

Augmentative and Alternative Communication

MODELS AND APPLICATIONS

Second Edition

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Contents

<i>Introduction</i>	<i>xiii</i>
<i>Acknowledgments</i>	<i>xix</i>
Chapter 1. Augmentative and Alternative Communication:	1
A General Introduction	
What Is Augmentative and Alternative Communication?	1
Standard and NonStandard Forms of Communication	4
Early Assumptions	4
Terminology	5
Learnability of Symbols	8
A Model for AAC Communication	10
AAC as Sender Support	11
Less Is More?	12
Alternative Access	13
Adapting Manual Signs	14
AAC as Support of Signal Transmission	14
Multimodality	15
AAC as Support of Receiver	15
Beyond the Communicator–Partner Interaction	16
Bronfenbrenner’s Ecological Model	17
To Sum Up	19
Points to Remember	19
References	19
Chapter 2. Access and Message Management	23
Typical Processes Involved in the MicroGenesis of Speech	24
A Proposed Framework to Understand Access	25
Rate of Expressive Communication	26
Access	28
Physical Access	28
Mental Access	28
Portability	28
Sender Access Facilitation	29
Intentionality	29
Lexicon Accessibility	29
Sets and Systems of Symbols: Do They Help in Lexical Access?	30
Access to Message Assembly Techniques	34
Message Externalizing	34
Behavior	37
Tools	38

Cognitive Processes	40
Message Transmission	40
Multimodality Principle	40
Materialization Principle	40
The Receiver’s Role and Assistance from Communication Partner	41
Help in the Physical Execution of the Message and Facilitated Communication (FC)	42
Help in Cause-Effect Grasping	43
Providing Choices	43
Help with Scanning	43
Lexical Help	45
Selection Strategies (Y-N Questions)	45
Strategic Feedback	45
Content Feedback	45
AAC Modeling	46
Points to Remember	46
References	47
Chapter 3. Nontech, Low-Tech, High-Tech, and Mobile Computing	51
Assistive Technology	52
Nontech, Low Tech, and High Tech	52
Nontech Solutions	54
Steering Technology	54
Movement-Sensing Technologies	55
Multi-Input Strategies	55
Language Representation Technology	55
Output Technology	57
Nontech Output	57
Device-Generated Speech	57
Desktop and Laptops	60
Tablets and Mobile Devices	60
Lexicon Technology	60
Lexicon Representation	61
The Super Lexicon and Increasing Interconnectivity	61
Growing and Accessible Databases	62
Conversion Technology	62
Word from/to Graphic Symbol	63
Manual Sign from/to Word	63
Simplification Technology	63
Recognition Technology	63
Speech Recognition	63
Integration with Other NonCommunication Technology	64
Conclusions	64
Points to Remember	65
References	66

Chapter 4. The Use of Symbols	69
What Are “Symbols”?	69
Symbol Classification	70
Unaided AAC Symbols	71
Unaided Symbols: Gestures	71
Everybody Uses Gesture	74
Conventional Gestures Are Manual Signs	75
Linguistic Unaided Symbols	76
Why Would Manual Signing Work?	77
Simplified Sign System	78
Key Word Signing	79
Aided AAC Symbols	82
Tangible Symbols	82
Graphic Symbols	82
Levels of Understandability of Graphic Symbols	84
Recognizable Graphic Symbols	84
Guessable Graphic Symbols	86
Symbols with Low Picturability	86
An Interesting Graphic Symbol System: <i>Bliss-Words</i>	88
Participics: Graphic Symbol Sets for a Specific Group	90
Animated Graphic Symbols	90
Adding Sounds to Graphic Symbols	90
Two Issues of Graphic Symbols: Polysemy and Sequentiality	90
The <i>Polysemy</i> Issue	91
The <i>Sequentiality</i> Issue	91
Uses for Graphic Symbols	92
Conclusions	95
Points to Remember	95
References	95
Chapter 5. Vocabulary and AAC	99
Words, Graphic Symbols, Manual Signs as Lexical Elements	100
Zipf’s Law, Core Vocabularies, and AAC	100
Typical Word Development	101
Balancing Number of Words with Accessibility Requirements:	101
The Problem of Lexical Access	
Teaching or Acquiring Vocabulary—Who Determines or Influences	101
Lexical Growth?	
The Core Vocabulary Approach	102
Comparing AAC and Typical Word Development—A Valid or	103
Flawed Approach?	
So, Is Core Vocabulary the Solution?	103
The Initial Lexicon	104
“Free Access” to Your Own Lexicon	105
Measuring Lexical Learning	108

Are Manual Signs the Lexical Equivalent of Words?	108
Manual Sign Lexicons	109
Are Graphic Symbols Really the Equivalent of Words?	109
Doing more with less?	111
Conclusion: The Vocabulary Challenge in AAC	111
Points to Remember	112
References	112
Chapter 6. AAC Intervention at the Prelinguistic and Early Linguistic Stages	115
The Beginnings of Communication	116
Forms of Communication	117
Functions of Communication	117
Behavior Regulation	118
Social Interaction	118
Joint Attention	119
From Unintentional Behavior to Intentional Communication	119
Understanding Cause-Effect	120
The Use of Tools	120
The Genesis of Internal Mental Representations	121
Symbol Development	121
When Does Communication Become Language?	122
From Idiosyncratic to Conventionalized Symbols	122
Communication and Symbol Development as Part of Interaction	122
Symbols Become Part of a Larger Structural Multilevel Combinatorial System	123
The Communication Matrix	124
AAC Solutions for Early Intervention	124
Determining the Communication System in Place	124
The Partners	127
The Communicative Environment	127
Making Unintentional Behaviors Intentional	127
Identify Potential Communicative Acts	128
Select Accessible Symbols	128
Transition to Linguistic Symbols	128
AAC Applications for People with Severe Developmental Limitations of All Ages	128
Make and Keep Communication Functional	129
Address Problem Behavior	129
Other Intervention Techniques	130
Requesting and Rejecting	131
Beyond Requesting and Rejecting	131
Extension of Communicative Repertoire	131
References	133

Chapter 7. AAC Applications for Individuals With Autism	137
Autism Spectrum Disorders and the Acquisition of Communication Through AAC	137
Barriers and Facilitators	138
Predictors, Moderators, and Mediators	138
The Specific Nature of Autism and AAC	139
The Visual Modality, Visual Processing, and Attention	139
Teaching Needs	140
AAC and Social Skills in Individuals with an Autism Diagnosis	141
References	141
Chapter 8. Language Intervention and AAC	143
How Are the Main Mechanisms of Language Acquisition Affected by the Use of AAC?	144
Biological Factors	144
Language Exposure	144
Cognitive Challenges	145
Social Regulations	145
What Is the Effect of the Decreased Output Possibilities?	145
What Do We Know About the Developing Lexicon?	147
What Do We Know About Phonology, Morphology, and Syntax Development?	148
Morphology and Syntax	149
How Does the Use of AAC Affect Literacy?	149
How Does Software in AAC Devices Represent Language, and Does It Facilitate Language Acquisition?	150
Language Learning Through Interaction	150
Code-Switching	151
Amount of Exposure to Communication and its Influence	153
Learning Structures and Strategies	154
Modeling	155
Recasting	155
Points to Remember	156
References	157
Chapter 9. AAC and Literacy Development	159
Literacy Acquisition and AAC Use: An Interesting Relation	160
A Help or a Barrier?	161
Three Abilities and Levels of Graphic Symbol Use	161
(1) The Ability to Pay Attention to Specifics of a Pictorial Representation	161
(2) The Ability to Understand the Referential-Pictorial Meaning of a Graphic Symbol	161
(3) The Ability to Insert a Pictorial Representation in a Meaningful Way in a Sequence of Actions	162
Can Graphic Symbols Aid Word Recognition Through Association?	162

Are the Graphic Symbols a Help to Literacy?	163
Literacy Activities and a Literacy Curriculum for AAC Users	164
Different Challenges at Different Stages	165
Literacy Activities as Compensatory AAC Strategies	166
Measuring Competencies	167
Becoming a Writer	167
AAC and Literacy in the Future	168
Points to Remember	168
References	168
Chapter 10. AAC and Intervention with Acquired Communication Disorders	171
An Increasing Prevalence	171
The Nature of the Condition: Cognitive, Linguistic, or Motor	172
What Is the <i>Linguistic</i> Nature of Disorder?	172
What Is the <i>Motor</i> Nature of the Disorder?	173
What Are the <i>Cognitive</i> Elements Affecting the Disorder?	173
Other Questions	173
Natural Speech	174
Acquired Cognitive Challenges	175
Acquired Linguistic Challenges	176
Functional Considerations and Classifications	176
Acquired Motor Impairment	178
Amyotrophic Lateral Sclerosis	178
Brainstem Dysfunction	179
Other Acquired Predominantly Motor Disorders	180
AAC as Therapy and Rehabilitation Tool	181
Short- and Long-Term Goals	182
Effects of (Partially) Device-Based Language Therapy	183
Acceptability	184
TelePractice, Self-Therapy, and Distance Intervention	184
Conclusion	184
Points to Remember	184
References	185
Chapter 11. AAC in Medical Environments	187
Exchanging Medical Information with AAC Users	187
Exchanging Medical Information with Non AAC Users	188
AAC as a Short- and Long-Term Solution for Exchanging Medical Information	188
References	191
Chapter 12. AAC and Assessment	193
AAC Assessment Is Part of AAC Intervention	193
Determination of AAC Needs	194
Communicative Competence as Object of Assessment	196

Assessment of the Larger Picture	196
AAC Assessment Is an Ongoing Decision-making, Testing, and Adjusting Process	197
Principles of AAC Assessment	198
Quantification	200
Can We Predict the Future?	201
Dynamic Assessment	203
Measuring Instruments	204
Measuring Communication as Part of a Developmental Component	204
Communication Competence Profile	205
Assessment of PreLinguistic and Early Linguistic Functioning	207
Language Tests and Their Usability	208
Measuring of Specific AAC-Related Skills	209
Conducting an Evaluation	210
Functional, Developmental, and Dynamic Interpretation of the Data	212
Feature Matching	214
The “Fives Approach”	216
Multidisciplinarity	216
Working with Manufacturers and Sales Representatives	216
Report Writing	217
New Ways of Assessment and Data Gathering	217
Costs and Funding	218
Points to Remember	218
References	219
Chapter 13. Intervention and AAC	223
Anticipated and Desired Outcomes	224
Who Sets the Goals? The Client and the Community of Practice	226
Creating and Maintaining a Communicative Environment	226
Planning or Natural Development?	227
Evidence-Based Practice	227
Points to Remember	229
References	229
Chapter 14. AAC and the Community	231
The Community—or the Communities	233
Social Networks	233
Making Meaning Through Interaction	233
Multiple Challenges	233
Attitudes and AAC	235
Attitudes of Peers	235
The AAC User as a Member of Cultures	237
AAC Linguistic Diversity	238
AAC and the Family	238
AAC in Education	241

Educational Goals and Organizing the Classroom	241
Inclusiveness	242
Universal Design for Learning	243
Educational Practices and Opportunities	244
Post-High School	244
Transitions to Adult Life	245
AAC in the Workplace	245
AAC and the Development of Friendships	246
The Virtual Community	247
Communication Assistants	247
Aging	247
Connections with the World	248
Risk of Abuse	248
AAC Users and Research	248
Points to Remember	249
References	250
Chapter 15. The AAC Experience	255
What Does It Mean to Be an AAC User?	256
The Difference Made by the AAC Solution	259
The Uniqueness of the AAC Experience	259
A Community of AAC Users	260
Where Do I Get Help?	261
Discussions about What Works Best	261
The Broken AAC Device	261
The New and Better AAC Device—Or Not So Much Better	261
Sexuality	262
AAC as a Normal Phenomenon	262
Perspectives of Hope, Expectations, and Fears	262
Points to Remember	263
References	263
<i>Appendix 1. AAC and Natural Speech</i>	265
<i>Appendix 2. Case Discussions</i>	279
<i>Appendix 3. Discussion and Debate Topics</i>	287
<i>Appendix 4. Speech-Language and AAC Assessment Protocol</i>	291
<i>Index</i>	305

Introduction

Augmentative and alternative communication (AAC) is the discipline that explores the possibilities of identifying alternative pathways to functional communication for individuals with a limited access to standard communication forms such as natural speech. Within AAC, alternative modes of communication have been found, such as the use of technology, manual signing, or picture exchange. AAC is a testimony to the fact that communication comes in many forms, and creative solutions can be found to establish human contact and participation.

AAC is at the same time an applied field and a field of fundamental research. It means that it generates ideas and possibilities that improve people's lives, most notable individuals with little functional speech. Augmentative and alternative communication is a testimony of the resilience of the human capacity to communicate, as well as of the natural tendency to adapt and adjust when typical forms of communication are not working as well. AAC is the field that describes and explains the methods, tools, and theories of the use of non-standard linguistic and non-linguistic communication by and with individuals without or with limited functional speech (see Chapter 1).

Today, AAC is used by an ever-growing group of individuals of all ages, each with their own personal and communication needs. For communication, some people use gestures or manual signs, whereas others use graphic symbols to get their messages across. Today many AAC users operate speech-generating devices, and every day there are more who use smart-

phones or electronic tablets (McNaughton & Light, 2013).

This book is an attempt to describe AAC comprehensively and to offer a framework that helps the reader understand what AAC intervention does (and does not) in the process of communication. Some AAC interventions help a person to formulate their thoughts into an utterance, whereas other interventions are geared to find an alternative way to natural speech. It depends on the needs, the condition, and the prognosis of a person's development which intervention may be effective.

AAC comes in many shapes and forms. Some people use AAC for just a few utterances, others use AAC of lectures, and yet others for almost non-stop communication with their partners during every waking moment. Is it even possible to find a commonality among all the forms? We believe that there is: It essentially comes down to the principles of interactive human communication, and the principles of personal message generating.

Since the first edition of this book (2014), the field of augmentative and alternative communication has continued to evolve. More than ever before, AAC practitioners, researchers and—most importantly—AAC users have published their work, their views, and their experiences. Also, even more than in the past, there is a living and lively AAC community where members interact with each other, learn from each other, and find consensus (and, as in all living communities, occasionally disagreements) on where the field is going.

**PRINCIPLE OF INTERACTIVE
HUMAN COMMUNICATION**

In the summer of 1991, during a one-month research visit at Purdue University, I was working on explanatory models for AAC. My host Lyle Lloyd convinced me that it would be a mistake to try to grasp AAC as if it is essentially different from typical communication. Both the typical communicator and the AAC user are essentially human minds processing and exchanging information. There is no reason to believe that these processes follow different channels or different laws. This view has helped me in my endeavors to paint a comprehensive picture of AAC. Just as typical communication, it is about externalizing thoughts in a form that can be captured by a communication partner. The forms can vary: They can be spoken or written words, whistles, eye winks, gestures, coughs, facial expressions, text messages, or photographs. Anything works. This is sometimes called *multimodality*. Very often, people use a combination of forms: Most people gesture while they speak, and many throw in an emoticon when they email. In AAC, we often seek for the most efficient and effective combination of communication forms . . . just as any human communicator does.

Another characteristic of human communication is speed (Reed & Durlach, 1998). Rate of information production needs to be within a range of comfortable information processing to work within live communication setting, that is, where sender and receiver are present and engaged in interaction. In other words, information exchange should neither go too fast or too slow in order to allow both sender and receiver to process, anticipate, and remember the messages and the flow

of conversation. The use of AAC does not always permit to keep the conversation within the comfortable range. I believe this is one of the major challenges that we still face in AAC.

**PRINCIPLE OF PERSONAL
MESSAGE GENERATING**

Multimodality is not only a social principle; it is also an *individual* phenomenon. It means that the different modes of communication are part of a person's own repertoire of communication forms. It implies that communication forms are "stored" in the person's mental system in such a way that they can be retrieved and activated for production (or for recognition). Within AAC, "alternative" symbols are often used, e.g., pictures or photographs (graphic symbols). Does the user have a mental representation of these that is similar to words in an internal lexicon? And how do internalized alternative symbols relate to words? Will they facilitate access to words?

Today's psycholinguistic models attempt to analyze speech and automaticity in communication: How is it possible that most people, when speaking, have little trouble finding the words to say? And how is it that these words seem to fall automatically into syntactic patterns? It is clear that fast internal processes precede the articulation of words. The most used model to describe the microgenesis of speech is Levelt's blueprint of the speaker (1993). This model proposes that the speaker finds the words in an internal lexicon and places them in a syntactic structure or template before actually starting speech. Similarly, AAC users will need to "navigate" their device to find the words or phrase they want to activate.

This navigation can simply consist of visually scanning a communication board, but it can also involve different steps through pages on a device to find the symbol that is looked for. Here lies another major challenge for AAC: Can AAC compete with the fast lexical access of typical communicators? How can we accelerate access?

RESEARCH AND AAC

Often the applications of AAC may appear to be merely common sense. “If the typical form of communication is not sufficient, try to add or replace it with something else,” sounds like a no-brainer. And yet, it is not as simple as that. The “commonsense approach” (just do something that works) holds another risk: It may seem to absolve practitioners from evidence-based self-reflection. In the initial years of AAC, practitioners and users were often satisfied if some solution brought an improvement to the baseline of “virtually no communication.” That is no longer acceptable. The field demands that practitioners and users look for the best possible solution, individualized to the needs and potential of the person. A “one-size-fits-all approach” is impossible to defend: If all AAC clients are using the same system, the same software or app, or the same device, then it seems unlikely that all individual needs are met. In other words, the field needs practitioners, researchers, consultants, and users who reflect on decisions to be made, and critically appraise the progress in the light of what is reasonable and can be explained and predicted rooted in a good understanding of our growing body of knowledge and research.

In the past decade, the field of AAC has grown and its foundations have deep-

ened. New developments include the many advances of technology, interconnectivity between users and practitioners, but also a better understanding of the demands of evidence-based practice, the applications of neuropsychological techniques, and a better understanding of how AAC use can facilitate cognitive development, learning, and social participation. Some of these new developments are discussed in this new edition of the book.

THE DISCUSSIONS AND THE DEBATES

AAC would not be a developing discipline if we would not have discussions and debates through which differences in perspectives would come to the foreground. These forums are what drives research, advances our thinking, and ultimately lead to better services to AAC users.

Some discussions include

- Are the advances in technology commensurate with the applications in the field?
- How can we respect cultural individuality in AAC users?
- Should AAC intervention be focused on vocabulary?

THE FUTURE OF AAC

In the past few years (and probably in the near future) applications of AAC have multiplied thanks to more affordable and faster technology (especially mobile computing and tablet technology). These developments are welcomed and encouraged because they make AAC available

to more individuals with fewer financial costs. It also “normalizes” AAC more as it blurs the distinction between disabled and non-disabled people since they both use the same type of devices for communication and information.

However, these new developments do not alter the framework within which AAC is defined: as a facilitation of information processing and information exchange.

The future of AAC continues to be exciting (Light & McNaughton, 2012). Besides (and partially because of) the increased availability of AAC solutions, a number of other developments are remarkable. Expectations are likely to be higher than ever: If we have more and better tools, we should have better results. Also, the fact that more individuals use AAC solutions, it becomes more possible to compare outcomes that lead to evidence-based practice (Schlosser & Raghavendra, 2004). Finally, I believe that AAC will become more than just an applied discipline. It tells us something about the potential of humans to go beyond standard forms of information exchange in communication. Natural speech will probably remain the standard and the norm of direct human communication. But alternatives to natural speech are as normal and a testimony of human resilience. The study of AAC use is potentially a very promising data source to demonstrate how people process and structure information that is brought to them through a combination of different modalities.

THE STRUCTURE OF THIS BOOK

This book is organized in 15 chapters, each focusing on an aspect of AAC.

Chapter 1 is the introductory chapter in which some of the basic concepts and terminology are explained.

Chapters 2 and 3 present the reader with the issue of access. Chapter 2 employs the blueprint of the speaker, a model proposed by the psycholinguist speaker that indicates how speech is the result of a parallel multi-componential process of word and sentence activation. The model is useful to pinpoint where in the process elements are different when non-typical communication (such as manual signs or the activation of a speech-generating device) occurs. Chapter 3 describes where in the process technological prostheses could be inserted to perform parts of the communication process.

Chapter 4 discusses the symbols, which are the units of meaning within a communication system. Spoken or written words are clearly symbols. Specific to AAC, probably the best-known symbols are graphic symbols (pictures, or a graphic representation of an object or idea based), but manual symbols, eye-blinking, or other movements can also serve as symbols.

In Chapter 5, we discuss vocabulary and lexicon in relation to AAC. In the past decade, many researchers and practitioners have defended the idea that working from and around a core vocabulary (a limited set of highly frequently used and usable words or symbols) is often a preferred practice to allow users to quickly access words on devices and generate messages.

Chapter 6 is about prelinguistic development and how AAC techniques can be used to help launch early communicative behaviors, which are typically displayed by children in the first two years of life. AAC techniques offer some possibilities to facilitate early communication and the

transition from early non-linguistic to linguistic communication (i.e., use of symbols in a basic grammatical structure).

Chapter 7 gives an overview of today's thinking of AAC with and for individuals with autism spectrum disorders, a population to whom AAC techniques have increasingly found applications.

Chapter 8 addresses the question of language learning, and acquisition. In this chapter we touch on an important discussion: Does the use of an "alternative" form of communication lead to a different form of structuring? AAC increases a person's opportunities to express language (and its structures). This allows the environment to respond to the person's utterances and "teach" structures of grammar.

In Chapter 9, we explore how literacy can be pursued with AAC users. We address the question how the use of alternative communication forms impacts or influences the acquisition of reading and writing.

Chapter 10 deals with the issue of needs for alternative forms of communication in individuals who have acquired disorders. This implies that the persons have functioned without any need for an alternative mode until an accident occurs or a medical condition reduces the degree of use of natural speech or language.

Chapter 11 explores the specific nature of AAC in a medical environment such as hospitals.

Chapter 12 focuses on AAC assessment, both as a theoretical and an applied issue. Can AAC performance be measured, and what should be the norms of measurement? Aren't communication, and certainly AAC, idiosyncratic, and can it therefore not be reconciled with the idea that communication performance should be compared with others? Moreover, what we need in assessment is not so much a

measurement of the communication at the time of assessment, but a measurement of the potential to use and adapt new forms (alternative and augmentative) of communication.

Chapter 13 presents an attempt of a coherent vision on how AAC intervention can and should be organized.

In Chapter 14, the relation between AAC use and the community is explored. Communication, by definition, is a social activity. Communication is always shared by at least one other person. As a social process, communication is key to participation. Communication (or lack thereof) can reveal much of how people are valued, perceived, and awarded opportunities. Communication also can show equalities and inequalities in how individuals interact. Through the nature of their communication, people who use AAC are not always supported and encouraged to participate fully.

In Chapter 15, the focus is on the AAC experience from the perspective of the AAC user. Throughout the chapters, it should have become clear that complex communication needs must have a strong impact on a person's perception of life. Not being an AAC user myself, I felt most hesitant to write about these perspectives as they are, by definition, very personal and can be hardly reported by a third person.

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1

Augmentative and Alternative Communication: A General Introduction

WHAT IS AUGMENTATIVE AND ALTERNATIVE COMMUNICATION?

Mr. Luke D., a neighbor of mine, had a stroke a few years ago and has trouble speaking. He now uses a computer tablet that seems to speak for him.

Leilani V., the daughter of my cousin, has been diagnosed as being on the autism spectrum. Her speech is hard to understand, but they taught her to use pictures on a board to indicate what she wants. Communication with her family has improved considerably.

Mrs. Evelyn D. is paralyzed and can't move her arms. But she remains in contact with her friends through e-mail, texting, and social

media—thanks to eye gaze technology that allows her to use her computer.

And little Sven M., a six-year-old boy with severe developmental delays, uses manual signs to communicate, even though he is not deaf. Lately, his teacher has suggested that he could start using an app on his iPad to complement his sign communication.

All of these people use different forms of augmentative and alternative communication (AAC), which refers to the methods, tools, and theories of nonstandard linguistic and nonlinguistic forms of communication by and with individuals without or with limited functional speech (Figure 1–1).

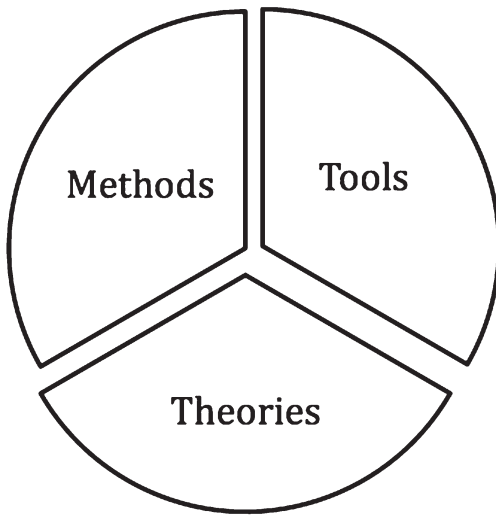


Figure 1–1. AAC methods, tools, and theories.

Methods include (1) the use of non-standard modalities, e.g., the use of manual signs or the use of a speech-generating communication device; (2) the “materialization” of the communication act, for example, picture or token exchanges between sender and receiver to make the communication more “tangible,” and (3) the modification of any parameter in the communication, e.g., bringing non-verbal communication forms more to the foreground in communication (e.g., the use of eye-gaze).

The *tools* are generally what make AAC stand out as a specific way of intervention or communicating. AAC tools include a variety of materials and devices varying from nontech, such as communication symbol cards and a communication vest, to low-tech means such as one-message switches, to high-tech computer-based communication devices. The tools of AAC also include any repertoire of communication forms such as manual signs, eye signaling codes, and basic nonlinguistic vocalizations.

Theories describe and explain how these forms of communication work and how they may or may not affect the user and the people with whom they interact. For example, theories attempt to explain how the different modalities work together in the mind of the AAC user. This includes the discussion about the compatibility of manual sign and speech: Does the use of signing facilitate or impede the development of speech? This has been a controversy among educators for more than two centuries. Theories also include the study of the impact on language acquisition by AAC users, the social impact for the AAC user, educational aspects such as AAC and literacy, AAC in the classroom, and the social perception and attitudes of communication partners. Theories should also account for differences and similarities among groups of AAC users: children (who are to acquire language), adults, individuals with neurogenic communication disorders (who may have lost linguistic or communicative functions), and so forth.

AAC is an *applied* discipline. This means that it uses information from other fields and sciences. Disciplines that inform our understanding of AAC (i.e., how AAC should be practiced) include developmental psychology, psycholinguistics, educational sciences, rehabilitation science, sociology, neuropsychology, computer sciences, and perception psychology. One could also consider AAC as a *translational discipline* because it incorporates developments and discoveries in other fields to improve the communication and interaction by individuals with limited functional speech. For example, most—if not all—of the technology used within AAC was not primarily developed with the purpose of serving individuals with special needs (e.g., the development

of synthetic speech) but was implemented in devices and apps to help the AAC users.

Theories within an applied discipline such as AAC must also be linked and dedicated to a growing body of evidence. Evidence-based practice is a principle of intervention that seeks to understand if and why a method works (or doesn't work), as well as which method yields the best results. One could argue that AAC is nothing other than common sense and "doing the right thing." Of course, it seems, if speech is not an option, it is not more than logical and reasonable to try something else. Choosing "something different" is, however, not as simple as it may seem. There is the fear or the uncertainty that "something different" means deviating from the norm, implying that the person would be placed in a deviant situation. This is most explicitly stated in the fear that "normal speech" would be sacrificed. Hence, AAC would create a problem, rather than solving a problem. This is discussed later in this chapter and more in detail in Appendix 1.

Also, "choosing something different" should not imply that just anything different will do the job. People who "need AAC" have specific and unique strengths, weaknesses, and potentials. There are no "one fits all" solutions within AAC. In the past decade, AAC users, practitioners, researchers, and developers have become aware of the importance to propose (and monitor) approaches, methods, and solutions that will yield the best results. Evidence-based practice (see Chapter 13) is a growing concern within AAC, although not without its challenges; for example, AAC users present with unique communication competence profiles (see Chapter 12), which makes it difficult to place them in comparable categories. Introduction of AAC always implies

choices, such as between devices, between vocabulary sets, or between learning steps. Practitioners need to be aware that evidence may or may not exist for these decisions (Thistle & Wilkinson, 2015).

In short, theories should provide a framework that helps us explain how AAC works. Theories are important, as they help predict and explain progress, as well as failure. Evidence and data resulting from observation can corroborate or weaken theories. For example, in the past, the use of alternative modes of communication was frequently considered to interfere negatively with the development of speech articulation skills. Underlying this opinion was the hypothesis that modalities are mutually exclusive and have a degree of incompatibility. However, observations and analysis of systematic studies of users of AAC now call for a revision of such theoretical assumptions: Modalities appear to operate in a mutually reinforcing way (Millar, Light, & Schlosser, 2006). Theories that emerge from observations and research must feed back into practices and into how AAC is conceptualized and practiced (Ryan et al., 2015). AAC constantly evolves as a result of new research, new practices, the analysis of outcomes, and how it will be translated into newer and better practice. In other words, how new evidence leads to impact the ways AAC is introduced, how decisions between interventions are made, and how it is evaluated against reasonable norms of progress (Smith, 2016). AAC will also evolve through more recent technological and societal developments. In the past decade, new forms of communication have become increasingly used by the general population: voice recognition software (Siri, Alexa, etc.), icons in apps (including emojis and animated Graphic Interchange Format pictures files or GIFs),

and conversion (translation) software have become the tools of millions of able-bodied users worldwide. One can wonder if this general development makes AAC more mainstream, as non-AAC users have adopted multiple modalities that are combined in a versatile way.

Although the term Augmentative and Alternative Communication (or AAC) was not coined and used until the early 1980s, the concept of using nonstandard communication forms to help individuals without speech or with limited speech has been around for centuries. AAC is typically not the term used for the most obvious and well-known solution for individuals with severe hearing impairment, but the use of manual signing (sign languages such as American Sign Language) in educational programs for deaf children is based on the same principle, which is the use of the most accessible modality (visual-gestural) to enable cognitive, social, linguistic, and academic development. The use of this principle goes back at least 250 years.

STANDARD AND NONSTANDARD FORMS OF COMMUNICATION

Standard linguistic forms of communication are speech/listening and writing/reading. We call them standard forms because they appear to be the most effective linguistic forms for typical language users.

Nonstandard forms of communication include gestures, vocalizations, body positions and body orientation, the use of graphic symbols, and eye gazing.

In the past two decades, electronic forms of communication have entered the realm of typical communication. These forms include e-mailing (computer-to-

computer communication) and increasingly mobile computing (tablet and cell phone technology). These developments continue to have an enormous impact on AAC as they help widen the selection of possibilities for individuals who need AAC. For example, the advent of tablet computing is considered by many to have dramatically changed the AAC world in terms of availability, cost structure, client-clinician relationship, and acceptability. New developments have also improved the quality of AAC technology. For instance, the improvement of intelligibility of digitized AAC speech is largely the result of mainstream research and development.

AAC is meant for *individuals without speech or with limited functional speech*. Although this is seldom explicitly described or mentioned, its traditional—or most often thought of—users are persons whose language and communication performances are not commensurate with their communicative, linguistic, and social potential. In the 1970s, during the earliest stages of AAC history, the first people to adopt AAC were often non-speaking children and adults with cerebral palsy whose speech limitations are clearly not due to linguistic, cognitive, or social impairments.

EARLY ASSUMPTIONS

This early view on the target user of AAC reveals three assumptions extending AAC in its use and applications. These assumptions have all been rightly refuted in the past three decades.

1. Early assumption #1: The success of AAC solutions depends on the cogni-

tive and linguistic skills as well as the motivation of the AAC user. Whereas this is certainly true, it largely underestimates the crucial role that is played by the communication partners. One cannot play tennis without a partner. If the communication partner has low expectations, does not respond, or does not provide communication opportunities, the AAC user's development will suffer.

2. Early assumption #2: AAC need not to be considered until more traditional speech and language intervention methods have failed. This "last resort" approach has often wasted important developmental potential in AAC users. Practitioners would frequently put off the introduction of AAC because they feared that it would make young users digress from normal development. An underlying fear was that there would be an incompatibility between natural speech and alternative forms of communication. Today, there is growing evidence that (1) there is no incompatibility between modalities, and (2) the use of a highly accessible modality reinforces early development. One striking development is that parents of typically developing children use Baby Signs to improve early communication and accelerate the transition from prelinguistic to linguistic communication (Goodwyn, Acredolo, & Brown, 2000). The underlying vision has shifted. Initially, it was feared that alternative forms of communication would get in the way of normal speech development. This general conviction has been contested for a simple reason: More accessible modalities have the potential to provide the child with experience in social exchanges (dia-

logues), naming, and self-expression. These experiences facilitate the transition to language. Applied to AAC, the early introduction of accessible communication is beneficial for social, linguistic, and cognitive development.

3. Early assumption #3: AAC was originally considered to be just about communication. AAC was considered to be something to remove a barrier, after which the actual intervention (linguistic, cognitive, social) could start. Today, AAC is more and more considered as an integral part of the intervention itself. For example, graphic symbols are now used in a wide range of didactic and educational tools, including schedules (Figure 1–2), calendars, and planning tools.

TERMINOLOGY

To understand AAC, it may be useful to focus on key terms:

- *Aided communication* refers to the use of aids external to the communicator's body; for example, symbol cards, a notebook, or a speech-generating communication device.
- *Unaided communication* refers to communication that is entirely established without external aids, such as natural speech, sign language, or gesturing.

Does the distinction between aided and unaided communication matter? Some practitioners have argued that it does. The fact that unaided communication is available to the person at all times is an important factor. It is suspected that

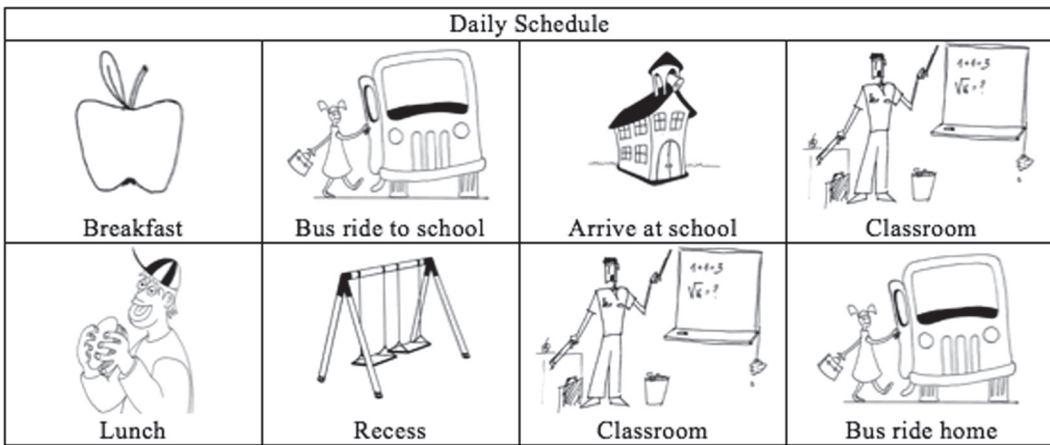


Figure 1–2. A communication board as a schedule.

unaided communication might be more natural and easier for maintaining eye-to-eye contact during communication. However, with the miniaturization of devices, it is not clear if this difference still has the same importance as it once had (see Chapter 3).

The following terms have been suggested and used to describe the person who uses AAC: AAC user, consumer, and person who uses AAC. More recently, the term *person with complex communication needs (CCN)* has been suggested and is increasingly used in the literature. The question is whether this term accurately describes who an AAC user is. For example, Lloyd (personal communication, 2012) points out that a person who has severe speech fluency problems could be characterized as having complex communication needs, even though one would generally not think that this person would need AAC. More recently, the obvious term *people who use augmentative and alternative communication (PWUAAC)* has been used (e.g., at the 2012 convention of the International Society for Augmentative and Alternative Communication, ISAAC). In this book, we

use more neutral terms—“people who use AAC” or “AAC user.”

Other terms that are relevant to understand AAC include: *communication*, *speech*, and *language*. *Communication* is the term used to indicate the exchange of information between at least two partners. AAC uses both linguistic and nonlinguistic means of communication. This communication can be linguistic (using language) or nonlinguistic (using all other forms of behaviors). *Language* refers to a socially shared code that is a specific rule-governed system consisting of phonology, a lexicon, morphology, and syntax. Many psycholinguists believe that language is a uniquely human system that only humans possess. *Speech* is one modality to express language. Speech is the result of encoding phonological sequences into articulatory gestures. It can be considered to be the preferred way of language output because it is rapid and effective, and because it is naturally embedded in face-to-face interaction. Speech is also relatively effortless—at least for a majority of language users. When speech is not an obvious and easy output of language, there are alterna-