A Handbook on Stuttering

Seventh Edition

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PLURAL PUBLISHING
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another source. If any have been inadvertently overlooked, the publisher will gladly make the necessary
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Foreword

A Handbook on Stuttering had its origin in 1959 as an 88-page booklet entitled *A Handbook on Stuttering for Professional Workers*. The National Society for Crippled Children and Adults (Easter Seal Society) had called on the American Speech and Hearing Association to prepare a publication on stuttering for distribution to physicians. The editor of the association, Robert West, gave the task to Oliver Bloodstein at Brooklyn College, one of the first students of the newly developed field of speech-language pathology, founded at the University of Iowa, and a student of Wendell Johnson. As Bloodstein saw it, his task was to provide a brief summary of what we had learned from this research. Unexpectedly, the booklet soon began to be adopted as a text in university courses on stuttering. As a result, the Easter Seal Society published an expanded version in 1969 that would be more suitable as a textbook. That was the first edition of *A Handbook on Stuttering*. As the research findings grew, new editions appeared. By 2005, when the sixth edition was contemplated by its then publisher (Cengage), Oliver was 85 years old and he asked Nan Bernstein Ratner to undertake the revision with him. Nan had been inspired to do her master's thesis (later appearing as Bernstein, 1981) by one of Oliver's articles and was thrilled to join in what was truly a decades-long act of love and support to the stuttering community.

In doing the sixth edition of the *Handbook* with him, Nan marveled that Oliver had by then completed seven versions of this incredible resource before computer technology or the Internet; he had literally spent thousands of hours in brick-and-mortar libraries, poring over journals and theses and writing letters and postcards to researchers asking for reprints. Revisions of the *Handbook* over the years were hampered by now outdated publishing procedures that made anything but adding material sequentially almost impossible. Together, Oliver and Nan brought the sixth edition of the *Handbook* to press in 2007, and Oliver lived long enough to enjoy favorable reviews before leaving us behind in 2010. As befit one of the founding fathers of American speech-language pathology, he passed away on the fourth of July, hav-ing e-mailed Nan only days earlier about research issues in stuttering. We hope that those not fortunate to have known him will visit a more complete description of his life, work, and passions at https://www.mnsu.edu/comdis/kuster/pioneers/bloodstein/bloodsteinobit.html

As Nan contemplated the next edition, which was being delayed by a variety of issues we discuss later in this Foreword, it was clear that, like Oliver, she would need a capable, dedicated, and selfless colleague to join in the effort. Given the advances in Internet search capacity, it was clear that thousands of articles and books would need to be reviewed. In some months, more than 100 potentially relevant publications would be indexed by search engines. Nan was fortunate enough to find such a talented and altruistic colleague in Shelley Brundage. Nan and Shelley had shared numerous relationships over the years (as student–teacher, coauthors, program administrators, and fluency organization board members); what united most of these experiences was an abiding interest in the evidence base for what we know about stuttering and how best to work with people who stutter and their families.

Even as the sixth edition was being prepared, Oliver and Nan knew that some hard decisions were on the horizon: as the editions and the research piled up, so did the page length of the *Handbook*. The sixth edition wound up being more than 550 double-columned, small-font pages. They discussed removing unpublished materials, materials without English summaries (Oliver was a polyglot), and small, unreplicated studies of single cases. This caused Oliver no small amount of distress: he knew it was necessary, but could not bear to do it. With his typical sense of humor, he pointed out that Nan could do it the next time, "after I'm gone."

And so we have. But we can't bear to cut material any more than Oliver did. Thus, our thoughtful publisher, Plural Publishing, has agreed to provide a link to the old *Handbook* for purchasers of the new edition. It will host those materials on the Internet so that scholars of the deep history of stuttering research will not lack for the thorough coverage of all

work, large and small, that Oliver felt merited inclusion in prior editions.

Bringing a seventh edition to press on Oliver's typical speedy schedule was unexpectedly complicated by a number of issues. The prior publisher stopped working in the field of communication disorders and a long process of reassuming copyright was undertaken by Nan and Oliver's son Danny. Searches for a new publisher hit unexpected snarls. We are incredibly grateful to Christina Gunning and her colleagues at Plural Publishing for agreeing to shepherd this seventh edition to press. We could not have done it without her.

Preface

In the dozen years that have passed since the last revision of *A Handbook on Stuttering*, thousands of new studies of stuttering have been reported. It was certainly a large task to tackle this growth in knowledge, and so, now two authors bring you the most recent incarnation of the *Handbook*.

Readers of past editions of the *Handbook* will find this edition quite differently organized, with new and reconceptualized chapters. Some of this was enabled by changes in publishing; whereas Oliver had been limited to making changes more or less in chronological presentation of information, with new findings appended to older ones, we had more freedom to shuffle content to better position—in our opinion, some questions that people tend to want answered before others—and to integrate findings across topics and chapters.

Some chapters are brand new in this edition. Oliver had never explicitly offered a chapter on assessment. In our opinion, great strides have been made in this area and inform appropriate treatment. As a result, Chapter 13, for the first time in *Handbook* history, synthesizes best practices and instruments for assessment of stuttering in people who stutter across the life span.

The Internet has also made tracking citations of the *Handbook* relatively easy, and so we made note of the fact that many fields use the *Handbook* to find basic facts about stuttering, as do, in our experience, people who stutter themselves and their families. To more concisely address many of the questions that many of them bring to reading the *Handbook*, we have now prepared a new chapter on what we call "Myths and Mysteries About Stuttering" to better inform different audiences about some lay beliefs about stuttering and its features.

As noted earlier, one thing that has changed in this edition is that we have removed some material that Oliver referenced in prior editions, with his consent (discussed before he passed away in 2010). To improve the scientific basis for our discussions and to be able to add new, high-quality published research to this edition without making it unreasonably long, we have removed all nonpublished references (including conference presentations, theses, and dissertations) and many older references (prior to 1950) that are not available in English language versions. Those who will miss these materials should be reassured that a link will be hosted by the publisher to the last edition and to all of those highlighted citations (for easier viewing) that were removed.

In addition, we have removed one chapter and the Appendix. Oliver and Nan shared some common views of stuttering, but even they disagreed on some issues. Writing a chapter together on "Inferences and Conclusions" was an interesting process in the last edition. In the current edition, we have decided not to include one. We will let the readers of the *Handbook* reach their own. We have also decided to eliminate the "Treatment Appendix." The current treatment chapter attempts to provide detail for all major therapies having current evidentiary support, in our opinion. Since the last edition, there has been an explosion of articles on a small set of treatments, leading to what we perceive would be an uneven proportion of the Appendix dedicated to somewhat overlapping data. It might persuade readers to equate the number of publications on a particular treatment approach with the strength of combined evidence across a smaller number of publications. For instance, one fairly recent head-to-head trial treated more children than a large number of individual reports on one of the treatments combined. Thus, we have opted to contextualize the strengths and weaknesses of currently employed therapies within Chapter 14's text. As with other features of the prior edition that will be maintained on the Plural website, the past "Treatment Appendix" will still be available for interested readers.

Some things we will not change. As always, the *Handbook* endeavors to provide the most up-to-date information about stuttering that it can, in as neutral and unbiased fashion that we can (noting our opinions when appropriate), as we were adding references up to the point of final copyediting. Advances in technology lie at the core of many of the recent themes that have grown incredibly even since the previous edition, such as genetics and brain imaging.

Many of the invaluable longitudinal studies of children who stutter, undertaken by labs around the world, are just beginning to shed light on risk factors for stuttering and its persistence.

At the same time, we have not removed large amounts of older research just because it is old and newer methods or questions updated our knowledge base. A good case in point is the current Chapter 6, where we keep the coverage of the search to relate handedness to the possible basis for stuttering. All of that work is now superseded by neuroimaging, but it proved to be rather prescient, in its own way. That is because, as much as the *Handbook* has always tried to provide the known facts about stuttering, it has always, from the first edition, tried to pay homage to how we have gotten to our current state of understanding. No other book really serves this purpose; in a sense, the *Handbook* on stuttering is as much a history of stuttering research as it is a distillation of its findings. For those impatient to know how well older research efforts cohere with our current knowledge base, we have attempted to provide some previews (in film we might call them spoilers) to contextualize the coverage.

Orientations toward stuttering are also changing, and we believe that Oliver would be pleased by these developments. He was insistent that counting disfluencies was a poor way to view either the impacts of stuttering or success in treating it, and newer, multi-factorial views of stuttering—from its underlying nature to its assessment and treatment—take center stage in most chapters. Additionally, older science, that seemed to have tackled stuttering the way that the mythical blind men studied the elephant, has evolved to examine interactions among systems once conceived of as free-standing "modules" (and separate chapters of the *Handbook*, even in this edition). Our challenge has been to reflect the numerous bridges among areas such as genetics, anatomy, physiology, motor systems, language, temperament, learning, and so forth that clearly impact stuttering and which we must understand if we are to develop any good explanatory theories about what it is and how best to work with people who seek treatment or advice.

It has been challenging to organize all this into what we hope is still a comprehensive but understandable resource for people wanting to learn about stuttering or update their existing knowledge. For example, in the last edition, brain imaging studies of PWS were covered in eight pages of text. In the current chapter on central neurological findings in children and adults who stutter, just the tables are longer than this!

Throughout it all, Nan and Shelley had an additional task, not to lose Oliver's distinctive voice and of course his innumerable contributions to the field he loved so dearly. We hope we have managed to achieve this important goal.

We'd like to end with how Oliver prefaced the sixth edition: "As in previous editions, the book's endeavor is to guide the reader to the edge of our knowledge about stuttering and, where the edge is not well defined, to point out where the footing is insecure and where we stand on solid ground."

We certainly could not say this better.

—Oliver Bloodstein,
Nan Bernstein Ratner, and
Shelley B. Brundage

About the Authors

Oliver Bloodstein, PhD, was emeritus professor of speech and former director of the program in speech-language pathology and audiology at Brooklyn College of the City University of New York. His career was spent in research, teaching, and clinical work on stuttering and he wrote extensively on the subject. He was a Fellow of the American Speech-Language-Hearing Association and the recipient of its highest award, the Honors of the Association.

Nan Bernstein Ratner, EdD, CCC-SLP, is professor in the Department of Hearing and Speech Sciences, University of Maryland at College Park. With degrees in child studies, speech-language pathology, and applied psycholinguistics, she is the editor of numerous volumes and author of numerous chapters and articles addressing stuttering as well as child language acquisition/disorders. Dr. Bernstein Ratner is a Fellow of the American Speech-Language-Hearing Association. In 2006, she was presented with the Distinguished Researcher Award by the International Fluency Association. She is pleased to be joining with Oliver Bloodstein in this edition of the *Handbook*, since his work was the primary inspiration for her first research study and professional publication. She hopes someday to inspire others to the degree that he has inspired her.

Shelley B. Brundage, PhD, CCC-SLP, BCS-F, is professor and chair in the Department of Speech, Language, and Hearing Sciences at George Washington University in Washington, DC. Her research focuses on the use of virtual reality in stuttering assessment and treatment as well as using technology to improve clinical learning. Dr. Brundage is a Fellow of the American Speech-Language-Hearing Association. In 2015, she received the Knowledge Development and Innovation Award by the International Fluency Association and in 2017 was recognized with the Alumni of Notable Achievement Award by the University of Minnesota. She is gratified to be a part of the *Handbook*, particularly given that Nan Ratner was the person who first got her interested in stuttering.

Reviewers

Plural Publishing and the authors would like to thank the following reviewers for taking the time to provide their valuable feedback during the manuscript development process.

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No book is an island. We'd like to thank a large number of people who made invaluable contributions and helped us get this latest edition of the *Handbook* to press. First, Christina Gunning at Plural Publishing has been everything an author could want. She's been helpful, gracious, and patient. Her advice was always timely and informed and has made both the writing process and the final product infinitely better than it otherwise would have been.

We'd also like to thank a number of people who contributed examples of assessment tools to the book, including Michael P. Boyle, Elaine Kelman, Sharon Millard, Martine Vanryckeghem, and J. Scott Yaruss. We thank Soo-Eun Chang and Ho Ming Chow for advice and editorial suggestions on Chapter 6; the burgeoning literature on brain imaging would not have been interpretable without their informed feedback. We thank Janetta Brundage for her assistance in organizing data for inclusion in the book and Rich Brundage for his work on figures and references. A special thank you goes out to Veronica Builes for her assistance in identifying unpublished work from prior editions for removal from the current edition.

In prior editions, Oliver painstakingly enumerated those founding parents of the discipline who had left us since the last version of the Handbook went to press. At this point in time, none are left; Oliver himself was one of the last. Of course, many talented people continue to work to foster research and clinical and social endeavors that all aim to improve the quality of life for those who stutter and their families. We could not list all of them, previous or current, here. But what we can do is pay homage to the one person who indisputably made the most ferocious attempt to make sure that none of these endeavors was forgotten so that people would have the incredible opportunity to build on them by going to one place, the Handbook.

Thus, we dedicate the seventh edition of the Handbook:

To Oliver

SECTION I

Understanding the Nature of Stuttering

The first section of the *Handbook* is devoted to understanding the nature of stuttering. These chapters provide background on what stuttering is (to both speakers and listeners); aspects of its behavioral, affective and cognitive features; and how it has been described and studied in the literature. Chapter 1 provides a broad overview of stuttering, including definitions of stuttering, how to measure it, and how its features change across the life span. Chapter 1 also addresses listener reactions toward stuttering, and the impact that stuttering has on the individual. The chapter highlights different possible frameworks or perspectives about the nature of stuttering and how these frameworks influence the questions one might ask about stuttering.

Chapter 2 covers the demographic features of stuttering. Topics in this chapter include prevalence, incidence, the apparent sex ratio, and factors that influence stuttering persistence and recovery. The chapter discusses earlier heredity studies of stuttering and more recent genetic investigations and concludes with discussions of cultural demography and linguistic diversity in stuttering.

Chapter 3 contrasts a large literature on typical disfluency profiles in early child speech production with findings that discuss what stuttering "looks like" near onset in young children. Variables that influence fluency in young children are addressed as well. Importantly, this chapter introduces the numer-ous longitudinal studies that have led to much of the information that we know about early childhood stuttering and will be referenced across numerous chapters of the *Handbook*.

Chapter 4 discusses the very early work on stuttering and some more recent work, which has aimed to discover whether people who stutter differ from typically fluent children and adults in "constitutional factors"—such as birth history, physical development and characteristics, and the presence of coexisting conditions. As we show, living with someone who stutters influences family perceptions, parenting styles, and the family dynamic. In school, the perceptions of teachers, peers, and children who stutter (CWS) themselves influence how CWS view their stuttering. These perceptions can be positive or negative and include teasing and bullying. The chapter ends with a discussion of how the presence of stuttering impacts employment for adults who stutter.

Theories and models need to be able to explain what we know about stuttering and make testable predictions regarding its nature and cause. Chapter 5 summarizes the challenges that such theories must address and discusses multiple models and theories that have been proposed to characterize and explain stuttering. These overarching approaches to stuttering set the stage for the chapters that follow, allowing the reader to appreciate the differing perspectives that have guided research in stuttering.

1

Defining and Describing Stuttering

CHAPTER OUTLINE

Introduction

We start this book by attempting to define and describe stuttering and aspects of it that will be important background for the other chapters in this book. Most people think they know what stuttering is, but we will suggest that their knowledge is fairly superficial. For instance, consider how stuttering is usually portrayed in popular media. Actors usually appear to be shy, anxious, or even mentally disturbed. Their speech appears hesitant and contains multiple repetitions of sounds. How well does this describe stuttering? We would argue, not very well; some portrayals are so inauthentic and stigmatizing that they have resulted in protests from the community of people who stutter.

A marked contrast to most portrayals was that of Colin Firth playing King George V in *The King's Speech* (2010), which won Academy Awards for both Firth and the film. Firth carefully studied contemporaneous films and audio of King George; most notably, he frequently "blocked," a behavior in which a person tries to speak but cannot initiate voicing. This behavior escapes most typically fluent people; yet, a recent conversation on the social media platform Reddit attracted quite a bit of affirmation from the thread, "I'd rather repeat than block!" Why might this be? We will discuss why blocking behavior, even if subtle to the hearer, is of great concern to the person who stutters.

We also need to distinguish between *a set of behaviors* that we group together as "stuttering" and the *diagnostic or self-identified state of being a person who stutters*—that is, a person who experiences these behaviors on a more or less daily basis, or at least very frequently. We start here because to understand stuttering, as we discuss it in this *Handbook*, we will need to use terminology and agree on its use. That goal, it turns out, is surprisingly hard to achieve.

For readers of prior editions of the *Handbook*, we alert them to a very different organizational schema for this chapter than what appeared in earlier editions. Some of this is spurred by changes in terminology and coding since the last edition, but it is further motivated by trying to paint a full picture of stuttering before digging deeply into accounts of how researchers have endeavored to define and describe both moments of stuttering and the condition we recognize as stuttering.

Terms Used in this Book

Stuttered Versus "Typical" Disfluency

We often need to use precise terminology to define stuttering and its core features and behaviors for practical reasons. If a person who stutters wants to seek therapy, they often must receive a diagnosis that is consistent with those in insurance manuals or similar health taxonomies. A speech-language pathologist needs to understand what features distinguish stuttering from other cases in which a speaker seems to experience difficulty with fluency, such as a person with nonnative language skill and so on. In this section, we review some definitions and terms which have been offered in research and practice in the field of stuttering.

Typical dis/dysfluencies (sometimes called *developmental disfluencies* when observed in the speech of very young children) are NOT stuttering. Typical disfluencies (discussed in the following text) occur in the speech of most children—both stuttering and nonstuttering—as they are learning language. These types of disfluencies—such as interjections, revisions, and phrase repetitions—also occur frequently in the speech of adults, both those who do and do not stutter. Typical disfluencies occur in many speaking situations, including when speakers are unsure of what they wish to say, are trying to deceive their listener, are under the influence of alcohol, and when they are tired, nervous, or anxious.

To summarize, stuttering and typical disfluencies are two fundamentally distinct sets of behaviors. Unfortunately, these two terms are often used interchangeably (e.g., "he sure stuttered a lot, he must have been nervous when he gave that speech"), which may be where the confusion started. Additionally, both stuttering and typical disfluencies interrupt the flow of speech and communication. These interruptions can lead to negative listener perceptions, such as the sense that speaking is difficult or that the speaker is a poor communicator. These negative perceptions can lead to stigma. What we hope is clear so far is that not every instance of disfluency is an example of stuttering.

There are even disputes as to whether moments of fluency breakdown are best described as "disfluency" or "dysfluency." Whether these two terms are mere spelling variants or should be used distinctively to refer to more typical and less typical fluency fail-

ures is a small but periodically interesting question that has been debated (Bernstein Ratner, 1988; Quesal, 1988). This version of the *Handbook* will use the term "disfluency" to refer to all moments of fluency breakdown.

Person-First Language: An Ongoing Discussion

We understand that terminology is important and that different terms are associated with different frameworks for viewing stuttering (see "The Points of View" section later in this chapter). Since the last edition of the *Handbook*, "person-first" terminology (e.g., *person who stutters* rather than *stutterer*) has been adopted as an editorial policy by many professional groups. Interestingly, the two labels may not be perceived differently by people who stutter, clinicians, or the public (see St. Louis, 1999), and person-first language, by introducing a clause within a noun phrase, makes sentence processing more difficult for you, the reader. We concur with the notion that the term "stutterer" does not reduce a person to symptoms; as one of our colleagues says, he does not think it better to call him "a person who skis" rather than a "skier" or a "person who writes" rather than a "writer" or "author." For these reasons, we will use a variety of labels to describe people who experience difficulty in speaking fluently, including the term "stutterer."

Defining "Stuttering" and "Moments of Stuttering"

In any consideration of the problem of defining stuttering it is, of course, also vitally necessary to keep distinct a number of different meanings with which the term may be used. For example, the question of whether a person "is a stutterer" or "person who stutters" (i.e., stutters habitually) is one on which it is generally fairly easy to obtain agreement—except sometimes with respect to young children (see Chapter 3)—on the basis of observed speech behavior on a series of occasions as well as the speech history; the conditions under which the behavior varies; the person's self-concepts, speech attitudes, methods of coping with the problem; and the like. Having said this, diagnostic codes for stuttering are not in perfect agreement, as we see later in this chapter. Agree-

ment that the person "is a stutterer," however, does not help much to answer the question of whether he or she has spoken in a stuttering manner in a given speech situation. That question, in turn, is not as difficult to answer as the question of whether the speaker has stuttered on a given word. The use of the term "stuttering" in each of these cases must not be allowed to become a source of confusion. If we are unable to define the moment of stuttering so as to differentiate it easily from other instances of speech interruption, this is a curious and by no means trivial fact. But it does not rule out an operationally meaningful definition of stuttering as a disorder.

Distinguishing Typically Disfluent Speakers From People Who Stutter

Experts can generally agree on what stuttering is, yet a great deal of disagreement generally results when we try to operationally define it. Some disagreement stems from conflicting inferences about the underlying nature of the disorder that reveal themselves in our definitions. When we try to avoid this problem by adhering strictly to the description of observable behavior, we find that the reliability of our observations is quite low (more on this a bit later in this chapter). Early descriptions of stuttering focused almost solely on the observable speech disruptions that interrupted the "rhythm" or fluency of speech; more recent research and reports from persons who stutter (PWS) themselves suggest that stuttering is a multifactorial disorder in which features of stuttering are not always confined in an easily identifiable manner to discrete "moments of stuttering."

In contrast to attempting to identify such discrete moments, other researchers have suggested that defining stuttering by categorizing the types of speech disruptions observed is folly and that stuttering should be considered a "threshold phenomenon" that will likely be interpreted in different ways by different listeners (Martin & Haroldson, 1981). More recent descriptions (discussed later in this chapter) include the speaker's reactions to and thoughts about the speech disruptions and their impact on communication. Other definitions also include descriptions of the impact that stuttering has on listeners.

There are many published definitions of stuttering (Table 1–1). Almost all of the definitions in Table 1–1 mention speech disruptions of some kind. Definitions differ in their level of specificity, their

TABLE 1–1. Various Definitions of Stuttering

Source	Definition
Wingate (1964)	Stuttering is characterized by involuntary—audible or silent—repetitions or prolongations in the utterance of short speech elements that occur frequently and are not readily controllable. Disruptions are accompanied by accessory activities involving the speech apparatus or body structures. It also includes the presence of an emotional state ranging from a general condition of excitement or tension to more specific negative emotions (embarrassment, irritation, fear, etc.).
Bloodstein (1987)	Stuttering is whatever is perceived as stuttering by a reliable observer who has relatively good agreement with others.
Perkins et al. (1991)	Stuttering is a disruption of speech experienced by the speaker as loss of control.
DSM-V (2013)	A. Disturbances in the normal fluency and time patterning of speech that are inappropriate for the individual's age and language skills, persist over time, and are characterized by frequent and marked occurrences of one (or more) of the following: (1) sound and syllable repetitions; (2) sound prolongations of consonants as well as vowels; (3) broken words (e.g., pauses within a word); (4) audible or silent blocking (filled or unfilled pauses in speech); (5) circumlocutions (word substitutions to avoid problematic words); (6) words produced with an excess of physical tension; or (7) monosyllabic whole-word repetitions (e.g., "I-I-I-I see him").
	B. The disturbance causes anxiety about speaking or limitations in effective communication, social participation, or academic or occupational performance—individually or in any combination.
	C. The onset of symptoms is in the early developmental period.
	D. The disturbance is not attributable to a speech-motor or sensory deficit, dysfluency associated with neurological insult (e.g., stroke, tumor, trauma), or another medical condition and is not better explained by another mental disorder.

descriptions of nonspeech behaviors, the presence of reactions and impacts of stuttering, and their ability to be measured objectively by an independent observer. Many definitions include the "core" features of stuttering such as part-word repetitions, sound prolongations, and blocks because these speech behaviors occur with greater frequency in the speech of persons who stutter than in the speech of those who do not. At least some of these definitions note the involuntary nature of stuttering. To clarify terms used in the definitions of "stuttering," we also define the individual terms used in these definitions in Table 1–2. We also add the recently developed transcription codes to unify how we portray these behaviors when transcribing or describing them using programs in FluencyBank (http://www.fluency.talkbank.org), an Internet repository for research data in fluency development, differences, and disorders. Standardized codes enable us to more clearly understand one another when we try to convey behaviors of importance or interest to readers who cannot see or hear the person speaking. They also enable software used in some clinical environments and research studies

to create sharable profiles of fluency behaviors both within and across individuals and research projects.

It is particularly important to point out that conventional definitions of stuttering, even when considerably elaborated, do not adequately serve to differentiate it objectively from various other forms of disfluency that are regarded as distinct from stuttering. Most definitions of stuttering are of notably little help in clarifying the relationship between the nonbehavioral features of stuttering and typical disfluency and so ride roughshod over some of the most critical questions that arise in developing a theory of stuttering. Johnson et al. (1959, Chap. 8) and Johnson (1961a) demonstrated that there is little the stuttering speaker does that can be conveyed by available descriptions of disfluent speech behavior that a typically fluent speaker does not also do to some extent and in some instances in equivalent measure.

Typical Disfluency

Typical disfluencies, as noted in Table 1–2, include filled and unfilled pauses, interjections, word and

TABLE 1–2. Examples and Codes for Stuttering Behaviors and Typical Disfluencies Used in CLAN

	Code	Example	Explanation Illustrates
Stuttering Behaviors			
Block	≠	≠butter	Inability of the speaker to initiate speech, often signaled by a postural fixation (e.g., mouth open but no vocalization or lips pressed together but no release follows)
Prolongation	:	s:paghetti	A prolonged /s/
Repeated segments	↩ℓ	↩ℓr-r-r-r↩ℓrabbit	3-Unit part-word repetition of the first sound in the word
Broken word	^	spa^ghetti	Midword discontinuity in phonation, often signaled by a rise in pitch
Phonological fragment	&+	&+sn dog	A word change from "snake" to "dog"
Typical Disfluencies			
Whole word repetition	follow word with [/]	butter [/] butter	"Butter" was repeated
Multiple whole word repetition	[× number]	muffin [× 7]	"Muffin" was repeated seven times
Phrase repetitions	<> [/]	<he is a> [/] he is a dog.	"He is a" was repeated
Phrase revisions	<> [//]	<what did you> [//] how can you see it?	"What did you" was revised to "how can you see it?"
Pause	(.) or (..) or (…)	(.)	Short, medium, and long silent pauses
Filled pauses	&-	&-um &-you_know	Filled pauses and the nature of the filler

Source: MacWhinney (2000). *The CHILDES Project: Tools for Analyzing Talk* (3rd ed.). Mahwah, NJ: Lawrence Erlbaum Associates.

phrase revisions, and phrase repetitions. Conversational speech contains a considerable amount and variety of interruptions or hesitations such as these and they are present in the speech of stuttering and nonstuttering speakers alike. These types of speech disruptions have long been known to occur frequently in connected speech produced by adults (Bortfeld et al., 2001; Fox Tree, 1995; Goldman-Eisler, 1958a, 1958b) and are particularly frequent in the speech of young children learning language (see Chapter 3). The presence of fatigue, anxiety, nervousness, or alcohol intoxication (Schiel & Heinrich, 2015) may increase the frequency of typical speech disfluencies.

Typical disfluencies occur at predictable places in the speech stream, such as before unfamiliar words, at syntactic boundaries, and as sentences become longer and more complex (see Chapters 3, 10, and 11). Typical disfluencies occur during speech planning, (Arnold et al., 2007), lexical access (Hartsuiker & Notebaert, 2010), and error repair processes (Postma et al., 1990a) as well as when discussing difficult or new information (Arnold et al., 2003; Arnold et al., 2007). The context of the interaction also influences the frequency of typical disfluencies. For example, many speakers are more disfluent when they are speaking to persons in authority and when speaking to large audiences (see Chapter 11).

Typical disfluencies have many negative connotations. For example, listeners have been shown to associate disfluencies with lying and deception