1976). Thus, the social as well as the nonsocial uses of speech have been practiced to some extent before object naming appears.

However, this still does not demonstrate that social speech differentiates at a very early age into cognitive and social language. It could instead indicate that they have separate roots. Private naming may become communicative in the interest of cognitive goals, for example, because the infant wants the parent to confirm that a word was used appropriately. Social speech may emerge to serve utilitarian goals (e.g., to obtain the parent's attention, to obtain objects). But even so, the first instances of vocal naming may be "pure propositional speech," speech acts that lack illocutionary value.

Summary

We have argued that early vocal naming is simply selective orienting to a percept. The word is verbalized perception, and because it is spoken, others accord communicative intent to it. The literature reveals that although there is almost unanimous agreement that naming emerges with communicative intent, evidence that unequivocally demonstrates this belief is lacking. Instead, we argue that the referential function of speech itself develops from selective orienting to stimuli outside the child, following a developmental progression whereby infants begin to point to a percept and subsequently to point and name it. In contrast to theories of language acquisition that treat the use of language as separate from the development of reference, we treat the emergence of vocal naming as continuing the development of reference.

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