# Chapter 5

# Pronouns and Proper Names

A central question in cognitive psychology is how humans and other animals determine the category or kind a novel entity belongs to—how we categorize something as an apple or a table, a face or some water. And most research in word learning addresses how we learn names for these kinds—*apple, table, face,* and *water.*

But we also think about and name individuals. If someone tosses you an apple, it is not enough to know the kind it belongs to; you need to follow that specific apple, tracking its movement through space. Our emotions are tied to specific people and things. Original artwork and autographs can be worth fortunes, while perfect duplicates might be worthless. You might love your own newborn baby and be indifferent toward somebody else's—even if you are unable to tell them apart. In fact, without the ability to individuate, you couldn't tell the difference between one baby and two, except that two usually make more noise and take up more space. Although the understanding of individuals is much less studied than the understanding of kinds, it is every bit as central to our mental life.

The following three sections address how children learn names for individuals—pronouns and proper names—distinguishing them from common nouns that refer to kinds. The rest of the chapter addresses the broader question of the relationship between our understanding of individuals and our understanding of kinds.

## *Pronouns*

### *Preliminaries*

Pronouns belong to a class of linguistic expressions known as deictics or indexicals. These are words whose interpretation changes radically as a result of the contexts in which they are used. If you hear "Dogs like to chase cats," you can safely assume that the person is talking about the same types of entities (dogs and cats) and the same activities (liking and chasing) that anybody else would be talking about when

saying the same sentence. But understanding "Bring me the cup on the left now" and interpreting the words *me, left,* and *now* require knowing who is saying the sentence, where that person is, and when it is being said.

Pronouns are the first deictic expressions learned, and the demonstrative pronouns *this* and *that* are typically found among children's first words (Nelson, 1973). Some children are so impatient that they coin their own demonstrative pronoun. For instance, at the age of about 12 months, Max would point to different objects and say "doh?," sometimes with the intent that we do something with the objects, such as bring them to him, and sometimes just wanting us to appreciate their existence. Once children combine words into two-word strings, pronouns are used extensively, showing up in utterances such as "Want this" and "That nice." The early usage of pronouns is not restricted in English; it holds as well for Chinese, Danish, Finnish, French, German, Italian, Japanese, Korean, modern Hebrew, Quechua, Samoan, and Swedish (Wales, 1979).

Demonstrative pronouns are not restricted to referring to physical objects (Jackendoff, 1990). You can say "I like that," and *that* could refer to some soup, a song, a dance step, a poem, or a grant proposal. Even children's first word combinations contain many utterances in which pronouns refer to entities other than objects (P. Bloom, 1990).

The personal pronouns *I, me,* and *you* are understood by children some time after they have learned the deictic pronouns, by about the age of 18 months (Clark, 1978; Macnamara, 1982; Oshima-Takane, 1988, 1999; Shipley & Shipley, 1969). The order in which these words are learned is unclear, and some children behave strangely when tested: in comprehension tasks, they do better with *you* than with *I;* in production tasks, they do better with *I* than with *you.* The most plausible explanation of this comes from John Macnamara (1982), who suggests that children are most comfortable dealing with pronouns when they refer to themselves (*you* when they are listening, *I* when they are speaking). These are the situations they have had the most experience with, as well as the ones they find the most interesting.

*Cues to Learning Pronouns*

When children hear a word, how do they know it is a pronoun? One potential cue is its syntax. Pronouns, like proper names, are not nouns. They are lexical noun phrases (NPs) and hence cannot be modified by adjectives, determiners, or quantifiers. In one study, the early word combinations of several one- and two-year-olds were studied, and their use of pronouns, proper names, and common nouns was analyzed (P. Bloom, 1990). The children honored the restriction that adjectives

cannot appear before pronouns and proper names; they almost never produced phrases like "big he" or "nice Fred." But they had no such prohibition against using adjectives before common nouns, as in "big dog" and "nice drink." This is just what one would expect if the children know that pronouns and proper names are lexical NPs and thereby cannot appear with prenominal adjectives. In sum, even one- and two-year-olds know the syntactic difference between nouns such as *dog* and NPs such as *he* and *Fred.*

This opens up the possibility that young children can use syntax to learn which words are pronouns. They might know that if a word is an NP, as in "Look at fep," it can be a pronoun but that if it is a noun, as in "Look at the fep," it cannot.

Syntax is a useful cue, but it can play at best a limited role in pronoun learning. First, while pronouns are lexical NPs, so are proper names. No strictly syntactic context distinguishes them. Second, the cues that identify NP contexts in English are ambiguous, as they also signal the presence of adjectives and mass nouns. The word *fep* in "Look at the fep" can be a proper name, as in "This is Fido," but it could also be a mass noun, as in "Look at the water." Third, the syntactic cue is not universal. In German, for instance, articles may precede proper nouns ("the Hans"), and it has been argued that Japanese common nouns have the same syntax as Japanese pronouns and proper names (Fukui, 1987).

The fourth reason that syntax is of limited importance has to do with how syntactic cues to word meaning are learned in the first place. Since such cues vary across languages, they cannot be innate. For instance, children exposed to English have to somehow figure out that *fep* can be a pronoun or proper name when used in the context "Look at fep" but not when used in the context "Look at the fep." But this learning can take place only if children can use *non*syntactic information to learn the meanings of some pronouns and proper names. More generally, children's use of syntactic cues to help to learn words that belong to a certain class requires them to be able learn the meanings of at least some words that belong to that class *without* syntactic support (see chapter 8 for discussion). For instance, a child might learn that *him* refers to an individual. Once the child knows this, hearing a sentence such as "Look at him" can give rise to the understanding that novel words that appear in the context "Look at _____" also refer to individuals.

So while syntax might help identify pronouns in some languages, it falls short of a complete solution. What other cues exist?

The most obvious cue that a word is a pronoun is the range of entities that it is used to refer to. A child could learn that *this* and *that* are

deictic pronouns by noting that they refer to a diverse set of entities in the environment—to the dog, the cereal, the child's mother, the marks on the wall, and so on. The specific meanings of these pronouns (roughly, *this* refers to closer objects than *that*) can be learned by observing the conditions in which they are used and by attending to utterances in which they are explicitly contrasted, as in "Don't eat that. Eat this instead."

But the learning of personal pronouns is considerably more complicated. Consider a child, Margaret, who is learning the pronoun *I*. Suppose she talks only with her mother. Margaret might reasonably draw the conclusion that *I* is her mother's name. Her mother uses this word only to refer to herself, after all, and the word has the same syntax as *Margaret* and *Mommy*. It would help rescue Margaret from this semantic dead-end if she hears another person use *I*. But other wrong hypotheses remain. After all, Margaret hears the word *I* used to refer to everyone but Margaret herself (Margaret is always called either *Margaret* or *you*), and so it would be sensible—but wrong—for her to conclude that this word can refer to everyone but her. For whatever reason, this is not the sort of generalization that children make. Maybe, as Macnamara (1982, p. 43) suggests, Margaret knows that she "is a person just as much as any others who take part in conversations, and so has as much right as any of them to be an I sometimes."

The second-person pronoun, *you*, poses a learning problem that cannot be resolved in the same way. Since the child is addressed as *you*, why doesn't she infer that *you* is her name? After all, the way Margaret learned her name is *Margaret* was presumably by hearing herself, and nobody else, called *Margaret*. So why doesn't the same reasoning apply when she hears herself called *you?*

One might be tempted to appeal to some lexical contrast principle; perhaps Margaret thinks *you* cannot be a proper name because she already has a name, *Margaret*, and she is loath to assume she has two. (Though this raises the question of how she figures out which of the words—*Margaret* and *you*—is the proper name and which is the pronoun.) The question of whether such a bias against multiple names exists is discussed below, but note that sooner or later children must be capable of learning that they have many names. Since Margaret will come to know that she is *Margaret, Maggie, Peggy*, and *Peg*, what stops her from adding *you* to this list?

Yuriko Oshima-Takane (1988, 1999) has proposed the following theory: children learn the meaning of the personal pronouns by attending to the conversations of other people. They learn *I* by hearing it used by different participants in a dialogue and observing that it is used by people to refer to themselves, not to other people. And they learn *you*

by hearing other people use it to refer to those who they are talking to. Oshima-Takane suggests that overheard speech might be *essential* here, particularly for the second-person pronoun. Only when a child hears other people called *you* can she can reasonably infer that it is not her name.

This is a radical proposal, as it flies in the face of the assumption that, at least for children in Western societies, word meanings are learned from child-directed speech. If this proposal is correct, then children's success at learning the personal pronouns has to be in part by attending to, and understanding, people who are talking to each other. If these people are adults, which would be the usual situation for a first-born child, this would require that children can cope with utterances that are faster, longer, and more complex than those typically directed at them. This reinforces the position, defended in chapter 3, that while child-directed speech might facilitate word learning, it is not necessary.

One source of support for Oshima-Takane's theory has to do with the errors children make. Although consistent reversal errors with pronouns are infrequent in normally developing children (Shipley & Shipley, 1969; Girouard, Ricard & Decarie, 1997), they do sometimes exist. Oshima-Takane reports an 18-month-old who used *you* to refer to himself and *me* to refer to his mother. Laura Petitto (1987) reports a similar error in a child learning American Sign Language, which is particularly striking given the potentially iconic nature of the pronouns in that language: the sign for *you* is a point away from the speaker, the sign for *me* is a point toward the speaker.

Oshima-Takane (1988) hypothesized that the main determinant of children's errors is the extent of exposure to overheard speech. In a training study, she found that 19-month-olds can improve their understanding of the personal pronouns by being exposed to their parents using them not with the child but with each other. And Oshima-Takane, Goodz, and Derevensky (1996) found that second-born children produced correct pronouns earlier than first-borns, even though the two groups did not otherwise differ in measures such as mean length of utterance and vocabulary size. Such findings support the claim that exposure to overheard speech is important in learning the meanings of these words.

Autistic children often have problems with the personal pronouns, going for a long period in which they reverse them. If learning these pronouns requires attending to and understanding the conversations of others, it is no surprise that autistic children find this particularly difficult; it follows in a clear way from their theory of mind deficit.

It is not as obvious, however, why blind children have similar problems (Andersen, Dunlea & Kekelis, 1983). One possibility, raised by Hobson (1994), is that visual coorientation might be an important precursor to the development of theory of mind; hence, like autistic children, blind children's problems with pronouns are due to a deficit in theory of mind. An alternative is that blind children find it harder to make sense of dialogues that they are not part of for the simple reason that it is harder to tell who is speaking to whom if you cannot see. As Landau and Gleitman (1985) note, being blind is like taking part in a conversation where everyone else is present together and you are connected to them by telephone. In either case, the special problems that autistic and blind children have with the personal pronouns is consistent with the view that learning these words involves attending to the conversations of other people.

## *Proper Names*

### *Preliminaries*

Pronouns are fickle; proper names are loyal. A proper name sticks faithfully to the same individual across all situations. One can use the name to talk about an individual in the past, present, and future and in hypothetical situations. These facts were first pointed out by philosophers in support of specific theories of reference (Donnellan, 1977; Kripke, 1980; Putnam, 1975), but there is nothing arcane about them. For instance, when presented with a scenario in which Dan Quayle changes his name and appearance to those of John F. Kennedy, even philosophically innocent college undergraduates are quite comfortable with the idea that this character is still Dan Quayle (Sternberg, Chawarski & Allbritton, 1998).

The intuition here is that a proper name picks out a particular individual. Unlike a common noun, which has an indefinite number of possible referents, a proper name has just one. If the dog in the corner is *Fido* and another animal walks through the door, the other animal can be a dog but cannot be *Fido,* regardless of how similar they are.

There is a subtlety here: *Fido* is such a popular dog's name that it is possible that this other dog *could* actually be named *Fido.* But *Fido* is still a proper name, referring to just one individual even though more than one *Fido* may exist. The multiple *Fidos* should be thought of in the same way that we think of the multiple words *bug.* It isn't that a single word refers to both winged insects and listening devices. Instead, there are two words: one *bug* refers to winged insects, the other *bug* refers to listening devices, and these happen to sound the same.

*Cues to Learning Proper Names*

When children hear a word, how do they know it is a proper name?

Katz, Baker, and Macnamara (1974) explored the role of syntax. They presented children with a novel word occurring either with or without a determiner (e.g., "This is zav" versus "This is a/the zav"). In a sentence like "This is zav," *zav* can be a lexical NP, while in a sentence like "This is a/the zav," *zav* must be a common noun. The word was applied either to a doll or to a block. After being taught the word, children were tested to see whether they would extend it to another doll or block (consistent with the kind interpretation) or whether they would restrict it to the original item (consistent with the individual interpretation).

Seventeen-month-old girls (but only 27-month-old boys) were sensitive to syntactic cues when learning the name for the doll, construing *zav* in "This is zav" as a proper name and *zav* in "This is a/the zav" as a name for the kind. In contrast, all the children applied the kind interpretation for words referring to the block regardless of the syntactic context in which they were used.

Gelman and Taylor (1984) replicated this study with slightly older children, changing the methodology and stimuli in certain regards. One change involved using unfamiliar kinds of objects; another involved adding a distracter item to the forced choice during testing to control for the possibility of guessing. They found much the same as Katz, Baker, and Macnamara (1974): two-and-a-half year olds were sensitive to the syntax when words named the animate entities. They also found that when a lexical NP was used to refer to an inanimate object, children often chose the distracter item, which is consistent with the view that they were confused by the use of the NP to refer to this sort of object (why would an inanimate thing get its own name?) and were searching for another referent to apply it to.

Liittschwager and Markman (1993) explored the possibility that children in the above studies might have been taking the new word within the "This is zav" sentences as an *adjective* (and thus denoting a subkind or property, as in "This is red"). If so, then their choice of the original item during testing would not be because they were picking out the same individual originally named as *zav*, but because they were picking out the object that has the same perceptual properties as this individual. To test this, Liittschwager and Markman showed three-year-olds an object (such as a bear or shoe), named it ("This is zav" or "This is a zav"), and then moved it to another location and removed a salient property, so that it looked different. Then they took out a second item, also without this property, and placed it next to the first, so that children were faced with two objects that looked identi-

cal. Children were then asked "Where's zav?" or "Where's a zav?" If they were learning the lexical NP as a name for the individual, they should point to the moved object, tracking it over space and time, while if they thought the word named a property, they should show no preference in its usage, since the items looked identical. Liittschwager and Markman found that when given sentences such as "This is zav" (but not when given sentences such as "This is a zav"), children chose the same individual they were first shown, consistent with the view that they took the lexical NP as naming an individual, not a property (see also Sorrentino, 1999, for a similar finding).

These studies suggest that syntax can help children learn proper names. Nevertheless, the limitations of syntax discussed above with regard to pronouns apply to proper names as well. First, proper names and pronouns are syntactically indistinguishable. Second, the same cues that suggest that a word is an NP are also cues that it is an adjective or mass noun. Third, the syntactic status of proper names is not universal. And fourth, to learn about the syntactic cues in the first place, children need to be able to identity some words as proper names without the support of syntax.

What are the alternatives to syntax? Four nonsyntactic sources of information have been proposed by Geoff Hall and his colleagues (see Hall, 1999), and I discuss them in turn.

The first is that an object gets only one proper name. Hall and Graham (1997) presented four-year-olds with an object, such as a stuffed dog. For half the children, it was explicitly given a proper name ("This dog is named Zavy"); for the other children, it was described with a novel adjective ("This dog is very zavy"). An identical animal was then brought out and children were asked, "Show me the dog that is named Daxy." In the condition in which the first dog had a proper name of *Zavy,* children chose the second dog as being named *Daxy* but had no such preference when the first dog was said to have the property of being "very zavy."

This suggests that if something already has a proper name, children believe that another proper name cannot describe the same object. But there are reasons to doubt the generality of this cue. After all, as Hall (1999) notes, people actually have many names. Even ignoring middle names, last names, titles, and pseudonyms, the same person can be *William, Will, Bill,* and *Billy; James, Jim, Jimmy,* and *Jimbo;* and *Margaret, Maggie, Peggy,* and *Peg.* Young children, who are cute and helpless, also suffer the indignity of being addressed as *Half-pint, Pumpkin, Sailor, Silly Girl, Spanky, Stinkbug, Stinky, Sweetie-Slug, Turtle,* and *Twinky-Winky.* There are no systematic data on multiple names, but an informal poll of a dozen friends revealed that all use multiple terms

to refer to their children (see the examples above), and that their children have never been confused by this.

Admittedly, such nicknames aren't actually proper names for a specific child (anybody can be called *Pumpkin*), but it is not clear whether children know this. And in any case, some examples don't involve nicknames, as with one boy who knew both his English name and his Chinese name before his first birthday. Even in a single language there are pet names that are limited to specific children. Steve Lewis (1997, pp. 71–72) presents some exotic examples of this:

> And of course, Clover is not the only one with unusual tags. Cael is Bubba, but he was Ralph Barca for years. Nancy has evolved to The Turtle from previous incarnations as Puppy Turtle, Turkey Puddle, The Scooper, and "Woopy Woop for a Full year till She's Full Grown" (which I later shortened to Wooper). Addie has worn, among several other monikers, Aderlwyn Yacht, Yetso Yurt, YD, The Bulldozer, and most recently Al-Edward, or Edward for short. Danny, who was Graybadge and E-man (Encyclopedia Man) and Danzek and Dansak and most recently Dazulu or Zule, is now Donald.

If children can cope with this multiple dubbing, why do they refuse to accept overlap in the Hall and Graham study? The answer has to do with the pragmatics of the situation. While a single individual can have many names, such names typically differ in nonreferential ways, such as in formality, and it would be odd to switch names in the middle of a conversation for no apparent reason (Clark, 1997). Imagine that someone says "I was talking to Mary yesterday" and then asks "Have you seen Molly recently?" You might well assume that the speaker was now referring to a different person. Similarly, even if children have no particular problem with multiple proper names, when they hear "This dog is named Zavy" and then are asked "Can you show me the dog named Daxy?," it would be reasonable for them to infer that the person is intending to talk about a different dog. This isn't an objection to Hall and Graham's proposal, but it does suggest that the bias against multiple proper names might be restricted to situations in which the multiple names are used in the very same discourse context.

A second cue also involves lexical contrast. Hall (1991) found that four-year-olds were more willing to treat a word as a proper name if it was used to refer to a familiar kind of stuffed animal (a cat) than to an unfamiliar kind (a monster). This is presumably because children know *cat* but have no basic-level name for the monster. A new word that refers to a cat is unlikely to be another basic-level name, which makes it more likely, though not necessary, that it is a proper name.

Summing up so far, if children know a proper name for an object, a different word referring to the same object is less likely to be a proper name, and if they know a common noun for an object, then a different word referring to the same object is more likely to be a proper name. These cues are important, but they are not essential: people *do* have more than one name, and objects *are* described by multiple common nouns. Further, such cues cannot apply at the very onset of word learning. Plainly, a bias against believing an object has two proper names is not going to be of any help to children who haven't yet learned their first proper names. And since children learn their first proper names for people long before they learn any common noun that refers to these individuals (such as *person* or *parent*), the second constraint cannot help either.

The third cue discussed by Hall is that only some entities get proper names. Humans and some animals are natural candidates for having names; most other things, such as bricks, are not. This fact about proper names is not the result of a limitation in what our conceptual systems can individuate. After all, bricks are conceptually just as much individuals as people: one can count bricks, point to them, throw them, follow their movement, and so on. Bricks don't receive proper names because they are seen as interchangeable. There is no value in giving a particular brick its own name, as opposed to describing it just as a member of a kind, as "a brick."

Any individual entity can conceivably receive a proper name if people come to find it interestingly distinct from other members of the same kind. John Locke (1690/1964, p. 16) notes that

> Besides persons, countries also, cities, rivers, mountains . . . have usually found peculiar names, and that for the same reason; they being such as men have often an occasion to make particularly, and, as it were, set before others in their discourses with them. And I doubt not but, if we had reason to mention particular horses as often as we have to mention particular men, we should have proper names for the one, as familiar as for the other. . . . And therefore we see that, amongst jockeys, horses have their proper names to be known and distinguished by, as commonly as their servants: because, amongst them, there is often occasion to mention this or that particular horse when he is out of sight.

This is a claim about why proper names come to exist, not how they are learned and understood. Do young children appreciate that only some things receive proper names?

There is some evidence they do. When given a novel word in a context such as "This is Daxy," two- and three-year-olds will treat the

word as a proper name if it refers to a doll but not a block (Katz, Baker & Macnamara, 1974), a monster but not a toy (Gelman & Taylor, 1984), and a bear but not a shoe (Hall, 1994; Liittschwager & Markman, 1993; Sorrentino, 1999). One possibility is that these children have observed that proper names refer only to living things and representations of living things and restrict their own inferences accordingly. But this is too simple, since even two-year-olds will accept a proper name for an inanimate entity (such as a foam rectangle with a cube on top of it) if it is described as possessing mental states (Sorrentino, 1997, 1999). This could mean either that it is not animacy that is relevant but intentionality, or that such an entity is thought of as a "surrogate animal" in the way that children think of a stuffed bear.

Older children's intuitions concerning what entities can get a proper name are quite sophisticated. Four-year-olds, like adults, are typically unwilling to give a proper name to an animal such as a bee, snake, or spider. But if they are told that such an animal is owned by the experimenter—he says "This is my bee"—this reluctance goes away (Hall, 1994). Also, as discussed in the last chapter, four-year-olds learn proper names for cultural institutions, such as *church* and *school,* and they appreciate that such names apply only to those individuals that have a certain social importance (Soja, 1994).

Several questions remain about children's understanding of what can get named. At some point, children must be able to learn proper names for artifacts (*Big Ben,* the *Titanic*), as well as names for events, groups, books, plays, and so on. No evidence has shown that young children can learn proper names for such nonintentional entities, but so far children have been tested only on entities that have no special value (a truck, a shoe). It would be interesting to see what children would do if exposed to a name for something they are especially attached to, such as a favorite blanket. There is also the question of the precise nature of their intuitions in the Hall and Soja studies. For instance, are the children reasoning that the pet bee is likely to have its own name simply because it is a pet? Or because being a pet makes it more salient and interesting in its own right? Or do they reason as Locke does: the bee is likely to have its own name because it is important in the eyes of other person, the person who owns it? These are open questions.

Hall's fourth cue is the most important. While a common noun is used to describe many entities (as is an adjective), a proper name is used to describe only one. This is the opposite cue that applies for the acquisition of pronouns: there the *diversity* of reference across multiple trials tells the child their semantic class; here *fidelity* of reference does so.

If children expect proper names to pick out unique individuals, then they should have problems coping with the fact that multiple individuals can have the same name. And they do. Macnamara (1982, p. 28) tells of his son Kieran, at 16 months, who "had a cousin of his, Lisa. He was then introduced to a girl of about the same age as Lisa also called Lisa. They played for half an hour, yet, most unusual for him, he refused to say her name, no matter how often anyone said it or urged him."

Hall (1999, p. 350) gives the anecdote from the mother of a 20-month-old named Matthew who "has a friend Rebecca at the sitters' that he loves to play with very much. He calls her Becca because it's easier for him to say. I have a friend who has a three-month-old daughter named Rebecca and Matthew will not call her by her name. I introduced him to her saying that her name was Rebecca, and he said 'No Becca!' He has since been calling her 'baby.' "

Hall (1996b) explored this experimentally, by presenting two groups of four-year-olds with a word in a context such as "This is zavy," in which the word could be either a proper name or an adjective. One group heard the label applied to one object, such as a striped dog; the other group heard it used first for one striped dog and then for another identical dog. The first group interpreted *zavy* as a proper name, using it only with the named dog, while the second group interpreted it as an adjective, extending it to both the original dog and to other striped objects as well. This supports Hall's conclusion that if a word refers to more than one object, children do not expect it to be a proper name.

How then do children come to make their way through a world of Johns, Marys, Lisas, and Rebeccas? In part, this is because they are sensitive to other cues that something is a proper name. If a child named John is explicitly told of another child "His name is John. He is also called John, just like you are," the child finds it sufficiently clear that *John* must be a proper name and will learn the name. In fact, Hall (1996b) found that you can prod children into accepting two identical proper names if, instead of the ambiguous and subtle "This dog is Zavy" for both dogs, you say "The name of this dog is Zavy. This dog is called Zavy. This dog's name is Zavy," and same for the other dog. Under these conditions, children treat *Zavy* as two proper names, one for each dog.

Finally, children learn certain conventions as to how proper names work. In some parts of the world, they learn that *John, Fred,* and *Paul* are boy's names and that *Mary, Jane,* and *Susan* are girl's names; that siblings tend to share last names but not first names; that a short form of *David* is *Dave;* and so on. They will come to use names as a signal

for nationality and ethnic origin, social class, and age and will come to appreciate the range of conventions underlying names for entities as diverse as cities, boats, rock groups, artwork, action movies, superheros, novels, and more.

Naming is a creative act, and at a certain point children move from being passive consumers of names and start to create their own. A skilled namer can choose to draw on connotations and conventions. David Lodge (1994) discusses trying to choose evocative names for the two main characters of his novel *Nice Work*—a coarse engineer and a cultured literature professor. He decided on *Vic Wilcox* and *Robyn Penrose*—and it is not hard to figure out who is who. Early on, children come to learn about the conventions underlying names; it would be a rare four-year-old indeed who named her imaginary friends *Daxy, Blicket, Fendle,* and *Wug.*

### *Names for Kinds and Individuals*

Suppose a two-year-old hears a word that refers to an object. What can tell this child whether this word is a pronoun, a proper name, or a common noun?

We have discussed four considerations above. There is syntax: if a word is used as a common noun (as in "This is a fep"), it cannot be a pronoun or proper name; if it is used with NP syntax (as in "This is fep"), it can be. If a language marks this distinction, as English does, this can be a powerful cue. There is lexical contrast: if an object already has a common noun associated with it, another word that refers to the object is more likely to be a pronoun or proper name, while if an object already has a proper name, another word that refers to the object is *less* likely to be a proper name and so could be a pronoun or common noun. A third cue is the type of entity the word refers to: common nouns and deictic pronouns can refer to anything. Personal pronouns, obviously enough, refer only to people and certain animals. And proper names pick out individuals that are in some sense *special,* including, but not limited to, people.

Even with all this information available, more is sometimes needed. Suppose the two-year-old hears "This is fep" used to refer to a rabbit, and suppose the child already knows a common noun (*rabbit*) that would otherwise refer to this individual. All the cues are in place here—syntactic, contrast, and entity type—but still the child can't yet know whether *fep* is a pronoun or proper name.

This brings us to the most important cue—the word's range of reference. Even if no other information is present, this alone could tell

children whether a word is a pronoun or a proper name. After all, being a pronoun is to refer to different individuals depending on the discourse context; being a proper name is to refer to a unique individual. If a word refers to different individuals depending on the discourse context, then it is a pronoun; if a word consistently refers to a single individual, it is the proper name.

This raises a question. Since children can tell for certain whether a word referring to a person is a pronoun or a proper name only by observing its usage over multiple occasions, then any single usage is ambiguous. What is the default hypothesis? Children might start big and assume that a word describing a person is a pronoun (as with *her*). If this is wrong and the word is a proper name, they could change this interpretation by observing that adults do not use the word to refer to anyone other than that person. Or children could start small and assume that a word describing an individual is a proper name (as with *Sally*). If this is wrong and the word is a pronoun, they could change this interpretation by observing that adults use the word in a more general way to refer to other people. Which do children do?

They start small. If they started big, we would expect errors in which children used proper names with inappropriately broad reference. For instance, a child named Harry might go through a brief phase where he calls everything and everyone "Harry." Such errors do not occur. Macnamara notes of his son Kieran, at 14 months, "It was uncanny how accurately he used proper names for particular individuals. His only mistakes were mistakes of identity owing to similarity of appearance" (1982, p. 28). Some putative exceptions to this are *Mommy* and *Daddy,* which are often overextended. But as Macnamara (1986) observes, such words are also used as kinship terms, as in "your Daddy" and "Joe's Mommy," and so it is quite legitimate for children to use them to refer to people other than their own parents.

The early understanding of proper names is an old observation. Locke (1690/1964, p. 17) says that for children, "the ideas of the nurse and the mother are well framed in their minds. . . . The names they first gave to them are confined to these individuals; and the names of *nurse* and *mamma,* the child uses, determine themselves to these persons."

Locke goes on to insist that at this early stage, children know only proper names. But this isn't correct; as soon as children are using proper names (and pronouns) to refer to individuals, they are also using common nouns to refer to kinds. This brings us to the question of how their understanding of kinds and individuals is related.

*Thinking about Kinds and Individuals*

Before they utter their first words, human babies think about the world in terms of both kinds and individuals. They categorize objects as falling into basic-level and superordinate categories (Mandler & McDonough, 1993; Xu & Carey; 1996). And they can track and enumerate specific individuals. For instance, in one set of studies, a Mickey Mouse doll is placed in front of a baby, a screen rises to hide it, and then a hand places another Mickey Mouse doll behind the screen. Babies expect to see two Mickey Mouse dolls and are surprised if the screen drops to reveal one or three (Wynn, 1992a). This result entails that each of the different dolls is thought of as a distinct individual, even though they are perceptually identical and most likely belong to the same kind. When tested the same way, macaque monkeys show precisely the same understanding (Hauser, MacNeilage & Ware, 1995).

It is easy to see why humans and other animals would have an understanding of kinds; as discussed in the following chapter, even the lowliest creature benefits from being able to make inferences based on whether something belongs to categories such as food, predator, and prey. But what are the benefits of an understanding of individuals?

One benefit is numerical. Gallistel (1990) reviews evidence that animals can determine rate of food return during foraging (calculated as number of food encounters per unit of time multiplied by average amount of food observed or obtained per encounter), and he notes that "the adaptive value of being able to estimate rate of return is obvious." Numerical cognition requires some ability to conceptualize each of the to-be-counted entities as distinct and hence requires some capacity for individuation.

A second benefit has to do with tracking. Predators and prey have the troublesome property of moving and disappearing behind other objects. Tracking might involve numerical reasoning, particularly when dealing with multiple objects that look alike (Wynn & Bloom, 1992). For instance, imagine being chased by three dogs who are shifting in position, moving behind trees, and so on. The knowledge that there are three of them governs one's expectations in obvious ways. In a moment when only two can be seen, you know that the third exists temporarily out of sight.

In some contexts a sensitivity to spatiotemporal continuity is essential for tracking, even for a single individual. Predators of herding animals will pick a single animal from the group and chase that specific animal, trying to wear it down. If predators were to switch quarries, they would get exhausted, and their prey would not (Pinker, 1997). To choose a gentler example, newly hatched ducklings will follow

whatever moving object they first see and form an attachment to that object. This tracking behavior is adaptive since that *specific* object, but not other objects that look the same, is typically the birds' mother and has an interest in its welfare.

A third benefit of individuation is social. It is adaptive for certain animals to keep track of their past histories with other animals, using what Pinker (1994b) calls "a mental Rolodex." Who are your children, your siblings, your parents? Whom have you mated with in the past, and whom have you fought with? Who owes you, and whom do you owe? The ability to engage in reciprocal relationships over a sustained period of time is a central part of the social abilities of humans and some other primates (Cosmides & Tooby, 1992).

A fourth benefit concerns the understanding of object kinds. It is hard to see how people could learn about dogs, for instance, without the ability to parse the world into individual dogs. This is particularly so given the importance of object shape in our understanding of such kinds.

Susan Carey (1994), however, suggests that *conceptual* individuation is not necessary for this understanding. After all, we distinguish between spaghetti and macaroni based on the shape of the pieces, but we think of these kinds as stuff, not individuals. One does not count spaghetti and macaroni, and they are named in English with mass nouns, not count nouns. Carey suggests that babies might think of all object categories in this manner, even though "the child's *perceptual* system must pick out individuals in order to represent shape" (p. 146, my emphasis).

This is plausible, but only insofar as an appreciation of objects as individuals is not relevant to how babies reason about them. The reason that saying we don't individuate spaghetti makes sense is that our inferences about that kind (what it tastes like, how to cook it, how much to prepare) involves its properties as *stuff.* The shape of spaghetti pieces might be relevant for perceptual recognition but nothing else. At least for adults, the shape of objects such as dogs and chairs is used not only for recognition but also for inferences about their behavior, function, and so on, and therefore our representation of their shapes must be more than perceptual. But as Carey notes, this is more of an open question with regard to babies.

### *Individuation and Identity*

It is often said that one needs to have prior knowledge of kinds or even of *sortals* (nouns that denote kinds) to understand reference to individuals. This view was first defended by philosophers (e.g., Geach,

1962; Gupta, 1980; Wiggins, 1980), but its implications for linguistic and conceptual development were elaborated by Macnamara (1986) and extended by Carey (1994), Hall (1994, 1996b, 1999), Macnamara and Reyes (1994), Oshima-Takane (1999), Xu (1997), and Xu and Carey (1996), among others. This issue is an important one, worth considering in some detail.

Macnamara (1986) has two main arguments for the importance of kinds. The first has to do with individuation. Macnamara (1986, p. 51) suggests that "there is no individuation of entities that is not sortal dependent. . . . individuals cannot be counted without the guidance of a sortal." It makes little sense to demand that someone simply count. You have to tell the person *what* to count (the people, the shoes, and so on).

Even referring to a single individual might be dependent on an understanding of a kind. To understand a sentence such as "That is Fred," one needs to know whether the pronoun *That* and the proper name *Fred* refer to the entire body, the visible surface, the clothes, the set of molecules, or the person himself. Macnamara argues that it is knowledge of the kind that specifies the relevant individual in such a case and thereby underlies the learning and use of pronouns and proper names.

The second argument concerns identity. Macnamara notes that a person (Margaret Thatcher, say) can over her life change all her inessential properties—her size, weight, shape, complexion, number of limbs, and so on. But we think of her as the same person and continue to call her *Margaret Thatcher.* And we do this because, according to Macnamara (1986, p. 51), "we have access to the substance sortal PERSON, which traces 'the identity of an individual over its whole existence and across all possible circumstances in which it might be. . . . Clearly, a PN [proper name] requires the support of a . . . sortal.'" The idea here is that we intuit that the proper name sticks to Thatcher through all these transformations because we recognize that she remains a person throughout.

Macnamara is surely right that to understand the reference of a pronoun or proper name we need some way to determine the scope of its reference, to pick out the right individual. And we also need to have some ability to track that individual: to realize, for instance, that a proper name continues to refer to someone when they get a haircut—but perhaps not if they are decapitated. It is clear that *something* must govern our intuitions about individuation and identity. What is less obvious is whether these intuitions are best explained in terms of our knowledge of the kinds that these individuals belong to.

There are three reasons to doubt that this is so. First, we individuate and track entities that belong to unknown or unfamiliar kinds. When someone points to a dot in the sky and says "It's a bird. It's a plane.

It's Superman!,'' they are demonstrating that one doesn't need to know what something is to talk about it and follow it through space and time (Kahneman, Treisman & Gibbs, 1992). Second, we individuate and track the referents of many object names (shoes, tables, cups, and so on) in precisely the same way—by attending to principles of spatiotemporal contiguity. It misses a generalization, then, to say that each kind imposes its own particular principles of identity and individuation. Third, we can track objects that change kind. With saw, hammer, and nails, one can turn a wooden table into a wooden chair, changing its kind. Proponents of the sortal theory (e.g., Wiggins, 1980) point out that it is no longer ''the same table,'' which is true enough. (If it isn't a table, then it can't be the same table.) But there is a clear sense in which we think of it as *the same individual* that was once a table, otherwise a sentence like ''This chair used to be a table'' would make no sense at all (see also Xu, 1997).

These three considerations refute the claim that basic-level kinds underlie our understanding of individuals. This is not to say that kind membership is irrelevant. Suppose you see a toy truck move behind a screen, there is a pause, and then a toy duck emerges from the other side of the screen. The duck then moves back behind the screen and a truck emerges from the other side. Then the truck returns behind the screen. The screen then drops to reveal either one object or two objects. Adults—and 12-month-olds—expect to see two objects, not one, even though only one object was visible at any time (Xu & Carey, 1996). This finding suggests that 12-month-olds have the concepts of duck and truck (Xu & Carey, 1996), and it is consistent with the view that kind membership can affect individuation: if you see a toy duck at one moment and a toy truck a couple of seconds later, it's likely that they aren't the same individual. After all, a duck does not typically turn into a truck.

But there's nothing special about kinds here; all sorts of factors can affect our intuitions about sameness. If you see a tiny red truck at one moment and a large green truck a couple of seconds later, you are also likely to view these as distinct individuals, since small red trucks are unlikely to change into large green trucks—even though they belong to the same kind. Or suppose I leave my coffee cup in the mailroom on Monday. On Tuesday, I turn on the TV and see a politician in Russia drinking from a coffee cup that looks exactly like mine (same kind, same properties). But I won't infer that the politician's cup is the same individual cup as mine because it would be wildly implausible that my cup could have made its way to Russia. My inference would be different if on Tuesday I were to see a graduate student in the mailroom

drinking from such a cup; this *could* be my cup because the student would have had easy access to it.

These examples suggest that what is really essential for something being the same individual is spatiotemporal continuity: something is the same object if and only if it tracks a continuous path through space. Other factors are relevant *only insofar as they are cues to spatiotemporal continuity.* Trucks don't typically morph into ducks, nor do they suddenly change size and color, and so kind membership and property information are relevant for individuation. I don't think that my cup is in Russia simply because it is unlikely that my cup could have traveled across the ocean to get there, and so location information is relevant as well. The spatiotemporal continuity requirement is central. Facts about kind (duck or truck?), property (small and red or large and green?), and location (in the psychology department or in Russia?) are important only because they bear on how likely it is that this condition has been met.

One response to these concerns is to shift the focus away from basic-level kinds and toward more general ones. Macnamara himself (1986, p. 60) raises the possibility that babies might possess only the kind *maximally-connected physical object,* an idea that he attributes to Ray Jackendoff. Fei Xu (1997) expands on this idea, arguing that the notion of *object* that has emerged from Spelke's work (what I have called earlier a *Spelke-object*) will do the trick.

I think this is half right. It works well for individuation. As discussed in the last chapter, considerable evidence shows that children and adults are biased to parse the world into Spelke-objects. If someone points and says "Look at that," the default assumption is that the speaker is referring to an object. And if someone shows you an array of different things and demands "Count!," you would likely count the objects. Other entities, such as parts, collections, and actions, are individuated according to different principles, but these might correspond to other superordinate kinds.

But a shift to Spelke-objects cannot entirely explain our intuitions about identity. Xu (1997, p. 385) focuses on the crucial issue here when she suggests that "in virtually all metamorphoses, the transformations do not violate the criteria for object-hood such as spatio-temporal continuity or the constraint that one object cannot be at two places at the same time." But this isn't true for our beliefs about personal identity. Some people believe in reincarnation, and I am told that if I misbehave in this life, I risk returning to the next world as a cockroach. That is, a cockroach scuttling around will be *me,* the very same individual I am now, even though my body will reside in a grave.

One might respond by observing that the individual in such transformation stories, though no longer the same object, is always a person, which is a distinct kind from Spelke-object. After all, it is likely that we intuitively conceptualize people as immaterial entities: we are not our bodies; we just occupy them. As Jon Stephen Fink (1997, p. 76) puts it: "It is human essence: this is what we are at heart and in fact, individual spirit not sagging meat and calcifying bones, not chemicals but consciousness—a life-hungry soul fills each body to the fingertips and shapes a single lifetime." Even if you don't believe this is so, and even if you reject the notions of life after death, reincarnation, astral projection, and the like, these ideas are psychologically natural: everyone can understand them, if only as fiction.

But it is not the case that *person* tracks an individual over its history. That is, it is not true that someone is the same individual if and only if he or she remains a person through all transformations. It is conceivable that someone can cease to be a thinking and feeling entity and then be "revived." Joe might be frozen for several years and then, through science-fiction technology, warmed up until he is conscious and in good health. (If you like your examples gruesome, you can imagine that his frozen body was chopped up and then reassembled immediately prior to warming.) When he awakes, it is still Joe. But during the period of freezing he was not a sentient being, which suggests that our intuitions about the personal identity of Joe do not entail that he remain a member of the kind person through his existence.

One could respond here that even when frozen (and dismantled) Joe is still a person. Some people might have this intuition, but consider: Why do you think the frozen lump (or lumps) is a person? It does not satisfy properties that people possess: it doesn't think, feel, experience pain. Instead, you believe that the lump (or lumps) *was once Joe* and that, since it has the potential to become Joe again, it should be counted as a person. There is nothing unreasonable about this sort of intuition, but note that your intuition about kind membership does not underlie your judgment about identity. Rather, your intuition about identity (that the lump is still Joe) underlies your judgment about kind membership (that the lump is a person).

It is fair to focus on people when discussing proper names, since these are the most nameable individuals. But what about inanimate entities? Xu is correct that transformations of objects do not violate the condition of spatiotemporal continuity. They do, however, violate other principles that characterize Spelke-objects. You can take something apart and put it back together again, and it can still be the same individual. To modify an example from Hirsch (1982), suppose I want to send a friend a gift. I buy a bicycle, dismantle it, put the pieces in

separate boxes, and send them by mail. At this point, many distinct Spelke-objects are separated in space; no single object exists that could be called a bicycle—just sticks of metal, gears, and wheels. When my friend receives the boxes, she reassembles the parts, ending up with the original bicycle. If you share the intuition that she now owns the *same* bicycle that I originally bought (and this is in fact the intuition of U.S. Customs), then you cannot believe that the identity of this individual has to do with the kind Spelke-object.

It is true that we need an account of individuation and an account of identity. But they are not the same accounts. Individuation is likely to be done, at least in part, though the Spelke-principles, as suggested by Macnamara (1986) and Xu (1997). But identity is a different story. People can retain their identity even if there is a period in which they are no longer people; objects can retain their identity even if there is a period in which they are no longer objects. Hence our identity intuitions are not entirely explained by appealing to kinds.

How then can we explain these intuitions? I have nothing to say here about questions of personal identity, except to note that this is a notoriously messy area and that our naive intuitions about the conditions under which someone remains the same person are often fuzzy and sometimes incoherent (see Dennett, 1987; Parfit, 1994). But an account of object identity may be more within our grasp. One hypothesis is that we are sensitive to the spatiotemporal continuity of the *stuff* that makes up the object. The tracking of stuff does not require appealing to the notion of Spelke-object. The bicycle that my friend reassembles is the same one I sent to her because it is made out of the same stuff. And since it was once a bicycle and is now a bicycle, it is the same bicycle.

We know little about the conceptual and perceptual capacities involved in the tracking of stuff. Nevertheless, we know that such capacities exist. After all, we can track entities that are not individuals, such as sand, whiskey, and spaghetti. Perhaps there is no substantive difference between how we track a bicycle and how we track a lump of spaghetti. And the simple fact that an object can be taken apart and put back together again, and still be the same object, suggests that some proposal of this nature is likely to be correct, at least for adults.

How does an understanding of identity develop? It is possible that the initial appreciation of identity really is limited to the tracking of Spelke-objects, as maintained by Xu (1997) and Xu and Carey (1996). Babies have problems reasoning about nonsolid substances (Huntley-Fenner & Carey, 1995), and, perhaps, unlike adults, they will not believe that something retains its identity if it is disassembled and reassembled. This specific question has never been addressed, though

the few studies that have been done on children's identity judgments (Gutheil & Rosengren, in press; Hall, 1998) suggest that their understanding of object identity does not differ substantively from that of adults.

Consider finally the famous ship of Theseus (Hobbes, 1672/1913). The story goes as follows. Over years of sailing, the parts of Theseus' ship wore out and were discarded and replaced, one part at a time. Eventually, the ship was made of entirely new parts. Is it the same ship? Under some circumstances, people agree that it is, even though it contains none of the stuff that the original ship was composed of (Hall, 1998; Hirsch, 1982; Wiggins, 1980).

But this is not a counterexample to the theory of object identity outlined above. Imagine that there are 20 instances in which a part is replaced: S1 (the original ship), S2, S3, . . . S21 (the final ship). S1 shares no common substance with S21, and so if one looks only at the endpoints, they are not the same ship. But note that each individual transformation preserves sameness of stuff: S2 has most of the same stuff as S1, S3 has most of the same stuff as S2, and so on. Since intuitions of identity are transitive (if S3 is the same ship as S2, and S2 is the same as S1, then S3 is the same ship as S1), it follows that S21 is the same ship as S1, even if sameness of stuff is all that is involved in identity judgments. In support of this analysis, our belief that S21 is the same ship as S1 increases if our attention is drawn to the series of individual transitions, as when there are many parts that are discarded and replaced, and when the change takes place over a long period of time (Hirsch, 1982; Hume, 1739/1978; see Hall, 1998 for review).

The discussion so far has focused on objects and people, but we track—and name—other sorts of individuals. Noam Chomsky (1995, p. 21) gives some examples:

> A city is both concrete and abstract, both animate and inanimate. Los Angeles may be pondering its fate grimly, fearing its destruction by another earthquake or administrative decision. . . . London could be destroyed and rebuilt, perhaps after millennia, still being London. . . . We have no problems understanding a report in the daily press about the unfortunate town of Chelsea, which is ''preparing to move'' (viewed as animate), with some residents opposed because ''by moving the town, it will take the spirit out of it,'' while others counter that ''unless Chelsea moves, floods will eventually kill it.''

The principles that work to track the identity of cups clearly will not suffice for entities such as cities. It might be that our intuitions about the identity conditions of each distinct type of entity (artifacts,

animals, foods, companies, cities, and so on) are based on its own special principles.

But there is another possibility. In the previous chapter, it was suggested that individuation is done mainly through two cognitive systems—one that deals with the domain of objects, another that deals with the domain of people. These same systems may underlie our judgments about identity. That is, any entity is tracked as either an inanimate body or an animate being, and such modes of tracking are distinct, for babies and perhaps for other animals as well. When faced with an individual that is neither a body or a person, we nonetheless shoehorn it into one of these categories. In some cases, we put it into *both;* so, as Chomsky notes, a city can be thought of as either animate or inanimate, and a shift in how one thinks about the city leads to an accompanying shift in identity intuitions.

To put this proposal in its strongest terms, we have evolved to think of the world as containing bodies and souls. These we individuate, count, and track and refer to with pronouns and proper names.

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# Chapter 6
# Concepts and Categories

Imagine a language with only proper names. A new word that names a dog must refer to that particular dog and nothing else. Learning this language would require the ability to track individuals over time, but it wouldn't require any ability to generalize, to recognize how collies are different from terriers or how dogs are different from tables.

Such languages don't exist, of course. Children who hear a word that refers to a dog have to cope with the possibility that it can also refer to other individuals that belong to the same category or kind. It could be a common noun, such as *dog*. To learn such words, they need some grasp of the conditions underlying category membership, some understanding of what is and is not a dog. Within psychology, this understanding is usually described as a concept (the concept of dog), and the concept that is associated with a word is usually described as the word's meaning (the meaning of *dog*).

This chapter discusses the concepts expressed by common nouns. It begins by asking why such concepts exist at all and goes on to defend an essentialist theory of their nature, contrasting this with the view that children's words are generalized solely on the basis of perceptual properties. It concludes with a discussion of the relationship between essentialized concepts and naive theories.

## *What Are Concepts For?*

Why do we have concepts at all? What is the value of treating dogs as members of a category, instead of seeing them just as distinct individuals? John Locke (1690/1964, bk. 2) has an insightful discussion of this issue, in the course of asking why *general terms* (what we would call *common nouns*) exist in natural language.

He has three proposals. The first is often found in the contemporary psychological literature. This is the idea that thinking about the world only in terms of individuals is just too hard for us (p. 14): "it is beyond the power of human capacity to frame and retain distinct ideas of all