CONTENTS

PREFACE

This book introduces and reclassifies disorders across the board from the vantage point of a more dynamic, comprehensive, consistent, and coherent theory of sign systems. In doing so, it presents newly discovered theoretical connections along with up-to-date published empirical and experimental demonstrations.

It is becoming increasingly evident that disorders and disease conditions, especially the unexpectedly persistent ones singled out as "communication disorders," invariably involve problems in representation. Such problems range from difficulties at the deepest levels of genetics to the highest levels of human emotion and intelligence manifested in experience, actions, language, and reasoning. More than ever before it is clear that health depends profoundly on dynamic representations, especially true ones, of the way things really are and how they are changing over time.

Disease conditions and disorders invariably involve mistaking fictional or deliberately false representations for true ones. Disease agents, it is clear, can falsely represent themselves to the body's defenses. Toxins can disrupt the capacity of the body and its immune systems to represent things correctly from genetics upward through metabolism and on to the highest levels of emotion, cognition, language, and reasoning. When fictions are mistaken for true representations, as when deliberate deceptions or mere fictions are taken to be true representations of actual facts, problems result. Such communication problems at the deepest levels from genetics and metabolism right on up to the most general forms of language and thought, form the underlying basis for disease, disorder, and mortality.

Without exception, disorders of communication and disease conditions in general, are the consequence of breakdowns and failures in systems of representation. At the core of the distinctly human capacities of communication are the dynamic pragmatic mapping relations by which sensory impressions of the physical world are linked through actions to abstract concepts of the linguistic kind. The simplest examples involve naming: For instance, if we refer to one of our editors as "Sandy," we aim to map the surface form of the name onto a certain person. If we succeed, our representation qualifies, as far as it is intended to qualify, as a true and valid representation. Another simple example of the pragmatic mapping relation would be a baby waving goodbye when someone else is actually taking leave of that baby, or vice versa. In that case the waving would be appropriately associated by way of reference or signification with the act of taking leave.

Such pragmatic mapping relations, as well demonstrated in the study of communication disorders, are fundamentally programmed into our neurological systems. It is not too much to say that they are dynamically built-in to the architecture of the brain. With that in mind as the basis for the dynamic connection between abstract ideas and concrete things through intelligence, it is also becoming increasingly evident, as our readers and students are discovering, that the many fields of study concerned with human communication and its disorders are undergoing a paradigm shift from static theories of distinct bits and pieces, surface forms, and independent components, toward theories taking account of dynamic, interconnected, systems that communicate with each other.

The dynamic systems-oriented approaches to human experience are central to the paradigm shift that we believe is already underway in the health sciences. The shift is bringing with it a better understanding of the central role of valid communications to well-being. It is ultimately the dissolution of representations themselves, or we could say the development of communication disorders, that leads to diseases and disordered conditions. This book chronicles the initial stages of the paradigm shift that we believe is underway and it anticipates some of the ways in which the

systems orientation must continue to develop in the coming months and years. Teachers who adopt the book and course, and their students, are assured of a cutting edge introduction to the best of current theories and ongoing empirical research being applied to test them. No other introduction offers as much historical depth or experimental currency concerning well researched cases. Nor does any other course provide a simpler, more coherent, or more intelligible theoretical perspective.

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What Are Communication Disorders?

OBJECTIVES

In this chapter, we:

1. Define communication and its disorders;
2. Consider why disorders are so costly;
3. Present an overview of the course and the DVD-ROM;
4. Begin to see disorders as they are seen by persons affected by them;
5. Discuss the systems of signs on which communication depends;
6. See how abilities come to light when things go wrong; and
7. Discuss how major classes of disorders are differentiated.

KEY TERMS

Here are some key terms of this chapter. Many you may already know, but it may help to review them. These terms are explained in the text and they are defined in the Glossary at the end of the book. They appear in **bold print** on their first appearance in the text.

abstractness
adrenoleukodystrophy
afferent nerves
articulation
autism
autonomic nervous system
central sulcus
cerebellum
cerebral palsy
codon
communication disorder
conjoined sequences
conventional
cortex
cortical functions
delusional pathology
dental amalgam
detoxification systems
developmental regression
Duchenne-type smile
efferent nerves
emphysema
entrainment
epidemiology
etiology
fissure of Rolando
frontal lobes
gas theory of smiling
generality
genome
glial cells
grammar
hallucinations
hierarchy
illusions
immune systems
infrasystems
instructional utility
interneurons
intonation
manual signs
metabolism
motor cortex
motor strip
multiple sclerosis
mythomania
neurotransmitter
parietal lobes
pathological lying
phylogenetic speculation
pragmatic mapping
pseudologia fantastica
pseudologue
reflex
reliability
semantic function
sensory cortex
sensory strip
sensory systems
somatic (bodily) systems
somatosensory cortex
startle response
surface forms
symptomology
syntax
temporal lobes
toxins
trauma
traumatic injury
validity
vegetative
volitional control

Communication systems are not static, unchanging "structures." For this reason, we use the term "systems" to call attention to the dynamic, changing, adaptive nature of all our bodily communication systems.

John Dewey said, "Of all affairs, communication is the most wonderful" (1925, p. 265). This chapter is about what communication is and why its disorders can be very costly. We introduce the sign systems on which communication depends and give a comprehensive overview of the full range of problems that can cause communication difficulties. At the outset, we should take notice of the fact that communication systems are not static, unchanging "structures." For this reason, we use the term "systems" to call attention to the dynamic, changing, adaptive nature of all our bodily communication systems.

Some of the critical systems, such as speech, writing, manual signing, and language, come under our voluntary control to a very high degree. Other communication systems that are essential to our survival, well-being, and the normal functioning of our language abilities, are outside of our conscious control. Systems that are par-

tially or completely beyond conscious control may be referred to as communication **infrasystems**. As we will see throughout this book and its accompanying materials, the infrasystems are essential to the health and well-being of all our higher communication systems including language. An infection, disease, or injury from poisonous chemicals can set up a metabolic imbalance that affects multiple other systems including the brain and our language capacity. In the medical jargon, any persistent undesirable disorder, disease, or condition is referred to as **morbidity**. If it results in death, the corresponding term is—mortality.

As an instance of system interactions, although it actually surprises some specialists, we now know for a certainty that disease in the intestines can affect the body's production of biochemicals that are essential to normal brain functions.

The Recovery of Ethan Kurtz

Ethan Kurtz, for example, began to show unmistakable symptoms of the most severe form of nonverbal **autism** at the age of two. Ethan stopped responding to his name, quit talking, and showed no interest in or awareness of social relations. These are the classic symptoms of severe autism. Many treatment regimens were tried over the next two years with only slight improvements in Ethan's evident abilities. However, a change in diet and a course of antifungal medications to kill an infestation in his small intestine resulted in a return to normal language abilities within a period of 21 days. Without discounting the impact of other therapies, such as behavioral and physical work by speech-language pathologists and physical therapists, it was evident that clearing up the disease in the gut was the principal source of Ethan's amazing improvement. See the video documentation of Ethan's recovery on the DVD by clicking on Ethan Kurtz.

If communication is wonderful, any loss or failure to develop any aspect of even one of our systems of communication, must be a genuine loss. The more severe the disorder, the greater the loss. By the same reasoning, the restoration of lost communication abilities must also be wonderful.

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SUCCESS IN LINGUISTIC COMMUNICATION IS THE NORM

When things are going smoothly, we take our abilities to know what is going on around us and to communicate with each other through language for granted. When things are going well, we are

like fish in water. But take the fish out of the water and we get an inkling of what it is like for a human being deprived of the ability to communicate.

Telling Disorders from Mere Difficulties of Communication

We define *communication disorders* as *unexpectedly long-lasting, persistent, or recurrent difficulties that interfere with normal, successful, ordinary communication.*

When any problem, difficulty, or interference with communication has an effect that unexpectedly persists or recurs over time, it can be referred to as a **communication disorder**. What distinguishes disorders from the most common ordinary breakdowns in communication—such as failures to comprehend, inability to get a particular idea across, and the like—is that *disorders are unexpectedly long-lasting, recurrent, and/or chronic difficulties*. They involve losses or failures to advance in development that are not normally expected to occur. Among them are many that have been traditionally recognized and treated as speech, language, and hearing problems. Surprisingly, some of the traditionally recognized disorders of swallowing—that are dealt with in speech-language pathology, for instance—do not on the surface involve speech, language, or communication. However, they are regarded as communication disorders and are treated by speech-language pathologists for reasons we consider in detail in Chapter 5.

In addition, many injuries and disease conditions that indirectly impact human communication abilities result in disorders, sometimes severe ones. All the things that can and sometimes do go wrong are impacted by our genetic makeup and some of the things that go wrong change our genes. As more and more details of human genetics are becoming known, deeper and more pervasive relations across all of the body's many systems of communication are also becoming known and better understood. Our bodily systems and even our social connections and relations interact.

By the standard definition of communication disorders—the one set off in italics just three paragraphs before this one—a temporary setback in development, for instance, such as the loss that may occur because of a childhood illness, is not necessarily indicative of a communication disorder. However, some problems should not be ignored. For instance, if a child suddenly and persistently—over a period of hours and days—stops responding to his or her own name, this is probably a sign of a deeper problem.

Defining Communication Disorders

Perhaps the most common and characteristic sign of the onset of a disorder is some sort of a **developmental regression**—a loss of previous gains where the individual seems to reach a higher level of development and then slip back to an earlier level. A dramatic

loss of prior gains, for example, when a child such as Ethan Kurtz stops responding to his own name, is often the first sign of a serious problem.

In disorders such as autism, the triggering event may involve infection, poisoning, or some combination of factors affecting **metabolism** in a genetically susceptible individual (D. B. Campbell et al., 2006). Metabolism is the whole complex of processes that are involved in the uptake of nutrients and disposal of wastes, but especially it involves the processes that occur at the biochemical level.

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Parent Reports

Parents of children with autism often note that a series of vaccinations, antibiotics, an illness, or some combination of these has pushed their normally developing child over the edge (McCarthy, 2007). Dr. Bryan Jepson (see Jepson & J. Johnson, 2007) refers to such a series of events as leading to the "toxic tipping point" after which a cascade of problems begins (p. 46). Also see the Foreword to Jepson and J. Johnson (2007) by Katie Wright telling about her son's descent into autism. According to a recent study (Woo et al., 2007) of 31 adverse vaccine reactions reported according to guidelines laid down by law, 87% were diagnosed with autism and 61% showed the sort of regression described by parents of children with autism such as Jon Shestack, Jenny McCarthy, Stan Kurtz, and thousands of others.

As more is understood about our systems of metabolism as they interact with our genetics, digestion, bodily defenses, and disposal of poisons, figuring out communication disorders seems to be crucial to understanding how our bodies work in general at a biochemical level. Communication disorders are especially indicative of and susceptible to injuries that impact and are impacted by our biochemistry.

Many metabolic diseases are linked to environmental **toxins**—that is, to poisons that injure the body at the atomic and molecular level of the infrasystems that support and sustain our normal communication abilities. In this introduction we will see why it is essential to recognize that environmental toxins are a major part of the upsurge in communication disorders and neurologic disease conditions that continue to rise exponentially in the 21st century (e.g., see J. W. Oller, & S. D. Oller, 2009). Among the worst offenders, in fact, as we have shown elsewhere, and as we will also see in this book, are certain known toxins that are being injected and/or ingested into our bodies through medicines, vaccines, dental fillings, food preservatives, and pesticides. Among the toxins contributing to the upsurge especially in diseases and disorders is the

heavy metal mercury in all its forms. Although there is considerable political controversy about mercury in vaccines, medicines, and **dental amalgam** (International Academy of Oral Medicine and Toxicology, n.d.), the toxicology is unambiguous and the research evidence is clear—mercury is a potent neurotoxin in parts per billion and is lethal in parts per million (U.S. EPA, "Mercury Compounds," 2000, retrieved March 20, 2009, from http://www.epa.gov/ttn/atw/hlthef/mercury.html).

To see how damaging that mercury can be, see the video titled How Mercury Damages Nerve Fibrils on the DVD (Leong, Syed, & Lorscheider, 2001).

The damage done by mercury in minute quantities at the molecular level results in the causation and/or worsening of many metabolic diseases and disorders. Interestingly, over half of the world's industrial mercury is in the mouths of human beings put there by well-meaning dentists who used it to fill cavities (Barr, 2004, retrieved March 20, 2009, from http://www.epa.gov/region5/air/mercury/meetings/Nov04/barr.pdf). On average, dental mercury accounts for well over half of the body burden of mercury in the human population (Aposhian et al., 1992). We will have a great deal more to say about the role of toxins in general, and mercury in particular, throughout the rest of the book.

Contrary to some theories of development that try to make disorders out to be normal, they would not be called "disorders" if they were the expected norm. Multiple bodily systems are out of balance in communication disorders and the disease conditions that produce them. Autism, **Alzheimer's disease** (**AD**), **Parkinson's disease** (**PD**), and so forth are examples. Jepson says that it makes about as much sense to call autism "a developmental disorder" as to call "a brain tumor a headache" (p. 44). It is important to differentiate the causes and nature of the various diseases, injuries, and disorders that produce communication disorders in order to get the diagnosis right and to provide effective treatment.

Disorders Show That Communication Normally Succeeds

Studies of communication disorders invariably begin from the underlying assumption that successful communication is usual, typical, normal, and desirable. By contrast, disorders are *neither* expected *nor* desired. In ordinary communication, things go well. We promise to meet people for coffee at a particular location and the various parties show up as agreed. We offer our credit or debit card to the clerk and the transaction goes through as expected. We put the letter in the mail on one side of the world, or we launch it through the Internet, and the intended person receives it miles away. We dial a series of numbers on our phone and we get connected with the person, or the voice mail of the person we wanted to talk to. We click on a URL and the link often takes us to the site we wanted to visit. We board a taxi, boat, train, or plane for a distant destination and, usually, we arrive there safe and sound. We tell someone what we experienced or what we are thinking and usually the other person understands much, if not all, of what we

mean. Even when communication becomes difficult, because of noise, or disagreements, quarrels, and the like, the people involved often, though not always, understand whatever it is that they are in disagreement about. Even in difficult situations, success in communication is common.

We often understand what is going on in the world and we often communicate successfully with each other. The physicist Albert Einstein [1879–1955] agreed with the philosopher Immanuel Kant [1724–1804] that our ability to understand the universe is "a miracle" (1936/1956, p. 61). C. S. Peirce [1839–1906] stated the essential implication of that "miracle" in 1908 by insisting that the comprehensibility of the universe is evidence of the existence of an Almighty God. Some disagree with Peirce's conclusion, but even in disagreeing they demonstrate that *communication usually succeeds*. That is, disagreeing with any argument implies that we understand it at least to some extent. In fact, disagreement presupposes that communication can and often does succeed.

When we consider how many things can go wrong, it is unsurprising that communication sometimes fails. In the light of all the things that can go wrong, what is surprising is that *communication usually succeeds.*

When Lives Hang in the Balance

To see just how common successful communication is, consider air transportation as an example. (see Boeing, 2007, retrieved March 20, 2009, from http://www.boeing.com/news/techissues/pdf/statsum.pdf). Extrapolating to the present year, 2008, the Boeing research shows that on the average about 50,000 jet aircraft of more than 60,000 pounds in weight (excluding only military planes) are departing from some airport every day. The vast majority of them arrive safely at their intended destinations. The same source shows that from 1970 to 2004 there were about 35,800 flights per day of the big nonmilitary jets. During that time, there were a total of 1,402 accidents with damage to the aircraft and 517 accidents that involved one or more fatalities. If we estimate that each flight depends on, say, about 100 successful exchanges of information between flight crews and ground personnel—an exceedingly low estimate for commercial jets carrying passengers and freight—there were about 43,435,000,000 communications of which fewer than one in 10 million resulted in an accident with damage to the plane and only about 1 in 100 million resulted in a fatal accident. We must suppose that all the rest of the communications on which flight safety depends were more or less successful. This means that billions of specific communications on which successful flights depend are successful every day, or at least they do not lead to any noteworthy incidents or accidents.

Communication Problems Cause Accidents

Continuing with international aviation as an example, when we consider the cases where a difficulty, near miss, or a fatal accident

does occur, it also comes out, unsurprisingly, that unsuccessful communications are the most common cause. The reported difficulties were much less often due to lack of skill of those flying the plane, the crew's knowledge of procedures and equipment, or the reliability of the equipment including the aircraft, the runway, and so on. Rather, in the vast majority of cases, the difficulties were caused by failures to understand ordinary communications (R. Yan, 2007). In 28,000 incidents reported between 1982 and 1991, more than 70% of losses in property, injuries, and fatalities could be attributed to communication problems (Ritter, 1996; Tajima, 2004). The most vulnerable link, according to the International Civil Aviation Organization (2004), is the one between the pilots in the air and air traffic controllers on the ground. Lives throughout the whole of the aviation industry, and in all other high-risk industries, depend on successful communication.

It is reassuring to air travelers that data from 1959 to 2004 show a dramatic decline in accidents in spite of the fact that the number of flights of the big jets was steadily increasing. Daily departures nearly tripled during the study period (R. Yan, 2007). The downward trend of accidents combined with the upward trend of numbers of flights shows that communication in the air transportation industries is becoming more and more reliable worldwide. All of this shows that communication is important, that it usually succeeds, and that it can be improved by focusing our attention on communication itself and on the ways that communication sometimes goes awry.

Early Diagnosis and Timely Intervention

Sometimes a wait-and-see attitude is advisable, but in many cases—for example, where poisoning is known to be a factor, the wait and see approach can be a sure method of worsening, prolonging, or even causing communication disorders. Because of the inevitable costs—physical, emotional, social, and material—getting the diagnosis early and getting it right are high priorities.

As we will see throughout this book, early diagnosis and timely intervention are key factors in minimizing the severity and in some cases altogether preventing or curing a problem. Sometimes a wait-and-see attitude is advisable, but in many cases—for example, where poisoning is known to be a factor, the wait-and-see approach can be a sure method of worsening, prolonging, or even causing communication disorders.

If communication is wonderful, it follows that its loss is not good. In fact, any loss or difficulty that threatens our ability to share experience is undesirable. An individual's disability not only affects that one person, but because of the social nature of communication, it also impacts the persons who interact with the person affected. Communication disorders tend to reach out in spreading waves to touch those who study alongside, who work with, who teach, or otherwise normally communicate with anyone affected by one or more communication disorders. Ultimately, communication disorders affect the whole community of human beings. A loss to one of us is a loss to all just as the success of one of us is of benefit to all of us. The normal response is to try to restore, or per-

haps to establish for the first time, what John Locke (2001) has termed "communion."

The loss of any ability to see, hear, feel, taste, and smell the world around us, or the loss of any ability to share experiences and emotions with others, is potentially a great loss. The loss of ability to move or carry out sequences of movements or the loss of any ability to use language, to think, talk, or write, or to understand others, is a great loss. We depend on communication with others through language to learn who we are, to discover our own names, the names of our family members, and to find out the identities of our parents and grandparents, our children, and grandchildren. We depend on communication to succeed in school, to get a job, to buy and sell, to own property, to get a driver's license, to use a credit card or a checkbook. In the case of fundamental communication disorders that interfere with the abilities we usually take for granted, the loss can be emotionally, financially, and physically draining.

Classification and Diagnosis of Disorders

Four major classes of communication disorders can be discerned on the basis of the sign systems affected: (1) bodily, (2) sensory, (3) sensory-motor, and (4) sensory-motor-linguistic. We will discuss these four classes of disorders in this order here and in following chapters.

Major classes of communication disorders can be discerned on the basis of the sign systems affected: (1) bodily, (2) sensory, (3) sensory-motor, and (4) sensory-motor linguistic.

Disorders are diagnosed and classified in three main ways. First, difficulties are noticed, diagnosed, and classified by their **symptomology**. How does the disorder in question affect the appearance, behavior, and/or abilities of the individual affected? Symptoms can be roughly divided into those that mainly affect the body in terms of its appearance and structure, sensations, movements, and its genetics and neurophysiology, feelings, moods, and behavior, and language, cognition, and mental abilities.

Second, difficulties can be classified with respect to recommended therapy. What is commonly done, if anything, to prevent, lessen, halt, or possibly cure the problem? Treatments are typically undertaken by different professionals or sometimes teams of them. They may include surgery in some cases, medicines aimed at improving body chemistry and/or removal of toxins, dietary regimens with a similar purpose, and physical or behavioral therapies aimed at improving range of motion, swallowing, **articulation**, gesturing, comprehension, intelligibility, and so forth. In some cases, the goal is merely to keep the condition from getting worse.

Third, difficulties may be classified by their supposed **etiology**. What are the suspected or known causes of the condition or problem? In fact, all the major ways of classifying communication disorders look ultimately to their causes. Underlying all of our discussion of such disorders is the presupposition that communication is both possible and desirable.

COMMUNICATION

The associations that enable language to work are **conventional**. They depend on the way linguistic signs are used. Conventions of use link arbitrary symbols to whatever they may represent—just as a name, for instance, is associated with whatever it is used to name.

We define communication as any interaction where information is transferred or exchanged between persons, organisms, or the parts of a system (even a computer, or a single person's mind or body) that relies on sign systems, or representations of any kind. Representations themselves are signs that are used to stand for things, persons, events, or relations between any of these. They may include sensations, actions, words, or sequences and combinations of any and all of these. Information is the abstract meaning that is validly associated with any representation. Of course, it is possible to associate anything with any representation whatever, but random associations cannot be informative or meaningful. With sign systems, the only kind of associations that count are those that are reliable and valid.

Conventional signs depend for their meaning on how ever they may be commonly used. This is all that is meant by the term "conventional" and it is the key distinctive quality of the signs of a particular language. In this book, we use the terms "representation" and "sign" almost interchangeably except that a representation is a sign that is applied to represent some particular meaning whereas a sign can be a sign without being applied—for example, the word "the" in quotes here in this sentence is just a sign and in this case represents only itself.

The Book in Your Hand as a Representation

This book is a representation and it consists almost exclusively of other representations. By writing this book, the authors communicate with other persons whom we cannot see, hear, or perceive in any way at this moment. By reading it, you make contact with us though you cannot perceive us just now. Our connection is only through abstract representations—words, diagrams, pictures, and other marks—that we present to you through these pages. That is how we are communicating even now as you read these words.

Except for its material pages and the accompanying plastic DVD-ROM, the book you are reading (and its DVD) only consist of three kinds of representations: (1) First, there are the words that refer to persons, research papers, theories, methods, diagrams, pictures, videos, the DVD itself, and one or more copies of the book itself. (2) Second, the book and the DVD consist of diagrams, lists (the References, the Glossary, the Index, this list), and illustrations that show complex relations between words and bodily persons, things, events, research papers, journals, other books, other authors, and combinations of all these. (3) Third, the book also consists of Web sites, still and moving pictures, and sounds that represent bodily persons, things, events, and their relations. Some of the pictures and sounds are contained in the pages of the book or on

the DVD. Others will only be imagined by the reader, and yet the whole interaction between us is dependent almost completely on representations plus a little bit of paper, plastic, a few computers, and our separate material bodies.

The book itself with the accompanying DVD *is* a representation and consists *almost exclusively* of representations. Without the particular representations that its authors have created, this particular book would not exist at all. Paper pages and plastic disks by themselves could not constitute the book you are reading. A hundred million copies of blank pages and the blank disks could not make this particular book. To be the book that it is, it must contain the words that its authors wrote and that you are now reading. But representations alone do not result in communication. In order to result in communication, the representations have to be connected to things—persons, event sequences, and experiences—other than themselves. Printed words are representations but they do not produce communication unless someone interprets them. An unreadable inscription in an unknown language that is never deciphered cannot be said to communicate anything in particular. It may be about particular persons, events, and experiences, but until the writing is interpreted (correctly) by someone, the inscription might as well be a random sequence of empty syllables or random marks.

To communicate through a particular language, we have to acquire the conventions of that language. We cannot understand a language by merely perceiving its **surface forms**. Strings of syllables, printed words, or manual signs are useless unless we know how they connect through conventions with their deeper meanings. The surface forms alone tell us very little.

To communicate through a particular language, we have to acquire the conventions of that language. We cannot understand a language by merely perceiving its **surface forms**.

Making Sense of Impressions

What Einstein Had to Say

Einstein argued that it is only through abstract relations between sensory impressions that we understand the world and communications about it. He argued that we understand sensory impressions (seeing, hearing, smelling, touching, and tasting) through "the creation of general concepts, relations between these concepts, and by relations between the concepts and sense experience" (1936/1956, p. 61). If Einstein was right, it follows that *all experience is itself a form of communication*.

Normal human experience involves interactions between representational systems of various kinds. Those systems of representation include the *senses*, also our abilities to act and move, and our social interactions through language. Even the communications among other species now appear to involve interactions that mirror, to

some extent, the social interactions of human beings (Hogan & Bolhuis, 2005). Of course, humans are far more adept at understanding even simple demonstrations of tool use, for example, than other species such as macaques (Rigamonti, Custance, Previde, & Spiezio, 2005) or even chimpanzees (Penn & Povinelli, 2007).

When Does Communication Begin?

If our bodies and our senses are working properly, and if our abilities to move and think are intact, we live in a world of shared voices, words, stories, knowledge, purposes, and emotions. When things are going along normally, we are always in a common world shared with other persons. Although we have memories of the past, we generally are unaware of when we came to be in the world as we know it. By studying the development of human babies, however, we can learn more about ourselves and about how and when social interaction begins to take place. Interestingly, it begins soon after conception and long before birth.

Among the early signs of social awareness, and the natural human interest in communication, is the baby's first social (genuine) smile (Figure 1–1).

Among the early signs of social awareness, and the natural human interest in communication, is the baby's first social (genuine) smile (Figure 1–1).

Commonly, this kind of smile is regarded

FIGURE 1–1. Baby smiling in the womb. Retrieved March 20, 2009, from London's Create Health Clinic, http://www.createhealth.org/. Copyright 2004 by Dr. Stuart Campbell. Reprinted with permission. All rights reserved.

align themselves quite perfectly by accident, the reader might consider the following series of questions: How is it possible for the authors, publishers, and readers of this book to agree that it is about communication disorders? What kinds of accidents would have to happen in order for this agreement to come about by chance? Or what kinds of errors would produce so much agreement? What kind of chance or randomness can produce the same result on every occasion? Or, consider the many facts contained in the book that readers will also agree on: Who are the authors of the book? Does the book deal with autism? Does it discuss poisons that cause disorders? Is it published by Plural?

As soon as the number of details concerning any common experience exceeds 1, the likelihood of accidental agreement on those details rapidly drops to just about exactly zero. We are compelled to infer that something other than chance is at work. In fact, we must infer shared language and abilities of representers in a common world that agree about known and truly represented facts, for example, this really is a book about communication disorders, and so forth, and the people who agree on this do so because of common access to and shared understanding of the same actual world of experience.

In fact, disagreements, disorders, and confusions could not be known at all, as what they are, if it were not possible for us normally to understand experience validly and to understand communications about it. If we have no idea about how things really are, we cannot tell any difference between what is and what is not; what is normal versus what is disordered. If there were no true representations, we could not discriminate at all between them and ones that are fictional, in error, or intended to deceive. Ordinary true representations must exist before we become able to represent anything about fictions, fantasies, errors, lies, jokes, metaphors, and so on.

If there were no true representations, we could not discriminate at all between them and ones that are fictional, in error, or intended to deceive. Ordinary true representations must exist before we become able to represent anything about fictions, fantasies, errors, lies, jokes, metaphors, and so on.

RESOURCES FOR THE COURSE

In this section, we provide an overview of the teaching/learning resources that accompany this book, then we conclude this chapter with a discussion of the reasons commonly given for studying communication disorders. We especially want to encourage our readers to consider what we believe are the highest and best reasons for pursuing this field of study. We have been greatly encouraged by our students, readers, and colleagues in the work that we present to you here. We thank you in advance for being there and we assure you that we are eager to hear from you concerning any part of this course. On the back jacket, we quote some of the comments we have received from our students and we invite yours as well especially on the new resources and material offered here for the first time.

The DVD

The DVD that comes with this book contains an expanded Table of Contents with the introductions and summaries of each chapter along with working hyperlinks to URLs (Uniform Resource Locators on the Internet) referred to in every chapter. It also contains all of the figures, illustrations, and media files referred to in the text, and a searchable version of all the open-ended Discussion Questions, References, Glossary, Index, and the Multiple Choice Questions (600 of them) that are systematically linked page-by-page to the unfolding story told chapter-by-chapter. There is also a PowerPoint summary on the DVD for each chapter highlighting key points.

The Multiple-Choice Questions

The multiple-choice questions appear in the same order in which the material comes up in the textbook and each of the questions is cross-referenced to the text by one or more page numbers to show where the answer for it may be found. In the DVD, we explain each item so that it is possible to see why how each of the choices, except for the correct one, can be ruled out. We also give an item analysis for each question based on the performance of the student samples from universities where the book and accompanying materials were pretested.

Each question focuses on one or more key points from the course. Together, the questions provide the basis for a point-by-point review on a chapter-by-chapter basis throughout the course. They show in detail how multiple-choice items in standardized tests are constructed by professional test writers and they provide important teaching/learning/testing/review options throughout the course. From the questions concerning any given chapter, instructors can construct multiple-choice tests including midterm and final examinations, or the questions may be used as study-guides that are thoroughly grounded in the course material. We use the test items in three ways—as study materials, review guides, and as tests.

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Our students routinely comment that the intensive study of our multiple choice test items has helped them to prepare for standardized tests in general. Students who were not good at taking multiple-choice tests comment that they have become good at it. The key is understanding how such items are constructed. It helps students prepare, for instance, for the PRAXIS test that is required nationally in the United States for licensing of **speech-language pathologists**. For instructors and students who prefer essay-type discussion questions, we provide lots of those too at the end of each chapter.

Should Students Study the Test Items?

Our research on this book—and also on our companion volume, *Milestones*, for the course on normal speech and language develop-

ment—shows that allowing students to study the items in advance, before those same items are used in multiple choice tests, enhances the **reliability**, **validity**, and **instructional utility** of the items themselves and the tests constructed from them (see Yan, 2007).

Better Communication

The principle is straightforward: *better communication of the subject matter results in better comprehension, learning, and connection to one's own world of experience*. When teaching and learning are more successful in this way, testing is also more reliable, valid, and useful. Reliability is improved because the better students understand the material, the more they are apt to get the same excellent results from one occasion to the next. Also, validity is improved because there is greater agreement about the subject matter and thus about why some answers to the questions are better than others. That is, there is more agreement between students, teachers, researchers, and so forth, about which answers are correct, or incorrect, and why. Better communication is just that. It is better.

Making Information Accessible

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Our purpose as teacher/communicators is to make information accessible. The objective of this book and the materials that accompany it is also to make the material of the course and all the research to which it is connected as accessible as possible.

The DVD includes an *Instructor's Manual* showing how to construct a countless variety of multiple-choice tests from the items included there. It is also easy to construct essay tests from the Discussion Questions at the end of each chapter. Instructors also can expand and modify the PowerPoint summaries to suit their distinct styles and preferences. Abundant reading resources are contained in the list of references at the end of the book and these are made completely searchable on the DVD. The Discussion Questions suggest many ways to expand on material in any given chapter and on the key issues that come up along the way. The Reference List and Index of Subjects and Authors are also provided in digital format making them conveniently searchable.

Case-Based Problem-Solving

We use a case-based approach referring to real persons in actual situations for several reasons. For one, such an approach is completely consistent with what we know of language acquisition and valid learning in general. The most effective teaching is necessarily

grounded in true representations of actual persons, things, events, and situations in the real world. This is the main reason that we follow the Harvard model of case-based problem-solving. The cases themselves are grounded in the real world, well documented, and referenced against the most reliable and valid and up-to-date theory and re-search (Mostaghimi et al., 2006; Tosteson, Adelstein, & Carver, 1994).

When we look to real cases of actual human beings, we stop thinking of problems in the abstract and begin seeing them as real problems that affect individuals like ourselves. This, we believe, is what the Harvard reformers meant by the phrase "care for the patient." When we see the patient, client, student as a human being, we start thinking of the problem as if it were our own. We identify with the parents of Ethan Kurtz. After seeing him at nine months as a happy bright-eyed boy, we are shocked when at 18 months he is unresponsive to his name. The symptoms of hand-flapping, social unresponsiveness, and full-blown autism are shocking. When we see the video of Ethan Kurtz where he retreats into severe autism, as if a prisoner inside his own body, we identify with his dad, Stan Kurtz (see "Children's Corner," n.d., retrieved March 20, 2009, from http://www.childrenscornerschool.com/stankurtz.htm). We share the intense desire and motivation to get Ethan back.

Real life cases move us to action. They give us the energy to burn the midnight oil, to spend the resources, and to do what it takes to make things better. They enable us to define and carry out the research needed to answer the critical questions about diagnosis, causation, and intervention.

Like Bryan and Laurie Jepson (see Jepson & Johnson, 2007), Jon Shestack and Portia Iverson (see and hear Shestack, 2003, at the Autism Summit retrieved March 20, 2009, from http://www.tvworldwide.com/events/nimh/031119/agenda.cfm), and Jenny McCarthy (2007)—when we learn about the regression of children whose mind and personality seem to have been kidnapped leaving a "bewildered body behind," we determine to find out what we can do to help get them back. Through firsthand acquaintance with real cases we put ourselves in the shoes of the parents and others who love the individuals with disorders. When we hear the story ("The Myelin Project," 2009, retrieved March 7, 2009, from http:www.myelin.org/en/cms/?14) and when we learn what Augusto and Michaela Odone did—as recounted in the film *Lorenzo's Oil* (retrieved March 20, 2009, from http://www.myelin.org/en/cms/?14)—to rescue their son from a fatal genetic disorder, we ourselves are motivated.

Another reason for using a case-based approach is that it shows more clearly than any other that the main goal in the study of communication disorders is to improve the quality of the lives of affected human beings. Persons affected directly or indirectly by impairments in abilities to communicate, typically want more than thick, rich, descriptive research concerning the behaviors associated with the disorder—as useful as such descriptions may be. They do not want to wait for half a century while researchers develop more of **epidemiology** and statistics. It is not enough to advocate increasing the number of caregivers, or enhancing the resources and facilities dedicated to the treatment of communication disorders, or improving the pay of persons who treat disorders. It is not enough to train

professionals to provide care and treatment. It is not enough to raise public awareness about communication disorders or to inform the public and professionals about the emotional, economic, and personal costs associated with communication disorders. All these goals are desirable and may be helpful in moving toward our deeper objective, but we agree with the American Speech-Language-Hearing Association (ASHA) as noted in Chapter 12: the highest and best goal is to discover the causes of disorders in order to cure, prevent, or lessen their negative impact.

Why Study Communication Disorders?

The obvious purpose of this book and all its accompanying resources is to introduce students to the nature and classification of communication disorders, but the best reason—perhaps the only legitimate one—for studying communication disorders is, as much as possible, to learn how to prevent them, to cure them whenever they cannot be prevented, and to make them less severe whenever they cannot be prevented or cured.

Human beings, after all, are not like rock crystals, physical phenomena, numbers, art, music, or literature that might be studied out of curiosity. Human beings with disorders are persons.

If they have one or more communication disorders that prevent them from enjoying human experience in all its dimensions, as human beings they merit our highest compassion, our complete attention, and our best efforts to help them. As fellow human beings, we must strive to enable persons with communication disorders, as much as possible, to achieve their full potential as human beings. As we will see, communication systems—including all the skills, abilities, and knowledge sources that make such systems possible—are essential to the full enjoyment of ordinary human experience. Noam A. Chomsky—an MIT linguist who happens to be the most quoted intellectual of modern times—has suggested that if we were to take away all our distinct human capacity to communicate, especially through language, our experience would be reduced to something like "an amoeboid creature," which would be "utterly impoverished and lacking the intricate special structures making possible a human existence" (1980, pp. 33–34). Does he go too far? Perhaps so, but the question is not only how much *do communication disorders limit human experience* but whether it is possible for some or all of the abilities lost to be recovered. This is the question on the minds of people who love the individual whose capacities to communicate with others or to interact with the world have been impacted by one or many communication disorders.

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Disorders as Amusement

Sometimes communication difficulties, breakdowns, and disorders are regarded as subjects of amusement and "comic relief"—as blindness was regarded at a burlesque show observed by Valentin Haüy (see the account in Chapter 3). The voice and behaviors of a joke-teller may change to sound like a person who is mentally disabled, who speaks with a cleft palate, or just has a "funny" accent. The gait of a performer may change to imitate that of a person with **cerebral palsy**, or some other motor-disorder, or a person with a physical deformity such as a cleft palate or lip. Comedians may imitate stutterers for effect. In many situations, these antics may be amusing, but for the persons affected by communication disorders—and those who love them—the loss of any ability to communicate is genuine. Some may regard autism, for instance, as "quirky," "cute," or "a special gift," or "a blessing in disguise" and many have argued that there is no "autism epidemic" (Gernsbacher, Dawson, & Goldsmith, 2005). But to the contrary, see Chapter 5, Jon Shestack (2003) said, "There is nothing 'cute' or 'quirky' about autism." Shestack is the Founder of Cure Autism Now, which recently merged with Autism Speaks (retrieved March 20, 2009, from http://www.autismspeaks.org/).

For all the foregoing reasons, in this course, we take the perspective of the persons most affected by communication disorders. For us, the goal of this study and all the work associated with it is restoration to the point of a cure and/or complete prevention of the disorder. That is our objective. We join Jon Shestack in the hope that autism, for instance—to single out the most prominent disorder of the 21st century, one still described in medical textbooks as an "unsolved mystery"—may soon be relegated to the history books.

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For reasons that will become clearer as we go along, we believe that the current epidemic of metabolic disorders including autism (Jepson, 2007), ADD/ADHD, Alzheimer's, **multiple sclerosis**, and many more will require and produce a revolution in the way toxin-related disorders are treated in the future.

SUMMING UP AND LOOKING AHEAD

In the next chapter, we deal with genetic and bodily disorders that affect appearance, anatomy, and every aspect of human experience. Such disorders also may influence seeing, hearing, smelling, touching, and tasting. In obvious ways, our senses ordinarily depend on

an intact, functional body. Above the senses which provide the most basic kinds of signs, the next level of signs involve movement, especially volitional movements that result from intentional actions. Yet intentional voluntary movements could not exist, much less have any social meaning, if they were not accompanied by meaningful sensations. So, meaningful movements, especially facial expressions such as smiling, gesturing, and all intentional social acts, must be aided by sensory signs. Language likewise depends on sensations and movements. Voluntary movements are crucial to speaking, writing, manual signed languages (as of the Deaf), and intentional acts in general. Even acts such as breathing, swallowing, clearing one's throat, sniffing, or blinking the eyes involve movements that can convey meanings in human interactions.

Above the senses which provide the most basic kinds of signs, the next level of signs involve movement, especially volitional movements that result from intentional actions.

In the following chapters, we consider the integration of our anatomy with sensory, motor, and linguistic systems. In Chapter 2 we consider how bodily disorders impact communication. As we will see throughout this book, communication disorders always spill over into related domains and have cascading effects. For this reason, disorders that impact the body and its growth tend to affect how we perceive ourselves and others, and how they perceive us. As a result, communication development and all the social relations, skills, and knowledge systems that depend on communication can be affected dramatically by the disorders to which we turn in Chapter 2.

STUDY AND DISCUSSION QUESTIONS

1. Why is successful communication harder to explain and to account for than breakdowns, failures to communicate, and disorders? (Consider the analogy of designing a lightbulb, an airplane, a computer, a space shuttle, and so on. Which is more difficult to account for, the many initial failures or the ultimate achievements and successes of ordinary acts of communication? Why are successes necessarily more complex than the failures that often precede them?)
2. Why do parents like Jonathan Shestack and Portia Iversen want more than just an explanation of their child's disorder—or an intensive microanalysis of his behaviors? Is what they are asking for unattainable? Is it reasonable? Should students of communication disorders be satisfied with less than a viable method of preventing or curing a particular disorder? Why so or why not? What is your personal view?
3. What are the arguments for and against claims that there is an epidemic of autism? What is your own conclusion and why do you think as you do? What evidence can you muster in favor of your own and opposing views?

4. What arguments show that the acquisition of any natural human language cannot be accomplished by the rote memorization of sentences? How can a child's memory produce a system of systems that is universal, abstract, and completely general?
5. What facts tend to support or refute the gas pain theory of smiling? What reasoning has been offered in its favor? What can we learn from that theory, if anything?
6. Why did Einstein argue that understanding sensory impressions requires reliance on the abstract relations that hold between them? Here is a problem to stimulate your thinking: How can you be sure that the classroom you are sitting in on a certain occasion, say, is the same one you were in a few minutes or a day before? How do you know it is the same room that your classmates also are in? Or, if you are working in a distance setting, how do you know you are following the same course as other students who are working through this book? Or, how do you know that a particular pencil, pair of sunglasses, or book sack, is your own?