Predicative Minds

The Social Ontogeny of Propositional Thinking

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To the memory of my uncle, my very dear Tache; and to all those good people who cared

If we do not understand predication, we do not understand how any sentence works, nor can we account for the structure of the simplest thought that is expressible in language.

—Donald Davidson, *Truth and Predication*

Contents

Preface

About fifteen years ago, I joined a growing group of psychologists and a few philosophers in the realization that naive psychology (or theory of mind) is a basic mental competence that evolved to represent and make sense of other minds and our own. That realization eventually went into a book (Bogdan 1997). Work on that book brought the further realization, shared by a much smaller group of developmental psychologists, that naive psychology is also a mind designer, as it enables, often generates, and even shapes a host of other mental faculties, and in particular reflexive thinking or thinking about our own thoughts. This new realization, too, went into a book (Bogdan 2000). This book continues the mind-design theme of the second book, actually a variation of it, as it explores the predicative roots of human thinking.

Predication is construed here as a mental competence—apparently uniquely human—that is exercised intently when one attributes explicitly a property to an object, an action to an agent, a relation to two or more objects, and so on. As far as I can tell, predication is a rather surprising competence, in philosophical, psychological, and evolutionary terms. It cannot be explained by just having and applying concepts, possessing a language, with its grammar, semantics, and pragmatics, or exercising other mental faculties, such as learning, attention, or perception. The capacity to predicate appears to be neither innate nor learned, yet it is universal among humans. And somehow, predication manages to produce thoughts and sentences that are more than the sum of their parts. Puzzling in its properties and history, the mental competence for predication still awaits a coherent and plausible explanation. This book takes up the challenge by inquiring into its developmental origins and raison d'être.

Although not a psychologist, I find that development—more than intuitions or conceptual analysis, the usual tools of the philosopher, or the abstract and functional boxes-and-arrows models of the cognitive

scientist—provides a most useful and systematic angle from which to figure out the design of the human mind in general and the predicative design of human thinking in particular. Predication, it turns out, is not only an outcome of development, as everything in an organism is, but also and essentially a by-product of uniquely human features of development, some of them quite unrelated to representation, cognition, and thinking. This truth, I think, would not have become apparent without a close look at development. If the human mind is unique, it is because human mental development is unique. The development of the competence for predication reflects this uniqueness by drawing on and blending several disparate and equally remarkable abilities, also explored in some detail here, such as intersubjective coregulation, communicating meanings, representing reference, and acquiring words. This developmental cocktail opens an unequaled window on the early design of the human mind.

The writing of this book overlapped with an unexpected and dramatic period in Catalina's and my life (and that of so many other people), during which the solidarity, warmth, and support of many friends (and also good-hearted strangers) enabled us to carry on with our life and work, almost normally. In the order of our peregrinations, our heartfelt thanks go to Jeannie and Richard Lee (in Fayetteville, Arkansas), Adrienne and Keith Lehrer as well as David Schmidtz (in Tucson, Arizona), and Barbara Moely and Harvey Green (on return in New Orleans). From a distance but as close in spirit and friendship, the constantly warm and supportive Helen Seidler and Owen Mitz, Alice ter Meulen, Luca Mezincescu, Gina and Sorel Vieru, and my sister Adriana watched over our well-being and helped in all sorts of ways, earning our warm gratitude. During this turbulent period, I lost my dear uncle, a second father to me. I miss him very much. I dedicate this book to his memory and to all these good people, who cared deeply when it mattered.

Many other people, in different places, deserve our thanks for their sensitivity and help. I am thinking in particular of those good souls in Tucson who did their best to make us feel at home for a few months—in particular, Lilian Jacques and John Pollock, Chris Maloney, and Massimo Piatelli-Palmarini (whose sonorous and melodic name I always wanted to appropriate, with no success so far).

On a professional level, I want to thank those who read or heard and commented on fragments and ideas of this book—especially Keith Lehrer and David Olson, anonymous reviewers of the manuscript, and audiences at the University of Arizona, the University of Bucharest (and Mircea

Dumitru and Sorin Vieru in particular), the Institut Jean Nicod in Paris (and Pierre Jacob in particular), and in Turkey, Bilkent University, the Middle Eastern Technical University (both in Ankara), Bogazici University (and Ilhan Inan in particular), and Koc University (both in Istanbul).

I want also to thank the MIT Press team for a very fine job at each stage in the development of this book: senior editor Tom Stone, for his constant interest in and support of the project, copyeditor Cindy Milstein for carefully dotting the right i's throughout the manuscript, and production editor Deborah Cantor-Adams for helpfully and graciously putting all the pieces together.

During the final writing of this book, Bilkent University and my colleagues in philosophy and psychology provided a congenial, stimulating, and pleasant place to live and work, for which Catalina and I are grateful. *Tesekkür ederim!*

Introduction

When conscious and explicit, human thoughts have a number of singular properties. One of them is being predicative. In a predicative mode, one can think and say of a house that it is big, a car that it is to the left of the house, a cat that it is about to jump, a hypothesis that it is plausible, this book that it is worth reading, or the like. The idea, in this formulation, is that a predicative mind singles out and represents an item (thing, agent, event, situation, and so on) in order to attribute to it—or to direct at it, as I prefer to put it—the representation of another item (be it property, relation, action, evaluation, and so forth).

Puzzling Thoughts

The mental practice of predication may not look like big deal, but I think it is. It is an immensely big deal and quite puzzling too, in evolutionary, psychological, and philosophical terms. Predication is *evolutionarily* puzzling because it is not practiced by other animal minds—at least not according to the analysis proposed here. Predication is *developmentally* puzzling because the thoughts of young children begin like those of other animals, operating in imperative and nonpredicative forms, yet when they turn descriptive and predicative, around the age of two or so, the transition looks less like a gradual maturation from simpler precursors and more like a rather revolutionary change. Finally, predication is *philosophically* puzzling, for several reasons. The oldest and best-known reason is that a predication is more than the sum of its parts. The thought that the lawn is green represents more then the parts—lawn, green, is—represent separately, as a conjunction or mere list. Another reason why predication is philosophically or (perhaps better said) cognitive-scientifically puzzling is that it is not reducible to, and hence cannot be explained by, its conceptual, logical, grammatical, semantic, and even pragmatic properties,

as was and still is assumed by most theorists of predication. Or so I will argue.

Predication marks a sharp divide between animal and human minds, and between the minds of young children and those of older children and adults. Predication is also at the heart of conscious, deliberate, explicit, and language-based human thinking. Predicative thoughts are the fuel of higher mental activities, such as deliberation, reflective planning, hypothetical reasoning, introspection, counterfactual imagination, theorizing, reflective self-control, and more. Predicative minds are the only ones that create art, technology, culture, and science. So many reasons, then, to ask the question—the central question of this book: what explains predication as a mental competence?

Many Faces

Predication is a multifaceted phenomenon. It operates as a mental representation, which can also take a linguistic form—hence as a thought and sentence, respectively—and is thus the output of a family of mental acts produced by the exercise of a mental competence. To understand the competence, it is important to approach its manifest outputs from the right angle, with the right notions. To this end, chapter 1 begins with a distinction between two sets of dimensions that characterize predicative outputs and therefore the mental acts that generate them. One set contains the standard dimensions, to be called *S-dimensions*, such as language, formal structure, concepts, and truth conditions. The other set contains less visible but as important dimensions, to be called *P-dimensions*, such as predicate-to-subject directedness, topic-comment-presupposition format, and intended descriptiveness. This distinction suggests a parallel one about propositions as contents of thoughts. A predicative proposition, I will argue, is one that satisfies both sets of dimensions, whereas a proposition that has only the standard S-dimensions represents only (what I will call) a *coinstantiation* of an object and a property, an agent and an action, or the like. To understand the difference between coinstantiation and predication is to understand the essential contribution of the P-dimensions to the acts of predication. This is also the difference between the approach taken in this book and most other accounts of predication.

Different Answers about Coinstantiation

Chapter 2 turns to some major accounts of predication that aim to explain predication, but as far as I can see, end up explaining only coinstantiation.

First examined are classical accounts and in particular Gottlob Frege's—notorious for its indifference to psychology and yet influential beyond philosophy. The chapter then looks at several psychologically sensitive accounts of predication. One account, shared by many philosophers and linguists, insists on predication being inherent in the syntactic formalism of a language, whether mental or natural. Another account derives the predicative format of animal thoughts from possessing and joining the concepts of objects, properties, relations, and so on. A third account finds the roots of predicative propositions in the naive psychology that interprets other minds. A fourth holds that the predicative format of thinking and communication is inherent in how visual perception works. Still another and somewhat related psychological account is that the predicative format is inherent in how attention works. Finally, a pragmatic account focuses on one central P-dimension (the topic-comment format), but ignores the others and stops short of exploring the mental underpinnings of predication. There are other versions as well, but the ones explored in chapter 2 are among the most influential and plausible. As far as I can see, none really explains the mental competence for predication, and most are about coinstantiation. Predication is thus in need of a different explanation, concerned primarily with its three most critical P-dimensions, the ones that really make the difference.

The Hypothesis

If I were to place my hypothesis in a philosophical lineage, I would note that David Hume and Immanuel Kant may have been the first major philosophers to treat the problem of predication under a psychologically relevant angle, in terms of how the mind works. Reacting to Hume's skepticism about how the mind unites distinct representations (i.e., only through coinstantiation by association, in my terms), Kant posited spontaneously active and purposeful judgments as mental unifiers, and in particular as acts of predication. Donald Davidson notes that unlike Hume, Kant was not aware that he had not addressed, let alone solved, the problem of the unity of predication. The unity problem, according to Davidson (2005, 99), is to explain what the mind adds to the components of a predication—e.g., lawn, green, is—to produce the predicative judgment that the lawn is green. Nevertheless, I think that Kant had the right insight: predication *is* a mental construction, a spontaneously active and purposeful judgment, made possible by certain abilities of the human mind. The unity itself, I will contend in chapter 3, results from how the P-dimensions, reflecting these abilities, animate and organize predicative judgments. The

psychological question, then, is what mental abilities are responsible for this accomplishment.

My hypothesis is that these P-abilities (as I will call them) are assembled gradually and cumulatively out of developments originating in disparate faculties that operate in disparate domains, for a variety of reasons that are initially unrelated to predication. These faculties constitute the main roots of predication, according to chapter 4. The first root is the adult-infant physiological coregulation, which later takes a psychological turn as bilateral and intersubjective communication by shared meaning. A second root is the young child's imperative and world-bound communication that treats adults as a means to the child's goals. A third root is the child's development of a sense of other minds, which builds mostly on the bilateral mental sharing of infancy and later on a growing naive psychology (or theory of mind).

The contribution of these roots to predication takes the form of an *ontogenetic staircase* leading successively to the child's sense of communicative meaning, prelinguistic coreference, and finally word coreference introduced by the adult's explicit acts of naming in contexts of shared attention. The child's mental scheme of explicit and shared word coreference becomes the source and template for the child's earliest predicative judgments.

The developmental process that generates this ontogenetic staircase is, according to chapter 5, one of *assembly*—as opposed to either maturation out of an innate base dedicated to predication, or learning by association and imitation. On this assembly view, distinct abilities and dispositions are recruited, joined, and blended together by successive challenges—some of them adult inspired or guided—that the young child's mind encounters and must handle adaptively, as it advances on the ontogenetic staircase to shared attention, then word acquisition, and finally predication.

Although chapter 5 concludes the developmental story of predication, it is worth meditating on its possible historical and neuropsychological implications, which is the topic of chapter 6. Since the abilities and dispositions that contribute to predication originate in separate faculties operating in separate domains (the roots of predication), and have initial functions unrelated to predication, it looks like the competence for predication may have first evolved as an *incidental* effect of selection for more basic ontogenetic adaptations for interpersonal coregulation, communication, language acquisition, and the assimilation of culture. The selection in question may have at first been mostly sexual and conducive to a revolution in parenting, probably rather recent historically. This parental revolution would explain the intense and intricate communicational interactions

between children and adults, and the escalating arms race during which new mental acquisitions of the child are met with new challenges, mostly linguistic and cultural, initiated by adults. The responses of the young minds may have begun as improvisations, whose successful versions may have ended up genetically assimilated as ontogenetic adaptations.

In a nutshell, then, this book maintains that humans develop predicative minds for several disparate reasons, mostly noncognitive, which bear initially on physiological coregulation, affective and manipulative communication, and the acquisition of words. Once developed, the competence for predication in turn redesigns human thinking and linguistic communication. This is why understanding the uniqueness and representational power of the human mind requires an explanation of why and how predication came to be. This book proposes such an explanation.

Credits

The search for an explanation took my inquiry into quite disparate territories—from the philosophy of mind and language to psycholinguistics and developmental psychology—that is, wherever I thought the empirical evidence was relevant and the theoretical insights useful. Along the way, at critical junctures, the search had some good guides. Thus, it was helped considerably by the bright and illuminating signposts first planted by Lev Vygotsky and his school several decades ago, which revealed some essential psychosocial contours of the human mind. These signposts were later rearranged more tightly, around the narrower area of the child's intersubjective communication, naive psychology, and language acquisition, by a cluster of broad-minded interdisciplinary developmentalists, ranging from Jerome Bruner to Peter Hobson and Michael Tomasello. But the ontogeny of predication being what I think it is—a mosaic of interacting ontogenetic adaptations—the search also took my inquiry into the territory of the child's (mostly) imperative communication, which was superbly mapped by Elizabeth Bates, working mostly with the tools of the alternative Piagetian tradition. Equally insightful was David Olson's pioneering analysis of the ontogenesis of propositions. Martha Gibson's survey of philosophical theories of predication was a useful guide to a large, complicated, but alas psychologically unilluminating literature. Other debts will of course be credited in the text. But the ones just cited deserve early recognition, as they paved the way to my understanding of the mental side of predication.

I The Territory

1 The Many Faces of Predication

This chapter maps the territory to be covered in this book. Section 1.1 begins with a conceptual portrait of predication drawn along two sets of dimensions, which I call *list S* and *list P*. The list S contains such standard dimensions as language, its expressions, and their formal structure, concepts, and truth conditions, among others, whereas the list P contains less visible but as important, if not more important, mental and pragmatic dimensions, such as predicate-to-subject directedness, topic-comment-presupposition format, and intended descriptiveness. Section 1.2 suggests that as the content of a thought, a predicative proposition is one that meets the conditions on both lists S and P. An S-dimensioned proposition is only minimal and nonpredicative. According to section 1.3, if the content of a thought is only S-dimensioned, so to speak, it merely joins the representation of an object to that of a property, an agent to that of an action, and so on. This is coinstantiation, as I will call it, but not predication. The notion of coinstantiation will be the main critical weapon used against a variety of accounts of predication.

1.1 Dimensions of Predication

Predications are the bread and butter of human propositional thinking and language use. When I think or judge, and say, that this pig is fat, I predicate—mentally and linguistically—a property (fatness) of an individual (this pig). I could have also predicated a relation of two (or more) individuals, as when I think and say, for example, that this pig is fatter than the one over there, or that this pig is the same as the one I saw yesterday. If I think that [the large and beautiful tree is to the left of the car], I predicate a relation (to the left) of two items of variable complexity (the large and beautiful tree, the car). The predicative mind also treats identity, analogy, or comparison as relations, hence predications, in largely similar terms.

Most of our predicative thoughts are of these sorts—object-property, agent-action, and various kinds of relations between two or among three or more items. Most of our deliberate and conscious thoughts are predicative, although not as simplistic as these examples may suggest. Predication, in short, is a way of linking concepts in a thought or judgment, expressed propositionally in an utterance or written sentence, to the effect that certain arrangements obtain among the items that the thought or judgment represents. This formulation is almost right but not quite, as we shall see. But it will do for the moment.

We can look at predication from (at least) three distinct angles. One angle is that of the *output*, the resulting representation, whether in the form of a judgment or utterance. I will treat the notions of judgment and thought as equivalently about the occurrent representational output of some mental act, and leave the notion of proposition to characterize the content of a thought or judgment. Another angle on predication is that of the *mental act* of predicating—or rather the activity, because it is a fairly complex set of acts—that produces the output representation. And a third angle is that of the *mental competence* whose exercise results in predicative acts. The aim of this book is to understand this competence, what it is, and where it comes from—to understand, in other words, what it takes to become a predicative mind and operate like one. But understanding the competence depends on getting the right story of the outputs, the predications, because it is through the latter that the competence is manifested and thus approachable theoretically. So the first task is to have a clear idea of what predication is. Given the examples just given, a sensible suggestion seems to be that a predication is a union or joining of two or more mental and/or linguistic representations that satisfy certain conditions. Commonsense reflection joins a philosophical and psychological consensus that a predicative judgment or thought, linguistically expressed, must at least have the following features or dimensions.

The S-List

A predicative judgment or thought

- represents information in some *code* or language [encoding]
- its information is *categorized* under some recognition devices, from sensory discriminations to *thematic* categories and concepts that represent objects, properties, agents, actions, etc. [thematic categorization]
- is *structured* by some combinatorial capacity into distinct components [linkage]

- reflects structurally thematic relations, such as object-property, agent-action, or object-relation-object [thematic structure]
- there are items, facts, and situations in the world that the thought is *about* and *true* of [aboutness and truth conditions]

I call these the *S-dimensions*. For exegetical reasons, the wording of the first dimension, concerning encoding, is left vague to allow for the possibility (later denied) of nonlinguistic animal or infant predication. Likewise, the wording of the linkage dimension is left vague to allow for the possibility of nongrammatical combinations in animal or infantile thinking. For the purposes of our discussion, the difference between categories and concepts is that the latter alone are embedded in complex networks that allow logical transitions and inferences. A dog surely has the category of cat (full stop), but may fail to connect it to the related categories of animal, mammal, feline, bird hunter, and so on, in which case the dog is a categorizer but not a conceptualizer.

The list S reflects (what we may call) a *structural perspective* on predication. It is the *standard* perspective on predication. It is also a perspective that reveals the *surface* form of predication. (Three good reasons for the S prefix.) According to the list S, predication is manifested and visible in its symbolic expression, grammatical organization, logical form, the concepts employed, and the resulting semantic content as propositional meaning.

The S-dimensions are clearly necessary for predication. But are they also *sufficient*? If they were, as the sole guide to predication, then the competence for predication would consist basically of the language resources, whether mental or natural, thematic categories or concepts, and some combinatorial or general reasoning abilities. The acts of predication would then amount to recognizing and categorizing inputs along thematic lines (objects, properties, etc.), and linking the thematic categorizations in (what I will call) minimally propositional coinstantiations. It turns out, as noted in the next chapter, that most theories of predication—in philosophy, linguistics, and psychology—take the list S to be definitive of predication, thus adopting the structural perspective, and differ only over which S-resources are involved and at what level of cognitive complexity.

What else is there, one may reasonably ask? After all, an S-dimensioned output does seem to be all there is to predication as a form of representing information; and the mental acts that produce the output, by exercising the underlying faculties, seem all that is required psychologically to have a predicative mind. *Seem* is, indeed, the right word, and *representing* not quite the right one. On the analysis proposed here, the S-dimensions, and

the mental acts and faculties they reveal, are only the tip of an iceberg. Most of the predication iceberg is under the S-surface, so to speak, and not visible without the right theoretical eyes. When, with the right eyes, we peek below the surface, we realize that predication is not just a representational enterprise and certainly has not initially developed as one. To see why, consider the strikingly parallel—and indeed quite related—story of propositional meaning.

The Meaning Parallel

There are different accounts of propositional meaning. Until recently, most focused on the sentence and regarded its propositional meaning in terms close to the S-dimensions such as truth conditions, what its concepts represent, the inferential role of the sentence, the larger contextual conditions in which the sentence can be asserted or its truth established, or so on. Simplifying somewhat but not too much, these structural accounts can be said to analyze propositional meaning in terms of what it takes for a sentence (or some other sort of symbolic expression) to *represent* what it does. This is the semantic notion of meaning as representation.

This structural perspective on propositional meaning has been challenged by a pragmatic perspective, adopted by a variety of accounts, most of them tied to communication and the use of ordinary language. The one of interest here is what may be called the *psychopragmatic* account of communicative meaning, anticipated by George Mead (1910, 1934) and elaborated analytically by Paul Grice (1957). Grice replaces the sentence with the (token) *utterance* as a basic unit of analysis, and the sentential meaning with the speaker's intended meaning that is directed at an audience on a particular occasion. As a result, the meaning of a sentence results from what its speaker intently means by uttering it. For Grice, then, sentential meaning derives from the mental act of the speaker, which is the act of meaning something on a particular occasion. And the act of meaning itself expresses the intent to convey information by producing a mental effect in an audience. There will be more on this Gricean story and its implications for predication in chapter 4, section 4.1.

Important to note right now is the fact that the Gricean account switches the frame of analysis of propositional meaning from the formal and conceptual structure and the semantics of a *sentence* (as a visible and frozen output, so to speak) to the psychology of the mental act of *intending* to communicate through a particular *utterance*. It is a switch from meaning as representation to meaning as intent to use information with a social effect. I will propose a rather similar switch in the analysis of predication,

from the set of representation-bound structural and semantic S-dimensions to a set of dimensions that reflect the unique psychopragmatic design of *predicating*. I call them the P-dimensions. They go beyond semantic representation, and reflect mental intent and, at least in early development, its social impact.

The P-List

According to the new list, a predicative thought also

- intently and *explicitly directs* the content of a thematic representation or more at the referent of another thematic representation or more, thus instantiating a thematic relation, such as object-property, agent-action, or agent-relation-object [intended directedness]
- organizes the resulting content in a specific, limited, and well-structured *topic-comment-presupposition format*, and makes this content, so organized, available to further predicatively sensitive mental operations [topic-comment-presupposition format]
- and does so in an intently *descriptive*, reportorial, or declarative manner [intended descriptiveness]

Suppose I think that [this house is big]. This thought emerges out of the exercise of a mental competence that selects and directs the representation of a property (bigness) at the representation of an object (house), and in so doing, describes or states a fact. According to the analysis of the next few chapters, the predicative nexus between property and object (or other thematic patterns of predication) is not just joining them in some pattern. The notion of intended directedness is meant to identify an additional factor that is involved in the predicative nexus. What the predicate represents (e.g., a property) is mentally directed, intendingly, at what the subject term refers to (e.g., an object), even though this intended directedness may no longer be apparent in most routine predications.

This first P-dimension reflects the mental activism of predications (so to speak)—that is, the fact that the predicator has initiative and control over what and how they represent propositionally. A mere coinstantiation of thematic categories, triggered by some perceptual or memory input, usually is passive and reflex, as in general is nonpredicative thinking. Mutatis mutandis, this difference is echoed in that between Grice's speaker's meaning and the standard representational meaning of a sentence.

Another factor, also responsible for the specificity and unity of predication, is identified in the next dimension. Unless it emerges out of the blue, in a sort of "mental ballistics" (to use a metaphor of Galen Strawson), a

predicative thought normally occurs within a presuppositional envelope, whose main elements are: a broader theme or context, as part of a train of thought, discourse, or conversation; some background information; some expectations; and some goal, as part of a well-aimed "mental artillery." Within this envelope, a predicative judgment has a specific topic, which it focuses on (the house, in our earlier example), and makes a comment about it (that it is big). Although in this example and many others the grammatical subject is the topic and the grammatical predicate is the comment, the topic-comment tandem can be extremely flexible, often transcending the narrow distinction between grammatical subject and predicate.

Finally, a predication is (again) intendingly or deliberately descriptive or reportorial, as it aims to state, describe, or inform about a definite and limited fact or situation. Moreover, it does so in terms that are publicly intelligible or shared, as opposed to egocentric or self-centered. This dimension may look trivial but it is not. Like the other two P-dimensions, it is not implicit in and cannot be derived solely from the S-dimensions. As argued later, an intended descriptiveness is not inherent in just having thoughts, nor is it inherent in such thoughts just being propositional.

Two-Tiered Operation

This way of looking at predication anticipates a two-tiered operation of the predication competence. To put it somewhat metaphorically, we may say that the mental abilities responsible for the P-dimensions—P-abilities, as I call them—form the hidden and underground core of predication, whereas the S-abilities form its outer and visible shell. The mental acts of predication can be said to convert the work of the P-abilities into the work of the S-abilities, thus mapping the deeper psychopragmatic P-dimensions onto the surface expressive, conceptual, and formal (logical and grammatical) S-dimensions. So construed, the predication competence can be said to operate at two levels: the P-level first, and then the S-level.

The proposal, elaborated in later chapters, is that the predicator *begins* by intending to direct the meaning of a predicate word at the referent of a subject word, as a comment about a topic, in order to share or convey descriptively some information (level P), which is then represented according to the S-dimensions (level S). The intentful act of directing is the *mental* (or psycho) component of predicating. The *pragmatic* component reflects the context-dependent topic-comment-presupposition matrix underlying a predication. So construed, predicating amounts to a set of psychopragmatic acts whose output is encapsulated in an explicit representation with

propositional content. Neither the mental nor the pragmatic components of a predication are necessarily manifest in the output structure that normally reflects only the surface S-dimensions—whence the tempting illusion of predication as mere representation.

For both the producer and consumer of predications, activating or tracking (respectively) the P-dimensions of predication requires *going beyond the output or surface representation* that embodies only the S-dimensions. For the producer, it is a matter of thinking or judging predicatively, according to the P-dimensions; for the consumer, it is a matter of inferring the P-dimensions from the context, other clues, and what is literally said in terms of S-dimensions. This is how communication works in general (Sperber and Wilson 1986). As in the parallel case of the Gricean notion of meaning, the communication angle is crucial, if we want to understand the origins of and reasons for predication.

Think, for a moment, of the alternative angle. If human thinking were built solely around a competence to represent the world, as widely assumed in philosophy and cognitive science, then it could do the job just fine with the mental faculties, acts, and structures that reflect the S-dimensions—hence nonpredicatively. This will be the critical point about coinstantiation in the next chapter: it could well do the job of representation, without predication. This contrast begins to suggest that predication might not originate in the representational resources of the mind, and might not have evolved for reasons having primarily to do with success in representation. Indeed, I will argue, although it ends up as the inextricable core of human thinking, predication actually enters the house of thinking, in early childhood, not through the front door of mental representation, but rather through the back doors (there are several) of interpersonal coregulation, intersubjective interactions, and the intent to influence other minds, all converging on word acquisition as the antechamber of predication.

1.2 Two Kinds of Propositions

For both the critical and constructive side of my argument, the distinction between the S- and P-dimensions needs to be related to, and further refined in terms of, other notions that are technically associated with predication. I begin with the controversial notion of proposition, modestly intended here to characterize the content of a representation, whether mental, linguistic, or logical.

Suppose I say, "This guy is not nice," and you ask, "What do you mean?" You fully understand the literal meaning of what I said. That literal meaning

is what I will call a *minimal proposition*. I call it "minimal" in order to contrast it with a predicative proposition. A minimal proposition can be the semantic content of a list, such as <this, guy, not nice>, conjunction <this&guy&not nice>, an abstract formula, as in the predicate calculus, on which more anon, or psychologically, of a thought that has a specific combinatorial pattern, with its own unity, which is *not* predicative. In the case of the list, conjunction, or the abstract formula, I would say that the content is a *logically* minimal proposition, and in the case of the (nonpredicative) thought a *psychologically* minimal proposition.

Your question was about what *I meant* to say—that is, what *I intended* to convey, informationally and attitudinally, by saying what I did. It may be that the guy was the topic of some prior conversation, in a context where being nice or not mattered. My predication projects the literal meaning of what I said, and hence the logically minimal proposition expressed, onto this psychopragmatic background. The intended result is a *predicative proposition*—that is, one that also satisfies the P-dimensions. A thought, therefore, is predicatively propositional only when, and thus because, it is intended to represent some state of affairs according to the P-dimensions.

According to later chapters, an animal or infant thought has only a *psychologically* minimal proposition as content. Such kinds of thoughts are mental vehicles (though not necessarily sentences in a natural language or symbol structures in a mental language) that represent various kinds of items, according to the S-dimensions, and therefore have truth-values in virtue of what they represent in some combinatorial pattern. As noted in the next section, this combinatorial pattern has its own sort of functional unity, but one that is not predicative.

The Unit Question

One may ask why two notions of proposition are needed to characterize psychologically the contents of thoughts—that is, one minimal (list S) and one predicative (lists S and P). Why not a single, standard notion of S-proposition as the predicative content of thoughts, leaving inference and context to fill in the P-dimensions? This is a fair and reasonable question. My preference for two notions is motivated by two related reasons. First, I do not think that minds, whether animal or human, think and communicate just by having semantic contents—that is, by representing, literally, in terms of minimal propositions. Such contents are likely to be cognitively and behaviorally inert, unless inserted in wider dynamic ensembles that

reflect psychopragmatic parameters, such as those on the P-list in the human case (Bogdan 1989). In that case, the *unit* of thinking and communication is bound to be a psychopragmatic rather than merely semantic content. If a predicative thought or utterance is such a deliberately formed unit, then it must reflect more than its S-core of representation as semantic content.

Second, and relatedly, there is the tough problem of the "unity of the proposition" (the fact that as a content of thought, a predicative proposition is more than the sum of its parts). The unity is assumed to define the nature of predication. Mighty minds, from Plato and Aristotle to Frege, Bertrand Russell, Ludwig Wittgenstein, Willard Van Orman Quine, and Peter Strawson, among others, have struggled with this problem, apparently without much success (for recent surveys and evaluations, see Davidson 2005; Gibson 2004). Their attempted solutions in general focused on the logically minimal propositions as the contents of predicative thoughts. Yet again, these contents are cognitively inert, and no different from the list or sum of their parts. Indeed, these contents are inert *because* they lack unity.

It stands to reason, then, that what secures the unity of predication also demarcates the *unit* of predication. By lacking unity, a list or sum of elements cannot be a unit of predication. Nor can a minimal proposition, either logically or psychologically. The unity and therefore the unit of predication are in the eyes of the beholder, so to speak—that is, of the one who predicates or understands a predication. And the eyes of the beholder, as predicator, see not only the S-dimensions but also, and essentially, the P-dimensions. Seeing only the S-dimensions, as necessary and sufficient for predication, leads to a different, popular, yet misguided notion, already anticipated but further elaborated next.

1.3 Coinstantiation

The distinctions introduced in this chapter—between S-dimensions and P-dimensions, and correlatively, between minimal and predicative propositions as the contents of thoughts—provide the main critical tool that will be employed, mostly in the next chapter but also later, against alternative accounts of predication.

The basic idea is simple. It is that representations that possess only the S-dimensions are *coinstantiations*. A coinstantiative representation is one that joins or links thematic representations in some combinatorial but

nonpredicative pattern. The content of a coinstantiative representation may be propositional minimally, and hence truth-valuable, without being predicative. Given the earlier distinction between logically and psychologically minimal propositions, we can distinguish between *logical* and *mental* coinstantiations. Both are nonpredicative, but the logical coinstantiation, unlike the mental one, is an abstract representation that satisfies the S-dimensions only and makes no assumption about the mental pattern in which thematic categories are linked, and hence has no unity. (Think of the difference as that between the notion of a circle defined in geometry and the representation of a physical circle.) A mental coinstantiation satisfies the S-dimensions in mental terms, which confer a psychologically coinstantiative unity to it.

A logical coinstantiation is a unit only by stipulation, not intrinsically. Consider the predicate calculus. A logician or mathematician may translate the logical or set-theoretical formula "Cx" in ordinary language as "x is C" without actually predicating C of x, but rather indicating the co-occurrence of a property and a variable, or the exemplification of the concept C by a class of entities subsumed under the variable x. This example suggests that even when the copula is treated as a "truth rule" that establishes when a sentence is true—namely, when the predicate term is true of the referent of the subject term (Wiggins 1984)—it does not follow that the sentence is actually predicative and that the "is" in question is of predication. On my analysis, as a truth rule, this "is" (as in "x is C") is an "is" of logical coinstantiation. One might suggest that logical coinstantiation is actually *logical* predication. I have no quarrel with the words employed, only with the concepts assumed. The point is that such "logical predication" has little in common with mental predication in thinking or linguistic predication in communication.

In contrast, mental coinstantiations normally result from the concomitant or successive application, through innate programs or acquired habits, of thematic categories, in a spontaneous, usually automatic or reflex manner, without reflection, deliberation, or intent. Spontaneous perceptual or memory judgments that lead to the recognition of objects, properties, or relations, in some patterns, are standard examples of coinstantiative representations. Animals constantly form such representations and so do we, a good deal of the time. As mental representations, coinstantiations are psychologically real and causally effective thoughts. Such thoughts have *their own* functional unity, as they represent more than a list of elements, in light of the cognitive role of the thoughts, their behavioral implications, and the goals they service. For a hungry cow, for instance,

the visual coinstantiative judgment <green lawn ahead> has a motivational and behavioral unity that the separate recognition of lawn and greenness (say, in an experiment) would not have. But that unity is not of the predicative sort, because the P-dimensions are not involved.

From what was said so far, one may conclude that coinstantiation is the core of predication, so that predication would amount to coinstantiation plus. The syllogism behind this conclusion may run as follows. The S-dimensions are necessary for predication; coinstantiation also satisfies the S-dimensions; therefore, coinstantiation is necessary (though not sufficient) for, and thus is a constitutive part of, predication. Necessary in what sense, though? Logically or mentally? Logically, yes, any predication cannot fail to be a coinstantiation of thematic concepts. This is to say, more or less, that a predication cannot fail to have semantic content. If I think that the lawn is green, I cannot fail to conceptualize both the object <lawn> and its property <green>. In this logical sense, I can be said to think *of* a green lawn. But *psychologically*, no, emphatically no: the predicative judgment *that* the lawn is green is vastly different (P-different, that is) from a coinstantiative representation generated (say) by an animal mind. The mental coinstantiation and the predicative thought may converge on the same thematic categories, but mentally speaking, they link and employ them in quite different ways. A wasp and a wolf share a good number of properties, from genetic to phenotypic, but that does not make the wasp biologically necessary for and constitutive of the wolf.

In short, when a predication satisfies the same S-conditions as a coinstantiation, the overlap is necessarily logical but not mental. Even though a predication encodes information, classifies it under thematic categories, links the latter in some combinational fashion, and so on, down the S-list, it does so in a *mental* format vastly different from that of a coinstantiative thought, even though the latter, too, may satisfy the same S-conditions, yet in its *own* format and terms.

Transition

The thrust of the critical strategy in the next chapter will be twofold: to show that various theories of predication actually are theories of coinstantiation, logical or mental, but also that in such theories, coinstantiation is often confused with predication or taken to be sufficient for predication. This is because most accounts of predication adopt a structural and standard perspective, limiting themselves to the S-dimensions, which is why they are at best accounts of coinstantiation rather than of predication. As

a result, even when they inquire psychologically into the competence for predication, these accounts at best explore the mental abilities involved in concept formation and application, the combinatorial syntax of mental representation, and so on, down the S-list. A few more pragmatically inclined theories gesture at some P-dimensions, but as we shall see, either do not go far enough toward explaining the mental competence for predication or go in the wrong direction.

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